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PRESENTATION PROGRAM AND METHOD

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN THAT BRUCE W. STEVENS, employee of the United States Government, citizen of the United States of America, and resident of North Kingstown, County of Washington, State of Rhode Island, has invented certain new and useful improvements entitled as set forth above of which the following is a specification.

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PATENT TRADEMARK OFFICE

1 Attorney Docket No. 80072

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3 PRESENTATION PROGRAM AND METHOD

4

5 STATEMENT OF THE GOVERNMENT INTEREST

6 The invention described herein may be manufactured and used
7 by or for the Government of the United States of America for
8 Governmental purposes without the payment of any royalties
9 thereon or therefore.

10

11 CROSS-REFERENCE TO OTHER PATENT APPLICATIONS

12 Not applicable.

13

14 BACKGROUND OF THE INVENTION

15 (1) Field of the Invention

16 The present invention relates generally to computer
17 presentation applications and, more specifically, to a computer
18 program that may be utilized for a presentation which utilizes
19 multiple computers and multiple associated displays.

20 (2) Description of the Prior Art

21 A weapons control system environment forms a computer
22 complex that may utilize numerous different workstations with
23 each workstation having one or more computer screens. In the

1 prior art, an actual use or complex simulation is necessary to
2 demonstrate operation of the weapons control system. Prior art
3 software applications do not provide for a coordinated
4 presentation wherein multiple computers display different images
5 and/or sounds. Special hardware modifications have been
6 utilized in the past as discussed subsequently in the listed
7 prior art patents for producing multiple displays, but hardware
8 modifications are often undesirable.

9 Prior art computer programs presently exist that may be
10 utilized to produce a series of images on a computer screen to
11 thereby provide a slideshow presentation. However, the prior
12 art programs may not be utilized to control a presentation that
13 utilizes simultaneously running multiple computers in a computer
14 complex with each computer displaying different graphics and
15 wherein each of the plurality of computers within the computer
16 complex may have one or more screens, which may also show
17 different images at different times.

18 Prior art computer programs for slideshow presentations may
19 encounter other problems such as the computers in a computer
20 system may be quite dissimilar and have different operating
21 systems whereby a prior art computer presentation program will
22 not even run on all the different computers. The prior art also
23 does not provide software means for controlling timing of the

1 presentation by coordinating each computer display with the
2 display of other computers. While the prior art does provide
3 for slide show presentations or video presentations, prior art
4 programs do not provide a software means for simultaneously
5 starting and operating all computers in a computer system
6 whereby each computer may display different images. While
7 images can be sent over a networked system, there is a time lag
8 in transmission in a networked system due to the volume of data
9 in each image. Combat video simulations may require thousands
10 of images to be displayed within a short time period and cause a
11 data flow volume that would tend to drag performance of a
12 presentation down.

13 Patents that show attempts to solve the above and other
14 related problems are as follows:

15 U.S. Patent No. 5,488,385, issued January 30, 1996, to
16 Singhal et al., discloses that video information is
17 simultaneously generated for presentation on multiple displays
18 by a display system including a video memory having a plurality
19 of addressable storage locations, each storage location
20 providing for the storage of data representing a component of an
21 independent displayable image and a video controller providing a
22 plurality of output display control and data signals connectable
23 to a respective plurality of video displays. The video

1 controller accesses the video memory in a predetermined
2 addressing pattern so as to access a sequence of the components
3 corresponding to a plurality of the independent displayable
4 images. The video controller, in turn, generates the plurality
5 of output display control and data signals whereby the sequence
6 of the components provided by way of each of the plurality of
7 the output display control and data signals corresponds to a
8 respective one of the independent displayable images.

9 U.S. Patent No. 5,606,336, issued February 25, 1997, to
10 Yuki discloses that a display control apparatus permits display
11 by a single display control apparatus on a plurality of display
12 devices which receive image data by an internal synchronization
13 signal. The display control apparatus outputs input image data
14 to a plurality of display devices and includes a control circuit
15 for selecting the longest one of the internal synchronization
16 signals from the display devices and a unit for supplying the
17 image data to the display devices in synchronism with the
18 selected synchronization signal.

