P1 273485

3

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office

July 20, 2000

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A FILING DATE UNDER 35 USC 111.

REC'D 26 JUL 2000
WIPO PCT

APPLICATION NUMBER: *60/155,404*
FILING DATE: *September 22, 1999*
PCT APPLICATION NUMBER: *PCT/US00/15406*

By Authority of the
COMMISSIONER OF PATENTS AND TRADEMARKS

N. WILLIAMS
Certifying Officer

PRIORITY DOCUMENT
SUBMITTED OR TRANSMITTED IN COMPLIANCE WITH RULE 17.1(a) OR (b)

A / PROV

Please type a plus sign (+) inside this box → +

PTO/SB/16 (2-98)
Approved for use through 01/31/2001. OMB 0651-0037
Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53 (c).

INVENTOR(S)

Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)
Eliot I.	BERNSTEIN	500 S.E. Mizner Blvd. Suite 102 Boca Raton, FL 33432-6080

☐ *Additional inventors are being named on the ___ separately numbered sheets attached hereto*

TITLE OF THE INVENTION (280 characters max)

APPARATUS AND METHOD FOR PRODUCING ENHANCED VIDEO IMAGES AND/OR VIDEO FILES

CORRESPONDENCE ADDRESS

Direct all correspondence to:

☐ Customer Number ____ → *Place Customer Number Bar Code Label here*

OR *Type Customer Number here*

☒ Firm or Individual Name	Raymond A. Joao, Esq.				
Address	Meltzer, Lippe, Goldstein & Schlissel, P.C.				
Address	190 Willis Avenue				
City	Mineola	State	NY	ZIP	11501
Country	USA	Telephone	516-747-0300	Fax	516-747-9363

ENCLOSED APPLICATION PARTS *(check all that apply)*

☒ Specification *Number of Pages*	29	☒ Small Entity Statement	
☒ Drawing(s) *Number of Sheets*	4	☒ Other (specify)	Power of Attorney

METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT *(check one)*

☒ A check or money order is enclosed to cover the filing fees

☐ The Commissioner is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number: ____

FILING FEE AMOUNT ($): 75.00

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☒ No.

☐ Yes, the name of the U.S. Government agency and the Government contract number are: ____

Respectfully submitted,

SIGNATURE Raymond A. Joao

Date 9/22/99

TYPED or PRINTED NAME Raymond A. Joao, Esq.

REGISTRATION NO. *(if appropriate)* 35,907

TELEPHONE 516-747-0300, xtn-240

Docket Number: 5865-7

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

This collection of information is required by 37 CFR 1.51. The information is used by the public to file (and by the PTO to process) a provisional application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the complete provisional application to the PTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, D.C., 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Box Provisional Application, Assistant Commissioner for Patents, Washington, D.C., 20231.

Attorney Docket No.: 5865-7

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	**Eliot I. Bernstein**
Serial No.	:	**Please assign**
Filed	:	**Concurrently herewith**
Title	:	**APPARATUS AND METHOD FOR PRODUCING ENHANCED VIDEO IMAGES AND/OR VIDEO FILES**

"Express Mail" mailing label number EL355808546US

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated below and is addressed to: Box Provisional Application, Assistant Commissioner for Patents, Washington, D.C. 20231

Date of Deposit: September 22, 1999

(Signature): Nicole Eliseo Pinou

Nicole Eliseo-Pinou

Box Provisional Application
Assistant Commissioner for Patents
Washington, D.C. 20231

PROVISIONAL PATENT APPLICATION TRANSMITTAL LETTER

Sir:

Please find transmitted herewith for filing the following:

(1) Provisional Application for Patent Cover Sheet;

(2) Provisional Patent Application including Specification, Claims and Abstract - 29 pages, and Drawings - 4 sheets.

(3) Verified Statement Claiming Small Entity Status;

(4) Check in the amount of $75.00 for the filing fee;

(5) Power of Attorney form; and

(6) Return Receipt Postcard.

It is respectfully requested that the above papers be filed as a Provisional Patent Application.

Respectfully submitted,
MELTZER, LIPPE, GOLDSTEIN
& SCHLISSEL, P.C.

By: ______________________
Raymond A. Joao
Reg. No. 35,907

September 22, 1999

MELTZER, LIPPE, GOLDSTEIN
& SCHLISSEL, P.C.
190 Willis Avenue
Mineola, New York 11501

Tel. No.: (516) 747-0300
Fax No.: (516) 747-9363

P:\PUBLIC\PATENT\IVIEWIT\5865-7\

FROM : VERIFIED STATEMENT CLAIMING SMALL ENTITY STATUS
(37 CFR 1.9(f) & 1.27(b))--INDEPENDENT INVENTOR

Attorney Docket No.: 5865-7

Applicant or Patentee: Eliot I. Bernstein

Serial or Patent No.: Please assign

Filed or Issued: Concurrently herewith

Title: APPARATUS AND METHOD FOR PRODUCING ENHANCED VIDEO IMAGES AND/OR VIDEO FILES

As a below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees to the Patent and Trademark Office described in:

X the specification filed herewith with title as listed above.
— the application identified above.
— the patent identified above.

I have not assigned, granted, conveyed or licensed and am under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention as listed below:

X No such person, concern, or organization exists.
— Each such person, concern, or organization is listed below.

Separate verified statements are required from each named person, concern or organization having the rights to the invention averring to their status as small entities. (37 CFR 1.27)

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

ELIOT I. BERNSTEIN
NAME OF PERSON SIGNING

500 S.E. Mizner Boulevard
Suite 102
Boca Raton, FL 33432-6080
ADDRESS OF PERSON SIGNING

SIGNATURE

9/20/99

DATE

Attorney Docket No. 5865-7

APPARATUS AND METHOD FOR PRODUCING ENHANCED VIDEO IMAGES AND/OR VIDEO FILES

FIELD OF THE INVENTION

The present invention is directed to an apparatus and a method for producing enhanced images and/or video files and, in particular, to an apparatus and a method for producing enhanced resolution digital images and/or digital video files obtained via digital and/or film video cameras and/or recording devices.

BACKGROUND OF THE INVENTION

The fields of telecommunications, multimedia, and related areas, are growing at increasing rates. With this continued growth, the need for high resolution digital imagery, for utilization in conjunction with the corresponding technologies, is becoming greater. Current technologies utilize film cameras and recorders as well as digital cameras and recorders.

Conventional video and image technologies typically have very low zoom quality and low image size restrictions or limitations associated therewith. Generally speaking, enlarged images produce a higher resolution image, and an associated higher resolution scanning quality, which further facilitates an improved enlargement or reduction of the image for different

sizes and different depths, without pixel distortion. Photographs, negatives, and associated images, utilize pixels which typically have a certain size. When enlarged or reduced, these pixels of the image become distorted, a feature which typically results in the image being fixed to an original size, or being available at very low magnifications, such as, for example, magnifications of from 200 times to 300 times. These images are also difficult to enlarge to a full screen size without a tremendous amount of distortion present in the end product.

Currently, panoramic imaging techniques utilize non-enlarged images as their starting point. With such associated limitations, the ability to provide enhanced resolution digital images and, especially, an enhanced resolution digital panoramic image, such as those utilized on, or over, the Internet and/or the World Wide Web, has been greatly compromised.

Another major drawback in the current technology lies in the fact that conventional processes often utilize panoramic lenses in order to capture an image. This practice has been criticized as creating distortions in the image immediately upon the image's enlargement or reduction. The conventional techniques associated with the use of panoramic lenses are known to result in image "bending", which further curtails one's ability to obtain realistic views, especially upon performing any associated

cropping and/or editing processes. In such instances, the upper end and the lower end of the image must be either erased, or covered, in order to prevent the flaw from being exposed. This typically results in the resulting image having a "fishbowl-type" distortion.

In some instances, wide angle lenses have been utilized in order to obtain enhanced floor to ceiling images without experiencing image bending. In these applications, however, the ability of the lens to capture optimal images varies depending upon the scene or image being photographed.

As a result, the ability to obtain enhanced video images and/or video files from film cameras and film recorders, from negatives and from digital cameras and recorders, has been limited.

SUMMARY OF THE INVENTION

The present invention provides an apparatus and a method for providing enhanced digital video images and/or digital video files which overcomes the shortcomings of the prior art. The digital images and/or digital files produced by utilizing the present invention can be easily managed, when displayed, projected, and/or posted on any viewing device and/or entity such

as, but not limited to, an Internet Web server, Web site or Web page, television, etc.

The present invention provides an apparatus and a method for producing enhanced digital video images and video files from video which may be recorded as print film image or file, a negative image or file, and/or a digital video image and/or file. The video images and/or files may be obtained via a digital camera, a digital recording device, a digital recorder, a digital camcorder, a film video camera, recorder, and/or camcorder, a VHS video camera, recorder, and/or camcorder, a beta video camera, recorder, and/or camcorder, and/or any other suitable video recording device.

The video images and/or video files which are produced by the apparatus and method of the present invention have improved and enhanced resolution and require far less effort in the associated maintenance and management of same. The video images and/or files, which are produced by the apparatus and method of the present invention, can be utilized and displayed on computers, projection devices, televisions, and, as noted above, can be posted to an Internet Web server, a Web site, and/or a Web page. The video images and/or files can be transmitted over a communication network and/or in computer-to-computer applications.

The present invention, in a preferred embodiment, is utilized to produce enhanced video images and/or files for posting and/or for downloading, to a digital display medium, which in the preferred embodiment, is an Internet and/or a World Wide Web server, a Web site, and/or Web page. In this manner, enhanced video images and/or video files can be produced from video images and/or video files which can be recorded using any video recording device and recording medium such as, but not limited to, digital cameras, digital recorders, film cameras, film recorders, etc. The video images and/or files obtained are thereafter processed in accordance with the apparatus and method of the present invention in order to produce enhanced video images and/or video files.

These resulting video images and/or video files have enhanced resolution which is unaffected by the typical resolution limiting and degrading parameters and phenomena which are associated with conventional digital and/or film video cameras, recorders and corresponding processing equipment, methods and/or techniques.

The apparatus can include a video camera or recorder which can be any one of an analog camera and/or a digital camera, an analog and/or digital recording device, an analog and/or digital camcorder, a film camera, a film recording device, and/or a film camcorder. For full motion video, a 3CCD chip, and/or any other

appropriate and/or suitable motion capture recording device, can be utilized in conjunction with the present invention. The camera can also be a hand-held camera, a fixed camera, and/or a camera which is mountable, such as on a tripod or on a stand. The camera can be utilized to obtain the video image and/or video file which will be processed in accordance with the present invention.

The present invention preserves image integrity from the point of capture of the image through and including any final compression or compressions of same. The apparatus can also include a developing device, which can be utilized for developing video images and/or files which are obtained on film. In the case of video images and/or files which are obtained digitally, no developing device would be needed. The apparatus can also include an enlarging device which can be utilized to enlarge the video images obtained. An enlarger can be utilized for enlarging either film images and/or digital images.

The apparatus can also include a computer, for performing the various processing routines during operation of the apparatus and method of the present invention. The computer may be a personal computer, a laptop computer, a mini-computer, a microcomputer, a mainframe computer, a network computer, a server computer, and/or any other suitable computer or computer system.

The computer can include a central processing unit (CPU), a read only memory (ROM), a random access memory (RAM), a display device, an input device and an output device. The input device may include a keyboard, a mouse, or other pointing device, and/or any other data and/or command input device, for allowing for data and/or command input by a user. The output device may include a printer and, in the preferred embodiment, the printer may be a color laser printer or a color inkjet printer. The computer can also include a receiver for receiving data and/or information over a communication network and a transmitter for transmitting data and/or information over the communication network.

The computer can also include a video capture device, which may or may not be an integral component of the computer. The video capture can also be an external peripheral device. Video data and/or information can be fed into, and/or played through, the video capture device, thereby digitizing the video data and/or information. The present invention preserves the integrity of any and/or all data and/or information upon conversion to digital formats. If full motion video is captured, any conversion can utilize full motion capture software and/or hardware. The video data and/or information can be fed into, and/or through, the video capture card, in real-time, thereby facilitating real-time video transmissions.

The computer can also include any other hardware device or peripheral device and/or software which is, or which may be, needed and/or desired in order to perform any of the functions and/or operation described herein. The computer can also include a video data capture device for capturing and processing the video images and/or files processed by the present invention.

The apparatus can also include a scanning device, for scanning video images or files, if needed, whether they be of a digital or of a print film type, in order to obtain a digital image representation of same.

The apparatus and method of the present invention provides video images and/or files which have enhanced resolution and quality while requiring less file management efforts.

The resulting video images and/or files which are obtained via the apparatus and method of the present invention are characterized by a high definition resolution and are suitable for high definition television, Web television, and large, full screen, panoramic Internet applications, including video playback and/or video transmission, which preserving resolution upon image and/or video file magnification or reduction.

The present invention also facilitates high speed file transfers of high resolution video images and/or video files,

thereby dispensing with the need to engage in long and slow conventional file downloads and/or file transfers.

The apparatus and method of the present invention can also be utilized in conjunction with three-dimensional images and video files in order to produce high resolution, three-dimensional video images and/or video files.

Accordingly, it is an object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files from files obtained via digital and/or film video cameras and/or a recording devices.

It is another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files from files obtained via digital and/or film video cameras and/or a recording devices, which have improved and enhanced resolution.

It is still another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, from files obtained via digital and/or film video cameras and/or a recording

devices digital images, which are suitable for display and/or for downloading to a digital computer, a television, and/or any other communication device utilized in a telecommunication environment and/or communications environment.

It is still another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, from files obtained via digital and/or film video cameras and/or a recording devices, which are characterized by image compression and/or minimal image compression thereby avoiding any dramatic loss in image quality.

It is another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, from files obtained via digital and/or film video cameras and/or a recording devices, which may dispense with the need to compress the image data.

It is yet another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, from files obtained via digital and/or film video cameras and/or a recording devices, which are characterized by high definition resolution, and which are suitable for high definition television, Web television and

large, full screen, panoramic internet applications, without loss of resolution upon image magnification or reduction.

It is another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, from files obtained via digital and/or film video cameras and/or a recording devices, which can be transmitted in a network environment.

It is still another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, from files obtained via digital and/or film video cameras and/or a recording devices, which facilitates high speed file transfer in a network environment and/or in a computer environment.

It is another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, which preserves image integrity from the point of capture of the image through and including final compression or compressions.

It is still another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, which

preserves the integrity of any and/or all data and/or information upon conversion to digital formats.

Other objects and advantages of the present invention will be apparent to those skilled in the art upon a review of the Description of the Preferred Embodiment taken in conjunction with the Drawings which follow.

BRIEF DESCRIPTION OF THE DRAWINGS

In the Drawings:

Figure 1 illustrates the apparatus of the present invention, in block diagram form; and

Figures 2A, 2B and 2C illustrate the method of the present invention, in flow diagram form.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention provides an apparatus and a method for providing enhanced digital video images and/or digital video files which can be utilized and which can be easily managed, when displayed, projected, and/or posted on any viewing device and/or entity such as, but not limited to, an Internet Web server, Web site or Web page, television, etc. In particular, the present

invention provides an apparatus and a method for producing enhanced digital video images and video files from video which may be recorded as a digital video image and/or files and/or as a film video image and/or file a print film image.

The video images and/or files may be obtained via a digital camera, a digital recording device, a digital recorder, a digital camcorder, a film video camera, recorder, and/or camcorder, a VHS video camera, recorder, and/or camcorder, a beta video camera, recorder, and/or camcorder, and/or any other suitable video recording device. The video images and/or video files which are produced by the apparatus and method of the present invention have improved and enhanced resolution and require far less effort in the associated maintenance and management of same. The video images and/or files, which are produced by the apparatus and method of the present invention, can be utilized and displayed on computers, projection devices, televisions, and, as noted above, can be posted to an Internet Web server, a Web site, and/or a Web page. The video images and/or files can be transmitted over a communication network and/or in computer-to-computer applications.

The present invention, in a preferred embodiment, is utilized to produce enhanced video images and/or files for posting and/or for downloading, to a digital display medium, which in the preferred embodiment, is an Internet and/or a World

Wide Web server, a Web site, and/or Web page. In this manner, enhanced video images and/or video files can be produced from video images and/or video files which can be recorded using any video recording device and recording medium such as, but not limited to, digital cameras, digital recorders, film cameras, film recorders, etc. The video images and/or files obtained are thereafter processed in accordance with the apparatus and method of the present invention in order to produce enhanced video images and/or video files.

These resulting video images and/or video files have enhanced resolution which is unaffected by the typical resolution limiting parameters and phenomena which are associated with conventional digital and film video cameras, recorders and corresponding processing equipment, methods and/or techniques.

Figure 1 illustrates the apparatus of the present invention which is denoted generally by the reference numeral 100, in block diagram form. With reference to Figure 1, the apparatus 100 includes a video camera or recorder 105 which, in the preferred embodiment, can be any one of a digital camera, a digital recording device, digital camcorder, a film camera, a film recording device, and/or a film camcorder. In the preferred embodiment, the camera 105 may be a hand-held camera, a fixed camera, and/or a camera which is mountable, such as on a tripod or on a stand. The camera 105 is utilized to obtain the video

image and/or video file which will be processed as described herein.

For full motion video, a 3CCD chip, and/or any other appropriate and/or suitable motion capture recording device, can be utilized in conjunction with the present invention.

The present invention can also be utilized in conjunction with any imaging and/or any video recording device and/or equipment, such as, but not limited to, those devices and equipment utilized in, or in conjunction with, medical imaging equipment, devices and/or instruments, motion picture production equipment, devices and/or instruments and/or in any other equipment, device, and/or instrument, which is, or which can be, utilized in conjunction with imaging and/or video applications and/or uses.

The apparatus 100 also includes a developing device 115, which would be utilized for developing video images and/or files which are obtained on film. In the case of video images and/or files which are obtained digitally, no developing device. The apparatus also includes an enlarging device which can be utilized to enlarge the video images obtained. The apparatus can include an enlarger for both film images as well as for digital images.

The apparatus 100 also includes a computer 120, for performing the various processing routines during operation of the apparatus and method of the present invention. The computer 120 may be a personal computer, a laptop computer, a mini-computer, a microcomputer, a mainframe computer, a network computer, a server computer, and/or any other suitable computer or computer system.

The computer 120 includes a central processing unit (CPU), a read only memory (ROM), a random access memory (RAM), a display device, an input device and an output device. The input device may include a keyboard, a mouse, or other pointing device, and/or any other data and/or command input device, for allowing for data and/or command input by a user. The output device may include a printer and, in the preferred embodiment, the printer may be a color laser printer or a color inkjet printer. The computer 120 also includes a receiver for receiving data and/or information over a communication network and a transmitter for transmitting data and/or information over the communication network.

The computer 120 also includes a video capture device 121 which, in the preferred embodiment, is an integral component of the computer 120. The video capture device 121, in the preferred embodiment, is a video capture card 121 which is located internal to the computer 120. The video computer device 121 may also be an external peripheral device. As described

herein, the video data and/or information is fed into, and/or played through, the video capture device 121, thereby digitizing the video data and/or information. The video data and/or information can be fed into, and/or through, the video capture card 121, in real-time, thereby facilitating real-time video transmissions.

The computer 120 may also include any other hardware device or peripheral device and/or software which is, or which may be needed and/or desired in order to perform any of the functions and/or operation described herein. In particular, the computer 120 will also include a video data capture device for capturing and processing the video images and/or files processed by the present invention.

The apparatus 100 also includes a scanning device 125, for scanning video images or files, if needed, whether they be digital or of a print film type, in order to obtain a digital image representation of same. Any suitable computer or scanner, and any suitable scanning software, may be utilized in conjunction with the present invention. In a preferred embodiment, any suitable scanning device can be utilized in conjunction with any appropriate software.

Figures 2A, 2B and 2C illustrate the method of the present invention, in flow diagram form. With reference to Figures 2A, 2B and 2C, the method of the present invention commences at step 200. At step 201, the video images and/or files are recorded with the video camera 105. The video can be recorded in any format, such as, but not limited to, i.e., beta, VHS, digital, and/or any of the standard file formats, including, but not limited to, *.AVI, *.MOV, *.MPEG, etc., by utilizing the video recording device 105. The video recording device 105 may also be a reel-to-reel recording device and/or a live video recording device.

At step 202, the video images and/or files are converted to a converted to digital files, if necessary, by utilizing the scanner 110. At step 203, digital video image files are loaded into the computer 120 for processing. At step 204, the video image files are fed into, or through, the capture device 121 of the computer 120. The video capture operation, which is performed by the video capture device 121, in the preferred embodiment, can be performed without compression and/or encoding operations being performed on the video image files and/or with only minimal compression and/or encoding operations being performed on the video image files.

The video capture device, in the preferred embodiment, can be any suitable video capture device or card and/or any other

appropriate and/or suitable video capture hardware. The capture software utilized can be any appropriate and/or suitable video capture software.

At step 205, the video images and/or files are edited, if necessary, by using any standard video editing tools, such as, for example, any editing software. At step 206, the video image files are then converted to any suitable real video format such as, for example, a *.RM format. At step 207, the size of the video within the file code is set either manually or automatically. In the preferred embodiment, the size of the video is set within the file code, which may or may not be the HTML file code to a 640 x 480 frame resolution, or any other suitable resolution, such as, but not limited to, 800 x 600, 1024 x 768, 1280 x 1024, 1600 x 1200 or other sizes.

At step 208, the obtained video image file or files is then posted to the computer 120 and/or to another hosting computer. If the posting is to an computer other than the computer 120, the posting is performed by transmitting the video file or files over a communication network to the hosting computer. In the preferred embodiment, the video file or files are posted via the Internet, and/or the World Wide Web, and can posted to a Web Page, a Web site, and/or any other network device. The posting operation is performed by utilizing any suitable posting software.

At step 209, the computer 120 or other hosting computer generates or writes a file or script, such as an ASCII file which calls the video to stream or to download. This results in video which will stream or "streaming" video for a full screen application which will be characterized by a good clarity and quality. At step 210, a separate file or script, such as an ASCII file is written and saved to an appropriately formatted file, such as an *.RPM file, or other suitable file format, which will call the original video file. This script can be typically included in any suitable code, such as an HTML code.

In the case of MPEG videos, Steps 201 through 203 are followed as described above. At step 204, however, the video file is converted, if not previously converted, to an MPEG format. Thereafter, the video is inserted into the appropriate file which may contain suitable coding, such as HTML codes. Thereafter, the file can be sized to any of herein-described resolutions. Thereafter, the video file is uploaded to the hosting computer, if utilized. Thereafter, the MPEG file is played from the computer 120 or the hosting computer, the Web page, and/or the Web site, depending upon the application, by first downloading a small portion of the file and by playing the file through a suitable device such as a player which supports any suitable video formats, such as AVI, MPEG-type, etc., and/or other suitable formats.

Thereafter, operation of the apparatus ceases at step 210.

The processing steps described herein provide for the production of video images and/or video files which have enhanced resolution and which can be easily and effectively managed in applications involving the display of same, the posting of same, to a host computer, a Web server, a Web site, a Web page, a computer display, a full screen projection display and/or a video presentation and/or playback of same, respectively. Further, the method of the present invention provides for image processing, including various image and/or file processing techniques, which may or may not include image compression and/or encoding operations.

The apparatus and method of the present invention provides video images and/or files which have enhanced resolution and quality while requiring less file management efforts.

The resulting video images and/or files which are obtained via the apparatus and method of the present invention are characterized by a high definition resolution and are suitable for high definition television, Web television, and large, full screen, panoramic Internet applications, including video playback and/or video transmission, which preserving resolution upon image and/or video file magnification or reduction. The present invention also dispenses with the need for plug-in software

during download and/or file transfer operations. The present invention also facilitates high speed file transfers of high resolution video images and/or video files, thereby dispensing with the need to engage in long and slow conventional file downloads and/or file transfers.

The apparatus and method of the present invention can also be utilized in conjunction with three-dimensional images and video files in order to produce high resolution, three-dimensional video images and/or video files.

The present invention preserves image integrity from the point of capture of the image through, and including, any final compression or compressions of same.

The present invention also preserves the integrity of any and/or all data and/or all information upon conversion to digital formats. If full motion video is captured, any conversion can utilize full motion capture software and/or hardware.

The resulting video images and/or files, which are obtained via the apparatus and method of the present invention, can be utilized, in any and/or all of the embodiments described herein, in conjunction with data and/or information which can be provided by any other and/or any external information source. The data and/or information may contain, but is not limited to, data

and/or information of and for sound and/or audio files, text files, video files, image files, and/or graphics files, and/or any other information source, data, information and/or file, which can be, and/or which may be linked to or with, and/or which can be operated and/or utilized in conjunction with, any video and/or image data and/or information. For example, any image and/or video data, information, or file, obtained via the present invention, can be utilized in conjunction with any sound file, audio file, text file, video file, image file, and/or graphics file, and/or any other data, information and/or file utilized in a multimedia environment, thereby providing for the utilization of enhanced images and/or video in conjunction with the respective file.

While the present invention has been described and illustrated in various preferred embodiments, such descriptions are merely illustrative of the present invention and are not to be construed to be limitations thereof. In this regard, the present invention encompasses any and all modifications, variations, and/or alternate embodiments, with the scope of the present invention being limited only by the claims which follow.

CLAIMS

What Is Claimed Is:

1. An apparatus for producing a digital image, comprising:

a device for generating a digital signal file from an image; and

a processor for processing said digital signal file and for generating an image file,

wherein said processor generates a first signal file from said digital signal file, and further wherein said processor processes said first signal file and generates said image file.

2. The apparatus of claim 1, further comprising:

one of a camera and a recording device for obtaining one of a photographic representation of an image, a film image, a negative image and a digital image.

3. The apparatus of claim 2, further comprising:

a developing device for developing one of said photographic representation of an image, a film image and a negative image.

4. The apparatus of claim 3, further comprising:

an enlarging device for enlarging said image.

5. The apparatus of claim 4, further comprising:

a scanning device for generating said digital signal file from said one of photographic representation of an image, a film image and a negative image.

6. The apparatus of claim 1, further comprising:

a video capture device for one capturing and processing said digital signal file.

7. The apparatus of claim 1, wherein said first signal file is an image file.

8. An apparatus for producing a digital image, comprising:

means for generating a digital signal file from an image file; and

means for processing said digital signal file and for generating an image file,

wherein said processing means generates a first signal file from said digital signal file, and further wherein said processing means processes said first signal file and generates said image file.

9. The apparatus of claim 8, further comprising:

means for obtaining said one of a photographic representation of an image, a film image, a negative image and a digital image.

10. The apparatus of claim 8, further comprising:

means for developing said one of photographic representation of an image, a film image and a negative image.

11. The apparatus of claim 8, further comprising:

means for enlarging said image.

12. The apparatus of claim 8, further comprising:

means for generating said digital signal file from said image.

13. The apparatus of claim 8, further comprising:

means for one of capturing and processing said digital signal file.

14. A method for producing a digital image, comprising:

generating a digital signal file from an image;

processing said digital signal file; and

generating an image file, wherein said processing operation further comprises:

generating a first signal file from said digital signal file; and

processing said first signal file and generating said image file.

15. The method of claim 14, further comprising:

obtaining one of a photographic representation of an image, a film image, a negative image and a digital image..

16. The method of claim 14, further comprising:

developing said one of photographic representation of an image, a film image, and a negative image; and

generating said image.

17. The method of claim 14, further comprising:

enlarging said image.

19. The method of claim 14, further comprising:

generating said digital signal file from said image.

20. The method of claim 14, further comprising:

one of capturing and processing said digital signal file.

21. The apparatus of any one of claims 1 to 13, wherein said image file is utilized in conjunction with at least one of a sound file, an audio file, a text file, a video file, an image file, and a graphics file.

22. The method of any one of claims 14 to 20, wherein said image file is utilized in conjunction with at least one of a sound

file, an audio file, a text file, a video file, an image file, and a graphics file.

ABSTRACT OF THE DISCLOSURE

An apparatus and method for producing a digital image, including a device for generating a digital signal file from an image and a processor for processing said digital signal file and for generating an image file. The processor generates a first signal file from the digital signal file. The processor processes the first signal file and generates the image file.

Attorney Docket No.: 5865-7

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

POWER OF ATTORNEY

Application of:	Eliot I. Bernstein
Serial No.:	Please assign
Filed on:	Concurrently herewith
Title:	APPARATUS AND METHOD FOR PRODUCING ENHANCED DIGITAL VIDEO IMAGES AND/OR VIDEO FILES

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

RAYMOND A. JOAO, Reg. No. 35,907

Address all telephone calls to Raymond A. Joao at telephone number: (516) 747-0300
Address all correspondence to Meltzer, Lippe, Goldstein and Schlissel, P.C.
190 Willis Avenue
Mineola, New York 11501

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of the sole inventor (given name, family name): ELIOT I. BERNSTEIN	
Inventor's signature: >	Date: > 9/22/99
Residence: 500 S.E. Mizner Boulevard Suite 102 Boca Raton, FL 33432-6080	Citizenship: U.S.A.
Post Office Address: SAME AS ABOVE	

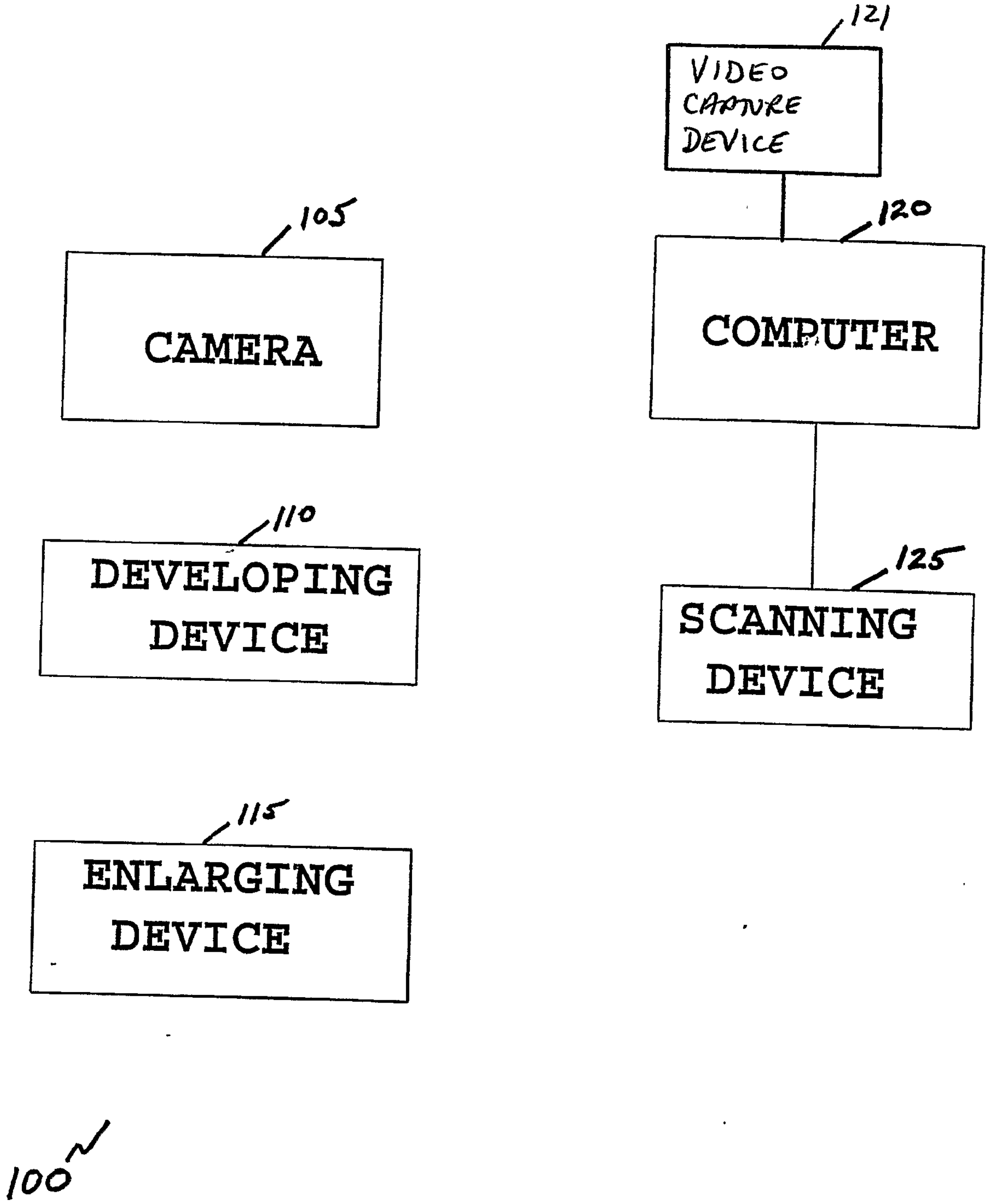


FIG. 1

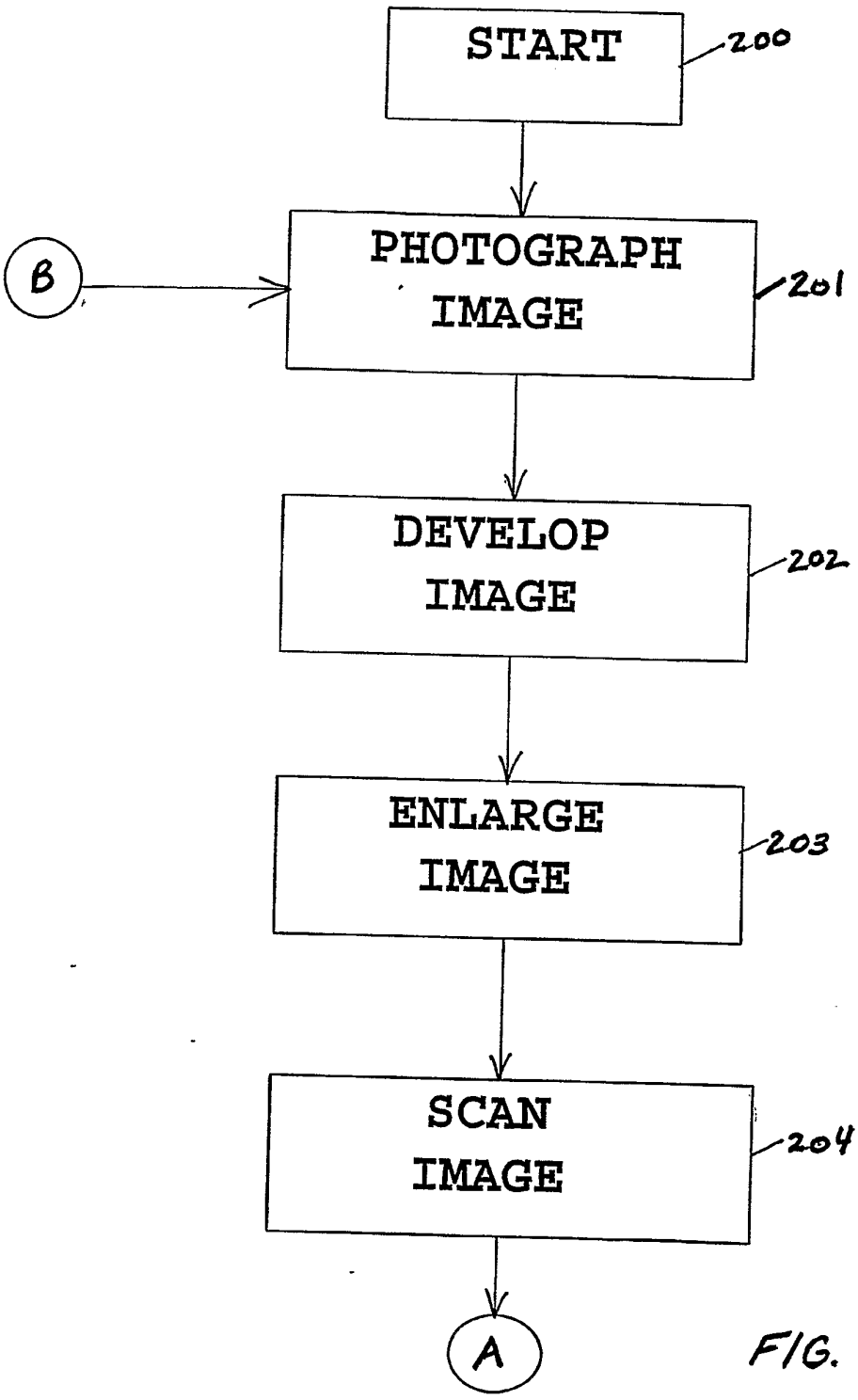

START
200
B
PHOTOGRAPH IMAGE
201
DEVELOP IMAGE
202
ENLARGE IMAGE
203
SCAN IMAGE
204
A

FIG. 2A

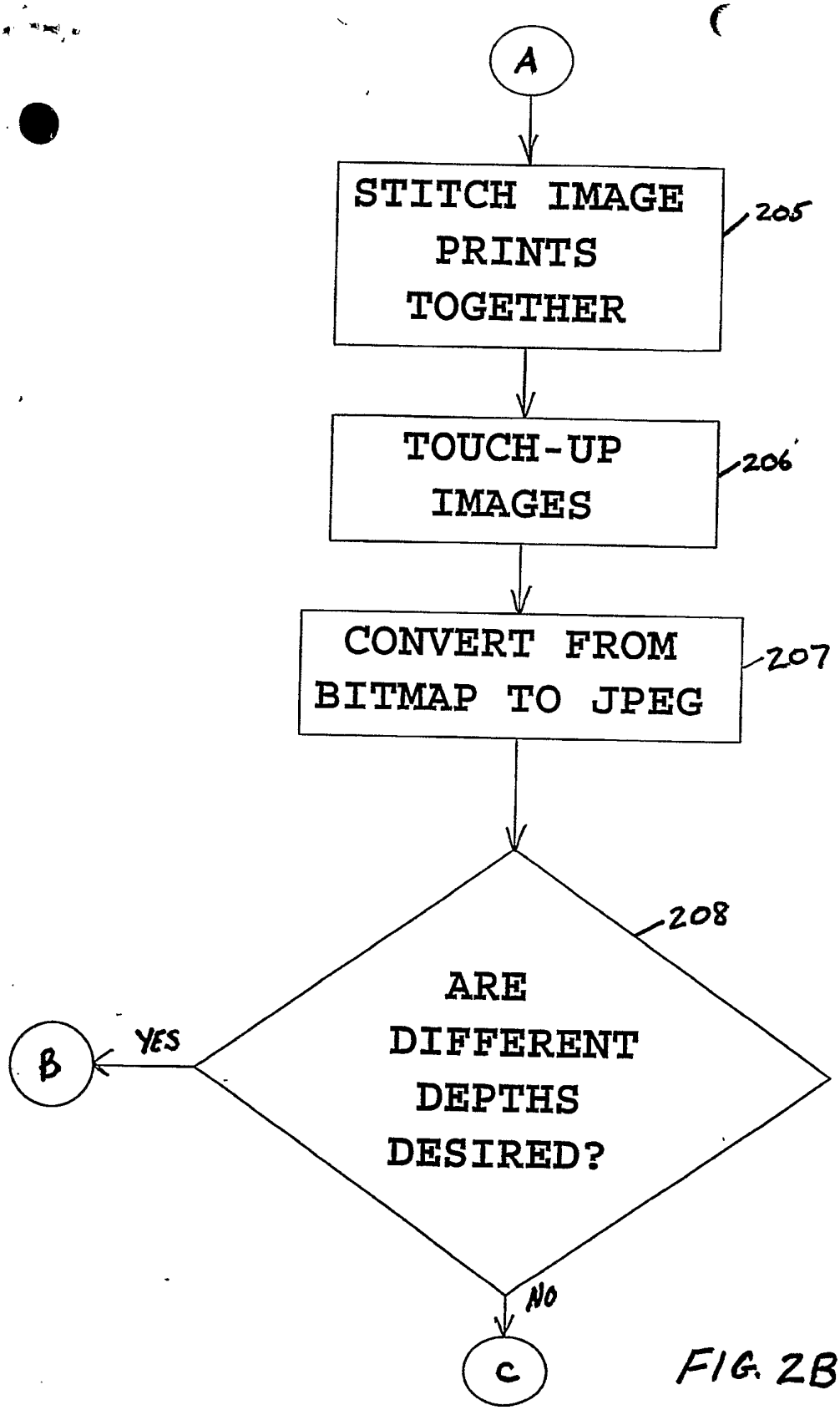


FIG. 2B

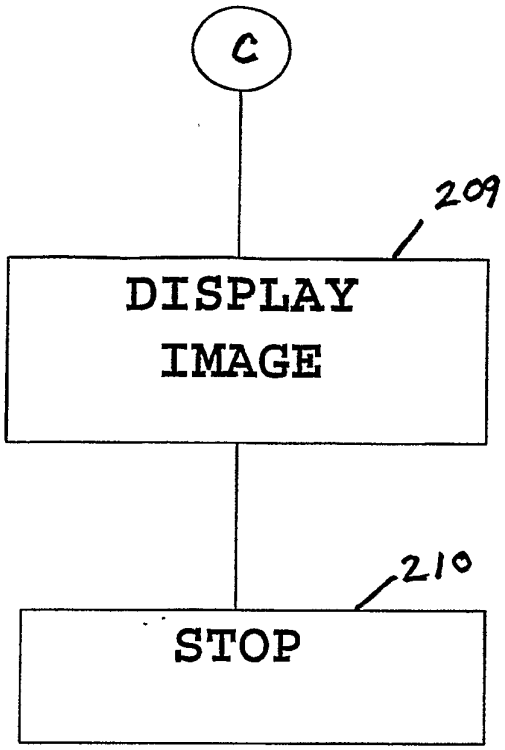


FIG. 2C

3

P1 273486

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office

July 18, 2000

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A FILING DATE UNDER 35 USC 111.

