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(54) **DOCUMENT DELIVERY SYSTEM
FACILITATING AGGREGATION OF
PERIODIC CONTENT**

Publication Classification

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(57) **ABSTRACT**

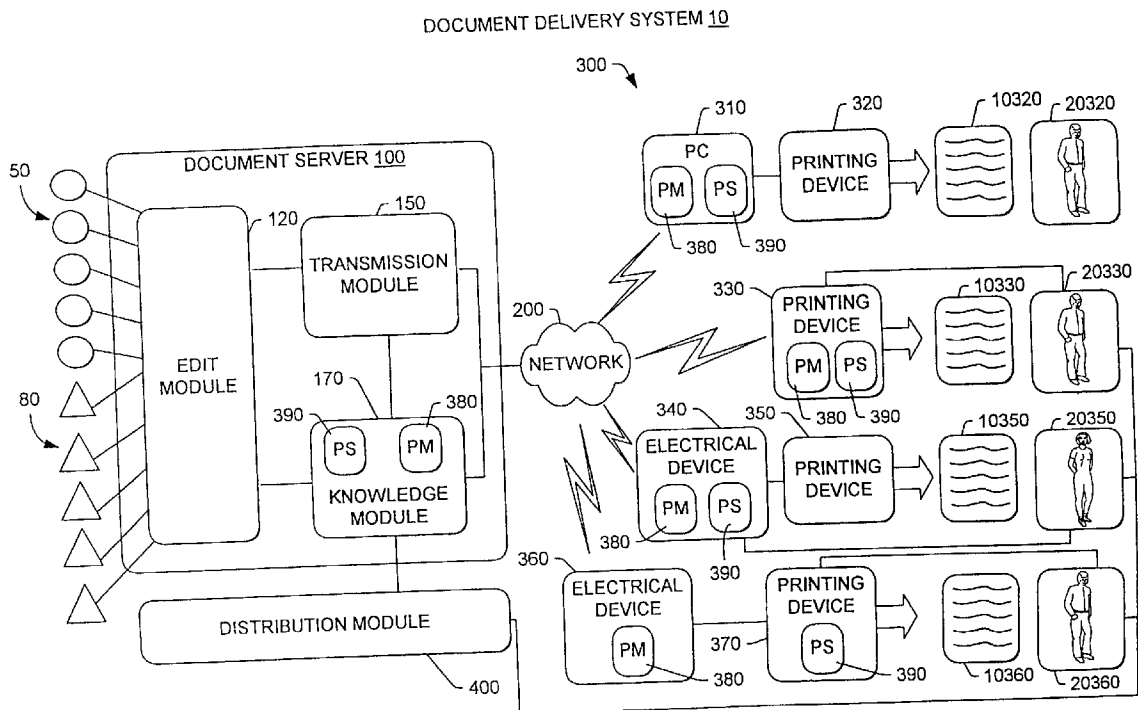
A document server is presented comprising a user profile, established by a user requesting delivery of content from one or more content providers on a periodic basis, and an edit module. The edit module periodically receives content from solicited content providers in accordance with a content provider publication schedule, and aggregates the received content for periodic delivery to a requesting user when the content provider's publication schedule deviates from a delivery schedule defined in the user profile.

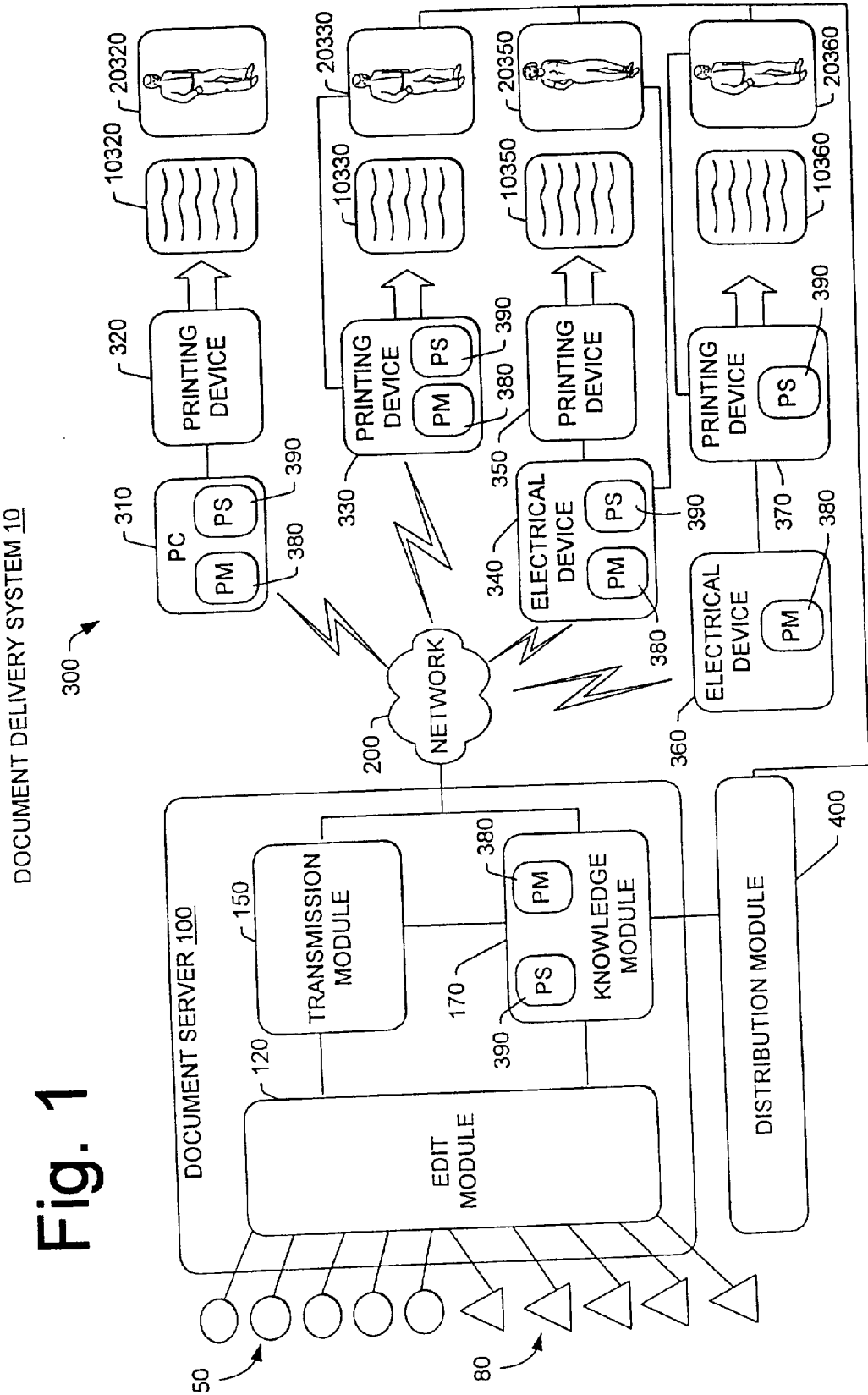
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Related U.S. Application Data

(63) **Continuation-in-part of application No. 09/325,040, filed on Jun. 7, 1999.**