19 U.S. Patent No. 5,959,686, issued September 28, 1999, to
20 Jeong discloses an apparatus and a method for controlling a
21 plurality of sub monitors in a video communication system in
22 which the same signal from a host computer or a video tape
23 recording/reproducing device is displayed on screens of the sub

1 monitors and a main monitor to which the sub monitors are
2 connected in series. The main monitor generates control data in
3 response to an external sub monitor control signal to set up a
4 desired one of the sub monitors. A plurality of communication
5 devices are included respectively in the sub monitors, for
6 serially transferring the control data from the main monitor to
7 the sub monitors and response data from the sub monitors to the
8 main monitor. A plurality of microcomputers are connected
9 respectively to the communication devices, for setting up a
10 corresponding one of the sub monitors in response to the control
11 data from the main monitor when the control data from the main
12 monitor is for the control of the corresponding sub monitor and
13 transferring the control data from the main monitor to the
14 subsequent sub monitor when the control data from the main
15 monitor is not for the control of the corresponding sub monitor.
16 According to the present invention, the main monitor can control
17 the plurality of sub monitors using the communication devices
18 therein and a program for the control thereof.

19 U.S. Patent No. 5,969,696, issued October 19, 1999, to
20 Stoye discloses an invention providing an interface for a
21 computer system that can drive several different display
22 systems. The interface of the invention consists of power
23 signals, ground signals, sense signals, programmable signals,

1 and a few miscellaneous signals. The sense signals are driven
2 by each display system that is designed to operate with the
3 invention's interface. Each display system drives the sense
4 signals with a code that uniquely identifies the display system.
5 The interface is self-configuring such that the computer system
6 reads the unique code output on the sense signals and
7 correspondingly outputs the proper display information on the
8 programmable signals to drive the display system connected to
9 the interface.

10 U.S. Patent No. 6,046,709, issued April 4, 2000, to Shelton
11 et al., discloses a method of synchronizing, at a system frame
12 display rate, a first set of frames displayed by a first monitor
13 with a second set of frames by a second monitor, utilizes frame
14 production rates of the two sets of frames to set the system
15 frame display rate. More particularly, the first set of frames
16 are produced at a first frame production rate by a first
17 graphics engine, and the second set of frames are produced at a
18 second frame production rate by a second graphics engine. The
19 first frame production rate and second frame production rate
20 first are compared to determine which frame production rate is
21 slower. The system frame display rate then is set to be no
22 greater than the slower of the two frame production rates.

1 U.S. Patent No. 6,104,414, issued August 15, 2000, to
2 Odryna et al., discloses a video distribution hub and display
3 method which is capable of driving a plurality of video display
4 monitors as a virtual monitor or monitors. The video
5 distribution hub receives a video signal from a single head
6 graphics card or a suitable video source which signal embodies
7 data within a video buffer on the graphics card or at the video
8 source. The hub processes the received video signal and stores
9 selected data segments corresponding to selected portions of the
10 video buffer in a plurality of frame buffers within the
11 distribution hub. The data stored within the plurality of frame
12 buffers is employed to drive respective video displays, such as
13 flat panel displays or conventional CRT displays. The hub
14 accommodates displays of different resolution. Additionally, the
15 hub accommodates displays having either a portrait or landscape
16 orientation.

17 The above cited prior art which does not show a suitable
18 purely software means for synchronizing the display of time
19 sequenced series of images amongst any number of various like
20 and dislike computers without the need for hardware changes to
21 the computers or computer system. Consequently, those skilled
22 in the art will appreciate the present invention that addresses
23 the above and other problems.

1 Accordingly, the present invention provides a method for
2 making (or generating) a presentation on a plurality of
3 computers or computer stations utilizing a software control
4 program. The method may comprise one or more steps such as, for
5 instance, providing that the software control program is written
6 in a platform independent computer programming language,
7 installing at least one instance of the software control
8 computer program on each of the plurality of computers, running
9 the software control program simultaneously on the plurality of
10 programs, and automatically starting unlike or different
11 sequences of displays for each of the plurality of computers
12 utilizing the simultaneously running software control programs.
13 Other steps may include providing that the sequence of displays
14 differs between the plurality of computers and/or installing a
15 respective set of files to be played by each of the plurality of
16 computers for the presentation including an initial file to be
17 played and an ending file to be played and/or timing playing of
18 each the files of the respective set of files for each of the
19 plurality of computers such that a beginning time and play
20 duration time is effectively associated with each file.

21 The step of automatically starting may further comprise
22 providing an initial file start time for each instance of the
23 software control program on each of the plurality of computers.

1 Thus, a method for making a presentation comprising steps
2 such as, for instance, installing for single execution of the
3 software computer control program on a one of a plurality of
4 computers, or alternatively for simultaneous and independent
5 ("in parallel") execution of the software program on a one of a
6 plurality of computers, installing a respective set of files to
7 be played by each of the plurality of computers for the
8 presentation including an initial file to be played and an
9 ending file to be played, associating timing for playing of each
10 the files of the respective set of files for each of the
11 plurality of computers whereby an effective beginning time and
12 play duration time is associated with each file, providing a
13 start time for an initial file to be played on each of the
14 plurality of computers, providing that each computer is
15 synchronized to a common time, providing that each instance of
16 execution of the control program on each of the plurality of
17 computers displays the initial file at the respective start
18 time, and sequentially playing each file in each respective set
19 of files for each of the plurality of computers.

