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(54) METHOD AND STRUCTURE FOR ELECTRONICALLY TRANSMITTING A TEXT DOCUMENT AND LINKED INFORMATION

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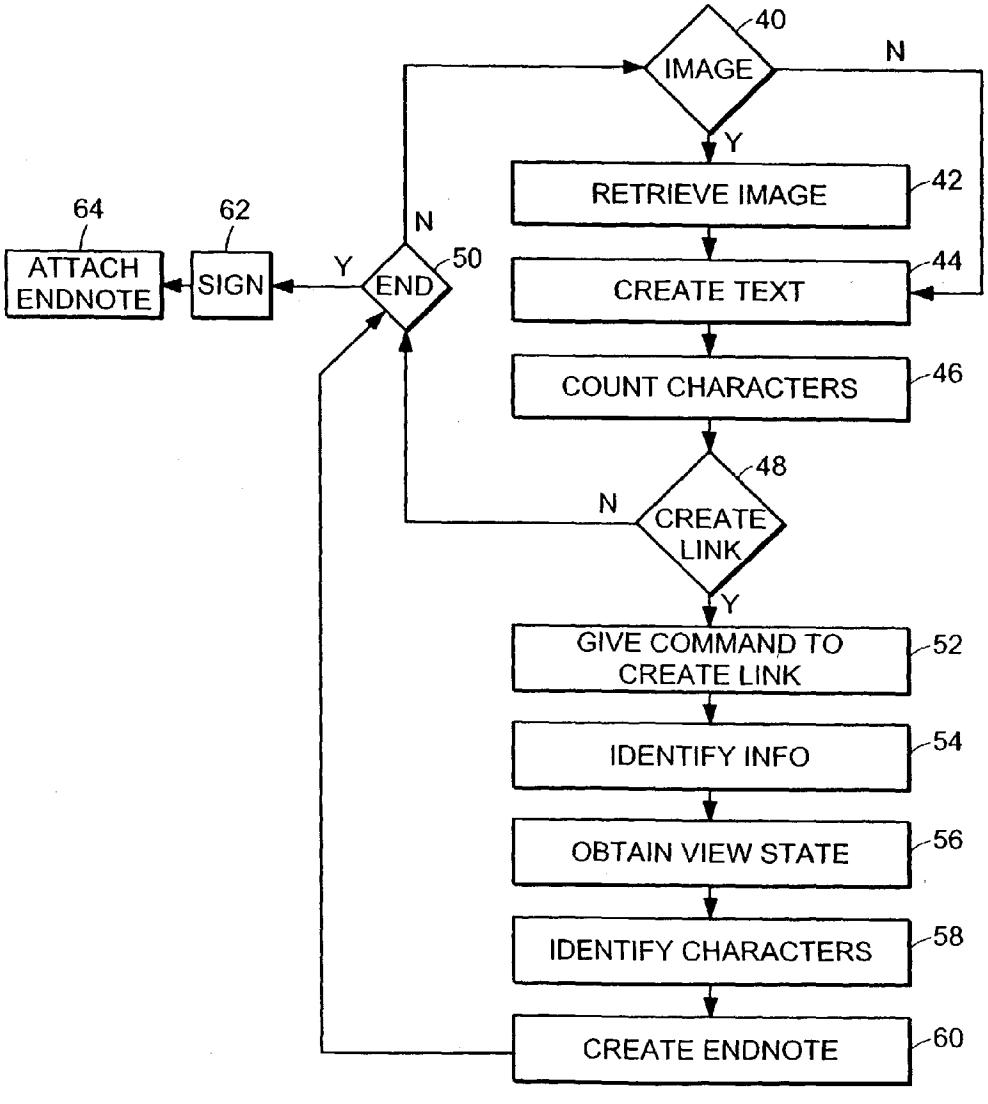
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(57) **ABSTRACT**

Method and structure for creating an electronically transmittable document having links therein which does not affect the integrity of the document as provided. The information is formatted to have a text portion, and an endnote portion, the endnote portion being independent of the text portion. The endnote portion includes link information for linking identified portions of the text with other ancillary link information.