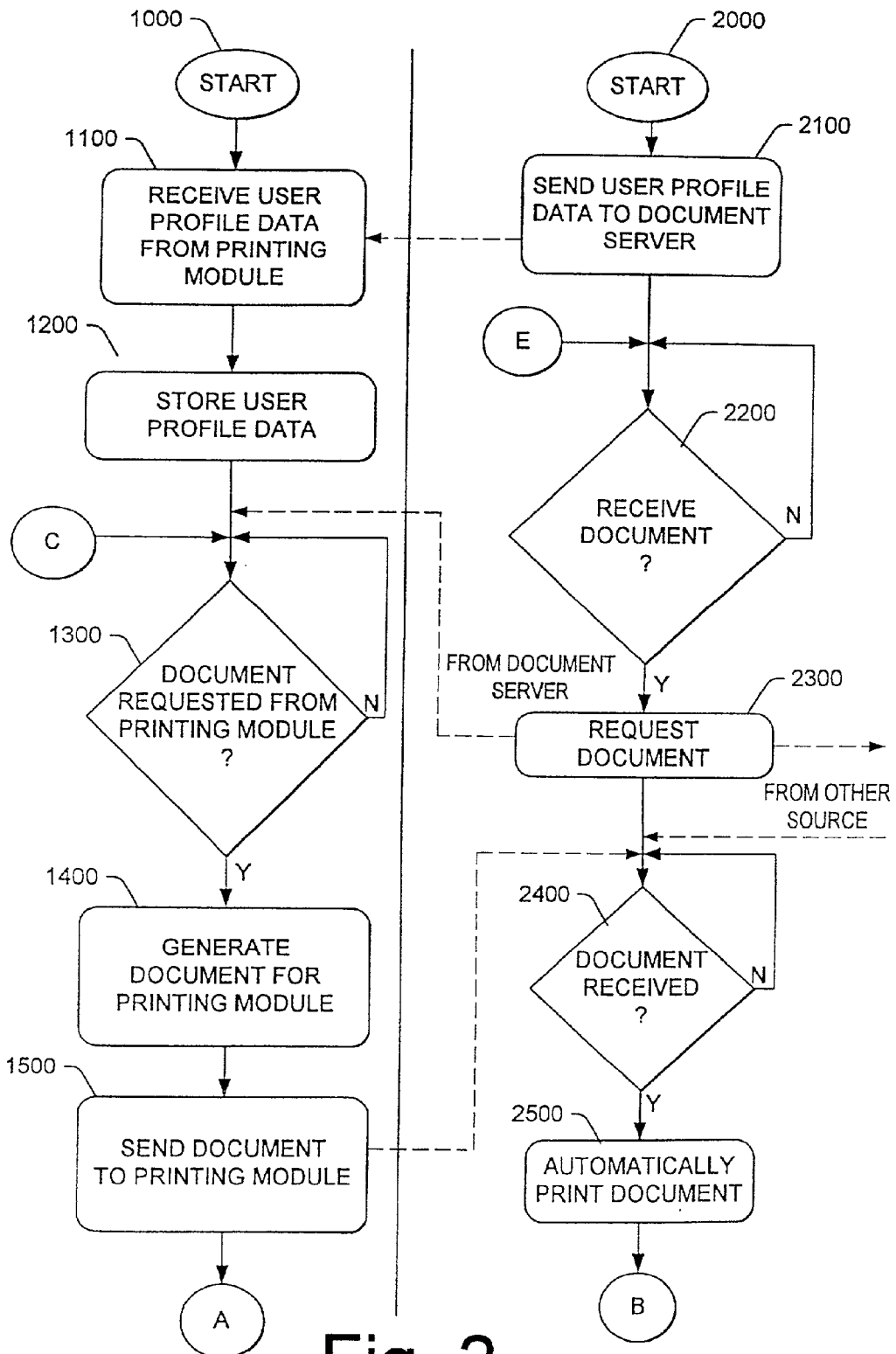


Fig. 2

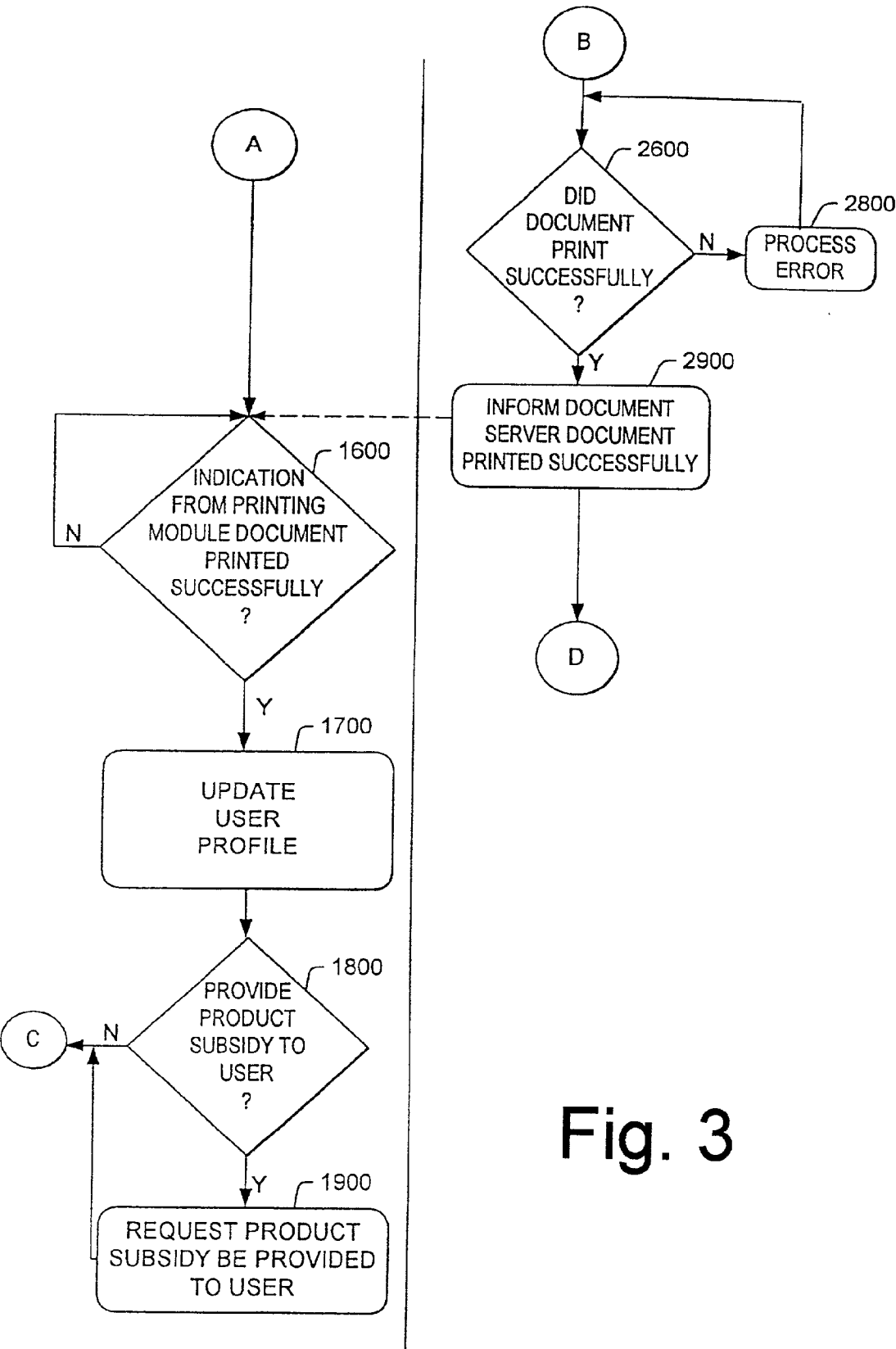


Fig. 3

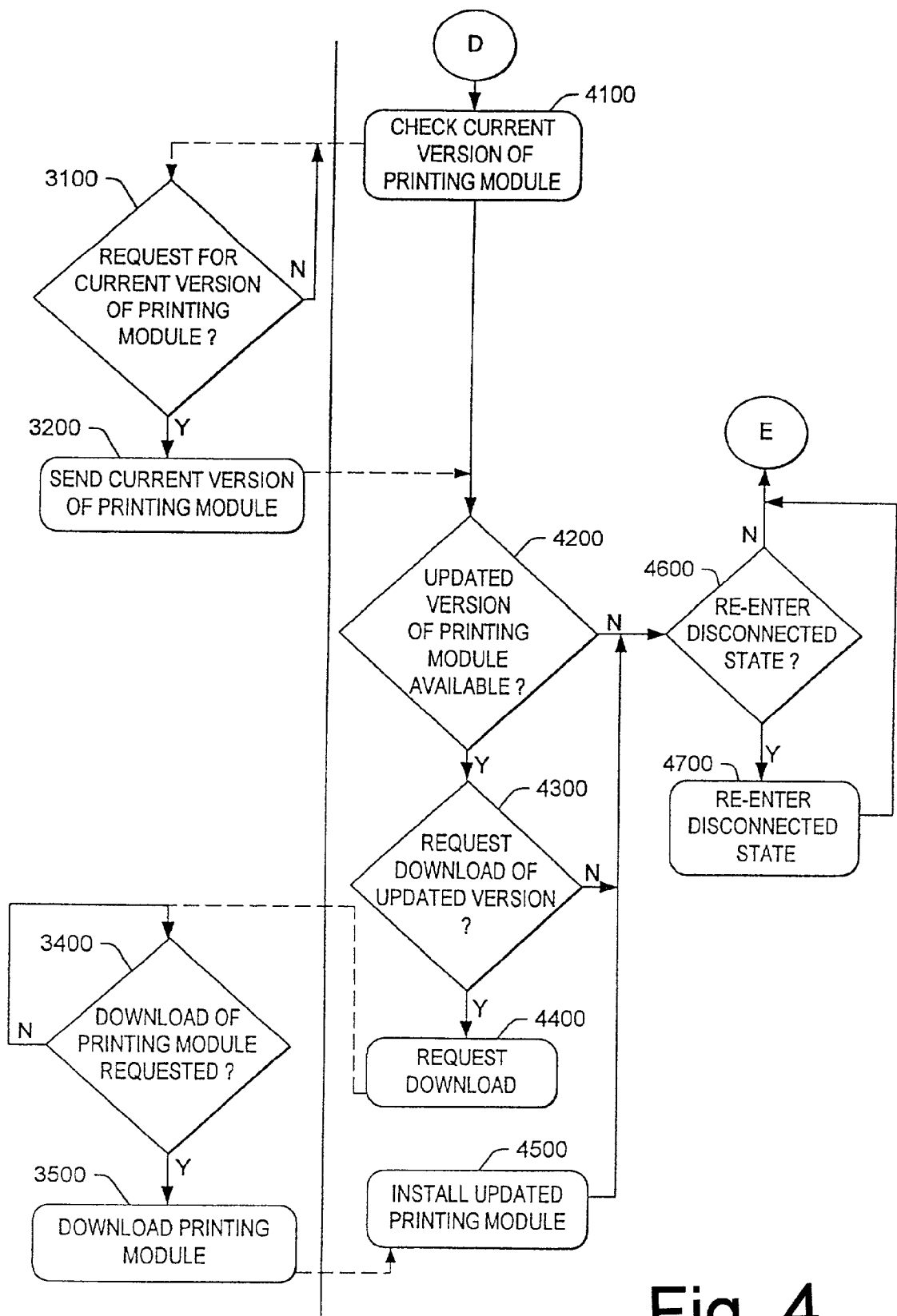


Fig. 4

HP INSTANT DELIVERY


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Fig. 5

TELL US ABOUT YOURSELF-MICROSOFT INTERNET EXPLORER

FILE EDIT VIEW GO FAVORITES HELP

BACK FORWARD STOP REFRESH HOME SEARCH FAVORITES HISTORY CHANNELS LINKS

TELL US ABOUT YOURSELF

FIELDS MARKED WITH RED LABELS ARE REQUIRED TO BE COMPLETED.

NAME:

FIRST, MI:

LAST

E-MAIL ADDRESS:

WHERE WILL YOU USE THIS PRODUCT?

<SELECT> ▼

COMPANY/INSTITUTION:

COMPANY NAME:

STREET ADDRESS:

CITY: STATE: <SELECT> ▼ ZIP:

VOICE PHONE: () EXT.

PRINTER INFORMATION

PRINTER TYPE: <SELECT> ▼ PRINTER MODEL:

COMPUTER INFORMATION

WHAT TYPE OF PC DO YOU USE? <SELECT> ▼ INTERNET CONNECTION <SELECT> ▼

AREAS OF INTEREST

☐ BUSINESS/FINANCE ☐ ENTERTAINMENT

☐ HOME/SELF IMPROVEMENT ☐ KIDS

☐ NEWS ☐ SPECIAL INTEREST

DONE MY COMPUTER

Fig. 6

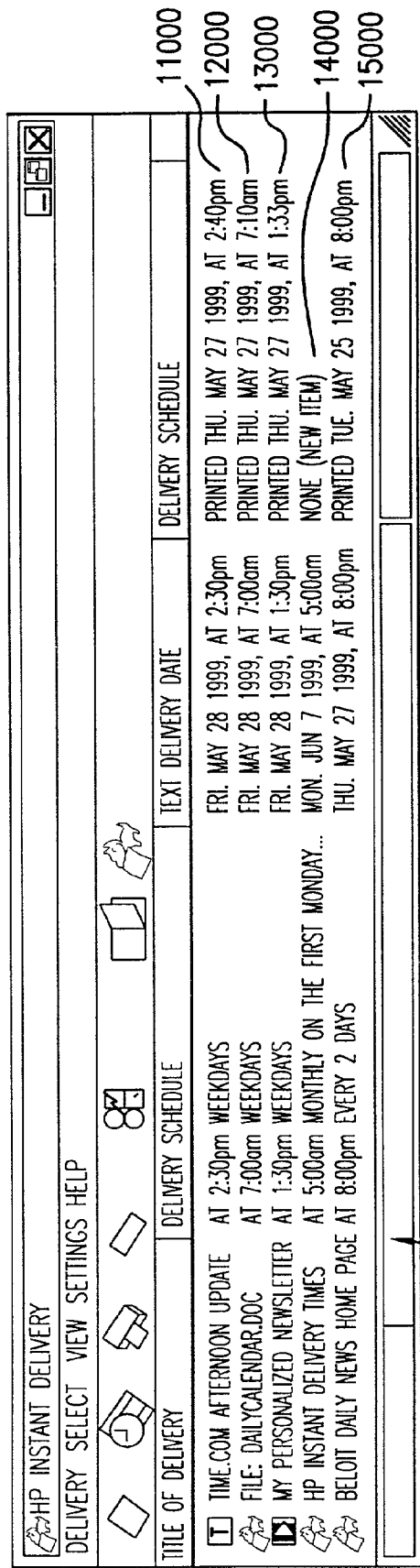


Fig. 7

 HP INSTANT DELIVERY - CNET News.com

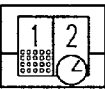
DOCUMENT SUMMARY

SCHEDULE

START/END DATE

PRINTER

DELIVERY TIME AND FREQUENCY



☐ USE THE PUBLISHER RECOMMENDED SCHEDULE

☐ USE MY DEFAULT SCHEDULE (AVAILABLE VIA THE SETTINGS MENU)

☒ USE THE CUSTOM SCHEDULE FOR THIS DELIVERY

DELIVERY DAYS

☒ DAILY
 ☐ WEEKLY
 ☐ MONTHLY

☐ EVERY

1

▲▼

 DAY(S)

☐ EVERY WEEKDAY (MON THROUGH FRI)