20 The respective set of files for each of the plurality of
21 computers may include graphic files and/or audio files to be
22 played. The method may comprise instances of simultaneous and
23 independent executions of the software control program on a

1 computer associated with a plurality of monitors where each
2 instance of execution of the software control program
3 independently coordinates a presentation display sequence for a
4 respective one of the plurality of monitors operated by the
5 computer. The effective beginning time and play duration time
6 may be determined from an absolute beginning time and an
7 absolute ending time or the effective beginning time and play
8 duration time may be determined based on a collective time of
9 previous image files and a given play duration time.

10 Thus, the invention provides a software control program is
11 operable for running simultaneously on a plurality of computers
12 and may include software elements such, for instance, a read
13 scenario command to read the scenario file which lists the files
14 to be played and associated timing thereof, at least one get
15 image command to retrieve each image file listed in the scenario
16 file, and a software timing control operable for coordinating
17 timing of display of each image file for each of the plurality
18 of computers to provide a coordinated presentation utilizing the
19 plurality of computers. The software control program may be
20 written in a platform independent computer programming language
21 so as to be operable on computers which may have dissimilar or
22 different operating systems. The invention may further comprise
23 a display command to designate a particular display for a

1 multiple display computer associated with a plurality of
2 displays. For instance, the command may set an x, y raster
3 position of a composite multiple display raster area for each
4 unlike presentation display of a plurality of unlike
5 presentation displays on a desired monitor of the multiple
6 display computer station. An additional feature useful in the
7 present invention is a time control program for setting an
8 internal clock of all of the plurality of computers to a common
9 time.

10

11 BRIEF DESCRIPTION OF THE DRAWING

12 A more complete understanding of the invention and many of
13 the attendant advantages thereto will be readily appreciated as
14 the same becomes better understood by reference to the following
15 detailed description when considered in conjunction with the
16 accompanying drawings wherein corresponding reference characters
17 indicate corresponding parts and wherein:

18 FIG. 1 is a block diagram of a JAVA control program in
19 accord with the present invention;

20 FIG. 2 is a block diagram of a computer complex, including
21 networked and stand alone computer stations with
22 displays/speakers that may be utilized for a synchronized

1 presentation by means of the JAVA control program of
2 FIG. 1; and

3 FIG. 3 is a diagrammatic representing the mapping of a
4 plurality of displays or monitors to a composite raster area.

5
6 DESCRIPTION OF PREFERRED EMBODIMENTS

7 The present invention provides the opportunity to make or
8 generate unique and interesting graphics sound effects for
9 presentations and the like which can make a complex computer
10 system seem to come alive.

11 Referring now to the drawings, and more particularly, to
12 FIG. 1 and FIG. 2 there is shown presentation program 10 which
13 may be utilized for producing a presentation for display using
14 multiple computer stations of computer complex 100.
15 Presentation program 10 may be utilized for synchronizing a
16 plurality of computers such as computer complex 100 which
17 comprises N computers and which may comprise N or more computer
18 displays and/or acoustic speakers. Computer complex 100 may
19 typically include one or more networked computers stations
20 connected to one or more servers 102. However, presentation
21 program 10 may also be utilized to coordinate one or more free
22 standing computer stations that have no interconnections such as

1 computers 104 and 106 and associated displays 108 and 110,
2 respectively.

3 In a preferred embodiment, a separate clock program 124 of
4 a type well known in the prior art may preferably be utilized to
5 set each internal clock of each computer, such as computers 1-N,
6 designated as 114, 116, 118, 120, and 122, to the same time.
7 Typically, clock programs 124 are in contact with a national
8 time standard and are extremely accurate. Numerous displays or
9 monitors are operatively associated with the computers. In many
10 cases one computer will have multiple display monitors, and the
11 computer will control the running or displaying of unlike
12 presentations on different monitors. Thus computer 114 controls
13 displays 128 and 130, computer 116 controls displays 132, 134,
14 and 136, computer 118 controls display 138, computer 120
15 controls display 140, and computer 122 controls display 142.
16 Presentation program 10 may be used to coordinate a presentation
17 on any number N displays with the display presentations unlike
18 or different, for the any number N computers, and utilizing tens
19 of thousands of graphics/sound files. Note that it is assumed
20 that each display may also have an attached sound speaker and/or
21 separate speaker so that sounds can also be produced, e.g., an
22 alarm or the like for presentations simulating a combat control
23 system.