REC'D 24 JUL 2000
WIPO PCT

APPLICATION NUMBER: *60/169,559*
FILING DATE: *December 08, 1999*
PCT APPLICATION NUMBER: *PCT/US00/15406*

By Authority of the
COMMISSIONER OF PATENTS AND TRADEMARKS

N. WILLIAMS
Certifying Officer

PRIORITY DOCUMENT
SUBMITTED OR TRANSMITTED IN COMPLIANCE WITH RULE 17.1(a) OR (b)

Please type a plus sign (+) inside this box → [+]

PTO/SB/16 (2-98)
Approved for use through 01/31/2001. OMB 0651-0037
Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53 (c).

INVENTOR(S)		
Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)
ELIOT	BERNSTEIN	500 S.E. Mizner Road Suite 102 Boca Raton, FL 33432

☐ *Additional inventors are being named on the ___ separately numbered sheets attached hereto*

TITLE OF THE INVENTION (280 characters max)

APPARATUS AND METHOD FOR PRODUCING ENHANCED VIDEO IMAGES AND/OR VIDEO FILES

CORRESPONDENCE ADDRESS

Direct all correspondence to:

☐ Customer Number [ ] → *Place Customer Number Bar Code Label here*

OR *Type Customer Number here*

[XX] Firm *or* Individual Name	RAYMOND A. JOAO, ESQ.				
Address	MELTZER, LIPPE, GOLDSTEIN & SCHLISSEL, P.C.				
Address	190 WILLIS AVENUE				
City	MINEOLA	State	NEW YORK	ZIP	11501
Country	USA	Telephone	516-747-0300	Fax	516-747-9361

ENCLOSED APPLICATION PARTS *(check all that apply)*

[X] Specification *Number of Pages*	47	☐ Small Entity Statement	
[X] Drawing(s) *Number of Sheets*	5	[X] Other (specify)	return postcard

METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT *(check one)*

[X] A check or money order is enclosed to cover the filing fees

☐ The Commissioner is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number: [ ]

FILING FEE AMOUNT ($): $150.00

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

[X] No.

☐ Yes, the name of the U.S. Government agency and the Government contract number are: _____

Respectfully submitted,

SIGNATURE [signature]

TYPED or PRINTED NAME RAYMOND A. JOAO

TELEPHONE 516-747-0300

Date 12/8/99

REGISTRATION NO. *(if appropriate)* 35,907

Docket Number: 5865-8

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

12-09-99 A/PROV

Attorney Docket No.: 5865-8

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:	Eliot I. Bernstein
Serial No.:	Please assign
Filed on:	Concurrently herewith
Title:	APPARATUS AND METHOD FOR PRODUCING ENHANCED VIDEO IMAGES AND/OR VIDEO FILES

Box Provisional Application
Assistant Commissioner for Patents
Washington, D.C. 20231

PROVISIONAL PATENT APPLICATION TRANSMITTAL LETTER

Sir:

Please find transmitted herewith for filing the following:

(1) Provisional Application for Patent Cover Sheet;

(2) Provisional Patent Application, including Specification, Claims and Abstract of the Disclosure (47 pages) and Drawings (5 sheets);

(3) Check in the amount of $150.00 for the filing fee;

(4) Power of Attorney form; and

(5) Return Receipt Postcard.

It is respectfully requested that the above papers be filed as a Provisional Patent Application.

Respectfully submitted,
MELTZER, LIPPE, GOLDSTEIN
& SCHLISSEL, P.C.

By: _____
Raymond A. Joao
Reg. No. 35,907

December 8, 1999

MELTZER, LIPPE, GOLDSTEIN,
& SCHLISSEL, P.C.
190 Willis Avenue
Mineola, New York 11501

Tel. No.: (516) 747-0300
Fax No.: (516) 747-9363

"Express Mail" mailing label number EK291365701US

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated below and is addressed to: Box Provisional Application, Assistant Commissioner for Patents, Washington, D.C. 20231

Date of Deposit: December 8, 1999

(Signature): _____

Attorney Docket No.: 5865-8

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

POWER OF ATTORNEY

Application of:	Eliot I. Bernstein
Serial No.:	Please assign
Filed on:	Concurrently herewith
Title:	APPARATUS AND METHOD FOR PRODUCING ENHANCED VIDEO IMAGES AND/OR VIDEO FILES

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

RAYMOND A. JOAO, Reg. No. 35,907

Address all telephone calls to Raymond A. Joao at telephone number: **(516) 747-0300**
Address all correspondence to **Meltzer, Lippe, Goldstein and Schlissel, P.C.**
190 Willis Avenue
Mineola, New York 11501

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of the sole inventor (given name, family name): ELIOT I. BERNSTEIN	
Inventor's signature: >	**Date:** > 12/8/99
Residence: 500 S.E. Mizner Boulevard Suite 102 Boca Raton, FL 33432-6080	**Citizenship:** U.S.A.
Post Office Address: SAME AS ABOVE	

P:\PUBLIC\PATENT\VIEWIT\5865-7\5865-7 POA

195203.1

Attorney Docket No. 5865-8

APPARATUS AND METHOD FOR PRODUCING ENHANCED VIDEO IMAGES AND/OR VIDEO FILES

FIELD OF THE INVENTION

The present invention is directed to an apparatus and a method for producing enhanced images and/or video files and, in particular, to an apparatus and a method for producing enhanced resolution digital images and/or digital video files obtained via digital and/or film video cameras and/or recording devices.

BACKGROUND OF THE INVENTION

The fields of telecommunications, multimedia, and related areas, are growing at increasing rates. With this continued growth, the need for high resolution digital imagery, for utilization in conjunction with the corresponding technologies, is becoming greater. Current technologies utilize film cameras and recorders as well as digital cameras and recorders.

Conventional print film, negative and digital, technologies typically have very low zoom quality and low image size restrictions or limitations associated therewith. Generally speaking, enlarged images produce a higher resolution image, and an associated higher resolution scanning quality, which further facilitates an improved enlargement or reduction of the image for

different sizes and different depths, without pixel distortion. Photographs, negatives, and associated images, utilize pixels which typically have a certain size. When enlarged or reduced, these pixels of the image become distorted, a feature which typically results in the image being fixed to an original size, or being available at very low magnifications, such as, for example, magnifications of from 200 times to 300 times. These images are also difficult to enlarge to a full screen size without a tremendous amount of distortion present in the end product without expanding the file size proportionately.

Currently, panoramic imaging techniques utilize non-enlarged images as their starting point. With such associated limitations, the ability to provide enhanced resolution digital images and, especially, an enhanced resolution digital panoramic image, such as those utilized on, or over, the Internet and/or the World Wide Web, has been greatly compromised.

Another major drawback in the current technology lies in the fact that conventional processes often utilize panoramic lenses in order to capture an image. This practice has been criticized as creating distortions in the image immediately upon the image's enlargement or reduction. The conventional techniques associated with the use of panoramic lenses are known to result in image "bending", which further curtails one's ability to obtain

realistic views, especially upon performing any associated cropping and/or editing processes. In such instances, the upper end and the lower end of the image must be either erased, or covered, in order to prevent the flaw from being exposed. This typically results in the resulting image having a "fishbowl-type" distortion.

In some instances, 32 mm lenses have been utilized in order to obtain enhanced floor to ceiling images without experiencing image bending. In these applications, however, the ability of the lens to capture optimal images varies depending upon the scene or image being photographed.

Images have typically been over-compressed prior to transmission over a communication network. This over compression has typically resulted in lack of image quality.

As a result, the ability to obtain enhanced video images and/or video files from film cameras and film recorders, from negatives and from digital cameras and recorders, has been limited.

SUMMARY OF THE INVENTION

The present invention provides an apparatus and a method for

providing enhanced digital video images and/or digital video files which overcomes the shortcomings of the prior art. The digital images and/or digital files produced by utilizing the present invention can be easily managed, when displayed, projected, and/or posted on any viewing device and/or entity such as, but not limited to, an Internet Web server, Web site or Web page, television, intranet computers and/or servers, and/or computers and/or servers which are utilized in wireless environments, etc.

The present invention provides for the processing, production and/or transmission of streaming video which can be transmitted on, or over, a communication network, the Internet, the World Wide Web, and/or any other communication network and/or medium. The streaming video obtained and/or transmitted via the present invention can provide for a video transmission which, once commenced, need not be stopped. The streaming video which is facilitated via the present invention can be played on demand while maintaining its streaming video nature.

The present invention provides an apparatus and a method for producing enhanced digital video images and video files from video which may be recorded as print film image or file, a negative image or file, a digital magnetic representation of a video image, an analog representation of a video image, and/or a

digital video image and/or file. The video images and/or files may be obtained via a digital camera, a digital recording device, a digital recorder, a digital camcorder, a film video camera, a recorder, and/or camcorder, a motion picture camera, a VHS video camera, recorder, and/or camcorder, a beta video camera, recorder, and/or camcorder, and/or any other suitable video recording device. The camera or recorder can be a conventional device and/or a solid state device which may contain a solid state storage medium.

The video images and/or video files which are produced by the apparatus and method of the present invention have improved and enhanced resolution and require far less effort in the associated maintenance and management of same. The video images and/or files, which are produced by the apparatus and method of the present invention, can be utilized and displayed on computers, projection devices, televisions, and, as noted above, can be posted to an Internet Web server, a Web site, and/or a Web page, an intranet computer and/or server, and/or computers and/or servers utilized in wireless environments. The video images and/or files can be transmitted over a communication network and/or in computer-to-computer applications. The video images and/or files obtained may also be stored in an appropriate storage medium, such as, but not limited to, a compact disk, a digital video disk, and/or any other appropriate digital and/or

analog storage medium.

The present invention, in a preferred embodiment, is utilized to produce enhanced video images and/or files for posting and/or for downloading, to a digital display medium, which in the preferred embodiment, is an Internet and/or a World Wide Web server, a Web site, and/or Web page, and/or an intranet computer and/or server, and/or computers and/or servers which are utilized in a wireless environment, and/or a compact disk, a digital video disk, and/or other suitable storage medium. In this manner, enhanced video images and/or video files can be produced from video images and/or video files which can be recorded using any video recording device and recording medium such as, but not limited to, digital cameras, digital recorders, film cameras, film recorders, motion picture cameras, photographic film recorders, and/or magnetic film or disk film recorders, etc. The video images and/or files obtained are thereafter processed in accordance with the apparatus and method of the present invention in order to produce enhanced video images and/or video files.

These resulting video images and/or video files have enhanced resolution which is unaffected by the typical resolution limiting and degrading parameters and phenomena which are associated with conventional digital and/or film video cameras,

recorders and corresponding processing equipment, methods and/or techniques.

The apparatus can include a video camera or recorder which can be any one of an analog camera and/or a digital camera, an analog and/or digital recording device, an analog and/or digital camcorder, a film camera, a film recording device, and/or a film camcorder. For full motion video, a 3CCD chip, and/or any other appropriate and/or suitable motion video capture recording device, can be utilized in conjunction with the present invention. A suitable audio capture device for digitizing any audio which accompanies and/or which corresponds to the video can also be utilized. The camera or recording device can be a hand-held camera, a fixed camera, and/or a camera which is mountable, such as on a tripod or on a stand. The camera can be utilized to obtain the video image and/or video file which will be processed in accordance with the present invention. The camera can also be a video recording device for recording both video and audio.

The present invention preserves image and/or video integrity, as well preserves the integrity of any audio, from the point of capture of the image through and including any final compression or compressions of same. The apparatus can also include a developing device, which can be utilized for developing video images and/or files which are obtained on film. In the

case of video images and/or files which are obtained digitally, no developing device would be needed. The apparatus can also include an enlarging device which can be utilized to enlarge the video images obtained. An enlarger can be utilized for enlarging either film images and/or digital images.

The apparatus can also include a computer, for performing the various processing routines during operation of the apparatus and method of the present invention. The computer may be a personal computer, a laptop computer, a mini-computer, a microcomputer, a mainframe computer, a network computer, a server computer, and/or any other suitable computer or computer system, television system, either of the conventional, digital, and/or high definition variety.

The computer can include a central processing unit (CPU), a read only memory (ROM), a random access memory (RAM), a display device, an input device and an output device. The input device may include a keyboard, a mouse, or other pointing device, and/or any other data and/or command input device, for allowing for data and/or command input by a user. The output device may include a printer and, in the preferred embodiment, the printer may be a color laser printer or a color inkjet printer, a compact disk recorder, a digital video disk recorder, and/or any other suitable storage medium recorder. The computer can also include

a receiver for receiving data and/or information over a communication network and a transmitter for transmitting data and/or information over the communication network.

The computer can also include a video capture device, which may or may not be an integral component of the computer. The computer can also include an audio capture device which may or may not be an integral component of the computer. The video capture can also be an external peripheral device. Video data and/or information, as well as any audio data and/or information, is utilized, can be fed into, and/or played through, the respective video capture device and audio capture device, thereby digitizing the respective video data and/or information and audio data and/or information. The present invention preserves the integrity of any and/or all data and/or information upon conversion to digital formats. If full motion video is captured, any conversion can utilize full motion capture software and/or hardware. The video data and/or information can be fed into, and/or through, the video capture device, in real-time, thereby facilitating real-time video transmissions. In a similar fashion, the audio data and/or information can be fed into, and/or through, the audio capture device, in real-time, thereby facilitating real-time audio transmissions.

The computer can also include any other hardware device or

peripheral device and/or software which is, or which may be, needed and/or desired in order to perform any of the functions and/or operation described herein. The computer can also include a video data capture device, for capturing and processing the video images and/or files processed by the present invention, as well as an audio data capture device, for capturing and processing the audio files processed by the present invention.

The apparatus can also include a scanning device, for scanning video images or files, if needed, whether they be of a digital or of a print film type, in order to obtain a digital image representation of same.

The apparatus and method of the present invention provides video images and/or files, as well as any accompanying audio files, which have enhanced resolution and quality while requiring less file management efforts.

The resulting video images and/or files, and any accompanying audio files, which are obtained via the apparatus and method of the present invention are characterized by a high definition resolution and are suitable for high definition television, Web television, and large, full screen, panoramic Internet applications, including video playback and/or video transmission, along with any accompanying audio, while preserving

resolution upon image and/or video file magnification or reduction.

The present invention also facilitates high speed file transfers of high resolution video images and/or video files, and any accompanying audio files, thereby dispensing with the need to engage in long and slow conventional file downloads and/or file transfers in order to maintain viewing quality.

The apparatus and method of the present invention can also be utilized in conjunction with three-dimensional images and video files in order to produce high resolution, three-dimensional video images and/or video files.

Accordingly, it is an object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files from files obtained via digital and/or film video cameras and/or a recording devices.

It is another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files from files obtained via digital and/or film video cameras and/or a recording devices, which have improved and enhanced resolution.

It is still another object of the present invention to provide an apparatus and a method for processing, producing, and/or transmitting streaming video for use on, or over, a communication network.

It is another object of the present invention to provide an apparatus and a method for producing streaming video which, once commenced, need not be stopped and/or halted during the subsequent transmission of same.

It is another object of the present invention to provide an apparatus and a method for producing streaming video which can be played continuously and on-demand.

It is yet another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, and accompanying audio files, from files obtained via digital and/or film video cameras and/or a recording devices, which have improved and enhanced resolution.

It is still another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, from files obtained via digital and/or film video cameras and/or a recording

devices digital images, which are suitable for display and/or for downloading to a digital computer, a television, and/or any other communication device utilized in a telecommunication environment and/or communications environment.

It is still another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, from files obtained via digital and/or film video cameras and/or a recording devices, which are characterized by image compression and/or minimal image compression thereby avoiding any dramatic loss in image quality.

It is another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, from files obtained via digital and/or film video cameras and/or a recording devices, which may dispense with the need to compress the image data.

It is yet another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, from files obtained via digital and/or film video cameras and/or a recording devices, which are characterized by high definition resolution, and which are suitable for high definition television, Web television and

large, full screen, panoramic internet applications, without loss of resolution upon image magnification or reduction.

It is another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, from files obtained via digital and/or film video cameras and/or a recording devices, which can be transmitted in a network environment.

It is still another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, from files obtained via digital and/or film video cameras and/or a recording devices, which facilitates high speed file transfer in a network environment and/or in a computer environment.

It is another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, which preserves image integrity from the point of capture of the image through and including final compression or compressions.

It is still another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, which

preserves the integrity of any and/or all data and/or information upon conversion to digital formats.

Other objects and advantages of the present invention will be apparent to those skilled in the art upon a review of the Description of the Preferred Embodiment taken in conjunction with the Drawings which follow.

BRIEF DESCRIPTION OF THE DRAWINGS

In the Drawings:

Figure 1 illustrates the apparatus of the present invention, in block diagram form; and

Figures 2 illustrates a method of the present invention, in flow diagram form; and

Figures 3a, 3B and 3C illustrate another method of the present invention, in flow diagram form.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention provides an apparatus and a method for providing enhanced digital video images and/or digital video, as

well as any accompanying audio, files which can be utilized and which can be easily managed, when displayed, projected, and/or posted on any viewing device and/or entity such as, but not limited to, an Internet Web server, Web site or Web page, television, etc. In particular, the present invention provides an apparatus and a method for producing enhanced digital video images and video files from video, as well as any accompanying audio files, which may be recorded as a digital video image and/or files and/or as a film video image and/or file a print film image.

The present invention provides for the processing, production and/or transmission of streaming video which can be transmitted on, or over, a communication network, the Internet, the World Wide Web, and/or any other communication network and/or medium. The streaming video obtained and/or transmitted via the present invention can provide for a video transmission which, once commenced, need not be stopped. The streaming video which is facilitated via the present invention can be played on demand while maintaining its streaming video nature.

The video images and/or files, and any accompanying audio files, may be obtained via a digital camera, a digital recording device, a digital recorder, a digital camcorder, a film video camera, recorder, and/or camcorder, a VHS video camera, recorder,

and/or camcorder, a beta video camera, recorder, and/or camcorder, and/or any other suitable video recording device. The video images and/or video files and any accompanying audio files, which are produced by the apparatus and method of the present invention have improved and enhanced resolution and require far less effort in the associated maintenance and management of same. The video images and/or files, and any accompanying audio files, which are produced by the apparatus and method of the present invention, can be utilized, displayed, and/or played, whichever the case may be, on computers, projection devices, televisions, and, as noted above, can be posted to an Internet Web server, a Web site, and/or a Web page. The video images and/or files, and any accompanying audio files, can be transmitted over a communication network and/or in computer-to-computer applications.

The present invention, in a preferred embodiment, is utilized to produce enhanced video images and/or files, and any accompanying audio files, for posting and/or for downloading, to a digital display medium, which in the preferred embodiment, is an Internet and/or a World Wide Web server, a Web site, and/or Web page. In this manner, enhanced video images and/or video files, and any accompanying audio files, can be produced from video images and/or video files, and accompanying audio files, which can be recorded using any video recording device and

recording medium such as, but not limited to, digital cameras, digital recorders, film cameras, film recorders, etc. The video images and/or files, and any accompanying audio files, obtained are thereafter processed in accordance with the apparatus and method of the present invention in order to produce enhanced video images and/or video files.

These resulting video images and/or video files, and any accompanying audio files, have enhanced resolution which is unaffected by the typical resolution limiting parameters and phenomena which are associated with conventional digital and film video cameras, recorders and corresponding processing equipment, methods and/or techniques.

Figure 1 illustrates the apparatus of the present invention which is denoted generally by the reference numeral 100, in block diagram form. With reference to Figure 1, the apparatus 100 includes a video camera or recorder 105 which, in the preferred embodiment, can be any one of a digital camera, a digital recording device, digital camcorder, a film camera, a film recording device, and/or a film camcorder. The camera or recorder can be a conventional device and/or a solid state device which may contain a solid state storage medium.

The camera or recording device can record video as well as

audio data and/or information. In the preferred embodiment, the camera 105 may be a hand-held camera, a fixed camera, and/or a camera which is mountable, such as on a tripod or on a stand. The camera 105 is utilized to obtain the video image and/or video file, as well as any audio files, which will be processed as described herein.

For full motion video, a 3CCD chip, and/or any other appropriate and/or suitable motion and/or video capture recording device, can be utilized in conjunction with the present invention. A suitable audio capture recording device can also be utilized in conjunction with the present invention.

The present invention can also be utilized in conjunction with any imaging and/or any video recording device, and/or audio recording device, and/or equipment, such as, but not limited to, those devices and equipment utilized in, or in conjunction with, medical imaging equipment, devices and/or instruments, motion picture production equipment, devices and/or instruments and/or in any other equipment, device, and/or instrument, which is, or which can be, utilized in conjunction with imaging and/or video and/or audio applications and/or uses.

The apparatus 100 also includes a developing device 115, which could be utilized for developing video images and/or files

which are obtained on film. In the case of video images and/or files which are obtained digitally, no developing device may be needed. The apparatus also includes an enlarging device which can be utilized to enlarge the video images obtained. The apparatus can include an enlarger for both film images as well as for digital images.

The apparatus 100 also includes a computer 120, for performing the various processing routines during operation of the apparatus and method of the present invention. The computer 120 may be a personal computer, a laptop computer, a mini-computer, a microcomputer, a mainframe computer, a network computer, a server computer, and/or any other suitable computer or computer system.

The computer 120 includes a central processing unit (CPU), a read only memory (ROM), a random access memory (RAM), a display device, an input device and an output device. The input device may include a keyboard, a mouse, or other pointing device, and/or any other data and/or command input device, for allowing for data and/or command input by a user. The output device may include a printer and, in the preferred embodiment, the printer may be a color laser printer or a color inkjet printer. The computer 120 also includes a receiver for receiving data and/or information over a communication network and a transmitter for transmitting

data and/or information over the communication network.

The computer 120 also includes a video capture device 121A and an audio capture device 121B, which, in the preferred embodiment, are integral components of the computer 120. The video capture device 121A, in the preferred embodiment, can be a video capture card 121A which is located internal to the computer 120. The video capture device 121A may also be an external peripheral device. As described herein, the video data and/or information is fed into, and/or played through, the video capture device 121A, thereby digitizing the video data and/or information. The video data and/or information can be fed into, and/or through, the video capture card 121A, in real-time, thereby facilitating real-time video transmissions.

In a similar manner, the audio capture device 121B, in the preferred embodiment, can be an audio capture card 121B which is located internal to the computer 120. The audio capture device 121 may also be an external peripheral device. As described herein, the audio data and/or information is fed into, and/or played through, the audio capture device 121B, thereby digitizing the audio data and/or information. The audio data and/or information can be fed into, and/or through, the audio capture card 121B, in real-time, thereby facilitating real-time audio transmissions.

The computer 120 may also include any other hardware device or peripheral device and/or software which is, or which may be needed and/or desired in order to perform any of the functions and/or operation described herein. In particular, the computer 120 will also include a video data capture device for capturing and processing the video images and/or files processed by the present invention. The computer 120 can also include an audio capture device for capturing and processing the audio files processed by the present invention.

The computer 120 also includes a transmitter (not shown) and a receiver (not shown) for facilitating operation in a network environment and/or as a server computer.

The apparatus 100 also includes a scanning device 125, for scanning video images or files, if needed, whether they be digital or of a print film type, in order to obtain a digital image representation of same. Any suitable computer or scanner, and any suitable scanning software, may be utilized in conjunction with the present invention. In a preferred embodiment, any suitable scanning device can be utilized in conjunction with any appropriate software.

Figure 2 illustrates a preferred embodiment method of the present invention, in flow diagram form. With reference to

Figure 2, the method of the present invention commences at step 200. The method described herein can be utilized to process both video and audio files as well as files which contain only video information. For the sake of explaining the present invention in a preferred embodiment, the processing of video files along with corresponding audio files is described below. At step 201, the video images or files, and corresponding audio files, are recorded with any appropriate or suitable recording device such as, but not limited to, the video recording camera 105. The video and corresponding audio can be recorded and/or otherwise obtained in any suitable format, such as, but not limited to, for example, beta, VHS, digital, and/or any other standard formats, including, but not limited to, NTSC, PAL, or SECAM. The video and corresponding audio files can also be obtained in other standard digital formats such as, but not limited to, IEEE1834, *.AVI, *.MOV, *.MPEG, etc., by utilizing an appropriately equipped video recording device. The video recording device 105 may also be a reel-to-reel recording device and/or a live video recording device.

At step 202, the respective digital files and corresponding audio files, are converted to digital files, if necessary, by utilizing respective digitizing and/or scanning hardware and/or software and/or devices. In the case of the video files, the video is digitized by utilizing digitizing hardware and/or software and/or any other necessary and/or appropriate driver

software or programs in conjunction with a video capture device. In the preferred embodiment, hardware such as Pinnacle DC10∞ or other equivalent and/or similar hardware and/or software and/or associated drivers can be utilized to perform the video digitizing operation. The video digitizing step can be performed, in the preferred embodiment, at a minimum frames per second (fps) or at least a television standard and/or 30fps and with frame sizes of at least 320 X 240 pixels.

It is understood that the herein-described video digitizing step is not limited to the settings and/or parameters described herein. Rather, any appropriate settings and/or parameters may be utilized in order to obtain digital video data and/or information which is consistent with the digital data and/or information described herein.

In an analogous manner, at step 201, the audio files are also digitized by utilizing appropriate digitizing or capture hardware and/or software and any other necessary and/or appropriate driver software or programs. In the preferred embodiment, hardware such as produced by Turtle Beach Montego∞ other equivalent and/or similar hardware and/or software, and any associated drivers, if needed, are utilized in order to perform the audio digitizing operation. The audio digitizing step can be performed, in the preferred embodiment, by utilizing PCM or an

equivalent and/or similar technique and at a sampling rate of at least 44 to 48 kilohertz (Khz), 16-bit stereo, and an audio resolution of at least 16-bits.

The video and/or audio files which are obtained via the processing routines at step 201, are digital files which can be in any standard digital format such as, but not limited to, *.AVI, *.MOV, or *.MPEG, and/or any other suitable digital file format. While video information can be obtained for any frame setting, in a preferred embodiment, frames settings of 320 x 240, 480 x 320 and/or 640 x 480 can be utilized.

At step 202, if desired the digitized video and audio files can be processed in conjunction with video editing software, such as, for example Adobe Premiere 5.1 and/or any other equivalent and/or similar editing software. The processing which is performed at step 202 is optional and need not be performed on the digital video and audio files. The processing which is performed on the digital video and audio files , at step 202, can be performed in order to facilitating the editing of the respective digital video and audio files if such may be desired.

The processing at step 202 also serves to convert the digital video and audio to respective digital formats which are amenable to various editing procedures. For example, a *.MOV formatted file is converted to a .RM file format, a *.AVI

formatted fire is converted to a .ASF file format, and a *.MPEG formatted file is converted to a .RM file format. The processing step which is performed at the optional step 202 can be preformed with the following processing parameters.

At step 203, the digital video and audio file is processed and/or encoded in order to generate the respective files for presentation from a player or server computer. The processing which occurs at step 203 is accomplished with Windows Media Encoder/Reel Producer Plus software in order to create digital files for both video and audio which are in an appropriate digital file format, such as, but not limited to .RM and .ASF, or other suitable and/or similar digital file formats. Thereafter, the digital video and audio files will be available for transmission to appropriate computers and/or communication devices, and/or for storage onto an appropriate storage medium.

The digital video and audio file, which is processed and encoded at step 203, can be transmitted at a data rate having a range of between 35Kbps to 750Kbps and can have a frame rate range of between 24 to 29.97 fps.

At step 204, the video and audio file can be transmitted from the sever computer 120 to a client computer or communication device. In the preferred embodiment, and in order to facilitate the presentation of the video and audio file at the client

computer or communication device, the presentation of the video and audio file can be accomplished in conjunction with video software such as, but not limited to, RealPlayer∞, MediaPlayer∞, and/or any other appropriate software. The transmission of the video and audio will take place with a data rate range of between 35 Kbps to 750 Kbps at with a frame rate range of between 24fps - 29.97fps.

The obtained video and audio file or files can then be posted to the computer 120 and/or to another hosting computer. If the posting is to a computer other than the computer 120, the posting is performed by transmitting the video file or files over a communication network to the hosting computer. In the preferred embodiment, the video and audio file or files are posted via the Internet, and/or the World Wide Web, and can posted to a Web Page, a Web site, and/or any other network device. The posting operation is performed by utilizing any suitable posting software. The video and audio file or video file can also be stored on a compact disk, a digital video disk and/or any other appropriate storage medium.

The above-describe processing routine facilitates the processing of digital video and audio files in such a manner that any compression, if performed, is maintained at minimum levels.

The respective video and audio files are digitized at an optimal level and thereafter encoded at an optimal level, thereby preserving the highest quality of video and audio content.

Transmission of the video and audio files to a client computer (not shown) can thereafter commence at step 205.

Typically, the various rates of transmission for the above transmission parameters will be dependent upon the type and specifications of the receiver or modem associated with the client computer or communication device. In another preferred embodiment, the server computer 120 can ascertain the receiver or modem specifications. Thereafter, the server 120 can process the information obtained regarding the client computer or communication device and determine the appropriate transmission rates and/or other parameters and commence transmission to the client computer or communication device at step 205.

Operation of the apparatus will then cease at step 206.

Figures 3A, 3B and 3C illustrate another preferred embodiment method of the present invention, in flow diagram form. With reference to Figures 3A, 3B and 3C, the method of the present invention commences at step 300. At step 301, the video images and/or files are recorded with the video camera 105. The video can be recorded in any format, such as, but not limited to,

i.e., beta, VHS, digital, and/or any of the standard file formats, including, but not limited to, *.AVI, *.MOV, *.MPEG, etc., by utilizing the video recording device 105. The video recording device 105 may also be a reel-to-reel recording device and/or a live video recording device.

At step 302, the video images and/or files are converted to a converted to digital files, if necessary, by utilizing the scanner 110. At step 303, digital video image files are loaded into the computer 120 for processing. At step 304, the video image files are fed into, or through, the capture device 121A of the computer 120. The video capture operation, which is performed by the video capture device 121A, in the preferred embodiment, can be performed with minimum compression and/or encoding operations being performed on the video image files and/or with only minimal compression and/or encoding operations being performed on the video image files.

The video capture device 121A, in the preferred embodiment, can be any suitable video capture device or card and/or any other appropriate and/or suitable video capture hardware. The capture software utilized can be any appropriate and/or suitable video capture software.

At step 305, the video images and/or files are edited, if

necessary, by using any standard video editing tools, such as, for example, any editing software. At step 306, the video image files are then converted to any suitable real video format such as, for example, a *.RM format. At step 307, the size of the video within the file code is set either manually or automatically. In the preferred embodiment, the size of the video is set within the file code, which may or may not be the HTML file code to a 640 x 480 frame resolution, or any other suitable resolution, such as, but not limited to, 800 x 600, 1024 x 768, 1280 x 1024, 1600 x 1200 or other sizes.

At step 308, the obtained video image file or files is then posted to the computer 120 and/or to another hosting computer. If the posting is to a computer other than the computer 120, the posting is performed by transmitting the video file or files over a communication network to the hosting computer. In the preferred embodiment, the video file or files are posted via the Internet, and/or the World Wide Web, and can posted to a Web Page, a Web site, and/or any other network device. The posting operation is performed by utilizing any suitable posting software. The video image file or video file can also be stored on a compact disk, a digital video disk and/or any other appropriate storage medium.

At step 309, the computer 120 or other hosting computer

generates or writes a file or script, such as an ASCII file which calls the video to stream or to download. This results in video-- which will stream or "streaming" video for a full screen application which will be characterized by a good clarity and quality. At step 309, the video file can then be transmitted to a client computer (not shown). At step 309, a separate file or script, such as an ASCII file is written and saved to an appropriately formatted file, such as an *.RPM file, or other suitable file format, which will call the original video file. This script can be typically included in any suitable code, such as an HTML code.

In the case of MPEG videos, Steps 301 through 303 are followed as described above. At step 304, however, the video file is converted, if not previously converted, to an MPEG format. Thereafter, the video is inserted into the appropriate file which may contain suitable coding, such as HTML codes. Thereafter, the file can be sized to any of herein-described resolutions. Thereafter, the video file is uploaded to the hosting computer, if utilized. Thereafter, the MPEG file is played from the computer 120 or the hosting computer, the Web page, and/or the Web site, depending upon the application, by first downloading a small portion of the file and by playing the file through a suitable device such as a player which supports any suitable video formats, such as AVI, MPEG-type, etc., and/or

other suitable formats.