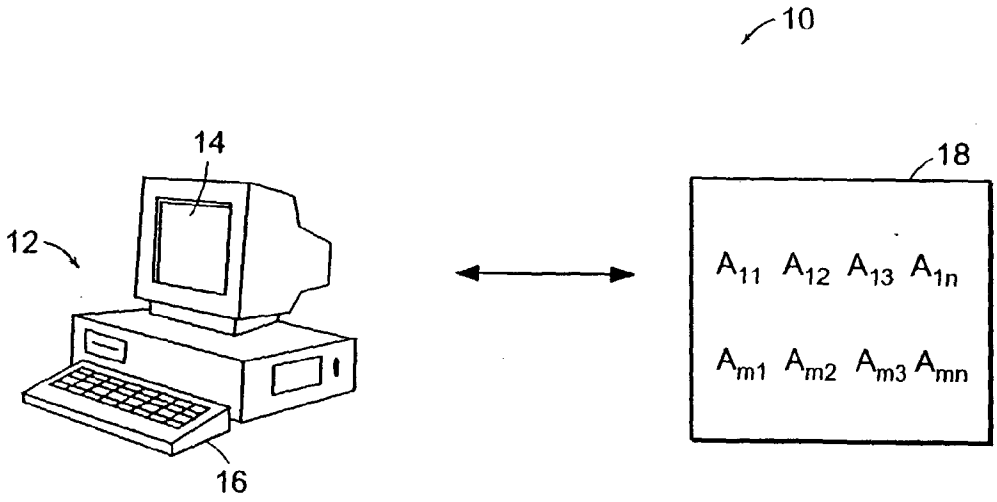


FIG. 1

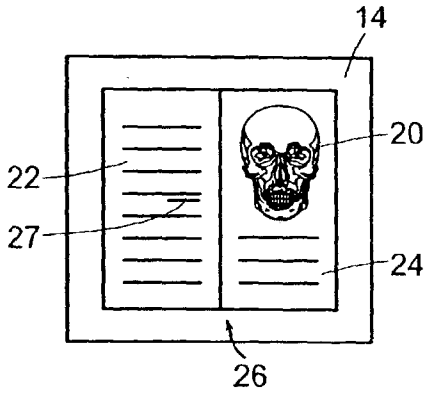


FIG. 2

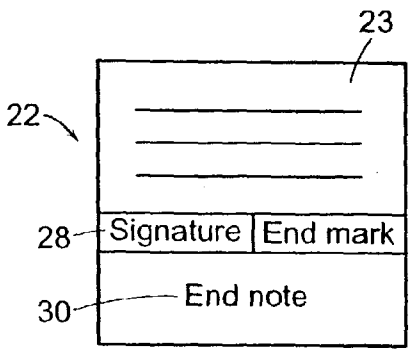


FIG. 3

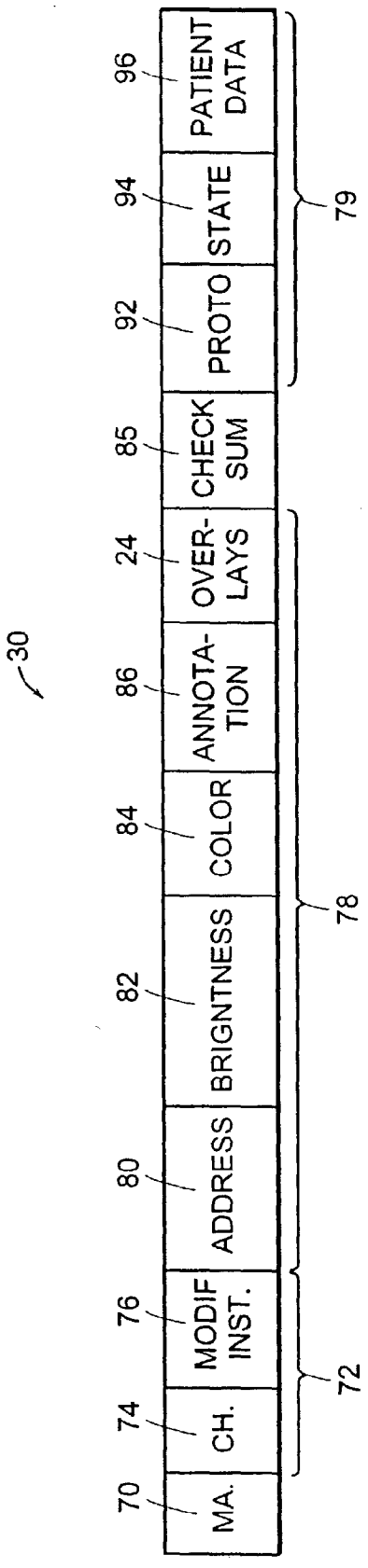

30
70
MA.
74
CH.
76
MODIF INST.
80
ADDRESS
82
BRIGNTNESS
84
COLOR
86
ANNOTA-TION
24
OVER-LAYS
85
CHECK SUM
92
PROTO
94
STATE
96
PATIENT DATA
72
78
79

