US005986690A

United States Patent [19]

Hendricks

[11] Patent Number: 5,986,690

[45] Date of Patent: Nov. 16, 1999

[54] **ELECTRONIC BOOK SELECTION AND DELIVERY SYSTEM**

[75] Inventor: **John S. Hendricks**, Potomac, Md.

[73] Assignee: **Discovery Communications, Inc.**, Bethesda, Md.

[21] Appl. No.: **08/336,247**

[22] Filed: **Nov. 7, 1994**

Related U.S. Application Data

[63] Continuation-in-part of application No. 07/991,074, Dec. 9, 1992, and application No. 08/160,194, Dec. 2, 1993.

[51] **Int. Cl.**[6] **H04N 7/173**

[52] **U.S. Cl.** **348/7**; 348/12; 455/4.2

[58] **Field of Search** 348/468, 461, 348/473, 474, 6, 12, 13, 7, 463; 455/3.1, 4.2, 5.1, 6.1; 358/86, 147; H04N 7/08, 7/087, 7/16, 7/173

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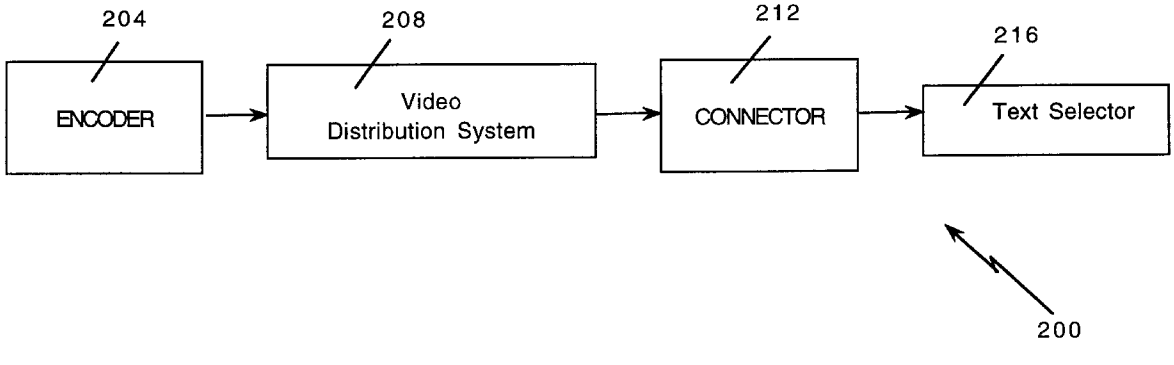
Primary Examiner—Chris Grant

Attorney, Agent, or Firm—Dorsey & Whitney LLP

[57] **ABSTRACT**

The invention, an electronic book selection and delivery system, is a new way to distribute books and other textual information to bookstores, libraries and consumers. The primary components of the system are a subsystem for placing text in a video signal format and a subsystem for receiving and selecting text that is placed in the video signal format. The system configuration for consumer use contains additional components and optional features that enhance the system, namely: (1) an operation center, (2) a video distribution system, (3) a home subsystem, including reception, selection, viewing, transacting and transmission capabilities, and (4) a billing and collection system. The operation center and/or video distribution points perform the functions of manipulation of text data, security and coding of text, cataloging of books, messaging center, and uplink functions. The home subsystem performs the functions of connecting to a video distribution system, menu selecting text, storing text, and transacting through phone or cable communicating mechanisms. A portable book-shaped viewing device is used for viewing the textual material delivered. The billing and collection system performs the transaction, management, authorization, collection and publisher payments automatically utilizing the telephone system.

40 Claims, 40 Drawing Sheets



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1130683	5/1989	Japan .	
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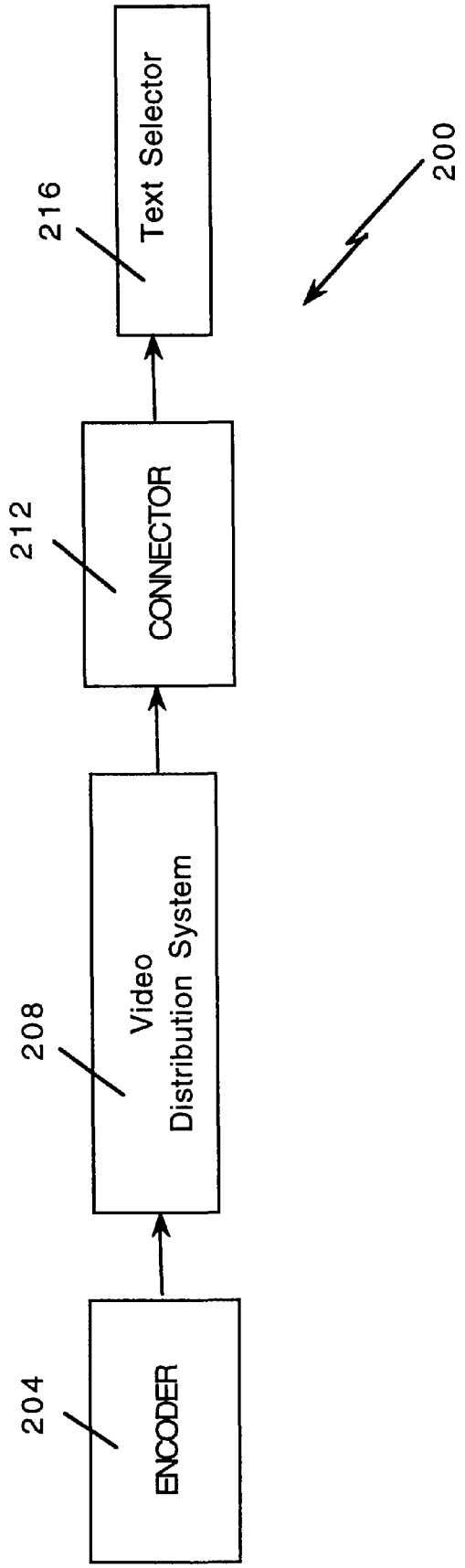

Text Selector
216
200
CONNECTOR
212
Video
Distribution System
208
ENCODER
204

Fig. 1

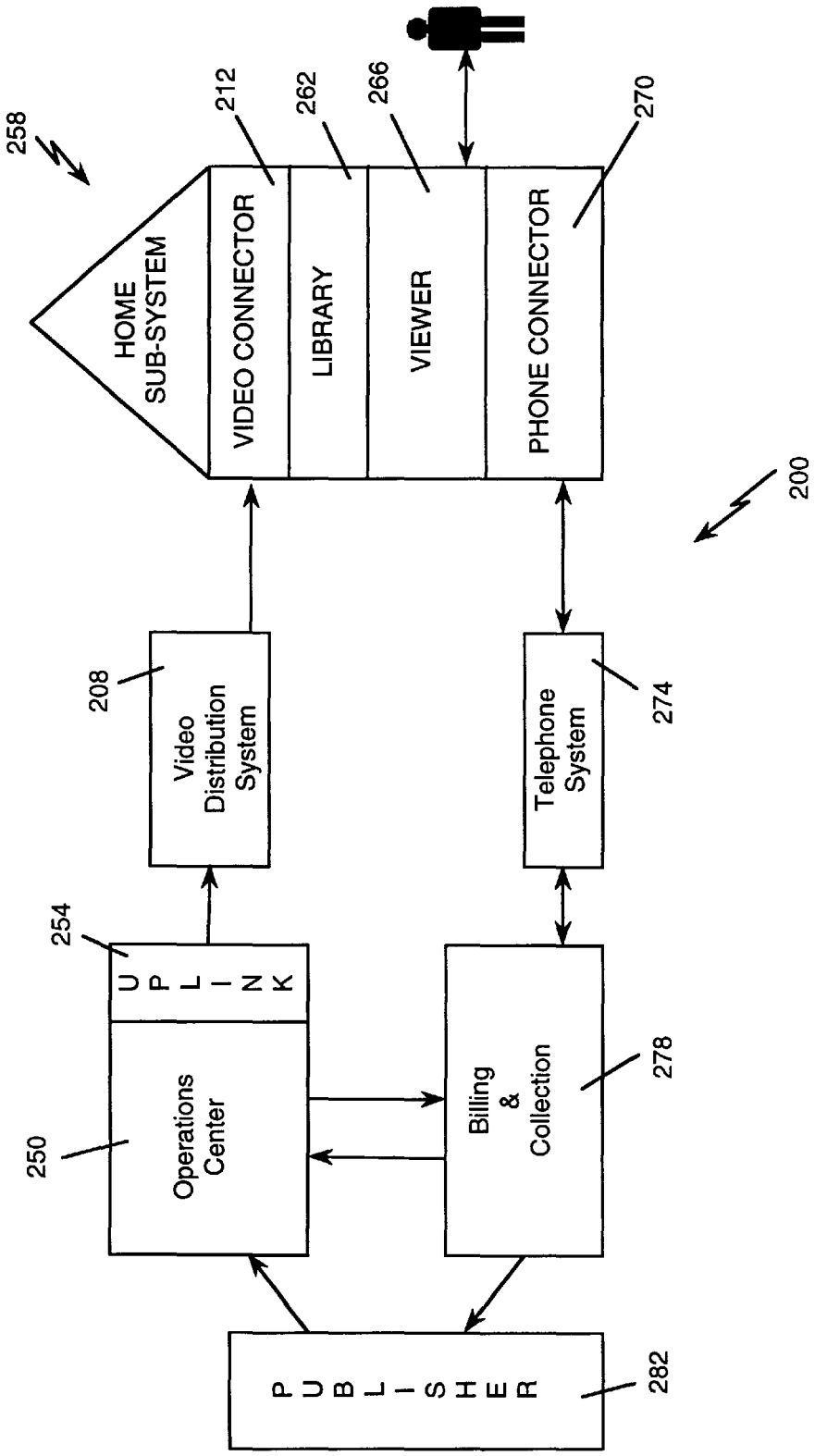
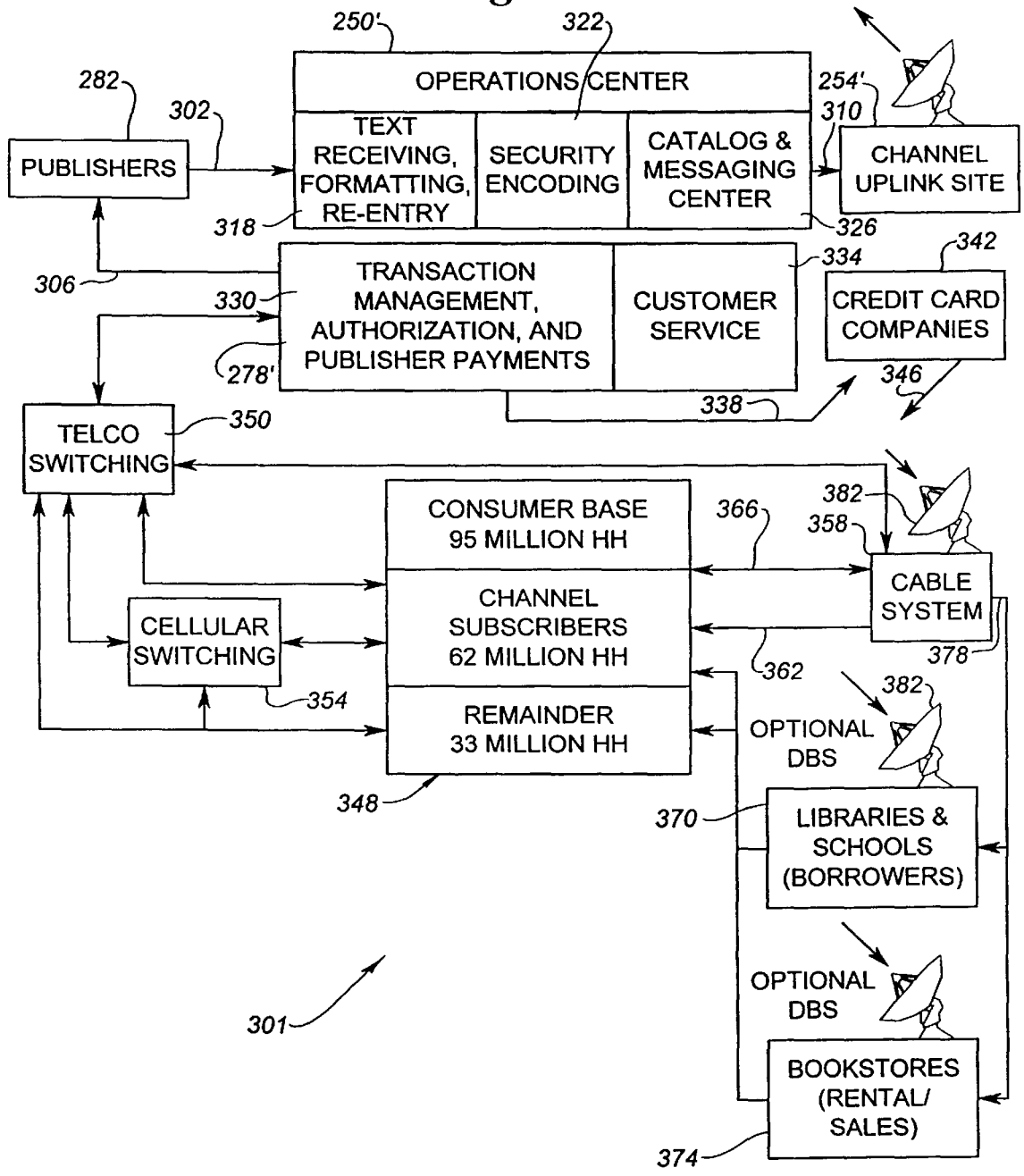

258
212
262
266
270
HOME SUB-SYSTEM
VIDEO CONNECTOR
LIBRARY
VIEWER
PHONE CONNECTOR
200
208
Video Distribution System
Telephone System
274
254
U P L I N K
Operations Center
250
Billing & Collection
278
P U B L I S H E R
282

Fig. 2

Fig. 3


250'
322
OPERATIONS CENTER
282
302
254'
310
PUBLISHERS
TEXT RECEIVING, FORMATTING, RE-ENTRY
SECURITY ENCODING
CATALOG & MESSAGING CENTER
CHANNEL UPLINK SITE
318
326
306
330
TRANSACTION MANAGEMENT, AUTHORIZATION, AND PUBLISHER PAYMENTS
CUSTOMER SERVICE
334
342
CREDIT CARD COMPANIES
278'
338
346
TELCO SWITCHING
350
CONSUMER BASE 95 MILLION HH
366
382
358
CABLE SYSTEM
CHANNEL SUBSCRIBERS 62 MILLION HH
CELLULAR SWITCHING
354
362
378
382
OPTIONAL DBS
REMAINDER 33 MILLION HH
348
370
LIBRARIES & SCHOOLS (BORROWERS)
OPTIONAL DBS
301
BOOKSTORES (RENTAL/ SALES)
374

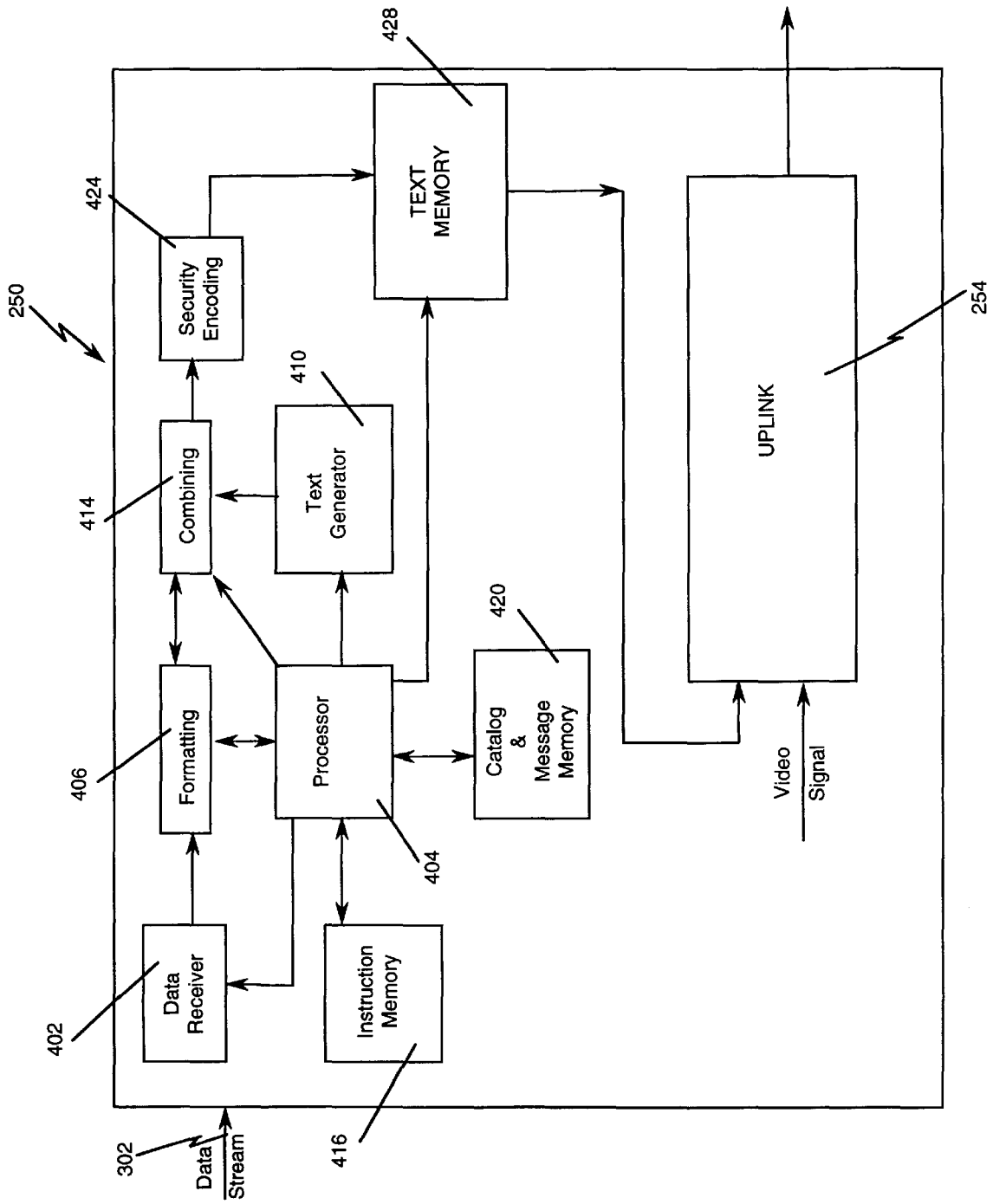

428
TEXT MEMORY
424
Security Encoding
250
410
Text Generator
414
Combining
406
Formatting
Processor
420
Catalog & Message Memory
404
UPLINK
254
Video Signal
402
Data Receiver
Instruction Memory
416
302
Data Stream

Fig. 4

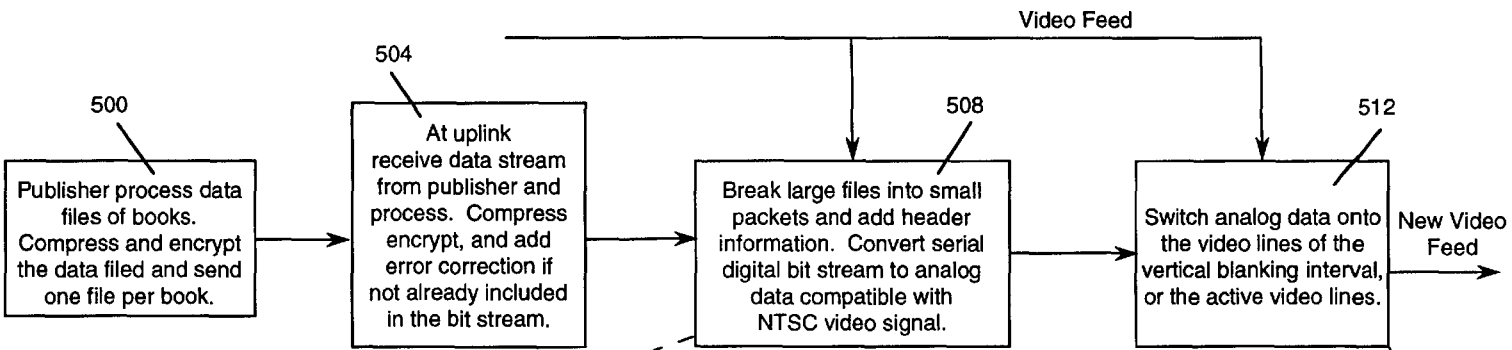

Video Feed
500
Publisher process data files of books. Compress and encrypt the data filed and send one file per book.
504
At uplink receive data stream from publisher and process. Compress encrypt, and add error correction if not already included in the bit stream.
508
Break large files into small packets and add header information. Convert serial digital bit stream to analog data compatible with NTSC video signal.
512
Switch analog data onto the video lines of the vertical blanking interval, or the active video lines.
New Video Feed

Fig. 5a

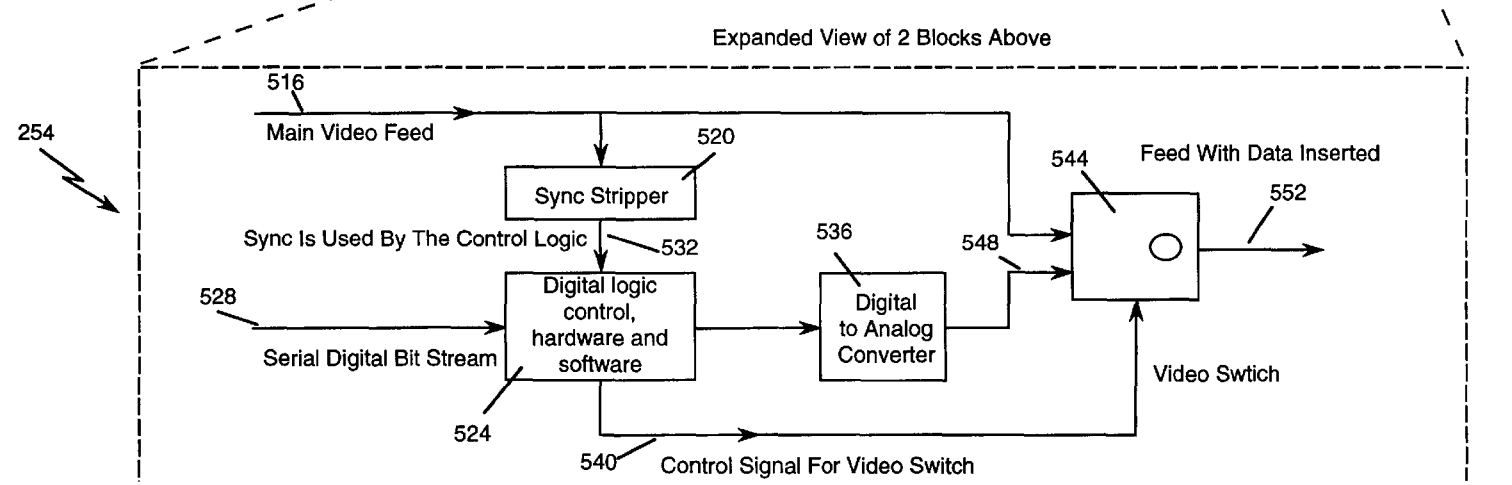

Expanded View of 2 Blocks Above
254
516
Main Video Feed
520
Sync Stripper
Sync Is Used By The Control Logic
532
528
Serial Digital Bit Stream
Digital logic control, hardware and software
524
536
Digital to Analog Converter
548
544
Feed With Data Inserted
552
Video Swtich
540
Control Signal For Video Switch