Thereafter, operation of the apparatus ceases at step 310.

The processing steps described herein provide for the production of video images and/or video files which have enhanced resolution and which can be easily and effectively managed in applications involving the display of same, the posting of same, to a host computer, a Web server, a Web site, a Web page, a computer display, a full screen projection display and/or a video presentation and/or playback of same, respectively. Further, the method of the present invention provides for image processing, including various image and/or file processing techniques, which may or may not include image compression and/or encoding operations.

The apparatus and method of the present invention provides video images and/or files which have enhanced resolution and quality while requiring less file management efforts.

The resulting video images and/or files, and any accompanying audio files, which are obtained via the apparatus and method of the present invention are characterized by a high definition resolution and are suitable for high definition television, Web television, and large, full screen, panoramic

Internet applications, including video playback and/or video transmission, which preserving resolution upon image and/or video file magnification or reduction. The present invention also facilitates high speed file transfers of high resolution video images and/or video files, and any accompanying audio files, thereby dispensing with the need to engage in long and slow conventional file downloads and/or file transfers.

The apparatus and method of the present invention can also be utilized in conjunction with three-dimensional images and video files in order to produce high resolution, three-dimensional video images and/or video files.

The present invention preserves image integrity from the point of capture of the image through, and including, any final compression or compressions of same.

The resulting video images and/or files, and any accompanying audio files, which are obtained via the apparatus and method of the present invention, can be utilized, in any and/or all of the embodiments described herein, in conjunction with data and/or information which can be provided by any other and/or any external information source. The data and/or information may contain, but is not limited to, data and/or information of and for sound and/or audio files, text files,

video files, image files, and/or graphics files, and/or any other information source, data, information and/or file, which can be, and/or which may be linked to or with, and/or which can be operated and/or utilized in conjunction with, any video and/or image data and/or information. For example, any image and/or video data, information, or file, obtained via the present invention, can be utilized in conjunction with any sound file, audio file, text file, video file, image file, and/or graphics file, and/or any other data, information and/or file utilized in a multimedia environment, thereby providing for the utilization of enhanced images and/or video in conjunction with the respective file.

As noted above, the present invention provides for the processing, production and/or transmission of streaming video which can be transmitted on, or over, a communication network, the Internet, the World Wide Web, and/or any other communication network and/or medium. The streaming video obtained and/or transmitted via the present invention can provide for a video transmission which, once commenced, need not be stopped. The streaming video which is facilitated via the present invention can be played on demand while maintaining its streaming video nature.

While the present invention has been described and

illustrated in various preferred embodiments, such descriptions are merely illustrative of the present invention and are not to be construed to be limitations thereof. In this regard, the present invention encompasses any and all modifications, variations, and/or alternate embodiments, with the scope of the present invention being limited only by the claims which follow.

CLAIMS

What Is Claimed Is:

1. An apparatus for producing a digital image, comprising:

a device for generating a digital signal file from an image; and

a processor for processing said digital signal file and for generating an image file,

wherein said processor generates a first signal file from said digital signal file, and further wherein said processor processes said first signal file and generates said image file.

2. The apparatus of claim 1, further comprising:

one of a camera and a recording device for obtaining one of a photographic representation of an image, a film image, a negative image and a digital image.

3. The apparatus of claim 2, further comprising:

a developing device for developing one of said photographic representation of an image, a film image and a negative image.

4. The apparatus of claim 3, further comprising:

an enlarging device for enlarging said image.

5. The apparatus of claim 4, further comprising:

a scanning device for generating said digital signal file from said one of photographic representation of an image, a film image and a negative image.

6. The apparatus of claim 1, further comprising:

a video capture device for one capturing and processing said digital signal file.

7. The apparatus of claim 1, wherein said first signal file is an image file.

8. An apparatus for producing a digital image, comprising:

means for generating a digital signal file from an image file; and

means for processing said digital signal file and for generating an image file,

wherein said processing means generates a first signal file from said digital signal file, and further wherein said processing means processes said first signal file and generates said image file.

9. The apparatus of claim 8, further comprising:

means for obtaining said one of a photographic representation of an image, a film image, a negative image and a digital image.

10. The apparatus of claim 8, further comprising:

means for developing said one of photographic representation of an image, a film image and a negative image.

11. The apparatus of claim 8, further comprising:

means for enlarging said image.

12. The apparatus of claim 8, further comprising:

means for generating said digital signal file from said image.

13. The apparatus of claim 8, further comprising:

means for one of capturing and processing said digital signal file.

14. A method for producing a digital image, comprising:

generating a digital signal file from an image;

processing said digital signal file; and

generating an image file, wherein said processing operation further comprises:

generating a first signal file from said digital signal file; and

processing said first signal file and generating said image file.

15. The method of claim 14, further comprising:

obtaining one of a photographic representation of an image, a film image, a negative image and a digital image.

16. The method of claim 14, further comprising:

developing said one of photographic representation of an image, a film image, and a negative image; and

generating said image.

17. The method of claim 14, further comprising:

enlarging said image.

19. The method of claim 14, further comprising:

generating said digital signal file from said image.

20. The method of claim 14, further comprising:

one of capturing and processing said digital signal file.

21. The apparatus of any one of claims 1 to 13, wherein said

image file is utilized in conjunction with at least one of a sound file, an audio file, a text file, a video file, an image file, and a graphics file.

22. The method of any one of claims 14 to 20, wherein said image file is utilized in conjunction with at least one of an audio file, a text file, a video file, an image file, and a graphics file.

23. An apparatus for producing a streaming video file, comprising:

a device for generating a digital signal file from a first video file; and

a processor for processing said digital signal file and for generating a second video file,

wherein said processor generates a first signal file from said digital signal file, and further wherein said processor processes said first signal file and generates said second video file, and further wherein said second video file is a streaming video file.

24. The apparatus of claim 23, further comprising:

one of a camera and a recording device for obtaining one of a photographic representation of an image, a film image, a negative image, a digital image, a video file, and a motion

picture.

25. The apparatus of claim 24, further comprising:

a developing device for developing one of said photographic representation of an image, a film image and a negative image, a digital image, a video file, and a motion picture.

26. The apparatus of claim 25, further comprising:

an enlarging device for enlarging said photographic representation of an image, a film image, a negative image, a digital image, a video file, and a motion picture video file.

27. The apparatus of claim 24, further comprising:

a scanning device for generating said digital signal file from said one of photographic representation of an image, a film image, a negative image photographic representation of an image, a film image and a negative image, a digital image, a video file, and a motion picture.

28. The apparatus of claim 23, further comprising:

a video capture device for one capturing and processing at least one of said video file and said digital signal file.

29. The apparatus of claim 23, wherein said first signal file is

a video image file.

30. The apparatus of claim 23, wherein said streaming video file is one of posted to a host computer and stored on a storage medium.

31. The apparatus of claim 30, wherein said storage medium is at least on of a compact disk, a digital video disk, a floppy disk, and solid state device.

32. The apparatus of claim 23, wherein said streaming video file can be transmitted at least one of on demand and continuously.

33. An apparatus for producing a streaming video file, comprising:

means for generating a digital signal file from a first video file; and

means for processing said digital signal file and for generating a second video file,

wherein said processing means generates a first signal file from said digital signal file, and further wherein said processing means processes said first signal file and generates said second video file, and further wherein said second video file is a streaming video file.

34. The apparatus of claim 33, further comprising:

means for obtaining one of a photographic representation of an image, a film image, a negative image, a digital image, a video file, and a motion picture.

35. The apparatus of claim 34, further comprising:

means for developing one of said photographic representation of an image, a film image and a negative image, a digital image, a video file, and a motion picture.

36. The apparatus of claim 35, further comprising:

means for enlarging said photographic representation of an image, a film image, a negative image, a digital image, a video file, and a motion picture video file.

37. The apparatus of claim 33, further comprising:

means for generating said digital signal file from said one of photographic representation of an image, a film image, a negative image photographic representation of an image, a film image and a negative image, a digital image, a video file, and a motion picture.

38. The apparatus of claim 33, further comprising:

means for one capturing and processing at least one of said video file and said digital signal file.

39. The apparatus of claim 33, wherein said first signal file is a video image file.

40. The apparatus of claim 33, wherein said streaming video file is one of posted to a host computer and stored on a storage medium.

41. The apparatus of claim 40, wherein said storage medium is at least on of a compact disk, a digital video disk, a floppy disk, and solid state device.

42. The apparatus of claim 33, wherein said streaming video file can be transmitted at least one of on demand and continuously.

43. A method for producing a streaming video file, comprising:

generating a digital signal file from a first video file; and

processing said digital signal file and generating a second video file,

wherein said first signal file is generated from said digital signal file, and further wherein said first signal file is utilized to generate said second video file, and further wherein said second video file is a streaming video file.

44. The method of claim 43, further comprising:

obtaining one of a photographic representation of an image, a film image, a negative image, a digital image, a video file, and a motion picture.

45. The method of claim 44, further comprising:

developing one of said photographic representation of an image, a film image and a negative image, a digital image, a video file, and a motion picture.

46. The method of claim 45, further comprising:

enlarging said photographic representation of an image, a film image, a negative image, a digital image, a video file, and a motion picture video file.

47. The method of claim 43, further comprising:

generating said digital signal file from said one of photographic representation of an image, a film image, a negative image photographic representation of an image, a film image and a negative image, a digital image, a video file, and a motion picture.

48. The method of claim 43, further comprising:

one capturing and processing at least one of said video file and said digital signal file.

49. The method of claim 43, wherein said first signal file is a video image file.

50. The method of claim 43, wherein said streaming video file is one of posted to a host computer and stored on a storage medium.

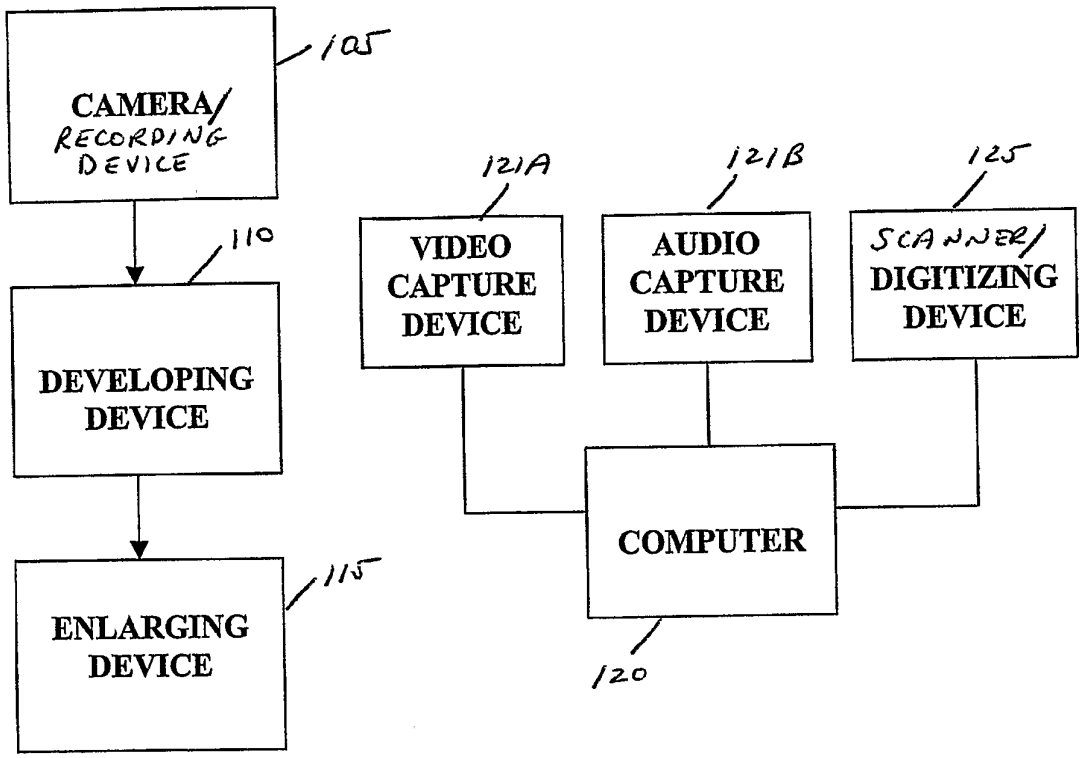
51. The method of claim 50, wherein said storage medium is at least on of a compact disk, a digital video disk, a floppy disk, and solid state device.

52. The apparatus of claim 43, wherein said streaming video file can be transmitted at least one of on demand and continuously.

ABSTRACT OF THE DISCLOSURE

An apparatus and method for producing a digital image, including a device for generating a digital signal file from an image and a processor for processing said digital signal file and for generating an image file. The processor generates a first signal file from the digital signal file. The processor processes the first signal file and generates the image file. An apparatus for producing a streaming video file, including a device for generating a digital signal file from a first video file and a processor for processing the digital signal file and for generating a second video file. The processor generates a first signal file from the digital signal file. The processor processes the first signal file and generates the second video, wherein the second video file is a streaming video file.

P:\PUBLIC\PATENT\IVIEWIT\5865-7\5865-7-1.DOC


CAMERA/ RECORDING DEVICE
105
DEVELOPING DEVICE
110
ENLARGING DEVICE
115
VIDEO CAPTURE DEVICE
121A
AUDIO CAPTURE DEVICE
121B
SCANNER/ DIGITIZING DEVICE
125
COMPUTER
120

100

FIG. 1

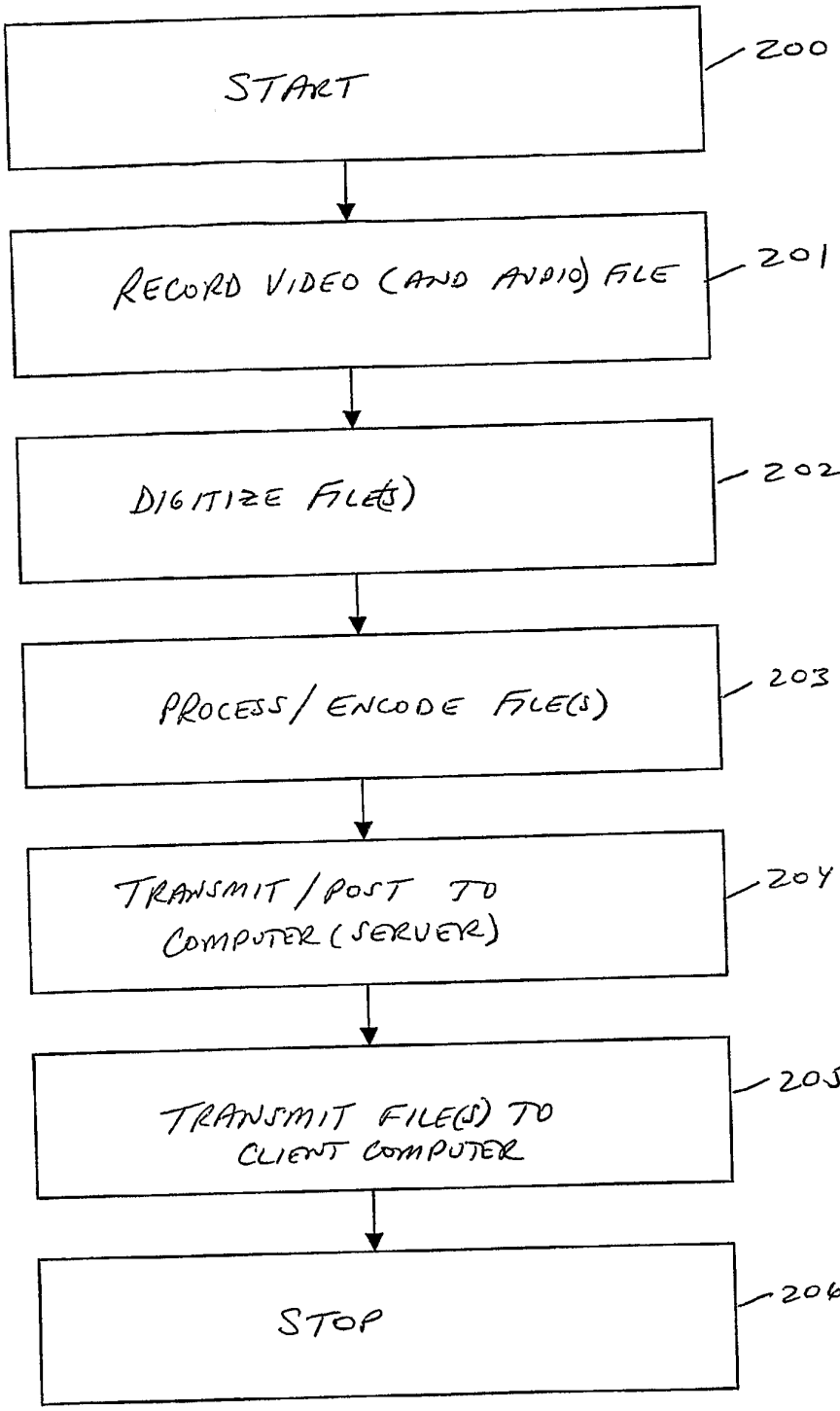

START
200
RECORD VIDEO (AND AUDIO) FILE
201
DIGITIZE FILE(S)
202
PROCESS / ENCODE FILE(S)
203
TRANSMIT / POST TO COMPUTER (SERVER)
204
TRANSMIT FILE(S) TO CLIENT COMPUTER
205
STOP
206

FIG. 2

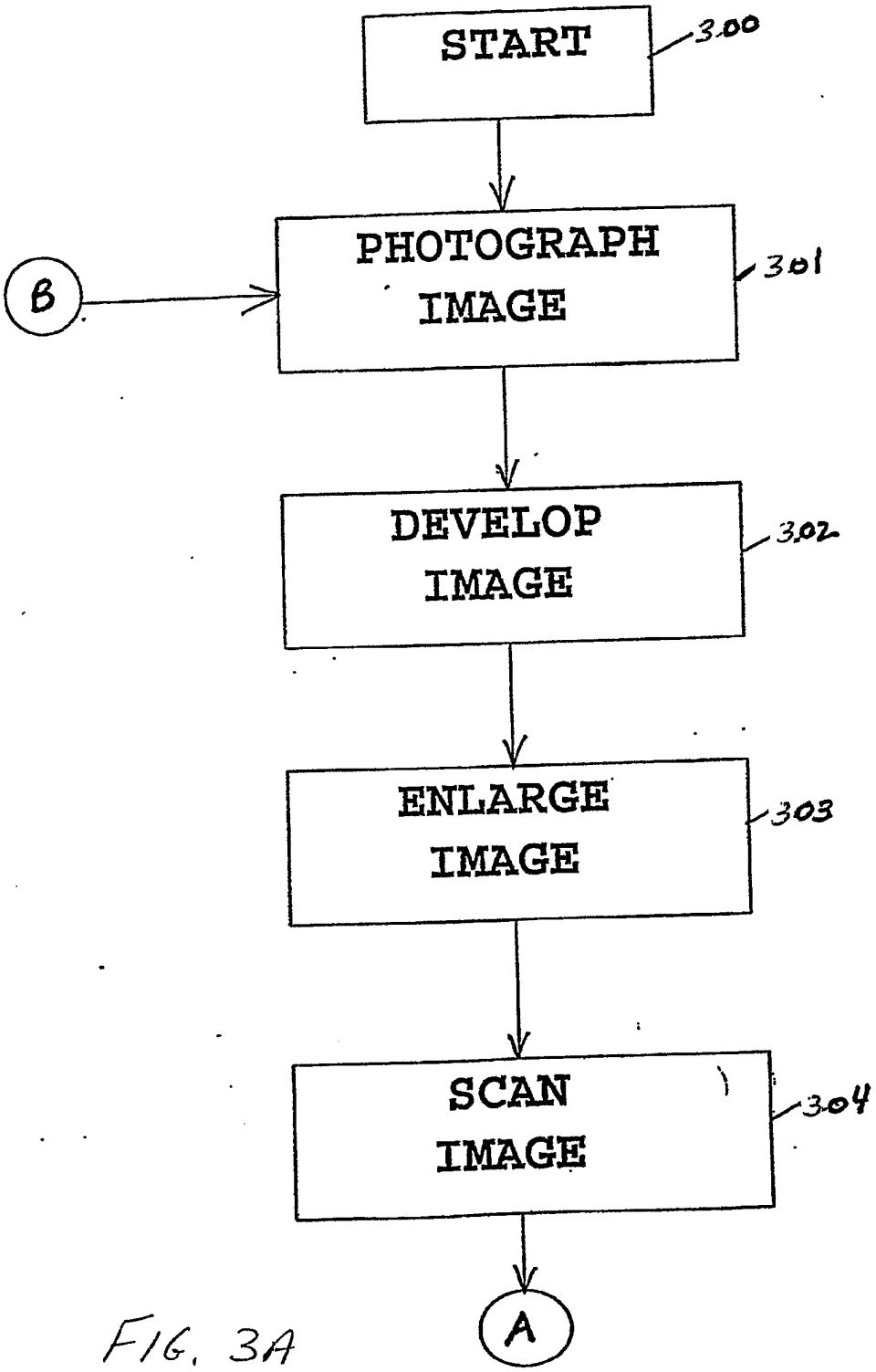

START
300
PHOTOGRAPH IMAGE
301
B
DEVELOP IMAGE
302
ENLARGE IMAGE
303
SCAN IMAGE
304
A

FIG. 3A

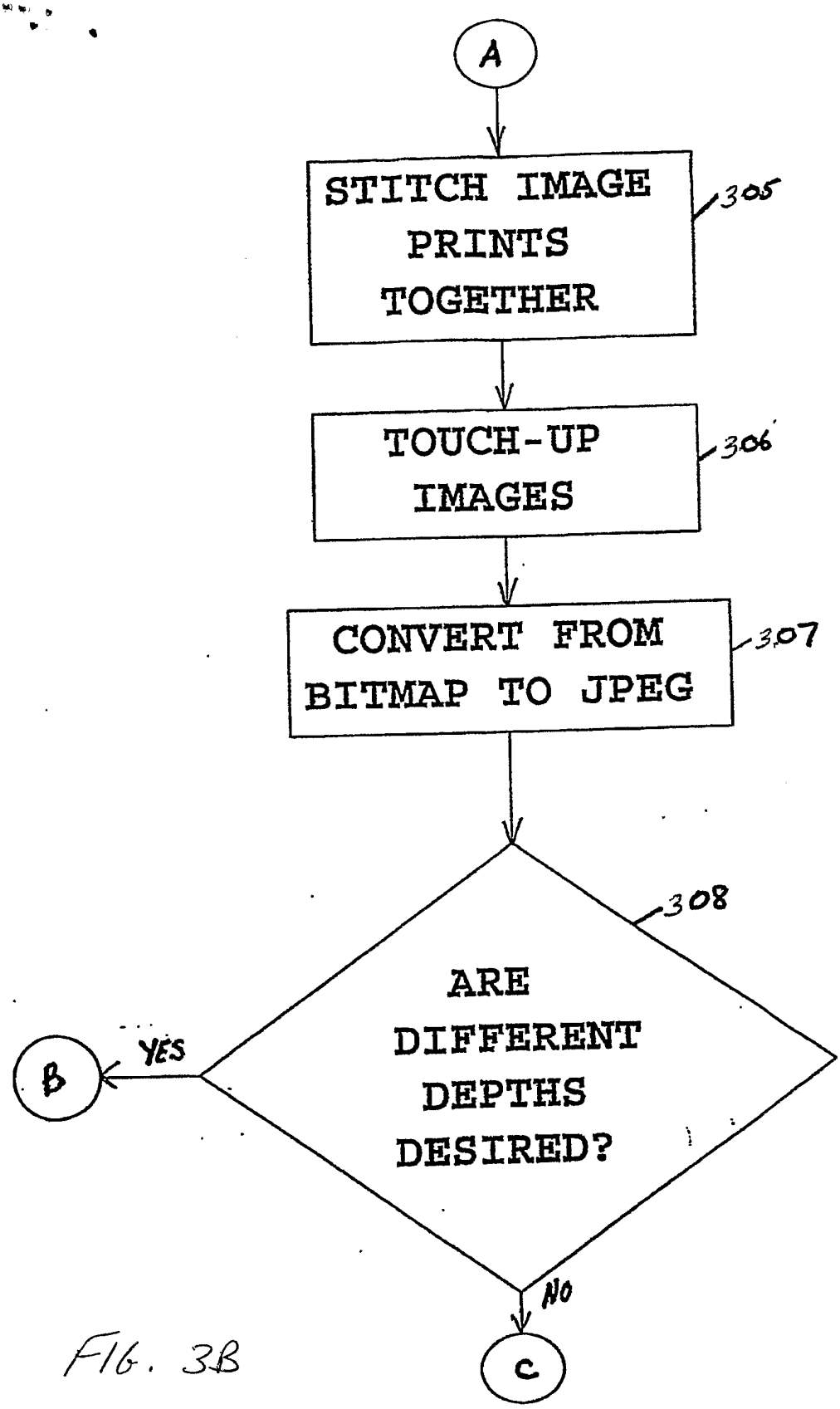

A
STITCH IMAGE PRINTS TOGETHER
305
TOUCH-UP IMAGES
306
CONVERT FROM BITMAP TO JPEG
307
ARE DIFFERENT DEPTHS DESIRED?
308
YES
B
NO
C

FIG. 3B

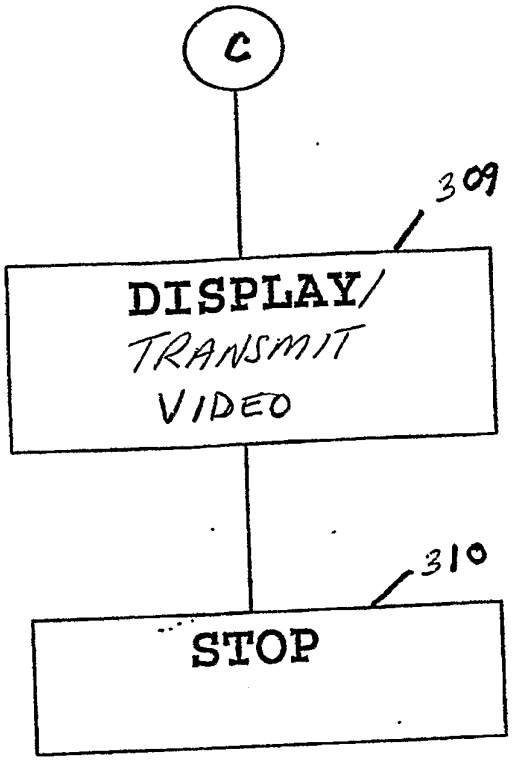


FIG. 3C

3

P1 273484

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office

July 20, 2000

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A FILING DATE UNDER 35 USC 111.

REC'D 26 JUL 2000
WIPO PCT

APPLICATION NUMBER: *60/137,297*
FILING DATE: *June 03, 1999*
PCT APPLICATION NUMBER: *PCT/US00/15406*

By Authority of the
COMMISSIONER OF PATENTS AND TRADEMARKS

N. WILLIAMS
Certifying Officer

PRIORITY DOCUMENT
SUBMITTED OR TRANSMITTED IN COMPLIANCE WITH RULE 17.1(a) OR (b)

Please type a plus sign (+) inside this box → [X]

PTO/SB/16 (2-98)
Approved for use through 01/31/2001. OMB 0651-0037
Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

A Prov

PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53 (c).

INVENTOR(S)		
Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)
Eliot	Bernstein	500 S.E. Mizner Road Suite 102 Boca Raton, FL 33432

[ ] *Additional inventors are being named on the ___ separately numbered sheets attached hereto*

TITLE OF THE INVENTION (280 characters max)

APPARATUS AND METHOD FOR PRODUCING ENHANCED VIDEO IMAGES

CORRESPONDENCE ADDRESS

Direct all correspondence to:

[ ] Customer Number [ ] → *Type Customer Number here*

OR

Place Customer Number Bar Code Label here

[X] Firm *or* Individual Name	Raymond A. Joao				
Address	Meltzer, Lippe, Goldstein & Schlissel, P.C.				
Address	190 Willis Avenue				
City	Mineola	State	NY	ZIP	11501
Country	USA	Telephone	516-747-0300	Fax	516-747-9363

ENCLOSED APPLICATION PARTS *(check all that apply)*

[X] Specification *Number of Pages* one
[ ] Drawing(s) *Number of Sheets*
[X] Small Entity Statement
[ ] Other (specify)

METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT *(check one)*

[X] A check or money order is enclosed to cover the filing fees

[ ] The Commissioner is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number. [ ]

FILING FEE AMOUNT ($): $75.00

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

[ ] No.

[ ] Yes, the name of the U.S. Government agency and the Government contract number are: _____

Respectfully submitted,

SIGNATURE Raymond A. Joao Date 6/3/99

TYPED or PRINTED NAME Raymond A. Joao REGISTRATION NO. *(if appropriate)* 35,907

TELEPHONE 516-747-0300 Docket Number: 5865-3

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

Attorney Docket No.: 5865-3

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:	Eliot I. Bernstein
Serial No.:	Please assign
Filed on:	Concurrently herewith
Title:	APPARATUS AND METHOD FOR PRODUCING ENHANCED VIDEO IMAGES

Box Provisional Application
Assistant Commissioner for Patents
Washington, D.C. 20231

PROVISIONAL PATENT APPLICATION TRANSMITTAL LETTER

Sir:

Please find transmitted herewith for filing the following:

(1) Provisional Application for Patent Cover Sheet;

(2) Provisional Patent Application including Specification - 1 page

(3) Verified Statement Claiming Small Entity Status;

(4) Check in the amount of $75.00 for the filing fee; and

) Power of Attorney form; and

(6) Return Receipt Postcard.

It is respectfully requested that the above papers be filed as a Provisional Patent Application.

Respectfully submitted,
MELTZER, LIPPE, GOLDSTEIN,
WOLF & SCHLISSEL, P.C.

By: _____
Raymond A. Joao
Reg. No. 35,907

June 3, 1999

MELTZER, LIPPE, GOLDSTEIN,
WOLF & SCHLISSEL, P.C.
190 Willis Avenue
Mineola, New York 11501

Tel. No.: (516) 747-0300
Fax No.: (516) 747-9363

"Express Mail" mailing label number EL 355808458 US

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated below and is addressed to Box Provisional Application, Assistant Commissioner for Patents, Washington, D.C. 20231

Date of Deposit June 3, 1999

(Signature) Nicole Elisa-Brown

P:\PUBLIC\PATENT\BERNSTEI\5865-3.XMT

FROM :

PTO/SB/09 (12-97)
Approved for use through 9/30/00. OMB 0651-0031
Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT CLAIMING SMALL ENTITY STATUS (37 CFR 1.9(f) & 1.27(b))--INDEPENDENT INVENTOR	Docket Number (Optional) 5865-3

Applicant, Patentee, or Identifier: Eliot Bernstein

Application or Patent No.:

Filed or Issued: Concurrently

Title: APPARATUS AND METHOD FOR PRODUCING ENHANCED VIDEO IMAGES

As a below named inventor, I hereby state that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees to the Patent and Trademark Office described in:

[X] the specification filed herewith with title as listed above.

[ ] the application identified above.

[ ] the patent identified above.

I have not assigned, granted, conveyed, or licensed, and am under no obligation under contract or law to assign, grant, convey, or license, any rights in the invention to any person who would not qualify as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern, or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

[X] No such person, concern, or organization exists.

[ ] Each such person, concern, or organization is listed below.

Separate statements are required from each named person, concern, or organization having rights to the invention stating their status as small entities. (37 CFR 1.27)

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

Eliot Bernstein		
NAME OF INVENTOR	NAME OF INVENTOR	NAME OF INVENTOR
Signature of Inventor	Signature of inventor	Signature of inventor
6-3-99		
Date	Date	Date

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

orney Docket No. 5865-3

APPARATUS AND METHOD FOR PRODUCING ENHANCED VIDEO IMAGES

The present invention is directed to an apparatus and a method for producing enhanced video images. A preferred embodiment of the invention is described in the following manner.

Step 1. Record the video under any format, i.e., beta, VHS, digital, and/or any of the standard file formats, including, but not limited to, *.AVI, *.MOV, *.MPEG, etc., by utilizing an appropriate recording device such as a video camera, a film camera, a reel-to-reel recording device, and/or a live video recording device.

Step 2. After the video is shot, the second step is to capture the video using any capture device such as a capture card or capture hardware, such as provided by Dazzle, and also by using capture software such as Adobe Premier version 5.1 or Real Producer G2.

Step 3. Edit the video, if necessary, by using any standard video editing tools, such as, for example, Adobe Premier 5.1.

Step 4. Convert the data and/or information obtained to a real video format such as, but not limited to, a *.RM format.

Step 5. Manually set the size of the video within the HTML code to a 640 x 480 frame resolution, or any other suitable resolution, such as, but not limited to, 800 x 600, 1024 x 768, 1280 x 1024, 1600 x 1200.

Step 6. Post the obtained file to a Web page, Web site and/or to the Web, by using any Web FTP software, such as, but not limited to, WS FTP PRO.

Step 7. Generate or write an ASCII file that calls the real video to stream. This results in streaming real video at full screen with very good clarity and quality. Under Step 7 a separate ASCII file is written and saved as an *.RPM file, or other suitable format, that will call the original real video file. This script is included in the HTML codes. For MPEG videos, Steps 1 through 3 are followed as described above. In Step 4, the file is converted, if not previously converted, to an MPEG format. Next, the video is inserted into the HTML codes and expanded to a 640 by 480 resolution, or higher resolution. Then the video file is uploaded to the Web page Web site, and/or the Web in Step 6. Thereafter, at Step 7, the MPEG file is played from the Web page, Web site and/or from the Web, by first downloading a small portion of the file and playing the file through a suitable player which supports AVI, MPEG-type, etc., video formats and/or other suitable formats.

Attorney Docket No.: 5865-3

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

POWER OF ATTORNEY

Application of:	Eliot I. Bernstein
Serial No.:	Please assign
Filed on:	Concurrently herewith
Title:	APPARATUS AND METHOD FOR PRODUCING ENHANCED VIDEO IMAGES

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

RAYMOND A. JOAO, Reg. No. 35,907

Address all telephone calls to Raymond A. Joao at telephone number: (516) 747-0300
Address all correspondence to Meltzer, Lippe, Goldstein, Wolf and Schlissel, P.C.
190 Willis Avenue
Mineola, New York 11501

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of the sole inventor (given name, family name): ELIOT I. BERNSTEIN	
Inventor's signature: >	Date: > 6/3/99
Residence: 500 S.E. Mizner Boulevard Suite 102 Boca Raton, FL 33432-6080	Citizenship: U.S.A.
Post Office Address: SAME AS ABOVE	

P.B.5818 - Patentlaan 2
2280 HV Rijswijk (ZH)
(070) 3 40 20 40
FAX (070) 3 40 30 16

Europäisches Patentamt	European Patent Office	Office européen des brevets
Generaldirektion 1	Directorate General 1	Direction générale 1

Iviewit Holdings, Inc.
One Boca Place,
2255 Glades Road,
Suite 337 West
Boca Ralton, FL 33431
ETATS-UNIS D'AMERIQUE

EPO - DG 1

20. 08. 2002

(42)

epoline® Customer Services

Tel.: +31 (0)70 340 45 00

Date
02.08.02

Reference	Application No./Patent No
	00938124.5-2202-US0015406

Applicant/Proprietor
Iviewit Holdings, Inc.

Notice drawing attention to Article 86(2) EPC, Art. 2 No. 5 of the rules relating to fees
- Payment of the renewal fee plus additional fee -

The renewal fee for the 03. year fell due on 30.06.02 unless this date falls within the period covered by an interruption of the proceedings in accordance with Rule 90(1) EPC.

The amount of the renewal fee on that date was **EUR 380,00** (see OJ EPO 2001, 374, 377, 378, and 543).

The renewal fee was not paid by the due date.
The renewal fee may still be validly paid **up to the last day of the sixth calender month** following the due date, provided that the additional fee (10% of the renewal fee) is paid at the same time.

Within the above period which cannot be extended the following fees are to be paid:

Renewal fee for the 03. year:	EUR	380,00
Additional fee:	EUR	38,00
TOTAL AMOUNT	EUR	418,00

If the renewal fee and the additional fee are not paid in due time, the European patent application shall be deemed to be withdrawn (Art.86(3) EPC).

Note to users of the automatic debiting procedure:
The normal time limit for payment of the above renewal fee had already expired when the automatic debit order was received. The renewal fee and the surcharge will be debited automatically on the last day of the period of grace (Supplement to OJ EPO 2/1999; OJ EPO 2000, 62).