FIG. 4

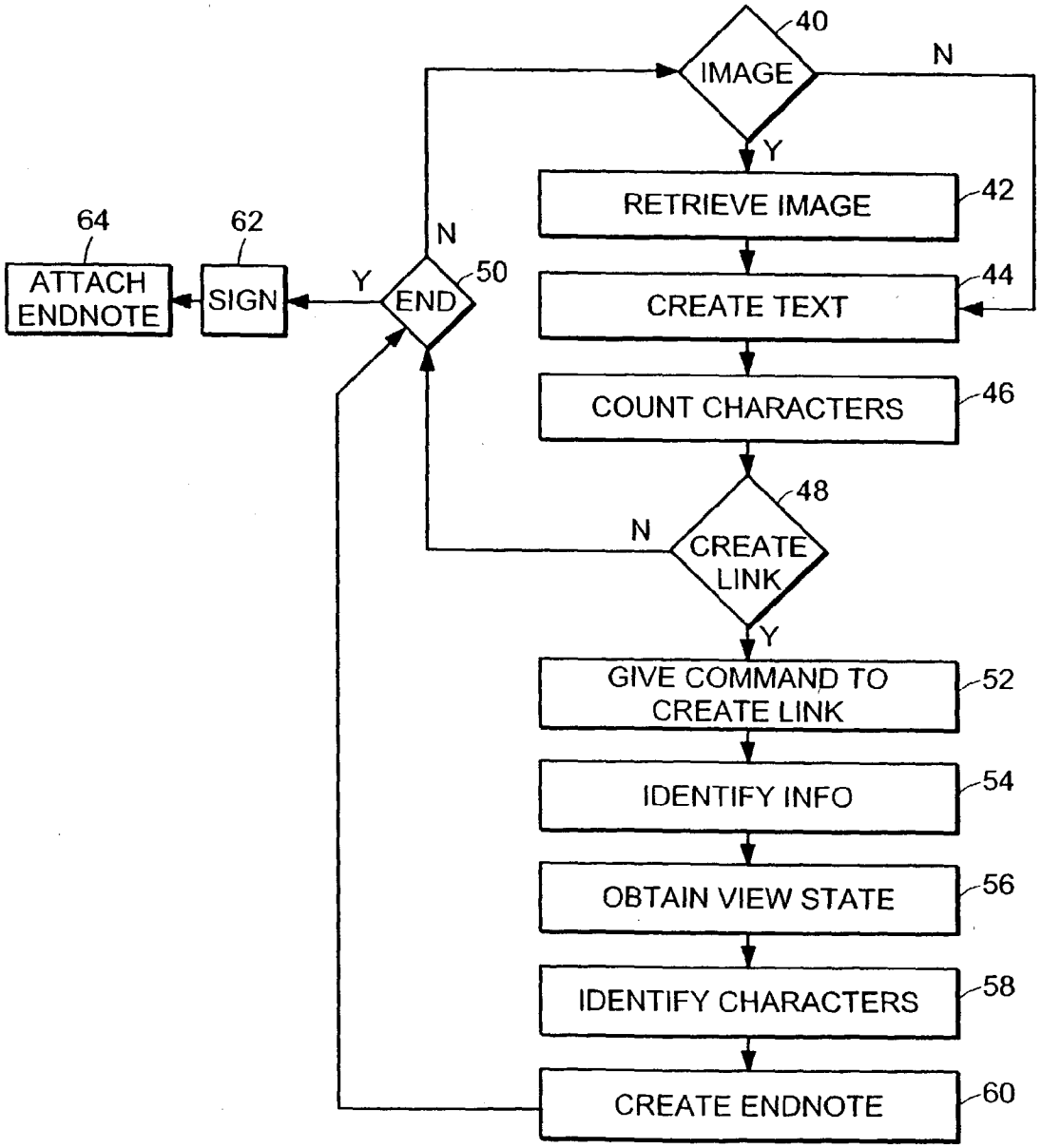

40
IMAGE
N
Y
RETRIEVE IMAGE
42
CREATE TEXT
44
COUNT CHARACTERS
46
48
CREATE LINK
N
Y
GIVE COMMAND TO CREATE LINK
52
IDENTIFY INFO
54
OBTAIN VIEW STATE
56
IDENTIFY CHARACTERS
58
CREATE ENDNOTE
60
END
50
N
Y
SIGN
62
ATTACH ENDNOTE
64

FIG. 5

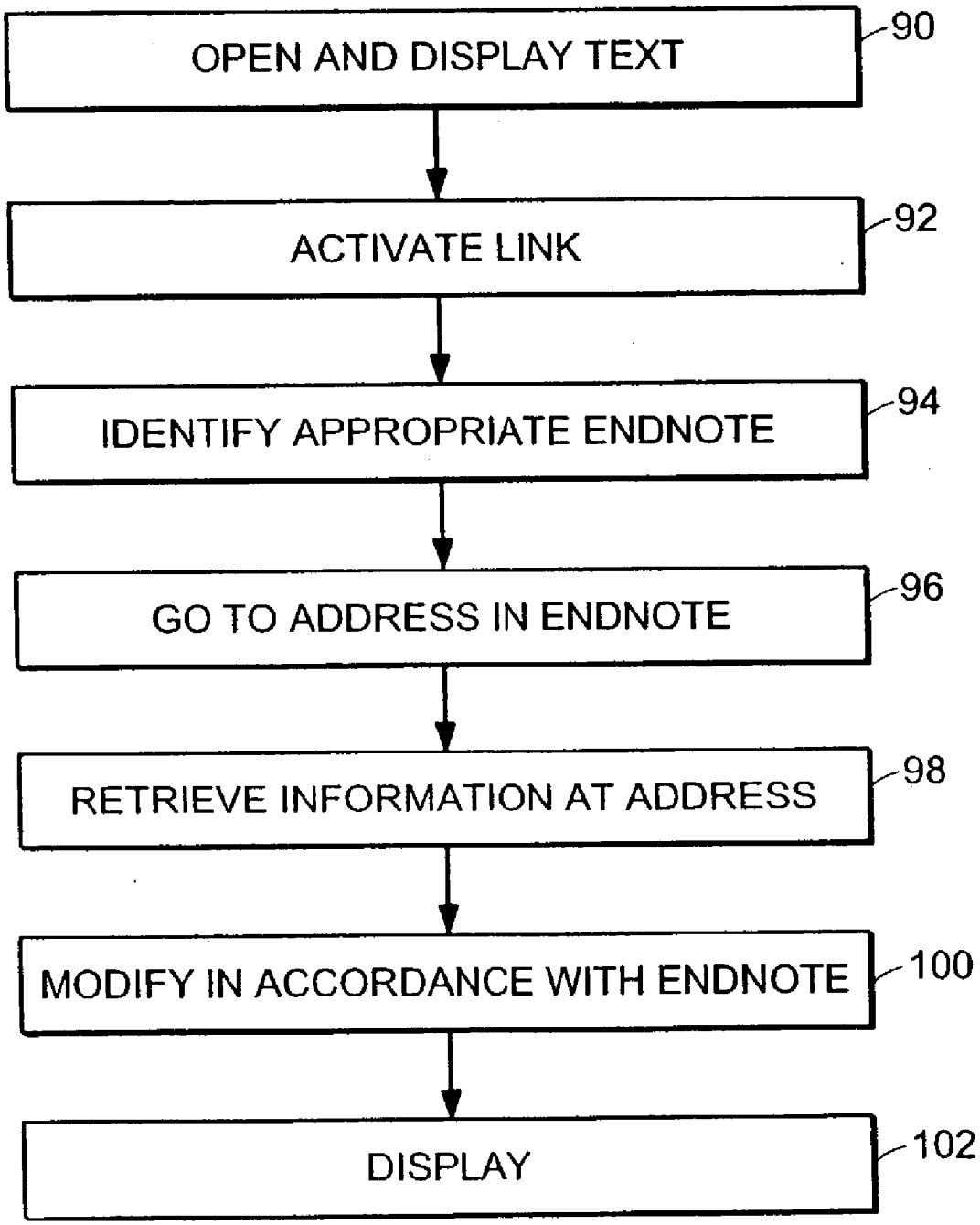

OPEN AND DISPLAY TEXT
90
ACTIVATE LINK
92
IDENTIFY APPROPRIATE ENDNOTE
94
GO TO ADDRESS IN ENDNOTE
96
RETRIEVE INFORMATION AT ADDRESS
98
MODIFY IN ACCORDANCE WITH ENDNOTE
100
DISPLAY
102

