US 20040163042A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2004/0163042 A1

Altman (43) Pub. Date: Aug. 19, 2004

(54) METHOD AND SYSTEM FOR ANNOTATING DOCUMENTS USING AN INDEPENDENT ANNOTATION REPOSITORY

(75) Inventor: **Ian K. Altman**, Potomac, MD (US)

Correspondence Address:
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314 (US)

(73) Assignee: **ITM ASSOCIATES**, McLean, VA (US)

(21) Appl. No.: **10/778,043**

(22) Filed: **Feb. 17, 2004**

Related U.S. Application Data

(63) Continuation of application No. 09/575,712, filed on Jul. 26, 2000, now Pat. No. 6,721,921.

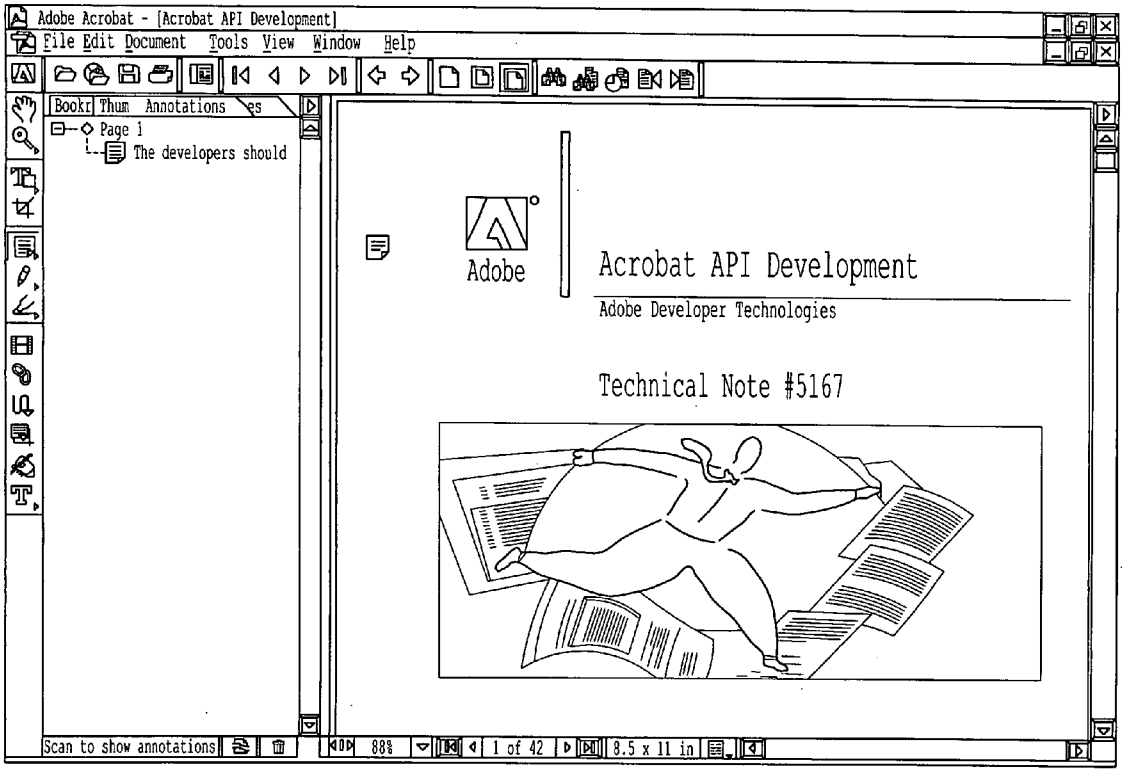
Publication Classification

(51) **Int. Cl.**[7] **G06F 15/00**

(52) **U.S. Cl.** **715/512**

(57) **ABSTRACT**

A method and system for generating workflow messages based on adding annotations to a file repository or database independent of an original document that they annotate. By separately storing the annotations in a searchable annotation repository, original documents can be preserved unchanged while still providing the ability to comment on the original document. By generating workflow messages, a system can track who has reviewed a document, whose proposed changes and/or comments require action by another person, and if everyone has reviewed the documents within the time constraints established.



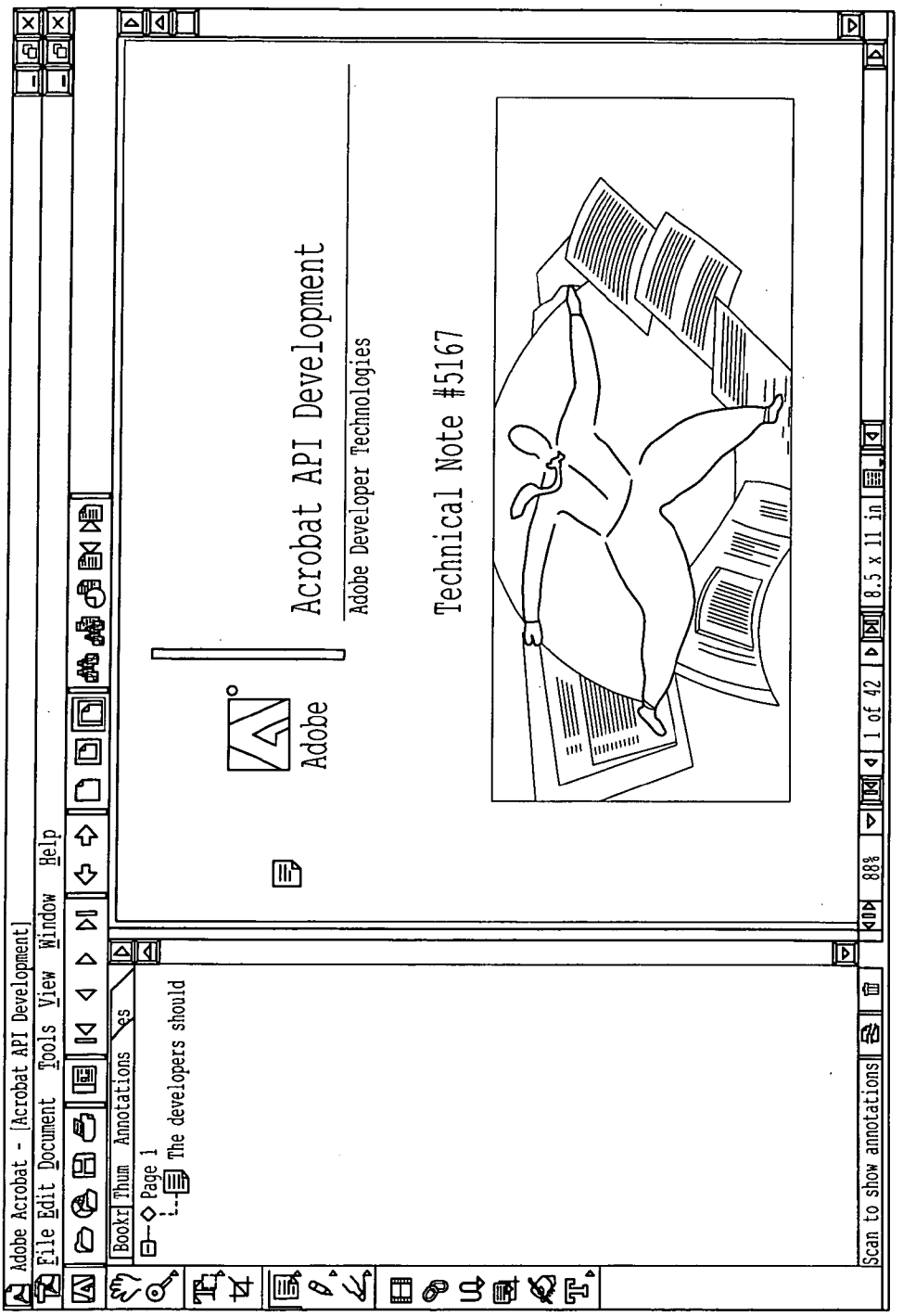

Adobe Acrobat - [Acrobat API Development]
File Edit Document Tools View Window Help
Bookr Thum Annotations
Page 1
The developers should
Adobe
Acrobat API Development
Adobe Developer Technologies
Technical Note #5167
88%
1 of 42
8.5 x 11 in
Scan to show annotations