EUROPÄISCHES PATENTAMT - EUROPEAN PATENT OFFICE - OFFICE EUROPÉEN DES BREVETS

Europäisches Patentamt
European Patent Office
Office Européen des Brevets
P.O. Box 5818
2280 HV RIJSWIJK (ZH)
Niederlande/Netherlands/Pays-Bas

PRIORITY
PRIORITAIRE

Port betaald
Port payé
Pays-Bas

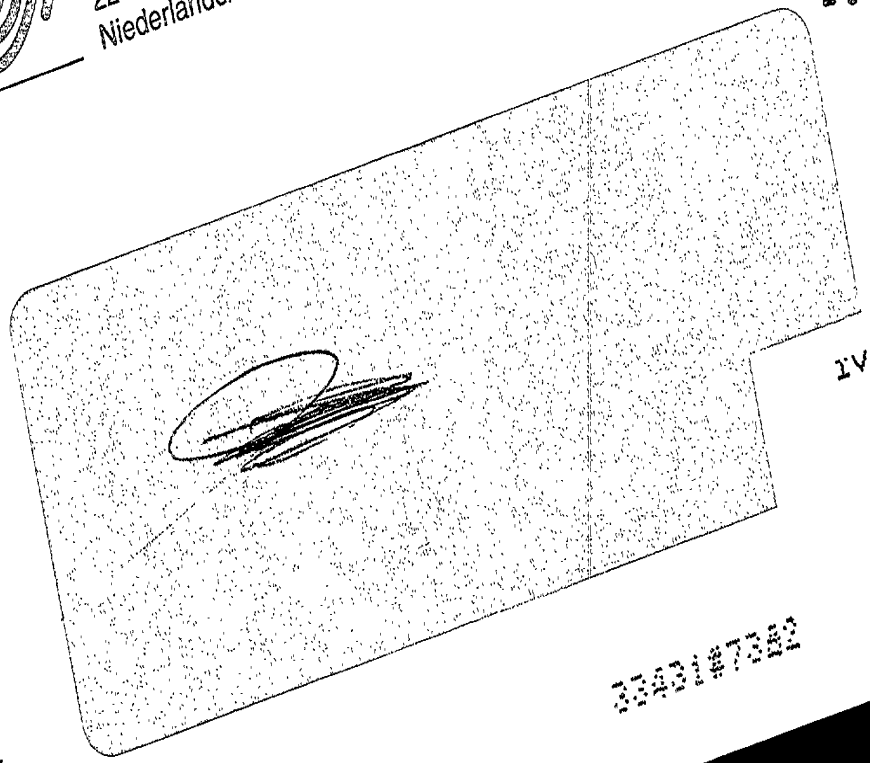
EPA EPO OEB
tel: (070) 340201[illegible]

☐ INSUFFICIENT ADDRESS
☐ NO SUCH NUMBER
☐ UNCLAIMED ☐ REFUSED
☐ ATTEMPTED NOT KNOWN
☐ NO SUCH STREET
☐ VACANT
☐ NO RECEPTACLE
☐ NOT DELIVERABLE AS ADDRESSED-UNABLE TO FORWARD

20 AUG. 2002

Mailroom

ROUTE NO. 32 DATE 8/12
CARR/INITIALS



IVIE225 334313031 IN 24 08/08/02
RETURN TO SENDER
NO FORWARD ORDER ON FILE
UNABLE TO FORWARD
RETURN TO SENDER

334316736B2

4.111

Europäisches Patentamt
GD1

European Patent Office
DG1

Office européen des brevets
DG1

File number : 00938124.5 04.06.02

Final Instructions

for closing an application (loss of all rights).

FINDING:

1. [X] No use has been made of any of the legal remedies available.
   [ ] The decision refusing the: appeal / application for reestablishment of rights / request for further processing has become final.
2. [ ] The application will not be dealt with as a European patent application (Rule 39 EPC).
   [ ] The decision refusing the application has become final.
   [X] The application is deemed to be withdrawn.

3. Form 1320 has been dispatched (if necessary).

4. The return of Form 1320 is to be controlled by coding "BEEF".

The Hague, ...
(Formalities Officer)

FINDING:

5. Checked with regard to costs; where applicable, refund ordered (RFAC).

INSTRUCTIONS:

6. ADWI(3) or REFU(3) and DEAD have been coded.

05-08-2002 Kaufmann, Jurgen

The Hague, ...
(Formalities Officer)

P.B.5818 - Patentlaan 2
2280 HV Rijswijk (ZH)
(070) 3 40 20 40
FAX (070) 3 40 30 16

Europäisches Patentamt	European Patent Office	Office européen des brevets
Generaldirektion 1	Directorate General 1	Direction générale 1

Iviewit Holdings, Inc.
One Boca Place,
2255 Glades Road,
Suite 337 West
Boca Ralton, FL 33431
ETATS-UNIS D'AMERIQUE

epoline® Customer Services
Tel.: +31 (0)70 340 45 00

Date
02.08.02

Reference	Application No./Patent No.
	00938124.5-2202-US0015406
Applicant/Proprietor: Iviewit Holdings, Inc.	

Notice drawing attention to Article 86(2) EPC, Art. 2 No. 5 of the rules relating to fees
- Payment of the renewal fee plus additional fee -

The renewal fee for the 03. year fell due on 30.06.02 unless this date falls within the period covered by an interruption of the proceedings in accordance with Rule 90(1) EPC.

The amount of the renewal fee on that date was **EUR 380,00** (see OJ EPO 2001, 374, 377, 378, and 543).

The renewal fee was not paid by the due date.
The renewal fee may still be validly paid **up to the last day of the sixth calender month** following the due date, provided that the additional fee (10% of the renewal fee) is paid at the same time.

Within the above period which cannot be extended the following fees are to be paid:

Renewal fee for the 03. year:	EUR	380,00
Additional fee:	EUR	38,00
TOTAL AMOUNT	EUR	418,00

If the renewal fee and the additional fee are not paid in due time, the European patent application shall be deemed to be withdrawn (Art.86(3) EPC).

Note to users of the automatic debiting procedure:
The normal time limit for payment of the above renewal fee had already expired when the automatic debit order was received. The renewal fee and the surcharge will be debited automatically on the last day of the period of grace (Supplement to OJ EPO 2/1999; OJ EPO 2000, 62).

P.B.5818 - Patentlaan 2
2280 HV Rijswijk (ZH)
☎ +31 70 340 2040
TX 31651 epo nl
FAX +31 70 340 3016

Europäisches Patentamt | **European Patent Office** | **Office européen des brevets**

Eingangsstelle | Receiving Section | Section de Dépôt

Iviewit Holdings, Inc.
One Boca Place,
2255 Glades Road,
Suite 337 West
Boca Ralton, FL 33431
ETATS-UNIS D'AMERIQUE

Datum/Date
22-02-2002

Zeichen/Ref./Réf.	Anmeldung Nr./Application No./Demande n°./Patent Nr ./Patent No./Brevet n°.
	00938124.5-1247-PCT/US0015406

Anmelder/Applicant/Demandeur/Patentinhaber/Proprietor/Titulaire
Iviewit Holdings, Inc.

I) NOTING OF LOSS OF RIGHTS PURSUANT TO RULE 69(1) EPC

The European patent application cited above is deemed to be withdrawn (Rule 108(1) EPC) for the following reason(s):

(a) ( ) translation of the international application into one of the EPO's official languages (Art. 158(2) EPC) not filed within the period specified in Rule 107(1)(a) EPC

(b) (X) national basic fee (X) search fee
(X) designation fees
(X) examination fee and/or written request for examination

not validly paid/made within the time limit specified in Rule 107(1)(c)-(f) EPC

(c) ( ) payment of fees on 07.02.01, after expiry of the period for payment (on 03.01.02).

II) MEANS OF REDRESS:

(1) The loss of rights [(a)(b)] shall be deemed not to have occurred if, within a (non-extendable) period of TWO MONTHS of notifcation of this communication, the above requirement(s) has (have) been fulfilled and the appropriate surcharge(s) under Article 2(3b)(3c) RFees have been paid (Rule 108(3) EPC).

If fees were paid late [(c)], evidence as specified in Article 8(3)(4) RFees is to be provided within the same time limit.

(2) If, however, the applicant considers that this finding is inaccurate, he may apply in writing for an EPO decision on the matter (Rule 69(2) EPC) within the same time limit, i.e. that specified in (1).

Encl.: Schedule of Fees --/2

REGISTERED LETTER 7002000 02/02/02

The finding will be set aside only if it does not actually correspond to the factual or legal situation.
The applicant's rights with regard to fee payment or filing the written request for examination cannot be re-established under Article 122 EPC.

(3) If, in spite of all due care required by the circumstances having been taken, the applicant was unable to OBSERVE THE TIME LIMIT FOR FILING THE TRANSLATION, he will, upon application, have his rights re-established provided that the time limits and formal requirements laid down in Article 122 EPC are complied with.

NOTE: Applicants not having either a residence or principal place of business within the territory of one of the EPC contracting states must have the above request under Article 122 EPC or Rule 69(2) EPC filed by a professional representative authorised to act before the EPO.

RECEIVING SECTION

Kaufmann, Jurgen

P1 273484

3

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office

July 20, 2000

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A FILING DATE UNDER 35 USC 111.

REC'D 26 JUL 2000
WIPO PCT

APPLICATION NUMBER: *60/137,297*
FILING DATE: *June 03, 1999*
PCT APPLICATION NUMBER: *PCT/US00/15406*

By Authority of the
COMMISSIONER OF PATENTS AND TRADEMARKS

N. WILLIAMS
Certifying Officer

PRIORITY DOCUMENT

SUBMITTED OR TRANSMITTED IN
COMPLIANCE WITH RULE 17.1(a) OR (b)

Please type a plus sign (+) inside this box → [X]

PTO/SB/16 (2-98)
Approved for use through 01/31/2001. OMB 0651-0037
Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

A
Prov

PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53 (c).

INVENTOR(S)		
Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)
Eliot	Bernstein	500 S.E. Mizner Road Suite 102 Boca Raton, FL 33432

☐ *Additional inventors are being named on the ___ separately numbered sheets attached hereto*

TITLE OF THE INVENTION (280 characters max)

APPARATUS AND METHOD FOR PRODUCING ENHANCED VIDEO IMAGES

CORRESPONDENCE ADDRESS

Direct all correspondence to:

☐ Customer Number [ ] → *Place Customer Number Bar Code Label here*

OR *Type Customer Number here*

[X] Firm *or* Individual Name	Raymond A. Joao				
Address	Meltzer, Lippe, Goldstein & Schlissel, P.C.				
Address	190 Willis Avenue				
City	Mineola	State	NY	ZIP	11501
Country	USA	Telephone	516-747-0300	Fax	516-747-9363

ENCLOSED APPLICATION PARTS *(check all that apply)*

[X] Specification *Number of Pages* one
[X] Small Entity Statement
☐ Drawing(s) *Number of Sheets*
☐ Other (specify)

METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT *(check one)*

[X] A check or money order is enclosed to cover the filing fees — FILING FEE AMOUNT ($): $75.00

☐ The Commissioner is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number.

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☐ No.

☐ Yes, the name of the U.S. Government agency and the Government contract number are:

Respectfully submitted,

SIGNATURE Raymond Joao

TYPED or PRINTED NAME Raymond A. Joao

TELEPHONE 516-747-0300

Date 6/3/99

REGISTRATION NO. *(if appropriate)* 35,907

Docket Number: 5865-3

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

This collection of information is required by 37 CFR 1.51. The information is used by the public to file (and by the PTO to process) a provisional application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the complete provisional application to the PTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, D.C., 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Box Provisional Application, Assistant Commissioner for Patents, Washington, D.C., 20231.

06/03/99 JC586 U.S. PTO

A/PROV

torney Docket No.: 5865-3

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

JC542 U.S. PTO 60/137297 06/03/99

Application of:	Eliot I. Bernstein
Serial No.:	Please assign
Filed on:	Concurrently herewith
Title:	APPARATUS AND METHOD FOR PRODUCING ENHANCED VIDEO IMAGES

Box Provisional Application
Assistant Commissioner for Patents
Washington, D.C. 20231

PROVISIONAL PATENT APPLICATION TRANSMITTAL LETTER

Sir:

Please find transmitted herewith for filing the following:

(1) Provisional Application for Patent Cover Sheet;

(2) Provisional Patent Application including Specification - 1 page

(3) Verified Statement Claiming Small Entity Status;

(4) Check in the amount of $75.00 for the filing fee; and

(5) Power of Attorney form; and

(6) Return Receipt Postcard.

It is respectfully requested that the above papers be filed as a Provisional Patent Application.

Respectfully submitted,
MELTZER, LIPPE, GOLDSTEIN,
WOLF & SCHLISSEL, P.C.

By: _____
Raymond A. Joao
Reg. No. 35,907

June 3, 1999

MELTZER, LIPPE, GOLDSTEIN,
WOLF & SCHLISSEL, P.C.
190 Willis Avenue
Mineola, New York 11501

Tel. No.: (516) 747-0300
Fax No.: (516) 747-9363

"Express Mail" mailing label number EL 355808458US

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated below and is addressed to Box Provisional Application, Assistant Commissioner for Patents, Washington, D.C. 20231

Date of Deposit June 3, 1999

(Signature) Nicole Elisa-Brown

P:\PUBLIC\PATENT\BERNSTEI\5865-3.XMT

PTO/SB/09 (12-97)
Approved for use through 9/30/00. OMB 0651-0031
Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT CLAIMING SMALL ENTITY STATUS (37 CFR 1.9(f) & 1.27(b))--INDEPENDENT INVENTOR	Docket Number (Optional) 5865-3

Applicant, Patentee, or Identifier: Eliot Bernstein

Application or Patent No.:

Filed or Issued: Concurrently

Title: APPARATUS AND METHOD FOR PRODUCING ENHANCED VIDEO IMAGES

As a below named inventor, I hereby state that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees to the Patent and Trademark Office described in:

[X] the specification filed herewith with title as listed above.

[ ] the application identified above.

[ ] the patent identified above.

I have not assigned, granted, conveyed, or licensed, and am under no obligation under contract or law to assign, grant, convey, or license, any rights in the invention to any person who would not qualify as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern, or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

[X] No such person, concern, or organization exists.

[ ] Each such person, concern, or organization is listed below.

Separate statements are required from each named person, concern, or organization having rights to the invention stating their status as small entities. (37 CFR 1.27)

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

Eliot Bernstein		
NAME OF INVENTOR	NAME OF INVENTOR	NAME OF INVENTOR
Signature of Inventor	Signature of inventor	Signature of inventor
6-3-99		
Date	Date	Date

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Attorney Docket No. 5865-3

APPARATUS AND METHOD FOR PRODUCING ENHANCED VIDEO IMAGES

The present invention is directed to an apparatus and a method for producing enhanced video images. A preferred embodiment of the invention is described in the following manner.

Step 1. Record the video under any format, i.e., beta, VHS, digital, and/or any of the standard file formats, including, but not limited to, *.AVI, *.MOV, *.MPEG, etc., by utilizing an appropriate recording device such as a video camera, a film camera, a reel-to-reel recording device, and/or a live video recording device.

Step 2. After the video is shot, the second step is to capture the video using any capture device such as a capture card or capture hardware, such as provided by Dazzle, and also by using capture software such as Adobe Premier version 5.1 or Real Producer G2.

Step 3. Edit the video, if necessary, by using any standard video editing tools, such as, for example, Adobe Premier 5.1.

Step 4. Convert the data and/or information obtained to a real video format such as, but not limited to, a *.RM format.

Step 5. Manually set the size of the video within the HTML code to a 640 x 480 frame resolution, or any other suitable resolution, such as, but not limited to, 800 x 600, 1024 x 768, 1280 x 1024, 1600 x 1200.

Step 6. Post the obtained file to a Web page, Web site and/or to the Web, by using any Web FTP software, such as, but not limited to, WS FTP PRO.

Step 7. Generate or write an ASCII file that calls the real video to stream. This results in streaming real video at full screen with very good clarity and quality. Under Step 7 a separate ASCII file is written and saved as an *.RPM file, or other suitable format, that will call the original real video file. This script is included in the HTML codes. For MPEG videos, Steps 1 through 3 are followed as described above. In Step 4, the file is converted, if not previously converted, to an MPEG format. Next, the video is inserted into the HTML codes and expanded to a 640 by 480 resolution, or higher resolution. Then the video file is uploaded to the Web page Web site, and/or the Web in Step 6. Thereafter, at Step 7, the MPEG file is played from the Web page, Web site and/or from the Web, by first downloading a small portion of the file and playing the file through a suitable player which supports AVI, MPEG-type, etc., video formats and/or other suitable formats.

Attorney Docket No.: 5865-3

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

POWER OF ATTORNEY

Application of:	Eliot I. Bernstein
Serial No.:	Please assign
Filed on:	Concurrently herewith
Title:	APPARATUS AND METHOD FOR PRODUCING ENHANCED VIDEO IMAGES

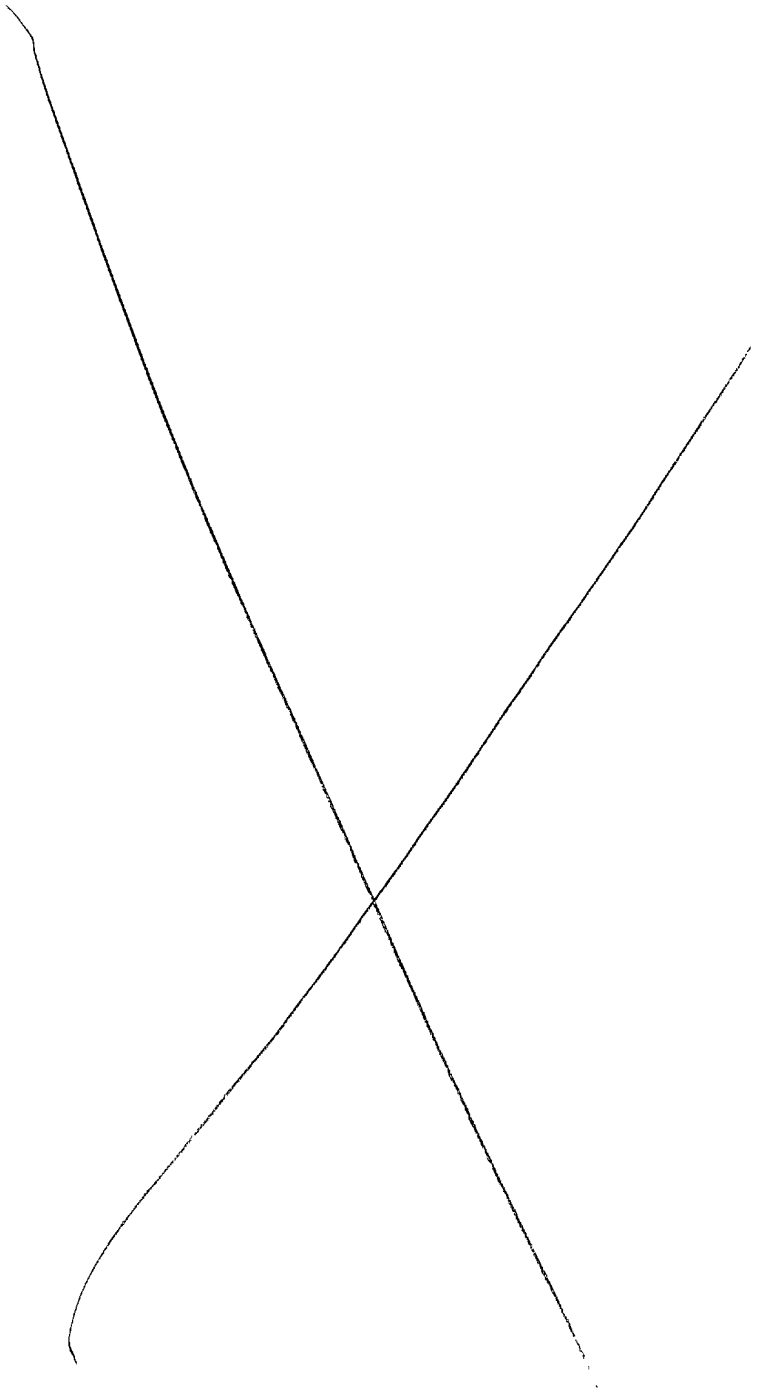
I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

RAYMOND A. JOAO, Reg. No. 35,907

Address all telephone calls to Raymond A. Joao at telephone number: (516) 747-0300
Address all correspondence to Meltzer, Lippe, Goldstein, Wolf and Schlissel, P.C.
190 Willis Avenue
Mineola, New York 11501

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of the sole inventor (given name, family name): ELIOT I. BERNSTEIN	
Inventor's signature: >	Date: > 6/3/99
Residence: 500 S.E. Mizner Boulevard Suite 102 Boca Raton, FL 33432-6080	Citizenship: U.S.A.
Post Office Address: SAME AS ABOVE	



P1 273485

3

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office

July 20, 2000

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A FILING DATE UNDER 35 USC 111.

REC'D 26 JUL 2000
WIPO PCT

APPLICATION NUMBER: ***60/155,404***
FILING DATE: ***September 22, 1999***
PCT APPLICATION NUMBER: *PCT/US00/15406*

By Authority of the
COMMISSIONER OF PATENTS AND TRADEMARKS

N. Williams

N. WILLIAMS
Certifying Officer

PRIORITY DOCUMENT

SUBMITTED OR TRANSMITTED IN
COMPLIANCE WITH RULE 17.1(a) OR (b)

A / PROV

Please type a plus sign (+) inside this box → [+]

PTO/SB/16 (2-98)
Approved for use through 01/31/2001. OMB 0651-0037
Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

JC520 U.S. PTO 09/22/99

JC563 U.S. PTO 60/155404 09/22/99

PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53 (c).

INVENTOR(S)

Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)
Eliot I.	BERNSTEIN	500 S.E. Mizner Blvd. Suite 102 Boca Raton, FL 33432-6080

☐ *Additional inventors are being named on the ___ separately numbered sheets attached hereto*

TITLE OF THE INVENTION (280 characters max)

APPARATUS AND METHOD FOR PRODUCING ENHANCED VIDEO IMAGES AND/OR VIDEO FILES

CORRESPONDENCE ADDRESS

Direct all correspondence to:

☐ Customer Number [ ] → *Place Customer Number Bar Code Label here*

Type Customer Number here

OR

[X] Firm *or* Individual Name	Raymond A. Joao, Esq.
Address	Meltzer, Lippe, Goldstein & Schlissel, P.C.
Address	190 Willis Avenue
City	Mineola — State: NY — ZIP: 11501
Country	USA — Telephone: 516-747-0300 — Fax: 516-747-9363

ENCLOSED APPLICATION PARTS ***(check all that apply)***

[X] Specification *Number of Pages*	29	[X] Small Entity Statement	
[X] Drawing(s) *Number of Sheets*	4	[X] Other (specify)	Power of Attorney

METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT ***(check one)***

[X] A check or money order is enclosed to cover the filing fees

☐ The Commissioner is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number: [ ]

FILING FEE AMOUNT ($): 75.00

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

[X] No.

☐ Yes, the name of the U.S. Government agency and the Government contract number are: ______

Respectfully submitted,

SIGNATURE [signature]

Date 9/22/99

TYPED or PRINTED NAME Raymond A. Joao, Esq.

REGISTRATION NO. *(if appropriate)* 35,907

TELEPHONE 516-747-0300, xtn-240

Docket Number: 5865-7

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

Attorney Docket No.: 5865-7

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	**Eliot I. Bernstein**
Serial No.	:	**Please assign**
Filed	:	**Concurrently herewith**
Title	:	**APPARATUS AND METHOD FOR PRODUCING ENHANCED VIDEO IMAGES AND/OR VIDEO FILES**

Box Provisional Application
Assistant Commissioner for Patents
Washington, D.C. 20231

"Express Mail" mailing label number EL355808546US

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated below and is addressed to: Box Provisional Application, Assistant Commissioner for Patents, Washington, D.C. 20231

Date of Deposit: September 22, 1999

(Signature): Nicole Eliseo-Pinou

Nicole Eliseo-Pinou

PROVISIONAL PATENT APPLICATION TRANSMITTAL LETTER

Sir:

Please find transmitted herewith for filing the following:

(1) Provisional Application for Patent Cover Sheet;

(2) Provisional Patent Application including Specification, Claims and Abstract - 29 pages, and Drawings - 4 sheets.

(3) Verified Statement Claiming Small Entity Status;

(4) Check in the amount of $75.00 for the filing fee;

(5) Power of Attorney form; and

(6) Return Receipt Postcard.

It is respectfully requested that the above papers be filed as a Provisional Patent Application.

Respectfully submitted,
MELTZER, LIPPE, GOLDSTEIN
& SCHLISSEL, P.C.

By: ______________________
Raymond A. Joao
Reg. No. 35,907

September 22, 1999

MELTZER, LIPPE, GOLDSTEIN
& SCHLISSEL, P.C.
190 Willis Avenue
Mineola, New York 11501

Tel. No.: (516) 747-0300
Fax No.: (516) 747-9363

FROM :

VERIFIED STATEMENT CLAIMING SMALL ENTITY STATUS
(37 CFR 1.9(f) & 1.27(b))--INDEPENDENT INVENTOR

Attorney Docket No.: 5865-7

Applicant or Patentee: Eliot I. Bernstein

Serial or Patent No.: Please assign

Filed or Issued: Concurrently herewith

Title: APPARATUS AND METHOD FOR PRODUCING ENHANCED VIDEO IMAGES AND/OR VIDEO FILES

As a below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees to the Patent and Trademark Office described in:

X the specification filed herewith with title as listed above.
__ the application identified above.
__ the patent identified above.

I have not assigned, granted, conveyed or licensed and am under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention as listed below:

X No such person, concern, or organization exists.
__ Each such person, concern, or organization is listed below.

Separate verified statements are required from each named person, concern or organization having the rights to the invention averring to their status as small entities. (37 CFR 1.27)

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

ELIOT I. BERNSTEIN
NAME OF PERSON SIGNING

500 S.E. Mizner Boulevard
Suite 102
Boca Raton, FL 33432-6080
ADDRESS OF PERSON SIGNING

SIGNATURE

9/22/99
DATE

PTO/SB/ 09 (10-92) Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

P:\PUBLIC\PATENT\VIEWIT\5865-7\

Attorney Docket No. 5865-7

APPARATUS AND METHOD FOR PRODUCING ENHANCED VIDEO IMAGES AND/OR VIDEO FILES

FIELD OF THE INVENTION

The present invention is directed to an apparatus and a method for producing enhanced images and/or video files and, in particular, to an apparatus and a method for producing enhanced resolution digital images and/or digital video files obtained via digital and/or film video cameras and/or recording devices.

BACKGROUND OF THE INVENTION

The fields of telecommunications, multimedia, and related areas, are growing at increasing rates. With this continued growth, the need for high resolution digital imagery, for utilization in conjunction with the corresponding technologies, is becoming greater. Current technologies utilize film cameras and recorders as well as digital cameras and recorders.

Conventional video and image technologies typically have very low zoom quality and low image size restrictions or limitations associated therewith. Generally speaking, enlarged images produce a higher resolution image, and an associated higher resolution scanning quality, which further facilitates an improved enlargement or reduction of the image for different

sizes and different depths, without pixel distortion. Photographs, negatives, and associated images, utilize pixels which typically have a certain size. When enlarged or reduced, these pixels of the image become distorted, a feature which typically results in the image being fixed to an original size, or being available at very low magnifications, such as, for example, magnifications of from 200 times to 300 times. These images are also difficult to enlarge to a full screen size without a tremendous amount of distortion present in the end product.

Currently, panoramic imaging techniques utilize non-enlarged images as their starting point. With such associated limitations, the ability to provide enhanced resolution digital images and, especially, an enhanced resolution digital panoramic image, such as those utilized on, or over, the Internet and/or the World Wide Web, has been greatly compromised.

Another major drawback in the current technology lies in the fact that conventional processes often utilize panoramic lenses in order to capture an image. This practice has been criticized as creating distortions in the image immediately upon the image's enlargement or reduction. The conventional techniques associated with the use of panoramic lenses are known to result in image "bending", which further curtails one's ability to obtain realistic views, especially upon performing any associated

cropping and/or editing processes. In such instances, the upper end and the lower end of the image must be either erased, or covered, in order to prevent the flaw from being exposed. This typically results in the resulting image having a "fishbowl-type" distortion.

In some instances, wide angle lenses have been utilized in order to obtain enhanced floor to ceiling images without experiencing image bending. In these applications, however, the ability of the lens to capture optimal images varies depending upon the scene or image being photographed.

As a result, the ability to obtain enhanced video images and/or video files from film cameras and film recorders, from negatives and from digital cameras and recorders, has been limited.

SUMMARY OF THE INVENTION

The present invention provides an apparatus and a method for providing enhanced digital video images and/or digital video files which overcomes the shortcomings of the prior art. The digital images and/or digital files produced by utilizing the present invention can be easily managed, when displayed, projected, and/or posted on any viewing device and/or entity such

as, but not limited to, an Internet Web server, Web site or Web page, television, etc.

The present invention provides an apparatus and a method for producing enhanced digital video images and video files from video which may be recorded as print film image or file, a negative image or file, and/or a digital video image and/or file. The video images and/or files may be obtained via a digital camera, a digital recording device, a digital recorder, a digital camcorder, a film video camera, recorder, and/or camcorder, a VHS video camera, recorder, and/or camcorder, a beta video camera, recorder, and/or camcorder, and/or any other suitable video recording device.

The video images and/or video files which are produced by the apparatus and method of the present invention have improved and enhanced resolution and require far less effort in the associated maintenance and management of same. The video images and/or files, which are produced by the apparatus and method of the present invention, can be utilized and displayed on computers, projection devices, televisions, and, as noted above, can be posted to an Internet Web server, a Web site, and/or a Web page. The video images and/or files can be transmitted over a communication network and/or in computer-to-computer applications.

The present invention, in a preferred embodiment, is utilized to produce enhanced video images and/or files for posting and/or for downloading, to a digital display medium, which in the preferred embodiment, is an Internet and/or a World Wide Web server, a Web site, and/or Web page. In this manner, enhanced video images and/or video files can be produced from video images and/or video files which can be recorded using any video recording device and recording medium such as, but not limited to, digital cameras, digital recorders, film cameras, film recorders, etc. The video images and/or files obtained are thereafter processed in accordance with the apparatus and method of the present invention in order to produce enhanced video images and/or video files.

These resulting video images and/or video files have enhanced resolution which is unaffected by the typical resolution limiting and degrading parameters and phenomena which are associated with conventional digital and/or film video cameras, recorders and corresponding processing equipment, methods and/or techniques.

The apparatus can include a video camera or recorder which can be any one of an analog camera and/or a digital camera, an analog and/or digital recording device, an analog and/or digital camcorder, a film camera, a film recording device, and/or a film camcorder. For full motion video, a 3CCD chip, and/or any other

appropriate and/or suitable motion capture recording device, can be utilized in conjunction with the present invention. The camera can also be a hand-held camera, a fixed camera, and/or a camera which is mountable, such as on a tripod or on a stand. The camera can be utilized to obtain the video image and/or video file which will be processed in accordance with the present invention.

The present invention preserves image integrity from the point of capture of the image through and including any final compression or compressions of same. The apparatus can also include a developing device, which can be utilized for developing video images and/or files which are obtained on film. In the case of video images and/or files which are obtained digitally, no developing device would be needed. The apparatus can also include an enlarging device which can be utilized to enlarge the video images obtained. An enlarger can be utilized for enlarging either film images and/or digital images.

The apparatus can also include a computer, for performing the various processing routines during operation of the apparatus and method of the present invention. The computer may be a personal computer, a laptop computer, a mini-computer, a microcomputer, a mainframe computer, a network computer, a server computer, and/or any other suitable computer or computer system.

The computer can include a central processing unit (CPU), a read only memory (ROM), a random access memory (RAM), a display device, an input device and an output device. The input device may include a keyboard, a mouse, or other pointing device, and/or any other data and/or command input device, for allowing for data and/or command input by a user. The output device may include a printer and, in the preferred embodiment, the printer may be a color laser printer or a color inkjet printer. The computer can also include a receiver for receiving data and/or information over a communication network and a transmitter for transmitting data and/or information over the communication network.

The computer can also include a video capture device, which may or may not be an integral component of the computer. The video capture can also be an external peripheral device. Video data and/or information can be fed into, and/or played through, the video capture device, thereby digitizing the video data and/or information. The present invention preserves the integrity of any and/or all data and/or information upon conversion to digital formats. If full motion video is captured, any conversion can utilize full motion capture software and/or hardware. The video data and/or information can be fed into, and/or through, the video capture card, in real-time, thereby facilitating real-time video transmissions.

The computer can also include any other hardware device or peripheral device and/or software which is, or which may be, needed and/or desired in order to perform any of the functions and/or operation described herein. The computer can also include a video data capture device for capturing and processing the video images and/or files processed by the present invention.

The apparatus can also include a scanning device, for scanning video images or files, if needed, whether they be of a digital or of a print film type, in order to obtain a digital image representation of same.

The apparatus and method of the present invention provides video images and/or files which have enhanced resolution and quality while requiring less file management efforts.

The resulting video images and/or files which are obtained via the apparatus and method of the present invention are characterized by a high definition resolution and are suitable for high definition television, Web television, and large, full screen, panoramic Internet applications, including video playback and/or video transmission, which preserving resolution upon image and/or video file magnification or reduction.

The present invention also facilitates high speed file transfers of high resolution video images and/or video files,

thereby dispensing with the need to engage in long and slow conventional file downloads and/or file transfers.

The apparatus and method of the present invention can also be utilized in conjunction with three-dimensional images and video files in order to produce high resolution, three-dimensional video images and/or video files.

Accordingly, it is an object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files from files obtained via digital and/or film video cameras and/or a recording devices.

It is another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files from files obtained via digital and/or film video cameras and/or a recording devices, which have improved and enhanced resolution.

It is still another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, from files obtained via digital and/or film video cameras and/or a recording

devices digital images, which are suitable for display and/or for downloading to a digital computer, a television, and/or any other communication device utilized in a telecommunication environment and/or communications environment.

It is still another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, from files obtained via digital and/or film video cameras and/or a recording devices, which are characterized by image compression and/or minimal image compression thereby avoiding any dramatic loss in image quality.

It is another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, from files obtained via digital and/or film video cameras and/or a recording devices, which may dispense with the need to compress the image data.

It is yet another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, from files obtained via digital and/or film video cameras and/or a recording devices, which are characterized by high definition resolution, and which are suitable for high definition television, Web television and

large, full screen, panoramic internet applications, without loss of resolution upon image magnification or reduction.

It is another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, from files obtained via digital and/or film video cameras and/or a recording devices, which can be transmitted in a network environment.

It is still another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, from files obtained via digital and/or film video cameras and/or a recording devices, which facilitates high speed file transfer in a network environment and/or in a computer environment.

It is another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, which preserves image integrity from the point of capture of the image through and including final compression or compressions.

It is still another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, which

preserves the integrity of any and/or all data and/or information upon conversion to digital formats.

Other objects and advantages of the present invention will be apparent to those skilled in the art upon a review of the Description of the Preferred Embodiment taken in conjunction with the Drawings which follow.

BRIEF DESCRIPTION OF THE DRAWINGS

In the Drawings:

Figure 1 illustrates the apparatus of the present invention, in block diagram form; and

Figures 2A, 2B and 2C illustrate the method of the present invention, in flow diagram form.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention provides an apparatus and a method for providing enhanced digital video images and/or digital video files which can be utilized and which can be easily managed, when displayed, projected, and/or posted on any viewing device and/or entity such as, but not limited to, an Internet Web server, Web site or Web page, television, etc. In particular, the present

invention provides an apparatus and a method for producing enhanced digital video images and video files from video which may be recorded as a digital video image and/or files and/or as a film video image and/or file a print film image.

The video images and/or files may be obtained via a digital camera, a digital recording device, a digital recorder, a digital camcorder, a film video camera, recorder, and/or camcorder, a VHS video camera, recorder, and/or camcorder, a beta video camera, recorder, and/or camcorder, and/or any other suitable video recording device. The video images and/or video files which are produced by the apparatus and method of the present invention have improved and enhanced resolution and require far less effort in the associated maintenance and management of same. The video images and/or files, which are produced by the apparatus and method of the present invention, can be utilized and displayed on computers, projection devices, televisions, and, as noted above, can be posted to an Internet Web server, a Web site, and/or a Web page. The video images and/or files can be transmitted over a communication network and/or in computer-to-computer applications.

The present invention, in a preferred embodiment, is utilized to produce enhanced video images and/or files for posting and/or for downloading, to a digital display medium, which in the preferred embodiment, is an Internet and/or a World

Wide Web server, a Web site, and/or Web page. In this manner, enhanced video images and/or video files can be produced from video images and/or video files which can be recorded using any video recording device and recording medium such as, but not limited to, digital cameras, digital recorders, film cameras, film recorders, etc. The video images and/or files obtained are thereafter processed in accordance with the apparatus and method of the present invention in order to produce enhanced video images and/or video files.

These resulting video images and/or video files have enhanced resolution which is unaffected by the typical resolution limiting parameters and phenomena which are associated with conventional digital and film video cameras, recorders and corresponding processing equipment, methods and/or techniques.