FIG. 6

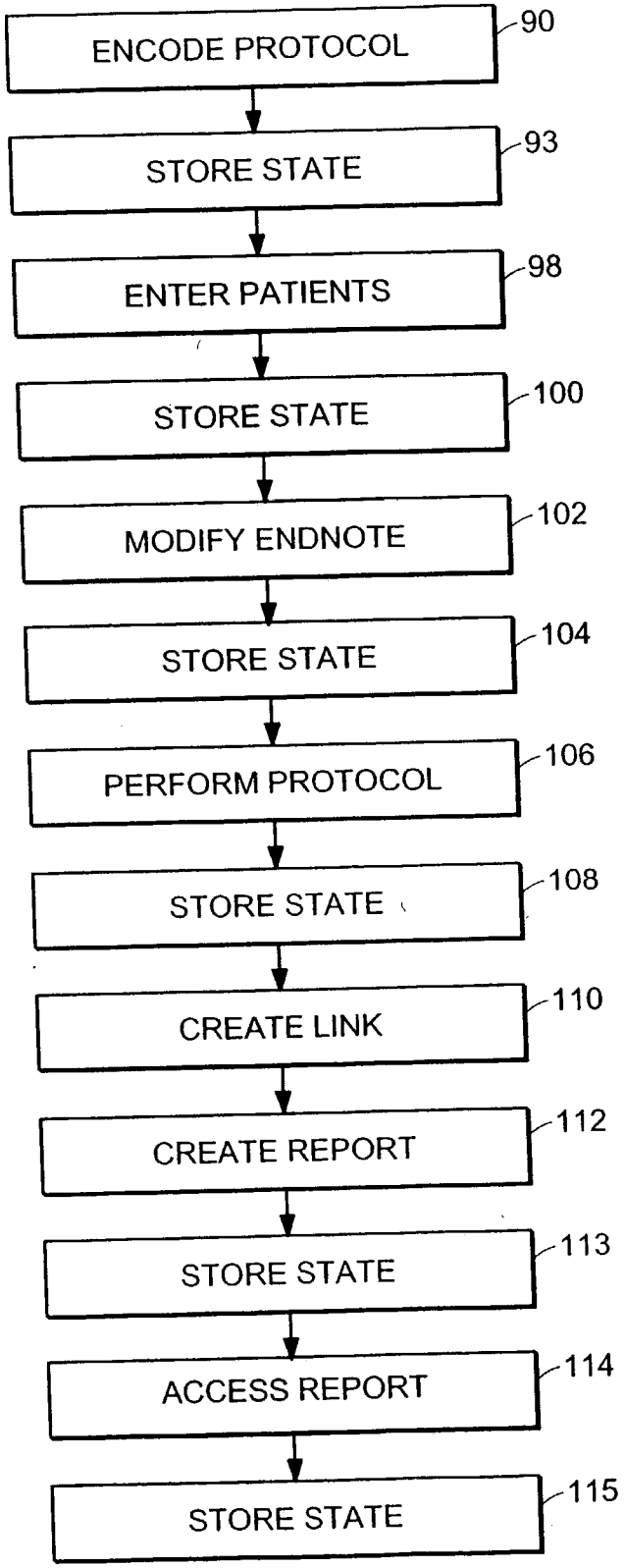

ENCODE PROTOCOL
90
STORE STATE
93
ENTER PATIENTS
98
STORE STATE
100
MODIFY ENDNOTE
102
STORE STATE
104
PERFORM PROTOCOL
106
STORE STATE
108
CREATE LINK
110
CREATE REPORT
112
STORE STATE
113
ACCESS REPORT
114
STORE STATE
115

FIG. 7

METHOD AND STRUCTURE FOR ELECTRONICALLY TRANSMITTING A TEXT DOCUMENT AND LINKED INFORMATION

BACKGROUND OF THE INVENTION

[0001] This invention is directed to a method for electronically transmitting a text document along with linked information, and in particular, for transmitting a text document with linked information without interfering with or jeopardizing the integrity of the text document.

[0002] It is known in the art to transmit text documents such as reports or other types of information as an electronic data stream to a distant terminal by way of Internet, intranet, or the like. It is also known, to provide links within the text which allow the user of the terminal to view one document and retrieve specified associated material that is either associated with or related to the portion of the document-text which contains the link.

[0003] It is often desirable to combine multiple elements into a single report. For example, written text may be combined with an illustrative image corresponding to that text, or, the text may, in fact, be describing or making comment on what is in the image. By way of example, a medical report describing the symptoms of a patient may include diagnostic images such as MRI, X-ray or the like. More generally, a report that represents interpretation of certain data such as the image or graphs or charts may include illustrative examples from the data. The example data may be included directly within the body of the report or it may be included by reference through a link. Often, these reports are what are known as signature reports, implying that the text of the report has not been tampered with. This is required so that other people making use of the report know that the report can be relied upon.

[0004] It is known to combine the illustrative image or data with the text, in effect linking the text through several methods. A first method is to embed the image directly into the text of the reports. However, such an embedding of the image in the report either requires technical know-how by the person creating the report who embeds the image into the report as they are writing it, or requires a second party to embed the image after the report has been completed. However, this brings into question the validity of the report once someone besides the author has manipulated the text to include the images. This is particularly important because any change to the report could result in misdiagnosis or mistreatment. Therefore, embedding pictures into a report after it has been prepared could result in jeopardizing the integrity of the report through inadvertent human error during the embedding process.

[0005] Furthermore, it is not always necessary that an image be present to make sense of the medical report. Therefore, embedding the image into the report may be a waste of screen space, text space, and the time of the doctor who is trying to make a quick study of the report.

[0006] To overcome these shortcomings, endnotes and web page hyperlinks (HTML) are provided to link the text to a desired address which will retrieve the required illustrative information (link information) as needed and display the link information along with the text. However, conventional endnotes in reports add markers to the body of the report and invalidate the signature. The HTML (hyperlink tags) also modify the body of the report and furthermore require HTML capable terminals in order to process the link.

[0007] Therefore, it is desired that a method be provided which allows the linking of text to illustrate data or images as desired which does not modify the text or interfere with the integrity of the text. In other words, it does not invalidate the signature for the report.

SUMMARY OF THE INVENTION

[0008] Generally speaking, in accordance with the invention, a structure and method for enabling one or more portions of a text report to be linked to ancillary information without modifying the content of the report is provided. The method includes creating text and counting characters while creating the text. At the desired point where the text is to be linked to other information, a command is given to create a link for the desired characters. The desired characters could be a word, letters or a symbol. The information to be linked is then identified. The character count for the identified portion of the text and the information to be linked, are then combined to form an endnote. When the text has been completed, the endnote is attached to the end of the document.