Fig. 5b

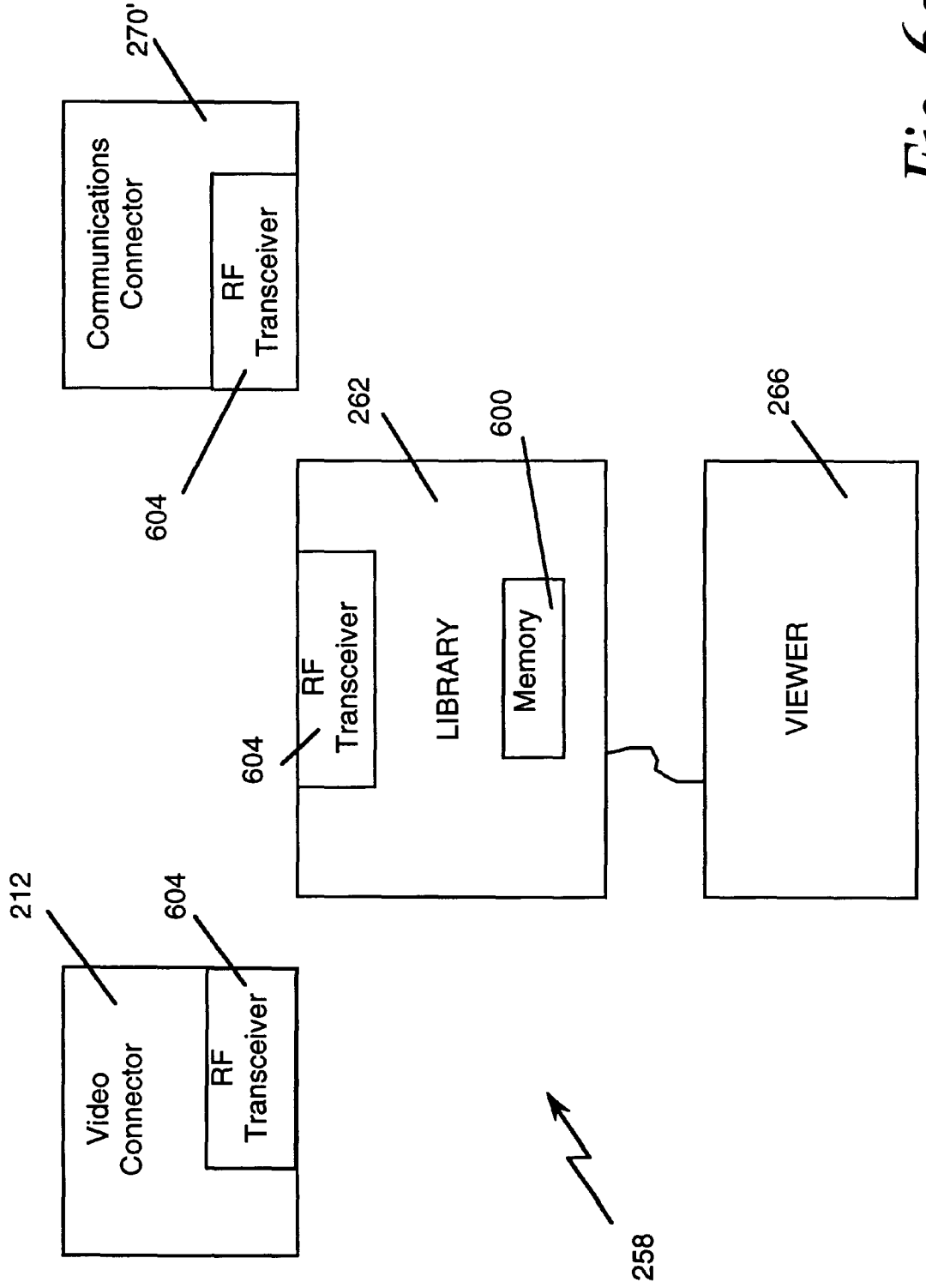

270'
Communications Connector
RF Transceiver
604
262
600
266
604
RF Transceiver
LIBRARY
Memory
VIEWER
212
604
Video Connector
RF Transceiver
258

Fig. 6a

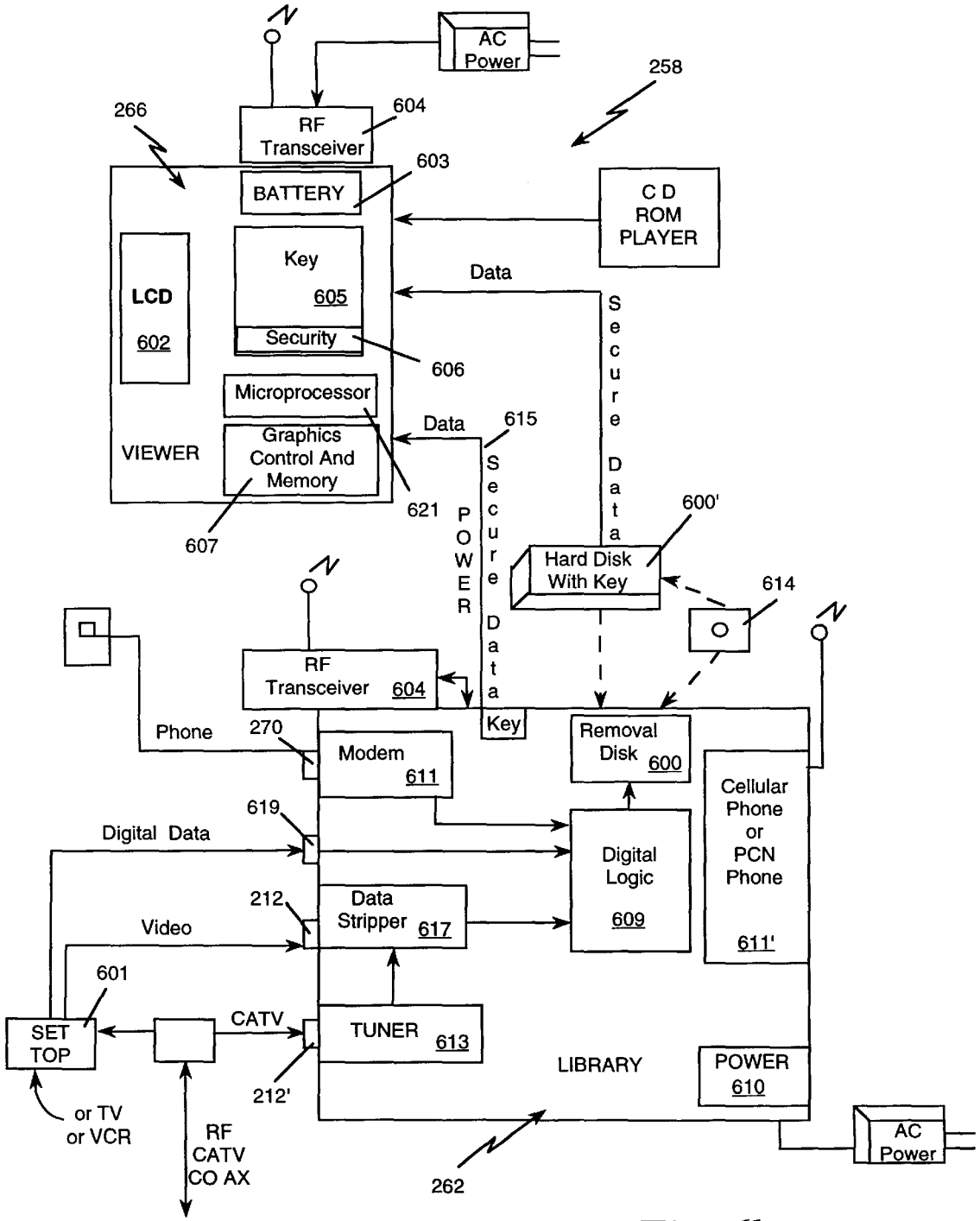

AC Power
258
266
RF Transceiver
604
603
BATTERY
C D ROM PLAYER
LCD 602
Key 605
Data
Security
606
Microprocessor
Graphics Control And Memory
VIEWER
607
Data
615
621
POWER
Secure Data
Secure Data
600'
Hard Disk With Key
614
RF Transceiver 604
Key
Phone
270
Modem 611
Removal Disk 600
619
Digital Data
Digital Logic 609
Cellular Phone or PCN Phone 611'
212
Data Stripper 617
Video
601
SET TOP
CATV
TUNER 613
LIBRARY
POWER 610
212'
or TV or VCR
RF CATV CO AX
262
AC Power

Fig. 6b

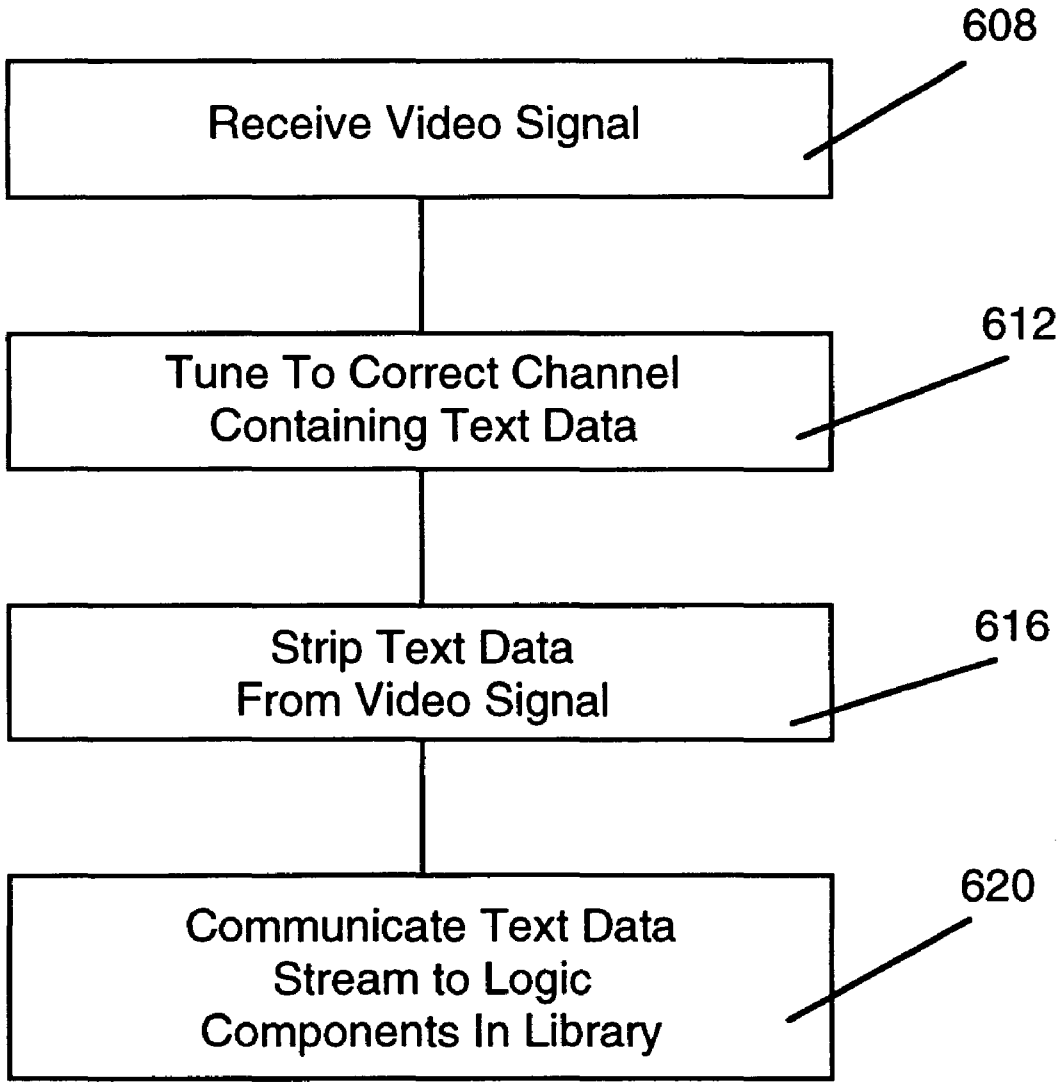

608
Receive Video Signal
612
Tune To Correct Channel Containing Text Data
616
Strip Text Data From Video Signal
620
Communicate Text Data Stream to Logic Components In Library

Fig. 7

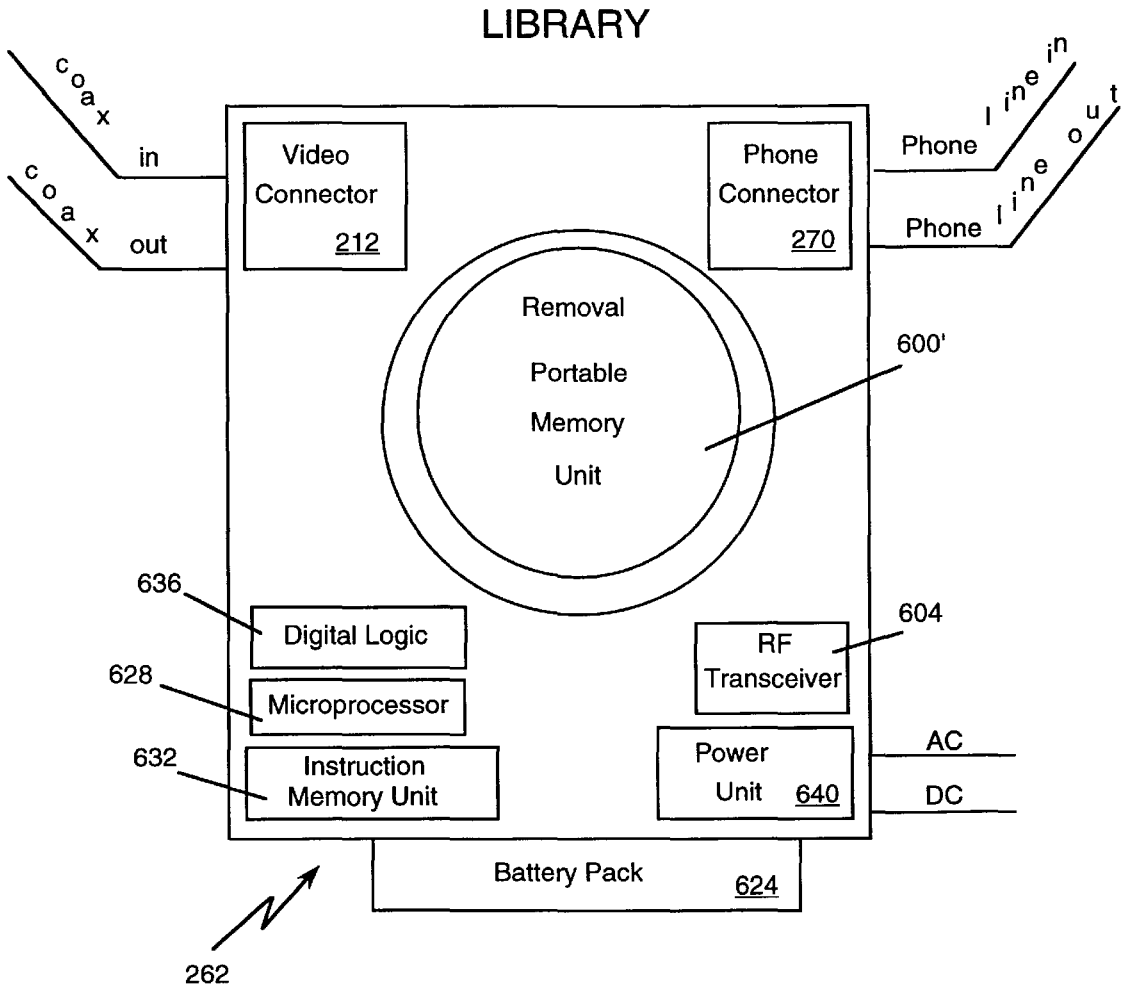

LIBRARY
coax in
coax out
Video Connector 212
Phone Connector 270
Phone line in
Phone line out
Removal Portable Memory Unit
600'
636
Digital Logic
628
Microprocessor
632
Instruction Memory Unit
604
RF Transceiver
Power Unit 640
AC
DC
Battery Pack 624
262

Fig. 8

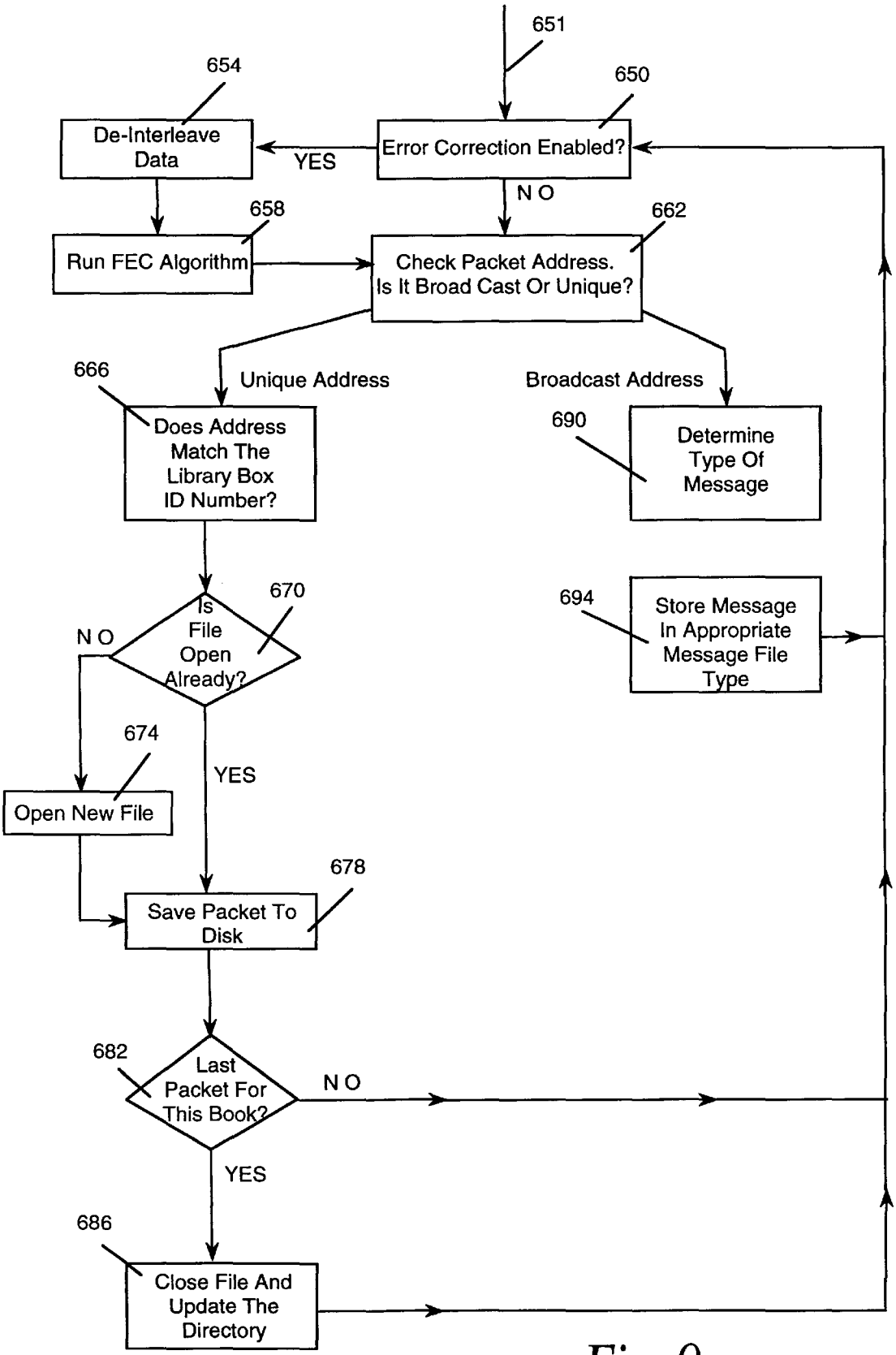

651
650
Error Correction Enabled?
YES
654
De-Interleave Data
NO
658
Run FEC Algorithm
662
Check Packet Address. Is It Broad Cast Or Unique?
Unique Address
Broadcast Address
666
Does Address Match The Library Box ID Number?
690
Determine Type Of Message
694
Store Message In Appropriate Message File Type
670
Is File Open Already?
NO
YES
674
Open New File
678
Save Packet To Disk
682
Last Packet For This Book?
NO
YES
686
Close File And Update The Directory