FIG. 1

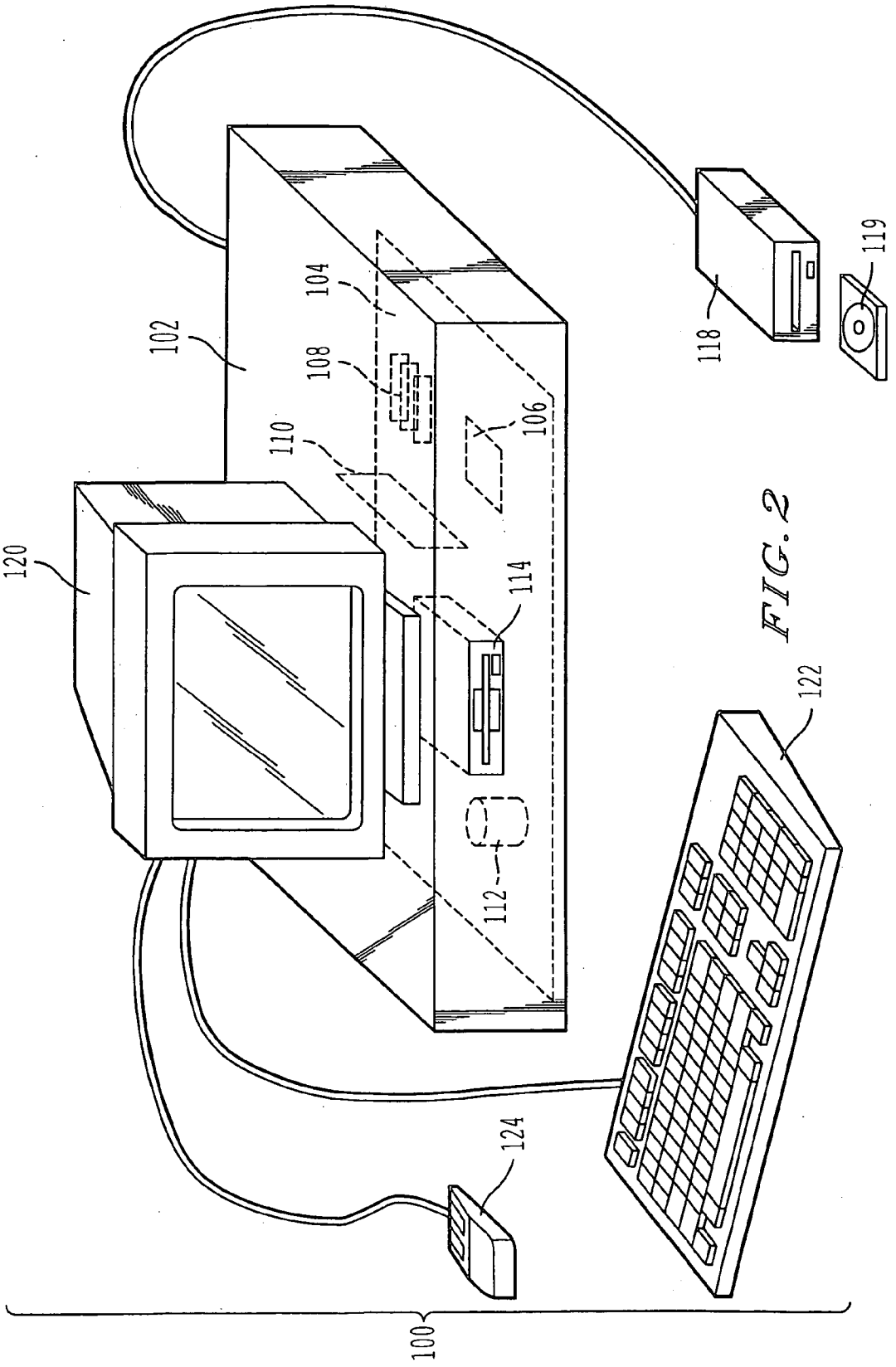


FIG. 2

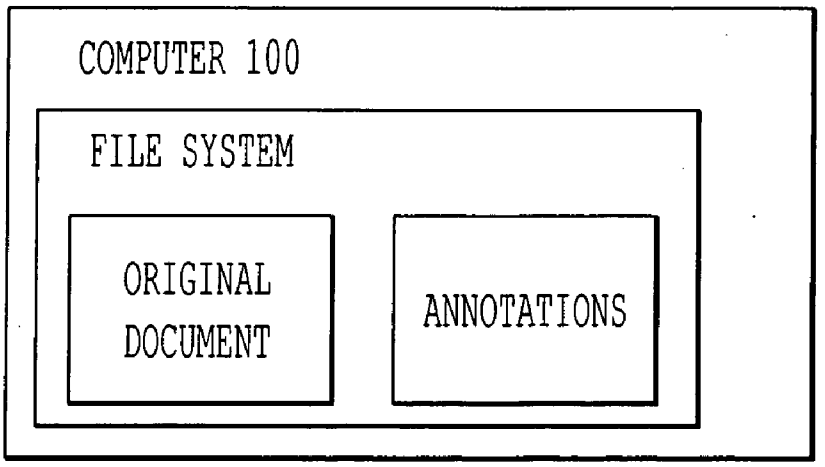

COMPUTER 100
FILE SYSTEM
ORIGINAL DOCUMENT
ANNOTATIONS

FIG. 3A

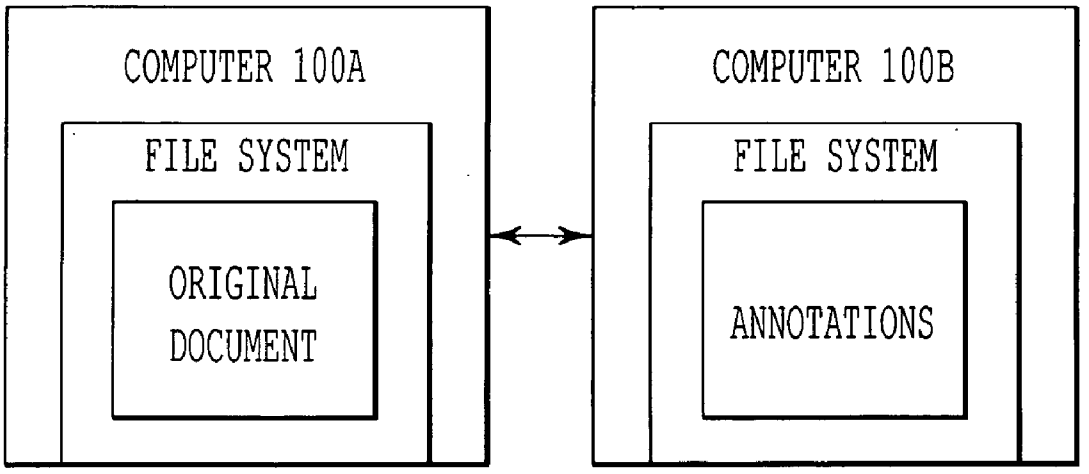

COMPUTER 100A
FILE SYSTEM
ORIGINAL DOCUMENT
COMPUTER 100B
FILE SYSTEM
ANNOTATIONS

FIG. 3B

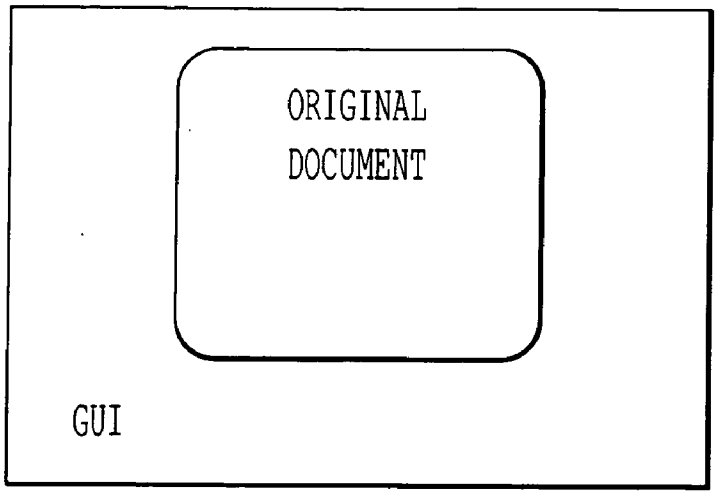


FIG. 4A

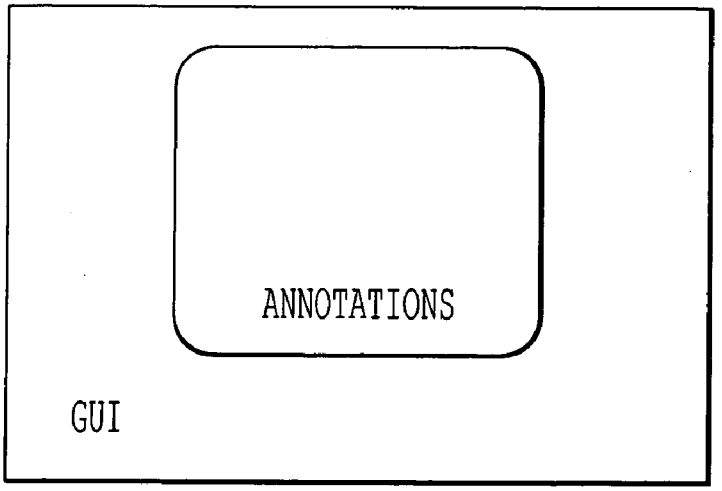


FIG. 4B

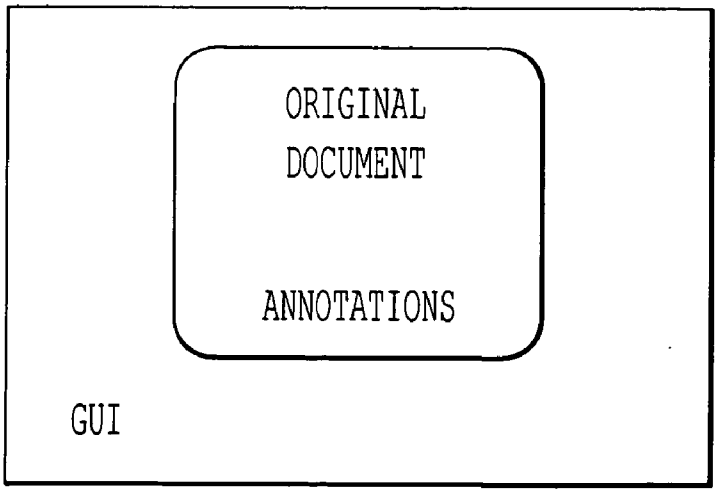


FIG. 4C

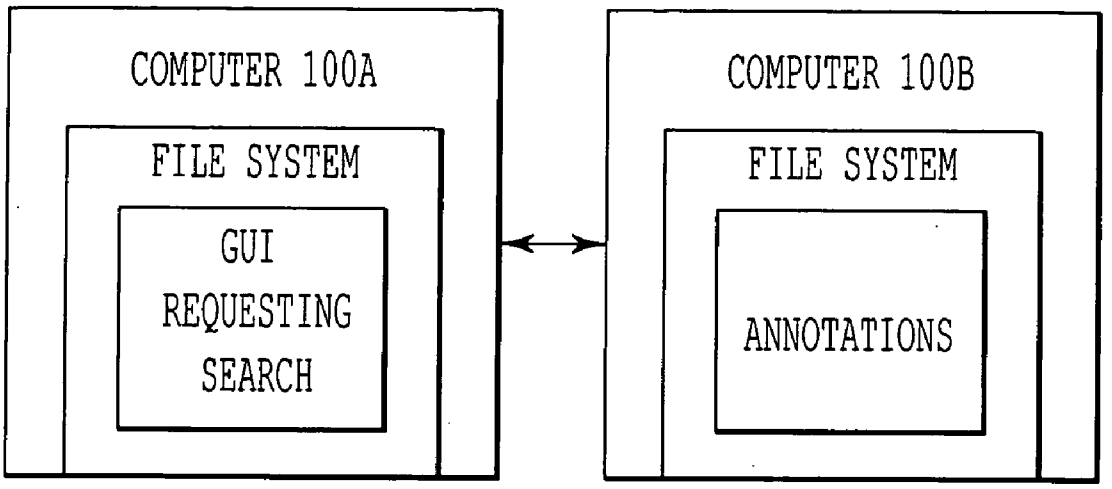

COMPUTER 100A
FILE SYSTEM
GUI
REQUESTING
SEARCH
COMPUTER 100B
FILE SYSTEM
ANNOTATIONS

FIG. 5

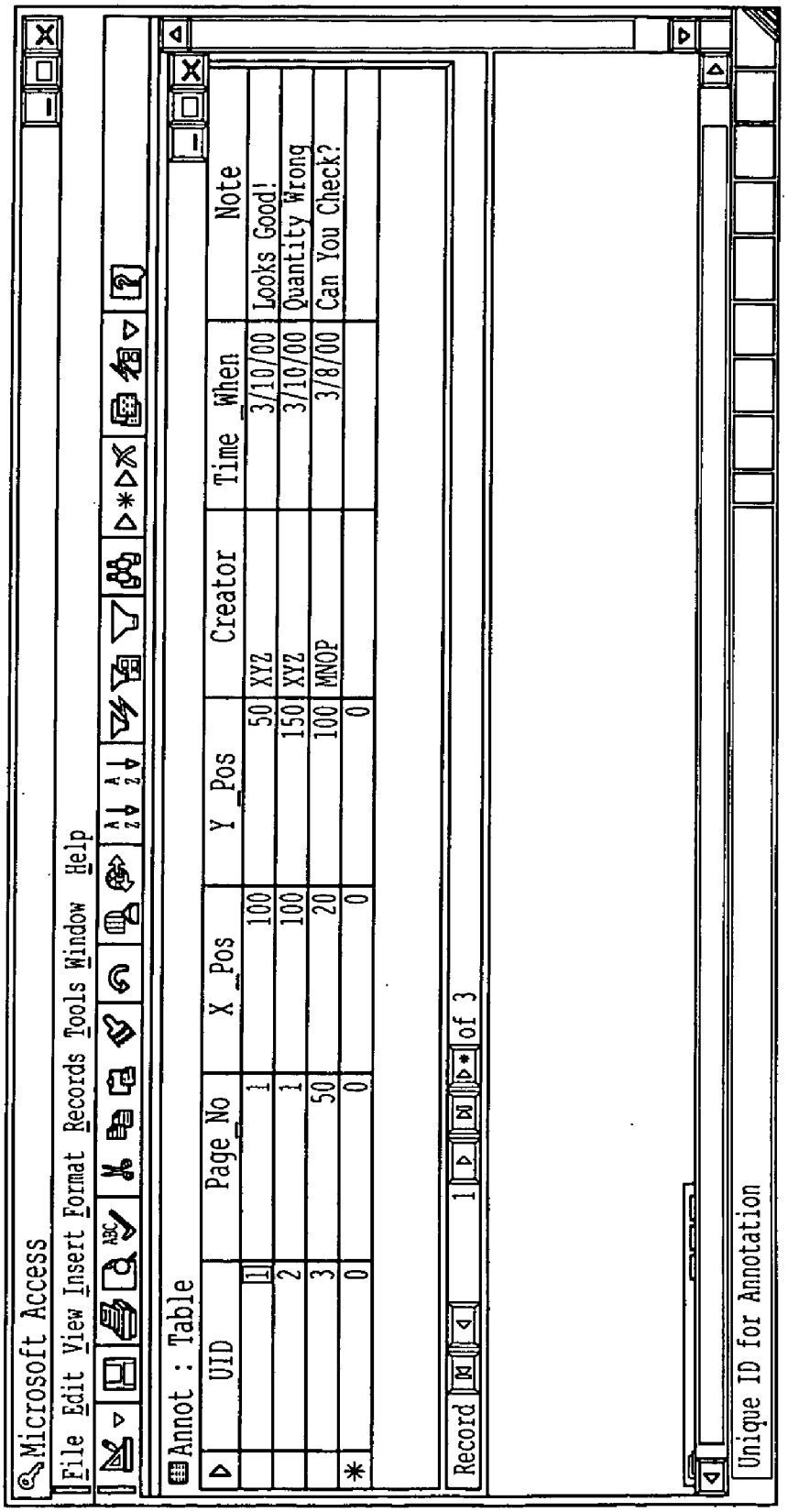

Microsoft Access
File Edit View Insert Format Records Tools Window Help
Annot : Table
UID
Page No
X_Pos
Y_Pos
Creator
Time_When
Note
1
1
100
50
XYZ
3/10/00
Looks Good!
2
1
100
150
XYZ
3/10/00
Quantity Wrong
3
50
20
100
MNOP
3/8/00
Can You Check?
0
0
0
0
Record 1 of 3
Unique ID for Annotation

FIG. 6

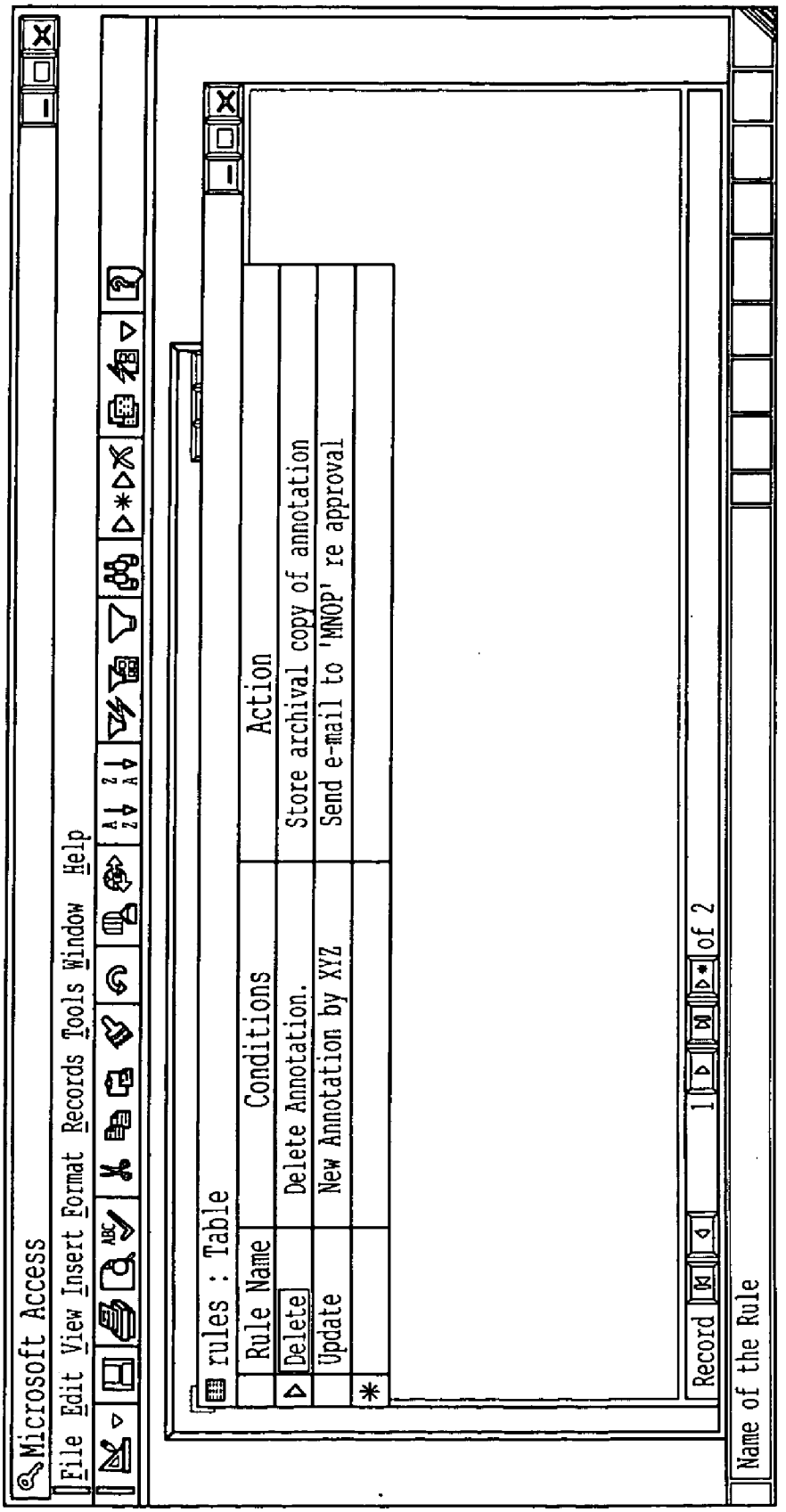
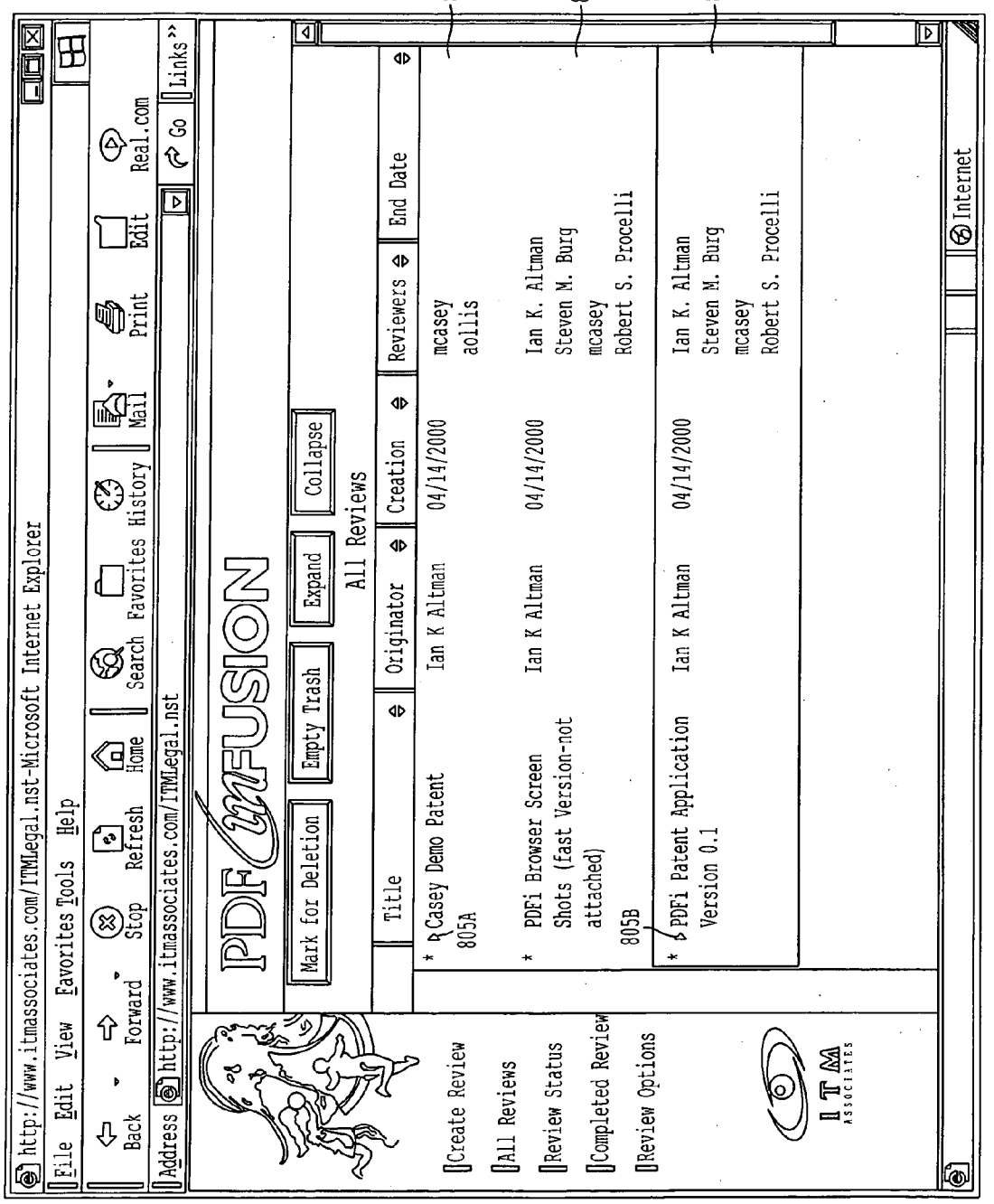

Microsoft Access
File Edit View Insert Format Records Tools Window Help
rules : Table
Rule Name
Conditions
Action
Delete
Delete Annotation.
Store archival copy of annotation
Update
New Annotation by XYZ
Send e-mail to 'MNOP' re approval
Record 1 of 2
Name of the Rule

FIG. 7

FIG 8A


http://www.itmassociates.com/ITMLegal.nst-Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Print Edit Real.com
Address http://www.itmassociates.com/ITMLegal.nst
Links
PDF fusion
Mark for Deletion
Empty Trash
Expand
Collapse
All Reviews
Title
Originator
Creation
Reviewers
End Date
* Casey Demo Patent 805A
Ian K Altman
04/14/2000
mcasey
aollis
* PDFi Browser Screen Shots (fast Version-not attached) 805B
Ian K Altman
04/14/2000
Ian K. Altman
Steven M. Burg
mcasey
Robert S. Procelli
* PDFi Patent Application Version 0.1
Ian K Altman
04/14/2000
Ian K. Altman
Steven M. Burg
mcasey
Robert S. Procelli
800A
800B
800C
Create Review
All Reviews
Review Status
Completed Review
Review Options
ITM ASSOCIATES
Internet