[0009] The endnote includes a marker indicating that an endnote exists, character identifying information which identifies the character in the text which constitutes the linked portion of the text, modification information for modifying the display of the text of those linked characters to signal that a link exists at that position in the text, as well as the address of the information to be linked. The information to be linked (link information) may either be the address of stored images and data at a repository, or maybe another related web site; or any other addressable information.

[0010] In a preferred embodiment, the process may be repeated several times to create multiple endnotes within the document. The document may also include an end of document marker such as a doctor's signature or other machine readable marker to facilitate placing of the endnote as well as further maintaining independence between the text and the endnote. Furthermore, the endnote may include a view state of an image stored in a repository, the view state including information such as the address within the repository where the image is stored, the brightness, color, and any annotations or overlays associated with the view state which may have been created in conjunction with the report or image transformation information.

[0011] Accordingly, it is an object of the invention to provide an improved method for linking text data with ancillary data without modifying the body of the text data.

[0012] Another object of the invention is providing a method for displaying both text reports and associated linked information which maintains the integrity of the report.

[0013] Yet another object of the invention is providing a method for displaying a text report and linked information which does not require special hardware or software for interpreting or storing the linkage method.

[0014] Still other objects of the invention will, in part, be obvious and will, in part, be apparent from the specification.

[0015] The invention accordingly comprises the several steps and the relation of one or more of such steps with respect to each of the others, and the apparatus embodying features of construction, combination of elements, and arrangement of parts which are adapted to affect such steps, all as exemplified in the following detailed disclosure and the scope of the invention will be indicated in the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] For a fuller understanding of the invention, reference is had to the following description in connection with the accompanying drawing, in which:

[0017] **FIG. 1** is a schematic view of a repository system which may be operated in accordance with the invention;

[0018] **FIG. 2** is a front plan view of a representative image of a display utilizing the method in accordance with the invention;

[0019] **FIG. 3** is a schematic diagram of the format of a document constructed in accordance with the invention;

[0020] **FIG. 4** is a schematic diagram of the format of an endnote constructed in accordance with the invention;

[0021] **FIG. 5** is a flow chart of a method for creating a document to be transmitted in accordance with the invention;

[0022] **FIG. 6** is a flow chart of the method for processing the document for display in accordance with the invention; and

[0023] **FIG. 7** is a flow chart of the method for creating an endnote in accordance with a second embodiment of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0024] Reference is now made to **FIGS. 1 and 2** which generally depict a system **10** for employing the method for transmitting text and linked information. System **10** includes a terminal **12** including a screen **14**, input/output keyboard **16** and a processor and scratch buffer, (not shown) as known in the art for conventional PC terminals. Terminal **12** is linked by either telephone, dedicated wire, radio or the like to a remote (off site) repository **18** of data. By way of example, repository **18** is a repository of X-ray images stored at addresses a_{11} through a_{mn} These images are digitally stored and are transmitted as electronic images to terminal **12** to be displayed. However repository **18** could easily be any addressable local memory.

[0025] Generally, when creating a report **26**, by way of example, a medical report for a radiologist, the radiologist will retrieve the desired images from repository **18** to be displayed on screen **14** as, for example, image **20** of **FIG. 2**. At the same time, the radiologist will prepare written text corresponding to the image utilizing keyboard **16** which will be displayed as text **22** on terminal **12**. Terminal **12**, utilizing the memory and the microprocessor, retains information regarding the stored image such as the address in the repository from which the image was retrieved, the brightness of the image, the color of the image, any annotations to the image which may have been made by the doctor preparing the report and any overlays which may have been added to the report such as written text **22** displayed on terminal screen **14**. As the doctor prepares their report **26**, they may pull up further images **20** corresponding to that specific portion of the report text **22** currently being created. These images **20** are again retrieved from the repository of images **18**. Once the doctor has completed the written text of the report, they place an end mark **28** such as an electronic signature on the report to indicate their approval, and to indicated that the document should not be tampered with.

[0026] In order to prevent the document from being tampered with while still maintaining the integrity of the document, the entire report **26** is treated as two separate sections. The written text **22** is treated as one element while the associated pictures **20** are treated as a second separate element; the two being linked.

[0027] Reference is now made to **FIG. 3** in which the format for the written text portion **22** of report **26** is provided. The written text **22** includes the character string **23** which includes the characters forming the words of the written text **22**. A signature **28** including an end of report mark is attached at the end of the characters **23** forming the report **26** and an endnote **30** containing information corresponding to linked portions of the text **22** is attached to the report **26** to the end of the document. When converted into an electronic bit stream, they may be serially transmitted beginning with text **22** and ending with endnote **30**. As discussed below, endnote **30** includes the information necessary to link the desired image to the appropriate portion of text **22**.

[0028] Reference is now made to **FIG. 5** in which a flow chart demonstrating the method for creating a report **26** having text **22** linked to images **20** is provided. In a first step **40**, it is determined whether or not the doctor wishes to retrieve an image from repository **18**. Assuming they are just beginning the report, they may begin by retrieving an image **20** from repository **18** utilizing electronic data retrieval methods in step **42**. The doctor would then create text **22** corresponding to that image in a step **44** although, if necessary, the doctor could return to step **42**, and retrieve a second or third image **20** prior to creating text **22**. As the doctor creates text, terminal **12** counts the characters and/or the lines of the text being typed, in effect, providing an address for each character (letter, number, symbol) within text **22** of the report **26**.

[0029] If no image is to be retrieved in step **40**, then the process moves to step **44** where text **22** is created absent an image. It is then determined whether or not a link should be created between the retrieved image of step **42** and the text of step **44** in a step **48**. If no link is to be created either because text **22** does not correspond sufficiently to retrieved image **20**, or there is no retrieved image **20**, then the process proceeds to a step **50** where it is determined whether the end of text **22** has occurred. If the end of text **22** has not occurred, then the process is returned to step **40** to determine whether or not a first image **20** or following image **20** should be retrieved.