Fig. 9

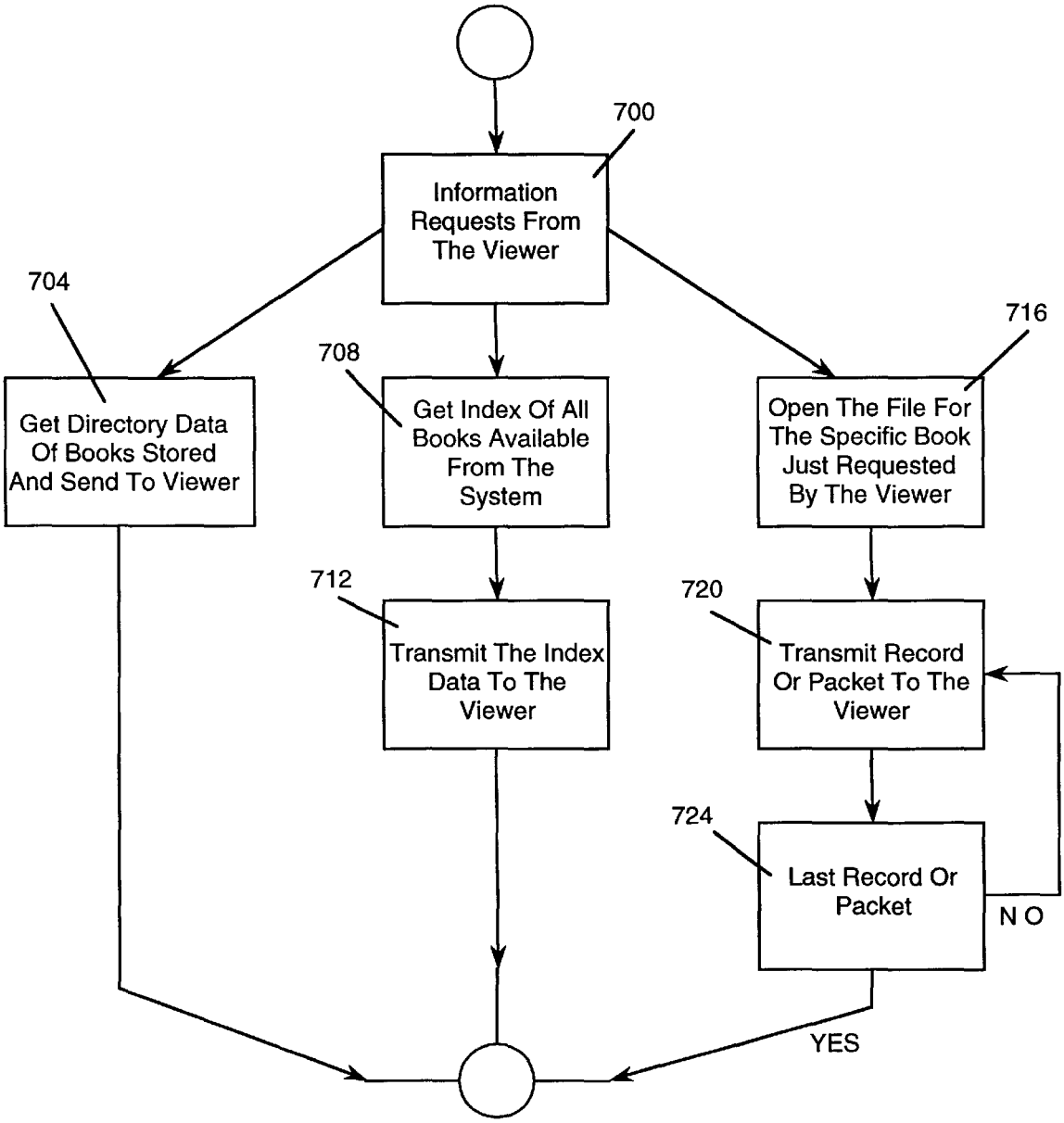

700
Information Requests From The Viewer
704
Get Directory Data Of Books Stored And Send To Viewer
708
Get Index Of All Books Available From The System
716
Open The File For The Specific Book Just Requested By The Viewer
712
Transmit The Index Data To The Viewer
720
Transmit Record Or Packet To The Viewer
724
Last Record Or Packet
N O
YES

Fig. 10

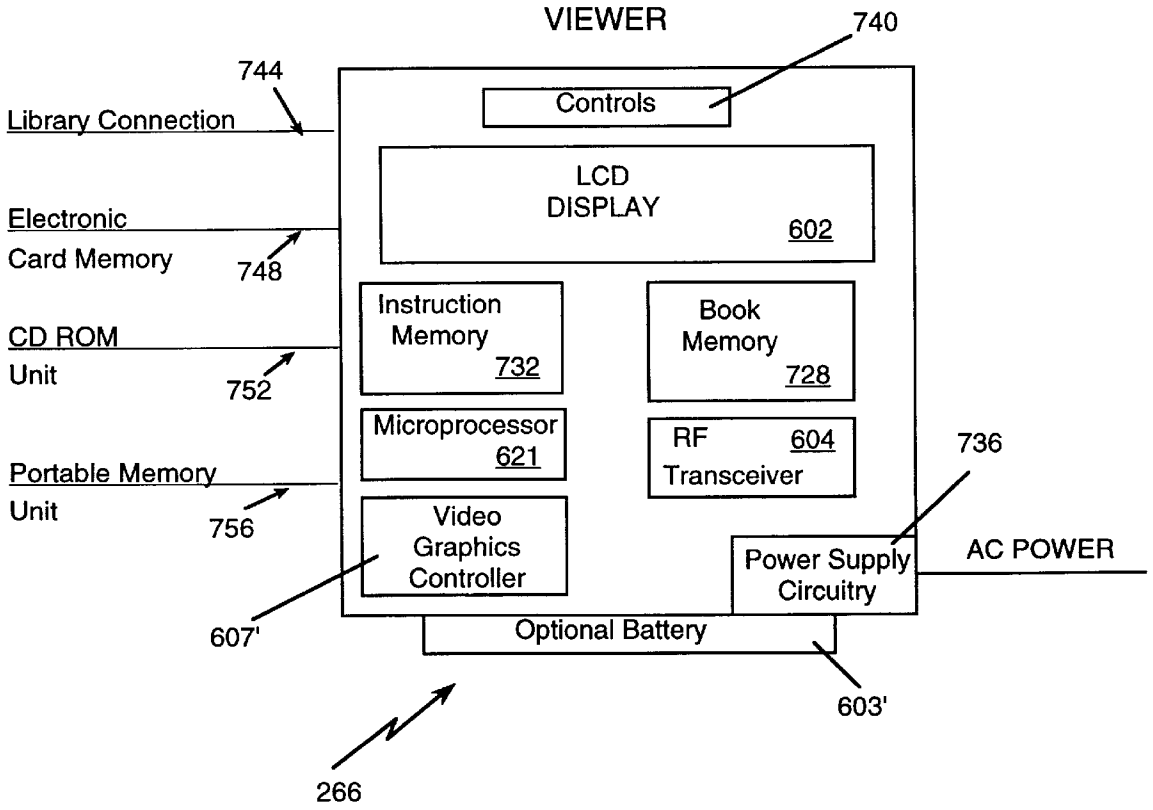

VIEWER
740
744
Library Connection
Controls
LCD
DISPLAY
602
Electronic
Card Memory
748
CD ROM
Unit
752
Instruction
Memory
732
Book
Memory
728
Microprocessor
621
RF
604
Transceiver
736
Portable Memory
Unit
756
Video
Graphics
Controller
Power Supply
Circuitry
AC POWER
607'
Optional Battery
603'
266

Fig. 11

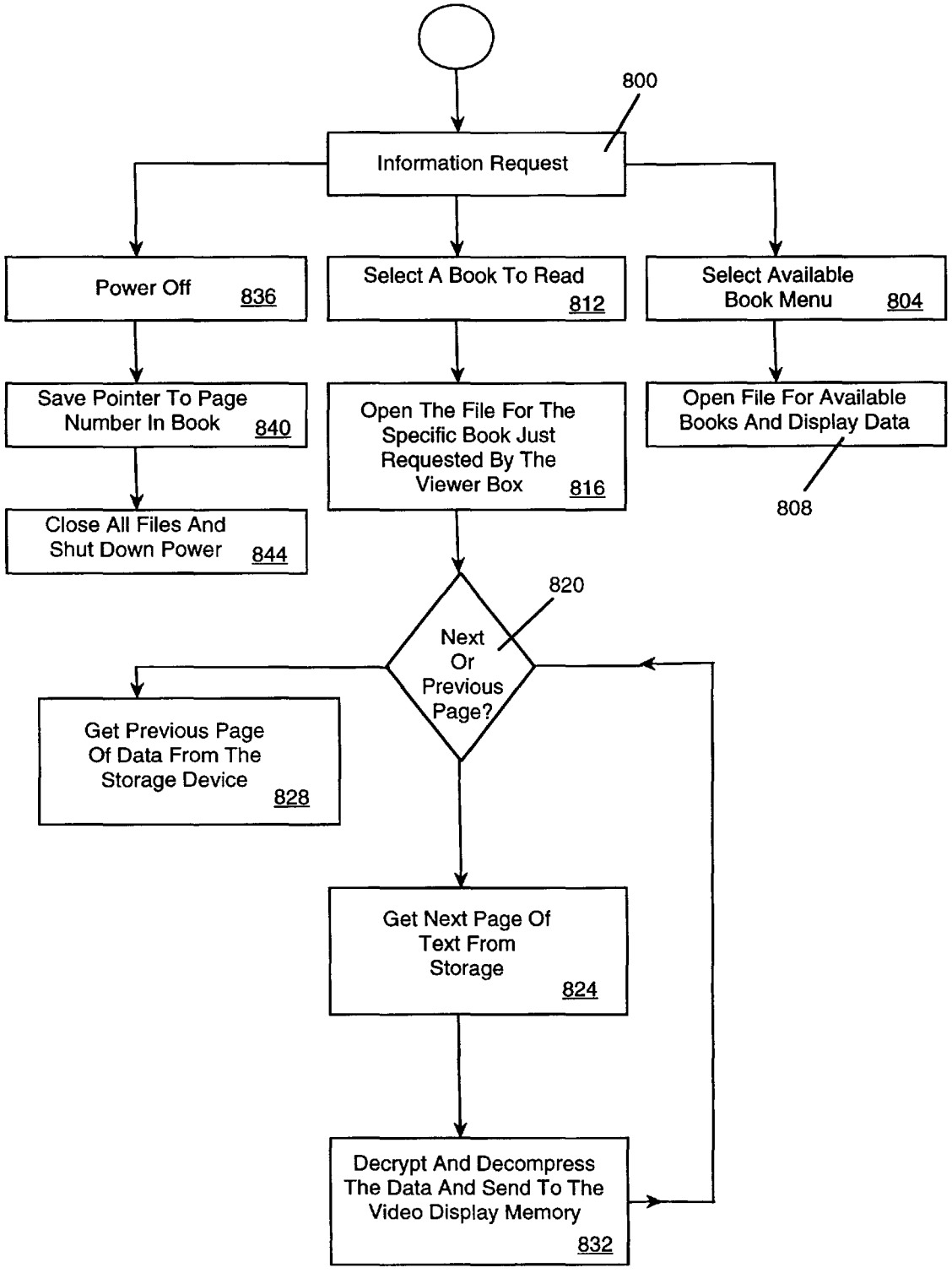
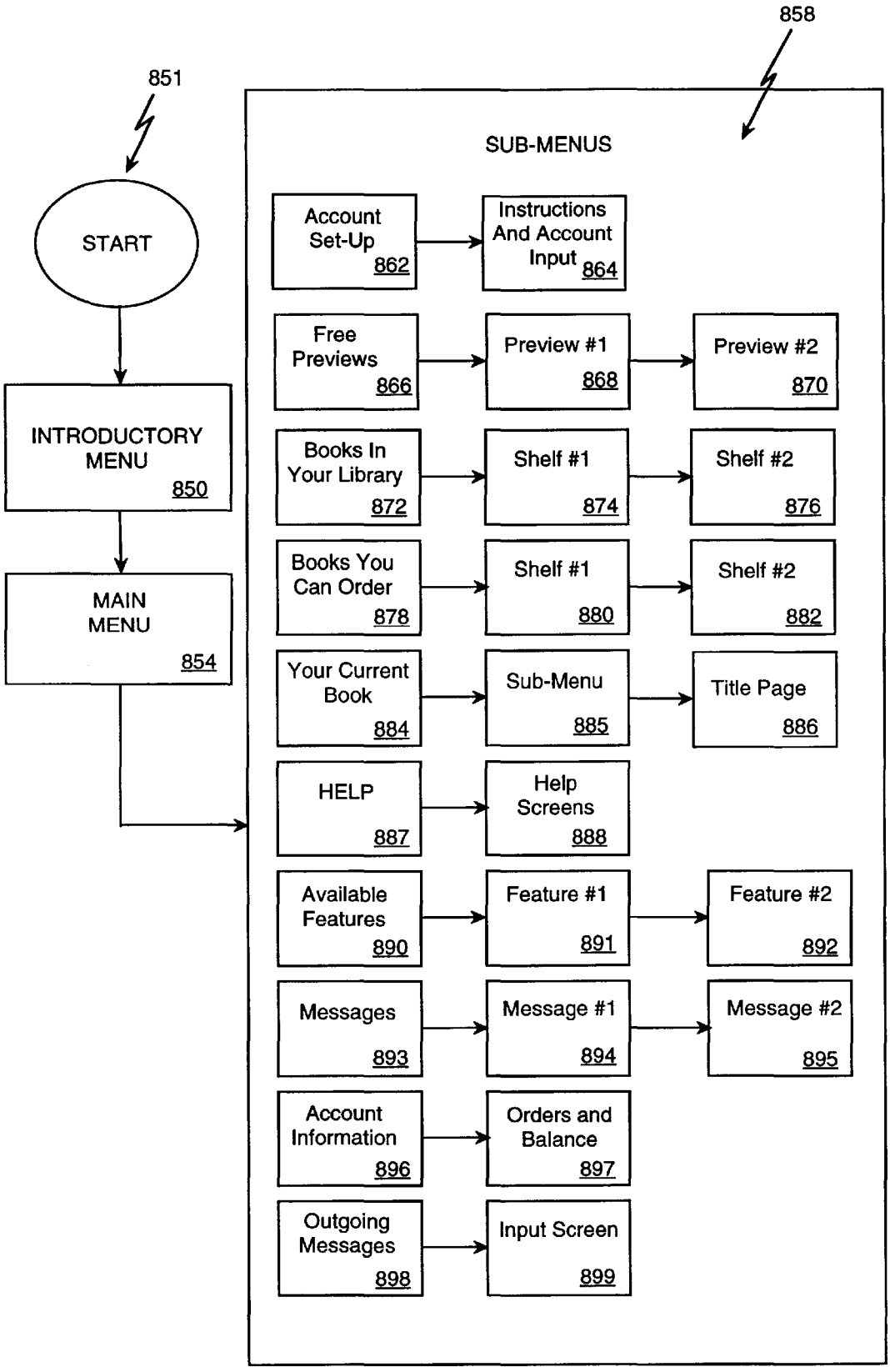

800
Information Request
Power Off 836
Select A Book To Read 812
Select Available Book Menu 804
Save Pointer To Page Number In Book 840
Open The File For The Specific Book Just Requested By The Viewer Box 816
Open File For Available Books And Display Data
808
Close All Files And Shut Down Power 844
820
Next Or Previous Page?
Get Previous Page Of Data From The Storage Device 828
Get Next Page Of Text From Storage 824
Decrypt And Decompress The Data And Send To The Video Display Memory 832

Fig. 12


858
851
SUB-MENUS
START
INTRODUCTORY MENU 850
MAIN MENU 854
Account Set-Up 862
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Messages 893
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Message #2 895
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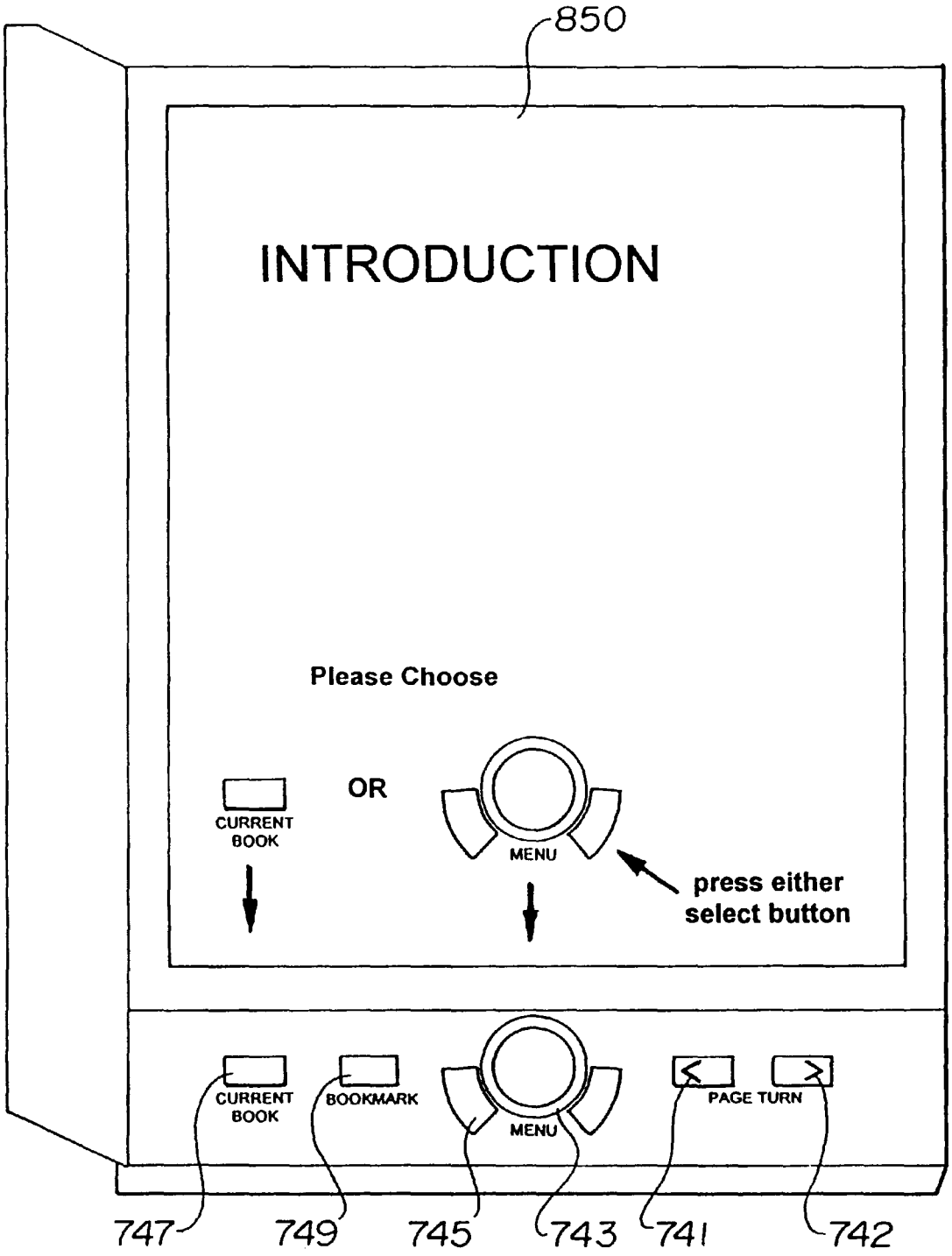
Orders and Balance 897
Outgoing Messages 898
Input Screen 899

Fig. 13

Fig. 14a


850
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OR
MENU
press either select button
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BOOKMARK
MENU
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747
749
745
743
741
742

Fig. 14b

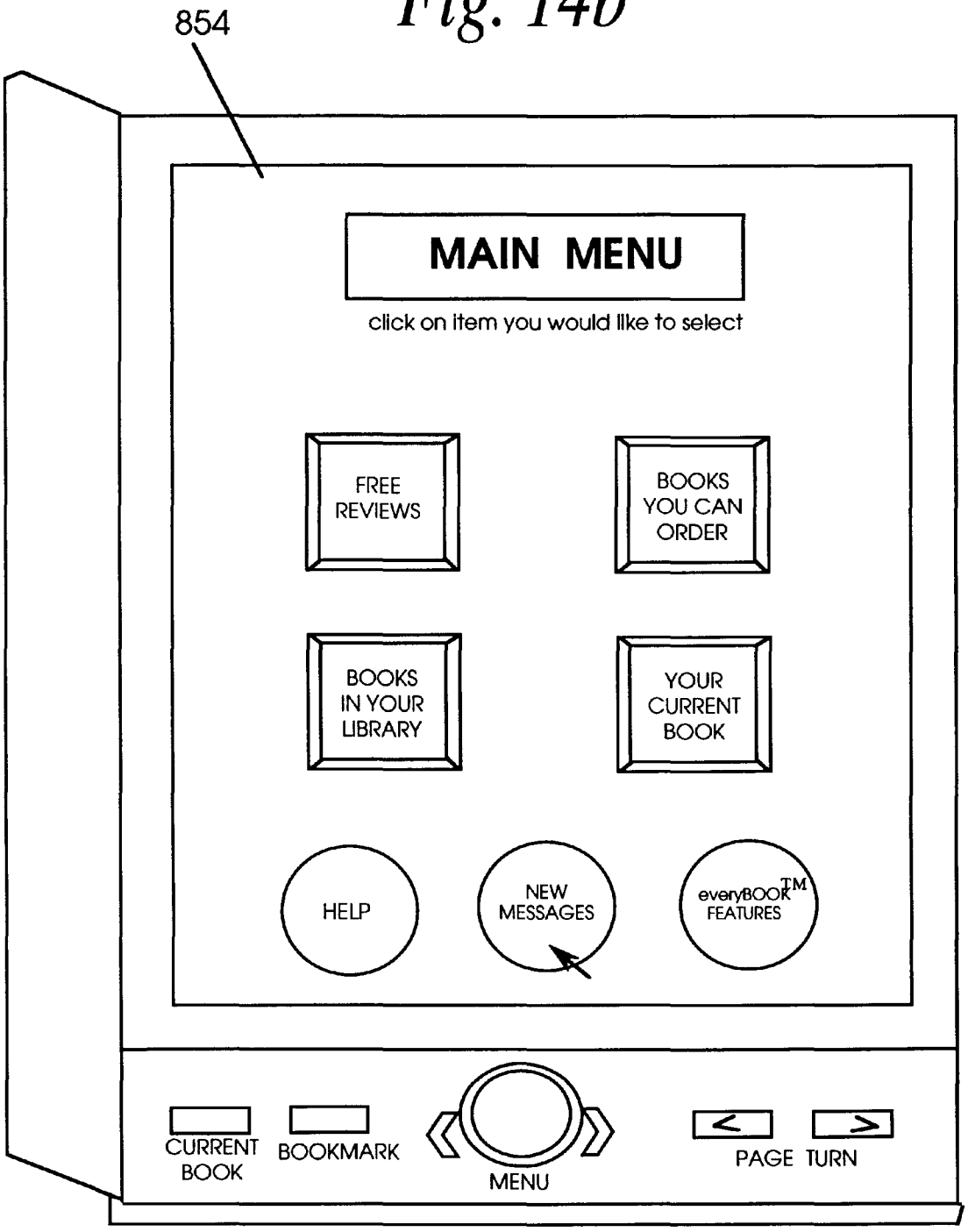
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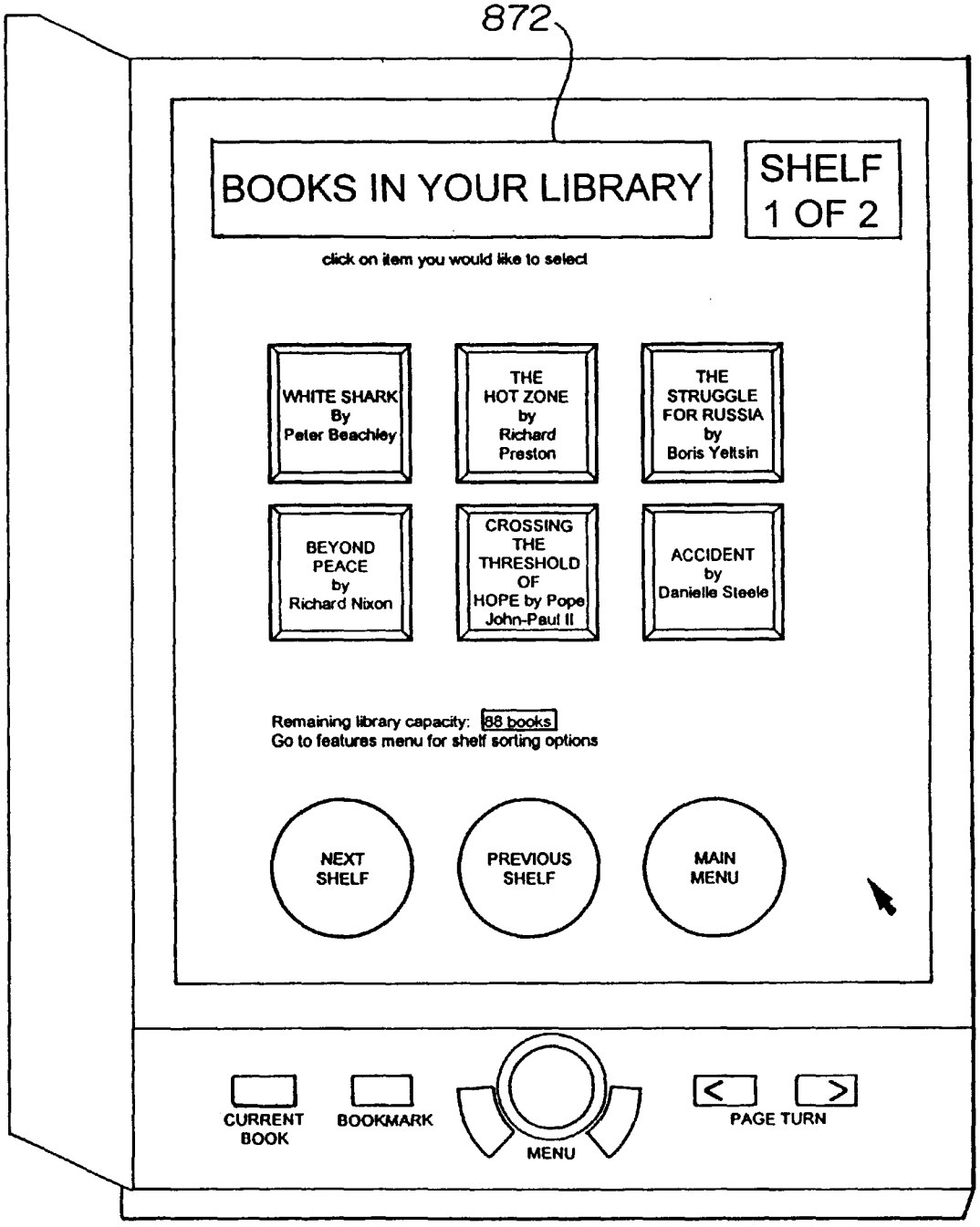
Fig. 14c