1 In a presently preferred embodiment of the invention,
2 presentation program 10 is written in a platform-independent
3 language so that presentation program 10 may be developed and
4 executed on a number of dislike computers executing dislike
5 operating systems. It is also desirable that computer program
6 10 present the operator with a uniform graphical user interface
7 across the various computers. While a presently preferred
8 embodiment of the program is written in the Java programming
9 language to thereby fulfill the above desirable characteristics,
10 computer program 10 could also be written in other computer
11 languages.

12 Due to the fact that computer program 10 operates computers
13 having multiple displays, in a presently preferred embodiment
14 when computer program 10 is started, a desired x position and y
15 position of the upper left hand corner of a particular display,
16 relative to the x, y coordinates of a composite raster area of
17 all the displays, is preferably specified as indicated at 12. A
18 plurality of separate copies of a single computer program such
19 as program 10 can be simultaneously executed on a single
20 computer system. Each executing "copy" of a program
21 corresponding to a display executes independently in its own
22 address space. This allows multiple instances of computer
23 program 10 to be executed on a single computer supporting

1 multiple displays such as computer 116 which supports computer
2 monitors or displays 132, 134, and 136.

3 It is well known that a plurality of display monitors
4 connected to a single computer system can map each individual
5 display monitor to a separate, non-overlapping rectangular
6 section of said computer's raster display area. For example,
7 four separate monitors can be arbitrarily mapped to four
8 separate, non-overlapping, rectangular sections as shown in FIG.
9 3. Each rectangular area in this example is 1280 pixels wide by
10 1024 pixels high. Monitor 1 is mapped to the raster area
11 representing by the upper left hand coordinates located at $x = 0$
12 and $y = 0$. Monitor 2 is mapped to the raster area represented
13 by the upper left hand coordinates located at $x = 0$ and $y =$
14 1024. Monitor 3 is mapped to the raster area represented by the
15 upper left hand coordinates located at $x = 0$ and $y = 2048$.
16 Monitor 4 is mapped to the raster area represented by the upper
17 left hand coordinates located at $x = 1280$ and $y = 0$. For
18 example, assume there is a total composite image display area of
19 $x = 1280$ by $y = 1024$, and the requirement is to match display
20 area to the raster area mapping of FIG. 3. A separate
21 simultaneous and independent "parallel" execution of program 10
22 can be mapped to a separate display monitor through
23 specification of the appropriate upper left hand raster area

1 coordinate as shown in FIG. 3. Expressed as a table:

2	<u>MONITOR</u>	<u>x,y, VALUES IN PROGRAM 10</u>
3	1	(0,0)
4	2	(0,1024)
5	3	(0,2048)
6	4	(1280,0)

7 Note that as is well known, a pixel is a single addressable
8 dot in the raster area that can be assigned a color.

9 Each instance of computer program 10 can therefore be
10 directed to display different images with different timing, for
11 instance, on each particular display 132, 134, and 136. That is
12 to say unlike or different display presentations appear on the
13 different computer monitors or displays. However, other means
14 for designating or separately controlling multiple displays on a
15 single program could also be utilized.

16 Computer program 10 may preferably provide a control window
17 at step 14 which allows the user to specify a scenario file.
18 The control window preferably has command menus and status
19 displays for this purpose. The scenario file is preferably a
20 simple text file, or other type of file, that specifies a list
21 of image graphics files, and/or sound files, and an associated
22 timing. The scenario file preferably specifies the location of
23 the file in some suitable means such that computer program 10

1 can find the file, e.g., a complete file extension name, a
2 beginning memory location, or the like.

3 In cases of a computer controlling a plurality of displays
4 (or monitors) plurality of sets of files, each set for a
5 respective display or monitor, is present in computer storage.
6 The scenario file sets up timing and coordination of sequences
7 for the playing of the individual file.

8 The timing may be of several types in accord with the
9 present invention with the goal being to coordinate the displays
10 of multiple computers whereby if time lag or delay occurs in one
11 computer, the collective presentation process nonetheless
12 corrects itself and remains on schedule. In one example, the
13 time may be a relative time whereby the associated display time
14 refers to the amount of time that an associated image/sound will
15 remain displayed/played on the selected graphics screen before
16 the next image/sound is activated. In another example, the time
17 may be an absolute time, e.g., 9:00:00.000 A.M to 9:00:00.1,
18 whereby the display is for one-tenth of a second that starts and
19 ends at designated times. In another example, the time may be a
20 collective time whereby each graphics/sound file is activated
21 based on the end time of another file for a selected delay with
22 respect to an absolute time. Sound and image files may be

1 played simultaneously, when desired, i.e., the start and/or end
2 times may be coincident.