DELIVERY DAYS

☒ ONCE AT

9:00am

▼

 SELECT OR TYPE A DELIVERY TIME

☐ MULTIPLE TIME

8:00am

▼

ADD

DELETE

☐ MULTIPLE TIMES AT A GIVEN FREQUENCY
 FROM

12:00am

▼

 TO

10:00am

▼

 EVERY

60

▲▼

 MINUTES

OK

CANCEL

HELP

Fig. 8

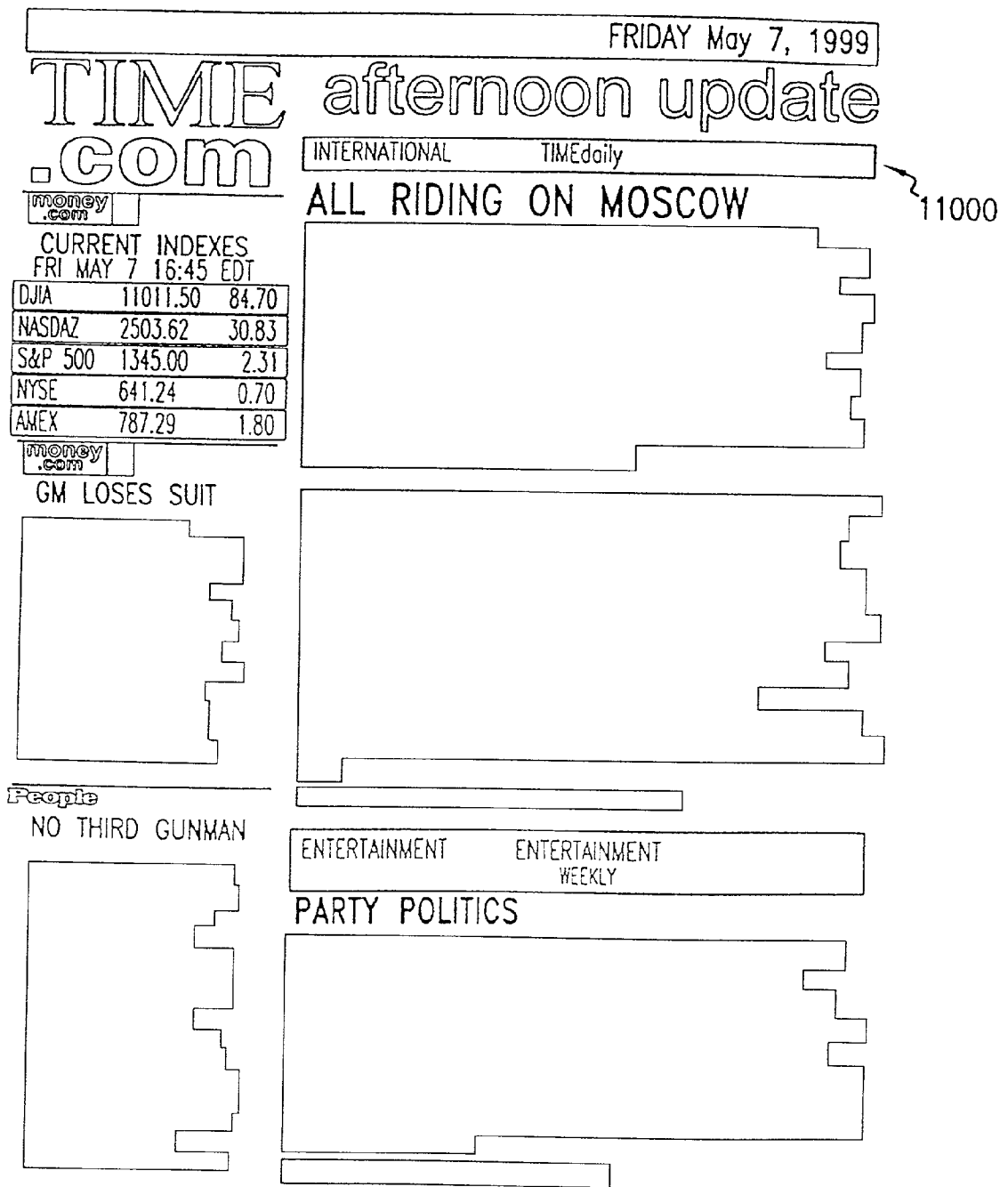


Fig. 9A

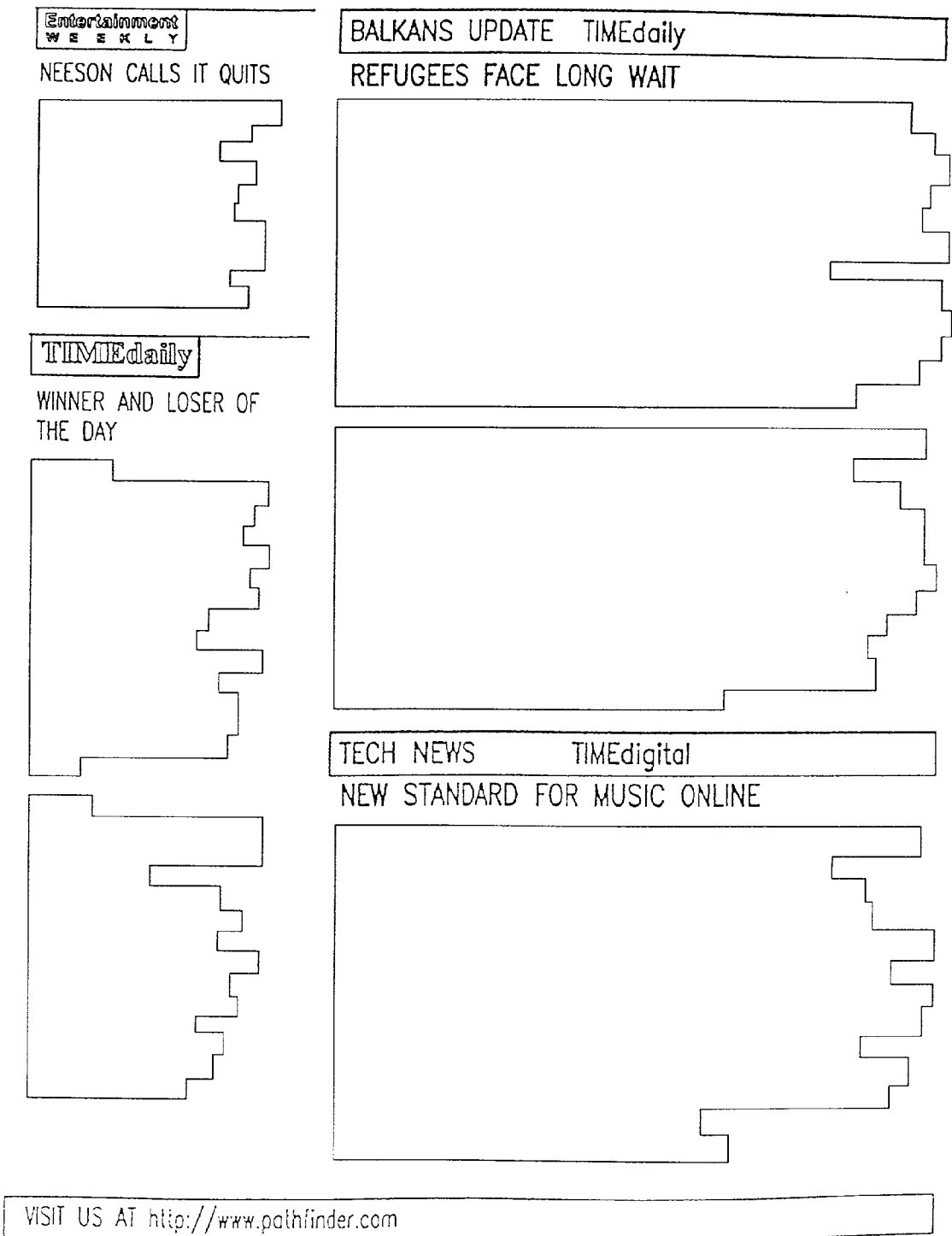


Fig. 9B

MAY 14, 1999
FRIDAY

MAY 1999

SMTWTFSS

1

2345678

9101112131415

16171819202122

23242526272829

3031

JUNE 1999

SMTWTFSS

12345

6789101112

13141516171819

20212223242526

27282930

	INTERVIEW CANDIDATE IN PALO ALTO?	UPDATE MANAGEMENT LOGS		TASKPAD
7 00			☒	TASKPAD
			☐	
8 00			☐	
	CPG TELECONFERENCE		☐	
9 00			☐	
			☐	
10 00			☐	
			☐	
11 00	LUCY WALKTHRU - RM 0		☐	
			☐	
12 00			☐	
			☐	
1 00				
2 00				
3 00				
4 00				
5 00	TAKE JUSTIN TO SOCCER PRACTICE			
6 00				