872
BOOKS IN YOUR LIBRARY
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click on item you would like to select
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THE HOT ZONE by Richard Preston
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BEYOND PEACE by Richard Nixon
CROSSING THE THRESHOLD OF HOPE by Pope John-Paul II
ACCIDENT by Danielle Steele
Remaining library capacity: 88 books
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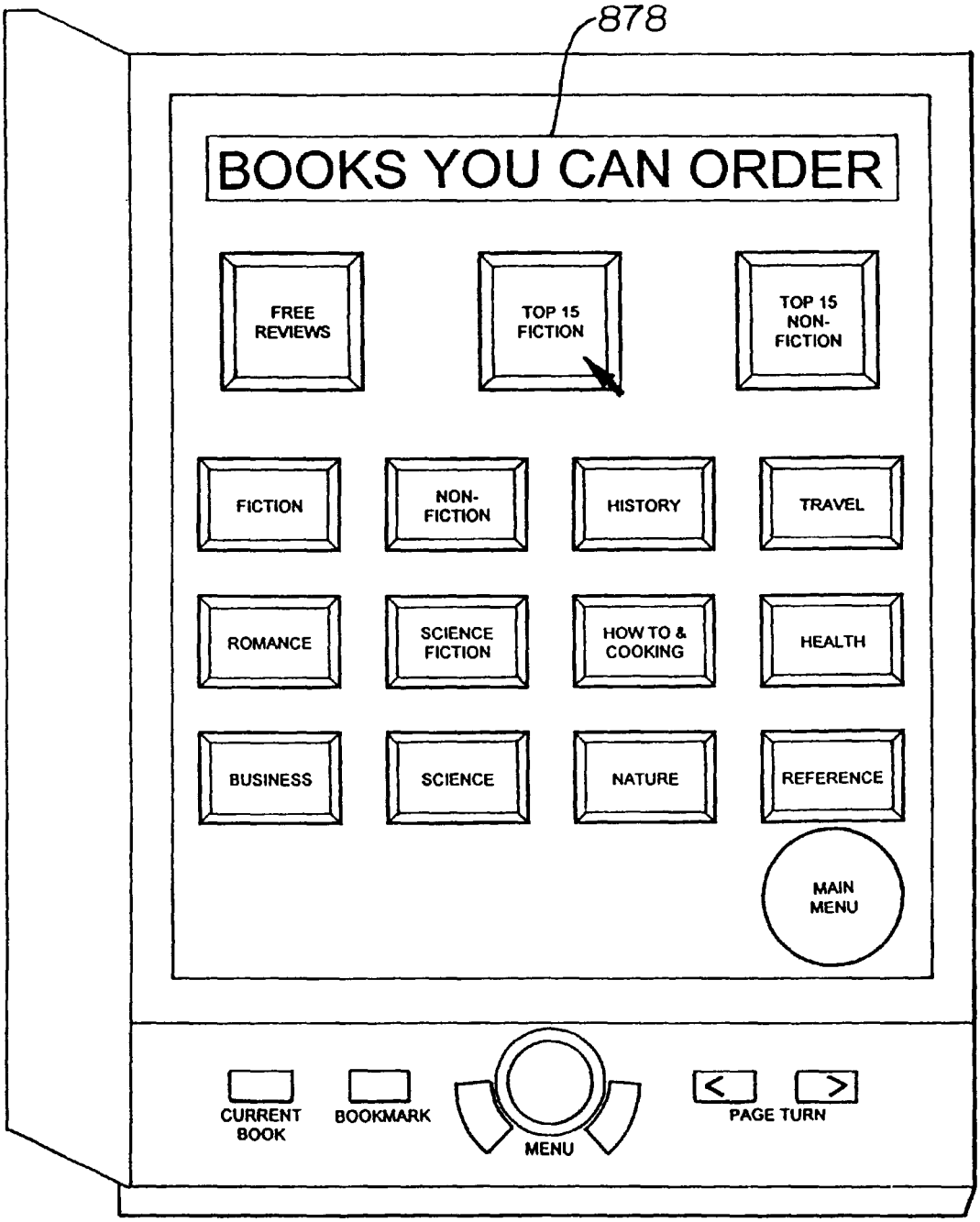
Fig. 14d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SCIENCE
NATURE
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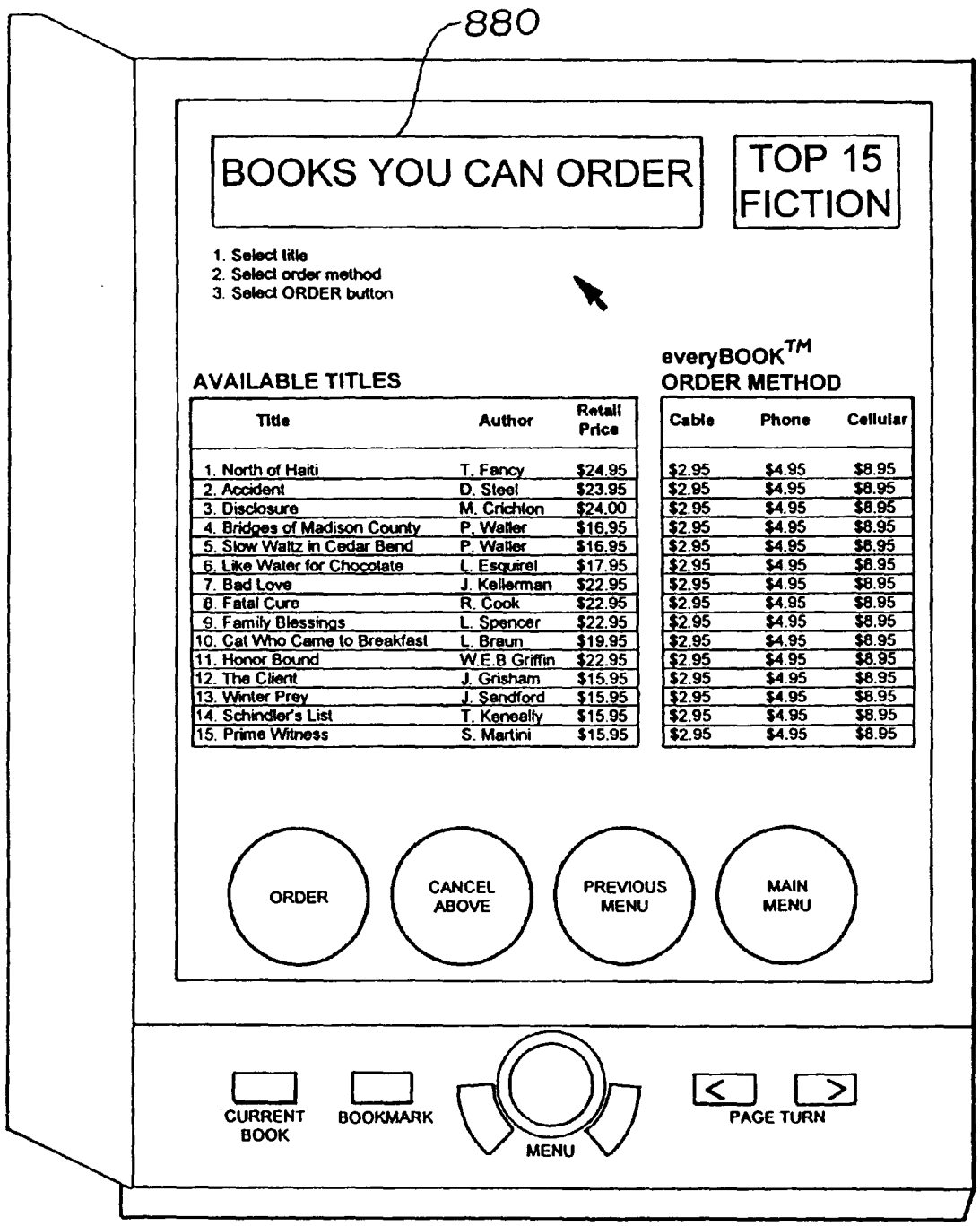
MENU
PAGE TURN

Fig. 14e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9. Family Blessings L. Spencer $22.95 $2.95 $4.95 $8.95
10. Cat Who Came to Breakfast L. Braun $19.95 $2.95 $4.95 $8.95
11. Honor Bound W.E.B Griffin $22.95 $2.95 $4.95 $8.95
12. The Client J. Grisham $15.95 $2.95 $4.95 $8.95
13. Winter Prey J. Sandford $15.95 $2.95 $4.95 $8.95
14. Schindler's List T. Keneally $15.95 $2.95 $4.95 $8.95
15. Prime Witness S. Martini $15.95 $2.95 $4.95 $8.95
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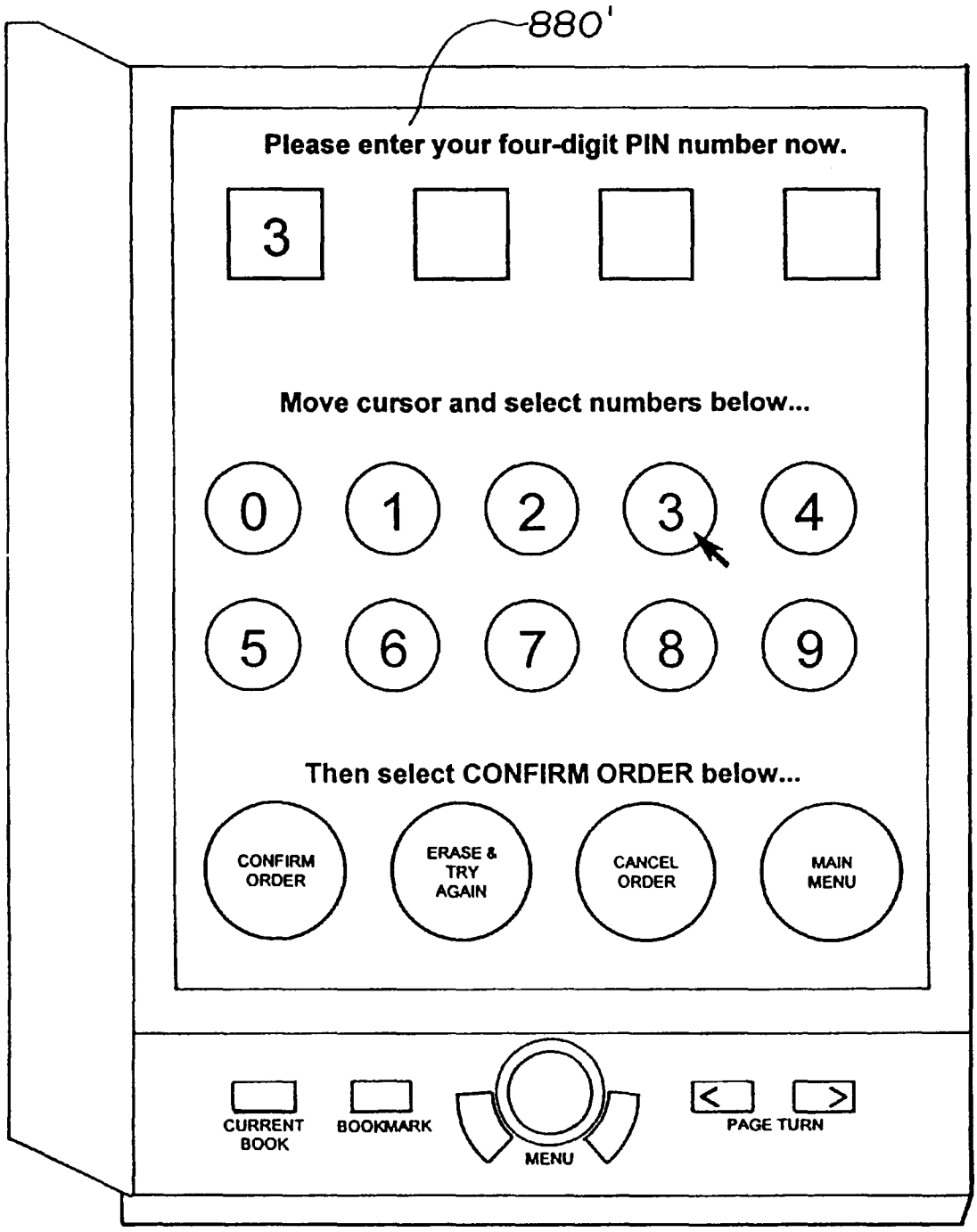
Fig. 14f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Please enter your four-digit PIN number now.
3
Move cursor and select numbers below...
0
1
2
3
4
5
6
7
8
9
Then select CONFIRM ORDER below...
CONFIRM ORDER
ERASE & TRY AGAIN
CANCEL ORDER
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BOOKMARK
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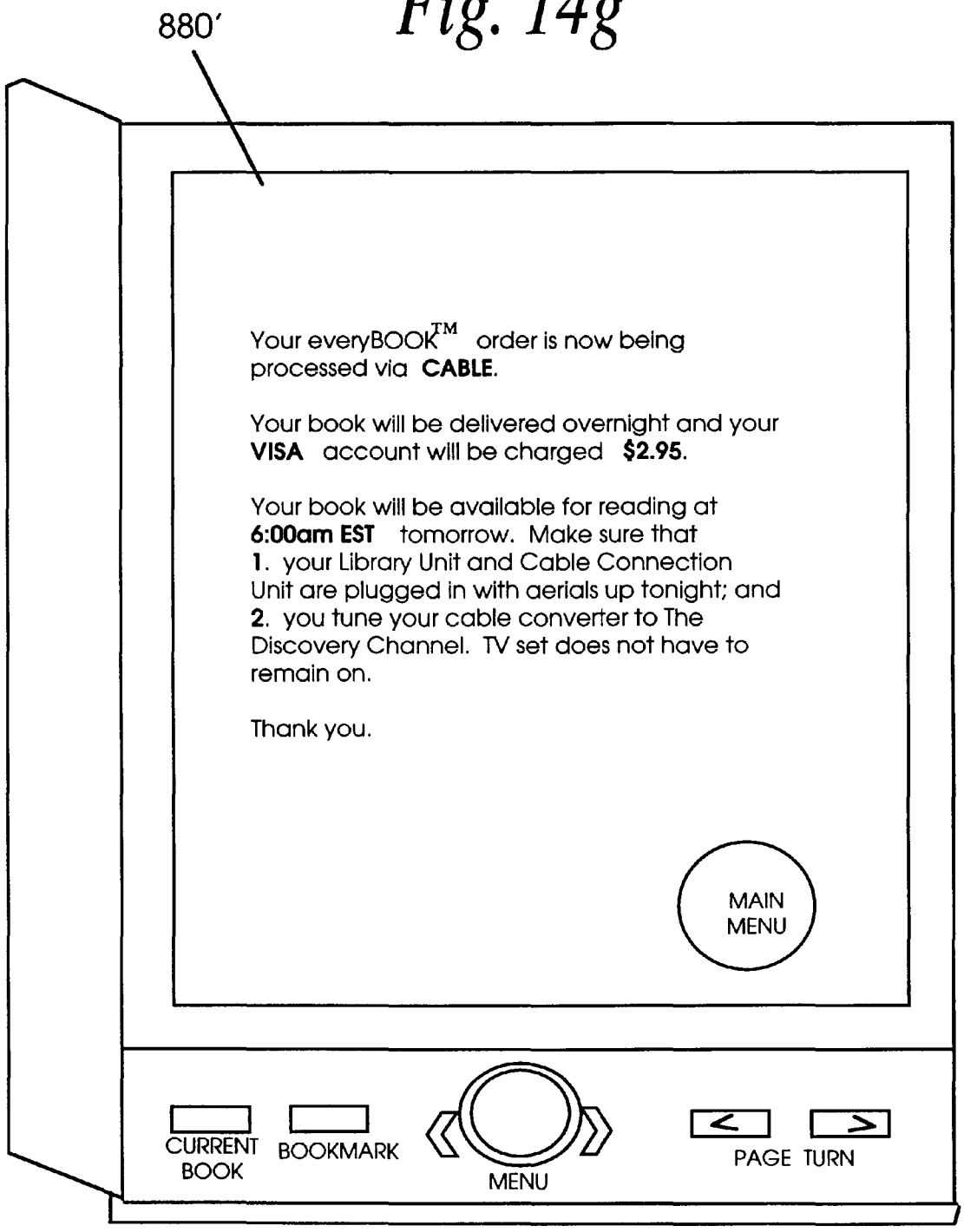
Fig. 14g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Your everyBOOK™ order is now being processed via **CABLE**.
Your book will be delivered overnight and your **VISA** account will be charged **$2.95**.
Your book will be available for reading at **6:00am EST** tomorrow. Make sure that **1**. your Library Unit and Cable Connection Unit are plugged in with aerials up tonight; and **2**. you tune your cable converter to The Discovery Channel. TV set does not have to remain on.
Thank you.
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BOOKMARK
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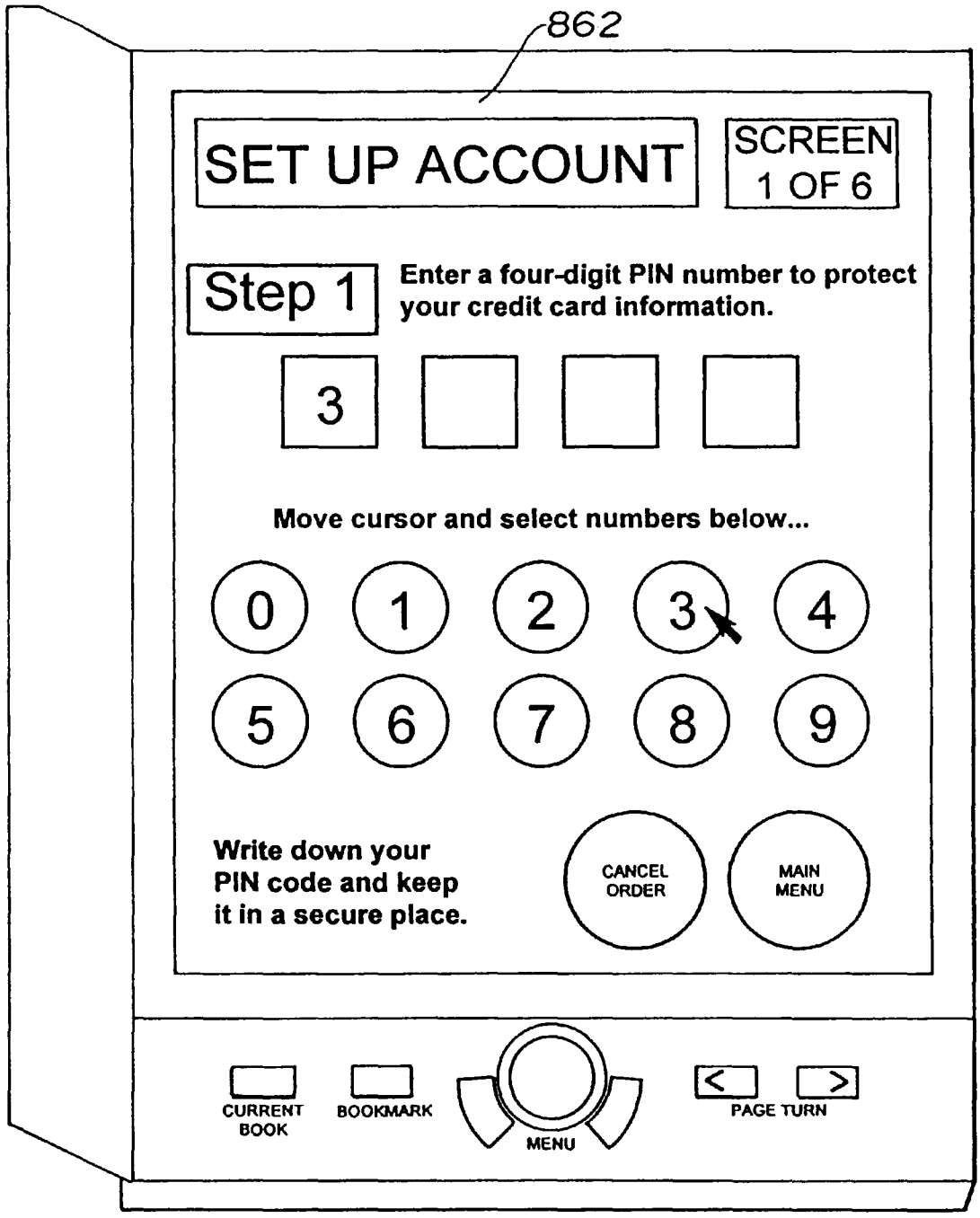
Fig. 14h