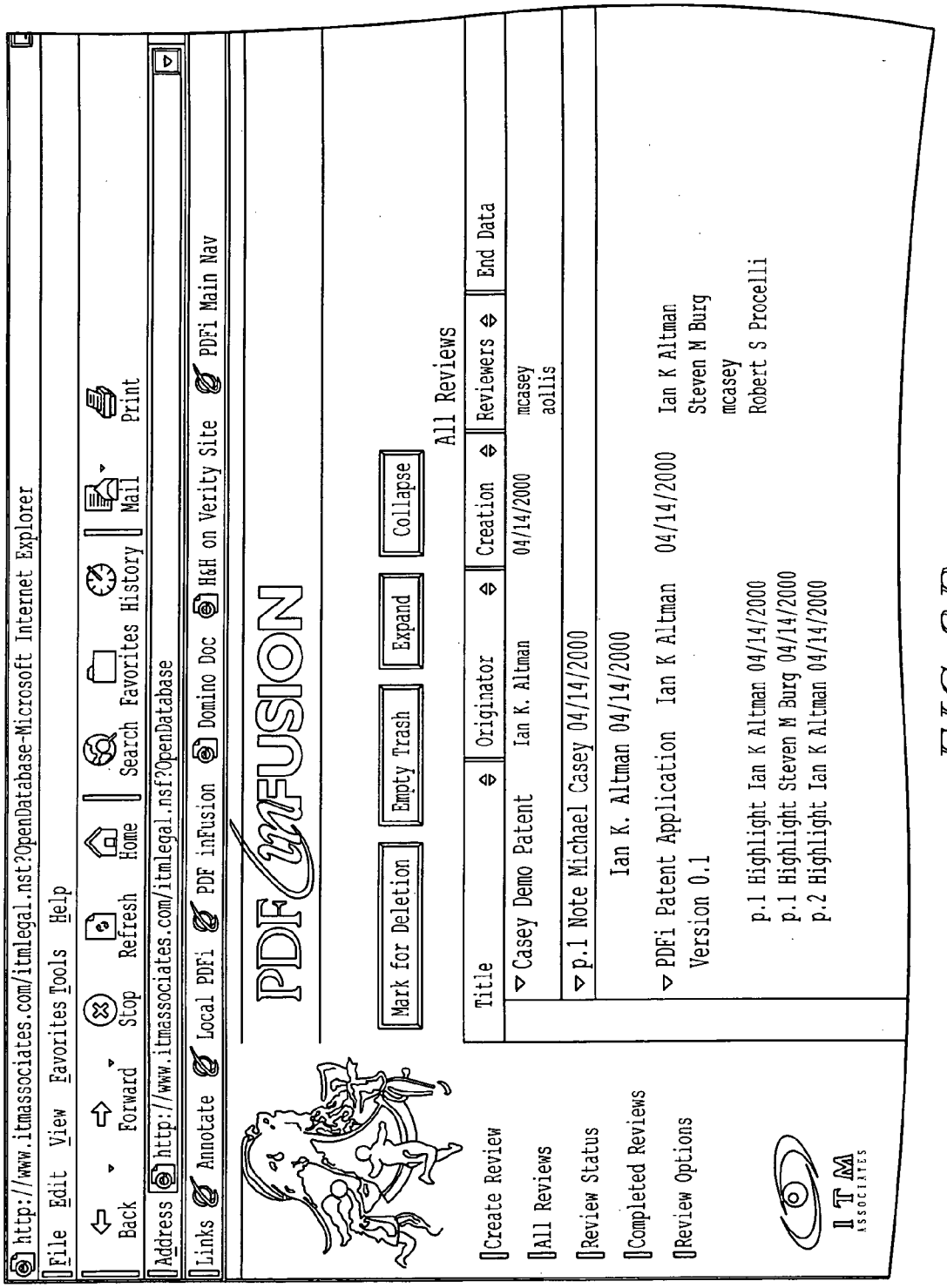

http://www.itmassociates.com/itmlegal.nst?OpenDatabase-Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Print
Address http://www.itmassociates.com/itmlegal.nsf?OpenDatabase
Links Annotate Local PDFi PDF inFusion Domino Doc H&H on Verity Site PDFi Main Nav
PDF inFUSION
Mark for Deletion
Empty Trash
Expand
Collapse
All Reviews
Title
Originator
Creation
Reviewers
End Data
Casey Demo Patent
Ian K. Altman
04/14/2000
mcasey
aollis
p.1 Note Michael Casey 04/14/2000
Ian K. Altman 04/14/2000
PDFi Patent Application Version 0.1
Ian K Altman
04/14/2000
Ian K Altman
Steven M Burg
mcasey
Robert S Procelli
p.1 Highlight Ian K Altman 04/14/2000
p.1 Highlight Steven M Burg 04/14/2000
p.2 Highlight Ian K Altman 04/14/2000
Create Review
All Reviews
Review Status
Completed Reviews
Review Options
ITM
ASSOCIATES

FIG 8B

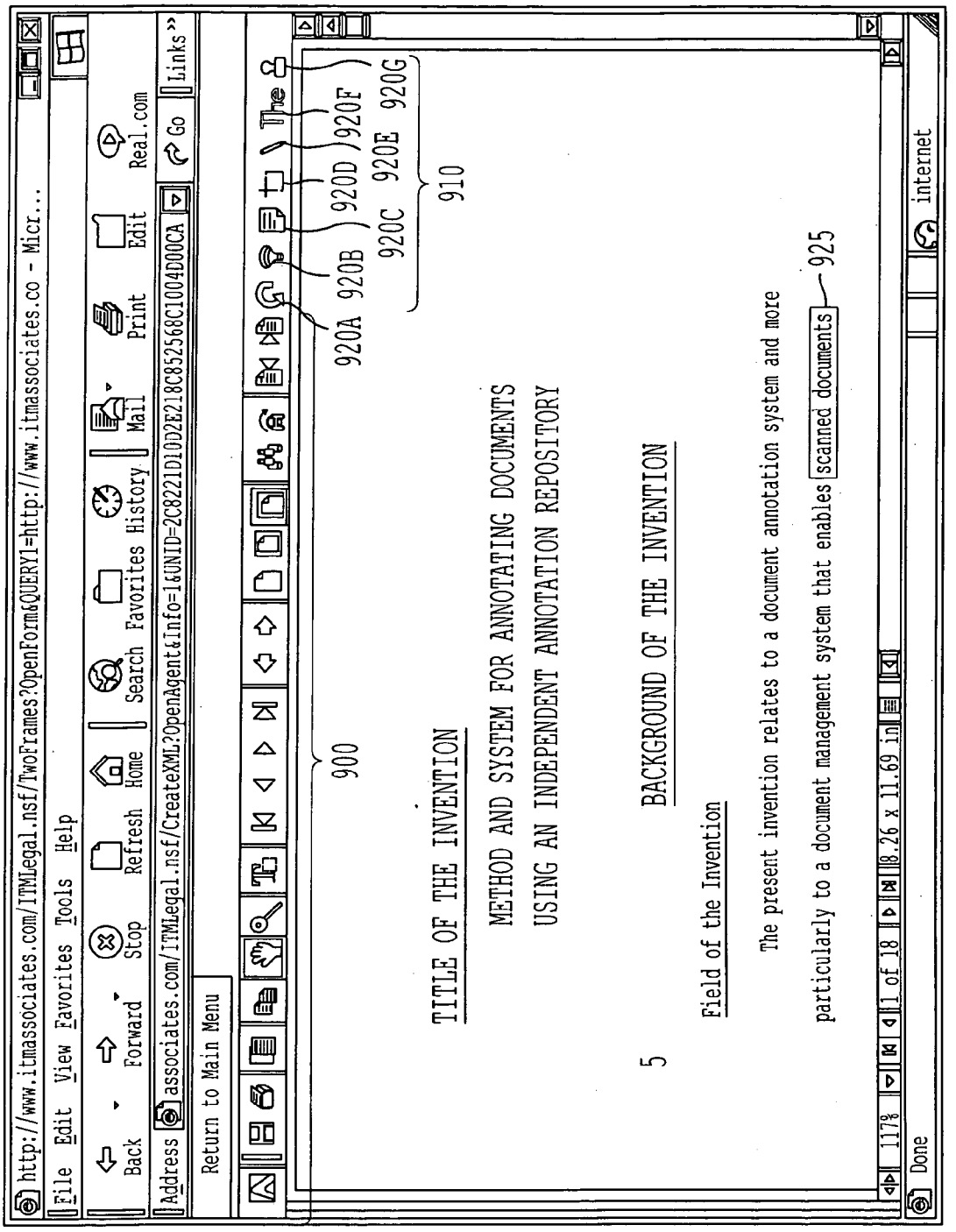

http://www.itmassociates.com/ITMLegal.nsf/TwoFrames?OpenForm&QUERY1=http://www.itmassociates.co - Micr...
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Print Edit Real.com
Address associates.com/ITMLegal.nsf/CreateXML?OpenAgent&Info=1&UNID=2C8221D10D2E218C852568C1004D00CA Go Links
Return to Main Menu
900
920A 920B 920D 920F
920C 920E 920G
910
TITLE OF THE INVENTION
METHOD AND SYSTEM FOR ANNOTATING DOCUMENTS
USING AN INDEPENDENT ANNOTATION REPOSITORY
5
BACKGROUND OF THE INVENTION
Field of the Invention
The present invention relates to a document annotation system and more
particularly to a document management system that enables scanned documents
925
Done
117%
1 of 18
8.26 x 11.69 in
internet

FIG. 9A

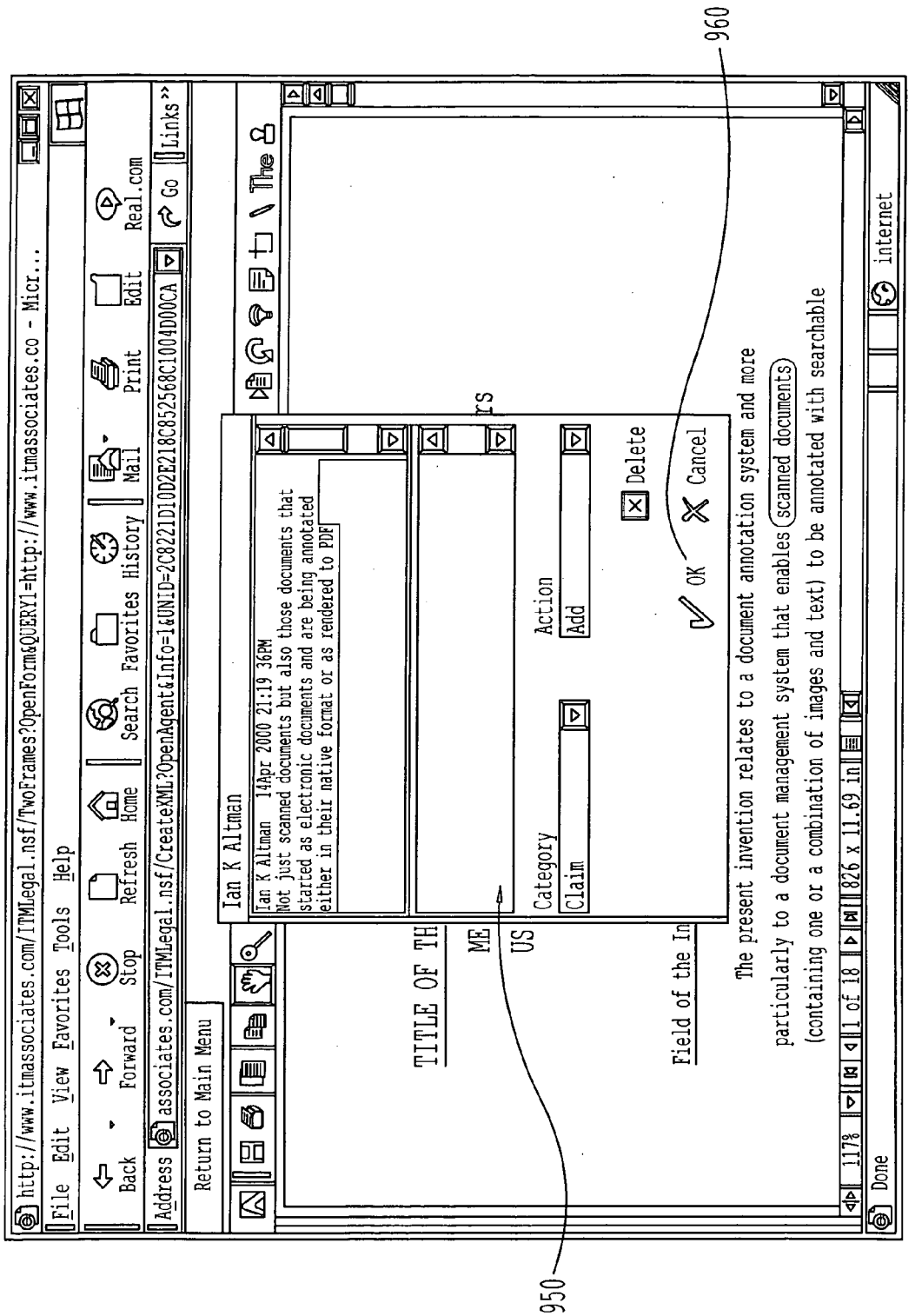

950
960
Ian K Altman
Ian K Altman 14Apr 2000 21:19 36PM
Not just scanned documents but also those documents that started as electronic documents and are being annotated either in their native format or as rendered to PDF
TITLE OF TH
ME
US
Field of the In
Category
Claim
Action
Add
Delete
OK
Cancel
The present invention relates to a document annotation system and more particularly to a document management system that enables (scanned documents) (containing one or a combination of images and text) to be annotated with searchable