NOTES

Fig. 10

Joe's Personalized Newspaper

INSTANT DELIVERY EDITION

FEBRUARY 11, 1999



CLINTON IMPEACHMENT TRIAL

MAJORITY VOTE TO CONVICT ON PERJURY SEEMS TO BE IN DOUBT

By ERIC SCHMITT
WASHINGTON --

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MIAMI'S GENERATIONS OF EXILES, SIDE BY SIDE, YET WORLDS APART

SPECIAL REPORT BY MIREYA NAVARRO

MIAMI --

CONTINUED ON PAGE 8

Fig. 11A

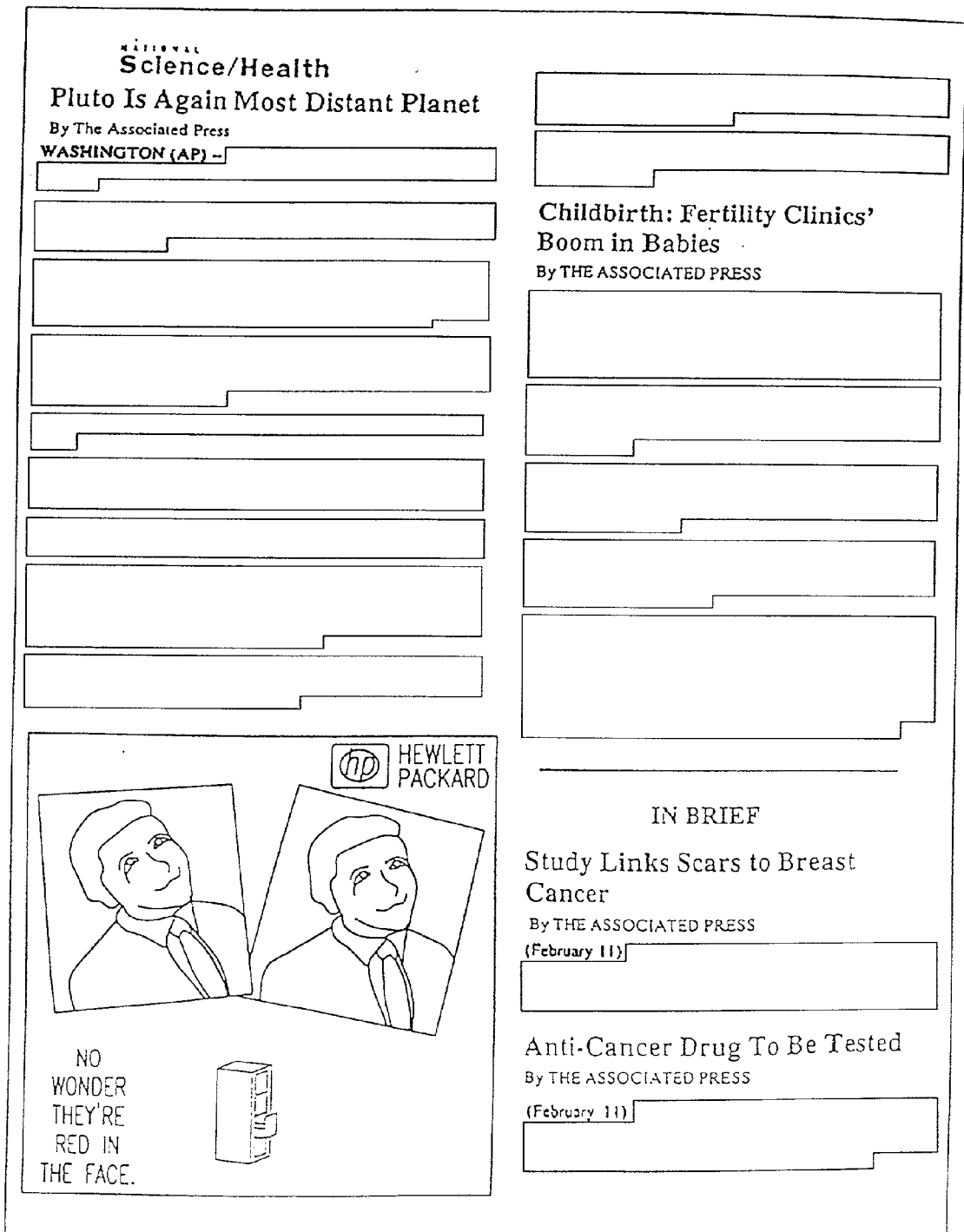


Fig. 11B

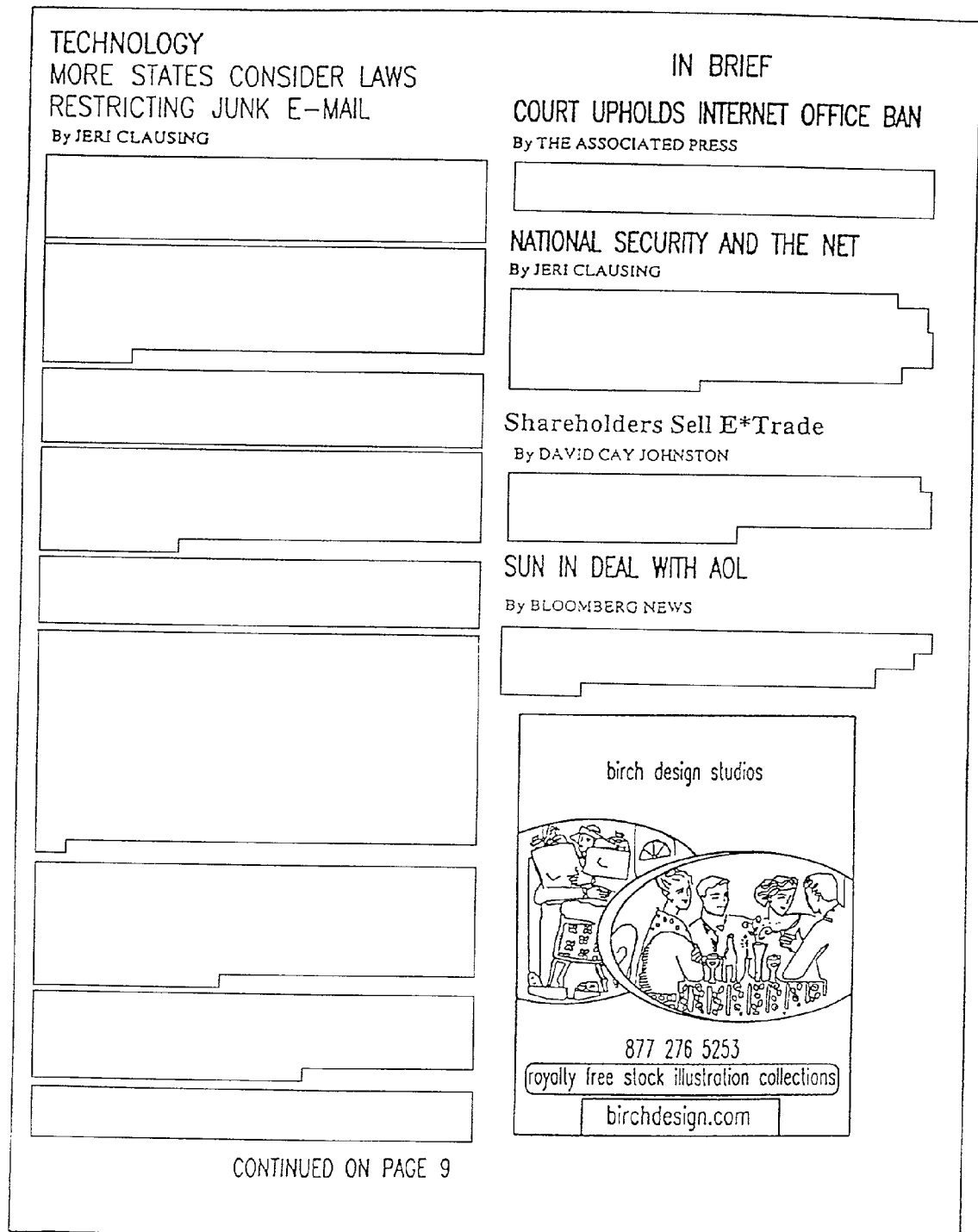


Fig. 11C

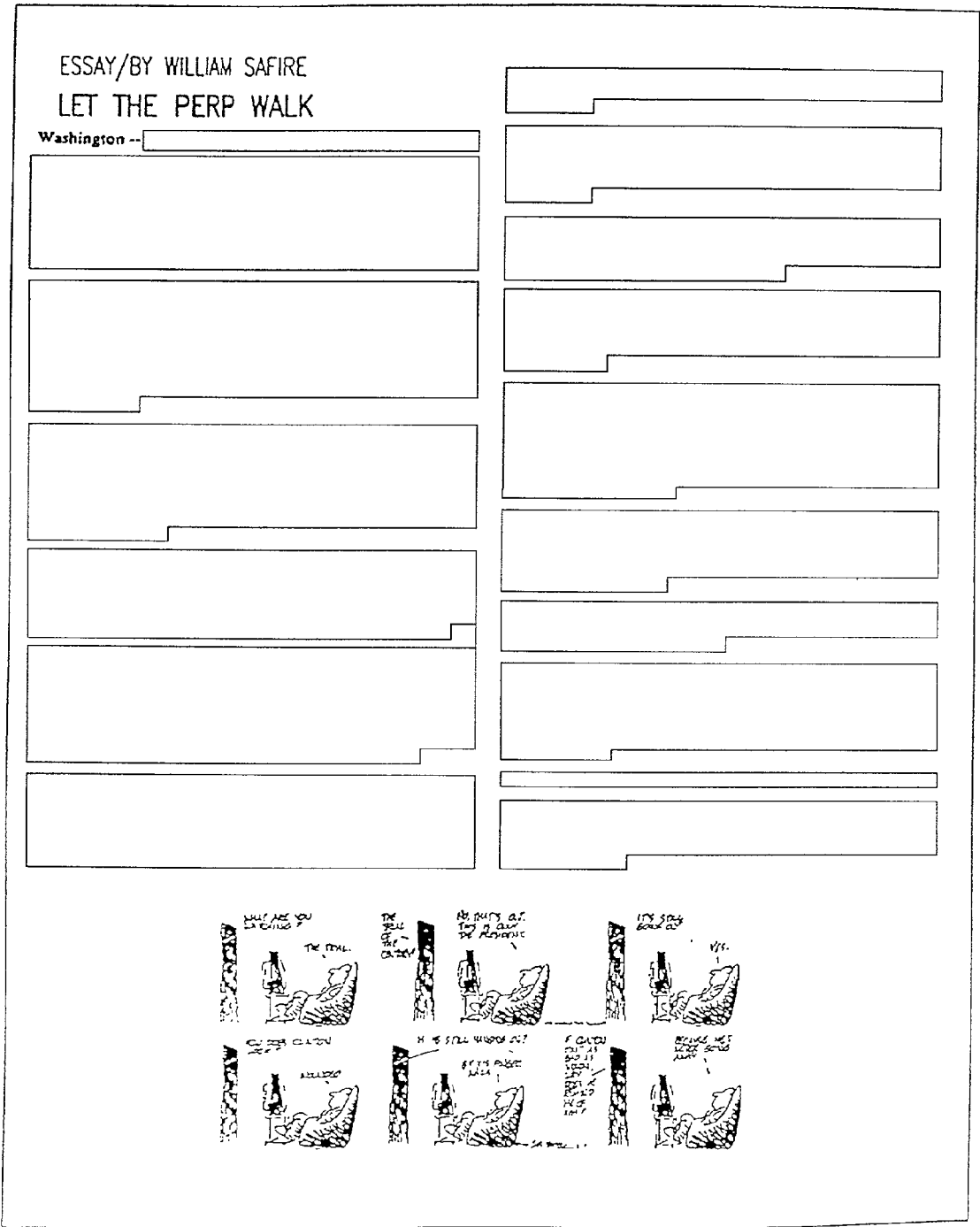


Fig. 11D

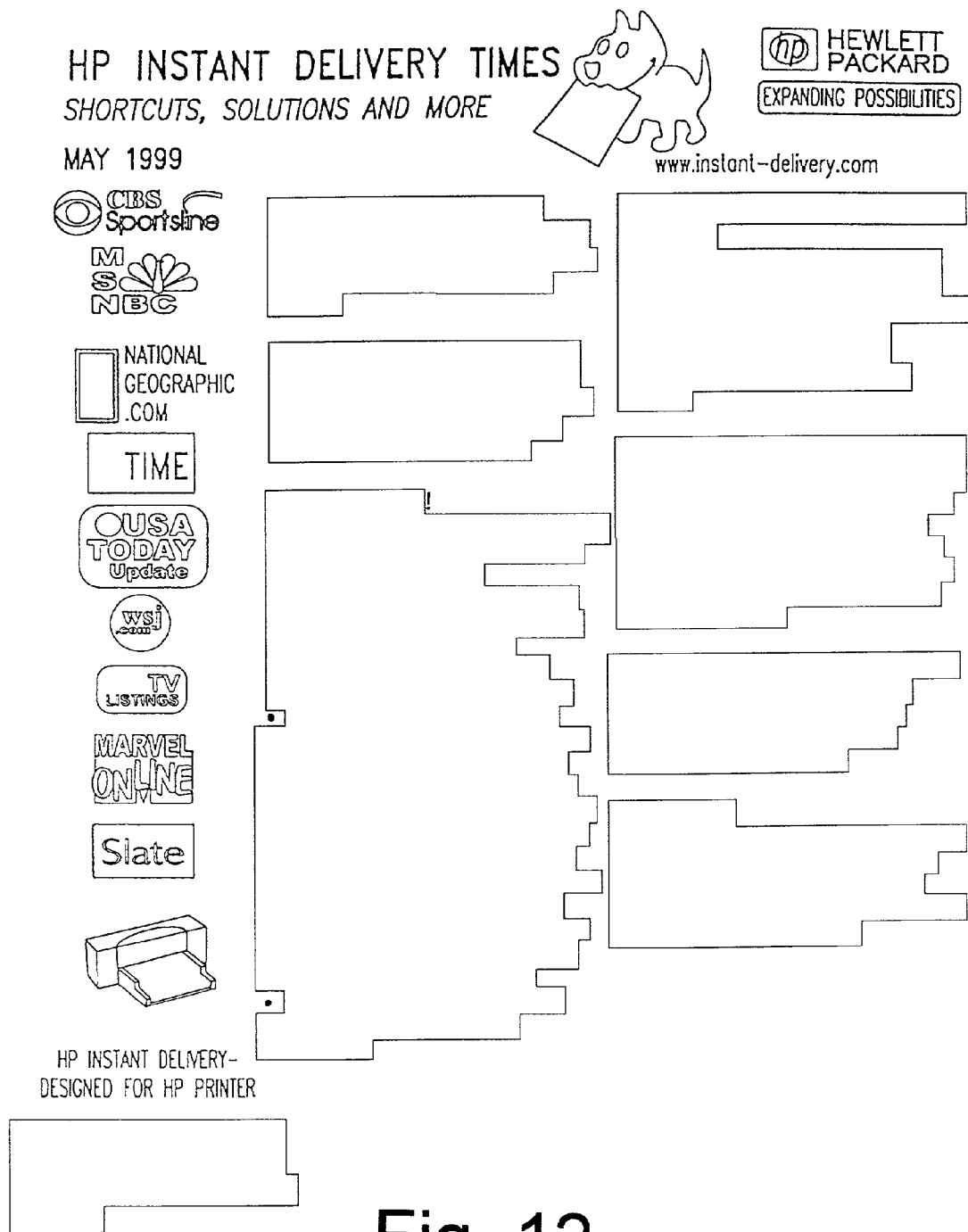


Fig. 12

Fig. 13