[0030] If a link is to be created, a command is given to create a link in step **52**. This can be done by identifying the characters which are to be linked by either highlighting utilizing a mouse click technique as is known in the art, indicate the command through keystroke, or orally. The information to be linked to the text is identified in a step **54**.

This would be the corresponding image **20** in the present example. The system would then obtain the view state information presently being utilized by terminal **12** in accordance with a step **56** to display image **20** with image overlay **24** (if present) in report **26**. In a step **58**, the system determines which numbered characters, i.e., the address of the characters within text **22** correspond to the link. An endnote **30** is created in step **60** in which the character information is married to the view state information to create the endnote. The process is then returned to step **50** where it is determined whether or not the end of the text has been reached.

[**0031**] Reference is now made to **FIG. 4** in which the format for endnote **30** is provided. The endnote includes two types of information to be used by the system to link the portion of the text **22** with the desired image **20** or other ancillary information; 1) the address of the character within text **22** that corresponds to the linked image **20** as well as 2) view state information pertaining to the linked image **20**. Endnote **30** includes an endnote begin marker **70** to indicate to the terminal **12** that an endnote is present. The next characters may be text information **72** including the character address **74** within text **22** such as the line number and/or character number and modification information **76** instructing system **12** how to display text **22** to highlight the character to indicate that the character is a linked portion of text **22**; for example, to underline that portion of the text with a link identifier **27** or to change the colors of those characters to indicate to a user at terminal **12** that the text is, in fact, a link.

[**0032**] Endnote **30** includes a view state portion **78** which includes a repository address **80** for the linked information, and may include a brightness control command **82** and color command **84** to instruct terminal **12** how to display image **20**. The view state information could also be image transformation information such as magnification, subrectangle or the like. Furthermore, view state **78** may include annotations **86** made during the creation of the report or the overlays **24** to be placed on image **20**. With this information, terminal **12** can determine the location of the link within text **22** as well as the information required to pull up the image associated with that link if the link is, in fact, activated. Lastly, endnote **30** includes a check sum **85** to confirm the completeness and accuracy of the endnote as well as to indicate the end of endnote **30**.

[**0033**] Once endnote **30** is created in step **60**, it is then determined whether or not text **22** is complete in step **50**. If text **22** is not complete, it is then determined in step **40** whether an additional image **20** is to be retrieved and, if not, further text **22** created in step **44** and the process is repeated. If it is the end of the written text **22** then an end of document mark **28** such as a signature is applied to indicate the end of the document in a step **62** and the previously created endnotes are attached to the document **26** after the signature in a step **64**.

[**0034**] It is preferable that an end mark be provided to separate the endnotes from the text and to indicate to the terminal as well as the user that the text portion has been completely transmitted. However, the same function can be performed by an endnote presence indicator such as endnote begin marker **70**, located in each endnote. Because the text is independent of the endnotes, an endnote indicator can also signal to the terminal that text is complete and processing of the endnotes should begin as discussed in detail below.

[**0035**] Once the report has been prepared including the signature and the endnotes, it can also be stored in a repository such as repository **18**, a separate report repository (not shown) or in the memory of terminal **12** for later recall and used either by the same doctor or by other persons requiring the information contained in the report in a step **90**. To retrieve the report, one would open and display text **22** as retrieved from its storage area. The document is read line by line into a temporary memory at terminal **12** as text until the signature or end of report indicator is read. When this data is encountered, the reading mode is changed from one of downloading text **22** to one of operating on the endnote information. As a result, each line of text is then processed as a separate data structure.

[**0036**] In a preferred embodiment, endnote **30** in its entirety, or merely components thereof, such as view state **78** are in XML language. It is also contemplated that rather than providing view state data **80** through **86**, the address **80** of view state **78** could correspond to a web site which is called up in conjunction with the data being read from the report **26**. The text **22** in the buffer is then operated upon, for example, by being inserted into a Java Swing document to modify the text in accordance with the instructions **76** stored in endnote **30** to indicate where links exist in the text **22**. For example, the text is inserted using standard text attributes and when the text is encountered, it must be displayed as modified. The modifications, such as changing color or underline, are inserted within the text as displayed, not within text **22** itself.

[**0037**] Once text **22** is presented this way, the link is activated through methods known in the art such as a mouse click highlight on screen **14** of terminal **12** or the like in a step **92**. The system then identifies the appropriate endnote **30** corresponding to those identified characters by matching the character address data **74** with the position within text **22** that has been activated in step **94**. The system then searches for the address **80** contained within the endnote in accordance with a step **96** and retrieves the information stored by way of example in repository **18**, at that address in accordance with a step **98**. The image is then modified in accordance with the information **82**, **84**, **86** and **24** in accordance with a step **100** and is displayed as modified in accordance with step **102**.

[**0038**] If terminal **12** cannot understand endnote **30** and/or end off text marker **28**, then the report will be displayed as shown in **FIG. 3** and link identifier **27** will not be shown. However, if terminal **12** does understand endnote **30** and can operate in accordance therewith the report **26** will be displayed as shown in **FIG. 2** if a link **27** is selected to be activated by the user. The above explanation was provided in connection with a medical report and associated medical diagnostic images. However, the method works equally well with graphs, or any other associated data which could be linked in the same way images **20** are linked, the main difference being that a view state data would now correspond to manipulation and presentation of other ancillary data. Furthermore, the address link could be to a web site of associated data. Lastly, the example was given by way of a dedicated repository of information linked to a terminal. It

should be understood that the repository and terminal can be linked as an Internet link, an intranet link, a dedicated line, or wireless transmission.

[0039] By providing the report which is formatted to include an endnote which contains information for linking a portion of the text to other information such as an image, a linked report is provided which is compatible with a legacy transcription system in which hyperlinks can be added to a report after the report is transcribed and signed using existing systems that are not hyperlink aware. Furthermore, it allows the use of preexisting data repositories without the requirement for special equipment. Lastly, even systems that do not interpret the commands of the hyperlink endnote will be able to display text **22** of report **26** without error because the hyperlink information is contained outside of text **22**, not within it. The hyperlink endnote may be visible, but it will be visible after the original signature and end of report marks.