Figure 1 illustrates the apparatus of the present invention which is denoted generally by the reference numeral 100, in block diagram form. With reference to Figure 1, the apparatus 100 includes a video camera or recorder 105 which, in the preferred embodiment, can be any one of a digital camera, a digital recording device, digital camcorder, a film camera, a film recording device, and/or a film camcorder. In the preferred embodiment, the camera 105 may be a hand-held camera, a fixed camera, and/or a camera which is mountable, such as on a tripod or on a stand. The camera 105 is utilized to obtain the video

image and/or video file which will be processed as described herein.

For full motion video, a 3CCD chip, and/or any other appropriate and/or suitable motion capture recording device, can be utilized in conjunction with the present invention.

The present invention can also be utilized in conjunction with any imaging and/or any video recording device and/or equipment, such as, but not limited to, those devices and equipment utilized in, or in conjunction with, medical imaging equipment, devices and/or instruments, motion picture production equipment, devices and/or instruments and/or in any other equipment, device, and/or instrument, which is, or which can be, utilized in conjunction with imaging and/or video applications and/or uses.

The apparatus 100 also includes a developing device 115, which would be utilized for developing video images and/or files which are obtained on film. In the case of video images and/or files which are obtained digitally, no developing device. The apparatus also includes an enlarging device which can be utilized to enlarge the video images obtained. The apparatus can include an enlarger for both film images as well as for digital images.

The apparatus 100 also includes a computer 120, for performing the various processing routines during operation of the apparatus and method of the present invention. The computer 120 may be a personal computer, a laptop computer, a mini-computer, a microcomputer, a mainframe computer, a network computer, a server computer, and/or any other suitable computer or computer system.

The computer 120 includes a central processing unit (CPU), a read only memory (ROM), a random access memory (RAM), a display device, an input device and an output device. The input device may include a keyboard, a mouse, or other pointing device, and/or any other data and/or command input device, for allowing for data and/or command input by a user. The output device may include a printer and, in the preferred embodiment, the printer may be a color laser printer or a color inkjet printer. The computer 120 also includes a receiver for receiving data and/or information over a communication network and a transmitter for transmitting data and/or information over the communication network.

The computer 120 also includes a video capture device 121 which, in the preferred embodiment, is an integral component of the computer 120. The video capture device 121, in the preferred embodiment, is a video capture card 121 which is located internal to the computer 120. The video computer device 121 may also be an external peripheral device. As described

herein, the video data and/or information is fed into, and/or played through, the video capture device 121, thereby digitizing the video data and/or information. The video data and/or information can be fed into, and/or through, the video capture card 121, in real-time, thereby facilitating real-time video transmissions.

The computer 120 may also include any other hardware device or peripheral device and/or software which is, or which may be needed and/or desired in order to perform any of the functions and/or operation described herein. In particular, the computer 120 will also include a video data capture device for capturing and processing the video images and/or files processed by the present invention.

The apparatus 100 also includes a scanning device 125, for scanning video images or files, if needed, whether they be digital or of a print film type, in order to obtain a digital image representation of same. Any suitable computer or scanner, and any suitable scanning software, may be utilized in conjunction with the present invention. In a preferred embodiment, any suitable scanning device can be utilized in conjunction with any appropriate software.

Figures 2A, 2B and 2C illustrate the method of the present invention, in flow diagram form. With reference to Figures 2A, 2B and 2C, the method of the present invention commences at step 200. At step 201, the video images and/or files are recorded with the video camera 105. The video can be recorded in any format, such as, but not limited to, i.e., beta, VHS, digital, and/or any of the standard file formats, including, but not limited to, *.AVI, *.MOV, *.MPEG, etc., by utilizing the video recording device 105. The video recording device 105 may also be a reel-to-reel recording device and/or a live video recording device.

At step 202, the video images and/or files are converted to a converted to digital files, if necessary, by utilizing the scanner 110. At step 203, digital video image files are loaded into the computer 120 for processing. At step 204, the video image files are fed into, or through, the capture device 121 of the computer 120. The video capture operation, which is performed by the video capture device 121, in the preferred embodiment, can be performed without compression and/or encoding operations being performed on the video image files and/or with only minimal compression and/or encoding operations being performed on the video image files.

The video capture device, in the preferred embodiment, can be any suitable video capture device or card and/or any other

appropriate and/or suitable video capture hardware. The capture software utilized can be any appropriate and/or suitable video capture software.

At step 205, the video images and/or files are edited, if necessary, by using any standard video editing tools, such as, for example, any editing software. At step 206, the video image files are then converted to any suitable real video format such as, for example, a *.RM format. At step 207, the size of the video within the file code is set either manually or automatically. In the preferred embodiment, the size of the video is set within the file code, which may or may not be the HTML file code to a 640 x 480 frame resolution, or any other suitable resolution, such as, but not limited to, 800 x 600, 1024 x 768, 1280 x 1024, 1600 x 1200 or other sizes.

At step 208, the obtained video image file or files is then posted to the computer 120 and/or to another hosting computer. If the posting is to an computer other than the computer 120, the posting is performed by transmitting the video file or files over a communication network to the hosting computer. In the preferred embodiment, the video file or files are posted via the Internet, and/or the World Wide Web, and can posted to a Web Page, a Web site, and/or any other network device. The posting operation is performed by utilizing any suitable posting software.

At step 209, the computer 120 or other hosting computer generates or writes a file or script, such as an ASCII file which calls the video to stream or to download. This results in video which will stream or "streaming" video for a full screen application which will be characterized by a good clarity and quality. At step 210, a separate file or script, such as an ASCII file is written and saved to an appropriately formatted file, such as an *.RPM file, or other suitable file format, which will call the original video file. This script can be typically included in any suitable code, such as an HTML code.

In the case of MPEG videos, Steps 201 through 203 are followed as described above. At step 204, however, the video file is converted, if not previously converted, to an MPEG format. Thereafter, the video is inserted into the appropriate file which may contain suitable coding, such as HTML codes. Thereafter, the file can be sized to any of herein-described resolutions. Thereafter, the video file is uploaded to the hosting computer, if utilized. Thereafter, the MPEG file is played from the computer 120 or the hosting computer, the Web page, and/or the Web site, depending upon the application, by first downloading a small portion of the file and by playing the file through a suitable device such as a player which supports any suitable video formats, such as AVI, MPEG-type, etc., and/or other suitable formats.

Thereafter, operation of the apparatus ceases at step 210.

The processing steps described herein provide for the production of video images and/or video files which have enhanced resolution and which can be easily and effectively managed in applications involving the display of same, the posting of same, to a host computer, a Web server, a Web site, a Web page, a computer display, a full screen projection display and/or a video presentation and/or playback of same, respectively. Further, the method of the present invention provides for image processing, including various image and/or file processing techniques, which may or may not include image compression and/or encoding operations.

The apparatus and method of the present invention provides video images and/or files which have enhanced resolution and quality while requiring less file management efforts.

The resulting video images and/or files which are obtained via the apparatus and method of the present invention are characterized by a high definition resolution and are suitable for high definition television, Web television, and large, full screen, panoramic Internet applications, including video playback and/or video transmission, which preserving resolution upon image and/or video file magnification or reduction. The present invention also dispenses with the need for plug-in software

during download and/or file transfer operations. The present invention also facilitates high speed file transfers of high resolution video images and/or video files, thereby dispensing with the need to engage in long and slow conventional file downloads and/or file transfers.

The apparatus and method of the present invention can also be utilized in conjunction with three-dimensional images and video files in order to produce high resolution, three-dimensional video images and/or video files.

The present invention preserves image integrity from the point of capture of the image through, and including, any final compression or compressions of same.

The present invention also preserves the integrity of any and/or all data and/or all information upon conversion to digital formats. If full motion video is captured, any conversion can utilize full motion capture software and/or hardware.

The resulting video images and/or files, which are obtained via the apparatus and method of the present invention, can be utilized, in any and/or all of the embodiments described herein, in conjunction with data and/or information which can be provided by any other and/or any external information source. The data and/or information may contain, but is not limited to, data

and/or information of and for sound and/or audio files, text files, video files, image files, and/or graphics files, and/or any other information source, data, information and/or file, which can be, and/or which may be linked to or with, and/or which can be operated and/or utilized in conjunction with, any video and/or image data and/or information. For example, any image and/or video data, information, or file, obtained via the present invention, can be utilized in conjunction with any sound file, audio file, text file, video file, image file, and/or graphics file, and/or any other data, information and/or file utilized in a multimedia environment, thereby providing for the utilization of enhanced images and/or video in conjunction with the respective file.

While the present invention has been described and illustrated in various preferred embodiments, such descriptions are merely illustrative of the present invention and are not to be construed to be limitations thereof. In this regard, the present invention encompasses any and all modifications, variations, and/or alternate embodiments, with the scope of the present invention being limited only by the claims which follow.

CLAIMS

What Is Claimed Is:

1. An apparatus for producing a digital image, comprising:

a device for generating a digital signal file from an image; and

a processor for processing said digital signal file and for generating an image file,

wherein said processor generates a first signal file from said digital signal file, and further wherein said processor processes said first signal file and generates said image file.

2. The apparatus of claim 1, further comprising:

one of a camera and a recording device for obtaining one of a photographic representation of an image, a film image, a negative image and a digital image.

3. The apparatus of claim 2, further comprising:

a developing device for developing one of said photographic representation of an image, a film image and a negative image.

4. The apparatus of claim 3, further comprising:

an enlarging device for enlarging said image.

5. The apparatus of claim 4, further comprising:

a scanning device for generating said digital signal file from said one of photographic representation of an image, a film image and a negative image.

6. The apparatus of claim 1, further comprising:

a video capture device for one capturing and processing said digital signal file.

7. The apparatus of claim 1, wherein said first signal file is an image file.

8. An apparatus for producing a digital image, comprising:

means for generating a digital signal file from an image file; and

means for processing said digital signal file and for generating an image file,

wherein said processing means generates a first signal file from said digital signal file, and further wherein said processing means processes said first signal file and generates said image file.

9. The apparatus of claim 8, further comprising:

means for obtaining said one of a photographic representation of an image, a film image, a negative image and a digital image.

10. The apparatus of claim 8, further comprising:

means for developing said one of photographic representation of an image, a film image and a negative image.

11. The apparatus of claim 8, further comprising:

means for enlarging said image.

12. The apparatus of claim 8, further comprising:

means for generating said digital signal file from said image.

13. The apparatus of claim 8, further comprising:

means for one of capturing and processing said digital signal file.

14. A method for producing a digital image, comprising:

generating a digital signal file from an image;

processing said digital signal file; and

generating an image file, wherein said processing operation further comprises:

generating a first signal file from said digital signal file; and

processing said first signal file and generating said image file.

15. The method of claim 14, further comprising:

obtaining one of a photographic representation of an image, a film image, a negative image and a digital image..

16. The method of claim 14, further comprising:

developing said one of photographic representation of an image, a film image, and a negative image; and

generating said image.

17. The method of claim 14, further comprising:

enlarging said image.

19. The method of claim 14, further comprising:

generating said digital signal file from said image.

20. The method of claim 14, further comprising:

one of capturing and processing said digital signal file.

21. The apparatus of any one of claims 1 to 13, wherein said image file is utilized in conjunction with at least one of a sound file, an audio file, a text file, a video file, an image file, and a graphics file.

22. The method of any one of claims 14 to 20, wherein said image file is utilized in conjunction with at least one of a sound

file, an audio file, a text file, a video file, an image file, and a graphics file.

ABSTRACT OF THE DISCLOSURE

An apparatus and method for producing a digital image, including a device for generating a digital signal file from an image and a processor for processing said digital signal file and for generating an image file. The processor generates a first signal file from the digital signal file. The processor processes the first signal file and generates the image file.

Attorney Docket No.: 5865-7

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

POWER OF ATTORNEY

Application of:	Eliot I. Bernstein
Serial No.:	Please assign
Filed on:	Concurrently herewith
Title:	APPARATUS AND METHOD FOR PRODUCING ENHANCED DIGITAL VIDEO IMAGES AND/OR VIDEO FILES

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

RAYMOND A. JOAO, Reg. No. 35,907

Address all telephone calls to Raymond A. Joao at telephone number: (516) 747-0300
Address all correspondence to Meltzer, Lippe, Goldstein and Schlissel, P.C.
190 Willis Avenue
Mineola, New York 11501

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of the sole inventor (given name, family name): ELIOT I. BERNSTEIN	
Inventor's signature: >	Date: > 9/22/99
Residence: 500 S.E. Mizner Boulevard Suite 182 Boca Raton, FL 33432-6080	Citizenship: U.S.A.
Post Office Address: SAME AS ABOVE	

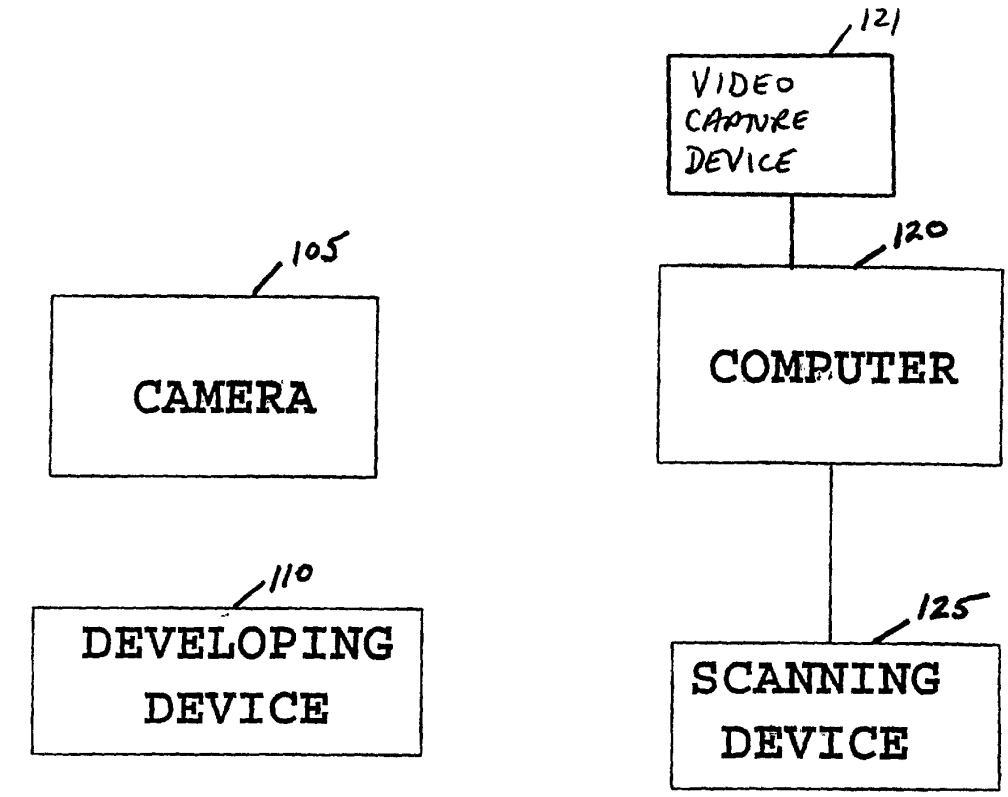

121
VIDEO CAPTURE DEVICE
105
CAMERA
120
COMPUTER
110
DEVELOPING DEVICE
125
SCANNING DEVICE
115
ENLARGING DEVICE
100

FIG. 1

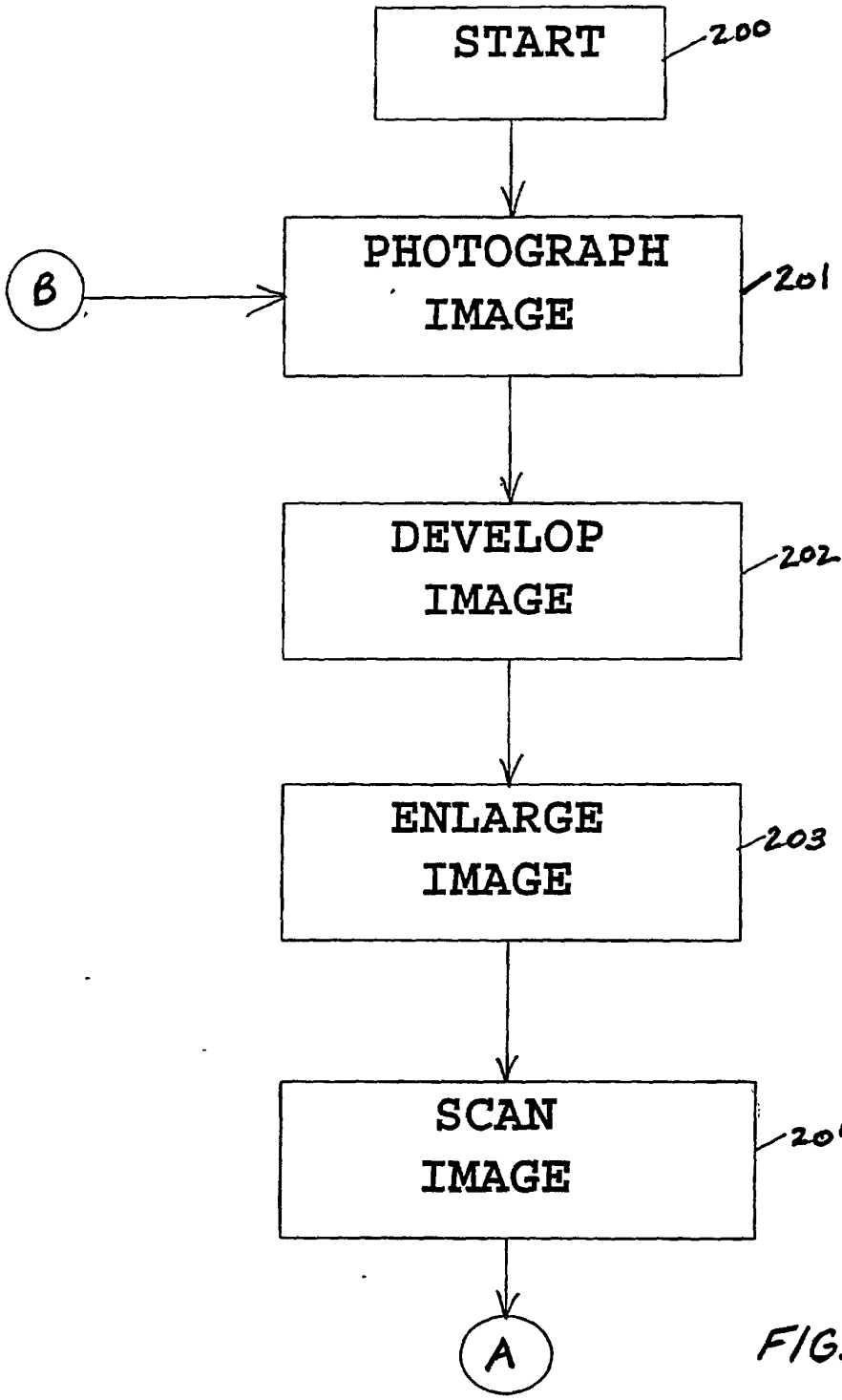

START
200
PHOTOGRAPH IMAGE
201
B
DEVELOP IMAGE
202
ENLARGE IMAGE
203
SCAN IMAGE
204
A

FIG. 2A

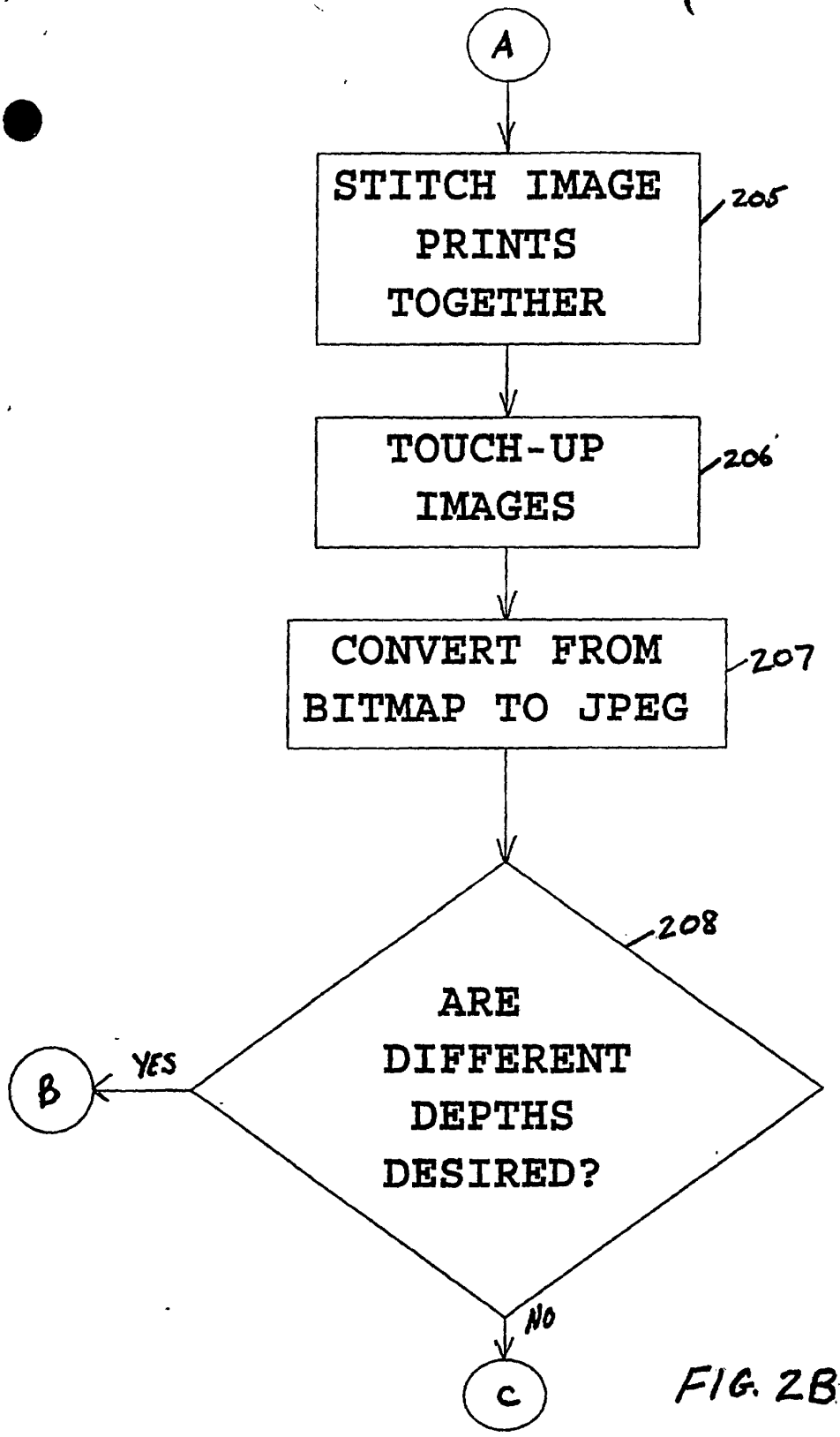

A
STITCH IMAGE PRINTS TOGETHER
205
TOUCH-UP IMAGES
206
CONVERT FROM BITMAP TO JPEG
207
ARE DIFFERENT DEPTHS DESIRED?
208
YES
B
NO
C

FIG. 2B

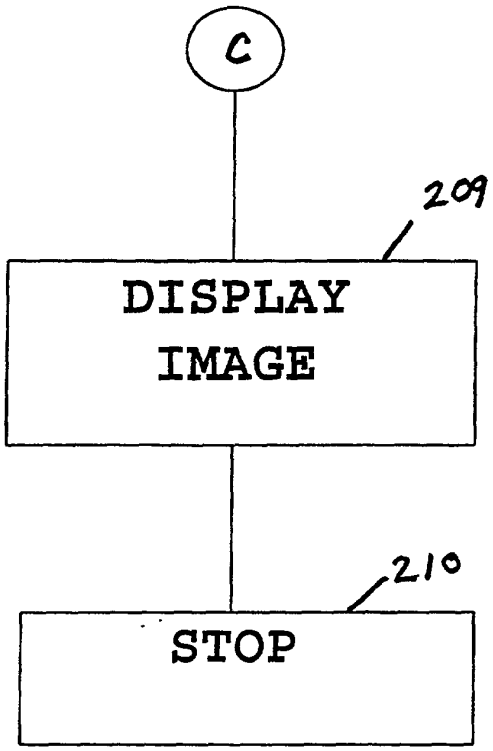
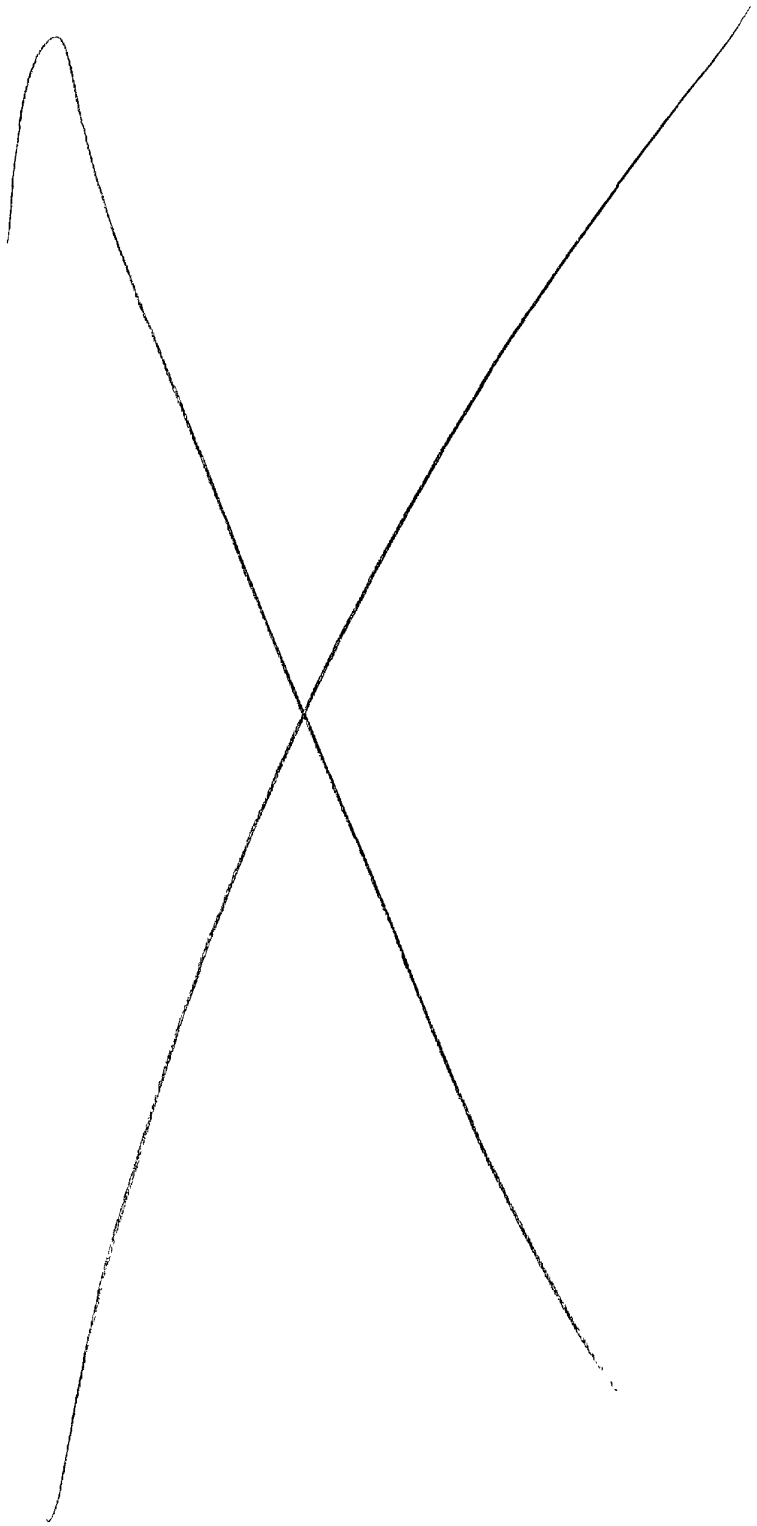


FIG. 2C



3

P1 273486

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office

July 18, 2000

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A FILING DATE UNDER 35 USC 111.

REC'D 24 JUL 2000
WIPO PCT

APPLICATION NUMBER: *60/169,559*
FILING DATE: *December 08, 1999*
PCT APPLICATION NUMBER: *PCT/US00/15406*

By Authority of the
COMMISSIONER OF PATENTS AND TRADEMARKS

N. WILLIAMS
Certifying Officer

PRIORITY DOCUMENT
SUBMITTED OR TRANSMITTED IN COMPLIANCE WITH RULE 17.1(a) OR (b)

Please type a plus sign (+) inside this box → [+]

PTO/SB/16 (2-98)
Approved for use through 01/31/2001. OMB 0651-0037
Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53 (c).

INVENTOR(S)		
Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)
ELIOT	BERNSTEIN	500 S.E. Mizner Road Suite 102 Boca Raton, FL 33432

☐ *Additional inventors are being named on the ___ separately numbered sheets attached hereto*

TITLE OF THE INVENTION (280 characters max)

APPARATUS AND METHOD FOR PRODUCING ENHANCED VIDEO IMAGES AND/OR VIDEO FILES

CORRESPONDENCE ADDRESS

Direct all correspondence to:

☐ Customer Number [ ] → *Place Customer Number Bar Code Label here*

OR *Type Customer Number here*

[XX] Firm *or* Individual Name	RAYMOND A. JOAO, ESQ.				
Address	MELTZER, LIPPE, GOLDSTEIN & SCHLISSEL, P.C.				
Address	190 WILLIS AVENUE				
City	MINEOLA	State	NEW YORK	ZIP	11501
Country	USA	Telephone	516-747-0300	Fax	516-747-9361

ENCLOSED APPLICATION PARTS *(check all that apply)*

[X] Specification *Number of Pages*	47	☐ Small Entity Statement	
[X] Drawing(s) *Number of Sheets*	5	[X] Other (specify)	return postcard

METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT *(check one)*

[X] A check or money order is enclosed to cover the filing fees

☐ The Commissioner is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number: [ ]

FILING FEE AMOUNT ($): $150.00

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

[X] No.

☐ Yes, the name of the U.S. Government agency and the Government contract number are: _____

Respectfully submitted,

SIGNATURE [signature]

TYPED or PRINTED NAME RAYMOND A. JOAO

TELEPHONE 516-747-0300

Date 12/8/99

REGISTRATION NO. *(if appropriate)* 35,907

Docket Number: 5865-8

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

This collection of information is required by 37 CFR 1.51. The information is used by the public to file (and by the PTO to process) a provisional application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the complete provisional application to the PTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, D.C., 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Box Provisional Application, Assistant Commissioner for Patents, Washington, D.C., 20231.

12-09-99 A/PROV

Attorney Docket No.: 5865-8

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:	Eliot I. Bernstein
Serial No.:	Please assign
Filed on:	Concurrently herewith
Title:	APPARATUS AND METHOD FOR PRODUCING ENHANCED VIDEO IMAGES AND/OR VIDEO FILES

Box Provisional Application
Assistant Commissioner for Patents
Washington, D.C. 20231

PROVISIONAL PATENT APPLICATION TRANSMITTAL LETTER

Sir:

Please find transmitted herewith for filing the following:

(1) Provisional Application for Patent Cover Sheet;

(2) Provisional Patent Application, including Specification, Claims and Abstract of the Disclosure (47 pages) and Drawings (5 sheets);

(3) Check in the amount of $150.00 for the filing fee;

(4) Power of Attorney form; and

(5) Return Receipt Postcard.

It is respectfully requested that the above papers be filed as a Provisional Patent Application.

Respectfully submitted,
MELTZER, LIPPE, GOLDSTEIN
& SCHLISSEL, P.C.

By: _____
Raymond A. Joao
Reg. No. 35,907

December 8, 1999

MELTZER, LIPPE, GOLDSTEIN,
& SCHLISSEL, P.C.
190 Willis Avenue
Mineola, New York 11501

Tel. No.: (516) 747-0300
Fax No.: (516) 747-9363

"Express Mail" mailing label number EK291365701US

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated below and is addressed to: Box Provisional Application, Assistant Commissioner for Patents, Washington, D.C. 20231

Date of Deposit: December 8, 1999

(Signature): _____

Attorney Docket No.: 5865-8

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

POWER OF ATTORNEY

Application of:	Eliot I. Bernstein
Serial No.:	Please assign
Filed on:	Concurrently herewith
Title:	APPARATUS AND METHOD FOR PRODUCING ENHANCED VIDEO IMAGES AND/OR VIDEO FILES

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

RAYMOND A. JOAO, Reg. No. 35,907

Address all telephone calls to Raymond A. Joao at telephone number: **(516) 747-0300**
Address all correspondence to **Meltzer, Lippe, Goldstein and Schlissel, P.C.**
190 Willis Avenue
Mineola, New York 11501

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of the sole inventor (given name, family name): **ELIOT I. BERNSTEIN**	
Inventor's signature: >	**Date:** >12/8/99
Residence: **500 S.E. Mizner Boulevard** **Suite 102** **Boca Raton, FL 33432-6080**	**Citizenship:** **U.S.A.**
Post Office Address: **SAME AS ABOVE**	

P:\PUBLIC\PATENT\VIEWIT\5865-7\5865-7 POA

195203.1

Attorney Docket No. 5865-8

APPARATUS AND METHOD FOR PRODUCING ENHANCED VIDEO IMAGES AND/OR VIDEO FILES

FIELD OF THE INVENTION

The present invention is directed to an apparatus and a method for producing enhanced images and/or video files and, in particular, to an apparatus and a method for producing enhanced resolution digital images and/or digital video files obtained via digital and/or film video cameras and/or recording devices.

BACKGROUND OF THE INVENTION

The fields of telecommunications, multimedia, and related areas, are growing at increasing rates. With this continued growth, the need for high resolution digital imagery, for utilization in conjunction with the corresponding technologies, is becoming greater. Current technologies utilize film cameras and recorders as well as digital cameras and recorders.

Conventional print film, negative and digital, technologies typically have very low zoom quality and low image size restrictions or limitations associated therewith. Generally speaking, enlarged images produce a higher resolution image, and an associated higher resolution scanning quality, which further facilitates an improved enlargement or reduction of the image for

different sizes and different depths, without pixel distortion. Photographs, negatives, and associated images, utilize pixels which typically have a certain size. When enlarged or reduced, these pixels of the image become distorted, a feature which typically results in the image being fixed to an original size, or being available at very low magnifications, such as, for example, magnifications of from 200 times to 300 times. These images are also difficult to enlarge to a full screen size without a tremendous amount of distortion present in the end product without expanding the file size proportionately.

Currently, panoramic imaging techniques utilize non-enlarged images as their starting point. With such associated limitations, the ability to provide enhanced resolution digital images and, especially, an enhanced resolution digital panoramic image, such as those utilized on, or over, the Internet and/or the World Wide Web, has been greatly compromised.

Another major drawback in the current technology lies in the fact that conventional processes often utilize panoramic lenses in order to capture an image. This practice has been criticized as creating distortions in the image immediately upon the image's enlargement or reduction. The conventional techniques associated with the use of panoramic lenses are known to result in image "bending", which further curtails one's ability to obtain

realistic views, especially upon performing any associated cropping and/or editing processes. In such instances, the upper end and the lower end of the image must be either erased, or covered, in order to prevent the flaw from being exposed. This typically results in the resulting image having a "fishbowl-type" distortion.

In some instances, 32 mm lenses have been utilized in order to obtain enhanced floor to ceiling images without experiencing image bending. In these applications, however, the ability of the lens to capture optimal images varies depending upon the scene or image being photographed.

Images have typically been over-compressed prior to transmission over a communication network. This over compression has typically resulted in lack of image quality.

As a result, the ability to obtain enhanced video images and/or video files from film cameras and film recorders, from negatives and from digital cameras and recorders, has been limited.

SUMMARY OF THE INVENTION

The present invention provides an apparatus and a method for

providing enhanced digital video images and/or digital video files which overcomes the shortcomings of the prior art. The digital images and/or digital files produced by utilizing the present invention can be easily managed, when displayed, projected, and/or posted on any viewing device and/or entity such as, but not limited to, an Internet Web server, Web site or Web page, television, intranet computers and/or servers, and/or computers and/or servers which are utilized in wireless environments, etc.

The present invention provides for the processing, production and/or transmission of streaming video which can be transmitted on, or over, a communication network, the Internet, the World Wide Web, and/or any other communication network and/or medium. The streaming video obtained and/or transmitted via the present invention can provide for a video transmission which, once commenced, need not be stopped. The streaming video which is facilitated via the present invention can be played on demand while maintaining its streaming video nature.