862
SET UP ACCOUNT
SCREEN 1 OF 6
Step 1
Enter a four-digit PIN number to protect your credit card information.
3
Move cursor and select numbers below...
0
1
2
3
4
5
6
7
8
9
Write down your PIN code and keep it in a secure place.
CANCEL ORDER
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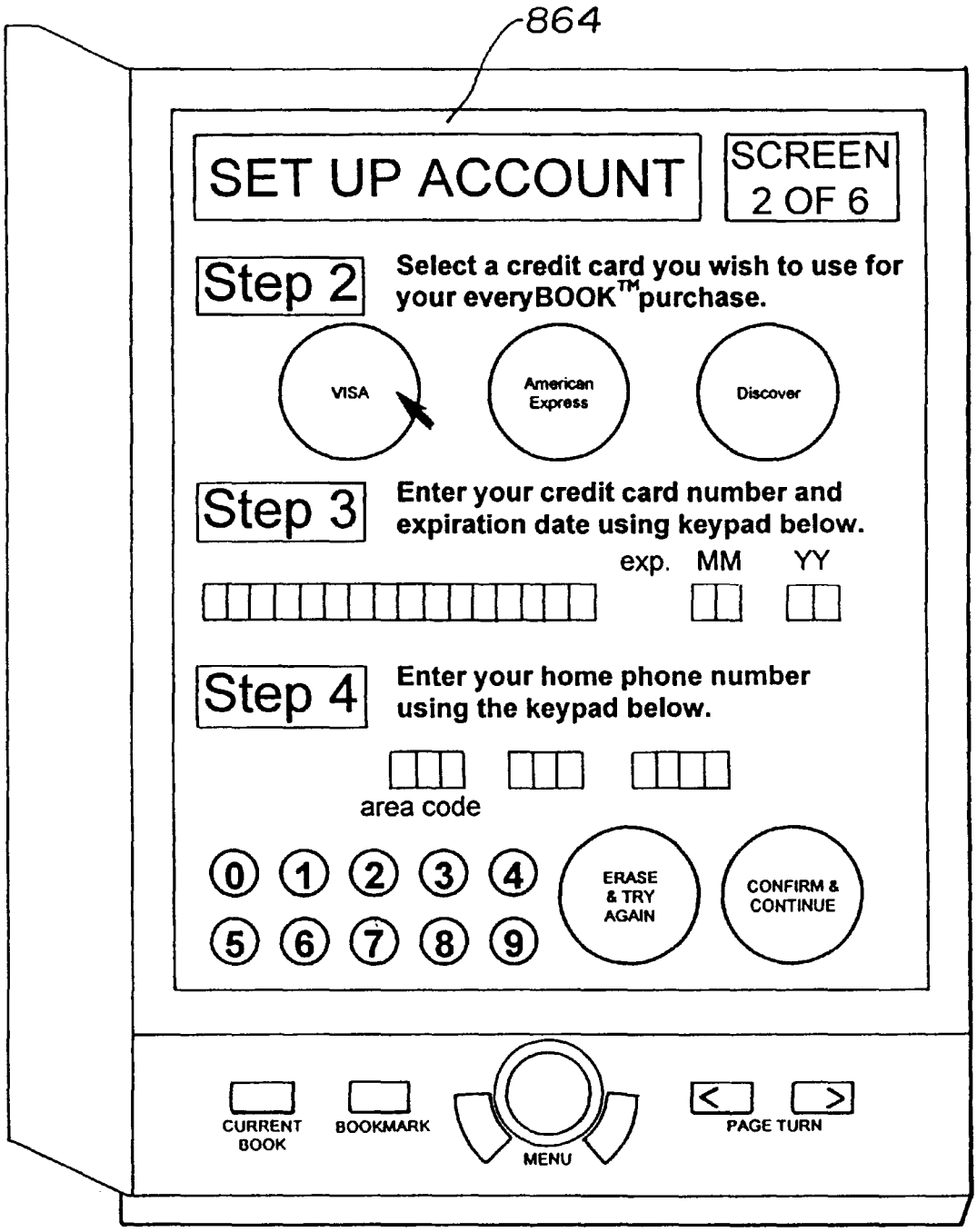
PAGE TURN

Fig. 14i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SET UP ACCOUNT
SCREEN 2 OF 6
Step 2
Select a credit card you wish to use for your everyBOOK™ purchase.
VISA
American Express
Discover
Step 3
Enter your credit card number and expiration date using keypad below.
exp. MM YY
Step 4
Enter your home phone number using the keypad below.
area code
0 1 2 3 4
5 6 7 8 9
ERASE & TRY AGAIN
CONFIRM & CONTINUE
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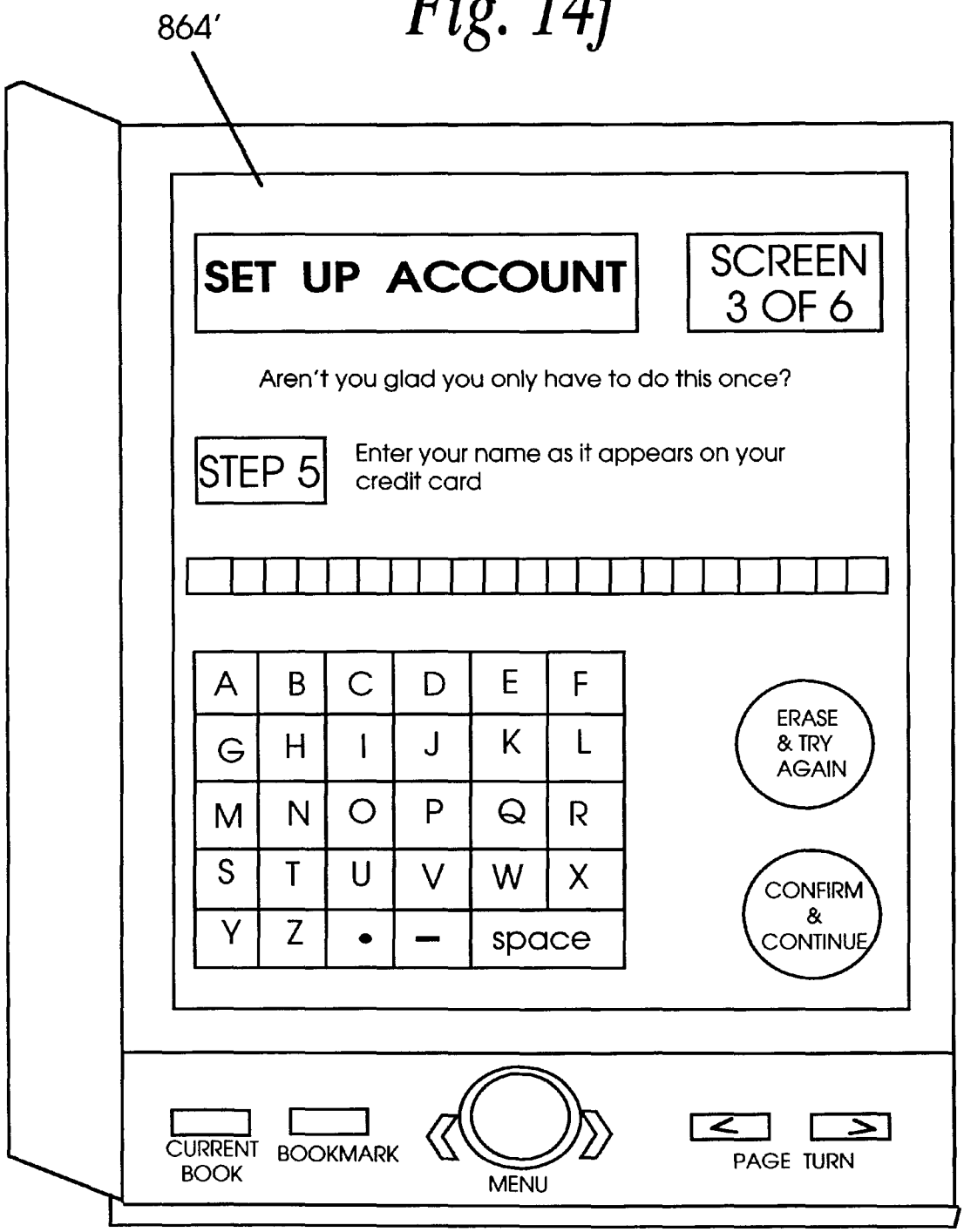
MENU
PAGE TURN

Fig. 14j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SET UP ACCOUNT
SCREEN 3 OF 6
Aren't you glad you only have to do this once?
STEP 5
Enter your name as it appears on your credit card
A B C D E F
G H I J K L
M N O P Q R
S T U V W X
Y Z • — space
ERASE & TRY AGAIN
CONFIRM & CONTINUE
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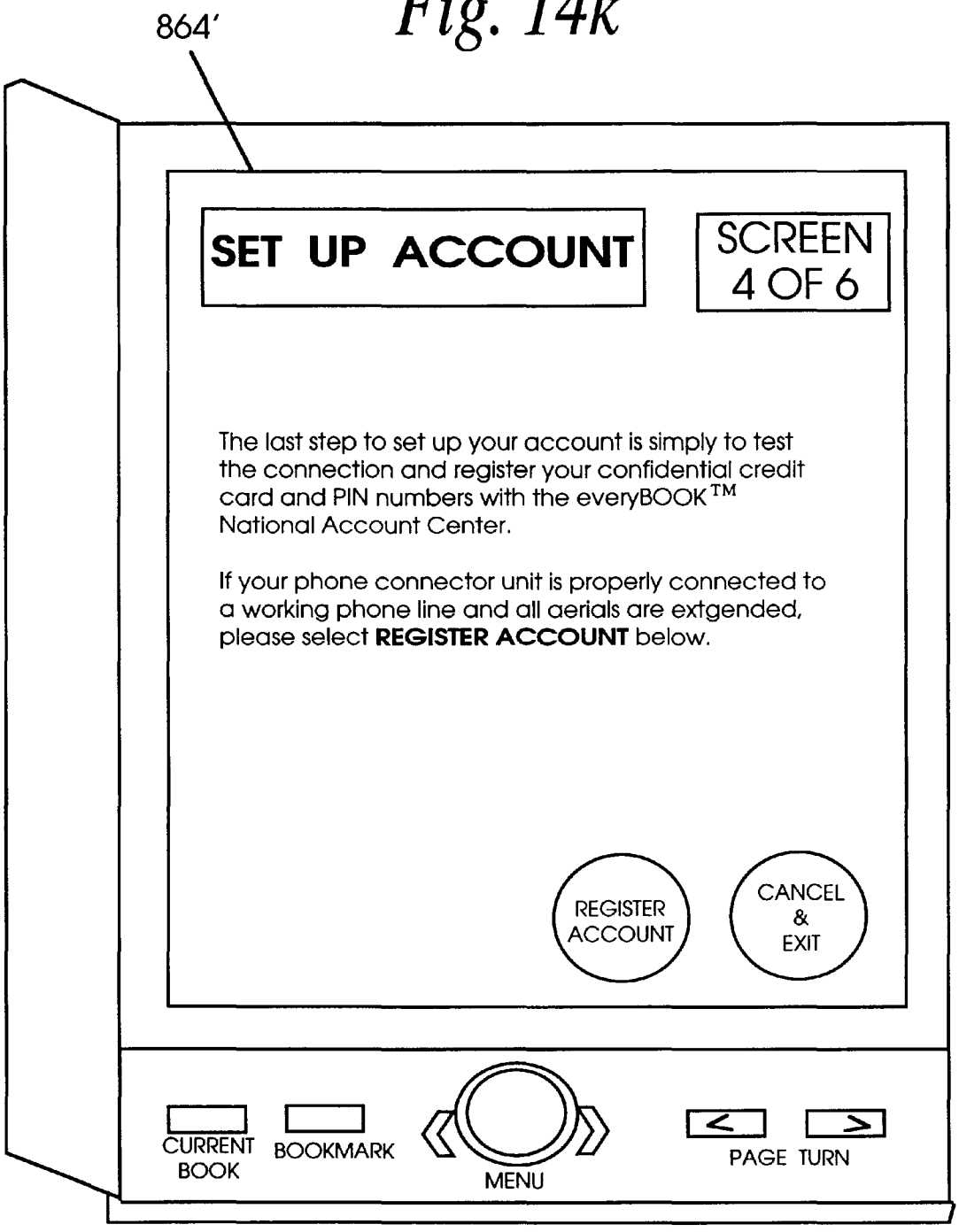
BOOKMARK
MENU
PAGE TURN

Fig. 14k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SET UP ACCOUNT
SCREEN 4 OF 6
The last step to set up your account is simply to test the connection and register your confidential credit card and PIN numbers with the everyBOOK™ National Account Center.
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REGISTER ACCOUNT
CANCEL & EXIT
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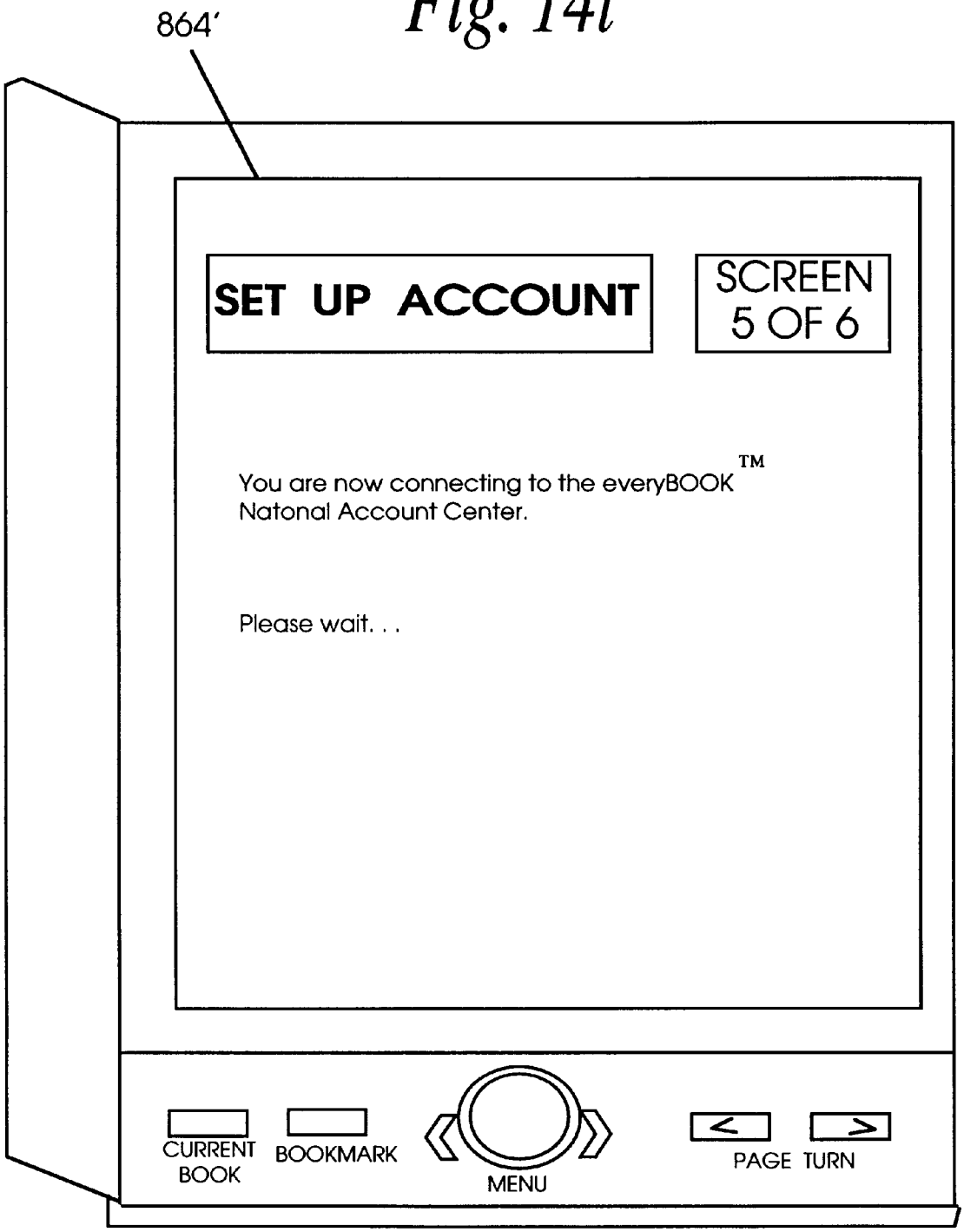
Fig. 14l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You are now connecting to the everyBOOK™ Natonal Account Center.
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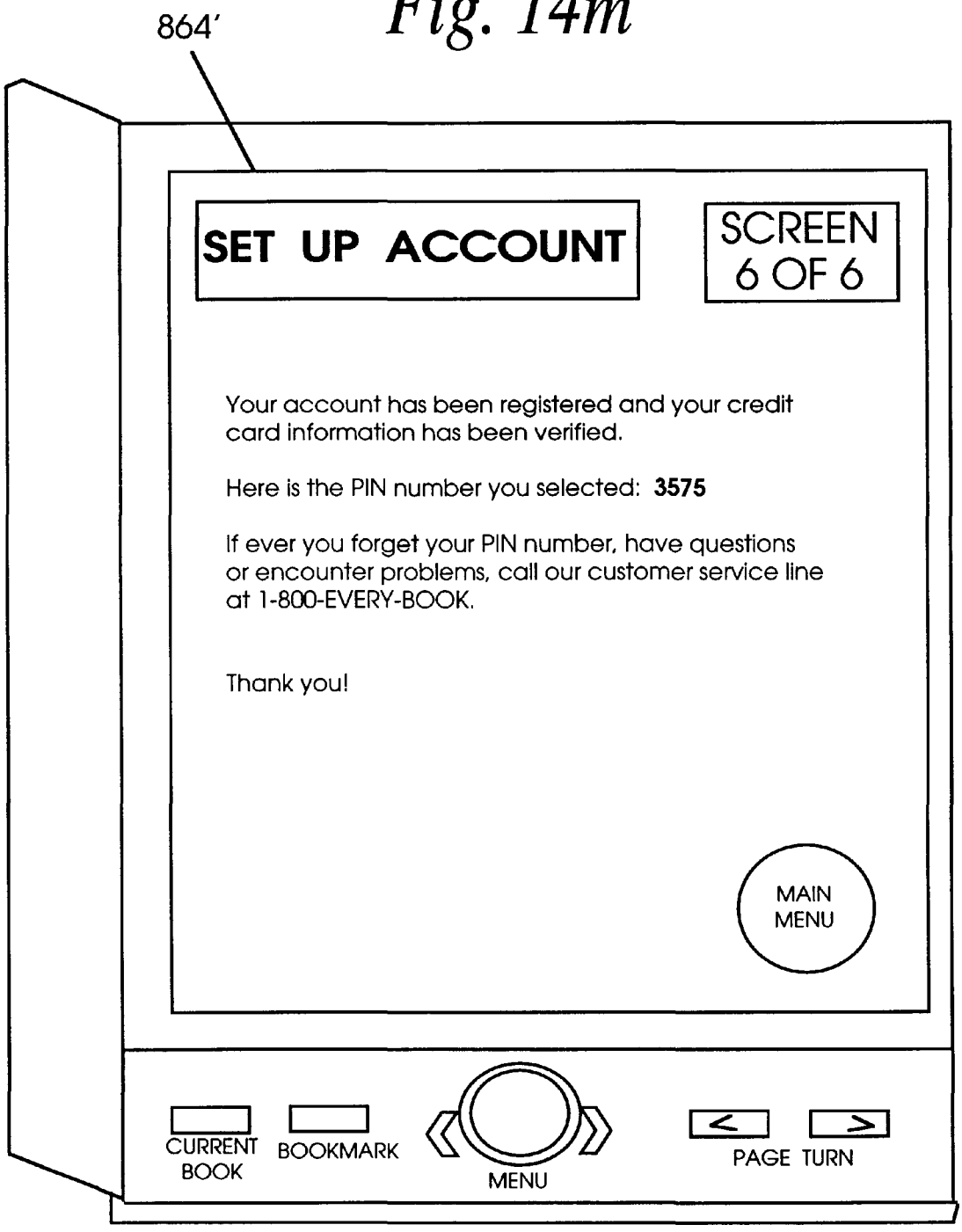
Fig. 14m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SET UP ACCOUNT
SCREEN 6 OF 6
Your account has been registered and your credit card information has been verified.
Here is the PIN number you selected: 3575
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Thank you!
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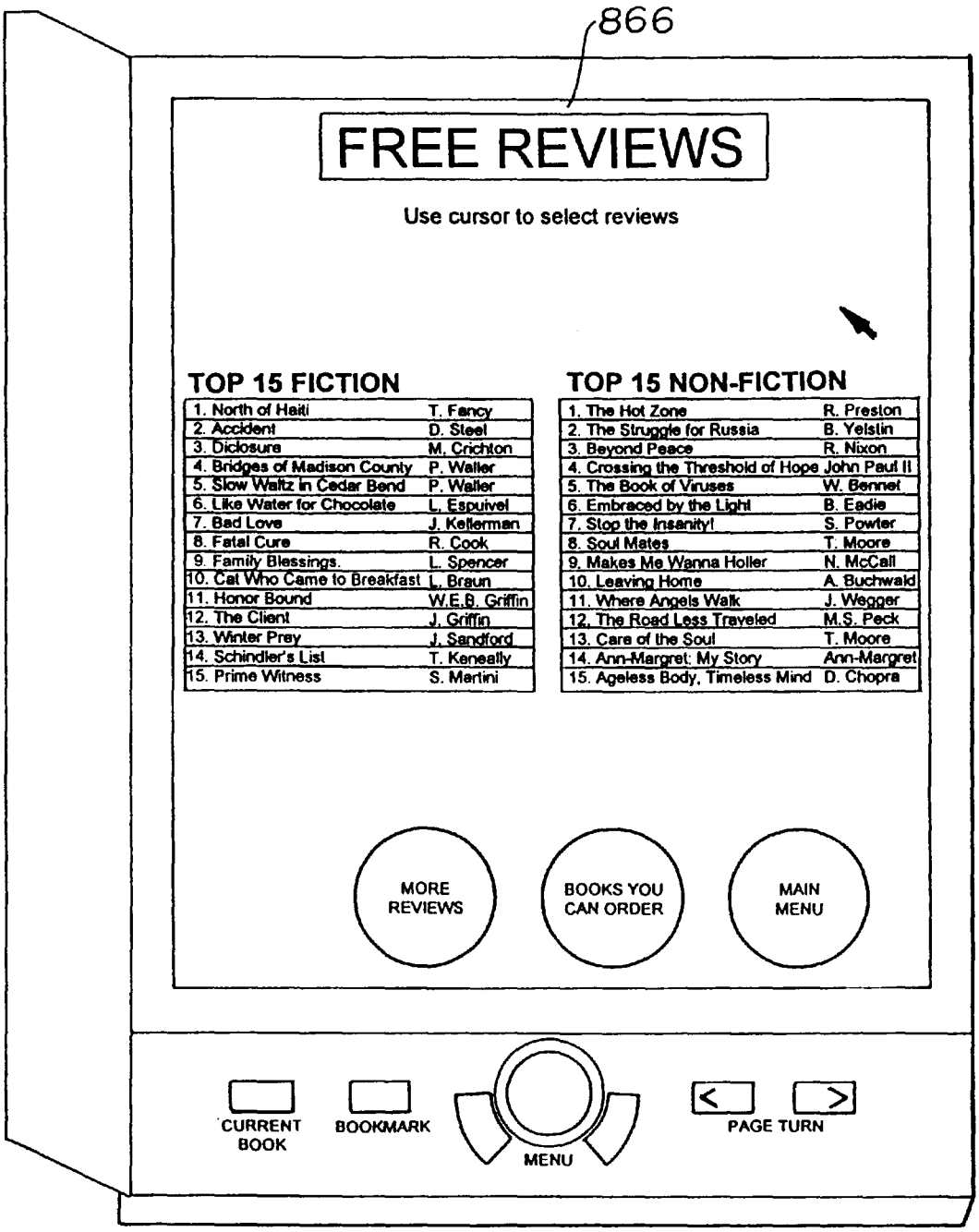
Fig. 14n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8. Fatal Cure R. Cook
9. Family Blessings. L. Spencer
10. Cat Who Came to Breakfast L. Braun
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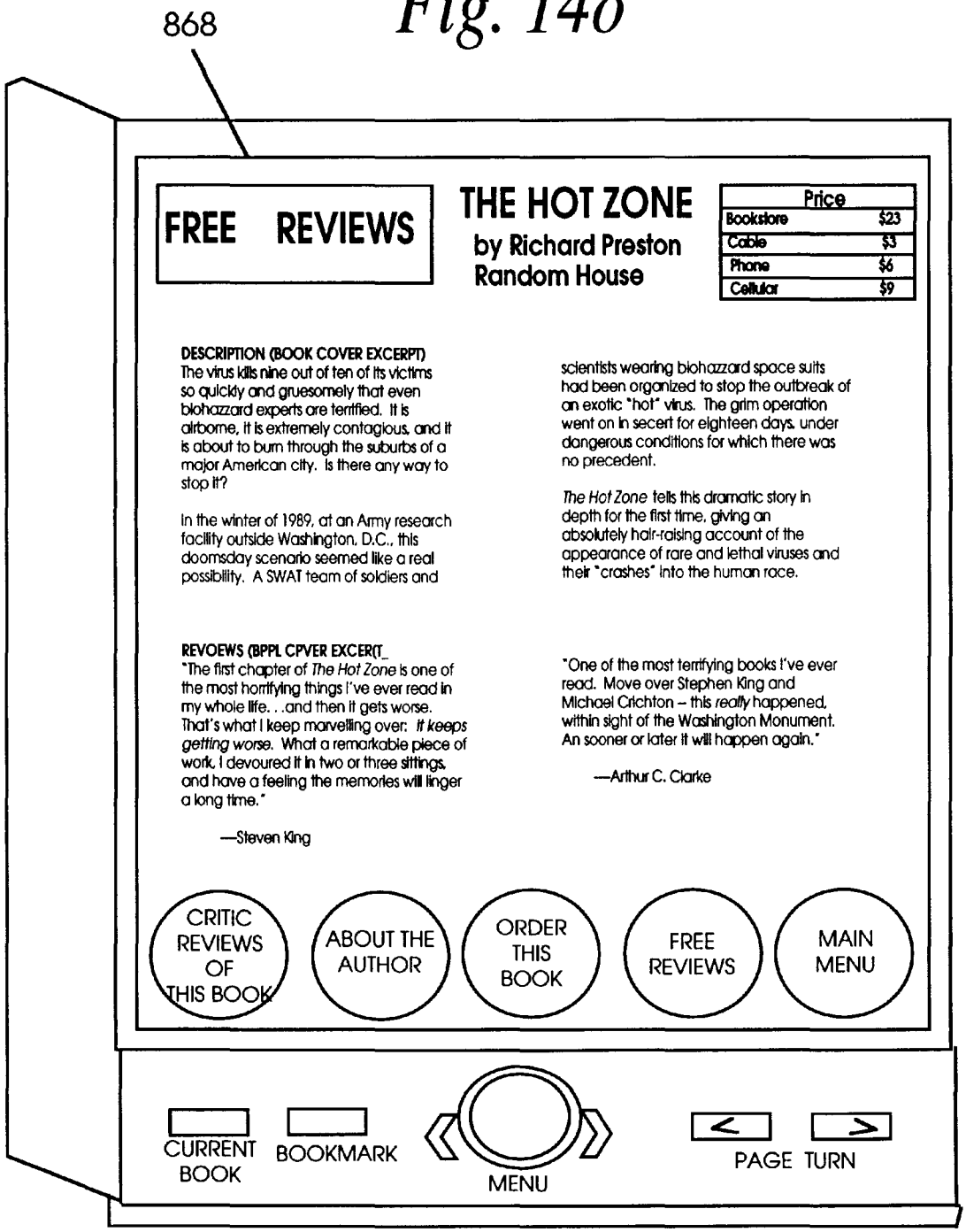
Fig. 14o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THE HOT ZONE
by Richard Preston
Random House
Price
Bookstore $23
Cable $3
Phone $6
Cellular $9
DESCRIPTION (BOOK COVER EXCERPT)
The virus kills nine out of ten of its victims so quickly and gruesomely that even biohazzard experts are terrified. It is airborne, it is extremely contagious, and it is about to burn through the suburbs of a major American city. Is there any way to stop it?
In the winter of 1989, at an Army research facility outside Washington, D.C., this doomsday scenario seemed like a real possibility. A SWAT team of soldiers and scientists wearing biohazzard space suits had been organized to stop the outbreak of an exotic "hot" virus. The grim operation went on in secert for eighteen days, under dangerous conditions for which there was no precedent.
The Hot Zone tells this dramatic story in depth for the first time, giving an absolutely hair-raising account of the appearance of rare and lethal viruses and their "crashes" into the human race.
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"The first chapter of The Hot Zone is one of the most horrifying things I've ever read in my whole life. . .and then it gets worse. That's what I keep marvelling over: it keeps getting worse. What a remarkable piece of work. I devoured it in two or three sittings, and have a feeling the memories will linger a long time."
—Steven King
"One of the most terrifying books I've ever read. Move over Stephen King and Michael Crichton – this really happened, within sight of the Washington Monument. An sooner or later it will happen again."
—Arthur C. Clarke
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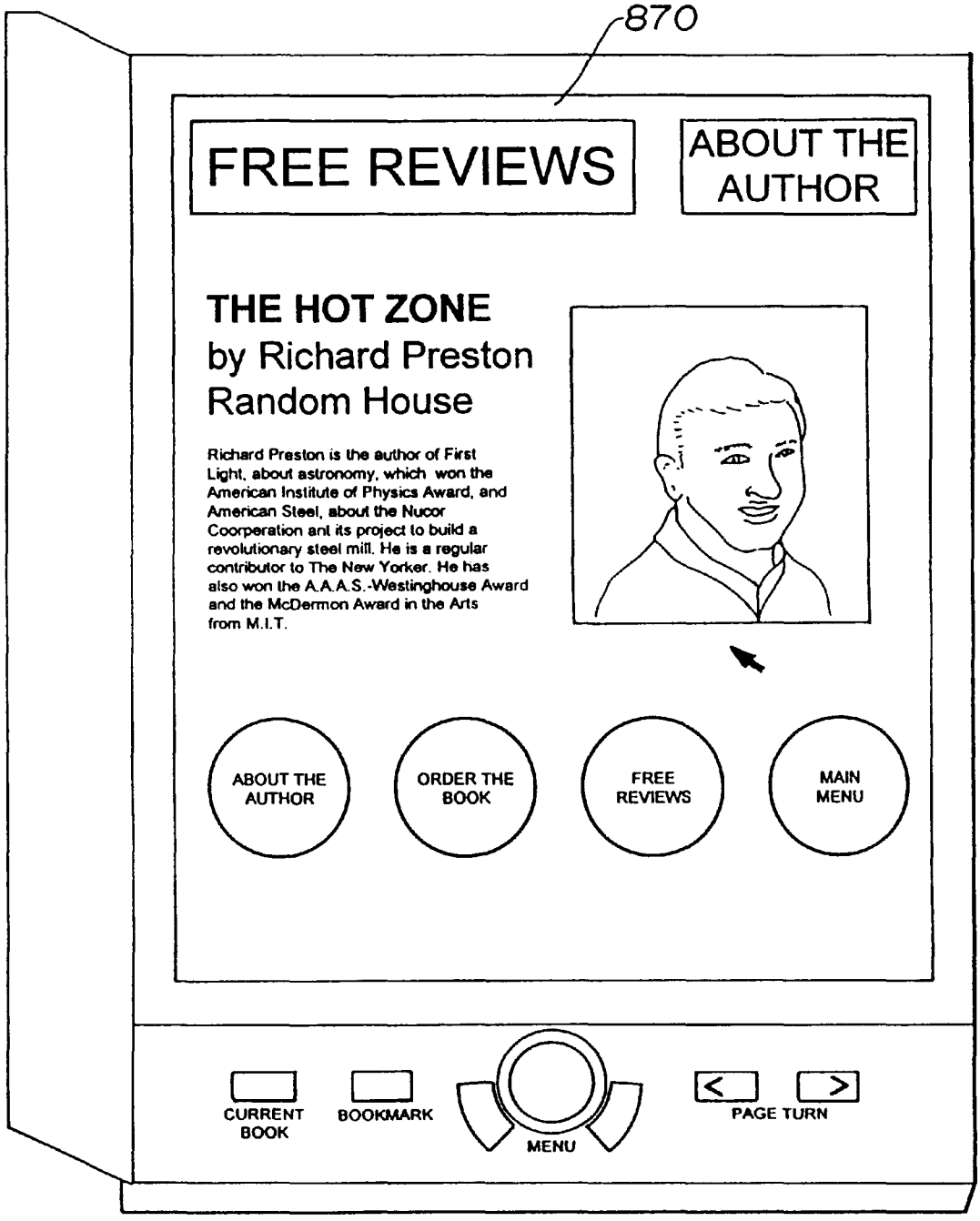
Fig. 14p