[0040] As discussed, endnotes formatted as described lend themselves to drafting reports which must be unaltered by their very nature once they have been completed. Such reports form part of a patient's medical records. The medical record is usually the case overview for a patient which includes associated reports, status, and logs describing the procedures, treatments, tests, and doctors' comments for a particular patient.

[0041] As medicine is now practiced, the medical report can be thought of as a plurality of protocols and procedures, each protocol and/or procedure having definite steps, or tasks, each task being capable of being performed by different individuals and most likely encouraged to be performed by different individuals. A procedure may have more than one protocol. Any protocol which can be broken up into a plurality of steps can be considered to have a workflow, the workflow being the totality of the steps required to perform a protocol. For example, the steps outlined in connection with **FIG. 5** as described above may be considered the definitive steps for the protocol of writing a report containing image data, the workflow being each of the steps from the initial writing of the text or retrieval of data through to the signature and attachment of endnotes. In such a protocol, each of the steps is performed by a single person, that being the commenting doctor. However, the procedures that made the report doable, such as the making of the X-ray images, would be a separate protocol of the overall procedure for diagnosing a patient and could include several steps such as ordering the X-rays to be taken, scheduling the taking of the X-rays, the actual taking of the X-rays, and the development of the X-rays. This protocol includes steps performed by distinct individuals including maybe one doctor and several technicians. Each discrete step is a state within the workflow and can be considered the Workflow State. The endnote described above in creating the report lends itself to tracking the workflow state of a protocol within a procedure.

[0042] Reference is now made to **FIG. 7** in which a flow chart for utilizing the endnote for tracking the workflow state is provided. An originator of a procedure for treating a patient's condition may publish the procedure as a generic template including several protocols to be performed prior to final treatment. Among each of these protocols may be the preparing of several reports like report **26** described above. The template, published as a web page, may consist of words and images describing the protocols and diagnostic tests associated with the particular treatment. Each of these protocols, for example, will result in a report. The originator of the procedure would also create a generic endnote having a workflow state portion **79** (which may also be in XML language) which will store the protocol and workflow associated with the preparation of the report in generic format to which later patient information can be applied. In a step **90** a protocol for the procedure and the workflow are encoded in the endnote. The inclusion of workflow state portion **79** is only required when tracking work state. The example given with references to FIGS. **1-5** above can obviously be accomplished without a workflow portion **79**.

[0043] In effect, endnote **30** exists as a shell even though there is no report **26** associated therewith. At this stage, endnote **30** is merely a file on a web site. By way of example, the creating of the template and the creating of the endnote shell may be, in fact, the first two states of the protocol workflow. Therefore, to keep track of the state, the number **2** or the word "endnote" may be stored in a workflow state indicator **94** of endnote **30** in a step **93**.

[0044] A physician, wishing to make use of the procedure and its protocols may copy the work state for the procedure along with one or more associated templates for creating reports from the web site. The physician would then enter the patient name and other information into the endnote **30** in a patient data portion **96** in a step **98**. This is the third step in the protocol and the physician, either manually or automatically, enters either the number **3** in state indicator **94** or the term "patient data" which alerts all users of the endnote of the state of the workflow. This state is stored in a step **100**. The physician then may, either manually or automatically, alert the various department that would perform the protocols for a particular procedure.

[0045] By way of example, in the next state of the workflow, someone may schedule a diagnostic protocol and modify endnote **30** in a step **102** and changes the state stored in state indicator **94** by either providing the word "schedule" or an incremented number in state indicator **94** in accordance with a step **104**. The protocol is then performed, in this case a diagnostic protocol, to obtain the raw data which is stored in repository **18** by way of example in a step **106**. Again, the state stored in state indicator **94** is incremented to reflect the completion of this workflow state in a step **108**. At this stage, endnote **30** may be modified to contain links to the created data in repository **18** by way of example or a web site as stored in address **80** in a step **110**.

[0046] In a step **112** a report is created as described above in connection with creating report **26**. Generally, a physician opens the report which still contains only an endnote **30** having workflow state information **79**. This would correspond to a new state which would be stored in state indicator **94**. Then, the doctor would either dictate report **26** or call up the raw data such as the images **20** stored in repository **18** which would correspond to another state along the workflow requiring increment again of the state stored in state indicator **94**. The report is then transcribed to form text **23** again incrementing the state stored in indicator **94** and a signature **28** may be added and endnote **30** is modified to add the address information **72** and view state information **78** as described above. Once the report is completed, the workflow state portion is again incremented to reflect the work state in step **113**.

[0047] Another physician such as the primary care practitioner or another specialist may access the medical record through the endnote which would include the link to report **26** as well as the workflow state stored in indicator **94** as well as the protocols which have been performed in a step **114**. Furthermore, the medical record would include a plurality of these reports if necessary. As the physician makes use of the report, this may also be a step within the procedure or protocol and therefore the workflow state indicator **94** is incremented again in a step **115** by changing the number value or storing the term "reviewed".

[0048] The report structure allows the addition of information to a report incrementally while remaining compatible with existing report repository and display means. By appending this information (for example, Workflow State, Image Link, Annotation and Digital Signature components) in plain text to the end of the plain text report, compatibility is maintained with the existing report repository, transmission and even display (including paper display). However, when the display is aware of the endnote format, it enables a number of enhancements and manipulations of the information associated with the report. The principal economic value of this invention is that it enables many features and benefits of Internet networks to be added to existing hospital and departmental information systems without the delay and expense of replacing major components of these systems. A further benefit of the invention is that report templates can be developed (by doctors, managed care organizations and pharmaceutical companies) and freely intermixed in the same formal information repositories. The different reports can carry vastly different protocols and might, in a preferred embodiment put this information in XML format.

[0049] By providing an endnote which can be used in connection with the report which forms part of a medical record, it is possible to create an electronic medical record including records of past procedures, protocols and logs. As a result, medical records linking a plurality of reports, protocols and procedures can be electronically stored, linked and accessed.