3 Thus, in computer step 16, the computer program reads the
4 scenario file 18 specified in step 14, and constructs a list of
5 image graphic files/sound files and appropriate absolute,
6 relative, or delay times. In step 20, the user has the option
7 to specify a loop count that allows the complete list of files
8 in the scenario file to be activated a desired number of times.
9 The default is one and in effect, the presentation will be
10 presented once if the default is used, twice if the count is set
11 to two, and so forth.

12 At computer step 22, a start time is specified whereby
13 the user specifies the exact time to play the first image/sound
14 file. At step 22, the computer may then calculate the exact
15 time to display succeeding images, such as for instance, by
16 adding the delays associated with each image. If absolute times
17 are utilized, then the timing is already available in the
18 scenario file. The delay times and starting times may be used
19 to calculate absolute times, if desired. Thus, the timing can
20 be effected in different ways with the goal being to coordinate
21 the overall presentation with, effectively a common clock, based
22 on the accurate time clock in each computer.

1 At step 24, program 10 runs the scenario when the start
2 time occurs. In one embodiment, after step 22, program 10 may
3 first blank the screen, display the time the first file will be
4 played, loads the first graphics and/or sound file to play into
5 computer memory as indicated at 26 and waits until the start
6 time, specified in step 20, arrives. In this way, each computer
7 screen can be fetched into computer memory prior to the
8 beginning the presentation to enhance smooth and timely
9 transitions. At the appropriate start time, step 28 initiates
10 operation of the sequence of images to be displayed.

11 In a preferred embodiment of the invention, image/sound
12 files 29 are, in a preferred embodiment, stored on the same
13 computer which will be displaying the images. This eliminates
14 the need to transfer graphic files over a network. Typically
15 such transfers occur at much slower speeds than occur within the
16 busses of the computer and so tens of thousands of images can be
17 displayed without delays caused by network transfers of files.

18 Thus, at step 22 computer program 10 has preferably
19 initialized each computer in which computer program is loaded
20 and each computer waits until a respective start time which may
21 be a simultaneous start time, if desired. When the start time
22 arrives as indicated at step 28, then the respective computer
23 plays, displays, and/or sounds the beginning or initial file(s)

1 at step 30 and then continues playing files based on the timing
2 schedule as indicated in the computer loop formed by steps 32,
3 34, 36, and back to step 30 until the last image/sound is
4 played. After the desired relative or absolute times, which are
5 indicated at 36, these times are utilized to control a sequence
6 of displays/sounds for successive images/sounds 34. This
7 terminates when the last image is determined. Prior to the last
8 image, decision box 32 requires computer control to stay within
9 the loop formed by steps 32, 34, 36, and 30 because the answer
10 to decision box 32 will be NO as indicated. Since all computers
11 are synchronized by the timing function, the overall
12 presentation is presented by a combination of all computers.
13 Where multiple displays are provided on a single computer, then
14 there are preferably multiple instances of computer program 10
15 running simultaneously and independently. The aforesaid term
16 "multiple instance" refers to instances of copies of computer
17 program 10 being replicated for simultaneous and independent
18 execution as redundant copies in the computer system's random
19 access memory (RAM). The replication of copies of a software
20 program in RAM may be performed by the conventional and well
21 known practice of transferring of the program from a single copy
22 in the computer's magnetic disk memory into different locations
23 in the RAM. In such case scenario, file 18 contains a set of a

1 corresponding multiplicity of timing, image/sound, and other
2 playing or processing) files to operate with the respective
3 copies of the program in RAM. Alternatively, an option could be
4 provided within a single program 10 for specifying multiple
5 displays. However utilizing multiple copies of the same program
6 in RAM to enable their simultaneous and independent execution
7 has been found to be a simpler approach.

8 If the last image is displayed as indicated at decision box
9 32, then the answer to decision box 32 takes the YES route
10 whereupon the loop count is incremented as indicated at 38. If
11 the loop count is equal to the specified display loop count as
12 per step 20. Then at decision box 40, program 10 proceeds by
13 the YES route and stops the presentation at step 42. If the
14 incremented loop count is not equal to the display loop count
15 specified at step 20, then the first image is loaded into memory
16 at step 44, the timing is determined and program 10 plays each
17 scenario file as discussed above over as discussed above until
18 the incremented loop count reaches the loop count specified in
19 step 20.