870
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THE HOT ZONE
by Richard Preston
Random House
Richard Preston is the author of First Light, about astronomy, which won the American Institute of Physics Award, and American Steel, about the Nucor Coorperation ant its project to build a revolutionary steel mill. He is a regular contributor to The New Yorker. He has also won the A.A.A.S.-Westinghouse Award and the McDermon Award in the Arts from M.I.T.
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Fig. 14q

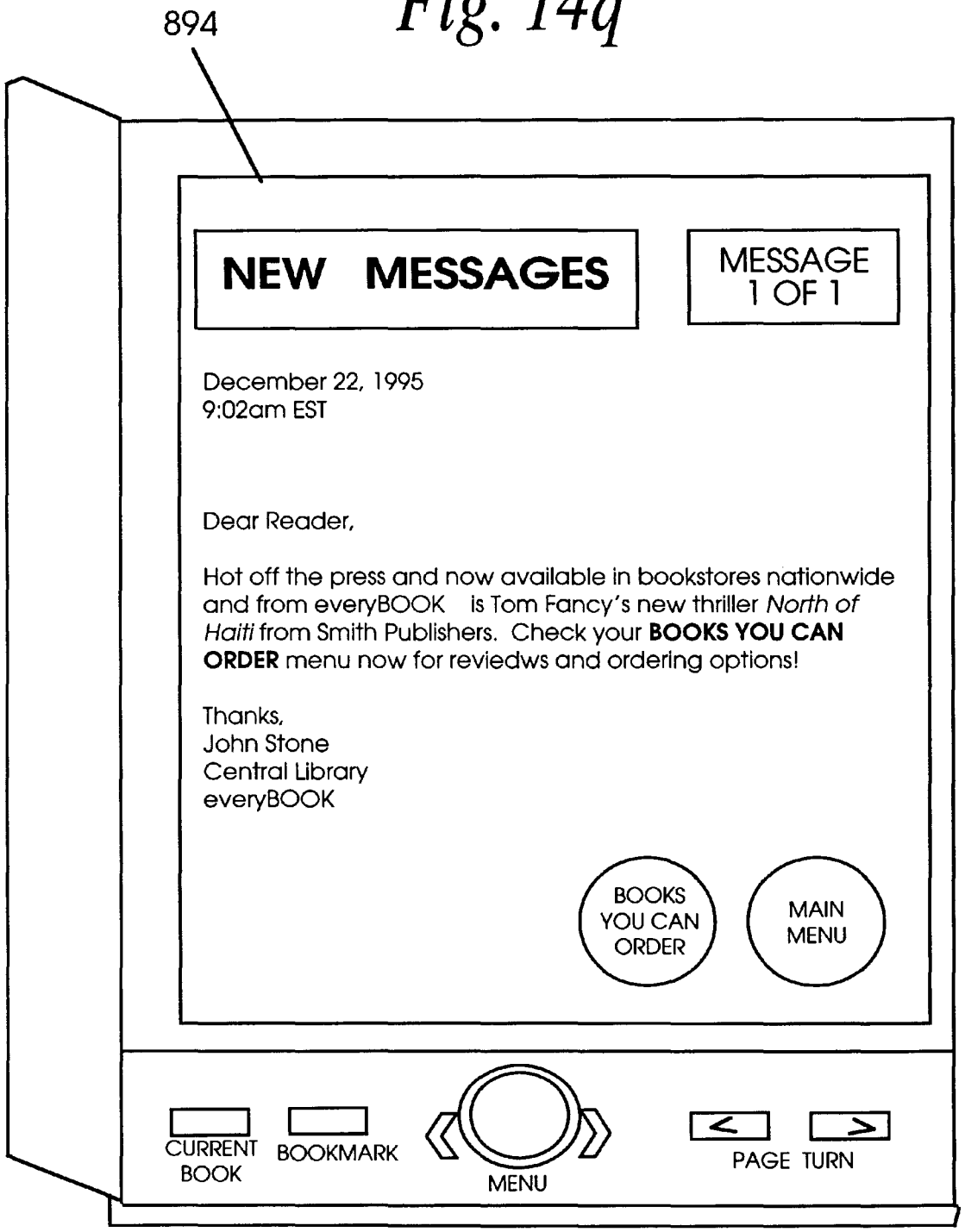
894
NEW MESSAGES
MESSAGE 1 OF 1
December 22, 1995
9:02am EST
Dear Reader,
Hot off the press and now available in bookstores nationwide and from everyBOOK is Tom Fancy's new thriller *North of Haiti* from Smith Publishers. Check your **BOOKS YOU CAN ORDER** menu now for reviedws and ordering options!
Thanks,
John Stone
Central Library
everyBOOK
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Fig. 14r

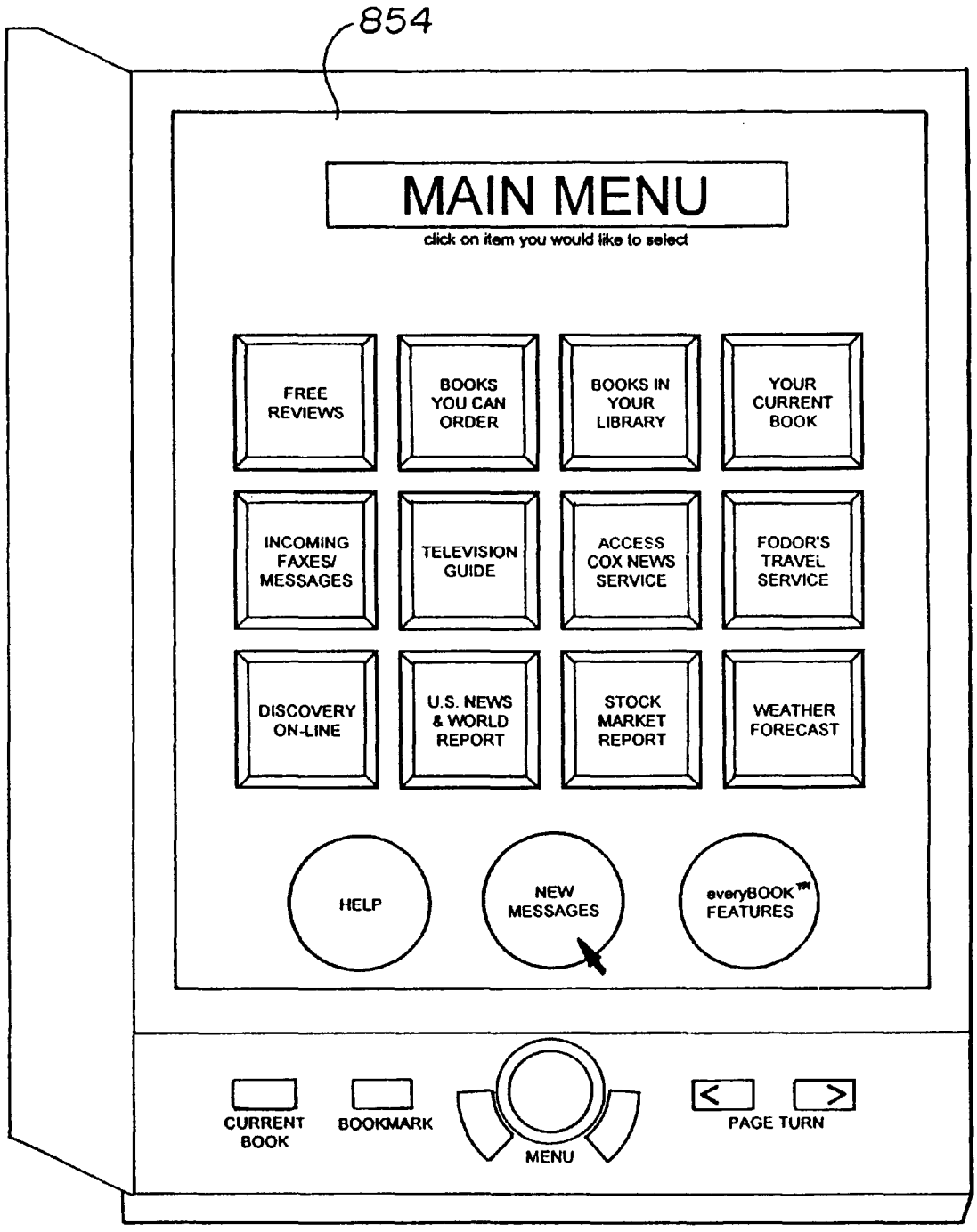
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Fig. 14s

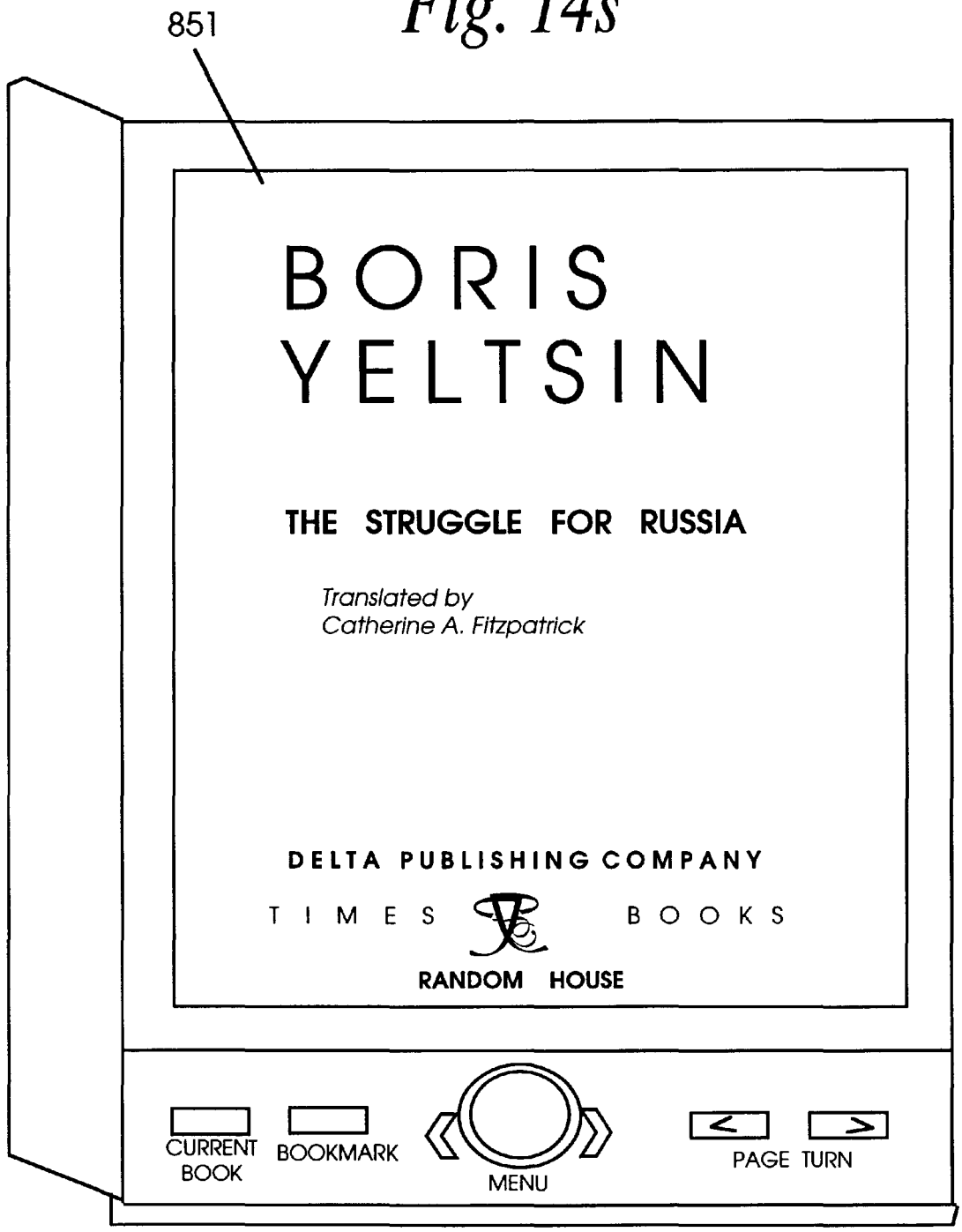
851
BORIS
YELTSIN
THE STRUGGLE FOR RUSSIA
Translated by
Catherine A. Fitzpatrick
DELTA PUBLISHING COMPANY
TIMES BOOKS
RANDOM HOUSE
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Fig. 14t