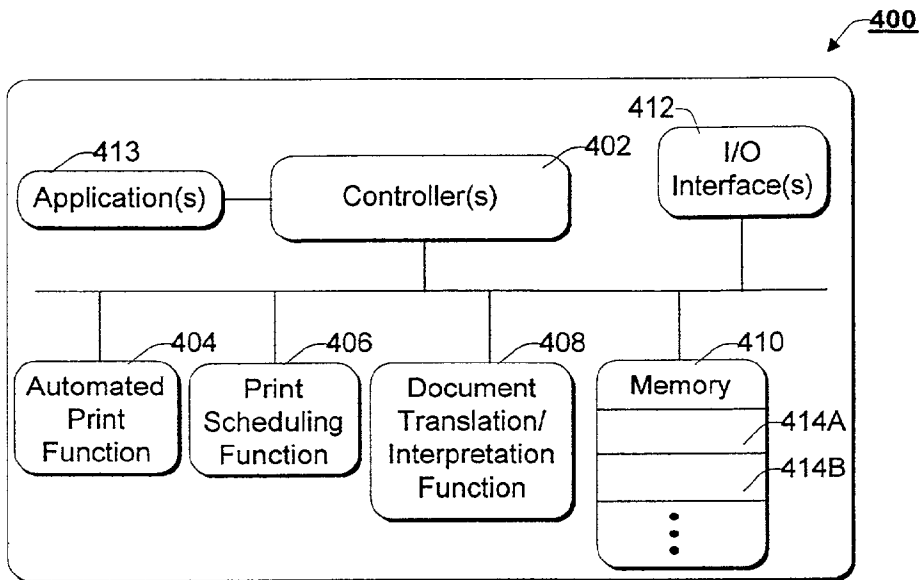


Fig. 15

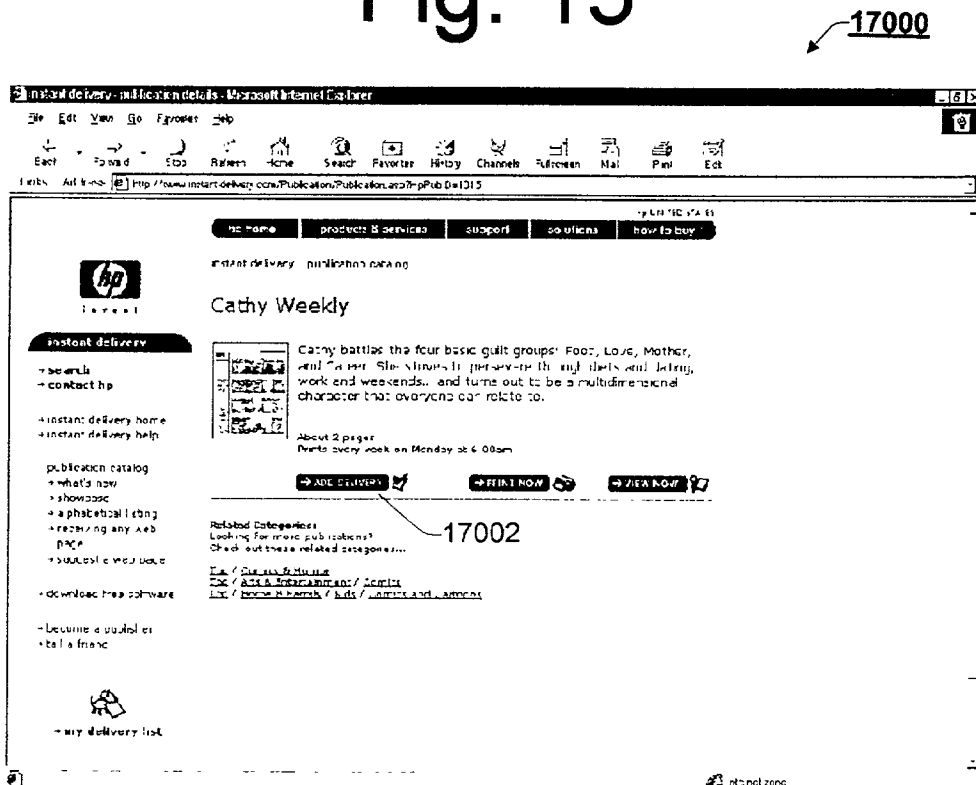


Fig. 14

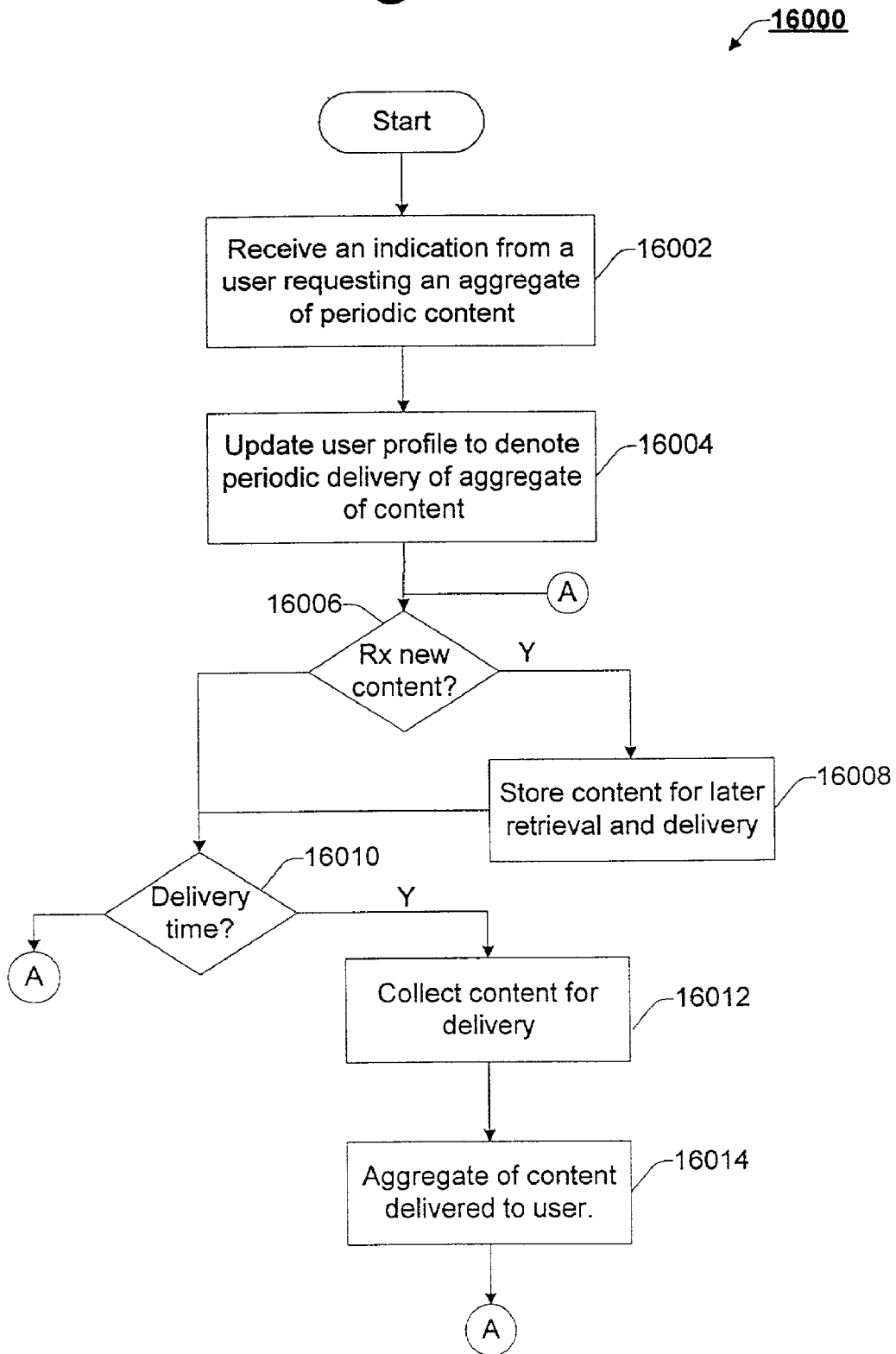


Fig. 16A

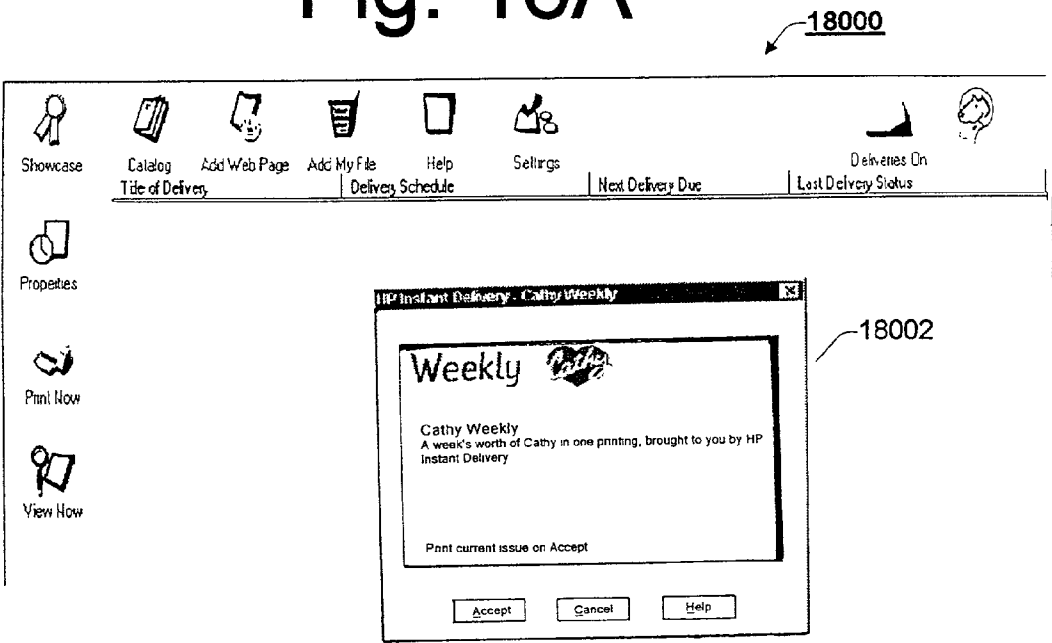


Fig. 16B

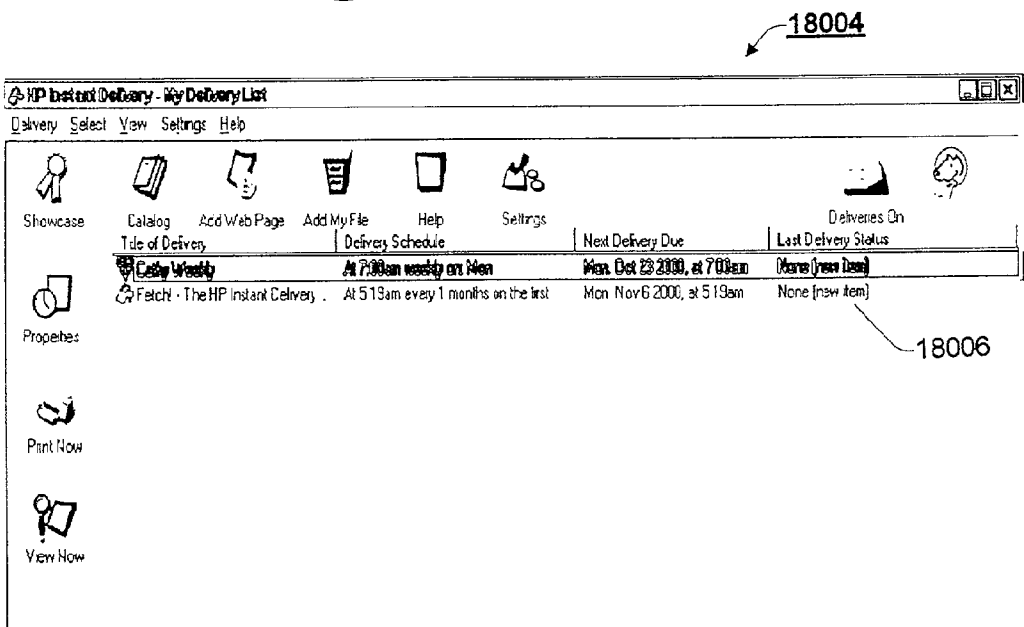
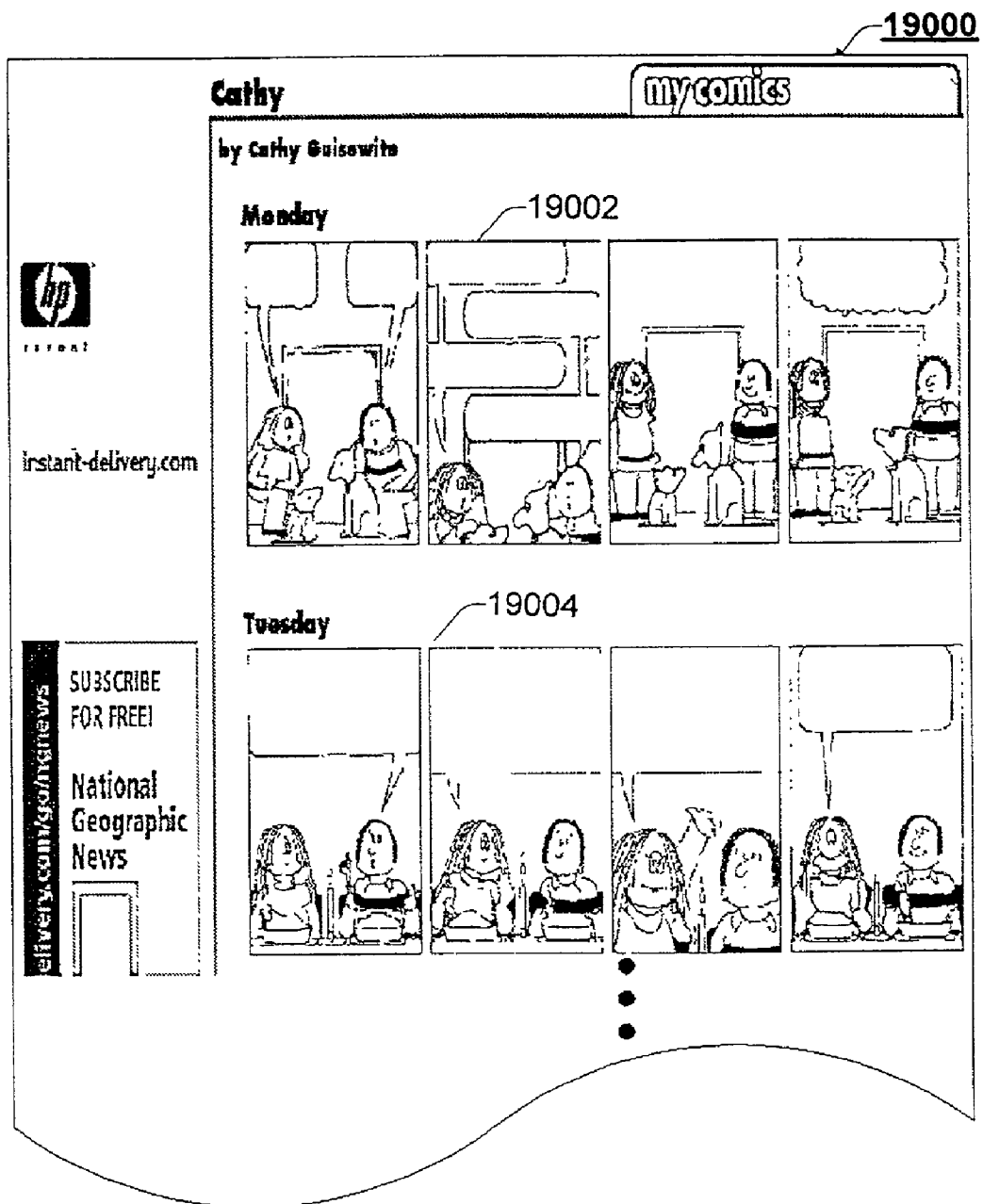


Fig. 17



DOCUMENT DELIVERY SYSTEM FACILITATING AGGREGATION OF PERIODIC CONTENT

RELATED INVENTIONS

[0001] The present invention is a continuation-in-part of U.S. application Ser. No. 09/325,040 filed on Jun. 7, 1999 titled *Document Delivery System for Automatically Printing a Document on a Printing Device*, by Brewster, et al.