20 By utilizing program 10 on each respective computer, with
21 the respective image/sound files preferably stored on each
22 respective computer, and preferably with the respective scenario
23 file stored on each computer, then precisely timed displays of

1 images on multiple display monitors connected to one or many
2 like or dislike (because as discussed above program 10 is
3 preferably written in a platform independent language) commonly
4 timed computers is now possible. This new capability allows
5 easy scripting of a variety of different realistic time
6 sequenced display images of, for example, new submarine combat
7 control system displays for concept evaluation, training, and/or
8 other purposes. Differences in image display performance make
9 it difficult or impossible to synchronize the display on dislike
10 systems without use of computer program 10 taught in accord with
11 the present invention. Computer program 10 provides a self-
12 healing timing algorithm that catches up on systems with slower
13 display performance giving the best synchronization possible.
14 Multiple instances of computer program 10 operating on multiple
15 dislike computers execute uniformly and reliably to produce a
16 unique type of presentation by using complex computer systems
17 such as computer complex 100 with up to N computers.

18 It will be understood that many additional changes in the
19 details, materials, steps and arrangement of parts, which have
20 been herein described and illustrated in order to explain the
21 nature of the invention, may be made by those skilled in the art
22 within the principle and scope of the invention as expressed in
23 the appended claims.

2

3 PRESENTATION PROGRAM AND METHOD

4

5 ABSTRACT OF THE DISCLOSURE

6 There is provided a computer software program and method
7 for simultaneously playing a programmed sequence of graphics and
8 sound files on each of a plurality of computers which may or may
9 not be networked together, which may or may not be similar
10 computers with similar clock times and processing speeds, and
11 which does not require any hardware changes to any of the
12 plurality of computers. Each computer may control a plurality
13 of different monitors and the present invention permits
14 different presentation displays (e.g., graphics) to be displayed
15 on each of the computer monitors controlled by a particular
16 computer. The present invention provides that a plurality of
17 simultaneously running software control programs simultaneously
18 supports, times, retrieves, and plays files for of the plurality
19 of computer programs to thereby utilize the plurality of
20 computers to produce a synchronized presentation.