FIG. 9B

FIG. 10

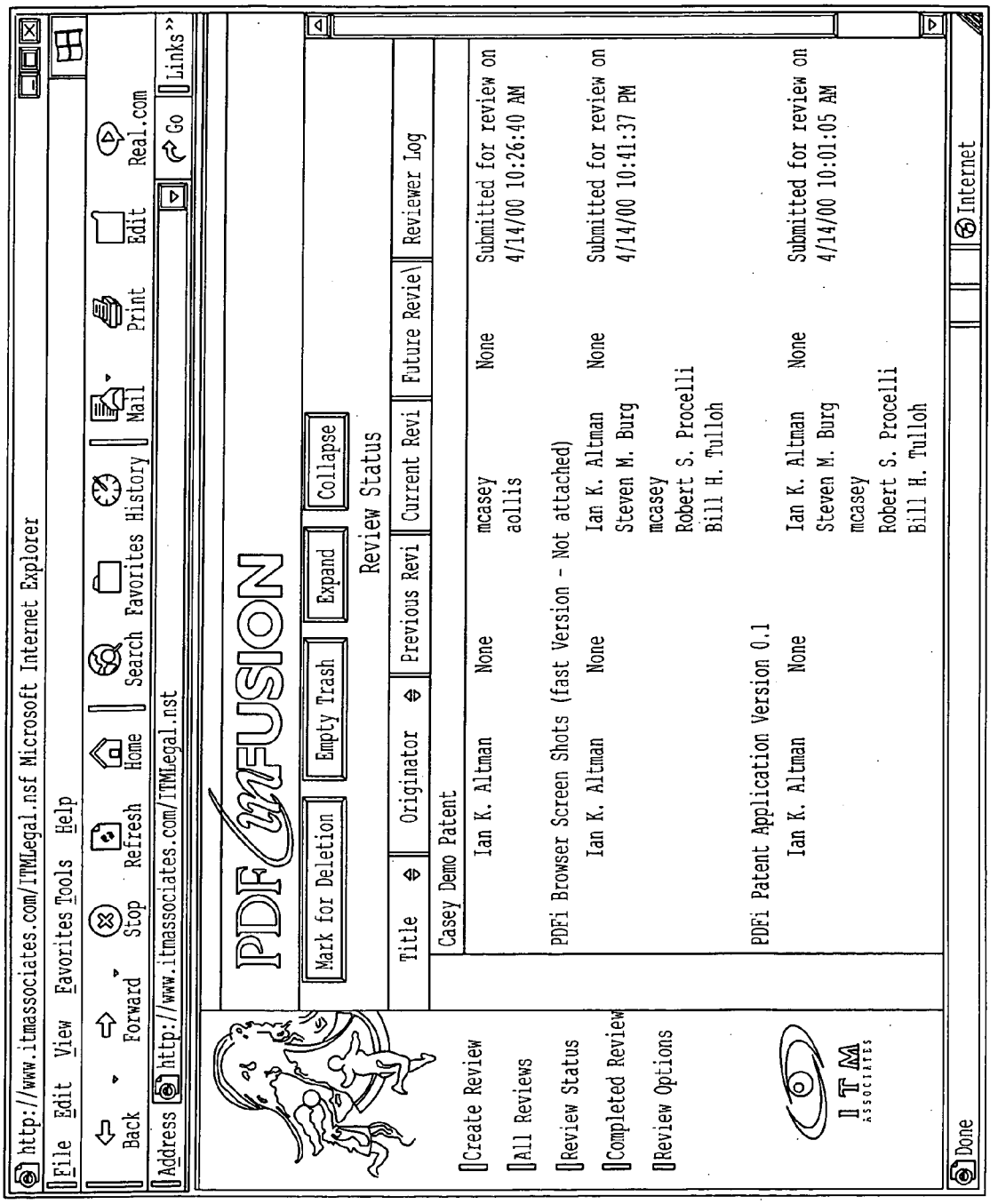
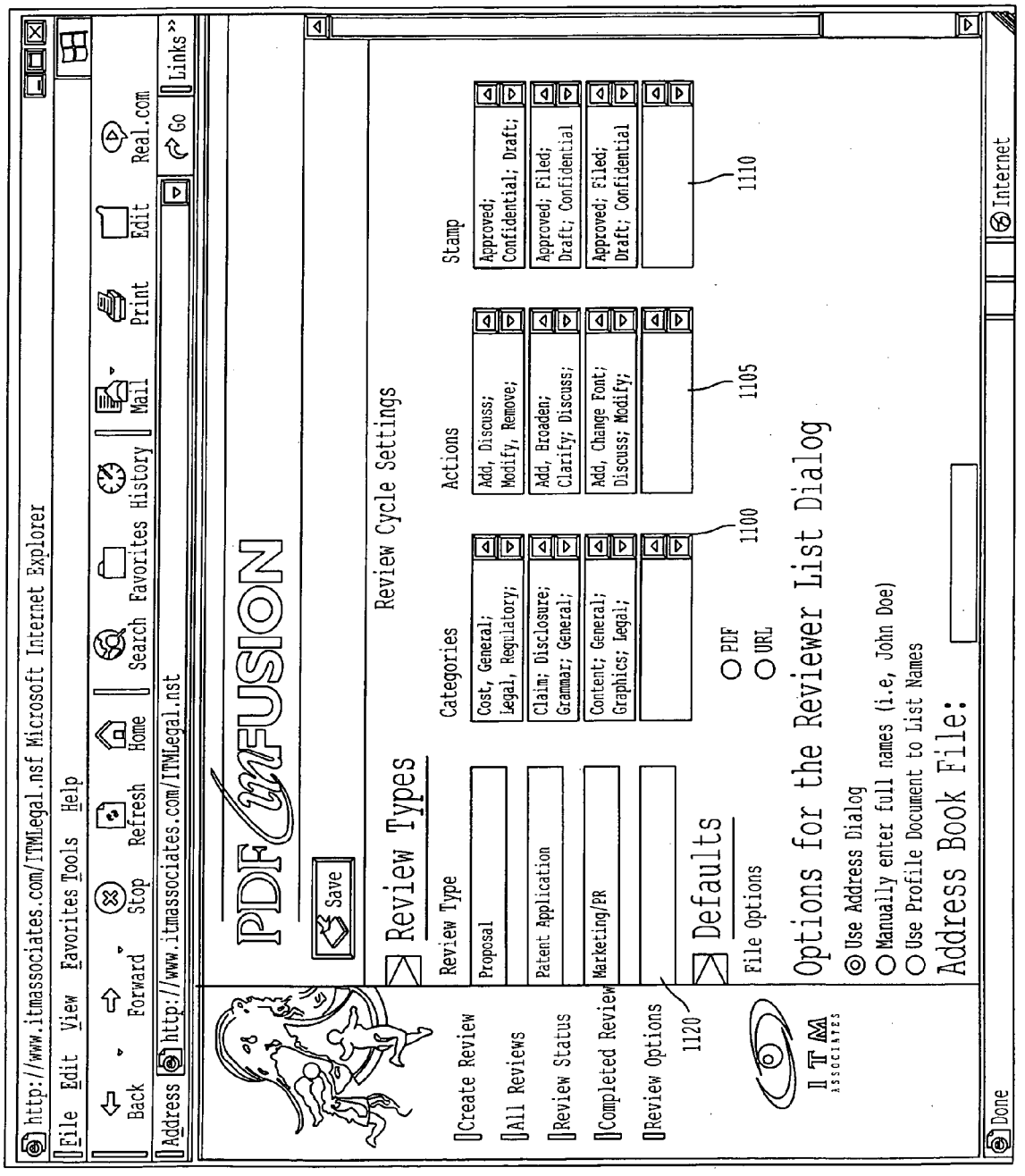

http://www.itmassociates.com/ITMLegal.nsf Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Print Edit Real.com
Address http://www.itmassociates.com/ITMLegal.nst
Go Links
PDF fusion
Mark for Deletion
Empty Trash
Expand
Collapse
Review Status
Title
Originator
Previous Revi
Current Revi
Future Revie\
Reviewer Log
Create Review
All Reviews
Review Status
Completed Review
Review Options
ITM ASSOCIATES
Casey Demo Patent
Ian K. Altman None mcasey None Submitted for review on
aollis 4/14/00 10:26:40 AM
PDFi Browser Screen Shots (fast Version - Not attached)
Ian K. Altman None Ian K. Altman None Submitted for review on
Steven M. Burg 4/14/00 10:41:37 PM
mcasey
Robert S. Procelli
Bill H. Tulloh
PDFi Patent Application Version 0.1
Ian K. Altman None Ian K. Altman None Submitted for review on
Steven M. Burg 4/14/00 10:01:05 AM
mcasey
Robert S. Procelli
Bill H. Tulloh
Done
Internet

FIG. 11


http://www.itmassociates.com/ITMlegal.nsf Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Print Edit Real.com
Address http://www.itmassociates.com/ITMlegal.nst
Go Links
PDFmFUSION
Save
Review Types
Review Cycle Settings
Review Type
Categories
Actions
Stamp
Create Review
Proposal
Cost, General; Legal, Regulatory;
Add, Discuss; Modify, Remove;
Approved; Confidential; Draft;
All Reviews
Patent Application
Claim; Disclosure; Grammar; General;
Add, Broaden; Clarify; Discuss;
Approved; Filed; Draft; Confidential
Review Status
Marketing/PR
Content; General; Graphics; Legal;
Add, Change Font; Discuss; Modify;
Approved; Filed; Draft; Confidential
Completed Review
Review Options
1120
1100
1105
1110
Defaults
File Options
PDF
URL
Options for the Reviewer List Dialog
Use Address Dialog
Manually enter full names (i.e, John Doe)
Use Profile Document to List Names
Address Book File:
ITM ASSOCIATES
Done
Internet

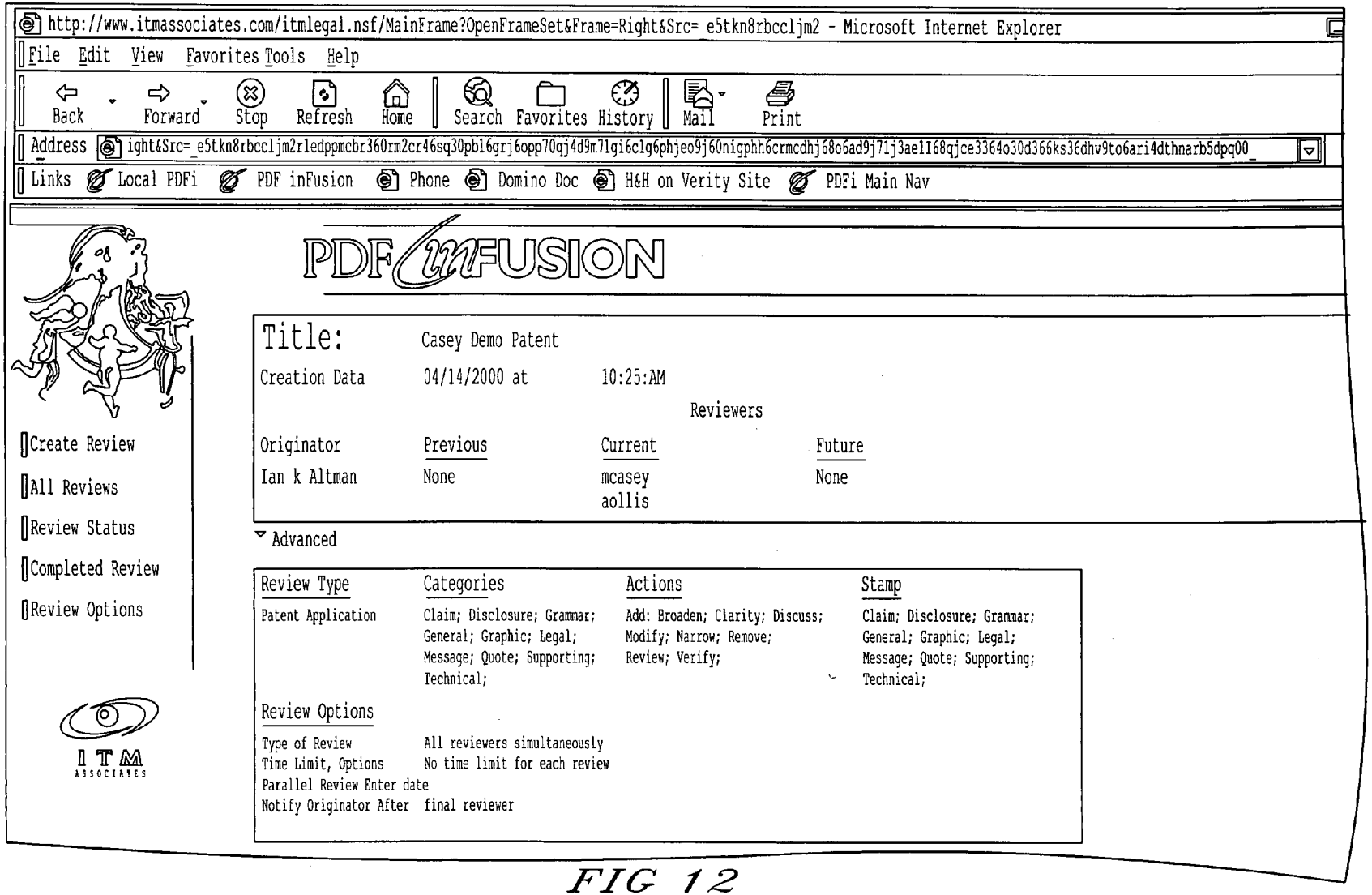

http://www.itmassociates.com/itmlegal.nsf/MainFrame?OpenFrameSet&Frame=Right&Src= e5tkn8rbccljm2 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Print
Address ight&Src=_e5tkn8rbccljm2rledppmcbr360rm2cr46sq30pbl6grj6opp70qj4d9m71gi6clg6phjeo9j60nigphh6crmcdhj68o6ad9j71j3aelI68qjce3364o30d366ks36dhv9to6ari4dthnarb5dpq00_
Links Local PDFi PDF inFusion Phone Domino Doc H&H on Verity Site PDFi Main Nav
PDF inFUSION
Create Review
All Reviews
Review Status
Completed Review
Review Options
ITM ASSOCIATES
Title: Casey Demo Patent
Creation Data 04/14/2000 at 10:25:AM
Reviewers
Originator Previous Current Future
Ian k Altman None mcasey aollis None
Advanced
Review Type Categories Actions Stamp
Patent Application Claim; Disclosure; Grammar; General; Graphic; Legal; Message; Quote; Supporting; Technical; Add: Broaden; Clarity; Discuss; Modify; Narrow; Remove; Review; Verify; Claim; Disclosure; Grammar; General; Graphic; Legal; Message; Quote; Supporting; Technical;
Review Options
Type of Review All reviewers simultaneously
Time Limit, Options No time limit for each review
Parallel Review Enter date
Notify Originator After final reviewer

FIG 12

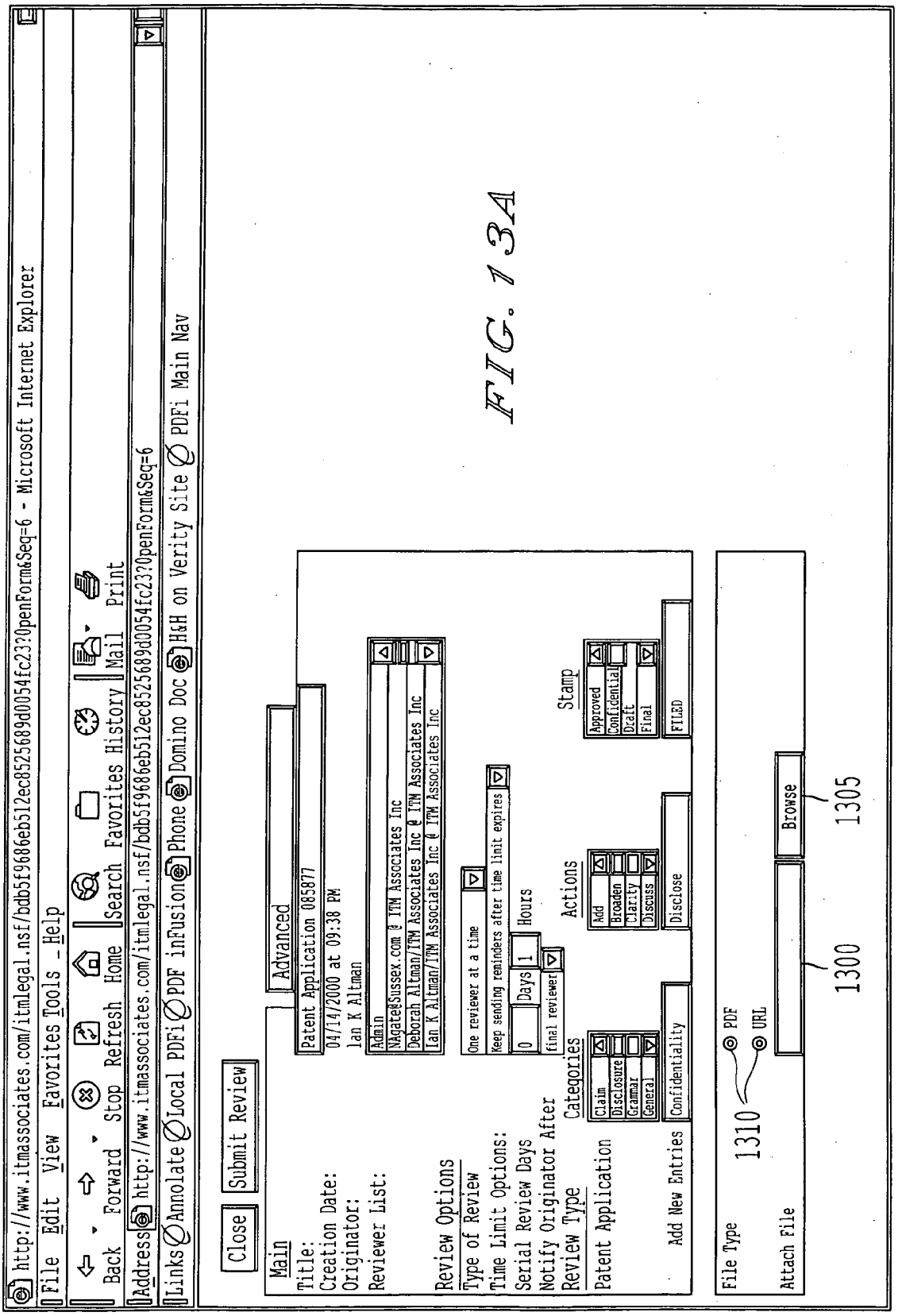

http://www.itmassociates.com/itmlegal.nsf/bdb5f9686eb512ec8525689d0054fc23?OpenForm&Seq=6 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Print
Address http://www.itmassociates.com/itmlegal.nsf/bdb5f9686eb512ec8525689d0054fc23?OpenForm&Seq=6
Links Annotate Local PDFi PDF inFusion Phone Domino Doc H&H on Verity Site PDFi Main Nav
Close
Submit Review
Main
Advanced
Title:
Patent Application 085877
Creation Date:
04/14/2000 at 09:38 PM
Originator:
Ian K Altman
Reviewer List:
Admin
NAgate@Sussex.com @ ITM Associates Inc
Deborah Altman/ITM Associates Inc @ ITM Associates Inc
Ian K Altman/ITM Associates Inc @ ITM Associates Inc
Review Options
Type of Review
One reviewer at a time
Time Limit Options:
Keep sending reminders after time limit expires
Serial Review Days
0
Days
1
Hours
Notify Originator After
final reviewer
Review Type
Categories
Actions
Stamp
Patent Application
Claim
Disclosure
Grammar
General
Add
Broaden
Clarity
Discuss
Approved
Confidential
Draft
Final
Add New Entries
Confidentiality
Disclose
FILED
File Type
PDF
URL
Attach File
Browse
1300
1305
1310