The present invention provides an apparatus and a method for producing enhanced digital video images and video files from video which may be recorded as print film image or file, a negative image or file, a digital magnetic representation of a video image, an analog representation of a video image, and/or a

digital video image and/or file. The video images and/or files may be obtained via a digital camera, a digital recording device, a digital recorder, a digital camcorder, a film video camera, a recorder, and/or camcorder, a motion picture camera, a VHS video camera, recorder, and/or camcorder, a beta video camera, recorder, and/or camcorder, and/or any other suitable video recording device. The camera or recorder can be a conventional device and/or a solid state device which may contain a solid state storage medium.

The video images and/or video files which are produced by the apparatus and method of the present invention have improved and enhanced resolution and require far less effort in the associated maintenance and management of same. The video images and/or files, which are produced by the apparatus and method of the present invention, can be utilized and displayed on computers, projection devices, televisions, and, as noted above, can be posted to an Internet Web server, a Web site, and/or a Web page, an intranet computer and/or server, and/or computers and/or servers utilized in wireless environments. The video images and/or files can be transmitted over a communication network and/or in computer-to-computer applications. The video images and/or files obtained may also be stored in an appropriate storage medium, such as, but not limited to, a compact disk, a digital video disk, and/or any other appropriate digital and/or

analog storage medium.

The present invention, in a preferred embodiment, is utilized to produce enhanced video images and/or files for posting and/or for downloading, to a digital display medium, which in the preferred embodiment, is an Internet and/or a World Wide Web server, a Web site, and/or Web page, and/or an intranet computer and/or server, and/or computers and/or servers which are utilized in a wireless environment, and/or a compact disk, a digital video disk, and/or other suitable storage medium. In this manner, enhanced video images and/or video files can be produced from video images and/or video files which can be recorded using any video recording device and recording medium such as, but not limited to, digital cameras, digital recorders, film cameras, film recorders, motion picture cameras, photographic film recorders, and/or magnetic film or disk film recorders, etc. The video images and/or files obtained are thereafter processed in accordance with the apparatus and method of the present invention in order to produce enhanced video images and/or video files.

These resulting video images and/or video files have enhanced resolution which is unaffected by the typical resolution limiting and degrading parameters and phenomena which are associated with conventional digital and/or film video cameras,

recorders and corresponding processing equipment, methods and/or techniques.

The apparatus can include a video camera or recorder which can be any one of an analog camera and/or a digital camera, an analog and/or digital recording device, an analog and/or digital camcorder, a film camera, a film recording device, and/or a film camcorder. For full motion video, a 3CCD chip, and/or any other appropriate and/or suitable motion video capture recording device, can be utilized in conjunction with the present invention. A suitable audio capture device for digitizing any audio which accompanies and/or which corresponds to the video can also be utilized. The camera or recording device can be a hand-held camera, a fixed camera, and/or a camera which is mountable, such as on a tripod or on a stand. The camera can be utilized to obtain the video image and/or video file which will be processed in accordance with the present invention. The camera can also be a video recording device for recording both video and audio.

The present invention preserves image and/or video integrity, as well preserves the integrity of any audio, from the point of capture of the image through and including any final compression or compressions of same. The apparatus can also include a developing device, which can be utilized for developing video images and/or files which are obtained on film. In the

case of video images and/or files which are obtained digitally, no developing device would be needed. The apparatus can also include an enlarging device which can be utilized to enlarge the video images obtained. An enlarger can be utilized for enlarging either film images and/or digital images.

The apparatus can also include a computer, for performing the various processing routines during operation of the apparatus and method of the present invention. The computer may be a personal computer, a laptop computer, a mini-computer, a microcomputer, a mainframe computer, a network computer, a server computer, and/or any other suitable computer or computer system, television system, either of the conventional, digital, and/or high definition variety.

The computer can include a central processing unit (CPU), a read only memory (ROM), a random access memory (RAM), a display device, an input device and an output device. The input device may include a keyboard, a mouse, or other pointing device, and/or any other data and/or command input device, for allowing for data and/or command input by a user. The output device may include a printer and, in the preferred embodiment, the printer may be a color laser printer or a color inkjet printer, a compact disk recorder, a digital video disk recorder, and/or any other suitable storage medium recorder. The computer can also include

a receiver for receiving data and/or information over a communication network and a transmitter for transmitting data and/or information over the communication network.

The computer can also include a video capture device, which may or may not be an integral component of the computer. The computer can also include an audio capture device which may or may not be an integral component of the computer. The video capture can also be an external peripheral device. Video data and/or information, as well as any audio data and/or information, is utilized, can be fed into, and/or played through, the respective video capture device and audio capture device, thereby digitizing the respective video data and/or information and audio data and/or information. The present invention preserves the integrity of any and/or all data and/or information upon conversion to digital formats. If full motion video is captured, any conversion can utilize full motion capture software and/or hardware. The video data and/or information can be fed into, and/or through, the video capture device, in real-time, thereby facilitating real-time video transmissions. In a similar fashion, the audio data and/or information can be fed into, and/or through, the audio capture device, in real-time, thereby facilitating real-time audio transmissions.

The computer can also include any other hardware device or

peripheral device and/or software which is, or which may be, needed and/or desired in order to perform any of the functions and/or operation described herein. The computer can also include a video data capture device, for capturing and processing the video images and/or files processed by the present invention, as well as an audio data capture device, for capturing and processing the audio files processed by the present invention.

The apparatus can also include a scanning device, for scanning video images or files, if needed, whether they be of a digital or of a print film type, in order to obtain a digital image representation of same.

The apparatus and method of the present invention provides video images and/or files, as well as any accompanying audio files, which have enhanced resolution and quality while requiring less file management efforts.

The resulting video images and/or files, and any accompanying audio files, which are obtained via the apparatus and method of the present invention are characterized by a high definition resolution and are suitable for high definition television, Web television, and large, full screen, panoramic Internet applications, including video playback and/or video transmission, along with any accompanying audio, while preserving

resolution upon image and/or video file magnification or reduction.

The present invention also facilitates high speed file transfers of high resolution video images and/or video files, and any accompanying audio files, thereby dispensing with the need to engage in long and slow conventional file downloads and/or file transfers in order to maintain viewing quality.

The apparatus and method of the present invention can also be utilized in conjunction with three-dimensional images and video files in order to produce high resolution, three-dimensional video images and/or video files.

Accordingly, it is an object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files from files obtained via digital and/or film video cameras and/or a recording devices.

It is another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files from files obtained via digital and/or film video cameras and/or a recording devices, which have improved and enhanced resolution.

It is still another object of the present invention to provide an apparatus and a method for processing, producing, and/or transmitting streaming video for use on, or over, a communication network.

It is another object of the present invention to provide an apparatus and a method for producing streaming video which, once commenced, need not be stopped and/or halted during the subsequent transmission of same.

It is another object of the present invention to provide an apparatus and a method for producing streaming video which can be played continuously and on-demand.

It is yet another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, and accompanying audio files, from files obtained via digital and/or film video cameras and/or a recording devices, which have improved and enhanced resolution.

It is still another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, from files obtained via digital and/or film video cameras and/or a recording

devices digital images, which are suitable for display and/or for downloading to a digital computer, a television, and/or any other communication device utilized in a telecommunication environment and/or communications environment.

It is still another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, from files obtained via digital and/or film video cameras and/or a recording devices, which are characterized by image compression and/or minimal image compression thereby avoiding any dramatic loss in image quality.

It is another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, from files obtained via digital and/or film video cameras and/or a recording devices, which may dispense with the need to compress the image data.

It is yet another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, from files obtained via digital and/or film video cameras and/or a recording devices, which are characterized by high definition resolution, and which are suitable for high definition television, Web television and

large, full screen, panoramic internet applications, without loss of resolution upon image magnification or reduction.

It is another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, from files obtained via digital and/or film video cameras and/or a recording devices, which can be transmitted in a network environment.

It is still another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, from files obtained via digital and/or film video cameras and/or a recording devices, which facilitates high speed file transfer in a network environment and/or in a computer environment.

It is another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, which preserves image integrity from the point of capture of the image through and including final compression or compressions.

It is still another object of the present invention to provide an apparatus and a method for producing enhanced resolution digital images and/or digital video files, which

preserves the integrity of any and/or all data and/or information upon conversion to digital formats.

Other objects and advantages of the present invention will be apparent to those skilled in the art upon a review of the Description of the Preferred Embodiment taken in conjunction with the Drawings which follow.

BRIEF DESCRIPTION OF THE DRAWINGS

In the Drawings:

Figure 1 illustrates the apparatus of the present invention, in block diagram form; and

Figures 2 illustrates a method of the present invention, in flow diagram form; and

Figures 3a, 3B and 3C illustrate another method of the present invention, in flow diagram form.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention provides an apparatus and a method for providing enhanced digital video images and/or digital video, as

well as any accompanying audio, files which can be utilized and which can be easily managed, when displayed, projected, and/or posted on any viewing device and/or entity such as, but not limited to, an Internet Web server, Web site or Web page, television, etc. In particular, the present invention provides an apparatus and a method for producing enhanced digital video images and video files from video, as well as any accompanying audio files, which may be recorded as a digital video image and/or files and/or as a film video image and/or file a print film image.

The present invention provides for the processing, production and/or transmission of streaming video which can be transmitted on, or over, a communication network, the Internet, the World Wide Web, and/or any other communication network and/or medium. The streaming video obtained and/or transmitted via the present invention can provide for a video transmission which, once commenced, need not be stopped. The streaming video which is facilitated via the present invention can be played on demand while maintaining its streaming video nature.

The video images and/or files, and any accompanying audio files, may be obtained via a digital camera, a digital recording device, a digital recorder, a digital camcorder, a film video camera, recorder, and/or camcorder, a VHS video camera, recorder,

and/or camcorder, a beta video camera, recorder, and/or camcorder, and/or any other suitable video recording device. The video images and/or video files and any accompanying audio files, which are produced by the apparatus and method of the present invention have improved and enhanced resolution and require far less effort in the associated maintenance and management of same. The video images and/or files, and any accompanying audio files, which are produced by the apparatus and method of the present invention, can be utilized, displayed, and/or played, whichever the case may be, on computers, projection devices, televisions, and, as noted above, can be posted to an Internet Web server, a Web site, and/or a Web page. The video images and/or files, and any accompanying audio files, can be transmitted over a communication network and/or in computer-to-computer applications.

The present invention, in a preferred embodiment, is utilized to produce enhanced video images and/or files, and any accompanying audio files, for posting and/or for downloading, to a digital display medium, which in the preferred embodiment, is an Internet and/or a World Wide Web server, a Web site, and/or Web page. In this manner, enhanced video images and/or video files, and any accompanying audio files, can be produced from video images and/or video files, and accompanying audio files, which can be recorded using any video recording device and

recording medium such as, but not limited to, digital cameras, digital recorders, film cameras, film recorders, etc. The video images and/or files, and any accompanying audio files, obtained are thereafter processed in accordance with the apparatus and method of the present invention in order to produce enhanced video images and/or video files.

These resulting video images and/or video files, and any accompanying audio files, have enhanced resolution which is unaffected by the typical resolution limiting parameters and phenomena which are associated with conventional digital and film video cameras, recorders and corresponding processing equipment, methods and/or techniques.

Figure 1 illustrates the apparatus of the present invention which is denoted generally by the reference numeral 100, in block diagram form. With reference to Figure 1, the apparatus 100 includes a video camera or recorder 105 which, in the preferred embodiment, can be any one of a digital camera, a digital recording device, digital camcorder, a film camera, a film recording device, and/or a film camcorder. The camera or recorder can be a conventional device and/or a solid state device which may contain a solid state storage medium.

The camera or recording device can record video as well as

audio data and/or information. In the preferred embodiment, the camera 105 may be a hand-held camera, a fixed camera, and/or a camera which is mountable, such as on a tripod or on a stand. The camera 105 is utilized to obtain the video image and/or video file, as well as any audio files, which will be processed as described herein.

For full motion video, a 3CCD chip, and/or any other appropriate and/or suitable motion and/or video capture recording device, can be utilized in conjunction with the present invention. A suitable audio capture recording device can also be utilized in conjunction with the present invention.

The present invention can also be utilized in conjunction with any imaging and/or any video recording device, and/or audio recording device, and/or equipment, such as, but not limited to, those devices and equipment utilized in, or in conjunction with, medical imaging equipment, devices and/or instruments, motion picture production equipment, devices and/or instruments and/or in any other equipment, device, and/or instrument, which is, or which can be, utilized in conjunction with imaging and/or video and/or audio applications and/or uses.

The apparatus 100 also includes a developing device 115, which could be utilized for developing video images and/or files

which are obtained on film. In the case of video images and/or files which are obtained digitally, no developing device may be needed. The apparatus also includes an enlarging device which can be utilized to enlarge the video images obtained. The apparatus can include an enlarger for both film images as well as for digital images.

The apparatus 100 also includes a computer 120, for performing the various processing routines during operation of the apparatus and method of the present invention. The computer 120 may be a personal computer, a laptop computer, a mini-computer, a microcomputer, a mainframe computer, a network computer, a server computer, and/or any other suitable computer or computer system.

The computer 120 includes a central processing unit (CPU), a read only memory (ROM), a random access memory (RAM), a display device, an input device and an output device. The input device may include a keyboard, a mouse, or other pointing device, and/or any other data and/or command input device, for allowing for data and/or command input by a user. The output device may include a printer and, in the preferred embodiment, the printer may be a color laser printer or a color inkjet printer. The computer 120 also includes a receiver for receiving data and/or information over a communication network and a transmitter for transmitting

data and/or information over the communication network.

The computer 120 also includes a video capture device 121A and an audio capture device 121B, which, in the preferred embodiment, are integral components of the computer 120. The video capture device 121A, in the preferred embodiment, can be a video capture card 121A which is located internal to the computer 120. The video capture device 121A may also be an external peripheral device. As described herein, the video data and/or information is fed into, and/or played through, the video capture device 121A, thereby digitizing the video data and/or information. The video data and/or information can be fed into, and/or through, the video capture card 121A, in real-time, thereby facilitating real-time video transmissions.

In a similar manner, the audio capture device 121B, in the preferred embodiment, can be an audio capture card 121B which is located internal to the computer 120. The audio capture device 121 may also be an external peripheral device. As described herein, the audio data and/or information is fed into, and/or played through, the audio capture device 121B, thereby digitizing the audio data and/or information. The audio data and/or information can be fed into, and/or through, the audio capture card 121B, in real-time, thereby facilitating real-time audio transmissions.

The computer 120 may also include any other hardware device or peripheral device and/or software which is, or which may be needed and/or desired in order to perform any of the functions and/or operation described herein. In particular, the computer 120 will also include a video data capture device for capturing and processing the video images and/or files processed by the present invention. The computer 120 can also include an audio capture device for capturing and processing the audio files processed by the present invention.

The computer 120 also includes a transmitter (not shown) and a receiver (not shown) for facilitating operation in a network environment and/or as a server computer.

The apparatus 100 also includes a scanning device 125, for scanning video images or files, if needed, whether they be digital or of a print film type, in order to obtain a digital image representation of same. Any suitable computer or scanner, and any suitable scanning software, may be utilized in conjunction with the present invention. In a preferred embodiment, any suitable scanning device can be utilized in conjunction with any appropriate software.

Figure 2 illustrates a preferred embodiment method of the present invention, in flow diagram form. With reference to

Figure 2, the method of the present invention commences at step 200. The method described herein can be utilized to process both video and audio files as well as files which contain only video information. For the sake of explaining the present invention in a preferred embodiment, the processing of video files along with corresponding audio files is described below. At step 201, the video images or files, and corresponding audio files, are recorded with any appropriate or suitable recording device such as, but not limited to, the video recording camera 105. The video and corresponding audio can be recorded and/or otherwise obtained in any suitable format, such as, but not limited to, for example, beta, VHS, digital, and/or any other standard formats, including, but not limited to, NTSC, PAL, or SECAM. The video and corresponding audio files can also be obtained in other standard digital formats such as, but not limited to, IEEE1834, *.AVI, *.MOV, *.MPEG, etc., by utilizing an appropriately equipped video recording device. The video recording device 105 may also be a reel-to-reel recording device and/or a live video recording device.

At step 202, the respective digital files and corresponding audio files, are converted to digital files, if necessary, by utilizing respective digitizing and/or scanning hardware and/or software and/or devices. In the case of the video files, the video is digitized by utilizing digitizing hardware and/or software and/or any other necessary and/or appropriate driver

software or programs in conjunction with a video capture device. In the preferred embodiment, hardware such as Pinnacle DC10∞ or other equivalent and/or similar hardware and/or software and/or associated drivers can be utilized to perform the video digitizing operation. The video digitizing step can be performed, in the preferred embodiment, at a minimum frames per second (fps) or at least a television standard and/or 30fps and with frame sizes of at least 320 X 240 pixels.

It is understood that the herein-described video digitizing step is not limited to the settings and/or parameters described herein. Rather, any appropriate settings and/or parameters may be utilized in order to obtain digital video data and/or information which is consistent with the digital data and/or information described herein.

In an analogous manner, at step 201, the audio files are also digitized by utilizing appropriate digitizing or capture hardware and/or software and any other necessary and/or appropriate driver software or programs. In the preferred embodiment, hardware such as produced by Turtle Beach Montego∞ other equivalent and/or similar hardware and/or software, and any associated drivers, if needed, are utilized in order to perform the audio digitizing operation. The audio digitizing step can be performed, in the preferred embodiment, by utilizing PCM or an

equivalent and/or similar technique and at a sampling rate of at least 44 to 48 kilohertz (Khz), 16-bit stereo, and an audio resolution of at least 16-bits.

The video and/or audio files which are obtained via the processing routines at step 201, are digital files which can be in any standard digital format such as, but not limited to, *.AVI, *.MOV, or *.MPEG, and/or any other suitable digital file format. While video information can be obtained for any frame setting, in a preferred embodiment, frames settings of 320 x 240, 480 x 320 and/or 640 x 480 can be utilized.

At step 202, if desired the digitized video and audio files can be processed in conjunction with video editing software, such as, for example Adobe Premiere 5.1 and/or any other equivalent and/or similar editing software. The processing which is performed at step 202 is optional and need not be performed on the digital video and audio files. The processing which is performed on the digital video and audio files , at step 202, can be performed in order to facilitating the editing of the respective digital video and audio files if such may be desired.

The processing at step 202 also serves to convert the digital video and audio to respective digital formats which are amenable to various editing procedures. For example, a *.MOV formatted file is converted to a .RM file format, a *.AVI

formatted fire is converted to a .ASF file format, and a *.MPEG formatted file is converted to a .RM file format. The processing step which is performed at the optional step 202 can be preformed with the following processing parameters.

At step 203, the digital video and audio file is processed and/or encoded in order to generate the respective files for presentation from a player or server computer. The processing which occurs at step 203 is accomplished with Windows Media Encoder/Reel Producer Plus software in order to create digital files for both video and audio which are in an appropriate digital file format, such as, but not limited to .RM and .ASF, or other suitable and/or similar digital file formats. Thereafter, the digital video and audio files will be available for transmission to appropriate computers and/or communication devices, and/or for storage onto an appropriate storage medium.

The digital video and audio file, which is processed and encoded at step 203, can be transmitted at a data rate having a range of between 35Kbps to 750Kbps and can have a frame rate range of between 24 to 29.97 fps.

At step 204, the video and audio file can be transmitted from the sever computer 120 to a client computer or communication device. In the preferred embodiment, and in order to facilitate the presentation of the video and audio file at the client

computer or communication device, the presentation of the video and audio file can be accomplished in conjunction with video software such as, but not limited to, RealPlayer∞, MediaPlayer∞, and/or any other appropriate software. The transmission of the video and audio will take place with a data rate range of between 35 Kbps to 750 Kbps at with a frame rate range of between 24fps - 29.97fps.

The obtained video and audio file or files can then be posted to the computer 120 and/or to another hosting computer. If the posting is to a computer other than the computer 120, the posting is performed by transmitting the video file or files over a communication network to the hosting computer. In the preferred embodiment, the video and audio file or files are posted via the Internet, and/or the World Wide Web, and can posted to a Web Page, a Web site, and/or any other network device. The posting operation is performed by utilizing any suitable posting software. The video and audio file or video file can also be stored on a compact disk, a digital video disk and/or any other appropriate storage medium.

The above-describe processing routine facilitates the processing of digital video and audio files in such a manner that any compression, if performed, is maintained at minimum levels.

The respective video and audio files are digitized at an optimal level and thereafter encoded at an optimal level, thereby preserving the highest quality of video and audio content.

Transmission of the video and audio files to a client computer (not shown) can thereafter commence at step 205.

Typically, the various rates of transmission for the above transmission parameters will be dependent upon the type and specifications of the receiver or modem associated with the client computer or communication device. In another preferred embodiment, the server computer 120 can ascertain the receiver or modem specifications. Thereafter, the server 120 can process the information obtained regarding the client computer or communication device and determine the appropriate transmission rates and/or other parameters and commence transmission to the client computer or communication device at step 205.

Operation of the apparatus will then cease at step 206.

Figures 3A, 3B and 3C illustrate another preferred embodiment method of the present invention, in flow diagram form. With reference to Figures 3A, 3B and 3C, the method of the present invention commences at step 300. At step 301, the video images and/or files are recorded with the video camera 105. The video can be recorded in any format, such as, but not limited to,

i.e., beta, VHS, digital, and/or any of the standard file formats, including, but not limited to, *.AVI, *.MOV, *.MPEG, etc., by utilizing the video recording device 105. The video recording device 105 may also be a reel-to-reel recording device and/or a live video recording device.

At step 302, the video images and/or files are converted to a converted to digital files, if necessary, by utilizing the scanner 110. At step 303, digital video image files are loaded into the computer 120 for processing. At step 304, the video image files are fed into, or through, the capture device 121A of the computer 120. The video capture operation, which is performed by the video capture device 121A, in the preferred embodiment, can be performed with minimum compression and/or encoding operations being performed on the video image files and/or with only minimal compression and/or encoding operations being performed on the video image files.

The video capture device 121A, in the preferred embodiment, can be any suitable video capture device or card and/or any other appropriate and/or suitable video capture hardware. The capture software utilized can be any appropriate and/or suitable video capture software.

At step 305, the video images and/or files are edited, if

necessary, by using any standard video editing tools, such as, for example, any editing software. At step 306, the video image files are then converted to any suitable real video format such as, for example, a *.RM format. At step 307, the size of the video within the file code is set either manually or automatically. In the preferred embodiment, the size of the video is set within the file code, which may or may not be the HTML file code to a 640 x 480 frame resolution, or any other suitable resolution, such as, but not limited to, 800 x 600, 1024 x 768, 1280 x 1024, 1600 x 1200 or other sizes.

At step 308, the obtained video image file or files is then posted to the computer 120 and/or to another hosting computer. If the posting is to a computer other than the computer 120, the posting is performed by transmitting the video file or files over a communication network to the hosting computer. In the preferred embodiment, the video file or files are posted via the Internet, and/or the World Wide Web, and can posted to a Web Page, a Web site, and/or any other network device. The posting operation is performed by utilizing any suitable posting software. The video image file or video file can also be stored on a compact disk, a digital video disk and/or any other appropriate storage medium.

At step 309, the computer 120 or other hosting computer

generates or writes a file or script, such as an ASCII file which calls the video to stream or to download. This results in video which will stream or "streaming" video for a full screen application which will be characterized by a good clarity and quality. At step 309, the video file can then be transmitted to a client computer (not shown). At step 309, a separate file or script, such as an ASCII file is written and saved to an appropriately formatted file, such as an *.RPM file, or other suitable file format, which will call the original video file. This script can be typically included in any suitable code, such as an HTML code.

In the case of MPEG videos, Steps 301 through 303 are followed as described above. At step 304, however, the video file is converted, if not previously converted, to an MPEG format. Thereafter, the video is inserted into the appropriate file which may contain suitable coding, such as HTML codes. Thereafter, the file can be sized to any of herein-described resolutions. Thereafter, the video file is uploaded to the hosting computer, if utilized. Thereafter, the MPEG file is played from the computer 120 or the hosting computer, the Web page, and/or the Web site, depending upon the application, by first downloading a small portion of the file and by playing the file through a suitable device such as a player which supports any suitable video formats, such as AVI, MPEG-type, etc., and/or

other suitable formats.

Thereafter, operation of the apparatus ceases at step 310.

The processing steps described herein provide for the production of video images and/or video files which have enhanced resolution and which can be easily and effectively managed in applications involving the display of same, the posting of same, to a host computer, a Web server, a Web site, a Web page, a computer display, a full screen projection display and/or a video presentation and/or playback of same, respectively. Further, the method of the present invention provides for image processing, including various image and/or file processing techniques, which may or may not include image compression and/or encoding operations.

The apparatus and method of the present invention provides video images and/or files which have enhanced resolution and quality while requiring less file management efforts.

The resulting video images and/or files, and any accompanying audio files, which are obtained via the apparatus and method of the present invention are characterized by a high definition resolution and are suitable for high definition television, Web television, and large, full screen, panoramic

Internet applications, including video playback and/or video transmission, which preserving resolution upon image and/or video file magnification or reduction. The present invention also facilitates high speed file transfers of high resolution video images and/or video files, and any accompanying audio files, thereby dispensing with the need to engage in long and slow conventional file downloads and/or file transfers.

The apparatus and method of the present invention can also be utilized in conjunction with three-dimensional images and video files in order to produce high resolution, three-dimensional video images and/or video files.

The present invention preserves image integrity from the point of capture of the image through, and including, any final compression or compressions of same.

The resulting video images and/or files, and any accompanying audio files, which are obtained via the apparatus and method of the present invention, can be utilized, in any and/or all of the embodiments described herein, in conjunction with data and/or information which can be provided by any other and/or any external information source. The data and/or information may contain, but is not limited to, data and/or information of and for sound and/or audio files, text files,

video files, image files, and/or graphics files, and/or any other information source, data, information and/or file, which can be, and/or which may be linked to or with, and/or which can be operated and/or utilized in conjunction with, any video and/or image data and/or information. For example, any image and/or video data, information, or file, obtained via the present invention, can be utilized in conjunction with any sound file, audio file, text file, video file, image file, and/or graphics file, and/or any other data, information and/or file utilized in a multimedia environment, thereby providing for the utilization of enhanced images and/or video in conjunction with the respective file.

As noted above, the present invention provides for the processing, production and/or transmission of streaming video which can be transmitted on, or over, a communication network, the Internet, the World Wide Web, and/or any other communication network and/or medium. The streaming video obtained and/or transmitted via the present invention can provide for a video transmission which, once commenced, need not be stopped. The streaming video which is facilitated via the present invention can be played on demand while maintaining its streaming video nature.

While the present invention has been described and

illustrated in various preferred embodiments, such descriptions are merely illustrative of the present invention and are not to be construed to be limitations thereof. In this regard, the present invention encompasses any and all modifications, variations, and/or alternate embodiments, with the scope of the present invention being limited only by the claims which follow.

CLAIMS

What Is Claimed Is:

1. An apparatus for producing a digital image, comprising:

a device for generating a digital signal file from an image; and

a processor for processing said digital signal file and for generating an image file,

wherein said processor generates a first signal file from said digital signal file, and further wherein said processor processes said first signal file and generates said image file.

2. The apparatus of claim 1, further comprising:

one of a camera and a recording device for obtaining one of a photographic representation of an image, a film image, a negative image and a digital image.

3. The apparatus of claim 2, further comprising:

a developing device for developing one of said photographic representation of an image, a film image and a negative image.

4. The apparatus of claim 3, further comprising:

an enlarging device for enlarging said image.

5. The apparatus of claim 4, further comprising:

a scanning device for generating said digital signal file from said one of photographic representation of an image, a film image and a negative image.

6. The apparatus of claim 1, further comprising:

a video capture device for one capturing and processing said digital signal file.

7. The apparatus of claim 1, wherein said first signal file is an image file.

8. An apparatus for producing a digital image, comprising:

means for generating a digital signal file from an image file; and

means for processing said digital signal file and for generating an image file,

wherein said processing means generates a first signal file from said digital signal file, and further wherein said processing means processes said first signal file and generates said image file.

9. The apparatus of claim 8, further comprising:

means for obtaining said one of a photographic representation of an image, a film image, a negative image and a digital image.

10. The apparatus of claim 8, further comprising:

means for developing said one of photographic representation of an image, a film image and a negative image.

11. The apparatus of claim 8, further comprising:

means for enlarging said image.

12. The apparatus of claim 8, further comprising:

means for generating said digital signal file from said image.

13. The apparatus of claim 8, further comprising:

means for one of capturing and processing said digital signal file.

14. A method for producing a digital image, comprising:

generating a digital signal file from an image;

processing said digital signal file; and

generating an image file, wherein said processing operation further comprises:

generating a first signal file from said digital signal file; and

processing said first signal file and generating said image file.

15. The method of claim 14, further comprising:

obtaining one of a photographic representation of an image, a film image, a negative image and a digital image.

16. The method of claim 14, further comprising:

developing said one of photographic representation of an image, a film image, and a negative image; and

generating said image.

17. The method of claim 14, further comprising:

enlarging said image.

19. The method of claim 14, further comprising:

generating said digital signal file from said image.

20. The method of claim 14, further comprising:

one of capturing and processing said digital signal file.

21. The apparatus of any one of claims 1 to 13, wherein said

image file is utilized in conjunction with at least one of a sound file, an audio file, a text file, a video file, an image file, and a graphics file.

22. The method of any one of claims 14 to 20, wherein said image file is utilized in conjunction with at least one of an audio file, a text file, a video file, an image file, and a graphics file.

23. An apparatus for producing a streaming video file, comprising:

a device for generating a digital signal file from a first video file; and

a processor for processing said digital signal file and for generating a second video file,

wherein said processor generates a first signal file from said digital signal file, and further wherein said processor processes said first signal file and generates said second video file, and further wherein said second video file is a streaming video file.

24. The apparatus of claim 23, further comprising:

one of a camera and a recording device for obtaining one of a photographic representation of an image, a film image, a negative image, a digital image, a video file, and a motion

picture.

25. The apparatus of claim 24, further comprising:

a developing device for developing one of said photographic representation of an image, a film image and a negative image, a digital image, a video file, and a motion picture.

26. The apparatus of claim 25, further comprising:

an enlarging device for enlarging said photographic representation of an image, a film image, a negative image, a digital image, a video file, and a motion picture video file.

27. The apparatus of claim 24, further comprising:

a scanning device for generating said digital signal file from said one of photographic representation of an image, a film image, a negative image photographic representation of an image, a film image and a negative image, a digital image, a video file, and a motion picture.

28. The apparatus of claim 23, further comprising:

a video capture device for one capturing and processing at least one of said video file and said digital signal file.

29. The apparatus of claim 23, wherein said first signal file is

a video image file.

30. The apparatus of claim 23, wherein said streaming video file is one of posted to a host computer and stored on a storage medium.

31. The apparatus of claim 30, wherein said storage medium is at least on of a compact disk, a digital video disk, a floppy disk, and solid state device.

32. The apparatus of claim 23, wherein said streaming video file can be transmitted at least one of on demand and continuously.

33. An apparatus for producing a streaming video file, comprising:

means for generating a digital signal file from a first video file; and

means for processing said digital signal file and for generating a second video file,

wherein said processing means generates a first signal file from said digital signal file, and further wherein said processing means processes said first signal file and generates said second video file, and further wherein said second video file is a streaming video file.

34. The apparatus of claim 33, further comprising:

means for obtaining one of a photographic representation of an image, a film image, a negative image, a digital image, a video file, and a motion picture.

35. The apparatus of claim 34, further comprising:

means for developing one of said photographic representation of an image, a film image and a negative image, a digital image, a video file, and a motion picture.

36. The apparatus of claim 35, further comprising:

means for enlarging said photographic representation of an image, a film image, a negative image, a digital image, a video file, and a motion picture video file.

37. The apparatus of claim 33, further comprising:

means for generating said digital signal file from said one of photographic representation of an image, a film image, a negative image photographic representation of an image, a film image and a negative image, a digital image, a video file, and a motion picture.

38. The apparatus of claim 33, further comprising:

means for one capturing and processing at least one of said video file and said digital signal file.

39. The apparatus of claim 33, wherein said first signal file is a video image file.

40. The apparatus of claim 33, wherein said streaming video file is one of posted to a host computer and stored on a storage medium.

41. The apparatus of claim 40, wherein said storage medium is at least on of a compact disk, a digital video disk, a floppy disk, and solid state device.

42. The apparatus of claim 33, wherein said streaming video file can be transmitted at least one of on demand and continuously.

43. A method for producing a streaming video file, comprising:

generating a digital signal file from a first video file; and

processing said digital signal file and generating a second video file,

wherein said first signal file is generated from said digital signal file, and further wherein said first signal file is utilized to generate said second video file, and further wherein said second video file is a streaming video file.

44. The method of claim 43, further comprising:

obtaining one of a photographic representation of an image, a film image, a negative image, a digital image, a video file, and a motion picture.

45. The method of claim 44, further comprising:

developing one of said photographic representation of an image, a film image and a negative image, a digital image, a video file, and a motion picture.

46. The method of claim 45, further comprising:

enlarging said photographic representation of an image, a film image, a negative image, a digital image, a video file, and a motion picture video file.

47. The method of claim 43, further comprising:

generating said digital signal file from said one of photographic representation of an image, a film image, a negative image photographic representation of an image, a film image and a negative image, a digital image, a video file, and a motion picture.

48. The method of claim 43, further comprising:

one capturing and processing at least one of said video file and said digital signal file.

49. The method of claim 43, wherein said first signal file is a video image file.

50. The method of claim 43, wherein said streaming video file is one of posted to a host computer and stored on a storage medium.

51. The method of claim 50, wherein said storage medium is at least on of a compact disk, a digital video disk, a floppy disk, and solid state device.

52. The apparatus of claim 43, wherein said streaming video file can be transmitted at least one of on demand and continuously.

ABSTRACT OF THE DISCLOSURE

An apparatus and method for producing a digital image, including a device for generating a digital signal file from an image and a processor for processing said digital signal file and for generating an image file. The processor generates a first signal file from the digital signal file. The processor processes the first signal file and generates the image file. An apparatus for producing a streaming video file, including a device for generating a digital signal file from a first video file and a processor for processing the digital signal file and for generating a second video file. The processor generates a first signal file from the digital signal file. The processor processes the first signal file and generates the second video, wherein the second video file is a streaming video file.