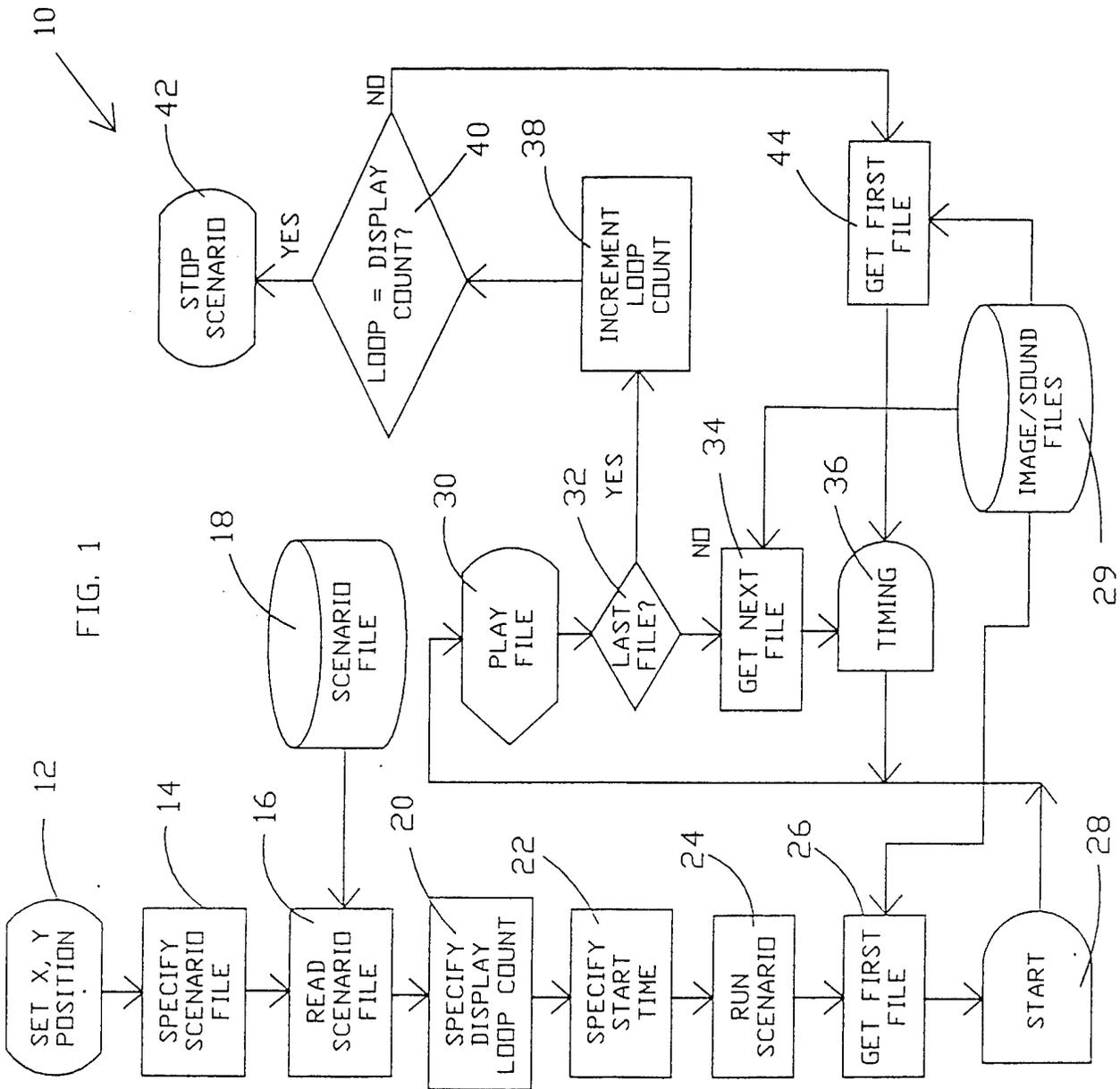


FIG. 1

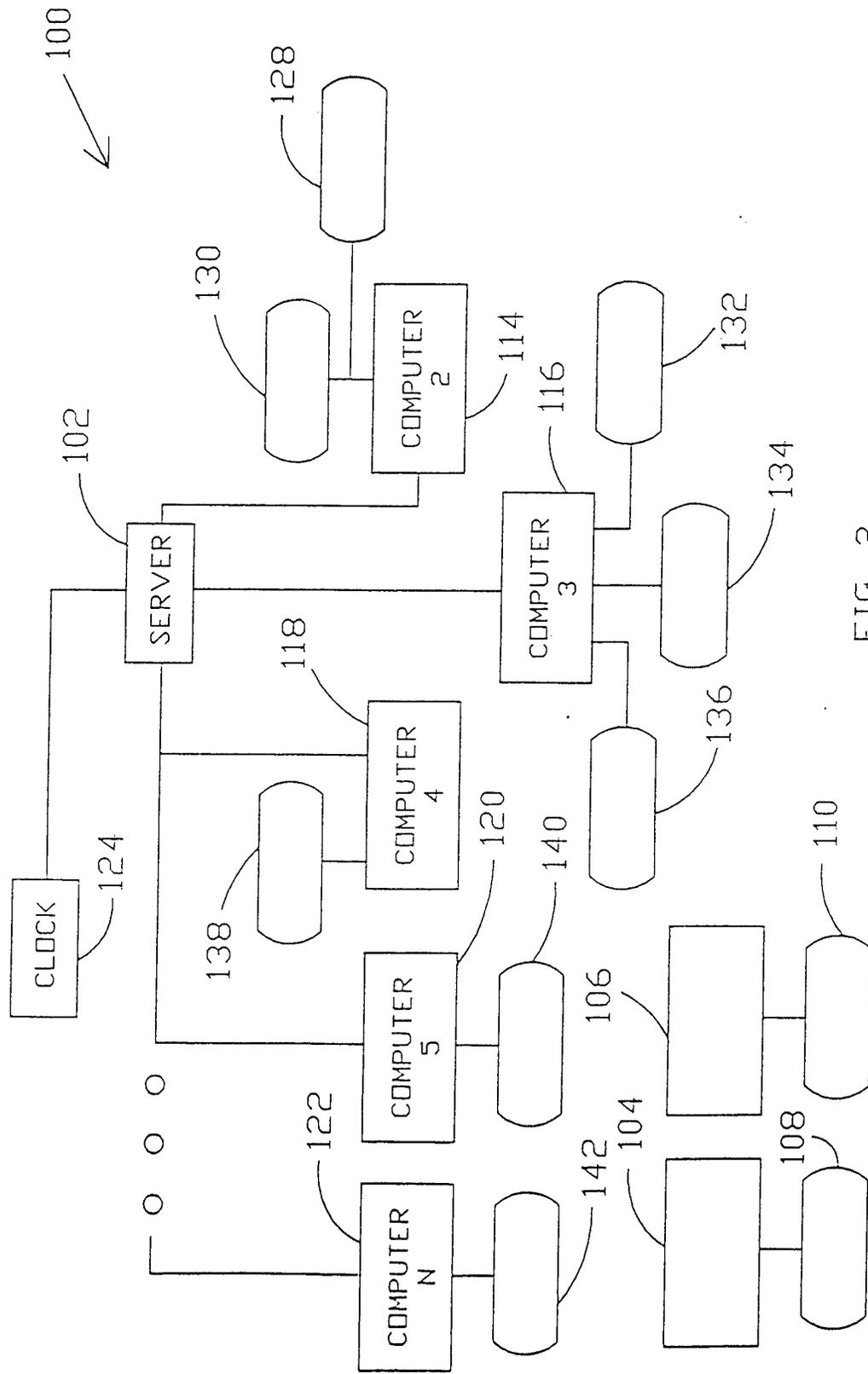


FIG. 2

0 X 2559

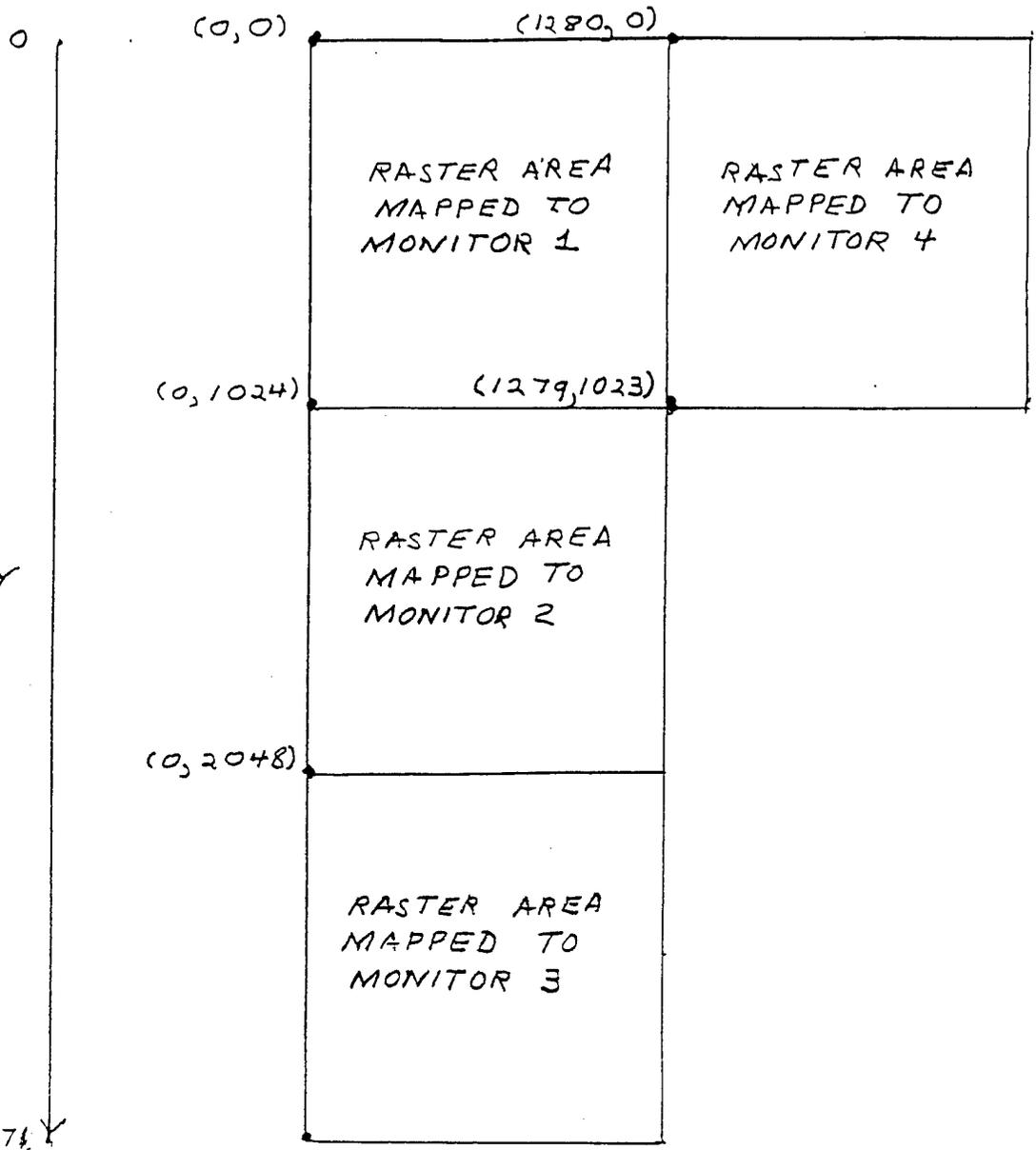


FIG. 3

500 SHEETS, FILLER 5 SQUARE
200 SHEETS, FILLER 2 SQUARE
100 SHEETS, FILLER 3 SQUARE
100 SHEETS, FILLER 4 SQUARE
200 SHEETS, EYE EASER 3 SQUARE
100 SHEETS, EYE EASER 4 SQUARE
100 RECYCLED WHITE 5 SQUARE
42-399 200 RECYCLED WHITE 5 SQUARE
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