TECHNICAL FIELD

[0002] This invention generally relates to the printing field and, more particularly, to a document delivery system facilitating aggregation of periodic content.

BACKGROUND

[0003] In the mid-1400's, Johann Gutenberg revolutionized how information is disseminated through his invention of the movable type press. With the publication of the Mazarin Bible, documents which were once held in the exclusive domain of a chosen few were now widely available to the masses. Nearly 550 years later, the mass media revolution that Gutenberg started is alive and well, complete with newspapers such as the New York Times and the Washington Post, magazines such as Newsweek and Sports Illustrated, and literally thousands upon thousands of other publications.

[0004] While these thousands of publications cover a wide range of interests, from news to sports to fashion to model rocketry, they have one thing in common: they are intended to be read by a mass market. Unlike the pre-Gutenberg days, where a document would literally be read by only one person of a very small number of people, it is not economically viable for today's publications to have such a small readership, due at least in part to high marketing, production and distribution costs. In fact, many of today's publications are funded to a very large extent by the advertising contained within them. These advertisers are attracted to publications that can consistently deliver a large, reliable audience of consumers that will be exposed to their advertising.

[0005] While this mass-market publication model has worked well for hundreds of years, it is not without its problems. One such problem is that a typical reader of a publication has a wide variety of interests, and no single mass market publication will be able to satisfy all of these interests. For example, a reader who is interested in international news, golf, fly-fishing, Genealogy, and computers may have to subscribe to several different publications to satisfy these interests. Of course, since these publications are intended for the mass market, they will also contain a significant amount of material that our reader is not interested in and will not read. It goes without saying that if there is a significant amount of material a reader isn't reading, there is a significant amount of advertising that the reader isn't reading either—as well as a significant amount of paper that is wasted. Advertisers know this, and agree to pay considerably less to a mass market magazine or newspaper per 1000 exposures to their ad than they would pay to a direct-mail generator that can provide a more specific guarantee that the people exposed to their ad are of a demographic group that will be much more likely to read and be receptive to their ad.

[0006] In addition, it is neither cost-effective nor time effective for most readers to subscribe to and/or read a large number of publications. Generally, the typical reader will only subscribe to a few publications that are of the most interest to them. The reduced readership level of the publications our typical reader chooses not to subscribe to, even though she might be interested in at least some of the editorial and advertising content contained inside, means that the publication receives less subscription and advertising revenue than they otherwise would. If many other readers make the same decision, the continued health of the publication may be in jeopardy, and the publication may be forced out of business. In fact, many publications do go out of business yearly for failing to attract a sustaining number of advertisers and readers—even if there are a large number of readers that would be interested in reading their publication, and a corresponding number of advertisers anxious to have these readers exposed to their ads. In general, publications that fail to attract a substantial mass market of people willing to pay for and/or read them cease publication. This is a shame, since many of these publications would enrich the diversity of information available to all readers, and would provide an avenue for lesser known writers and artists to practice their wares.

[0007] In more recent years, a new type of publication has emerged: the electronic publication. Readers of these publications typically sign into the Internet through their computer, and read the publications online. Some of these publications, such as CNN.com and pointcast.com, allow users to state personal preference(s) on what type of material they would like to read. Often, these personalized publications include advertising, usually in the form of a banner ad that is placed on or along a periphery of the visual display (top, bottom, side, etc.).

[0008] While these electronic publications have been an interesting development in the distribution of information, they still represent only a tiny fraction of the information that is published under the more traditional post-Gutenberg model. Many readers of these electronic publications complain that they are very difficult to read (on the video display), especially for long periods of time. While it might be convenient for a reader to sign onto the Internet to look at the CNN.com web site for a brief summary of late breaking news, this reader would most likely only spend a few minutes at the site, and would likely still subscribe to the more traditional print media such as Newsweek or the Washington Post. They would also likely spend significantly more time reading the more traditional printed publication than they would spend reading the electronic publication, and correspondingly, spend more time being exposed to the ads in the traditional printed publication. Accordingly, printed publications continue to flourish today—more than five centuries after Gutenberg made them possible—and after more than a decade after the innovation of the electronic publication.

[0009] While these printed publications have certainly benefited modern society, no significant attempt has been made thus far to solve the underlying problems with these publications discussed above. Just such a solution is provided herein.

SUMMARY

[0010] In accordance with the teachings of the present invention, a document delivery system for automatically

printing a document on a printing device is presented. More specifically, in accordance with one aspect of the invention, a document server is presented comprising a user profile, established by a user requesting delivery of content from one or more content providers on a periodic basis, and an edit module. The edit module, responsive to the user profile, periodically receives content from solicited content providers in accordance with a content provider publication schedule, and aggregates the received content for periodic delivery to a requesting user when the content provider's publication schedule deviates from a delivery schedule defined in the user profile.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] FIG. 1 shows a block diagram of a document delivery system of one embodiment of the invention;

[0012] FIGS. 2-4 illustrate flow charts detailing the operation of the transmission module and the printing module of the document delivery system of one embodiment of the invention;

[0013] FIG. 5 illustrates how user profile information is acquired from a user in one embodiment of the invention;

[0014] FIG. 6 shows how user profile information is acquired from a user in one embodiment of the invention;

[0015] FIG. 7 shows a print schedule for the delivery of documents in one embodiment of the invention;

[0016] FIG. 8 shows how the print schedule of FIG. 7 can be modified by the user;

[0017] FIGS. 9A-9B shows a document printed by the printing device according to one embodiment of the invention;

[0018] FIG. 10 shows a document printed by the printing device according to one embodiment of the invention;

[0019] FIGS. 11A-11D show a document printed by the printing device according to one embodiment of the invention;

[0020] FIG. 12 shows a document printed by the printing device according to one embodiment of the invention;

[0021] FIG. 13 illustrates a block diagram of an example print manager, according to one embodiment of the present invention;

[0022] FIG. 14 is a flow chart of an example method of generating and delivering a personalized publication, in accordance with another aspect of the present invention;

[0023] FIG. 15 graphically illustrates an example form requesting aggregated delivery of periodic content, according to one example embodiment;

[0024] FIGS. 16A and B graphically illustrate an example delivery list segment of a user profile, according to one example embodiment; and

[0025] FIG. 17 illustrates an example publication of aggregated content, according to one embodiment of the present invention.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

[0026] FIG. 1 illustrates a block diagram of a document delivery system of one embodiment of the invention. Docu-

ment delivery system 10 contains document server 100. In the preferred embodiment, document server 100 is operatively coupled via network 200 to a variety of personal computers, printing devices, and other electronic devices, collectively referred to as devices 300. Document server 100 contains edit module 120, transmission module 150 and knowledge module 170. Edit module 120 receives inputs from one or more content providers 50, and/or one or more advertising providers 80. Distribution module 400 is operatively coupled to document server 100. In a preferred embodiment, document server 100 is a minicomputer/server, such as an HP 9000 server sold by the Hewlett-Packard Company, although those skilled in the art will appreciate that document server 100 could be any type of other computing or electronic device(s) that performs the functions described herein and still fall within the spirit and scope of the invention. Network 200 is preferably the Internet, although an Intranet, local area network, or other type of public or private network, either wired (e.g., telephone, cable TV, etc.) or wireless (e.g., satellite, radio, cell phone, etc.), could also or additionally be used.

[0027] Devices 300 are shown in FIG. 1 as being capable of being configured in a wide variety of ways. For example, personal computer 310 is shown connected to printing device 320, which prints document 10320 for user 20320. Personal computer 310 is operatively coupled to network 200. In contrast, printing device 330, which prints document 10330 for user 20330, is operatively coupled to network 200 without an intervening personal computer or other electronic device. Printing device 350, which prints document 10350 for user 20350, is shown connected to electronic device 340, which could be a set top box, television set, palmtop personal digital assistant (PDA) or other type of electronic device that is operatively coupled to network 200. Finally, printing device 370, which prints document 10370 for user 20370, is connected to electronic device 360, which is operatively connected to network 200. The printing devices shown in FIG. 1 could be printers, such as the HP DeskJet 890 printer, HP LaserJet V printer, or other models of printers manufactured by HP or others; so-called "mopiers" or other multi-function printing devices that can print, fax, scan, and/or copy, or any other device capable of transferring information to a printable media such as plain paper, specialty paper, transparencies, or other media capable of tangibly receiving such information and which can be easily carried about by the user.

[0028] According to one aspect of the present invention, document delivery system 100 includes an innovative printing module 380 and a transmission module 150. Transmission module 150 is preferably located with document server 100. As FIG. 1 shows, printing module 380 could be located in any of the devices 300, such as in personal computer 310, printing device 330, or electronic device 340, operatively coupled via network 200 to document server 100, or it could be located within document server 100 itself, such as in knowledge module 170. According to one embodiment of the invention, transmission module 150 and printing module 380 represent software functions that execute on suitably programmed microprocessor(s) within a device 300 and/or document server 100. It will be appreciated, however, that special purpose hardware or other mechanisms could be employed to implement the innovative features and functions described below.

[0029] Turning briefly to **FIG. 13**, a block diagram of an example printing module **380** is presented, according to one embodiment of the invention. According to one embodiment, to be described more fully below, printing module **380** resides within one or more of devices **300** and, in response to user interaction with a user interface (not shown), schedules and manages the delivery of one or more documents to a printing device. Any of a number of user interfaces may be used to utilize the features and functions of printing module **380**. According to a preferred embodiment, to be described more fully below, a web page is projected to a device **300** by document server **100**, content provider **50** and/or advertisers **80**, wherein the web page includes one or more iconic function calls to one or more of the features/functions provided by printing module **380**.

[0030] As shown in **FIG. 13**, printing module **380** includes one or more controller(s) **402**, a print function **404**, a scheduler function **406**, a document translation/interpretation function **408**, a memory/storage system **410**, an input/output (I/O) interface **412**, and optionally one or more applications **413**, each coupled as shown. It will be appreciated that, although denoted as separate functional blocks, one or more elements **402-413** may well be combined without deviating from the spirit and scope of the present invention. Moreover, although depicted in accordance with a hardware paradigm, those skilled in the art will appreciate that printing module **380** and its associated elements **402-413** may well be embodied as a series of executable instructions which, when executed by a host processor of devices **300**, implement the features and functions of printing module **380** to be discussed below. In this regard, **FIG. 13** is merely illustrative of the scope and spirit of the claimed invention.

[0031] As shown, controller(s) **402** selectively invoke one or more functions **404-408** and/or applications **413** in response to user interaction with a user interface, e.g., a web page. According to one embodiment, the user interface includes iconic selectors, e.g., buttons, which when selected by the user causes controller **402** to selectively invoke an instance of a function associated with the selector. In this regard, controller **402** communicates with external elements via input/output (I/O) interface(s) **412**. In an alternate embodiment, controller **402** provides a user with a user interface from applications **413**.

[0032] As used herein, I/O interface(s) **412** are intended to include one or more of any of a number of communication interfaces known in the art including, but not limited to, a direct connect communication interface (e.g., a serial interface, a parallel interface, a Universal Serial Bus (USB), an Advanced Graphic Port (AGP), etc.), a local area network interface (e.g., an Ethernet interface, a Token Ring interface, etc.), or a wide area network interface. In this regard, printing module **380** may communicate with any of a number of external and remote devices using an appropriate one of a plurality of wired and/or wireless I/O interfaces **413**.

[0033] Automated print function **404** is selectively invoked by controller **402** in response to a user indication to immediately print a document (e.g., within the next several seconds) without first viewing or displaying the document. According to one embodiment, a user interface projected by printing module **380** or from an external source (e.g.,

document server **100**) includes an iconic selector associated with one or more documents to invoke the automated print function **404** to print the one or more documents. Insofar as selection of the iconic selector associated with the one or more documents automatically causes the documents to be queued for printing (e.g., within the subsequent several seconds), the iconic selector is referred to herein as an "automated print" icon, or an "instant print" icon.

[0034] When the automated print icon associated with one or more documents is selected by a user, the user interface provides controller **402** with information regarding the associated one or more documents. According to one implementation, user interface provides controller **402** with a name/identifier and storage location of the one or more documents. Controller **402** provides the name/identifier and location information to automated print function **404** to queue the document for printing. As will be described in more detail below, automated print function generates and issues a request to retrieve the identified document(s) from the identified storage location via I/O interface **412**. The retrieved documents are stored in memory locations **414A**, **414B**, etc. of memory **410**. Once retrieved, document translation/interpretation function **408** is selectively invoked to interpret/translate and print the retrieved document. According to one implementation, the retrieved documents are queued and printed substantially instantaneously (e.g., within the subsequent several seconds). In alternate embodiments, the retrieved document(s) are printed according to a print schedule defined by the user.