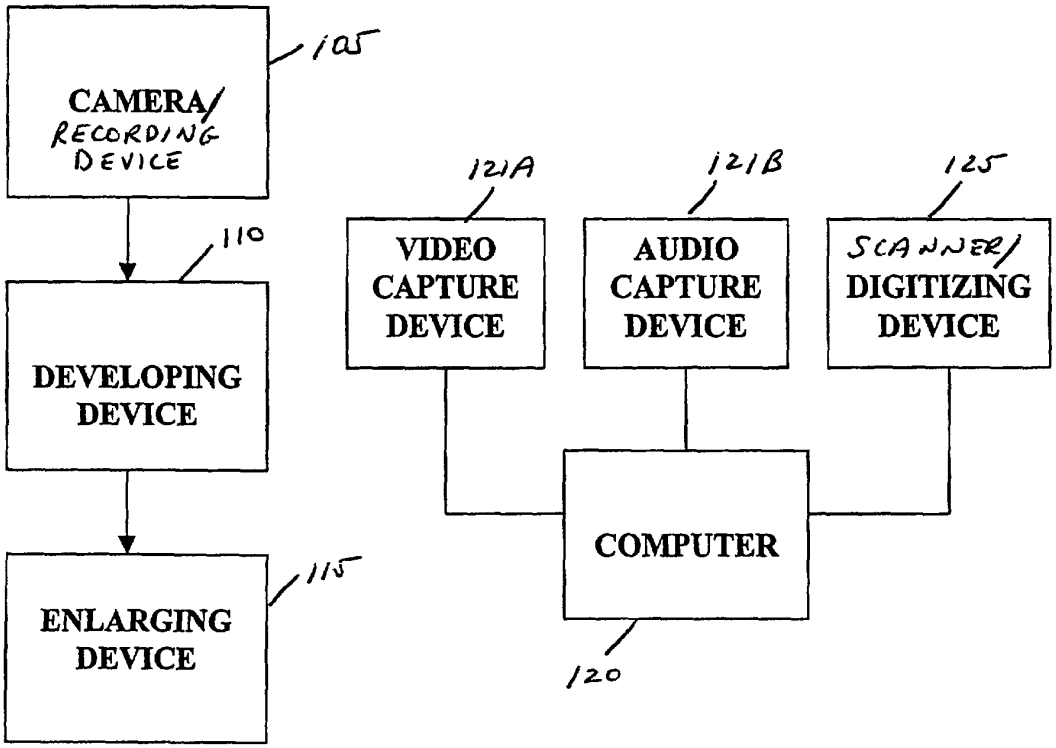

CAMERA/ RECORDING DEVICE
105
110
DEVELOPING DEVICE
ENLARGING DEVICE
115
121A
VIDEO CAPTURE DEVICE
121B
AUDIO CAPTURE DEVICE
125
SCANNER/ DIGITIZING DEVICE
COMPUTER
120
100

FIG. 1

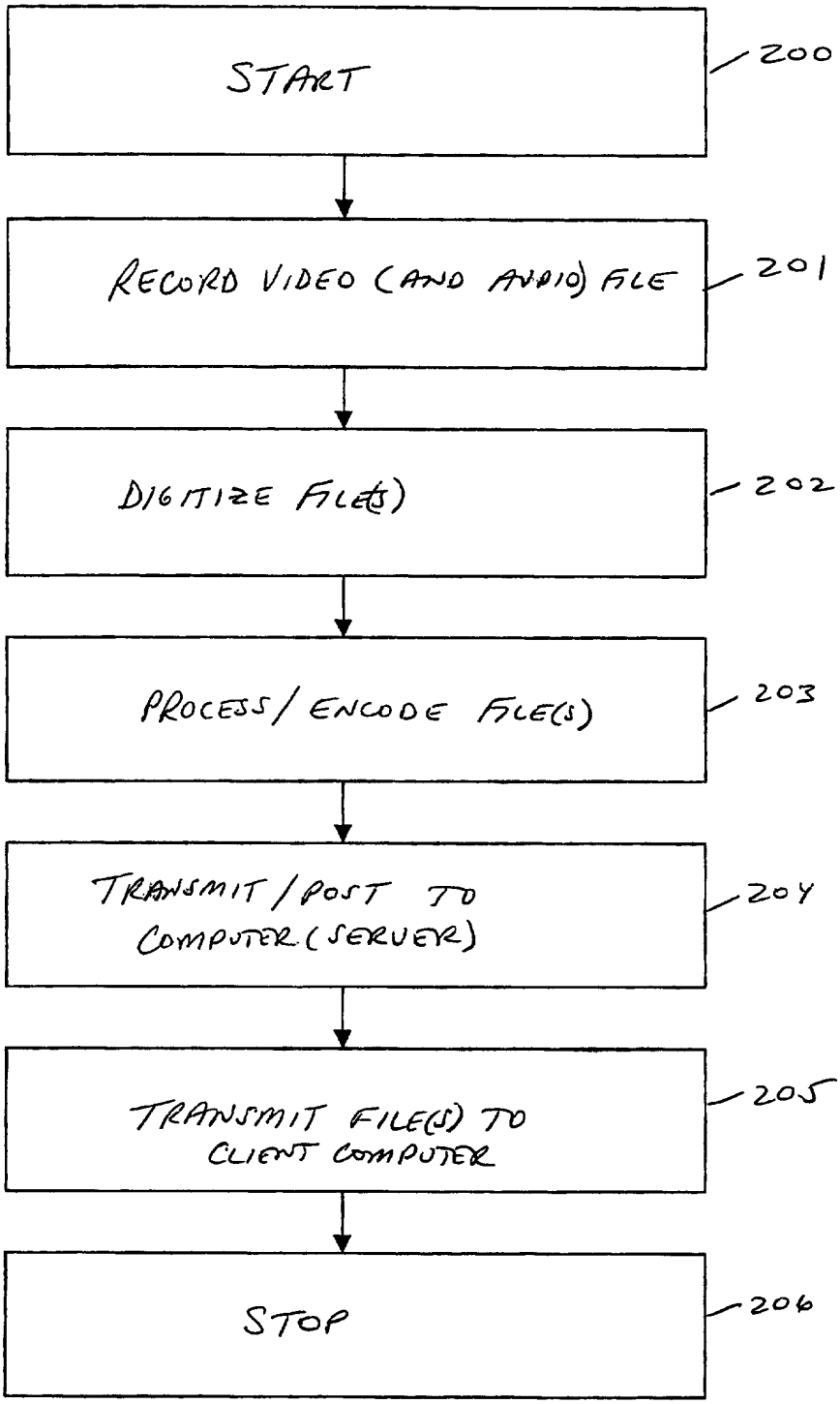

START
200
RECORD VIDEO (AND AUDIO) FILE
201
DIGITIZE FILE(S)
202
PROCESS / ENCODE FILE(S)
203
TRANSMIT / POST TO COMPUTER (SERVER)
204
TRANSMIT FILE(S) TO CLIENT COMPUTER
205
STOP
206

FIG. 2

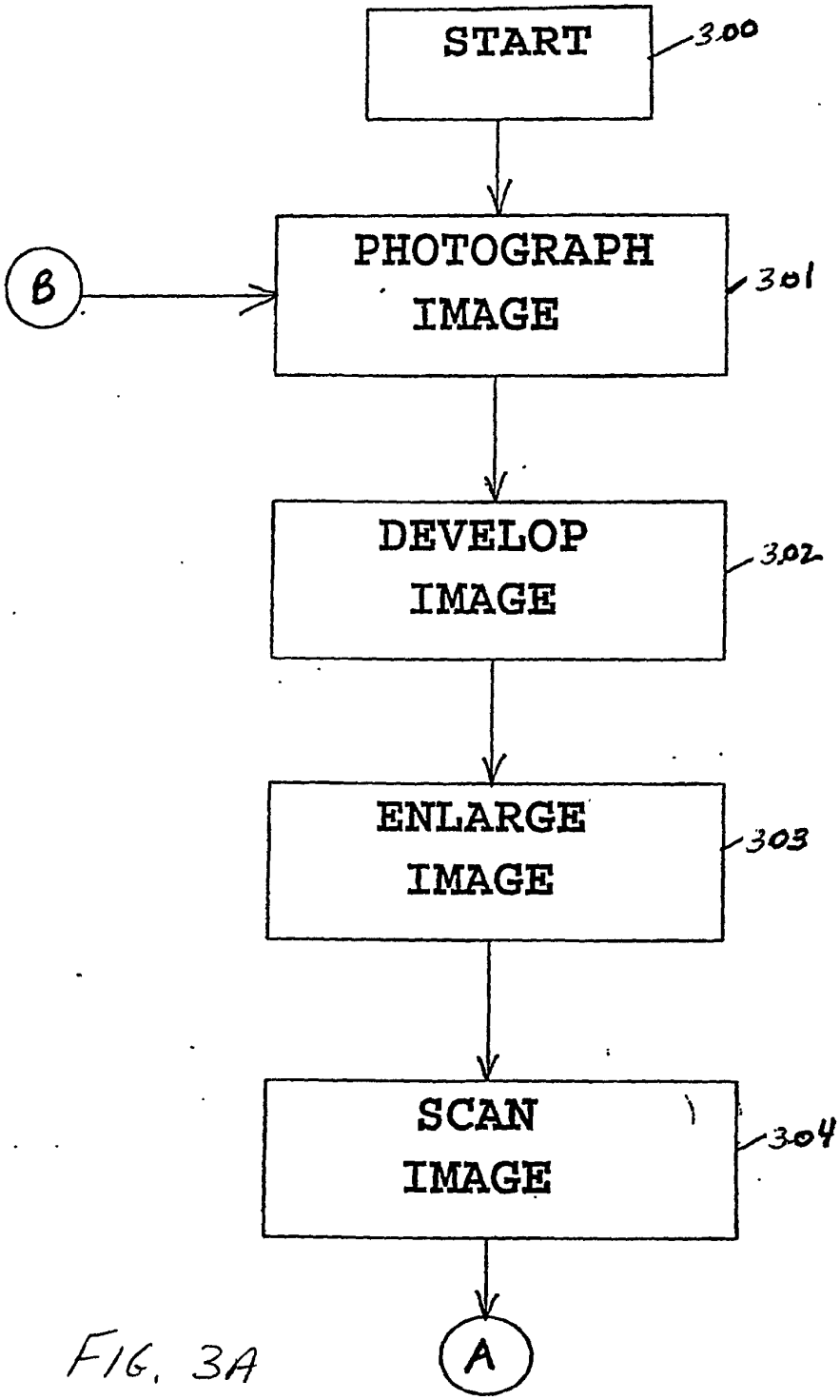

START
300
PHOTOGRAPH IMAGE
301
B
DEVELOP IMAGE
302
ENLARGE IMAGE
303
SCAN IMAGE
304
A

FIG. 3A

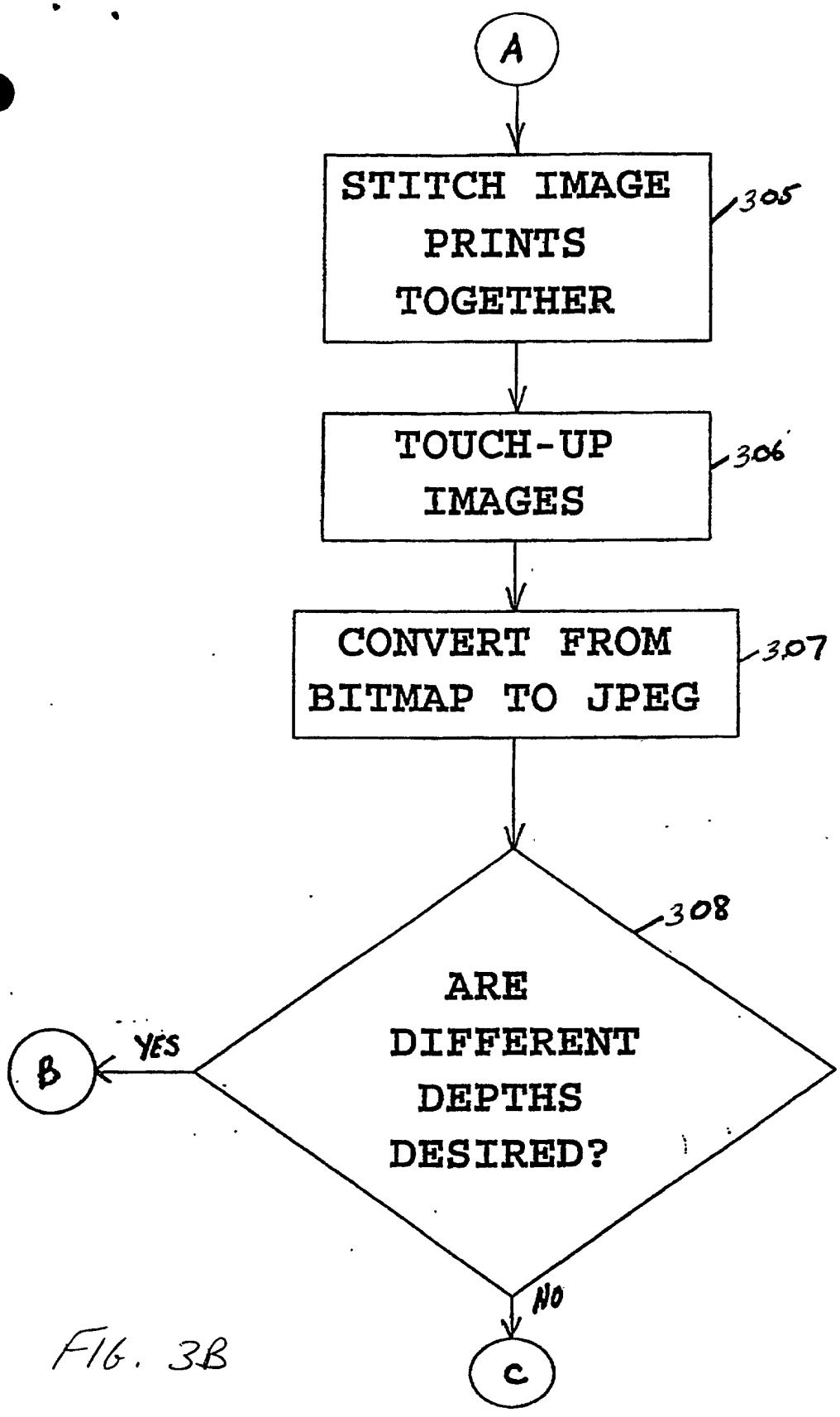

A
STITCH IMAGE PRINTS TOGETHER
305
TOUCH-UP IMAGES
306
CONVERT FROM BITMAP TO JPEG
307
ARE DIFFERENT DEPTHS DESIRED?
308
YES
B
NO
C

FIG. 3B

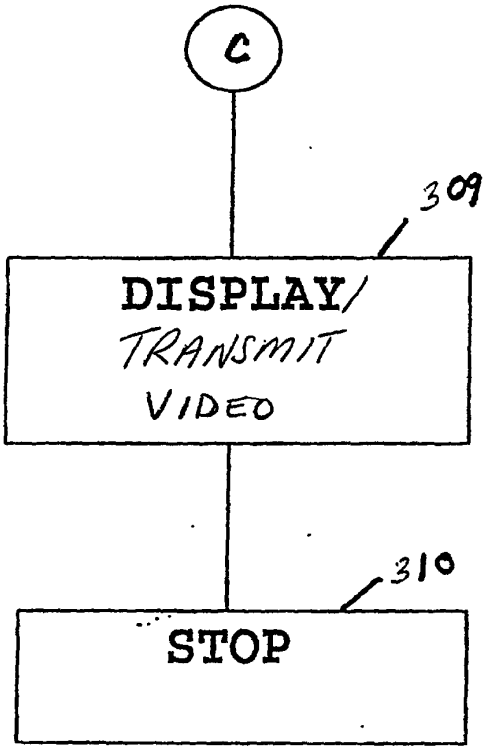
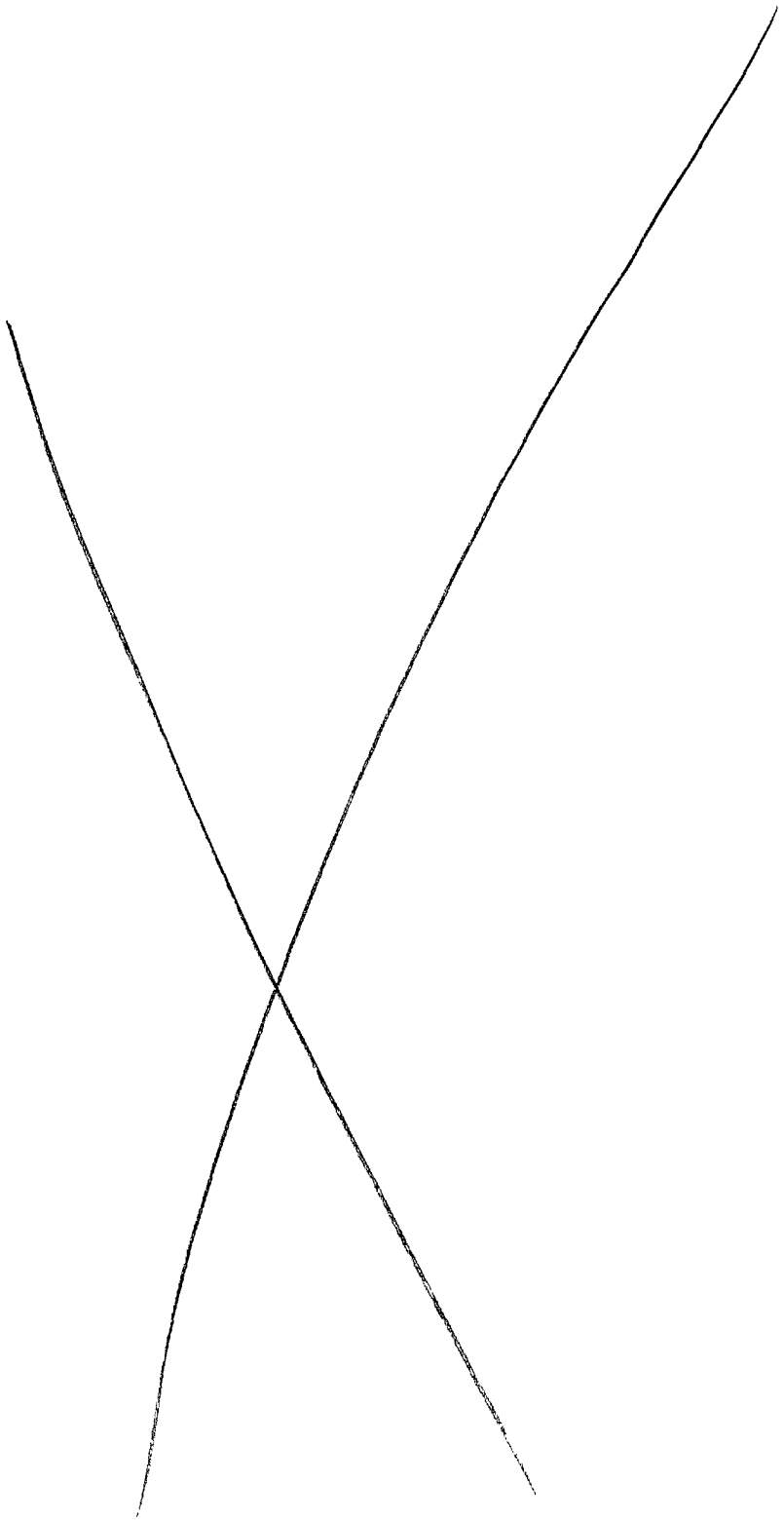


FIG. 3C



P.B.5818 - Patentlaan 2
2280 HV Rijswijk (ZH)
☎ +31 70 340 2040
TX 31651 epo nl
FAX +31 70 340 3016

Europäisches Patentamt
Eingangs-stelle

European Patent Office
Receiving Section

Office européen des brevets
Section de Dépôt

FOLEY & LARDNER
777 East Wisconsin Avenue
33rd Floor
Milwaukee, WI 53202-5367

ETATS-UNIS D'AMERIQUE

Datum/Date
21/12/00

Zeichen/Ref./Réf.	Anmeldung Nr./Application No./Demande n°./Patent Nr ./Patent No./Brevet n°.
	00938124.5-1247-PCT/US0015406

Anmelder/Applicant/Demandeur/Patentinhaber/Proprietor/Titulaire
IVIEWIT HOLDINGS, INC.

ENTRY INTO THE EUROPEAN PHASE BEFORE THE EUROPEAN PATENT OFFICE

NOTE: These notes describes the procedural steps required for entry into the European phase before the European Patent Office (EPO). You are advised to read them carefully; failure to take the necessary action in time can lead to your application being deemed withdrawn.

1. European patent application no. 00938124.5 has been allotted to the above-mentioned international patent application.

2. Applicants WITHOUT a residence or their principal place of of business within the territory of an EPC Contracting State may themselves initiate European processing of their international application, provided they do so before expiry of the 21st or 31st month from the the priority date (see also point 7 below).

   During the European phase before the EPO as designated or elected Office, however, such applicants must be represented by a pro-professional representative (Articles 133(2) and 134(7) EPC).

   Procedural acts performed after expiry of the 21st or 31st month by a professional representative who acted during the international phase but is not authorised to act before the EPO have no legal effect and therefore lead to loss of rights.

   Please note that a professional representative authorised to act before the EPO and who acted for the applicant during the international phase does not automatically become the representative for the European phase. Applicants therefore strongly advised to appoint in good time any representative they wish to initiate the European phase for them; otherwise, the EPO has to send all communications direct to the applicant.

3. Applicants WITH a residence or their principal place of business within the territory of an EPC Contractin State are not obliged to appoint a professional representative authorised to act before the EPO for the European phase before the EPO as a designated or elected Office.
However, in view of the complexity of the procedure it is recommended that they do so.

4. Applicants and professional representatives are strongly advised to initiate the European phase using EPO Form 1200 (available free of charge from the EPO). This however is not compulsory.

5. TO ENTER THE EUROPEAN PHASE BEFORE THE EPO, the following acts must be performed. (NB: Failure validly to do so will entail loss of rights or other adverse legal consequences).

   5.1 If the EPO acting as DESIGNATED OFFICE under Article 22(1) PCT, applicants must, within 21 months from the date of filing or (where applicable) the earliest priority date:

   a) Supply a translation of the international application into an EPO official language, if the International Bureau did not publish the application in such a language (Article 22(1) PCT and Rule 107(1)a) EPC).
   If the translation is not filed in due time, the international application is deemed to be withdrawn before the EPO (Article 24(1)(iii) PCT).

   b) Pay the national basic fee and, where a supplementary European search report has to be drawn up, the search fee (Rule 107(1)c) and e) EPC).

   c) Within six months from publication of the international search report, pay a designation fee for each designated Contracting State (Rule 107(1)d) EPC), and file a written request for examination and pay the examination fee (Rule 107(1)f) EPC).

5.2 If the EPO is acting as ELECTED OFFICE under Article 39(1)a) PCT, applicants must, within 31 months from the date of filing or (where applicable) the earliest priority date:

a) File a translation as per 5.1 a) above.

b) Pay the fees as per 5.1 b) above.

c) If the time limit under Article 79(2) EPC expires before the 31-month time limit, pay the designation fee for each designated Contracting State (Rule 107(1)d) EPC).

d) If the time limit under Article 94(2) EPC expires before the 31-month time limit, file the written request for examination A N D pay the examination fee (Rule 107(1)f) EPC).

e) Pay the renewal fee for the third year, if it falls due before the expiry of the 21-month time limit (Rule 107(1)g) EPC)

5.3 If the application documents on which the European grant procedure is to be based comprise more then ten claims, a claims fee is payable within the time limit under Rule 107(1) EPC for the eleventh and each subsequent claim (Rule 110(1) EPC). The fee can however still be paid within a period of grace of one month from notification of an EPO communication (Rule 110(2) EPC).

6. If the necessary fees are not paid in time, they may still be validly paid within a period of grace of one month from notification of an EPO communication, subject to payment at the same time of a surcharge for each late-paid fee (Rule 85a(1), 85b EPC).
For the renewal fee, the period of grace is six months from the fee's due date (Article 86(2) EPC).

7. If the applicant had a representative during the application's international phase, the present notes will be sent to the representative, asking him to inform the applicant accordingly.

All subsequent communications will be sent to the applicant, or - if the EPO is informed of his appointment in time - to the applicants's European representative.

8. For more details about time limits and procedural acts before the EPO as designated and elected Office, see the EPO brochure

How to get a European patent
Guide for applicants - Part 2
PCT procedure before the EPO - "EURO-PCT"

This brochure, the list of professional representatives before the EPO, Form 1200 and the latest fees are all on the internet under

http://www.european-patent-office.org.

RECEIVING SECTION

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
14 December 2000 (14.12.2000)

PCT

(10) International Publication Number
WO 00/76219 A1

(51) International Patent Classification[7]: H04N 7/173, 7/24

(21) International Application Number: PCT/US00/15406

(22) International Filing Date: 2 June 2000 (02.06.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

60/137,297	3 June 1999 (03.06.1999)	US
60/155,404	22 September 1999 (22.09.1999)	US
60/169,559	8 December 1999 (08.12.1999)	US

(71) Applicant *(for all designated States except US)*: **IVIEWIT HOLDINGS, INC.** [US/US]; One Boca Place, 2255 Glades Road, Suite 337 West, Boca Raton, FL 33431 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **BERNSTEIN, Eliot, I.** [US/US]; 500 S.E. Mizner Boulevard, Boca Raton, FL 33432-6080 (US). **SHIRAJEE, Zakirul, A.** [BD/US]; 9485 Boca Cove Circle, #708, Boca Raton, FL 33428 (US).

(74) Agent: **FOLEY & LARDNER**; 777 East Wisconsin Avenue, 33rd Floor, Milwaukee, WI 53202-5367 (US).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

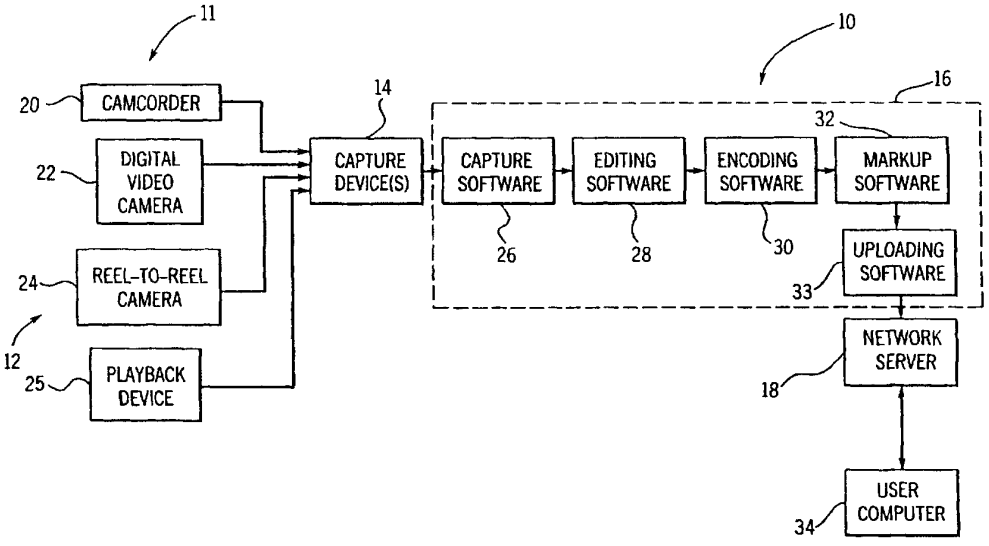
Published:

— *With international search report.*

— *Before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments.*

[Continued on next page]

(54) Title: SYSTEM AND METHOD FOR PLAYING A DIGITAL VIDEO FILE



(57) Abstract: A method of playing a digital video file over a network includes providing a digital video file to a first storage device; downloading a first portion of the digital video file from the first storage device over a network to a computer having a second storage device and a display screen; expanding the viewing frame size of the computer display screen to at least 640 x 480 pixels; and playing the first downloaded portion on the expanded display screen from the second storage device while substantially simultaneously downloading a second portion of the digital video file to the second storage device.

WO 00/76219 A1

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

TITLE OF THE INVENTION

SYSTEM AND METHOD FOR PLAYING A DIGITAL VIDEO FILE

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of U.S. Provisional Application No. 60/137,297, filed June 3, 1999, U.S. Provisional Application No. 60/155,404, filed September 22, 1999, and U.S. Provisional Application No. 60/169,559, filed December 8, 1999.

FIELD OF THE INVENTION

The present invention relates generally to video imaging. More specifically, the present invention relates to a system and method for providing high quality digital video files for streaming across a network.

BACKGROUND OF THE INVENTION

Streaming video is a technique by which video is played in real time as it is downloaded over the Internet, as opposed to storing it in a local file first. A video player decompresses and plays the data as it is transferred to a user computer over the World-Wide Web. Streaming video avoids the delay entailed in downloading an entire file and then playing it with a plug-in application. Streaming video requires a communications connection (e.g., a network, Internet, etc.) and a computer powerful enough to execute the decompression algorithm in real time.

In the field of streaming video, the primary design challenge is that the viewer desires perfect video quality over a

limited-bandwidth network. Perfect video quality requires an enormous amount of digital data. Today's networks are not capable of providing life-like, full motion, full screen streaming video.

It is known to capture video using a capture device, compress the resulting captured video, store the compressed video, and send the compressed video across the Internet. However, prior attempts have failed to produce high quality streaming video that can be transmitted over the Internet. For example, prior attempts at streaming video have been unable to produce full-screen, real video frame rate video at any acceptable quality.

Several teachings have emerged that attempt to improve the quality and decrease the file size of streaming video. One teaching in the art is to reduce the number of frames per second that are being encoded, from the 25 to 30 fps of standard television to 6 or 7 fps or less for streaming video. While this reduces the amount of data that is being sent, the video appears jittery and corresponding voice appears asynchronous with the jittery video. Another teaching in the art is to capture the video at a small frame size of 160 x 120 or less. The small frame size of 160 x 120 is the widely used standard in Internet streaming video. Further teachings are directed to reducing the amount of data that is provided prior to compressing to reduce the file size resulting from compression. Other teachings in the art have pointed toward compressing a digital video file as much as possible prior to transmission. Full-screen, full-motion video has historically been viewed as requiring far too much data for transmission over a limited-bandwidth network.

Accordingly, there is a need for an improved system and method for providing an enhanced digital video file for streaming across a network. Further, there is a need for a digital video file having high quality at various screen sizes with minimal quality loss when the video is expanded to full screen size. Further still, there is a need for a digital video file having a real video frame rate that can be streamed across a limited bandwidth network, such as the Internet. Further yet, there is a need for a video transmission which, once commenced, need not be stopped.

BRIEF SUMMARY OF THE INVENTION

According to an exemplary embodiment, a method of playing a digital video file over a network includes providing a digital video file to a first storage device; downloading a first portion of the digital video file from the first storage device over a network to a computer having a second storage device and a display screen; expanding the viewing frame size of the computer display screen to at least 640 x 480 pixels; and playing the first downloaded portion on the expanded display screen from the second storage device while substantially simultaneously downloading a second portion of the digital video file to the second storage device.

According to an another exemplary embodiment, a system for playing a digital video file over a network includes means for providing a digital video file to a first means for storing; means for downloading a first portion of the digital video file from the first storing means over a network to a computer having a second means for storing and a display screen; means for expanding the viewing frame size of the computer display screen to a full screen size; and means for playing the first downloaded portion of the digital video

file on the expanded display screen from the second storing means while substantially simultaneously downloading a second portion of the digital video file to the second storing means.

According to yet another exemplary embodiment, a method of playing a digital video file across the Internet includes capturing and compressing a source video signal to generate a digital video file; providing a first portion of the digital video file across the Internet to a computer; playing the first portion of the digital video file at substantially full screen size on the computer while substantially simultaneously downloading a second portion of the digital video file to the computer.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will become more fully understood from the following detailed description, taken in conjunction with the accompanying drawings, wherein like reference numerals refer to like parts, in which:

FIG. 1 is a block diagram of a system for generating an enhanced digital video file according to an exemplary embodiment;

FIG. 2 is a flowchart of a method for generating an enhanced digital video file according to the exemplary embodiment of FIG. 1; and

FIG. 3 is a block diagram of a system for playing a digital video file across a network.

DETAILED DESCRIPTION OF THE INVENTION

Referring to FIG. 1, a system 10 for generating an enhanced digital video file is shown. System 10 may be used as

shown, or portions of system 10 may be integrated with other video processing systems, such as medical imaging equipment, motion picture production equipment, etc. System 10 generates a digital video file expandable to a full screen size and having a real video frame rate (i.e., life-like, smooth, not jerky, comparable with recorded video formats, such as, NTSC (National Television Standards Committee) at 29.97 frames per second (fps), PAL (Phase Alternative Line) at 25 fps, and SECAM (Séquentiel Couleur Avec Mémoire) at 25 fps)) with a file size that is suitable for streaming over the Internet, for such uses as high definition television, Web television, computers and servers utilized in wireless environments, etc.

As known in the art, video is recorded having certain standard recorded video parameters, such as, frame rate, and number of lines scanned. For example, it is will known that a source conforming to the NTSC (National Television Standards Committee) standard operates at 29.97 frames per second (fps), a source conforming to the PAL (Phase Alternative Line) standard operates at 25 fps, and a source conforming to the SECAM (Séquentiel Couleur Avec Mémoire) standard operates at 25 fps. It is will known in the art that the NTSC standard includes two interleaved frames at 240 lines scanned, while the PAL standard is 270 lines scanned. Note that the number of lines scanned corresponds to the number of vertical pixels in a standard 320 x 240 frame size compatible with standard capture cards, such as, a Dazzle LAV-1000S capture device manufactured by Dazzle, Inc. of Fremont, California.

System 10 includes one or more sources, including recording devices 12 or playback device 25, a capture device 14, a computer 16, and a network server 18. Recording devices 12

include a camcorder 20, a digital video camera 22, and a reel-to-reel camera 24, each of which may be hand-held or mounted on a tripod or stand. System 10 may include a playback device 25 (e.g., tape player, VHS (Vertical Helix Scan) player, Beta player, DVD (Digital Versatile Disk) player, etc.). Camcorder 20 may be a VHS recorder, Beta recorder, or other camcorder, and is configured to store video on magnetic tape. Digital video camera 22 may be any type of digital video camera configured to generate video in a digital format. In this exemplary embodiment, digital video camera 22 stores the digital video data to a tape. Digital video camera 22 is configured to provide digital video data in real time or via the tape in a digital format, such as, Beta digital, AVI, MOV, MPEG (Motion Picture Experts Group), or other format compatible with the IEEE 1394 standard, etc., to capture device 14. AVI is an audio/video standard designed by Microsoft Corp., Redmond, Washington. According to one exemplary embodiment, a digital video camera including 3CCD technology is used to record the video. The 3CCD technology (3-chip charge-coupled device) includes a dichroic prism and three CCDs, each CCD being aligned to detect only the red, green, or blue color. A 3CCD camera will provide enhanced color resolution. Reel-to-reel camera 24 includes recording equipment that uses magnetic tape which must be threaded through the equipment and onto an empty reel. According to one alternative embodiment, a separate audio recording device, such as a microphone, may be utilized in conjunction with recording devices 12, in which embodiment recording devices 12 are used to record only video. Other recording devices may be used, such as, devices optimized for live video-conferencing.

Computer 16 includes a processor, memory, magnetic storage device, input/output devices and circuitry, etc. Computer 16 may include multiple computer at multiple sites, with different portions of the process described hereinafter operating on different computers.

Capture device 14 is coupled to one or more of sources 11. Capture device 14 is shown external to computer 16, but may alternatively be an internal capture device coupled within the housing of computer 16 or an internal capture device within the housing of one of recording devices 12 or playback device 25. In this exemplary embodiment, a Dazzle LAV-1000S capture device is utilized, though other capture devices may be used, such as a Pinnacle DC10PLUS or Pinnacle DC30PRO device, both manufactured by Pinnacle Systems, Inc., Mountain View, California, or a MotoDV Mobile capture device, manufactured by Digital Origin, Inc., Mountain View, California. Capture software 26, such as Amigo 2.11, manufactured by Dazzle, Inc. or Adobe Premier 5.1, manufactured by Adobe Systems Inc., San Jose, California, is operable on computer 16 to interface capture device 14 with computer 16. Other capture software may be utilized, such as, RealProducer G2, manufactured by RealNetworks, Inc., Seattle, Washington.

In conjunction with capture software 26, capture device 14 is configured to receive a video signal from one of recording devices 12 or playback device 25, to digitize the video signal, and to store the video signal as a digital video file. The parameters of the video capture will be discussed below with reference to FIG. 2. The digital video file is an MPEG-1 file in this exemplary embodiment, but may alternatively be generated in other digital video formats, such

as, MPEG-2, AVI, etc. Capture device 14 is a combined audio/video capture device, but may alternatively include discrete audio and video capture devices, the audio capture device configured to digitize any audio which corresponds to the video being captured by the video capture device. As a further alternative, audio captured device may be utilized alone without a video capture device. The audio capture device may be, for example, a Montego II device, manufactured by Voyetra Turtle Beach, Inc., Yonkers, New York, and configured to generate a digital audio file in a digital audio format, such as, PCM (Pulse Code Modulation).

Editing software 28 is operable on computer 16. In this exemplary embodiment, Adobe Premier 5.1 is utilized, though other video editing software may be used. Editing software 28 receives the captured digital video file and enables an operator to edit the digital video file by adding or deleting frames, adjusting the color, contrast, and brightness of the frames, etc. The edits are then saved to the digital video file or can be exported to AVI or MOV file types.

Encoding software 30 is operable on computer 16. In this exemplary embodiment, RealProducer G2 is utilized, though other encoding software may be used. Encoding software 30 receives the edited digital video file and encodes the digital video file into an encoded format, such as, an RM format. Encoding software 30 may also compress the digital video file, if needed, to reduce the size of the digital video file, using a video compression algorithm, such as MPEG-1, MPEG-4, etc.

Markup software 32 is operable on computer 16. In this exemplary embodiment, a hypertext markup language (e.g., HTML, Dynamic HTML, Cold Fusion) is utilized. An operator marks

up the encoded digital video file in HTML to prepare the digital video file for uploading to the network server 18. In this exemplary embodiment, a code segment representing a full screen frame size, such as 640 x 480 pixels, is associated with the digital video file in the HTML code. The full screen frame size code segment may alternatively include other screen sizes, such as 800 x 600 pixels, 1024 x 768 pixels, 1280 x 1024 pixels, and 1600 x 1200 pixels. During a subsequent video streaming step, the full screen frame size code segment causes or enables a video player program, such as RealPlayer, manufactured by RealNetworks, Inc., to enlarge the streaming video to a full screen frame size, such as 640 x 480 pixels.

References herein to frame sizes in pixels, such as, 320 x 240 pixels, 640 x 480 pixels, are intended to include equivalent frames sizes thereto. For example, it is known that a frame size of 320 x 240 pixels may include an additional number of unneeded pixels (e.g., which can be as much as 10% of the total pixels) attributed to overscan. Thus, one equivalent to a 320 x 240 pixel frame size is 304 x 228 pixels. As a second example, when rectangular pixels are used, the exact pixel count differs from the stated frame size. Thus, one equivalent to a 320 x 240 pixel frame size is 352 x 240. Accordingly, references to frame sizes in pixels are intended to included these and other equivalent frame sizes, and the teachings herein include any and all such insubstantial variations.