FIG. 13A

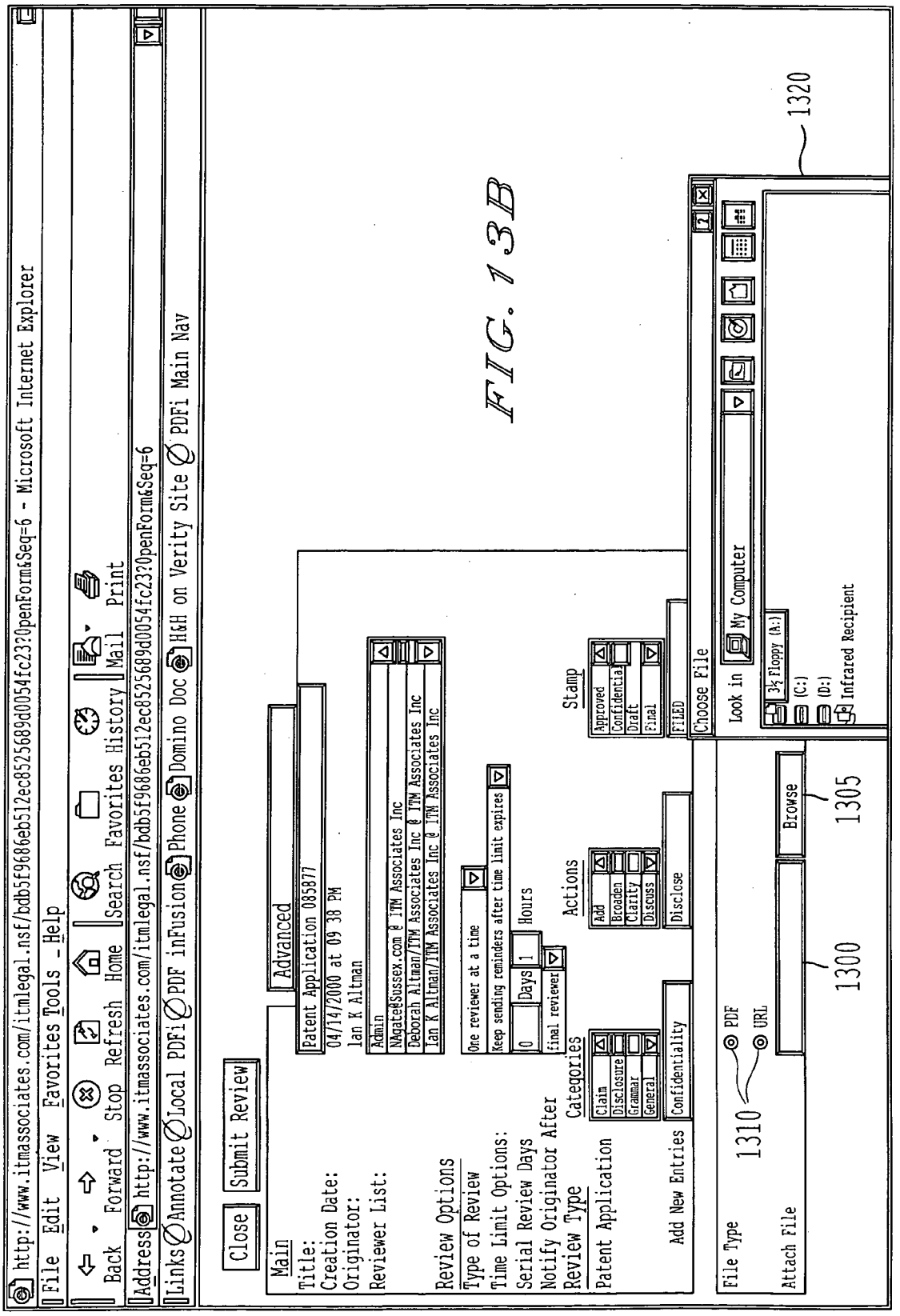

http://www.itmassociates.com/itmlegal.nsf/bdb5f9686eb512ec8525689d0054fc23?OpenForm&Seq=6 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Print
Address http://www.itmassociates.com/itmlegal.nsf/bdb5f9686eb512ec8525689d0054fc23?OpenForm&Seq=6
Links Annotate Local PDFi PDF inFusion Phone Domino Doc H&H on Verity Site PDFi Main Nav
Close
Submit Review
Main
Advanced
Title:
Patent Application 035877
Creation Date:
04/14/2000 at 09 38 PM
Originator:
Ian K Altman
Reviewer List:
Admin
NAgate@Sussex.com @ ITM Associates Inc
Deborah Altman/ITM Associates Inc @ ITM Associates Inc
Ian K Altman/ITM Associates Inc @ ITM Associates Inc
Review Options
Type of Review
One reviewer at a time
Time Limit Options:
Keep sending reminders after time limit expires
Serial Review Days
0
Days
1
Hours
Notify Originator After
final reviewer
Review Type
Categories
Actions
Stamp
Patent Application
Claim
Disclosure
Grammar
General
Add
Broaden
Clarity
Discuss
Approved
Confidential
Draft
Final
Add New Entries
Confidentiality
Disclose
FILED
Choose File
Look in
My Computer
3½ Floppy (A:)
(C:)
(D:)
Infrared Recipient
File Type
PDF
URL
1310
Attach File
Browse
1300
1305
1320

FIG. 13B

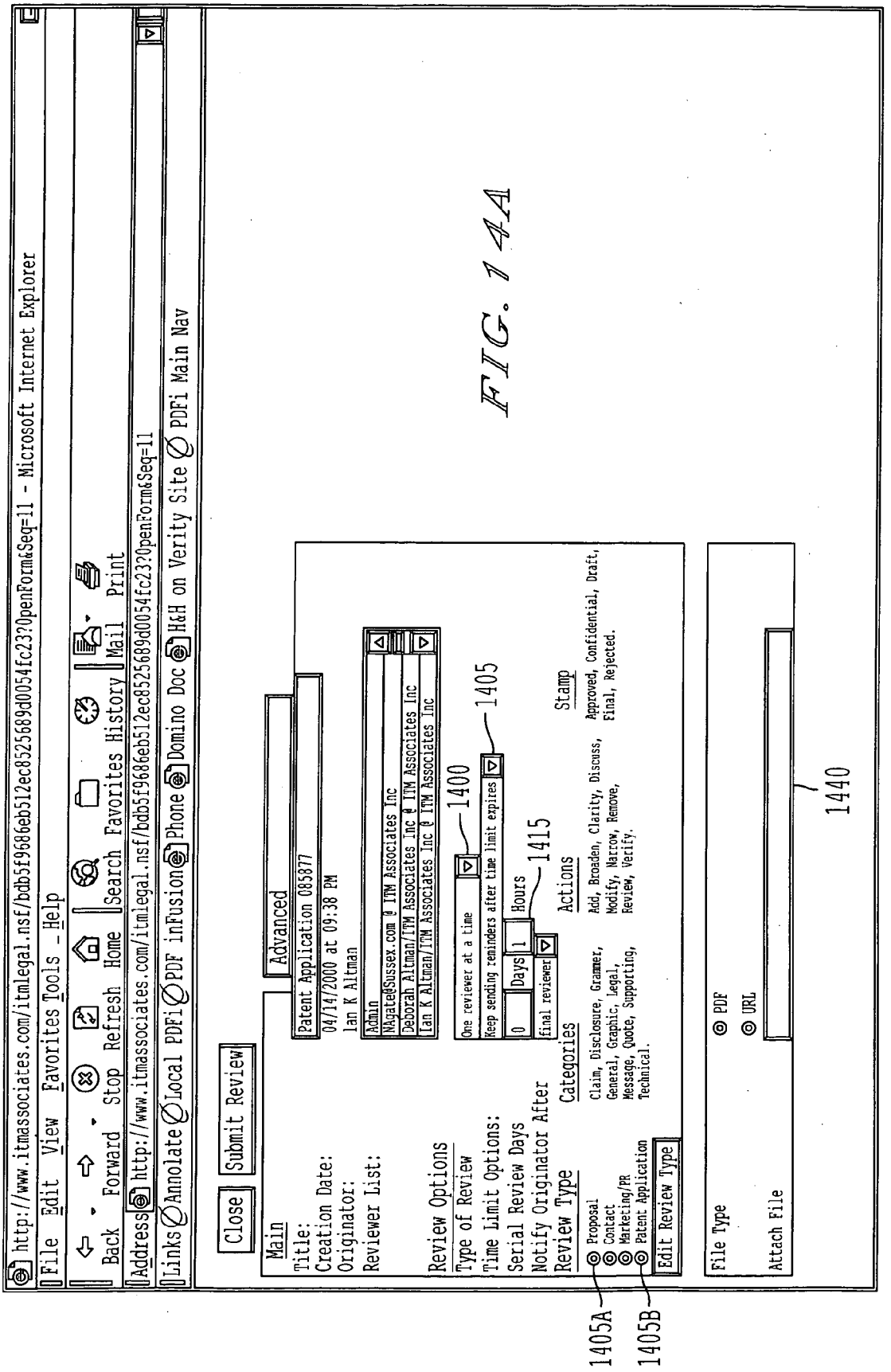

http://www.itmassociates.com/itmlegal.nsf/bdb5f9686eb512ec8525689d0054fc23?OpenForm&Seq=11 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Print
Address http://www.itmassociates.com/itmlegal.nsf/bdb5f9686eb512ec8525689d0054fc23?OpenForm&Seq=11
Links Annolate Local PDFi PDF inFusion Phone Domino Doc H&H on Verity Site PDFi Main Nav
Close
Submit Review
Main
Advanced
Title:
Patent Application 085877
Creation Date:
04/14/2000 at 09:38 PM
Originator:
Ian K Altman
Reviewer List:
Admin
NAgate@Sussex.com @ ITM Associates Inc
Deborah Altman/ITM Associates Inc @ ITM Associates Inc
Ian K Altman/ITM Associates Inc @ ITM Associates Inc
Review Options
Type of Review
One reviewer at a time
1400
Time Limit Options:
Keep sending reminders after time limit expires
1405
Serial Review Days
0
Days
1
Hours
1415
Notify Originator After
final reviewer
Review Type
Categories
Actions
Stamp
Proposal
Contact
Marketing/PR
Patent Application
Claim, Disclosure, Grammer, General, Graphic, Legal, Message, Quote, Supporting, Technical.
Add, Broaden, Clarity, Discuss, Modify, Narrow, Remove, Review, Verify.
Approved, Confidential, Draft, Final, Rejected.
Edit Review Type
File Type
PDF
URL
Attach File
1440
1405A
1405B

FIG. 14A

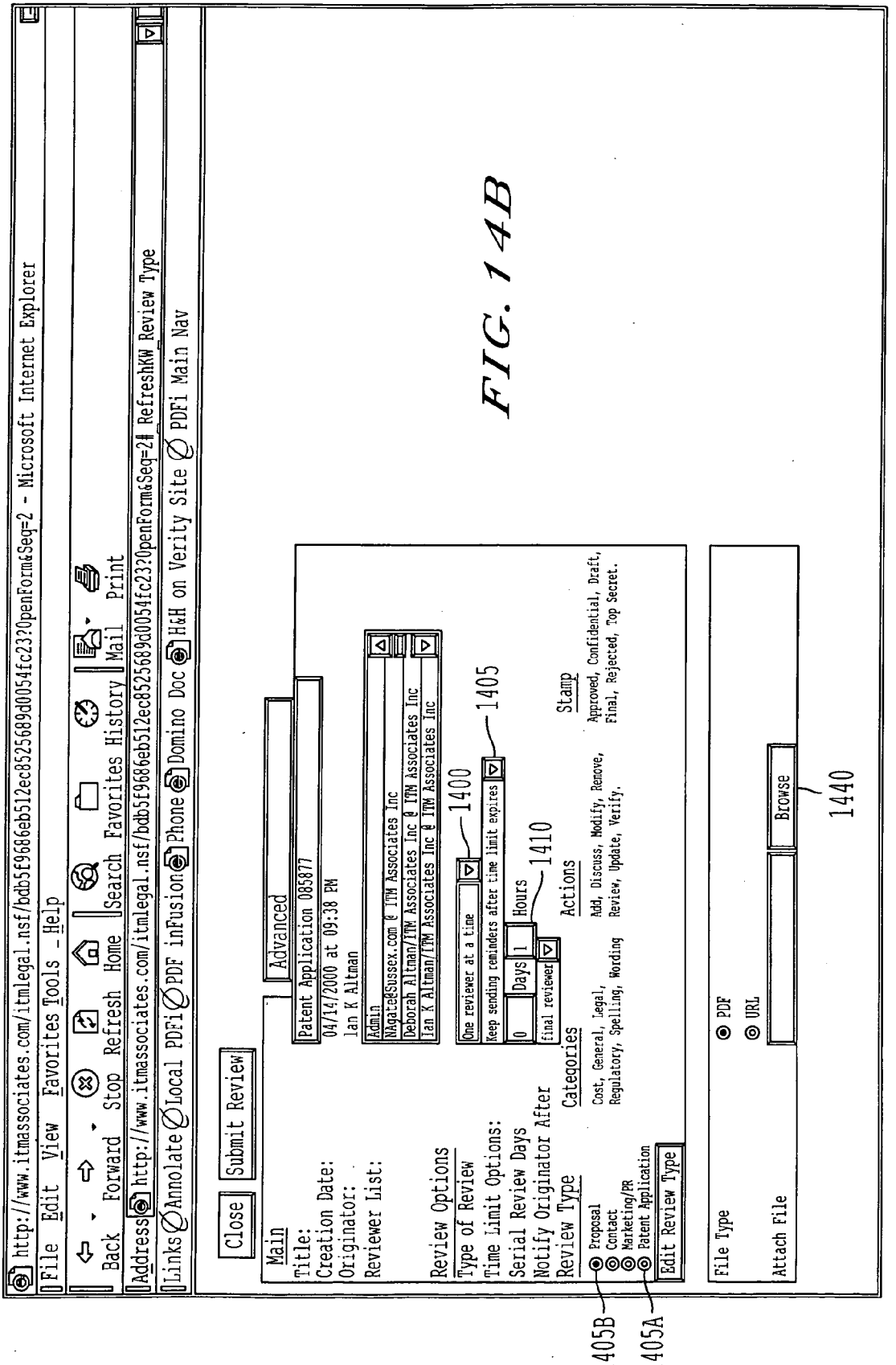

http://www.itmassociates.com/itmlegal.nsf/bdb5f9686eb512ec8525689d0054fc23?OpenForm&Seq=2 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Print
Address http://www.itmassociates.com/itmlegal.nsf/bdb5f9686eb512ec8525689d0054fc23?OpenForm&Seq=2# RefreshKW Review Type
Links Annolate Local PDF1 PDF inFusion Phone Domino Doc HtH on Verity Site PDFi Main Nav
Close
Submit Review
Main
Advanced
Title:
Patent Application 085877
Creation Date:
04/14/2000 at 09:38 PM
Originator:
Ian K Altman
Reviewer List:
Admin
NAgate@Sussex.com @ ITM Associates Inc
Deborah Altman/ITM Associates Inc @ ITM Associates Inc
Ian K Altman/ITM Associates Inc @ ITM Associates Inc
1400
Review Options
Type of Review
One reviewer at a time
Time Limit Options:
Keep sending reminders after time limit expires
1405
Serial Review Days
0
Days
1
Hours
1410
Notify Originator After
final reviewer
Review Type
Categories
Actions
Stamp
Proposal
Contact
Marketing/PR
Patent Application
Cost, General, Legal, Regulatory, Spelling, Wording
Add, Discuss, Modify, Remove, Review, Update, Verify.
Approved, Confidential, Draft, Final, Rejected, Top Secret.
1405B
1405A
Edit Review Type
File Type
PDF
URL
Attach File
Browse
1440