[0050] It will thus be seen that the objects set forth above, among those made apparent from the preceding description are efficiently attained and, since certain changes may be made in carrying out the above method and the construction set forth without departing from the spirit and scope of the invention, it is intended that all matter contained in the above description and shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

[0051] It is also to be understood that the following claims are intended to cover all of the generic and specific structures of the invention herein described and all statements of the scope of the invention which, as a matter of language, might be said to fall there between.

What is claimed is:

1. A format for a linked report electronically transmittable to a terminal, the report format comprising a text section, and an endnote section, the endnote section being independent of the text section and including information for linking portions of text contained in the text section to predetermined link information.

2. The format of claim 1, wherein said link information includes an image.

3. The format of claim 1, wherein said endnote section comprises at least one endnote, said endnote including character information for identifying the address within the text which is to be linked and view state information, the view state information further including at least a link information address corresponding to the address from which the link information can be retrieved.

4. The format of claim 3, wherein said view state information also includes image brightness information, image color information, annotations to an image, image overlay and transformations.

5. The format of claim 3, wherein said view state information includes an external web site address.

6. The format of claim 3, wherein said link information address includes the address within a repository of stored images for a predetermined image.

7. The format of claim 1, wherein said endnote section includes a plurality of endnotes.

8. The format of claim 3, wherein said view state information is in extensible mark up language.

9. The format of claim 3, wherein said endnote includes a check sum.

10. The format of claim 3, wherein said endnote includes a workflow state information portion.

11. The format of claim 1, further comprising an end marker, said end mark being a signature.

12. A method for creating a linked report which is electronically transmittable through a terminal comprising the steps of:

creating the text for a report;

retrieving link information to be displayed along with the text in association with a predetermined portion of the text;

creating an independent endnote containing information sufficient to link said predetermined text portion and link information; and

attaching the endnote to the report after the text.

13. The method of claim 12, further comprising the step of counting at least the characters within the text to obtain a character address for each character within the text;

the link information including an image, obtaining view state information for said image, the view state information including at least a link information address corresponding to the address from which the link information can be retrieved;

said endnote including the character address of the predetermined portion and the link information address.

14. The method of claim 13, wherein said endnote further includes image brightness information, image color information, image annotations, and image overlay.

15. The method of claim 12, wherein said endnote includes text modification instructions for modifying the display of the predetermined portion of the text to indicate that characters contained in the predetermined portions are linked.

16. The method of claim 12, wherein the link information includes an image.

17. The method of claim 11, further comprising the step of providing an end of text marker after the text and attaching the endnote to the report after the end of the text marker.

18. The method of claim 17, wherein the end of text marker is a signature.

19. A method for reading a report electronically receivable at a terminal, the report including a text section, and an endnote section; the endnote section being independent of the text section and signature section and including information for linking predetermined portions of the text to predetermined link information comprising the steps of:

opening and displaying the text at a terminal;

activating the link;

identifying the appropriate endnote corresponding to the activated link;

retrieving link information at an address in accordance with information included in the endnote;

and displaying said retrieved link information.

20. The method of the claim 19, wherein said endnote includes instructions for modifying the display of the text to indicate the portion of the text to be linked; and further comprising the step of modifying the display of the text in accordance with the instructions.

21. The method of claim 19, further comprising the step of retrieving said link information from a repository.

22. The method of claim 19, wherein said link information is a web site.

23. The method of claim 19, further comprising the steps of providing an end marker at the end of the text section and reading the text portion line by line into a temporary memory as text until the signature is read, and operating on the endnote operation so that each line of text is processed as a separate data structure.

24. The method of claim 23, further comprising the step of operating upon each line of text by inserting said line of text into a Java Swing document, and modifying the text in accordance with the instructions stored in the endnote to indicate where links exist.

25. The method of claim 19, further comprising the steps of providing an end marker at the end of the text section and reading the text portion character by character into a temporary memory as text until the signature is read, and operating on the endnote operation so that each line of text is processed as a separate data structure.

26. A method for creating a report based upon a protocol including the steps of:

creating an endnote having a workflow state portion and encoding the protocol in said workflow state portion;

the endnote including a work state indicator, and storing a workflow state in the work state indicator; and;

performing a step in the protocol and changing the workflow state value stored in said workflow state indicator to indicate the performed step has been completed.

27. The method of claim 26, further comprising the steps of modifying the endnote to contain data for identifying a patient to which the protocol is to be performed;

increase the workflow state value stored in the workflow state indicator;

modify the endnote to include specific protocol steps;

increment the workflow state value stored in the workflow state portion to indicate modification of the endnote;

perform the protocol; and

increment the workflow state value stored in the workflow state indicator to indicate performance of the protocol;

28. The method of claim 27, further comprising the steps of creating a link to results of the performed protocol;

increment the workflow state value in the workflow state indicator to indicate the creation of the link;

create a report by modifying the endnote to include link and report address information; and

incrementing the workflow state value in the workflow state indicator.

29. The method of claim 28, wherein the report includes text further comprising the step of creating the text;

counting at least the characters within the text to obtain a character address for each character within the text;

obtaining view state information for said image, the view state information including at least a link information address corresponding to the address from which the results of the performed protocol can be retrieved; and

said endnote including the character address of a predetermined portion of the text and the link information address.

30. The method of claim 29, wherein said endnote further includes image brightness information, image color information, image annotations, and image overlay.

31. The method of claim 29, wherein said endnote includes text modification instructions for modifying the display of the predetermined portion of the text to indicate that characters contained in the predetermined portions are linked.

32. The method of claim 29, wherein the results of the performed protocol include an image.

33. The method of claim 29, further comprising the step of providing an end of text marker after the text and attaching the endnote to the report after the end of the text marker.

34. The method of claim 33, wherein the end of text marker is a signature.

35. A format for an endnote for use with a linked report electronically transmittable to a terminal, the endnote comprising:

a character information portion for containing information for identifying the address within text of the report to be linked with ancillary information;

view state information directed to the view state of the ancillary information; and

a workflow state information portion for containing workflow state information.

36. The format for an endnote of claim 35, wherein the work state information portion includes a work state indicator for storing a workflow state therein.

37. The format of claim 35, wherein the view state information portion includes at least a link information address corresponding to the address from which the ancillary information can be retrieved.

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