The uploading process utilizes uploading software 33, such as, a Web FTP (file transfer protocol) software (e.g., WS FTP PRO, manufactured by Ipswitch, Inc., Lexington, Massachusetts.) The digital video file is uploaded to network server 18, which includes a computer configured to generate a web page on an

internet-protocol network, such as the Internet or a company-wide intranet. A web page is a block of data written in a markup language, such as HTML, and any related files for scripts and graphics. Network server 18 may alternatively be coupled to a non-internet-protocol network, such as, an ethernet, a local area network, a wide area network, a wireless network, etc.

A user computer 34 may access the web page provided by network server 18 via a network, such as, the Internet. Upon actuating a user input device (e.g., a web page button, hypertext link, etc.) associated with the uploaded digital video file, the HTML code launches a suitable video player program (e.g., RealPlayer) at user computer 34, activates the full screen frame size at user computer 34, and streams the video from the digital video file to user computer 34. Alternatively, the video player program may initially play the streaming video at a smaller frame size (e.g., 320 x 240), and the user may actuate a user input device on the video player to enlarge the streaming video to a full-screen size, such as 640 x 480. Notably, capture software 26, editing software 28, encoding software 30, markup software 32, and uploading software 33 may be operable on one computer or on different computers during different steps in the process.

According to one alternative embodiment, the encoded digital video file is stored directly to a storage device, such as, a compact disk, a digital video disk, a magnetic storage device, etc., for subsequent viewing on another computer, on a personal digital assistant (e.g., a Palm Pilot manufactured by Palm, Inc., Santa Clara, California), etc. According to another alternative embodiment, digital video data is provided on a storage device (e.g., a floppy disk, a hard disk storage, etc.) which has been pre-captured. The pre-captured

digital video data is provided in a compressed or uncompressed digital video format to encoding software 30 for subsequent processing.

Referring now to FIG. 2, a method 50 for generating an enhanced digital video file according to the exemplary embodiment of FIG. 1 is shown. Method 50 is operable using one or more of the elements of system 10, as needed. While the steps of method 50 are explained with reference to captured video, it is understood that captured audio may be processed along with the captured video, or perhaps processed independently in a similar manner. As will be seen, the recorded video will be captured and encoded at near-optimal levels, as determined by the selected parameters in these processes, thereby preserving the highest quality video content. While exemplary values are presented herein for such parameters, it is understood that one of ordinary skill in the art will recognize other combinations of parameters based on these teachings.

According to one exemplary embodiment, a customer provides pre-recorded video saved to a disk or other storage device. At step 52, if the video has been pre-recorded by the customer, the method proceeds to step 58. If the video has not yet been recorded, at step 54, video is recorded using one or more of recording devices 12 or playback device 25. The video is recorded into any suitable format, such as, VHS or Beta, and is played back using a television standard, such as, NTSC (National Television Standards Committee), PAL (Phase Alternative Line), SECAM (Séquentiel Couleur Avec Mémoire), a digital format, such as, AVI, MOV, MPEG, a digital format compatible with the IEEE 1394 standard, or another format, etc. At step 56, the video is captured by coupling one of recording devices 12 or playback device 25 to capture device 14, which is an

external Dazzle LAV-1000 capture device in this exemplary embodiment, but may alternatively be an internal card or other capture devices, such as a Pinnacle DC10 device.

Capture software is also utilized, such as, Amigo 2.11, Adobe Premier 5.1 or Real Producer G2. Capture device 14 and capture software 26 generate a digital video file based on the recorded video. If the recorded video is in an analog format, capture device 14 digitizes the analog video to create digital video data. If the recorded video is in a digital format, capture device 14 merely receives the digital video data and formats a file in the appropriate standard (e.g., AVI, MOV, MPEG1, etc.). According to one exemplary embodiment, capture software 26 is set for real video capture, i.e., having a frame rate of a television or movie standard, such as, 29.97 frames per second. Real video capture may further have a frame rate of between 24 and 30 frames per second, or at least substantially more than the 6 to 9 frames per second conventionally used in streaming video applications. Further, the video is captured with at least approximately 76,800 pixels per frame (at least approximately 69,000 pixels taking into consideration overscan). For a 4:3 aspect ratio, the frame size of the video capture is at least 320 x 240 in this exemplary embodiment (at least 304 x 228 taking into consideration overscan), or at least more than the 160 x 120 used in conventional streaming video applications. Frame sizes of 480 x 320 and 640 x 480 may also be utilized in the video capture. However, particularly advantageous results are associated with the 320 x 240 capture frame size.

In an alternative embodiment, a separate audio capture device is utilized in parallel with the video capture device. In the alternative embodiment, corresponding audio capture software is

operable on computer 16 to digitize the audio into a digital audio format, such as PCM. The sampling rate is between 44 and 48 kiloHertz (kHz); the bus size is 16-bit, allowing an audio resolution of 16-bits; and the audio is sampled in stereo. These parameters may also be set using the video capture software in an embodiment wherein video and audio are captured using one capture device.

The captured video data may be stored as a data file in a storage device (e.g., a hard drive) or may be stored in memory and fed directly to an encoder. The captured video data may further be compressed, for example, to an MPEG-1 file before being saved to the storage device.

At step 58, the digital video file is edited using a video editing software, such as, Adobe Premier 5.1. Adobe Premier 5.1 generates an output file in a MOV or AVI format, but may alternatively generate an output file in any digital video format. The edited digital video file may be stored in the storage device. Step 58 is optional but, if included, preferably Adobe Premier 5.1 maintains a frame size of at least 320 x 240 pixels and a real video frame rate.

At step 60, the edited digital video file is converted or encoded using a video encoding algorithm to create a streaming video file. The edited digital video file is first retrieved from the storage device (unless the digital video data is provided directly from capture device 14). In this exemplary embodiment, the digital video file is encoded to a RealMedia format (i.e., RM) using a RealNetworks encoding algorithm. RM is an audiovisual file format proprietary to RealNetworks, Inc. As a further alternative, Windows Media Encoder, manufactured by Microsoft Corp., may be utilized to encode the captured digital video file, for example, to an ASF format (Advanced Streaming Format) or ASX format. Further still,

QuickTime, manufactured by Apple Computer, Inc., Cupertino, California, may be utilized to encode the captured digital video file, for example, to an MOV format.

Encoding may additionally include compression, if a smaller file size is desirable, as indicated by steps 62 and 64. The amount of compression may be selected by the operator using encoding software 30 or alternative compression software. During the encoding process, the digital video file is encoded to have a data rate of between approximately 35 kbps (kilobits per second) to 750 kbps, and a frame rate of between approximately 24 fps (frames per second) and 30 fps (e.g. 29.97 fps.). The number of pixels per frame is set to at least approximately 76,800 (again, at least approximately 69,000 pixels taking into consideration overscan) which, for a 4:3 aspect ratio, is 320 x 240 pixels (again, at least 304 x 228 pixels taking into consideration overscan), or at least more than the 160 x 120 pixels of conventional usage. However, editing, encoding, and compression are optional steps.

At step 66, the digital video file is marked up with a markup language, such as, HTML. At step 68, a full screen frame size is associated with the digital video file. A full screen frame size is at least 640 x 480 pixels, and may also be 800 x 600 pixels, 1024 x 768 pixels, 1280 x 1024 pixels, 1600 x 1200 pixels, etc. In this exemplary embodiment, the markup language associated with the digital video file includes a code segment that causes the digital video file to stream at the desired full screen frame size. While the markup language is used to associate the full screen frame size code segment with the digital video file in this exemplary embodiment, the full screen frame size code segment may be associated with the

digital video file in another step of the method, such as the encode step 60, compression step 62, or another step.

At step 70, the digital video file is uploaded to an Internet web page using uploading software, such as, WS FTP PRO. At step 72, a script (e.g., an ASCII file (American Standard Code for Information Interchange)) is associated with the marked-up digital video file. The script calls the video to stream in response to a user actuation from user computer 34. The script is written in a RAM format, such as from a Microsoft Notepad software program. The script is included in the markup language associated with the digital video file. In this exemplary embodiment, an actuatable user input device (e.g., a hypertext link) is associated with the HTML code.

Thus, a user from anywhere in the world may access network server 18 via the Internet, actuate the user input device, and call the video to stream. Upon actuation, the HTML codes launch video playing software (e.g., RealPlayer) at the user computer, enlarge the viewing window of the software to full screen mode (i.e., at least 640 x 480), and begin streaming the video to the user computer. Alternatively, the user may expand the viewing screen to full screen mode by actuating an input device on the video player software. Other methods of expanding the viewing screen to a full screen are contemplated. The transmission speed of the digital video file is dependent upon the bandwidth of the user's network connection, but may range from approximately 35 kbps to 750 kbps, or as low as 28.8 kbps, with a frame rate of between approximately 24 fps to 29.97 or 30 fps.

According to one alternative embodiment, network server 18 is configured to query user computer 34 to ascertain the network connection used by computer 34 (e.g., 28.8 kbps modem,

T1 line, ISDN, etc.). Thereafter, network server 18 determines the appropriate transmission rate based on the ascertained network connection.

EXAMPLE A

A Sony DCR VX-1000 digital video camera, having 3CCD technology, manufactured by Sony Electronics, Inc., Park Ridge, N.J., was utilized to record a video signal. The video camera generated an output signal of 6MHz in NTSC format.

A Dazzle LAV-1000S external capture device was coupled to the video camera. Amigo 2.11, Dazzle's capture software was used. The Dazzle capture device and capture software were programmed with several parameters. The frame size was left at the default setting of 320 x 240 pixels. The frame speed was set to 29.97 frames per second. The bit rate was set to 3.0 Megabits (Mb) per second. The audio capture was set to 44 kHz, 16 bit sampling rate. An MPEG-1 file was generated based on the video signal using the capture device and software programmed with these parameters.

When the captured MPEG-1 file was provided to RealEncoder G2, the resulting encoded file failed to retain the real video frame rate. Therefore, Adobe Premier 5.1 was utilized to receive the MPEG-1 file and export it to a MOV or AVI or MPEG file., based on several parameters. The frame rate in Adobe Premier 5.1 was set to 29.97 fps. The frame size was set to 320 x 240. The "Quality" setting, representing the number of colors to appear in the edited file, was set to a high setting (e.g., 100%). Adobe Premier

5.1 generated an AVI file or an MOV file or a MPEG file, depending upon the operator selection.

RealEncoder G2 software was used to encode the AVI or MOV file into a streaming video file in RM format. The RealEncoder G2 software was programmed with several parameters. The bitrate was set to 220 kbps. The frame rate was set to 30 fps. The "Surestream" option was selected. "Surestream" technology adjusts the playing speed of the encoded digital video file to accommodate the network connection speed of the user. For sound quality, "stereo/music", the highest quality, was selected. For image quality, "sharpest image", the highest quality, was selected. Regarding frame size, this version of RealEncoder generated an output signal having a frame size equal to that of the frame size of the MOV or AVI input file. RealEncoder compressed the MOV or AVI input file using the RealNetworks compression algorithm. An RM file was generated based on the these parameters.

The RM file was uploaded to an Internet server. Using Microsoft Notepad, a script was written in RAM format to 1) identify the location of the RM file, 2) launch RealPlayer on the user computer, 3) resize the viewing screen on the user computer to 640 x 480, and 4) begin the video stream. The result was unexpectedly high-quality, full-screen, real video frame rate, streaming video. The RM file was subsequently streamed to a client computer via a telephone modem and via other broadband connections. The same unexpectedly high-quality, full-screen, real video frame rate, streaming video was experienced. The streaming playback was intermittent due to the need to buffer to accommodate the lower bit-rate of transmission.

EXAMPLE B

According to another example, an NTSC analog signal is provided to a Pinnacle DC-10PLUS capture device. The Pinnacle capture device and associated software generate a digital video file in AVI format based on several parameters. The capture type is set to NTSC. The frame size is set to 320 x 240 pixels, or "1/4 full frame size". Brightness, sharpness, and color are adjusted, as desired. The compression rate is set to 2.5:1. The frame rate is set to 29.97. Square pixel ratio is selected. Audio is set to stereo format, 44 kHz, 16 bit sampling. The data rate is set to 1739 kbps. The capture device utilizes a Miro codec to create a digital video file in AVI format.

Optionally, a header and footer is provided to the beginning and end of the digital video file. The header and footer include a trademark for the assignee of the present application. Adobe Premier is used to render the header, footer, and watermark to the digital video file. A parameter within Adobe Premier is set to a frame size of 320 x 240. Adobe Premier further utilizes a Miro codec to create a digital video file in AVI format.

The edited AVI file is encoded by RealProducer software. The following parameters are programmed in the RealProducer software. One set of parameters was used for a low-speed network connection at the user computer (hereinafter designated "LO"), and another set of parameters was used for a high-speed network connection at the user computer (hereinafter designated "HI"). RealNetworks "Surestream" technology is selected. Alternatively, "single-stream" can be selected, and an RAM file can be generated to query the connection speed of the user

computer and stream the video at the proper connection speed. The encoding speed is set to, for LO, 28 kbps or 56 kbps, and for HI, LAN, DSL, Cable Modem, or T1. Sound quality is set to "voice only" or "stereo music" or "CD quality". Video quality is set to "sharper image". Frame rate is set to 29.97 fps. Target bit rate is set to 350 kbps. The target player is specified as RealPlayer G2. Frame size is set to 320 x 240. Based on these parameters, the RealEncoder software generates an RM file or other streaming video data file, which is subsequently uploaded to RealServer.

The exemplary embodiments disclosed herein provide greatly enhanced streaming video suitable for streaming over a limited-bandwidth network, such as the Internet. Several discoveries have enabled various aspects of this technology. The first discovery was that the efficiency of encoding from a captured digital video file to a streaming video file is increased with an increase in the frame size of the captured digital video file. Thus, while conventional teachings pointed toward minimizing the capturing and encoding frame sizes (typically to 160 x 120 pixels, which has widely become an Internet standard for streaming video) to reduce the size of the resulting file, the present inventors turned away from these teachings and increased the capturing and encoding frame sizes to 320 x 240 pixels. Second, one goal of the present inventors was to achieve full-screen, real video frame rate, streaming video. Conventional teachings would point toward encoding at a frame size of 640 x 480 pixels to achieve full-screen streaming video. However, with today's technology, enlarging the frame size of a captured digital video file during encoding to 640 x 480 (for example, from 160 x 120 pixels) pixels causes an enormous increase

in the amount of data in the resulting encoded digital video file and requires enormous bandwidth to stream. Therefore, the present inventors discovered that encoding at 320 x 240 pixels (or its equivalent) provided greatly improved results when doubled to full-screen for viewing.

These conventional teachings were evidenced in the capabilities of the encoder used at the time of invention, namely, RealProducer G2. RealProducer G2 taught away from real video streaming since digital video files that were captured at a real video frame rate (e.g., 30 fps) would be automatically reduced to a lower, non-real video frame rate (e.g., 15 fps) to reduce the size of the streaming video file. Furthermore, digital video files which were captured directly from a capture device using RealProducer G2 were encoded at a frame rate of only 6-7 fps and had no option to adjust frame size. Therefore, to obtain a real video frame rate, the inventors followed the steps in EXAMPLE A above to achieve the first high quality, full-screen, real frame rate streaming video file.

Referring now to FIG. 3, a system 80 for playing a digital video file across a network is shown, and a corresponding method is described. System 80 includes a network server 82 having a processor 84, a storage device 86, and a network interface 88. A capture device 90 is coupled to network server 82 and is configured to capture a video signal, as described hereinabove. Processor 84 controls capture device 90 and provides various parameters to capture device 90 regarding frame size, bit rate, etc. For example, one or more of the methods for capturing video and generating a digital video file described hereinabove may be implemented by processor 84, storage device 86, and capture device 90. Processor 84 and capture device 90 generate a digital video file

in a digital video format (e.g., MPEG, AVI, etc.) and store it to storage device 86. As used in this description of FIG. 3, the term "storage device" includes such devices as magnetic tape, a hard drive, a floppy disk, magnetic disk, or other similar non-volatile storage media, but not including random access memory or other temporary memory. The capture process may alternatively be carried out on another computer, after which the resulting digital video file is stored in (e.g., uploaded to) storage device 86.

Network server 82 is coupled through network interface 88 to a network 92, such as the Internet, a LAN, etc. Processor 84 is configured to generate a web page having a hypertext link to the digital video file stored in storage device 86. A network client 94 includes a processor 96, a storage device 98, an input device 100, a display 102, and a network interface 104. Network client 94 is operable via a user to access the web page generated by network server 82 and to actuate the hypertext link to begin downloading the digital video file from storage device 86.

One drawback of downloading video files is that, for very large files, the delay before any portion of the digital video file can be viewed can be on the order of minutes, hours, or longer. Thus, according to one advantageous aspect of system 80, while the digital video file is being downloaded to network client 94 and stored in storage device 98, some of the digital video file which has already been downloaded and stored is being simultaneously played on display 102. A suitable player which supports AVI, MPEG, and other digital video formats is utilized for the video play. This procedure may be referred to as viewing/downloading. Stated another way, a first portion of the digital video file is played from storage device 98 while later portions of the digital video file are still

downloading from storage device 86 via network 92 to storage device 98.

One method of launching the player and beginning the play of the first portion is for a user to simply select these steps via input device 100 (e.g., a mouse, a keyboard, etc.) a certain time after the downloading has begun. Alternatively, an algorithm may be provided, either attached to the digital video file (e.g., HTML, Java, a macro, etc.) or as part of the player (e.g., QuickTime, RealPlayer, etc.) which begins playing the digital video file at a predetermined time after the download to storage device 98 has begun. This predetermined time may be pre-programmed or adjusted in real-time based on inputs from client server 94 or network server 82. According to one example, the algorithm calculates the predetermined time based on the download speed (e.g., including network connection speed of network interface 104, etc.), the viewing speed (e.g., frames per second, etc.), and the size of the digital video file. For example, if the viewing speed is four times the download speed, the algorithm monitors the amount of the file (e.g., in bytes) which is downloaded until 75% of the file is downloaded. When 75% of the file is downloaded, the algorithm begins playing the digital video file from storage device 98. By playing the file at this predetermined time, the digital video file will play substantially without delays for buffering. Of course, other predetermined times are contemplated, including those earlier and later than that set forth in this exemplary embodiment.

Thus, one can view a digital video file shortly after clicking on the hypertext link and before the entire digital video file has downloaded to storage device 98. Once the entire digital video

file is finished playing, network client 94 retains a copy of the digital video file in storage device 98 for later playing.

According to one alternative, the digital video data is captured in real-time and streamed in real-time across network 92 (i.e., without first storing to storage device 86) to storage device 98.

While the embodiments and applications of the invention illustrated in the FIGS. and described above are presently preferred, it should be understood that these embodiments are offered by way of example only. For example, while the steps of the exemplary embodiments contemplate recording audio and video at one time and streaming the audio and video at another time, the audio and video may alternatively be fed through system 10 in real-time, thereby facilitating real-time audio/video transmissions. Furthermore, the exemplary software programs mentioned may be replaced by newly developed versions and/or programs in the future. Accordingly, the present invention is not limited to a particular embodiment, but extends to various modifications that nevertheless fall within the scope of the appended claims.

WHAT IS CLAIMED IS:

1. A method of playing a digital video file over a network, comprising:

providing a digital video file to a first storage device;

downloading a first portion of the digital video file from the first storage device over a network to a computer having a second storage device and a display screen;

expanding the viewing frame size of the computer display screen to at least 640 x 480 pixels; and

playing the first downloaded portion on the expanded display screen from the second storage device while substantially simultaneously downloading a second portion of the digital video file to the second storage device.

2. The method of claim 1, further comprising capturing a video signal to generate the digital video file.

3. The method of claim 2, further comprising compressing the captured video signal such that the digital video file is compressed.

4. The method of claim 3, wherein the digital video file is stored in an MPEG file format.

5. The method of claim 1, wherein the network is the Internet.

6. The method of claim 1, wherein the playing of the first portion of the digital video file is started a predetermined time after

the downloading of the first portion of the digital video file has started.

7. The method of claim 6, wherein the predetermined time is based on the viewing speed and the download speed of the digital video file.

8. The method of claim 6, wherein the playing of the digital video file ends at approximately the same time as the download of the digital video file.

9. The method of claim 7, wherein at least 50% of the digital video file is downloaded before the first portion of the digital video file is played.

10. The method of claim 1, wherein the second storage device includes a magnetic storage device.

11. The method of claim 10, wherein the second storage device is a hard drive.

12. A system for playing a digital video file over a network, comprising:

means for providing a digital video file to a first means for storing;

means for downloading a first portion of the digital video file from the first storing means over a network to a computer having a second means for storing and a display screen;

means for expanding the viewing frame size of the computer display screen to a full screen size; and

means for playing the first downloaded portion of the digital video file on the expanded display screen from the second storing means while substantially simultaneously downloading a second portion of the digital video file to the second storing means.

13. The system of claim 12, further comprising means for capturing a video signal to generate the digital video file.

14. The system of claim 13, further comprising means for compressing the captured video signal such that the digital video file is compressed.

15. The system of claim 14, wherein the digital video file is stored in an MPEG file format.

16. The system of claim 12, wherein the network is the Internet.

17. The system of claim 12, wherein the playing of the first portion of the digital video file is started a predetermined time after the downloading of the first portion of the digital video file has started.

18. The system of claim 17, wherein the predetermined time is based on the viewing speed and the download speed of the digital video file.

19. The system of claim 18, wherein the playing of the digital video file ends at approximately the same time as the download of the digital video file.

20. The system of claim 19, wherein at least 50% of the digital video file is downloaded before the first portion of the digital video file is played.

21. The system of claim 12, wherein the second storage device includes a magnetic storage device.

22. The system of claim 21, wherein the second storage device is a hard drive.

23. A method of playing a digital video file across the Internet, comprising:

capturing and compressing a source video signal to generate a digital video file;

providing a first portion of the digital video file across the Internet to a computer;

playing the first portion of the digital video file at substantially full screen size on the computer while substantially simultaneously downloading a second portion of the digital video file to the computer.

24. The method of claim 23, further comprising:

downloading the first portion to a storage device;

automatically launching a video file player at the second computer; and

automatically playing the first portion of the digital video file after the first portion has been downloaded.

25. The method of claim 24, wherein the playing of the digital video file ends at approximately the same time as the download of the digital video file.

26. The method of claim 24, wherein the entire digital video file is stored on a storage device coupled to the computer after the playing step.

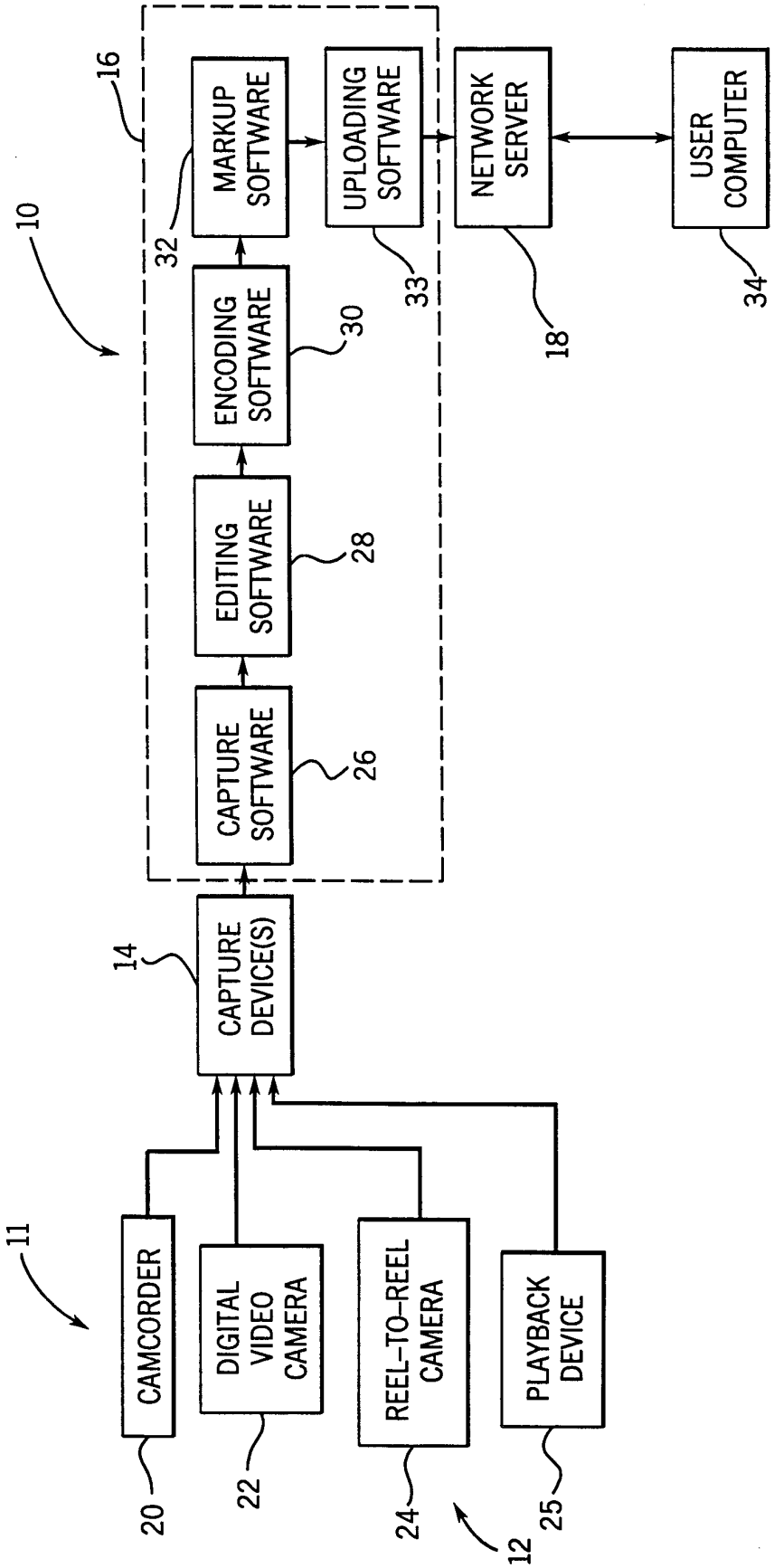

10
11
12
14
16
18
20
22
24
25
26
28
30
32
33
34
CAMCORDER
DIGITAL VIDEO CAMERA
REEL-TO-REEL CAMERA
PLAYBACK DEVICE
CAPTURE DEVICE(S)
CAPTURE SOFTWARE
EDITING SOFTWARE
ENCODING SOFTWARE
MARKUP SOFTWARE
UPLOADING SOFTWARE
NETWORK SERVER
USER COMPUTER

FIG. 1

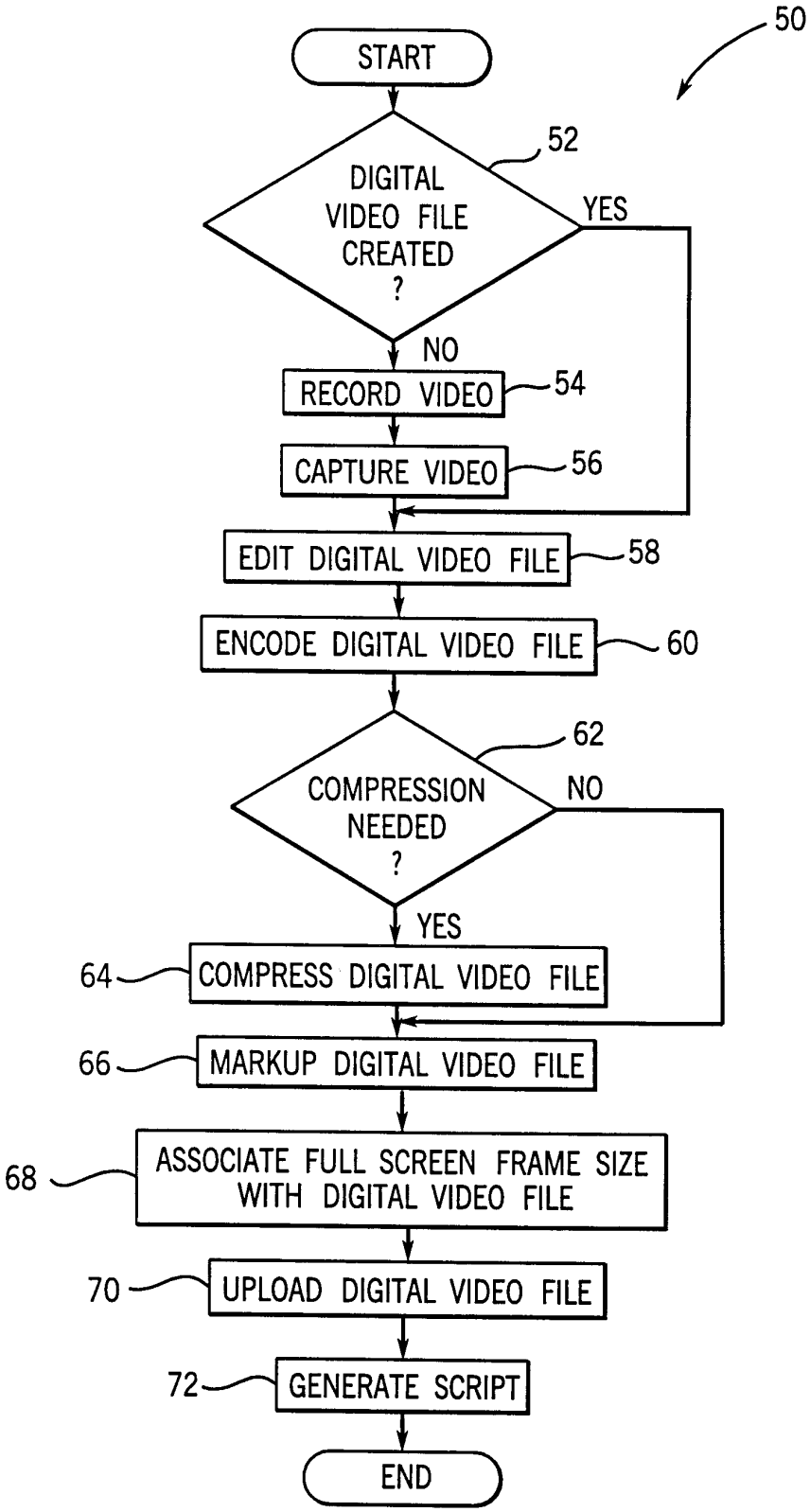

50
START
52
DIGITAL VIDEO FILE CREATED ?
YES
NO
RECORD VIDEO
54
CAPTURE VIDEO
56
EDIT DIGITAL VIDEO FILE
58
ENCODE DIGITAL VIDEO FILE
60
62
COMPRESSION NEEDED ?
NO
YES
64
COMPRESS DIGITAL VIDEO FILE
66
MARKUP DIGITAL VIDEO FILE
68
ASSOCIATE FULL SCREEN FRAME SIZE WITH DIGITAL VIDEO FILE
70
UPLOAD DIGITAL VIDEO FILE
72
GENERATE SCRIPT
END

FIG. 2

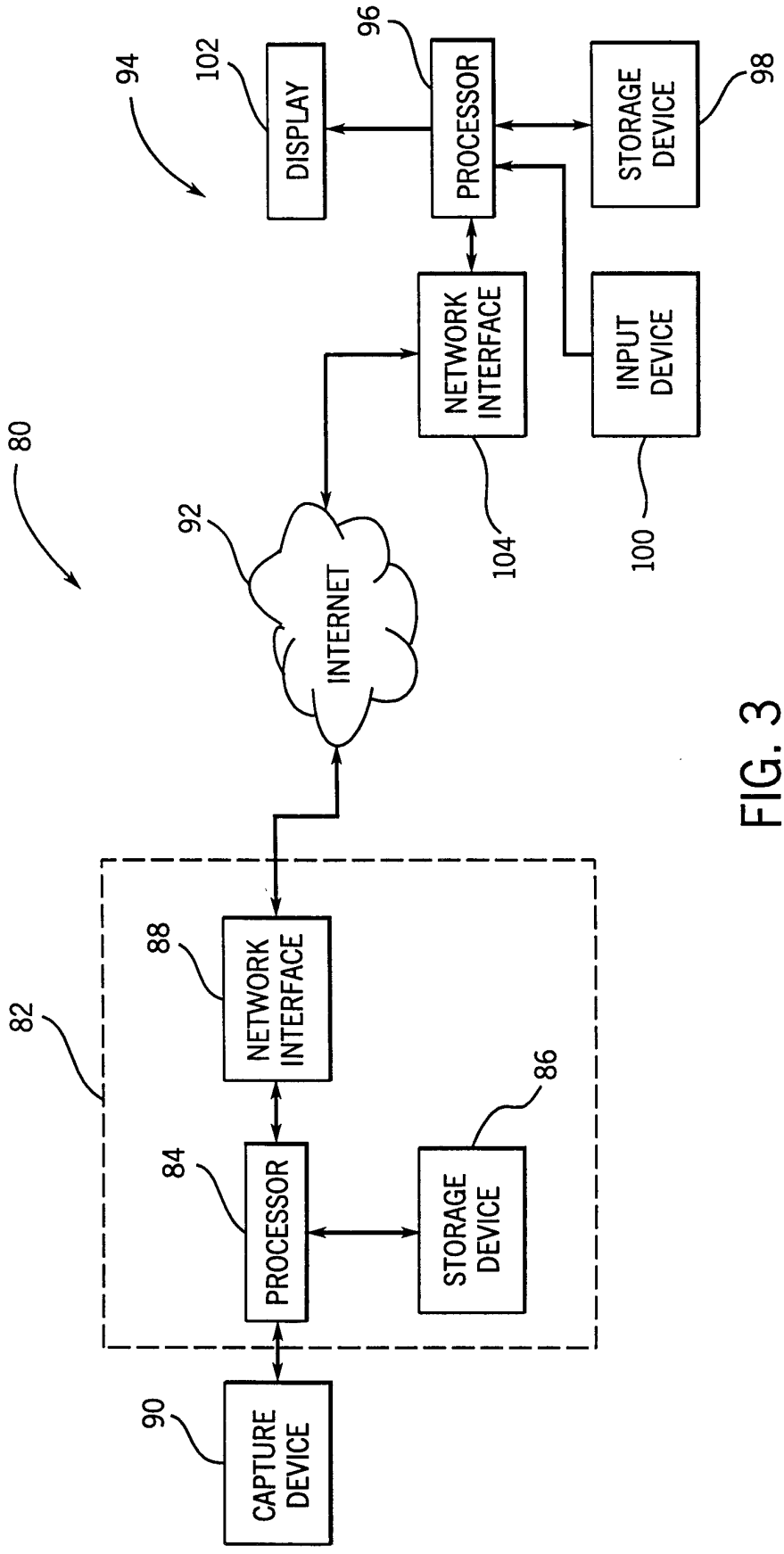

80
82
84
86
88
90
92
94
96
98
100
102
104
CAPTURE DEVICE
PROCESSOR
STORAGE DEVICE
NETWORK INTERFACE
INTERNET
NETWORK INTERFACE
INPUT DEVICE
STORAGE DEVICE
PROCESSOR
DISPLAY

FIG. 3

INTERNATIONAL SEARCH REPORT

Int ional Application No
PCT/US 00/15406

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04N7/173 H04N7/24

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JOSÉ ALVEAR: "Web Developer.com Guide to Streaming Multimedia " 9 April 1998 (1998-04-09) , JOHN WILEY & SONS , NEW YORK XP002150042 page 65 -page 86 page 127 -page 139 page 183 -page 204 page 349 -page 370 ---	1-26
A	PROGRESSIVE NETWORKS INC.: "Real Video Content Creation Guide Version 1.0" 'Online! 12 June 1997 (1997-06-12) XP002149004 Retrieved from the Internet: <URL: http://docs.real.com/docs/ccguide_rv10.pdf > 'retrieved on 2000-10-13! page 99, line 7 -page 101, line 18 ---	1-26
	-/--	

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
16 October 2000	02/11/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Giannotti, P

2

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Int ional Application No
PCT/US 00/15406

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
A	REALNETWORKS INC.: "Realproducer Pro User's Guide Version G2" 'Online! 2 February 1999 (1999-02-02) XP002150043 Retrieved from the Internet: <URL: http://docs.real.com/docs/prodprouserguide 2.pdf> 'retrieved on 2000-10-13! page 37, line 3 -page 40, line 11 ---	1-26
A	US 5 768 535 A (NORTHCUTT J DUANE ET AL) 16 June 1998 (1998-06-16) ---	
A	US 5 481 275 A (KHUBCHANDANI TEJU J ET AL) 2 January 1996 (1996-01-02) ---	
A	WO 98 35468 A (SLOTZNICK BENJAMIN) 13 August 1998 (1998-08-13) ------	

2

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

information on patent family members

Int onal Application No
PCT/US 00/15406

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5768535 A	16-06-1998	US 5621660 A	15-04-1997
		EP 0739140 A	23-10-1996
		JP 9163362 A	20-06-1997
US 5481275 A	02-01-1996	NONE	
WO 9835468 A	13-08-1998	AU 6037198 A	26-08-1998
		EP 1016021 A	05-07-2000
		US 6011537 A	04-01-2000