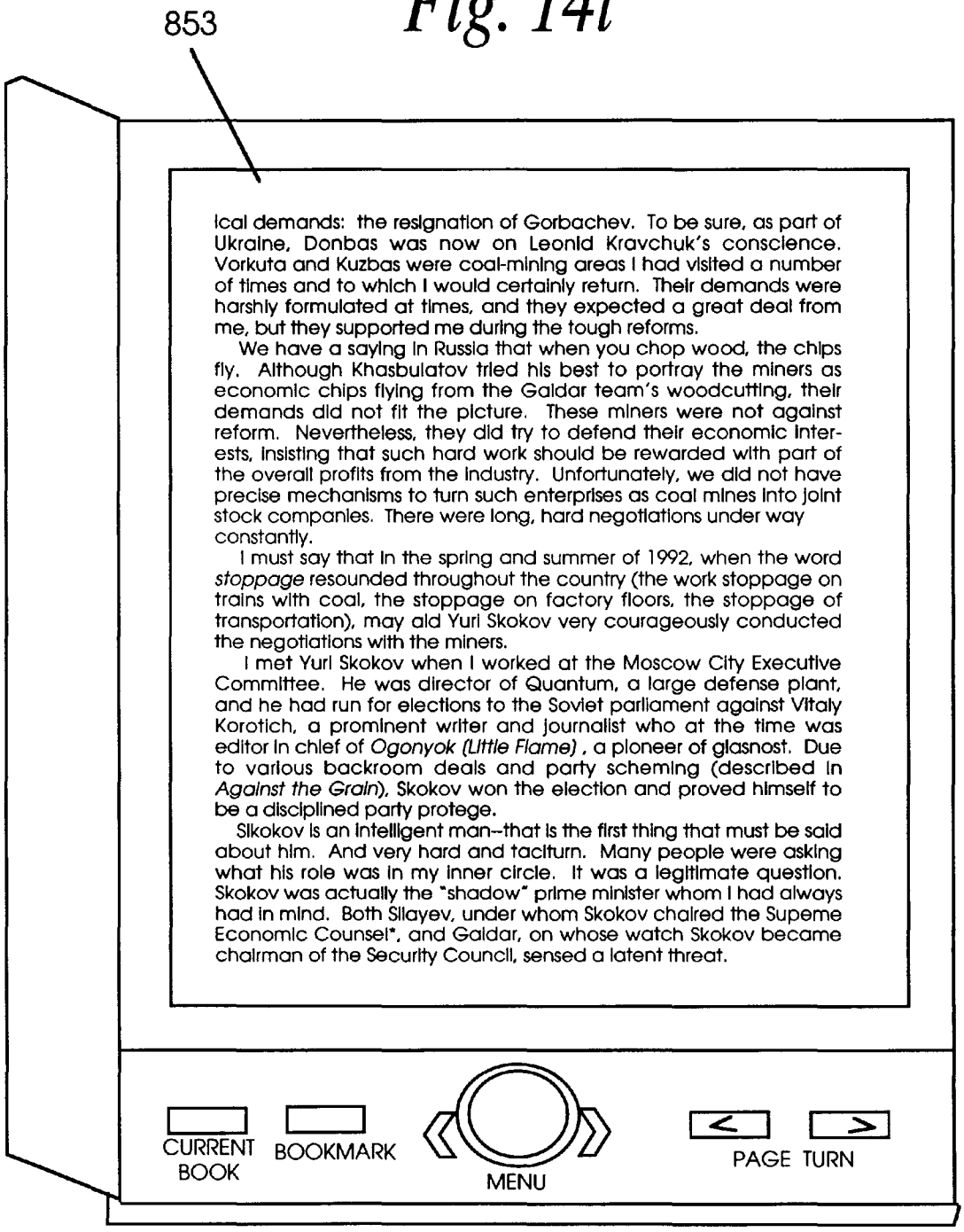
853
ical demands: the resignation of Gorbachev. To be sure, as part of Ukraine, Donbas was now on Leonid Kravchuk's conscience. Vorkuta and Kuzbas were coal-mining areas I had visited a number of times and to which I would certainly return. Their demands were harshly formulated at times, and they expected a great deal from me, but they supported me during the tough reforms.
We have a saying in Russia that when you chop wood, the chips fly. Although Khasbulatov tried his best to portray the miners as economic chips flying from the Gaidar team's woodcutting, their demands did not fit the picture. These miners were not against reform. Nevertheless, they did try to defend their economic interests, insisting that such hard work should be rewarded with part of the overall profits from the industry. Unfortunately, we did not have precise mechanisms to turn such enterprises as coal mines into joint stock companies. There were long, hard negotiations under way constantly.
I must say that in the spring and summer of 1992, when the word *stoppage* resounded throughout the country (the work stoppage on trains with coal, the stoppage on factory floors, the stoppage of transportation), may old Yuri Skokov very courageously conducted the negotiations with the miners.
I met Yuri Skokov when I worked at the Moscow City Executive Committee. He was director of Quantum, a large defense plant, and he had run for elections to the Soviet parliament against Vitaly Korotich, a prominent writer and journalist who at the time was editor in chief of *Ogonyok (Little Flame)*, a pioneer of glasnost. Due to various backroom deals and party scheming (described in *Against the Grain*), Skokov won the election and proved himself to be a disciplined party protege.
Skokov is an intelligent man--that is the first thing that must be said about him. And very hard and taciturn. Many people were asking what his role was in my inner circle. It was a legitimate question. Skokov was actually the "shadow" prime minister whom I had always had in mind. Both Silayev, under whom Skokov chaired the Supeme Economic Counsel", and Gaidar, on whose watch Skokov became chairman of the Security Council, sensed a latent threat.
CURRENT BOOK
BOOKMARK
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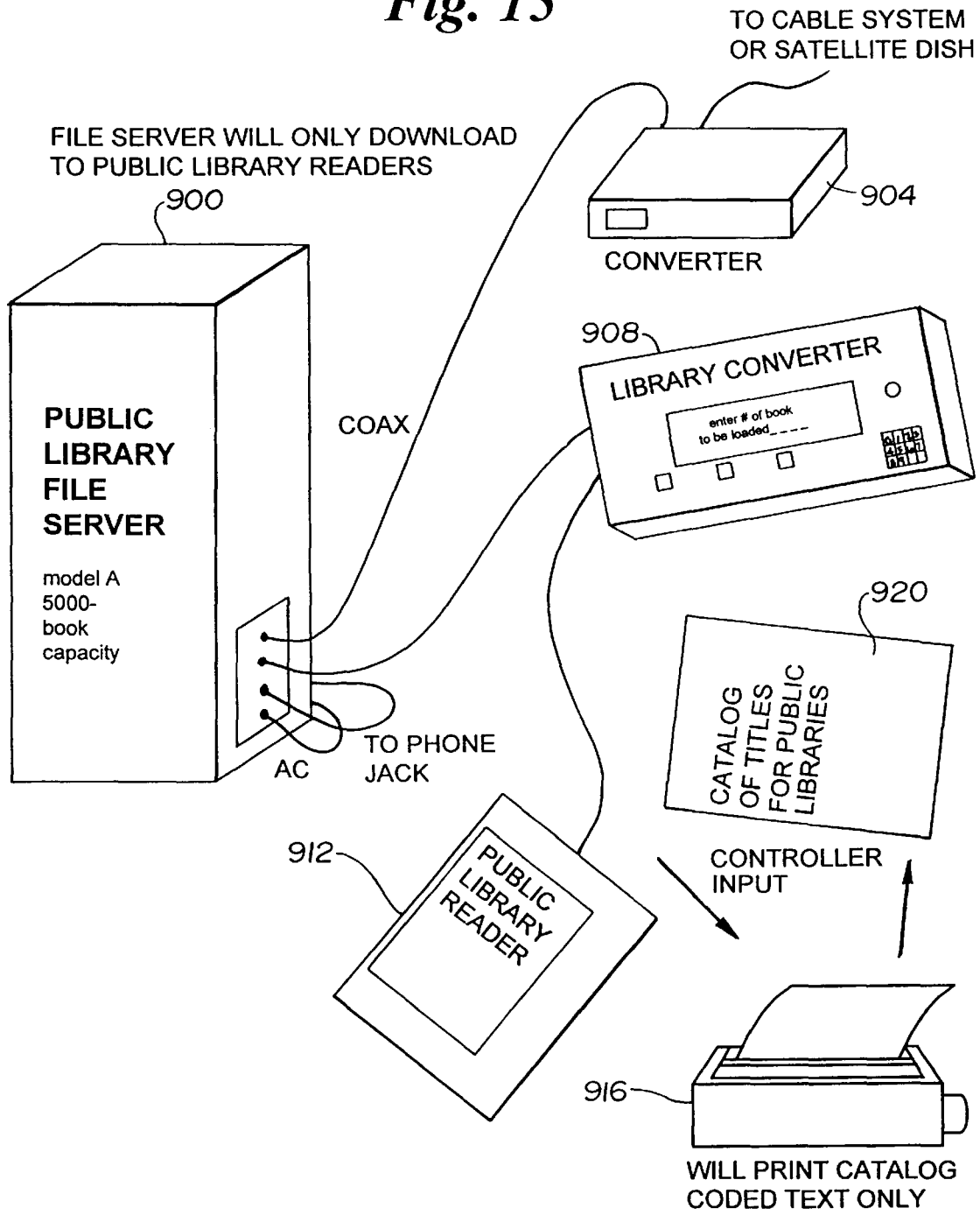
Fig. 15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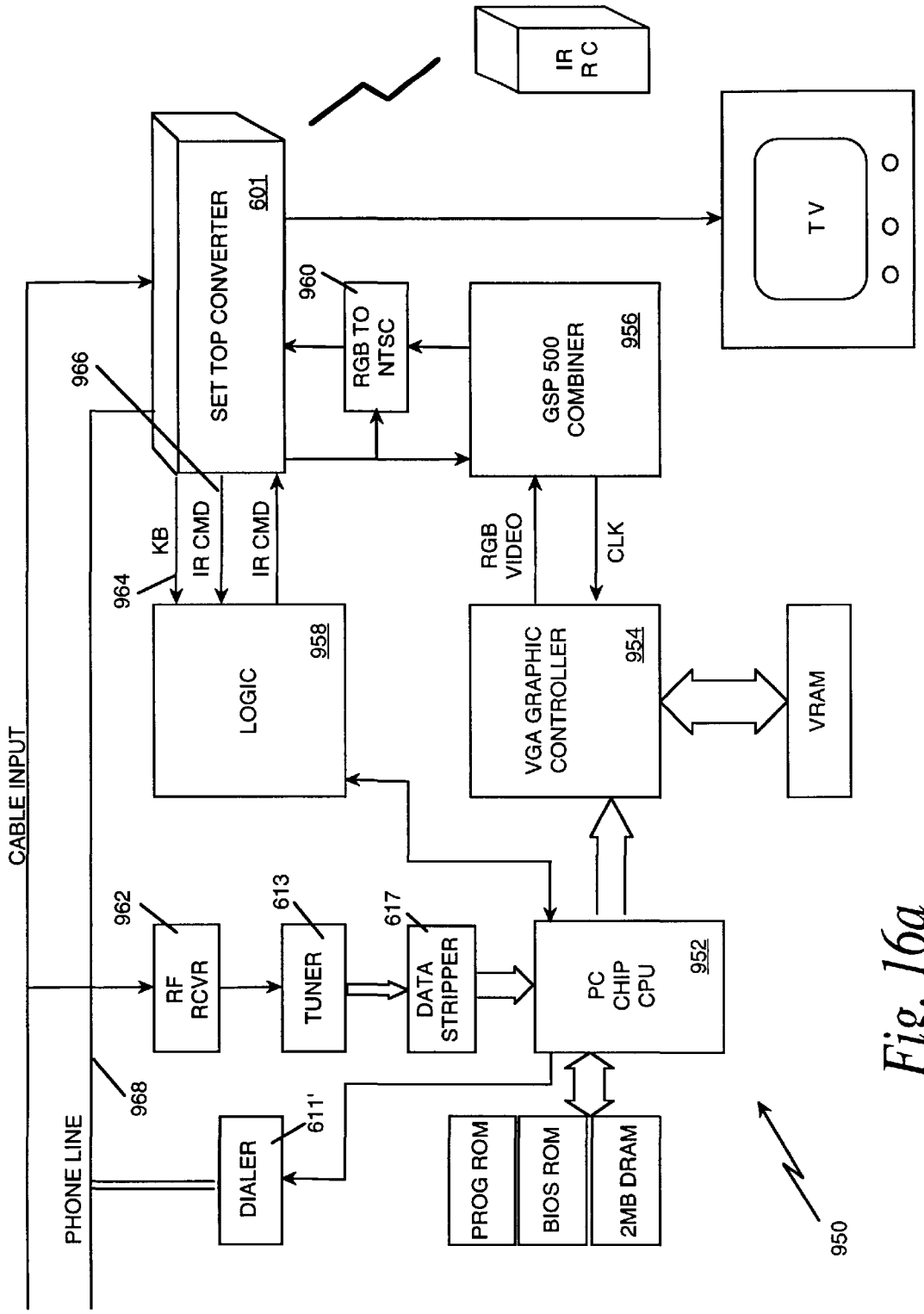
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956
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964
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613
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617
DATA STRIPPER
PC CHIP CPU
952
968
611'
DIALER
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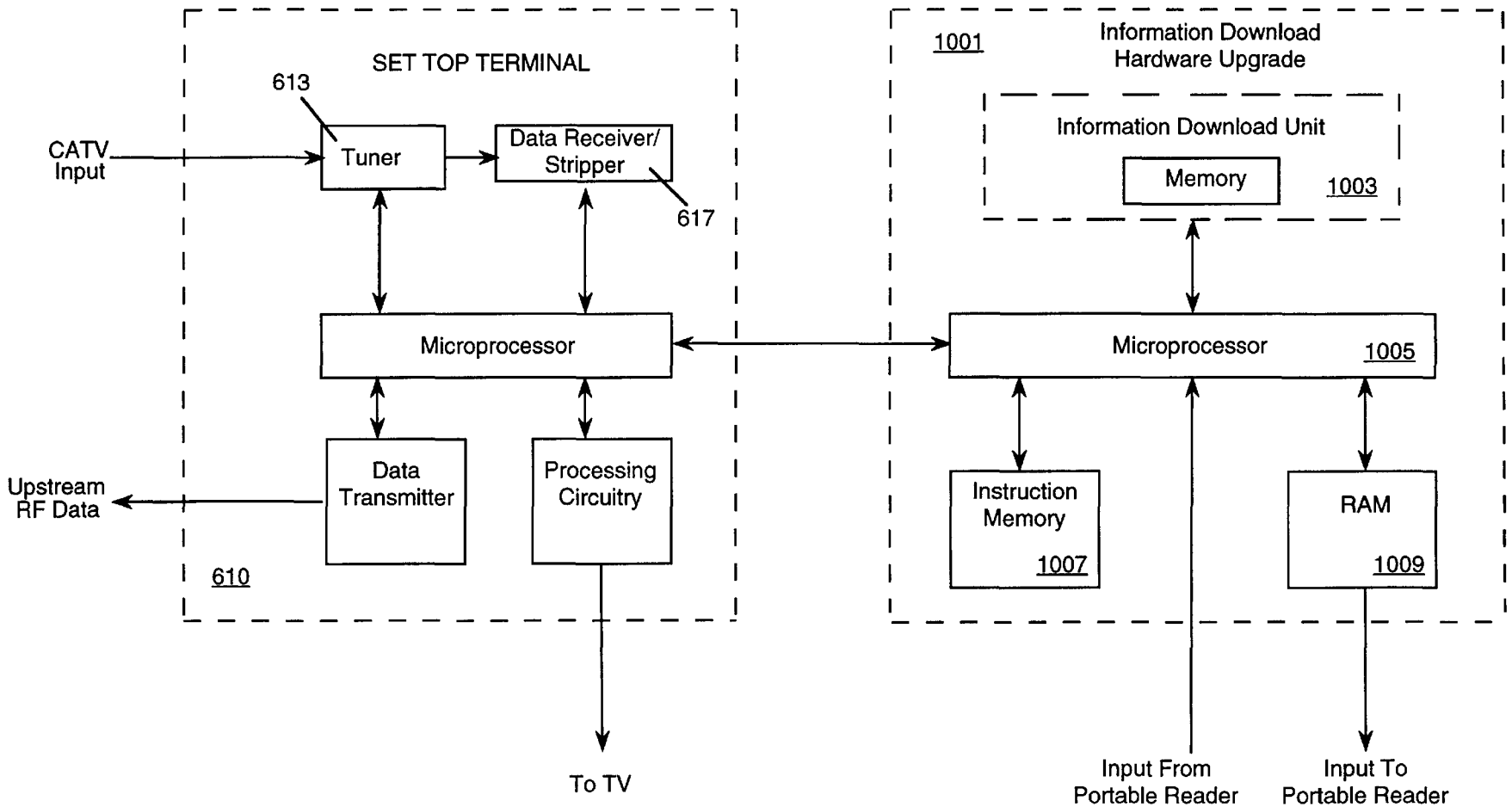
PROG ROM
BIOS ROM
2MB DRAM
950

Fig. 16a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CATV Input
Tuner
Data Receiver/ Stripper
617
Microprocessor
Data Transmitter
Processing Circuitry
Upstream RF Data
610
To TV
1001
Information Download Hardware Upgrade
Information Download Unit
Memory
1003
Microprocessor
1005
Instruction Memory
1007
RAM
1009
Input From Portable Reader
Input To Portable Reader

Fig. 16b

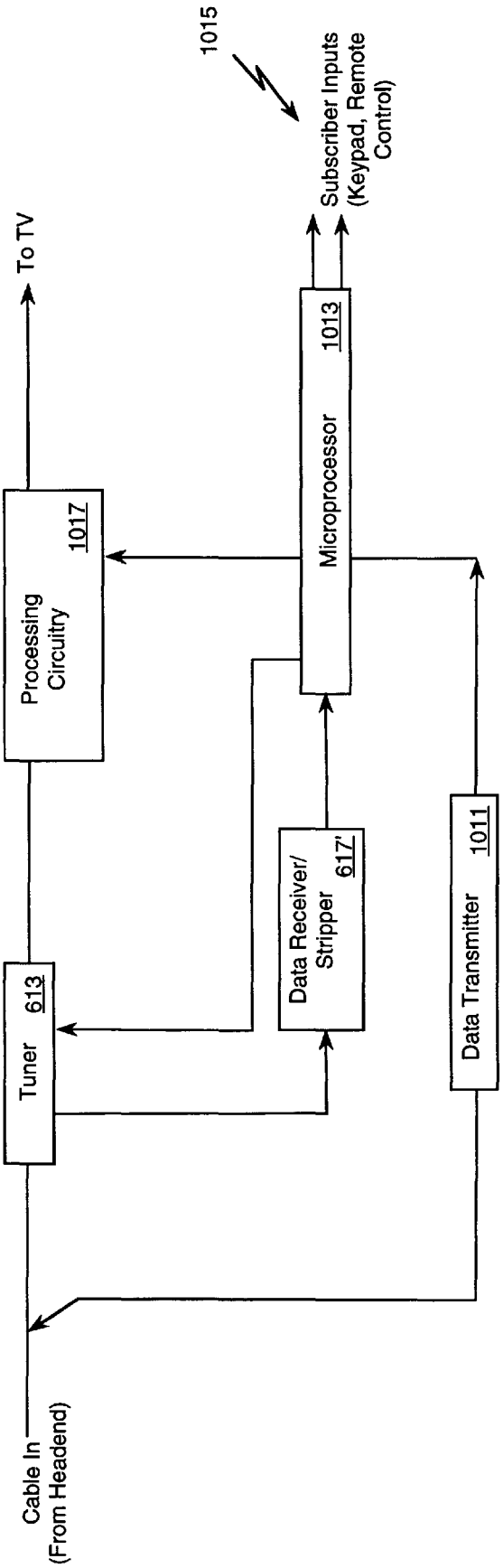

1015
Subscriber Inputs (Keypad, Remote Control)
To TV
Microprocessor 1013
Processing Circuitry 1017
Data Receiver/ Stripper 617'
Data Transmitter 1011
Tuner 613
Cable In (From Headend)