FIG. 14B

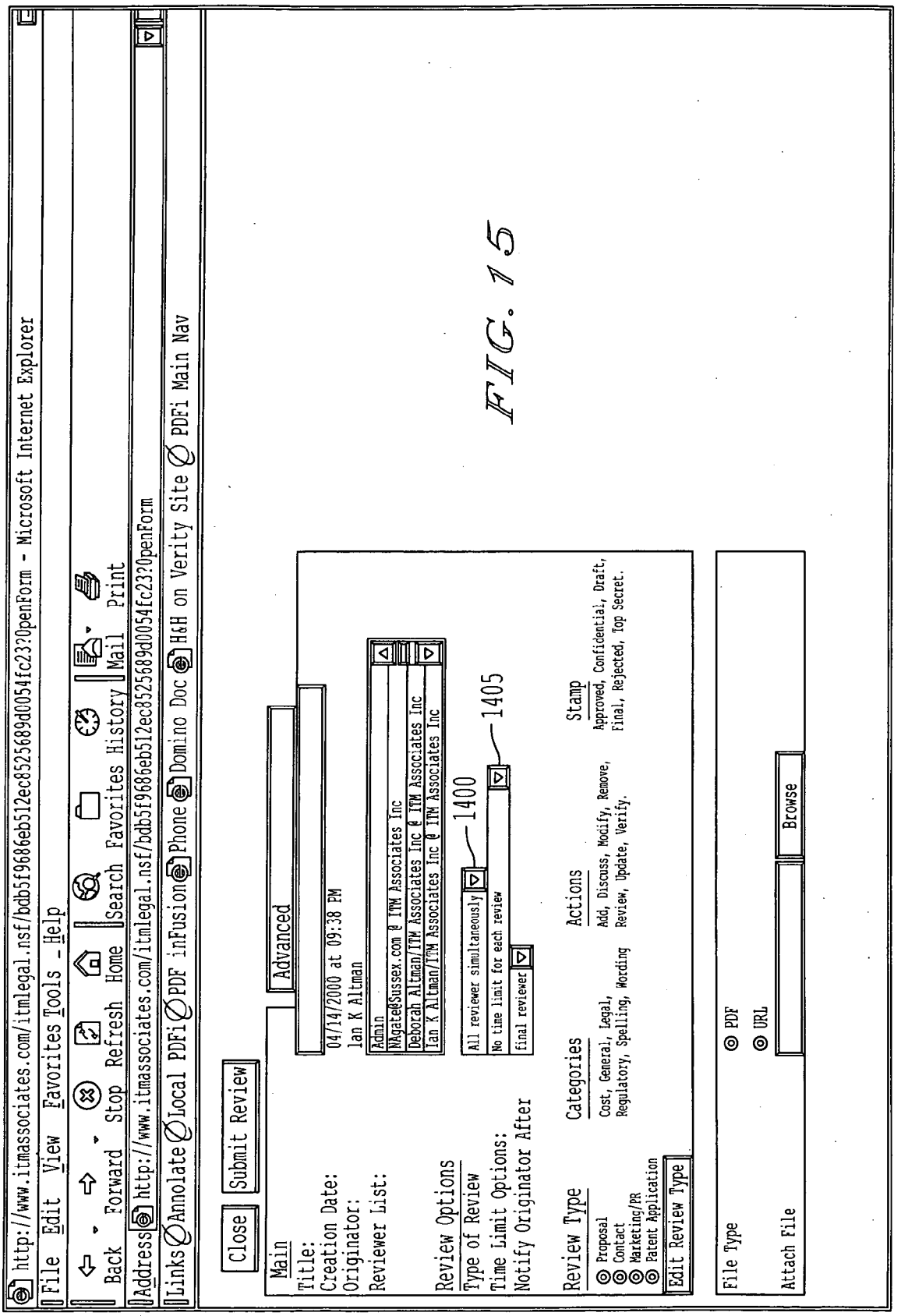

http://www.itmassociates.com/itmlegal.nsf/bdb5f9686eb512ec8525689d0054fc23?OpenForm - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Print
Address http://www.itmassociates.com/itmlegal.nsf/bdb5f9686eb512ec8525689d0054fc23?OpenForm
Links Annotate Local PDFi PDF inFusion Phone Domino Doc H&H on Verity Site PDFi Main Nav
Close
Submit Review
Main
Advanced
Title:
Creation Date:
04/14/2000 at 09:38 PM
Originator:
Ian K Altman
Reviewer List:
Admin
MAgate@Sussex.com @ ITM Associates Inc
Deborah Altman/ITM Associates Inc @ ITM Associates Inc
Ian K Altman/ITM Associates Inc @ ITM Associates Inc
Review Options
Type of Review
All reviewer simultaneously
1400
Time Limit Options:
No time limit for each review
1405
Notify Originator After
final reviewer
Review Type
Categories
Actions
Stamp
Proposal
Contact
Marketing/PR
Patent Application
Cost, General, Legal, Regulatory, Spelling, Wording
Add, Discuss, Modify, Remove, Review, Update, Verify.
Approved, Confidential, Draft, Final, Rejected, Top Secret.
Edit Review Type
File Type
PDF
URL
Attach File
Browse

FIG. 15

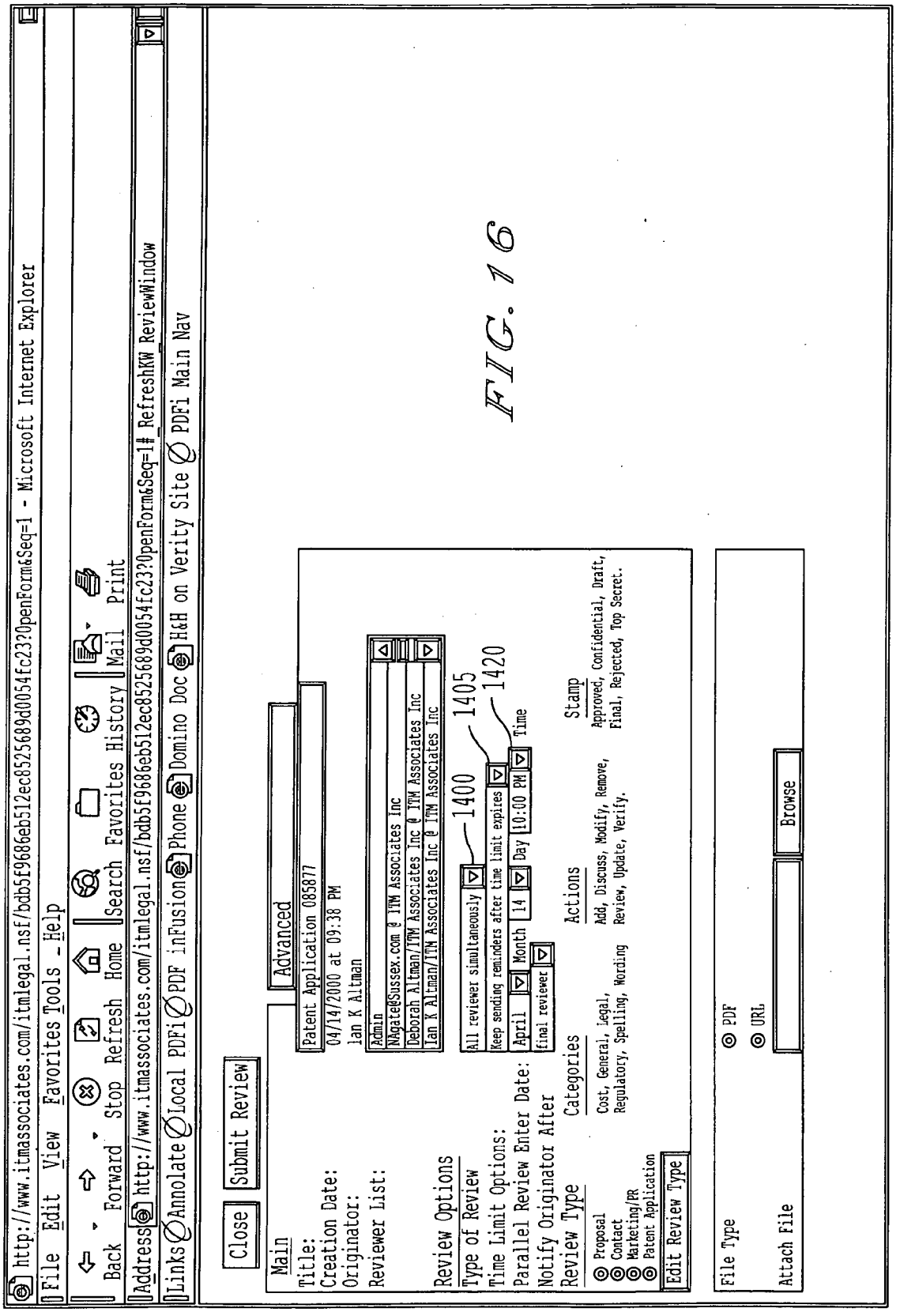

http://www.itmassociates.com/itmlegal.nsf/bdb5f9686eb512ec8525689d0054fc23?OpenForm&Seq=1 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Print
Address http://www.itmassociates.com/itmlegal.nsf/bdb5f9686eb512ec8525689d0054fc23?OpenForm&Seq=1# RefreshKW ReviewWindow
Links Annotate Local PDFi PDF inFusion Phone Domino Doc H&H on Verity Site PDFi Main Nav
Close
Submit Review
Main
Advanced
Title:
Patent Application 085877
Creation Date:
04/14/2000 at 09:38 PM
Originator:
Ian K Altman
Reviewer List:
Admin
NAgate@Sussex.com @ ITM Associates Inc
Deborah Altman/ITM Associates Inc @ ITM Associates Inc
Ian K Altman/ITM Associates Inc @ ITM Associates Inc
Review Options
Type of Review
All reviewer simultaneously
1400
1405
Time Limit Options:
Keep sending reminders after time limit expires
1420
Parallel Review Enter Date:
April
Month
14
Day
10:00 PM
Time
Notify Originator After
final reviewer
Review Type
Categories
Actions
Stamp
Proposal
Contact
Marketing/PR
Patent Application
Cost, General, Legal, Regulatory, Spelling, Wording
Add, Discuss, Modify, Remove, Review, Update, Verify.
Approved, Confidential, Draft, Final, Rejected, Top Secret.
Edit Review Type
File Type
PDF
URL
Attach File
Browse

FIG. 16

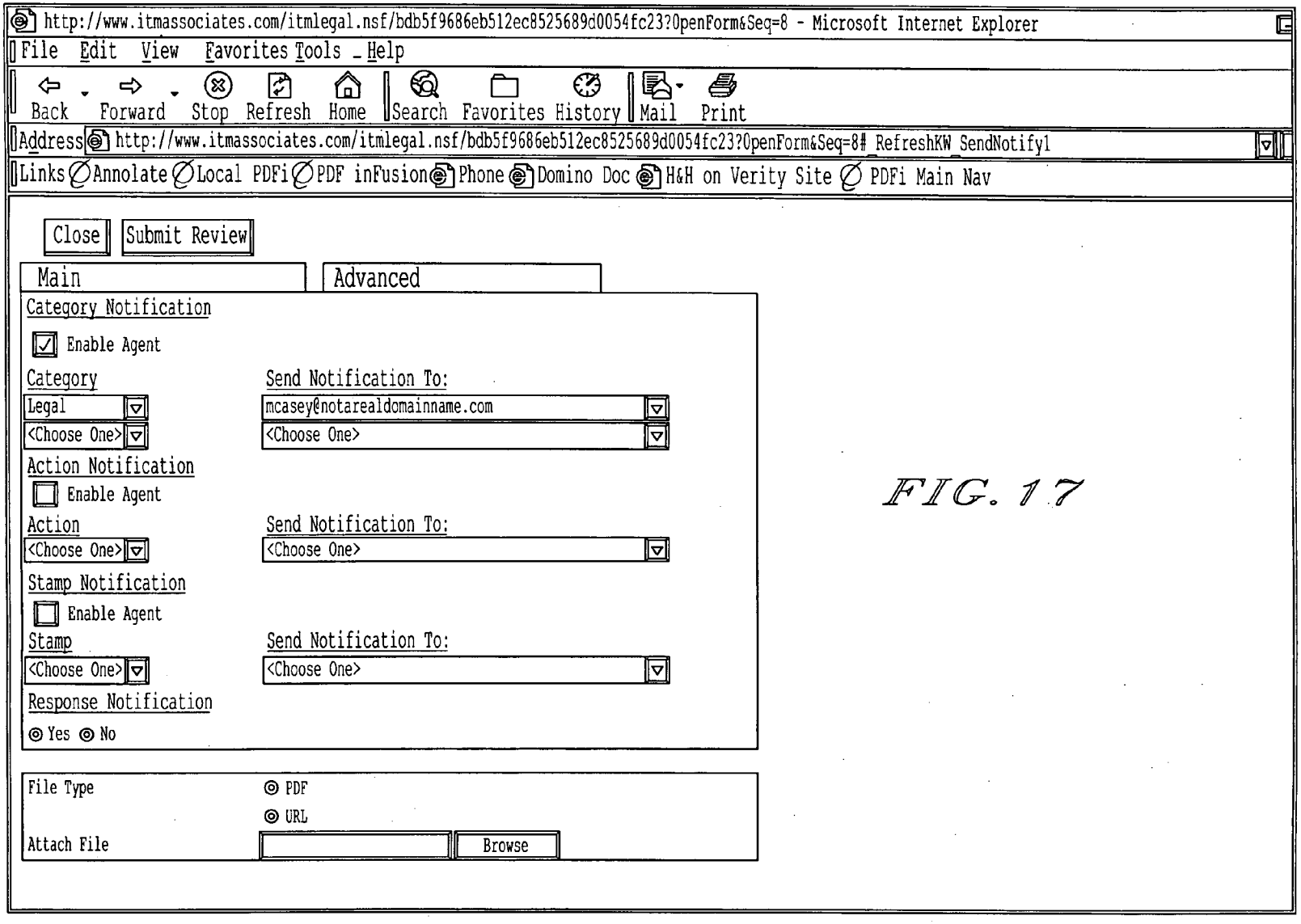

http://www.itmassociates.com/itmlegal.nsf/bdb5f9686eb512ec8525689d0054fc23?0penForm&Seq=8 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Print
Address http://www.itmassociates.com/itmlegal.nsf/bdb5f9686eb512ec8525689d0054fc23?0penForm&Seq=8# RefreshKW SendNotify1
Links Annolate Local PDFi PDF inFusion Phone Domino Doc H&H on Verity Site PDFi Main Nav
Close
Submit Review
Main
Advanced
Category Notification
Enable Agent
Category
Legal
<Choose One>
Send Notification To:
mcasey@notarealdomainname.com
<Choose One>
Action Notification
Enable Agent
Action
<Choose One>
Send Notification To:
<Choose One>
Stamp Notification
Enable Agent
Stamp
<Choose One>
Send Notification To:
<Choose One>
Response Notification
Yes No
File Type
PDF
URL
Attach File
Browse

FIG. 17

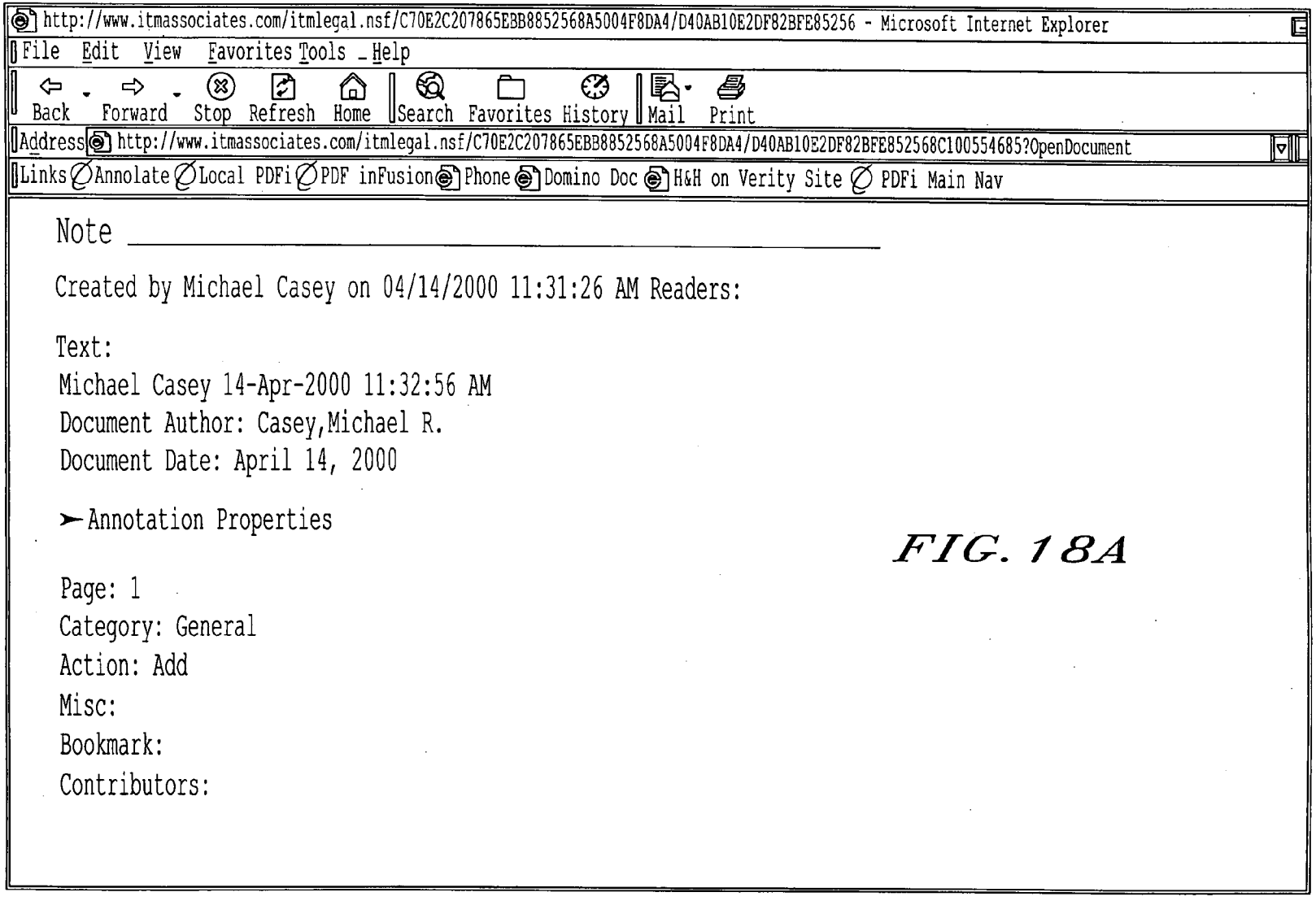

http://www.itmassociates.com/itmlegal.nsf/C70E2C207865EBB8852568A5004F8DA4/D40AB10E2DF82BFE85256 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Print
Address http://www.itmassociates.com/itmlegal.nsf/C70E2C207865EBB8852568A5004F8DA4/D40AB10E2DF82BFE852568C100554685?OpenDocument
Links Annolate Local PDFi PDF inFusion Phone Domino Doc H&H on Verity Site PDFi Main Nav
Note
Created by Michael Casey on 04/14/2000 11:31:26 AM Readers:
Text:
Michael Casey 14-Apr-2000 11:32:56 AM
Document Author: Casey,Michael R.
Document Date: April 14, 2000
Annotation Properties
Page: 1
Category: General
Action: Add
Misc:
Bookmark:
Contributors:

FIG. 18A

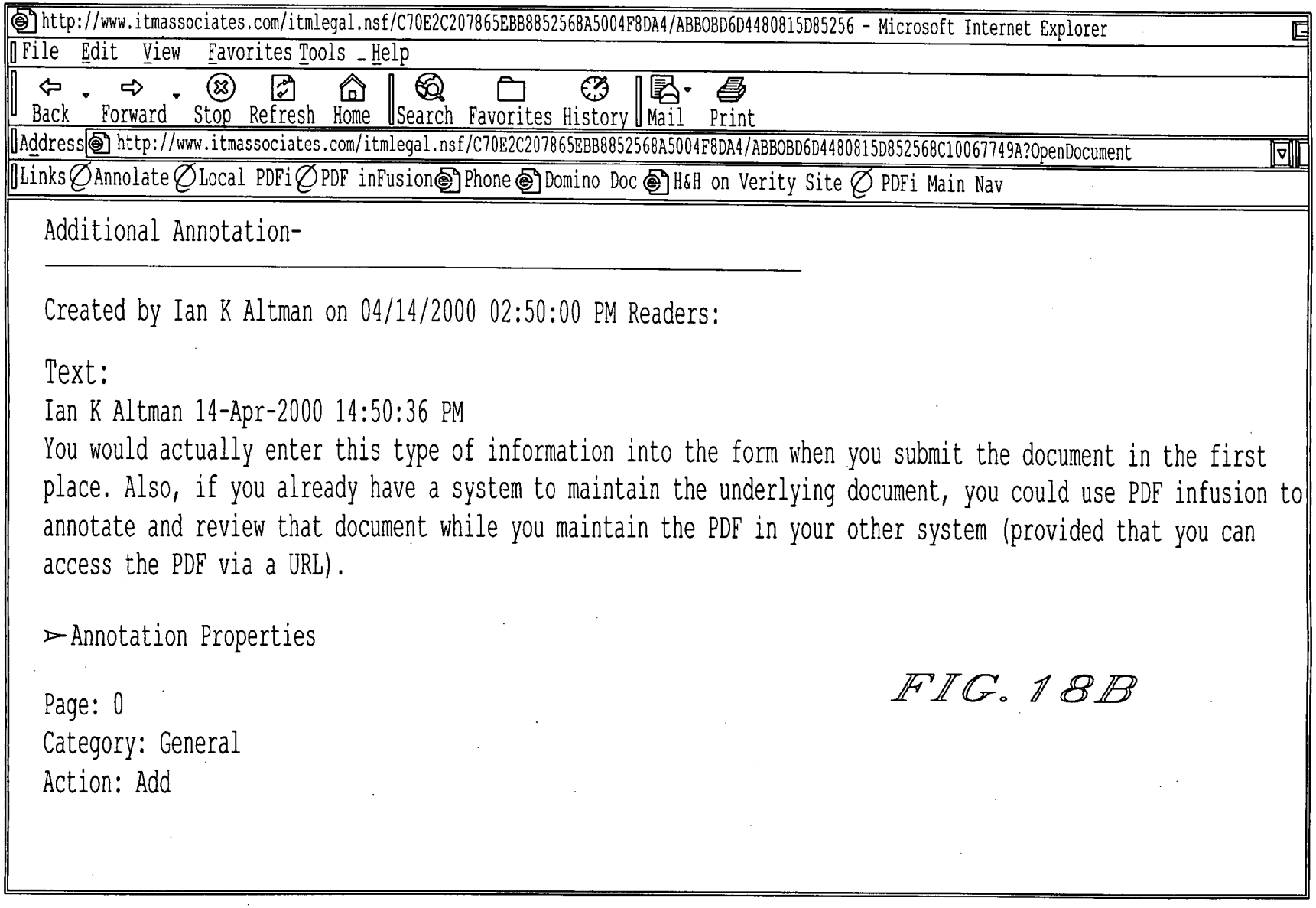

http://www.itmassociates.com/itmlegal.nsf/C70E2C207865EBB8852568A5004F8DA4/ABBOBD6D4480815D85256 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Print
Address http://www.itmassociates.com/itmlegal.nsf/C70E2C207865EBB8852568A5004F8DA4/ABBOBD6D4480815D852568C10067749A?OpenDocument
Links Annolate Local PDFi PDF inFusion Phone Domino Doc H&H on Verity Site PDFi Main Nav
Additional Annotation-
Created by Ian K Altman on 04/14/2000 02:50:00 PM Readers:
Text:
Ian K Altman 14-Apr-2000 14:50:36 PM
You would actually enter this type of information into the form when you submit the document in the first place. Also, if you already have a system to maintain the underlying document, you could use PDF infusion to annotate and review that document while you maintain the PDF in your other system (provided that you can access the PDF via a URL).
Annotation Properties
Page: 0
Category: General
Action: Add

FIG. 18B

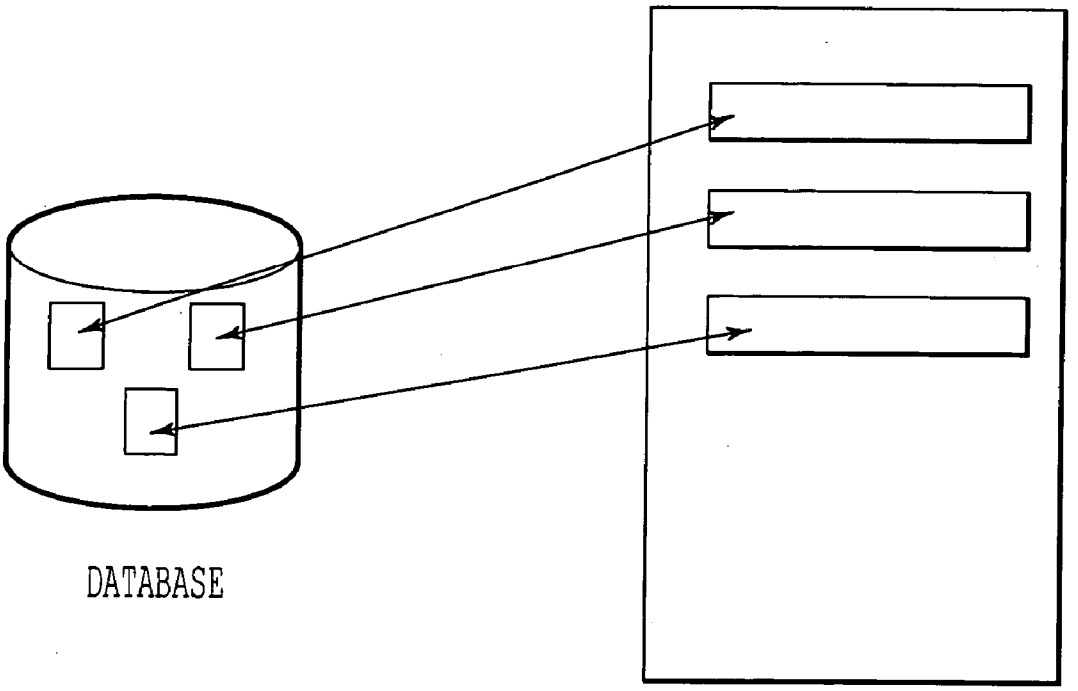


FIG. 19

METHOD AND SYSTEM FOR ANNOTATING DOCUMENTS USING AN INDEPENDENT ANNOTATION REPOSITORY

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation of U.S. patent application Ser. No. 09/575,712 filed on Jul. 26, 2000, the entire contents of which are herein incorporated by reference.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates to a document annotation system and more particularly to a document management system that enables (1) documents (containing one or a combination of images and text) to be annotated with searchable text that is stored independently from the underlying scanned documents and (2) the annotation of those documents to cause workflow rules to be triggered.

[0004] 2. Discussion of the Background

[0005] Various software packages have been built to manage computer generated and/or scanned documents. One such software package is Adobe Acrobat by Abode Systems that enables Portable Document Format (PDF) files to be written. (A more limited functionality PDF reader is also available under the tradename Abode Acrobat Reader.) In addition to the "native" features that are available, Adobe Acrobat can be augmented with additional functionality using "plug-ins" that conform to an Application Programming Interface (API).

[0006] Various texts have been written describing some of the features of Adobe Acrobat. Examples of such texts include: "PDF Printing and Workflow," by Frank J. Romano, published by Prentice Hall (Oct. 20, 1998), ISBN: 013020837X; Adobe Acrobat Forms Set, By Adobe Developer Technologies, Published by Adobe Systems Inc., Published: January 2000, ISBN: DM10003157; Adobe Acrobat Interapplication Communication Documentation Set, By Adobe Developer Technologies, Published by Adobe Systems Inc., Date Published: February 2000, ISBN: DM10002537; Portable Document Format Reference Manual, Version 1.3, by Adobe Systems; Acrobat Software Development Kit (SDK), Version 4.05; Adobe Acrobat Forms Data Format (FDF) Toolkit SDK; and Abode Technical Notes 5167, 5182, 5190, 5191, 5164, 5165, 5183, 5157, 5158, 5151, 5181, 5193, 5194, 5162, 5160, 5192, 5400, 5172, 5150, and 5159, each revised November, 2000. Each of those references is incorporated herein by reference in their entirety. As shown in FIG. 6.1 of Portable Document Format Reference Manual, Version 1.3, Adobe Acrobat enables annotations to be stored within a PDF file such that they may be retrieved and/or searched later. An exemplary annotation is shown in **FIG. 1**. However, the embedding of those annotations within the file also prevents them from being easily searched by non-Adobe Acrobat applications.

[0007] In addition, database software packages are also available from various manufacturers. Such software includes, but is not limited to, Lotus Notes, SQL Server from Microsoft Corporation, and Oracle8i from Oracle Corporation. Such software enables data to be stored in and retrieved from the corresponding databases.

SUMMARY OF THE PRESENT INVENTION

[0008] It is an object of the present invention to provide at least one of a text overlay and a graphic overlay for a displayable computer document (e.g., a PDF file) where the overlay and the image are stored separately and the addition, modification or deletion of parts of the overlay cause workflow rules to be triggered.

[0009] This object and other advantages of the present invention are addressed by at least one computer system in which information of a first type (e.g., a textual or graphic annotation) is stored in a first location and a document of a second type (e.g., a scanned image or a computer generated file) is stored in a second location. In one embodiment, the first and second locations are different files and/or databases of a single computer. Alternately, in another embodiment, the first and second locations are file systems of two different computers connected via a network.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] A more complete appreciation of the invention and many of the attendant advantages thereof will become readily apparent with reference to the following detailed description, particularly when considered in conjunction with the accompanying drawings, in which:

[0011] **FIG. 1** is a screen capture of an annotation applied to a Portable Document Format (PDF) file;

[0012] **FIG. 2** is a schematic illustration of a computer for providing the services of the present invention;

[0013] **FIG. 3A** is a block diagram of a first embodiment of the present invention in which original documents and their annotations are stored on a single computer;

[0014] **FIG. 3B** is a block diagram of a second embodiment of the present invention in which original documents and their annotations are stored on a separate computers connected via a network;

[0015] **FIG. 4A** is a block diagram showing a graphical user interface (GUI) displaying an original document;

[0016] **FIG. 4B** is a block diagram showing the GUI of **FIG. 4A** displaying a set of annotations;

[0017] **FIG. 4C** is a block diagram showing the GUI of **FIG. 4A** displaying an original document overlaid with the annotations of **FIG. 4B**;

[0018] **FIG. 5** is a block diagram showing that a first computer can perform a search of remotely stored annotations;

[0019] **FIG. 6** is a screen capture showing an exemplary database structure for storing annotations external to an original document;

[0020] **FIG. 7** is a screen capture showing an exemplary structure for storing rules triggered by the creation of a new annotation or the modification of an existing annotation;

[0021] **FIG. 8A** is a screen capture showing an exemplary user interface for selecting at least one review of a set of reviews accessible by a user;

[0022] **FIG. 8B** is a screen capture showing the exemplary user interface of **FIG. 8A** expanded by using the details arrow;

[0023] **FIG. 9A** is a screen capture showing an exemplary user interface, including a native toolbar and a supplemental toolbar, for annotating an electronic document;

[0024] **FIG. 9B** is a screen capture showing an annotation of the electronic document of **FIG. 9A**;

[0025] **FIG. 10** is a screen capture showing the status of reviews of a set of reviews of **FIG. 8A** that are accessible by a user;

[0026] **FIG. 11** is a screen capture showing the options for a set of reviews of **FIG. 8A** that are accessible by a user;

[0027] **FIG. 12** is a screen capture showing the review information, including a list of reviewers, for the first document of **FIG. 8A**;

[0028] **FIG. 13A** is a screen capture of an exemplary interface for creating a review of a document specified in the attach file box;

[0029] **FIG. 13B** is a screen capture of an exemplary interface for creating a review of a document specified via the browse dialog box;

[0030] **FIG. 14A** is a screen capture of an exemplary interface showing the patent review options of a document selected in **FIG. 13A** or 13B, using one reviewer at a time;

[0031] **FIG. 14B** is a screen capture of an exemplary interface showing the proposal review options of a document selected in **FIG. 13A** or 13B, using serial review, one reviewer at a time;

[0032] **FIG. 15** is a screen capture of an exemplary interface showing the proposal review options of a document selected in **FIG. 13A** or 13B, using parallel review between all reviewers simultaneously without a specified time limit;

[0033] **FIG. 16** is a screen capture of an exemplary interface showing the proposal review options of a document selected in **FIG. 13A** or 13B, using parallel review between all reviewers with a specified enter time;

[0034] **FIG. 17** is a screen capture of an exemplary interface showing the rules triggered by a category, action or stamp;

[0035] **FIG. 18A** is a screen capture of an annotation added to a document;

[0036] **FIG. 18B** is a screen capture of a follow-up to a the annotation of **FIG. 18A**; and

[0037] **FIG. 19** is a block diagram of interactions between a database for storing form fields and a form in which fields can be populated.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0038] Referring now to the drawings, in which like reference numerals designate identical or corresponding parts throughout the several views, **FIG. 2** is a schematic illustration of a computer system for managing annotations for documents, either locally or using a wide area network (e.g., the Internet). A computer **100** implements the method of the present invention, wherein the computer housing **102** houses a motherboard **104** which contains a CPU **106**, memory **108** (e.g., DRAM, ROM, EPROM, EEPROM, SRAM, SDRAM, and Flash RAM), and other optional special purpose logic devices (e.g., ASICs) or configurable logic devices (e.g., GAL and reprogrammable FPGA). The computer **100** also includes plural input devices, (e.g., a keyboard **122** and mouse **124**), and a display card **110** for controlling monitor **120**. In addition, the computer system **100** further includes a floppy disk drive **114**; other removable media devices (e.g., compact disc **119**, tape, and removable magneto-optical media (not shown)); and a hard disk **112**, or other fixed, high density media drives, connected using an appropriate device bus (e.g., a SCSI bus, an Enhanced IDE bus, or a Ultra DMA bus). Also connected to the same device bus or another device bus, the computer **100** may additionally include a compact disc reader **118**, a compact disc reader/writer unit (not shown) or a compact disc jukebox (not shown). Although compact disc **119** is shown in a CD caddy, the compact disc **119** can be inserted directly into CD-ROM drives that do not require caddies. In addition, a printer (not shown) also provides printed listings of annotations stored externally to an original document.