[0035] According to one aspect of the invention, to be described more fully below, the document associated with an iconic selector is retrieved from a provider into memory **410** of print module **380** and immediately printed without invoking an application associated with the document. That is, translation/interpretation function **408** reads the stored document(s), interprets the textual, image, formatting, etc. content of the document(s) to print the document on an operatively coupled printer without having to invoke the application associated with the retrieved document(s), and without having to display the document(s) to the user prior to printing.

[0036] In an alternate embodiment, an application **413** (e.g., Microsoft Word, Adobe Acrobat, etc.) associated with the document is invoked by controller **402** to print the document, but neither the document nor the application **413** are displayed to the user so, from the user's perspective, the application is not launched. In either case, automated print function **404** enables a user to immediately print a remote document without having to manually download, launch and print the document, thereby providing the user with the convenience and selection of electronic publications, with the physical reading experience introduced by the Gutenberg press.

[0037] The scheduling function **406** enables a user to establish a print schedule **390** for documents of interest. According to one embodiment of the present invention, scheduling function **406** is selectively invoked by controller **402** in response to a user's indication to add the document to a print schedule **390**. As shown in **FIG. 1**, the printing schedule **390** may be located in devices **300**, document server **100** or any other accessible location.

[0038] Turning to **FIGS. 2-4**, flowcharts detailing the operation of transmission module **150** and a first mode of

operation of printing module **380** are presented, according to one embodiment of the invention. In FIGS. 2-4, the flow diagram shown in the left column is executed by transmission module **150** of document server **100**, and the flow diagram in the right column is executed by printing module **380**.

[0039] Referring now to FIG. 2, the flow diagram for transmission module **150** starts in block **1000**, and the flow diagram for printing module **380** starts in block **2000**. Since there is a great deal of interaction between these two flow diagrams, as represented by dashed lines connecting the two columns, the operation of the two flow diagrams will be described simultaneously.

[0040] In block **2100**, user profile data is sent to document server **100** to be stored in the user profile. This user profile data can take on many different forms, from simple to very detailed. FIG. 5 shows a very simply acquisition of user profile data, such as that used in HP's Instant Delivery Program, the first version of which was generally available to the public less than one year from the filing date of this patent application. In this program, only three pieces of information are stored in the user profile: type of printer, email address, and whether HP can contact the user. FIG. 6 shows a more complicated user profile than that currently used in HP's Instant Delivery Program, which includes the user's name, email address, company name, city, state, country, zip or postal code, phone number, printer information, and areas of interest. Those skilled in the art will appreciate that more or less user profile data from those shown in FIGS. 5 and 6 could be sent to transmission module **150** in block **2100** and still fall within the spirit and scope of the invention, and that at least some of this information could come from a source other than a user. For example, the user profile data could also include household income, age, and sex of the user, among other things. In any event, block **1100** receives the user profile data sent by block **2100**. Block **1200** stores the user profile data, preferably in knowledge module **170**. Alternately, the user profile data could be stored in device **300** or in some other local or remote location.

[0041] Block **2200** checks to see whether a document should be received from document server **100**. This is done by checking print schedule **390** which is preferably stored on a device **300** or document server **100**, but may be stored in some other local or remote location. Printing schedule **390** preferably contains information that can be used to determine when documents should be printed by the printing device, such as upon document creation, user requested time, lapse of specified time period, and/or occurrence of one or more external events (e.g., a stock price or index reaching a specified value, a final score of a sporting event, etc.). Printing schedule **390** may be associated with an individual user, a device or a group of users and/or devices. In addition, each entry of printing schedule **390** could result in the printing of one or more documents.

[0042] FIG. 7 shows one example of printing schedule **390**, of the type that might be used in an enhanced version of HP's Instant Delivery program. In this example, the title of delivery, delivery schedule, next delivery data and time, and the last deliver status are shown. Preferably, the user can select what time a document should be printed, whether it should be printed on a specific day of the week or month,

weekdays, or weekends, and whether the printing schedule should expire after a specific period of time or continue indefinitely.

[0043] Referring again to FIG. 2, printing module **380** monitors printing schedule **390** to see if a document should be requested from document server **100** or from another source. When block **2200** determines that a document should be requested from document server **100** or from another source, block **2200** is answered affirmatively, and block **2300** automatically requests the document without user intervention from server **100** or from another source, as will be described in greater detail below. Note that if printing module **380** is located on device **300**, block **2200** operates in a "pull" mode—where the document is "pulled" from document server **100** or another source to device **300**. However, if printing module **380** is located remotely from device **300**, such as in document server **100**, block **2200** operates in a "push" mode—where the document is "pushed" from document server **100** or another source to device **300**. If block **2300** determines that the document is located on document server **100** or at another source accessible via network **200**, and if device **300** is currently in a disconnected state where it is not operatively coupled to the network **200**, block **2300** will sign on to or otherwise enter a connected state with network **200**, so that device **300** is operatively coupled to network **200**.

[0044] Meanwhile, block **1300** checks to see if a document has been requested from printing module **380** in block **2300**. Once it determines that such a document has been requested, block **1400** generates the document for printing module **380**. Block **1500** then sends the document to printing module **380**. Block **2400** checks to see whether a document has been received from document server **100** via block **1500**. Once such a document has been received, block **2500** automatically prints the document, without user intervention, on a printing device. The term "without user intervention" means that a user is not directly involved in the printing operation; the document is sent automatically to a device **300** to be printed out by a printing device. According to this mode of operation, the user does not press "any" print buttons or otherwise be directly involved in the printing process; in fact, the user may not even be present in the same room, city, state, or country as device **300** during the printing operation. The printing operation automatically occurs in an unattended state—regardless of whether the user is present or not. In addition, if print schedule **390** is stored in a device-independent manner, such as on document server **100**, a travelling user could "log in" to document server **100** and have his or her customized document sent to a device **300** that is convenient to the user's current location.

[0045] Referring now to FIG. 3, block **2600** checks to see whether the document printed successfully. If not, block **2800** performs error handling, such as attempting to print the document again, notifying the user that the printing device is out of paper or has some other error condition, or simply deciding not to print the document. When the document prints successfully, block **2900** informs document server **100** that the document printed successfully. Block **1600** waits for an indication from printing module **380** that the document did print successfully. When such an indication is received, block **1700** updates the user profile with this information.

[0046] It will be appreciated that not all of the blocks in FIGS. 2-4 need be implemented, or implemented according

to the order denoted, to fall within the spirit and scope of the present invention. More specifically, according to one implementation, flow of control moves from block **2600** to block **4100** of **FIG. 4**, as will be discussed later, and from block **1500** back to block **1300** of **FIG. 2**.

[**0047**] An alternate embodiment has been contemplated where other information is transmitted back to document server **100** in block **2900** to update the user profile preferably stored in knowledge module **170**. This other information could be ink usage (total usage or usage broken out by ink color), printable media usage (number of pages printed, type of media used, etc.), or other types of information. In addition, another alternate embodiment has been contemplated where some or all of the information contained in the user profile stored in knowledge module **170** came from a source other than the user via printing module **380**. For example, publicly or privately available information about the user, and/or the devices **300** he/she/they use, could be acquired from a wide variety of different sources and inserted into the user profile preferably stored in knowledge module **170**.

[**0048**] Block **1800** examines the user profile preferably stored in knowledge module **170** to determine whether a product subsidy should be provide to the user. For example, if the information in the user profile indicates that this user has printed off his 1000th document, such as a “preferred” document that contains advertising from advertising providers **80** or is otherwise under the control of edit module **120**, providing a product subsidy to the user may be warranted. For purposes of this invention, a “product subsidy” could be a print consumable or other product. A “print consumable” is an inkjet cartridge for an inkjet printer, ink for such an inkjet cartridge, a toner cartridge for a laser printer, toner for such a toner cartridge, or any other product or substance that is depleted when a document gets printed, including printer ribbons, etc. Note that the “ink” referred to above would typically be of a permanent variety, but erasable ink, such as that sold by the E Ink Company, could also be used.

[**0049**] Note that the product subsidy referred to herein is preferably funded at least in part by advertising revenue received from advertising providers **80** (**FIG. 1**), but an embodiment has been contemplated where the product subsidy is funded at least in part from the distribution revenue received from content providers **50** (**FIG. 1**). In either case, information (such as statistical information) about what was printed by whom is preferably provided to content providers **50** and/or advertising providers **80**—preferably as a document that is automatically sent to one or more printing devices according to the teachings of this invention.

[**0050**] Other forms of products that are contemplated to be subsidized by this invention include printable media, such as plain paper, specialty paper, transparencies, and the like, and may also include devices **300** such as printing devices, electronic devices, and personal computers. In fact, alternate embodiments have been contemplated where other products, such as a subscription price to a document, or even a product not directly related to the document delivery system shown herein, such as soap or dog food, are subsidized. If block **1800** determines that such a subsidy is warranted, block **1900** requests that distribution module **400** provides such a subsidy to the user. In one embodiment, distribution module **400** simply mails a product such as a print consumable or

other product such as the type described above to a user at the address specified in the user profile. In another embodiment, distribution module **400** mails or electronically generates a coupon that the user can use to receive a free or discounted product of the type described above. Regardless of whether block **1800** is answered affirmatively or negatively, flow of control then returns back to block **1300** (**FIG. 2**) to see if another document has been requested from the printing module **380**.

[**0051**] Referring again to **FIG. 3**, after block **2900** informs document server **100** that the document printed successfully, flow of control moves to block **4100** (**FIG. 4**), which checks with document server **100** to see what the current version of printing module **380** is. Block **3100** checks to see whether such a request has been received, and when it is, block **3200** sends information concerning the current version of the printing module to printing module **380**. Block **4200** compares this information from document server **100** with its own version and determines whether an updated version of printing module is available. For example, if printing module **380** is running version 4.0, and document server **100** indicates that version 4.1 is the current version of printing module **380**, block **4200** would determine that an updated version of printing module **380** is available, and flow control would move to block **4300**. Block **4300** checks to see whether this updated version of printing module **380** should be requested to be downloaded. While a user would typically be asked whether such a download should be requested or not, and would typically perform this download at a convenient time, such a step could also be performed automatically without user intervention. If such a download is requested, block **4400** is answered affirmatively, and block **3500** downloads the updated printing module, which is then installed in block **4500**. Regardless of how blocks **4200** and **4300** are answered, flow of control moves to block **4600**, which checks to see if a disconnected state should be entered. If block **2300** (**FIG. 2**) determined that device **300** was in a disconnected state when the document was requested, as discussed above (i.e., not operatively coupled to network **200**), block **4600** is answered affirmatively, and block **4700** reenters the disconnected state. In any event, flow of control returns to block **2200** of **FIG. 2**.

[**0052**] Referring again to print schedule **390** shown in **FIG. 7**, it can be seen that many different types of documents can be requested to be printed. For example, the title of document **11000** specifies a network address, such as an Internet uniform resource locator (URL) that contains the network location of a document to be printed. Note that this URL may be partially or completely hidden from the user, as is the case with the URL for document **15000** (<http://www.beloitdailynews.com>). In this scenario, edit module **120** of document server **100** merely goes out to the Internet at the URL indicated (which would be shown in **FIG. 1** as one of the content providers **50**), and captures the indicated content, which may well be aggregated over a period of time, formatted and subsequently transmitted to a requesting user, e.g., at a coupled printing device, via transmission module **150** and printing module **380**, as has been discussed. Alternatively, device **300** could go directly out to the URL itself without assistance from document server **100**; in this case, block **2300** (**FIG. 2**) requests document **11000** from another source—directly from the content provider **50** (at the indicated URL) via network **200**.

[0053] In certain instances, described more fully below, edit module 120 periodically receives content on behalf of a requesting user for aggregation and delivery according to a user-defined delivery schedule that differs from a content provider publication schedule. Accordingly, edit module 120 stores the received content for later retrieval, aggregation and formatting into a personalized publication for delivery in accordance with the user defined delivery schedule (e.g., as denoted in the user profile).

[0054] In contrast, document 12000 is not a document that originates with a content provider 50 via the Internet, but instead is stored directly on device 300, such as a printing device, personal computer, or other electronic device. An example of such a document could be a daily calendar from a program such as Microsoft Outlook, which the user has requested be printed automatically to his printer, without any user intervention, at 7:00 a.m. every weekday morning. In such an embodiment, printing module 380 does not need to request the document from document server 100, since it can access the documents without going through network 200. In this embodiment, block 2300 of FIG. 2 requests the document from another source—device 300. While block 2900 would still preferably indicate that the document was printed, and while block 1700 would still preferably update the user profile in knowledge module 170, printing such a document would preferably not generate any type of credit towards a product subsidy, since such a document would not be considered a “preferred” document, e.g., not a document under the control of edit module 120.

[0055] Referring again to FIG. 7, a print schedule of document 13000 is shown. Document 13000 is referred to as a “personalized document”. A “personalized document” is a document that is assembled by edit module 120 of document server 100 from a variety of content providers 50 and advertising providers 80, based on information contained in the user profile stored in knowledge module 170. For example, document 13000 is a “personalized document”. Our user has requested that document 13000—his personalized newspaper—be printed at 6:00 a.m. every day. Edit module 120 examines the user’s interests as specified in the user profile stored in knowledge module 170 to assemble the document from selected content providers 50 in which the user has indicated an interest. Edit module 120 also inserts advertising from selected advertising providers 80—again based on the user profile stored in knowledge module 170.

[0056] FIG. 8 shows how the print schedule 390 of FIG. 7 can be edited by the user. The user can use the publisher’s recommended schedule, use a default schedule the user has set, or use a custom schedule for delivery. If a custom schedule is selected, the user can select a daily, weekly, or monthly delivery, or select a delivery once every specified number of days, or specify every weekday. In addition, the time of day can also be specified: once at a designated time, multiple times during the day, or multiple times separated by a specified period of time. While not shown here, the user could also edit print schedule 390 to request that a document be sent upon creation, or upon the occurrence of an external event.

[0057] FIGS. 9A-9B show document 11000 printed by the printing device according to one embodiment of the invention. Note that this document came from one content provider 50 via network 200 (either through document server

100 or directly), and contains no advertising. While document 11000 is preferably formatted by content provider 50 such that the information contained in the document is optimized to be printed, such formatting is not necessary.

[0058] FIG. 10 shows document 12000 printed by the printing device according to one embodiment of the invention. Note that this document is a user’s daily calendar which came directly from device 300 and not from document server 100 via network 200.

[0059] FIGS. 11A-D show document 1300 printed by the printing device according to one embodiment of the invention. Note that this document is a user’s personalized newspaper which contains information in which the user has indicated a specific interest in, as stored in the user profile in knowledge module 170. Note also that this document contains advertising that edit module 120 determined the user would also be interested in, again based on the information contained in the user profile stored in knowledge module 170. As has already been discussed, when the user prints a sufficient number of such “preferred” documents, the user may receive a product subsidy of a print consumable or other product(s).

[0060] FIG. 12 shows document 14000 printed by the printing device according to one embodiment of the present invention. Note that document 14000 is the HP Instant Delivery Times—a document located on document server 100. While this document does not contain advertising per se, it is still considered to be a “preferred document”, since it is under the control of edit module 120. Document 14000 informs users of Instant Delivery of new releases or new information about the Instant Delivery Program.

[0061] Aggregated Delivery of Periodic Content

[0062] Having introduced an example document delivery system architecture and associated operational methods, above, attention is now drawn to FIGS. 14-17, wherein another aspect of the invention is presented. As introduced above, document server 100 solicits and/or receives content from one or more content providers (50, 80) in the generation of personalized publications for requesting users. Typically, to provide the most current information, once the content is received from the content provider(s) (50, 80), it is formatted and delivered to the user. There is content, however, wherein it is not as important that the user receive it while it is “fresh”. Indeed, there are circumstances when it may well be more convenient for the user to receive an aggregate of such content on a periodic basis which differs (e.g., more infrequently) from the publication schedule of the content itself. For example, while comic strips are published on a daily basis, it may be more convenient for certain users to receive an aggregate of such content on a weekly or monthly basis. Thus, in accordance with one aspect of the present invention, document delivery system 10 may well incorporate a content repository (e.g., a storage medium coupled to document server 100) to aggregate periodic content for delivery in accordance with a user-defined delivery schedule. For purposes of illustration, and not limitation, this aspect of the invention will be developed in accordance with the example implementation introduced above, wherein a user wishes to receive a weeks worth of daily content (e.g., the Cathy® comic strip) once a week.

[0063] Turning to FIG. 14, a flow chart of an example method for delivering aggregate content to a requesting user

is presented, according to one aspect of the present invention. In accordance with the illustrated example embodiment of **FIG. 14**, the method begins with block **16002**, wherein document server **100** receives an indication from a user requesting content delivery in accordance with a user-defined schedule. Unlike the implementations introduced above, however, the user wants the content delivered according to a schedule (user-defined schedule) that differs from the publication schedule of the content provider(s) (**50, 80**). According to one example implementation, edit module **120** of document server **100** receives a request from a user interface (UI) rendered on a computing interface for the user. A graphical illustration of an example UI to generate just such an indication is presented with reference to **FIG. 15**.

[**0064**] Turning briefly to **FIG. 15**, a graphical illustration of an example user interface enabling a user to schedule aggregate delivery of content is presented, according to one example embodiment. In accordance with the illustrated example embodiment of **FIG. 15**, a user interface **17000** associated with the select content (e.g., Cathy® comic strip) is presented. According to one implementation, the UI **17000** is presented upon user selection of the content from a catalog of available content. The indication introduced above is sent to, for example, edit module **120**, when the user selects the “add delivery” button **17002**.

[**0065**] In block **1604**, edit module **120** updates a print schedule **390** associated with the user to denote periodic delivery of aggregate of content. More particularly, edit module **120** presents the user with an interface that enables the user to add the content to the delivery schedule, and updates the delivery schedule to reflect the user's preferences. Just such an interface is presented with reference to **FIGS. 16A and B**.

[**0066**] As shown, **FIG. 16A** and **FIG. 16B** graphically illustrate an example interface to manage a user print schedule, according to one example embodiment. In accordance with the illustrated example implementation of **FIGS. 16A and B**, the user's delivery schedule **18000** is presented, along with a dialog box **18002** requesting that the user confirm that they wish to add the select content to the delivery schedule. If the user selects the “accept” button of the dialog box **18002**, a management interface is presented, which enables the user to define the delivery criteria for the selected content. An example management interface was presented above, with reference to **FIG. 8**. As introduced above with reference to **FIG. 8**, a user can select delivery of content on a schedule that differs from that of the content provider(s) publication schedule. More particularly, by selecting “my default schedule” or the “custom defined schedule” for the delivery of the content, the user can elect to receive an aggregate of the content provider's serially published content on a schedule that suits their particular situation. In accordance with the illustrated example implementation, perhaps it is more convenient for the user to receive the entire week's worth of Cathy® comic strips, published daily, on Sunday when they have the time to read the content they so enjoy. If the content were delivered according to the publication schedule, it may go unread if the user does not have the time to review the material, thereby wasting print-related supplies (e.g., paper, ink, etc.). Once the user has defined the delivery criteria for the selected content in the UI of **FIG. 8**, an updated delivery

schedule **18004** is generated, in accordance with the teachings above, to reflect the addition of the aggregate content, block **18006**.

[**0067**] Continuing with the flow chart of **FIG. 14**, once the delivery schedule has been updated to reflect the addition of aggregate content **18006**, edit module **120** determines whether new content has been received, block **16006**. According to one example implementation, edit module **120** periodically receives content from one or more content providers in accordance with the content providers publication schedule for delivery to requesting users. For those users that wish delivery of the content in accordance with the publication schedule of the content provider (**50, 80**), the content is prepared for delivery in accordance with **FIGS. 2-4**. For those users that desire delivery of the content on their own schedule, the process continues with block **16008** wherein the new content is stored in a content repository accessible by edit module **120** for subsequent retrieval and delivery by document server **100**.

[**0068**] According to one implementation, document server **100** includes a storage device (not shown) which caches pointers to memory locations at the content provider(s), wherein a copy of content that was previously published for serial delivery may be found. It is to be appreciated that by leveraging the storage capability of the content provider(s) (**50, 80**), which likely retain a copy of published content for a period of time anyway, the storage requirements of the document server **100** are reduced. In an alternate embodiment, document server **100** is coupled to one or more storage devices which receive and maintain a copy of select content from content provider(s) (**50, 80**) for subsequent retrieval and delivery to requesting users.

[**0069**] In block **16010**, the process continues with edit module **120** determining whether it is delivery time for one or more of the content identified in the delivery schedule **18004**. If not, document server **100** continues with block **16006**. If, in block **16010** edit module determines that it is time to deliver aggregate content, the content is collected from the content repository for delivery, block **16012**. In accordance with the illustrated example implementation, the content repository is accessed by edit module **120** to retrieve the select content published since the last scheduled delivery. As introduced above, the collection by edit module **120** may involve issuing requests to memory of the content provider(s) for content stored at memory locations denoted by the one or more pointers retrieved from the repository. Alternatively, the edit module **120** retrieves the actual content from local storage for delivery to the user. According to one implementation, edit module **120** formats the aggregate content, in accordance with user preferences, to denote when the content was originally published. In accordance with the example implementation, edit module **120** formats a publication with a weeks-worth of Cathy® comic strips, wherein each daily strip is specifically denoted.

[**0070**] In block **16014**, the personalized publication comprising the aggregated content is delivered to the requesting user. An example of just such a personalized publication is presented with reference to **FIG. 17**, according to the example implementation introduced above.

[**0071**] **FIG. 17** illustrates an example publication of aggregated content, according to one embodiment of the present invention. In accordance with the illustrated

example implementation of **FIG. 17**, a personalized publication comprising a weeks worth of Cathy® comic strips is generated for periodic delivery to the user, in accordance with the user delivery schedule **18004**. As introduced above, edit module **120** may format the personalized publication **19000** to denote when the content was originally published (e.g., the day of the week, the date, etc.). Thus, in accordance with the illustrated example implementation, edit module **120** formats the personalized publication **19000** to denote which strip appeared on Monday **19002**, Tuesday **19004**, etc.

What is claimed is:

1. A method for generating a publication, the method comprising:

soliciting content from one or more content providers in response to a user request to receive such content in accordance with a user-defined delivery schedule; and

receiving the content at a content repository in accordance with a publication schedule of the content and aggregating the content for subsequent delivery to the requesting user if the publication schedule differs from the user-defined delivery schedule.

2. A method according to claim 1, further comprising:

compiling the received content into a document format; and

delivering the formatted content in a user-defined form to the requesting user.

3. A method according to claim 2, wherein compiling the received content into a document format comprises:

formatting the received content within a publication to denote a chronological order in which the content was received.

4. A method according to claim 2, wherein delivering the aggregated content comprises:

sending the formatted publication, along with a print instruction, to printing device designated by the requesting user.

5. A method according to claim 4, wherein the print instructions designates a time for printing the publication.

6. A method according to claim 2, wherein delivering the aggregated content comprises:

sending the formatted publication to one or more electronic mailboxes designated by the requesting user.

7. A method according to claim 1, wherein soliciting content from one or more content providers comprises:

sending a subscription request to one or more content providers requesting the content in accordance with the publication schedule of the content provider.

8. A method according to claim 1, wherein soliciting content from one or more content providers comprises:

periodically issuing requests to the content providers for content on behalf of the requesting user.

9. A method according to claim 8, wherein the period is determined by the publication schedule of the content provider(s).

10. A method according to claim 8, wherein the requests are issued daily.

11. A storage medium comprising a plurality of executable instructions which, when executed, implement an edit module to solicit content from one or more content providers in response to a user request to receive such content in accordance with a user-defined delivery schedule, to receive the content at a content repository in accordance with a publication schedule of the content, and to aggregate the content for subsequent delivery to the requesting user if the publication schedule differs from the user-defined delivery schedule.

12. A storage medium according to claim 11, wherein the edit module compiles the received content into a document format, and delivers the formatted content in a user-defined form to the requesting user.

13. A storage medium according to claim 12, wherein the edit module compiles the received content by formatting the received content within a publication to denote a chronological order in which the content was received.

14. A storage medium according to claim 12, wherein the edit module delivers the aggregate content by sending the formatted publication, along with a print instruction, to printing device designated by the requesting user.

15. A storage medium according to claim 12, wherein the edit module delivers the aggregate content by sending the formatted publication to one or more electronic mailboxes designated by the requesting user.

16. A document delivery system comprising:

an content repository, to receive content from one or more content providers in accordance with a content provider publication schedule; and

an edit module, coupled to the content repository, to periodically collect and aggregate content received in the content repository for delivery to a requesting user in accordance with a user-defined delivery schedule.

17. A document delivery system according to claim 16, wherein the edit module compiles the received content into a document format, and delivers the formatted content in a user-defined form to the requesting user.

18. A document delivery system according to claim 17, wherein the edit module compiles the received content by formatting the received content within a publication to denote a chronological order in which the content was received.

19. A document delivery system according to claim 17, wherein the edit module delivers the aggregate content by sending the formatted publication, along with a print instruction, to printing device designated by the requesting user.

20. A document delivery system according to claim 17, wherein the edit module delivers the aggregate content by sending the formatted publication to one or more electronic mailboxes designated by the requesting user.

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