[0039] As stated above, the system includes at least one computer readable medium. Examples of computer readable media are compact discs **119**, hard disks **112**, floppy disks, tape, magneto-optical disks, PROMs (EPROM, EEPROM, Flash EPROM), DRAM, SRAM, SDRAM, etc. Stored on any one or on a combination of computer readable media, the present invention includes software for controlling both the hardware of the computer **100** and for enabling the computer **100** to interact with a human user. Such software may include, but is not limited to, device drivers, operating systems and user applications, such as development tools. Such computer readable media further includes the computer program product of the present invention for storing and managing annotations for original documents external to those original documents. The computer code devices of the present invention can be any interpreted or executable code mechanism, including but not limited to scripts (including Active Server pages), interpreters, dynamic link libraries, Java classes, and complete executable programs. These computer code devices may run on either one of, or on a combination of, a client and a server computer. Information on providing Web services is provided in the following references which are incorporated herein by reference: (1) Visual Studio Core Reference Set, by Microsoft Press, (2) Visual InterDev 6.0: Web Technologies Reference, by Microsoft Press, (3) Professional Active Server Pages 2.0 by Francis et al., published by WROX Press Ltd., (4) Oracle PL/SQL Programming by Scott Urman, Published: March 1996, (5) Hitchhikers Guide to Visual Basic and SQL Server: with CD-ROM, by William Vaughn, Published: May 1997, (6) Using Microsoft SQL Server 6.5 (Special Edition) by Stephen Wynkoop, Published: March 1997, and (7) Advanced PowerBuilder 6 Techniques by Ramesh Chandak.

[0040] Turning now to **FIG. 3A, a** stand-alone computer **100** stores in one or more separate file systems both original documents and annotations. As shown in FIGS. **4A-4C**, using a graphical user interface (GUI) of the computer **100**, a user can combine the separately stored original documents and annotations. An advantage of such a separation is that the original document need not be altered directly. This

enables the original document to be stored as a read-only file. Moreover, the annotations can be made immutable, i.e., write-once with multiple reads, but they cannot be overwritten. This speeds up access to the annotations and removes the need for complicated version control logic. Another advantage of this distributed annotations model is that it is possible to annotate a document that is not in the same system as the annotator or annotations. The annotations manager need only be pointed to the location of the document (e.g., by using a URL of the PDF) such that the manager can read the document in—even if the manager cannot write to the file.

[0041] As shown in **FIG. 5**, the computer code devices of the computer **100** control the GUI to determine what portion of which page(s) of a document is being displayed and what annotations need to be superimposed on that portion. For example, in one embodiment of the present invention, a Web browser acts as the graphical user interface using an annotations plug-in (e.g., an Adobe Acrobat/Reader plug-in). In another embodiment, Lotus Notes acts as a primary GUI, with a plug-in modifying the standard interface of Lotus Notes. Plug-ins can be implemented in a fashion known to those of ordinary skill in the art (e.g., as a computer code device written as a C++ programming language dynamic linked library). The plug-in (annotations manager) determines what portion (e.g., described as a bounding box) of what page is currently being displayed using an Application Program Interface (API) associated with Adobe Acrobat. The annotation manager than queries an annotation repository (e.g., a database) to determine if any annotations are present in that area.

[0042] By way of an example, turning to **FIG. 6**, the annotation manager queries a database to determine the annotations on page 1. As a result, the database returns two records indicating that annotations with UIDs equal to 1 and 2 are present on page 1. The annotation manager can then parse out the x and y locations of those annotations (e.g., from the x_pos and y_pos fields, respectively), and superimpose the corresponding text if the corresponding portions of the page are displayed. In an alternate embodiment of annotations of varying sizes, the database may likewise contain an additional coordinate pair (e.g., (x_extent, y_extent)) that specifies, in conjunction with the base coordinate (e.g., (x_pos, y_pos)) the bounds of where the annotation is displayed. In one such embodiment, all coordinates are expressed in native coordinates of a PDF file.

[0043] As would be evident to one of ordinary skill in the art from the present disclosure, the database of **FIG. 6** could likewise contain a field that distinguishes between textual and graphical annotations. In such an embodiment, the "Note" field could be re-used to include the filename or Uniform Resource Locator (URL) of the corresponding graphic to be displayed at the specified location. In yet another embodiment, at least one graphic is associated with each text annotation such that the user is shown an icon (or other image) corresponding to a minimized annotation. Upon activating the minimized icon (e.g., by clicking on it with a mouse), the text annotation is displayed, either superimposed on the original document or in a separate window of the GUI.

[0044] Returning to **FIG. 3**B, in an alternate embodiment of the present invention, the annotations and the original documents are not stored on a single machine. Instead, a first computer **100**A stores the original documents, and a second computer **100**B stores the annotations (e.g., in a Lotus Notes database). The annotations and original documents can be combined using the network connecting the two computers **100**A and **100**B.

[0045] As would be understood by one of ordinary skill in the art, the annotations may also include drawn annotations (e.g., using free-hand or pre-defined shapes) and highlighting. Highlighting provides the illusion of changing the color of the underlying original document while still being able to see the original document through the highlighting. As with all annotations of the present invention, highlighting is done without changing the contents of the original document.

[0046] In order to create a new text annotation, the text tool of the annotation manager displays (or "pops up") a typing area in which the annotation can be typed. That annotation is then written back to the annotation repository. The annotations may be written back for storage in any form specified by the communication protocol between the annotation manager and the annotation repository. In one embodiment, the annotation is written back in eXtended Markup Language (XML) to enable flexible processing of the annotation by at least one third-party program.

[0047] In order to modify an existing text annotation, the annotation manager requests from the annotation repository an existing annotation specified by a user (through the GUI). The retrieved annotation is then displayed as an overlay or in a separate window.

[0048] Creation of a new annotation and/or the modification of an existing annotation can cause the annotation manager to perform processing specified in a set of processing rules. For example, as shown in **FIG. 7** in pseudo rules and pseudo commands, the deletion of an annotation always triggers storage of an archival copy of the annotation. This prevents annotations from inadvertently becoming irretrievable. Similarly, the "Update" rule of **FIG. 7** causes an e-mail to be sent to "MNOP" for each new annotation that "XYZ" makes. Such a procedure may be required where an architect or professional engineer needs to approve changes to a blueprint. Similarly, a senior associate or partner may need to approve all annotations to documents that have been included in a privilege log. (Additional rule processing is explained in more detail with reference to **FIG. 17**, below.)

[0049] As would be understood by one of ordinary skill in the art, the rules and/or commands may be written in any language supported by the annotation repository. For example, the addition of a record to a Lotus Notes database can be used to trigger the condition checking and rules processing described above. In this way, the condition checking code need not be rewritten. Instead, the Lotus Notes services can be re-used.

[0050] As would be appreciated by one of ordinary skill in the art, the communication between the annotation manager and the annotation repository may either be implicit (e.g., using database calls) or explicit (e.g., using TCP/IP sockets or using a Java communications interface).

[0051] Additional details of the present invention are discussed herein using actual captured computer screen images. **FIG. 8A** is a screen capture showing an exemplary user interface for selecting at least one review of a set of

reviews accessible by a user. (As would be appreciated by one of ordinary skill in the art, to get to such an interface, a user is required to authenticate himself/herself to the remote information server (i.e., to the Web server in the exemplary embodiment). Such authentication may be way of a username and password, a certificate, or any other authentication technique.) Accordingly, the user "mcasey" has logged into the system and has access to three different documents that can be selected by links **800**A, **800**B, and **800**C. As shown, each document is illustrated as having a title, an originator, a creation date, a list of reviewers, and an end-date. As would be evident to one of ordinary skill in the art, other information categories about documents could also be provided.

[**0052**] In one embodiment, each user interface also includes a "details" arrow **805**A and **805**B that allows a user to select additional/expanded details about any one of the documents. Once a corresponding arrow (**805**A or **805**B) has been selected, the corresponding arrow is rotated, and the additional detail is shown. **FIG. 8B** is a screen capture showing the exemplary user interface of **FIG. 8A** expanded by using the details arrow. In one embodiment of the present invention, such detail is provided using Dynamic HTML (DHTML). In an alternate embodiment of the present invention, such detail is provided using JavaScript. In yet an alternate embodiment of the present invention, such detail is provided using a combination of DHTML and JavaScript.

[**0053**] **FIG. 9A** is a screen capture showing an exemplary user interface, including a native toolbar **900** and a supplemental toolbar **910**, for annotating an electronic document. In one embodiment of the present invention, to achieve the dual toolbars, Adobe Acrobat acts as a first plug-in to a browser (e.g., the Microsoft browser as illustrated), and then the system of the present invention acts as a second plug-in to Adobe Acrobat. In one embodiment of the present invention, a second log-in sequence is used to authenticate the second plug-in (i.e., the plug-in to Acrobat) to the information server of database server providing the annotations.

[**0054**] The supplemental toolbar **910** includes icons **920**A through **920**G for (A) refreshing the annotations, (B) filtering annotations, (C) inserting new annotations, (D) draw a rectangle, (E) highlight text or graphics, (F) strikeout text or graphics, and (G) stamp a document. Also illustrated is a text annotation **925**. By selecting that annotation (e.g., by double clicking on it), the text of the annotation is brought up (e.g., in a dialog box as shown in **FIG. 9B**). In one embodiment of the present invention, it is possible to add text to the annotation by typing in the text box **950** and selecting the OK button **960**. Preferably, the added text is stored as its own record, thereby enabling the original record not to have to be locked during the add operation. This reduces contention for individual records and speeds the addition process.

[**0055**] **FIG. 10** is a screen capture showing the status of reviews of a set of reviews of **FIG. 8A** that are accessible by a user. None of the documents are scheduled for future review, and each document was submitted at a different time.

[**0056**] **FIG. 11** is a screen capture showing the options for a set of reviews of **FIG. 8A** that are accessible by a user. The categories **1100**, actions **1105**, and stamps **1110** change depending on the review type **1120** being specified. For example, the Patent Application type includes a "claim" category that is not applicable to the proposal and marketing/PR types since proposals and marketing materials do not contain claims.

[**0057**] Once the information of **FIG. 11** is entered into a long-term repository (e.g., database on the information server), it can be queried to determine a current status of the review options. **FIG. 12** is a screen capture showing the review information, including a list of reviewers, for the first document of **FIG. 8A**.

[**0058**] **FIG. 13A** is a screen capture of an exemplary interface for creating a review of a document. By specifying a file name in the "attach file" box **1300**, an electronic document is selected to have the specified attributes. In an alternate embodiment of the present invention, as shown in **FIG. 13**B, the file name specified by selecting the browse button **1305** which brings up the browse dialog box **1320**. Using either interface, the file type should be specified (e.g., using radio buttons **1310**).

[**0059**] Once a review has been specified for a document, changes in the review options can be made by selecting a hyperlink to the document or by using the filename box **1440** (**FIG. 14A**). The review types **1120** of **FIG. 11** are converted to radio buttons (e.g., **1405**A and **1405**B) that can be selected as shown in **FIG. 14A**. In the illustrated embodiment of the user interface, for the patent application review type **1405**A, the user has selected, via drop down box **1400**, to perform a serial review using one reviewer at a time. To "encourage" the reviewer to complete the review within the period set in the time area **1415**, the drop down box **1405** establishes that the e-mail reminders are to be sent until the review has been completed. This prevents one user from holding up the entire review process. The reviewer can then specify other options for the proposal review type **1405**B, as shown in **FIG. 14B**.

[**0060**] In an alternate embodiment of the present invention, as shown in **FIG. 15**, the type of review drop-down box **1400** enables the user to select to use parallel review between all reviewers simultaneously. Although a time limit could be specified, the user has selected, using drop-down box **1405**, to specify that there is no time limit on when reviews must be completed. However, had the user selected, using drop-down box **1405**, that there is a time limit, then an additional "Parallel review enter date" field **1420** would appear to enable the user to select that date.

[**0061**] Once a reviewer no longer wishes to submit additional annotations, the user notifies the system that he/she has finished reviewing a specified document. Such a notification can be made using a plug-in, on a separate web page, or by e-mail. Upon receipt of such a notification, the system records that the review is complete and removes the reviewer from the list of people to get reminders. In one embodiment, the submission of a review also triggers a message to the document "owner" or coordinator to notify the owner that one fewer review is outstanding. The message may include one or a combination of the names/user ids of (1) those people who have submitted reviews and (2) those people who are still expected to submit a review but have not.

[**0062**] As discussed above, **FIG. 17** is a screen capture of an exemplary interface showing the rules triggered by a category, action or stamp. In the illustrated example, an e-mail notification is sent to

"mcasey@notarealdomainname.com" when a legal issue is added to the document or a follow-up is added.

[0063] **FIG. 18A** is a screen capture of a general annotation added to a document. It was subsequently followed up by an additional annotation as shown in **FIG. 18B**.

[0064] In light of the movement of data from database to documents and back again, the present invention also includes a method, system and computer program product for populating forms with data from a database, as shown in **FIG. 19**. Using the same technique as described above, by submitting the form using the second plug-in, the second plug-in can parse the form fields to store their corresponding values into the database. Similarly, a form pulled up can be populated by the by querying the database for previously stored values.

[0065] Obviously, numerous modifications and variations of the present invention are possible in light of the above teachings. It is therefore to be understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically described herein.

1. A computer program product, comprising:

a computer storage medium and a computer program code mechanism embedded in the computer storage medium for causing a computer to separately manage an original document and annotations for the original document, the computer program code mechanism comprising:

a first computer code device configured to receive an original document stored in a first file repository;

a second computer code device configured to create at least one of a text annotation and a graphical annotation for the original document;

a third computer code device configured to overlay the original document and the at least one of a text annotation and a graphical annotation without changing a contents of the original document; and

a fourth computer code device configured to send the at least one of a text annotation and a graphical annotation to a second file repository containing a workflow message trigger activated by adding the at least one of a text annotation and a graphical annotation to a second file repository.

2. The computer program product as claimed in claim 1, wherein the second file repository comprises a fifth computer code device configured to add the at least one of a text annotation and a graphical annotation to a database.

3. The computer program product as claimed in claim 1, wherein the first through fourth computer code devices comprise a plug-in to a markup language browser.

4. The computer program product as claimed in claim 1, wherein the original document comprises an Adobe Acrobat document.

5. The computer program product as claimed in claim 1, further comprising a fifth computer code device configured to authenticate a user to at least one of the first and second file repositories.

6. The computer program product as claimed in claim 1, wherein the first computer code device comprises a fifth computer code device configured to receive a form document illustrating at least one form field; and

wherein the second computer code device comprises a sixth computer code device configured to create a text annotation by extracting a contents of the at least one form field.

7. The computer program product as claimed in claim 1, wherein the second computer code device comprises a fifth computer code device configured to specify a corresponding category for the at least one of a text annotation and a graphical annotation.

8. The computer program product as claimed in claim 7, further comprising a sixth computer code device configured to select a trigger type for execution based on the category specified for the at least one of a text annotation and a graphical annotation.

9. A computer-implemented method comprising:

(a) receiving an original document stored in a first file repository;

(b) creating at least one of a text annotation and a graphical annotation for the original document;

(c) overlaying the original document and the at least one of a text annotation and a graphical annotation without changing a contents of the original document; and

(d) sending the at least one of a text annotation and a graphical annotation to a second file repository containing a workflow message trigger activated by adding the at least one of a text annotation and a graphical annotation to a second file repository.

10. The method as claimed in claim 9, wherein the second file repository comprises a database.

11. The method as claimed in claim 9, wherein the steps (a)-(d) are performed by a plug-in to a markup language browser.

12. The method as claimed in claim 9, wherein the original document comprises an Adobe Acrobat document.

13. The method as claimed in claim 9, further comprising authenticating a user to at least one of the first and second file repositories.

14. The method as claimed in claim 9, wherein the step (a) comprises receiving a form document illustrating at least one form field; and

wherein the step (b) comprises creating a text annotation by extracting a contents of the at least one form field.

15. The method as claimed in claim 9, wherein the step (b) comprises specifying a corresponding category for the at least one of a text annotation and a graphical annotation.

16. The method as claimed in claim 15, further comprising selecting a trigger type for execution based on the category specified for the at least one of a text annotation and a graphical annotation.

17. The method as claimed in claim 15, further comprising triggering a category-specific trigger based on the category specified for the at least one of a text annotation and a graphical annotation.

18. A system for separately managing an original document and annotations for the original document, the system comprising:

a receiver configured to receive an original document stored in a first file repository;

an input device configured to create at least one of a text annotation and a graphical annotation for the original document;

an overlay circuit configured to overlay the original document and the at least one of a text annotation and a graphical annotation without changing a contents of the original document; and

a transmitter configured to send the at least one of a text annotation and a graphical annotation to a second file repository containing a workflow message trigger activated by adding the at least one of a text annotation and a graphical annotation to a second file repository.

* * * * *