Fig. 17

Fig. 18a

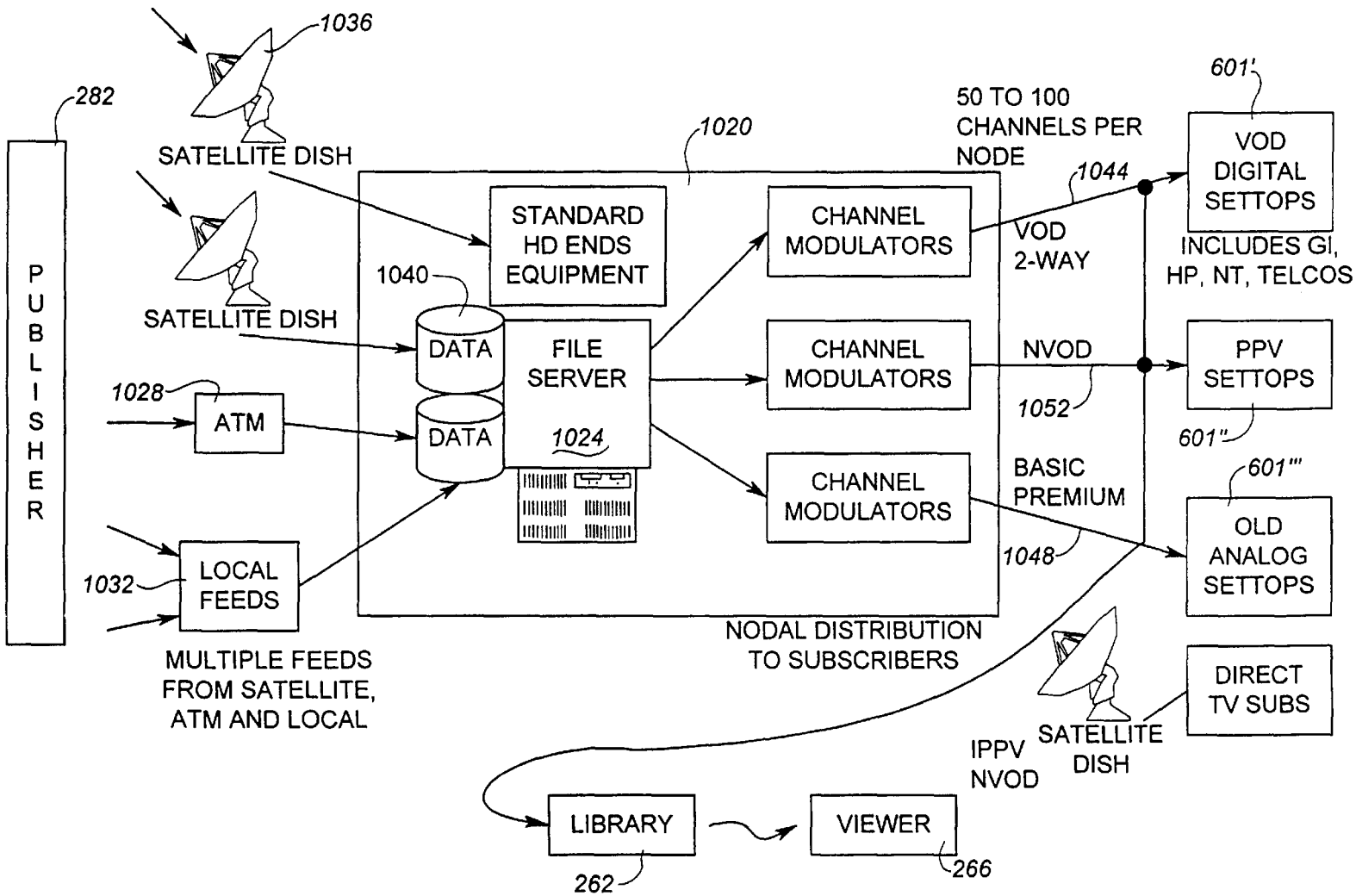
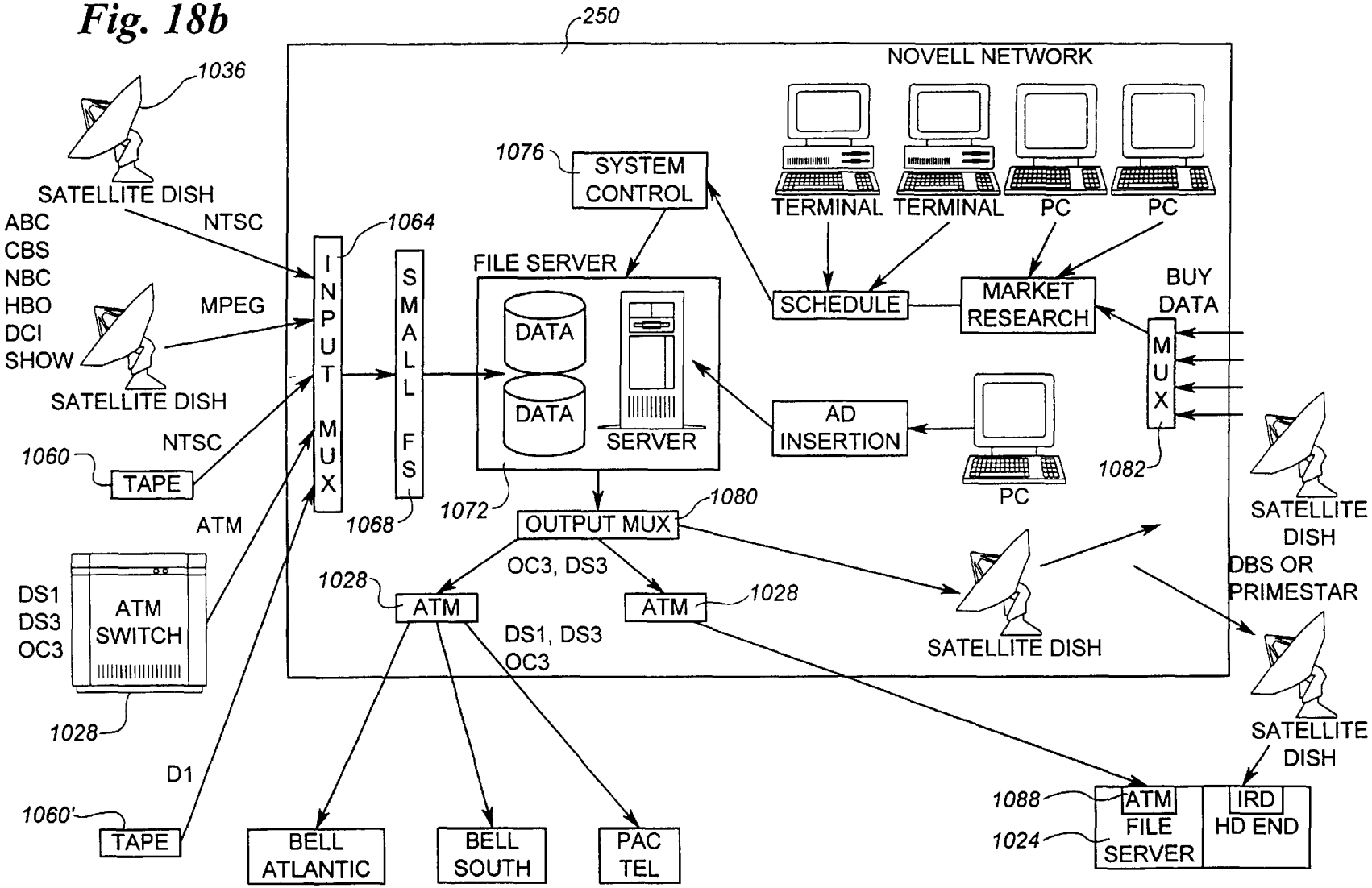

1036
282
SATELLITE DISH
SATELLITE DISH
PUBLISHER
1020
50 TO 100
CHANNELS PER
NODE
601'
VOD
DIGITAL
SETTOPS
INCLUDES GI,
HP, NT, TELCOS
1044
VOD
2-WAY
STANDARD
HD ENDS
EQUIPMENT
CHANNEL
MODULATORS
1040
DATA
FILE
SERVER
1024
DATA
1028
ATM
CHANNEL
MODULATORS
NVOD
1052
PPV
SETTOPS
601"
CHANNEL
MODULATORS
BASIC
PREMIUM
601'''
OLD
ANALOG
SETTOPS
1048
1032
LOCAL
FEEDS
MULTIPLE FEEDS
FROM SATELLITE,
ATM AND LOCAL
NODAL DISTRIBUTION
TO SUBSCRIBERS
DIRECT
TV SUBS
SATELLITE
DISH
IPPV
NVOD
LIBRARY
VIEWER
262
266

Fig. 18b


250
NOVELL NETWORK
1036
SATELLITE DISH
ABC
CBS
NBC
HBO
DCI
SHOW
NTSC
MPEG
SATELLITE DISH
NTSC
1060
TAPE
ATM
DS1
DS3
OC3
ATM SWITCH
1028
D1
1060'
TAPE
INPUT MUX
1064
SMALL FS
1068
1076
SYSTEM CONTROL
FILE SERVER
DATA
DATA
SERVER
1072
TERMINAL
TERMINAL
PC
PC
SCHEDULE
MARKET RESEARCH
BUY DATA
MUX
AD INSERTION
PC
1082
OUTPUT MUX
1080
OC3, DS3
1028
ATM
ATM
1028
DS1, DS3
OC3
SATELLITE DISH
SATELLITE DISH
DBS OR PRIMESTAR
SATELLITE DISH
1088
1024
ATM FILE SERVER
IRD HD END
BELL ATLANTIC
BELL SOUTH
PAC TEL

ELECTRONIC BOOK SELECTION AND DELIVERY SYSTEM

RELATED APPLICATIONS

This application is a continuation-in-part of application Ser. No. 07/991,074, filed Dec. 9, 1992, entitled TELEVISION PROGRAM PACKAGING AND DELIVERY SYSTEM WITH MENU DRIVEN SUBSCRIBER ACCESS and U.S. Ser. No. 08/160,194, entitled ADVANCED SET-TOP TERMINAL FOR CABLE TELEVISION DELIVERY SYSTEMS, filed Dec. 2, 1993.

BACKGROUND OF THE INVENTION

Sparked by the concept of an information superhighway, a revolution will take place in the distribution of books. Not since the introduction of Gutenberg's movable typeset printing has the world stood on the brink of such a revolution in the distribution of text material. The definition of the word "book" will change drastically in the near future. Due to reasons such as security, convenience, cost, and other technical problems, book and magazine publishers are currently only able to distribute their products in paper form. This invention solves the problems encountered by publishers.

SUMMARY OF INVENTION

The electronic book selection and delivery system is a new way to distribute books to bookstores, libraries, and consumers. The technological breakthroughs of this invention provide a secure electronic system for both delivering selected books and receiving payments. The system has an unusual combination of features that provides the consumer with a daily use household appliance that has a high tech aura while being very practical, portable, and easy to use.

The clear advantage of the system is that it eliminates the distribution of any physical object such as a paper book or computer memory device from any book distribution system. The purchase of a book becomes a pay-per-read™ event avoiding the overhead, "middle-men," printing costs, and time delay associated with the current book distribution system. Published material and text such as the President's speech, a new law, a court decision on abortion, or O. J. Simpson's testimony can be made immediately available to the consumer at a nominal fee.

The system is a novel combination of new technology involving the television, cable, telephone, and computer industries. It utilities high bandwidth data transmissions, strong security measures, sophisticated digital switching, high resolution visual displays and user friendly interface software.

The primary components of the text delivery system are the subsystem for placing the text onto a video signal and the subsystem for receiving and selecting text that was placed on the video signal. The preferred embodiment of the system includes additional components and optional features that enhance the system. The system may be configured for use by bookstores, libraries, and consumers. The system for consumer use is made up of four subsystems, namely: (1) an Operations Center, (2) a video distribution system, (3) a home subsystem including reception, selection, viewing, transacting and transmission capabilities, and (4) a billing and collection system.

The Operations Center performs several primary functions: manipulating text data (including receiving, formatting and storing of text data), security encoding text, cataloging books, providing a messaging center capability, and performing uplink functions. The system delivers the text from the Operations Center to consumer homes by inserting data within analog video signals. The insertion of text is generally performed with a text generator and an encoder at an uplink site that is within or near the Operations Center. The system can be several lines of the Vertical Blanking Interval (VBI), all the lines of the analog video signal, or a digital video signal to transmit text data. Using the VBI delivery method, the top ten or twenty book titles may be transmitted with video during normal programming utilizing existing cable or broadcast transmission capability without disruption to the subscriber's video reception. Using the entire video signal, thousands of books may be transmitted within just one hour of air time. Nearly any analog or digital video distribution system may be used to deliver the video signal with included text.

The home subsystem performs four primary functions: connecting to the video distribution system, selecting text, storing text, and transacting through a phone or cable communicating mechanism. The components of the home subsystem may be configured in a variety of hardware configurations. Each function may be performed by a separate component, the components may be integrated, or the capability of existing cable set top converter boxes and televisions may be utilized. Preferably, a connector, library unit and viewer unit are used. The connector portion of the home subsystem receives the analog video signal and strips or extracts the text from the video. The home library stores the text signal, provides a user friendly software interface to the system and processes the transactions at the consumer home. The viewer provides a screen for viewing text or menus.

The viewing device is preferably a portable book shaped viewer which stores one or more books for viewing and provides a screen for interacting with the home library unit. A high resolution LCD display is used to both read the books and to interact with the home library software. An optional phone connector or return-path cable connection initiates the telephone calls and, with the aid of the library, transmits the necessary data to complete the ordering and billing portion of the consumer transaction. The billing and collection system performs transaction management, authorizations, collections and publisher payments automatically utilizing the telephone system.

DESCRIPTION OF THE DRAWINGS

FIG. **1** is a block diagram of the primary components of the electronic book selection and delivery system.

FIG. **2** is a schematic showing an overview of the electronic book selection and delivery system.

FIG. **3** is a schematic of the delivery plan for the electronic book selection and delivery system.

FIG. **4** is a block diagram of the operations center.

FIG. **5***a* is a flow diagram of the processing at the operations center and uplink.

FIG. **5***b* is a block diagram of the hardware configuration for an uplink site.

FIG. **6***a* is a block diagram of the hardware configuration for a four component home subsystem.

FIG. **6***b* is a schematic of a two unit home subsystem.

FIG. **7** is a flow diagram of the processes performed by the video connector.

FIG. **8** is a block diagram for an example of a library unit.

FIG. **9** is a flow diagram of some of the processes performed by the library on the received data stream.

FIG. **10** is a flow diagram of the processes performed by the library unit on information requests from the viewer.

FIG. **11** is a block diagram showing the components for an example of a viewer.

FIG. **12** is a flow diagram of some of the processes performed by the viewer on an information request from a subscriber.

FIG. **13** is a chart depicting the menu structure and sequencing of menus in the menu system.

FIG. **14***a* is a schematic of an introductory menu.

FIG. **14***b* is a schematic showing an example of a main menu.

FIG. **14***c* through FIG. **14***q* are schematics showing examples of submenus.

FIG. **14***r* is a schematic showing another example of a main menu.

FIG. **14***s* and FIG. **14***t* are schematics showing examples of screens for a book.

FIG. **15** is a schematic diagram of an electronic book system for a bookstore or public library.

FIG. **16***a* and FIG. **16***b* are schematics of hardware modifications or upgrades to a set top converter.

FIG. **17** is a schematic showing a set top terminal that includes a data receiver and data transmitter.

FIG. **18***a* is a schematic of a book-on-demand system.

FIG. **18***b* is a schematic of an operations center supporting a book-on-demand system.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The primary components of the electronic book selection and delivery system **200** are an encoder **204**, a video distribution system **208**, a connector **212**, and a text selector **216** as shown in FIG. **1**. The encoder **204** places textual data on a video signal to form a composite signal. A variety of equipment and methods may be used to encode text data onto a video signal. The video distribution system **208** distributes the video signal from the single point of the encoder **204** to multiple locations which have connectors **212**. The connector **212** receives the digital or analog video signal from the video distribution system **208** and separates, strips or extracts the text data from the composite video signal. If necessary, the extracted text data is converted into a digital bit stream. Text selector **216** works in connection with the connector **212** to select text.

Using a connector **212** and text selector **216** combination, various methods of selecting and retrieving desired text from a composite or video signal are possible. Text may be preselected, selected as received or selected after being received and stored. The preferred method is for the connector **212** to strip all the text from the video signal and have the text selector **216** screen all the text as received from the connector **212**. The text selector **216** only stores text in long term or permanent memory if the text passes a screening process described below.

An overview of a preferred embodiment is shown in FIG. **2**. The system **200** includes: an operations center **250** including an uplink site **254**, a video distribution system **208**, a home subsystem **258** including a video connector **212**, a library **262**, a viewer **266**, and a phone connector **270**, and telephone system **274** and a billing and collection subsystem **278**. The operations center receives textual material from outside sources **282** such as publishers, newspapers, and on-line services. The operations center receives this textual material in various digital formats and converts them to a standard compressed format for storage. In so doing, the operations center creates a pool of textual material that is available to be delivered to the home system. Normally, the text material is grouped by books or titles for easy access. The operations center includes an uplink site for placing the text onto a video signal and sending the composite video signal into a video distribution system. The uplink site would generally include an encoder (not shown in FIG. **2**) to encode the text onto a video signal. The text is placed on a video formatted composite signal produced from a textual signal containing textual data, a menu signal containing menu data related to categories of the textual data, and from a video signal containing video data. The composite signal is transmitted to a receiver for menu generation and text selection.

Many analog and digital video distribution systems **208** can be used with this text delivery system **200**, such as, cable television distribution systems, broadcast television distribution systems, video distributed over telephone systems, direct satellite broadcast distribution systems, and other wire and wireless distribution systems. Nearly any distribution system which can deliver a video signal will work with the text delivery system. It is also possible to distribute the text without using a video signal as described below.

The home subsystem performs five primary functions, (1) connecting with a video distribution system, (2) selecting data, (3) storing data, (4) displaying data, and (5) handling transactions. An important optional function of the home sub-system is communicating using a telephone communication system. The home subsystem is made up of primarily four parts: a video connector **212** or similar type of connector for connecting with a video distribution system, a library unit **262** for storing and processing, a viewer unit **266** for viewing menus and text and a telephone connector **270** for connecting with a telephone communications system **274**.

The billing and collection subsystem **278** may be co-located with the operations center **250** or located remote from the operations center. The billing and collection subsystem **278** is in communication with the home subsystem via telephone-type communication systems. Any of a number of telephone type communication systems, such as, a cellular system, will operate with the billing and collection system. The billing and collection system records the books or portions of text that are selected or ordered by the subscriber. The collection system will charge a subscriber's credit account or bill the subscriber. In addition, the billing and collection system will monitor that amount due to publishers or other outside sources **282** who have provided textual data or other services such as air time to enable the text delivery system **200** to operate.

FIG. **3** is an expanded overview of a preferred delivery plan for the electronic book selection and delivery system. It is a comprehensive delivery plan to support various types of users and various billing systems. FIG. **3** shows that publishers **282** will provide text transfer **302** to the operations center **250'** and receive payments **306** from the billing and collection system **278'**. A separate channel uplink site **254'** is shown in this configuration receiving data **310** from the operations center **250'**. The operations center **250'** has three separate sections (**318**, **322**, **326**) one for text receiving, formatting and re-entry **318**, a second for security encoding **322** and a third section for catalog and messaging center functions **326**.

The collection and billing system **278'** shown has two sections (**330**, **334**) one for transaction management, autho-

rizations and publisher payments **330**, and the other for customer service **334**. The customer service section **334** provides for data entry and access to customer account information. Transaction accounting information **338** is supplied to credit card companies **342** by the transaction management section **330** of the billing and collection system **278'**. The credit card companies **342** provide billing **346** to customers either electronically or by mail.

Three methods for communicating between the subscriber base **348** and the billing and collection system **278'** are shown: by telephone switching **350** alone, cellular switching **354** and telephone switching **250** combined, and by use of the cable system **358** and the telephone switching **350**. The system shown supports both one-way **362** and two-way cable communication **366** with subscribers. Libraries and schools **370** as well as bookstores **374** may use the delivery system.

Libraries and schools **370** would have a modified system to allow the viewer to be checked-out or borrowed while bookstores **374** would rent or sell the viewer and sell electronic book data. The bookstores **374** as well as the libraries and schools **370** may be serviced by cable **378**. Optional direct broadcast systems (DBS) **382** can also be used with the system **200**.

I. The Operations Center

FIG. **4** is a schematic of an operations center **250** which includes an uplink **254**. The Operations Center **250** gathers text or books by receiving, formatting, storing, and encoding. A data stream **302** containing text is received at the operations center by a data receiver **402**. The data receiver **402** is under the control of a processor **404**. After reception, the data stream is formatted using digital logic for formatting **406** which is also under the control of the processor **404**. If any additional text is being generated at the operation center locally for insertion into the distributed signal, the text generation is handled through text generator hardware **410** which may include a data receiver and a keyboard (not shown). Following processing by the text generator, the additional text can be added to the text received the combining hardware **414** that includes digital logic circuitry (not shown).

The processing at the operations center is controlled by a processor **404** which uses an instruction memory **416**. The processor and instruction memory may be supplied by a personal computer or mini-computer. To perform the catalog and messaging functions, the operations center uses a catalog and message memory **420** and the text generator **410** if necessary.

The data stream of text, catalog and messages is preferably encoded by a security encoding prior to being sent to the uplink module **424**. Various encoding techniques may be used such as the commercial derivative of NSA's encryption algorithm, Data Encryption System (DES), and General Instrument's DigiCipher II may be used by the security encoding module **424**. Following encoding, the encoded text may be stored in text memory **428** prior to being sent the uplink **254**. It is preferred that a first-in-first-out text memory arrangement is used under the control of the processor **404**. Various types of memory may be used for the text memory **428** including RAM. The operations center may use file server technology for the text memory **428** to catalog and spool books for transmission as is described below.

To transmit textual data, the delivery system uses high bandwidth transmission techniques such as those defined by the North American Broadcast Teletext Standard (NABTS) and the World System Teletext (WST) standard. Using the WST format (where each line of the Vertical Blanking Interval contains 266 data bits), a four hundred page book, for example, may be transmitted during programming using four lines of the Vertical Blanking Interval at a rate of approximately one book every 1.6 minutes (63,840 bits per second). Alternatively, books may be transmitted over a dedicated channel, which interrupts programming so that 246 lines of video can be used to transmit approximately 2,250 books every hour (3.9 Mbits per second). A teletext type format is the simplest but possibly the slowest text format to use with the system. In either event, an encoder is utilized at an uplink site to insert textual data into the analog video signal. In many other respects, the delivery of the textual information is completed using existing cable television plants and equipment.

FIG. **5***a* is a flowchart of the steps involved in processing text from the publisher or provider **282** that occurs at the operations center **250**. As shown in block **500**, the publisher **282** processes data files of text for books, compresses, encrypts and sends the data files to the operations center or uplink. Text files for books are preferably sent one book at a time. As shown in block **504**, the uplink **254** or operations center **250** receives and processes the data stream from the publisher **282**. Generally, part of this processing includes encryption and error correction.

As shown in block **508**, files are broken into smaller packets of information. Header information is added to the packets. The bit stream is converted from a serial digital bit stream to an analog bit stream that is compatible with an NTSC video signal. Block **512** shows the switching of analog data into the video lines of a video signal. The analog data is either placed in the VBI or the active video lines.

FIG. **5***b* is an example of a hardware configuration to perform some of the functions for blocks **508** and **512**. A video feed **516** is received and processed through a sync stripper **520**. The sync signal **532** stripped is used by the digital logic control **524**. The digital logic control **524** receives the sync signal **532** and a serial digital bit stream **528** for processing. The digital logic control **524** passes the serial digital bit stream to the Digital to Analog converter **536** and outputs a control signal **540** for the video switch **544**. The video switch **544** integrates the video feed **516** and analog data stream **548** into a video feed with analog data signal inserted **552**.

As an alternative to cable or television delivery methods, the telephone system may be used to transmit books to the subscribers. An average book would take about 7 minutes to transmit over the public telephone system. Using the telephone system, it is not necessary to combine video and text into a composite signal. In most other respects, the operation center would remain similar whether text delivery was by telephone or cable. It is preferred that file server technology (such as that described in U.S. Pat. No. 5,262,875, entitled AUDIO/VIDEO FILE SERVER INCLUDING DECOMPRESSION/PLAYBACK MEANS, issued to Mincer, et al., and, U.S. Pat. No. 5,218,695, entitled FILE SERVER SYSTEM HAVING HIGH-SPEED WRITE EXECUTION, issued to Noveck, et al., incorporated herein by reference) be used at the operation center with a telephone system text delivery method.

II. The Home Subsystem

The hardware configuration for a four component home subsystem **258** is shown in FIG. **6***a*. FIG. **6***b* shows a hardware configuration for a two component home subsystem. The home subsystem **258** performs several functions, such as receiving data and video transmissions, stripping the data from the video signal, screening and storing the data, providing user friendly interface software,

displaying menus and text, processing transactions, initiating telephone calls and transmitting billing data. Various hardware configurations may be utilized to achieve the desired functions of the home subsystem. For example, as shown in FIG. **6***b*, the home subsystem can be configured to utilize the reception and channel tuning capability of the current installed subscriber base of cable converter boxes and televisions **601**. The home subsystem can also be designed as an advanced set top terminal converter box with menu generation capability, electronic memory and a telephone modem as described in section V below.

The electronic components which make up the home subsystem can be arranged in a variety of ways. In the four unit subsystem of FIG. **6***a* the viewer **266** and library **262** are wired together while the remaining components communicate through RF transceivers **604**. In the simplest version of the home subsystem there are only two units, a library **262** and a viewer **266**. FIG. **6***b* shows a two unit home subsystem with certain optional features. The viewer **266** is generally equipped with a high resolution viewing area **602**, digital logic (including a key **605**, security **606**, and a microprocessor **621**), video graphics control and memory **607**, power supply circuitry **602** (not shown), an optional battery **603** and an optional RF transceiver **604**. In a two unit arrangement, the library **262** contains the connector function to the video distribution system, connector function to a public telephone communications system, and memory **600** (which may be removable and portable **600'**). More specifically, the library would include data stripping functions **617**, digital logic **609**, memory storage **600**, power circuitry **610**, optional telephone connections **611** (including cellular or PCN **611'**), optional battery (not shown), optional tuner module **613** and an optional RF transceiver **604**. The video connector **212** and the public telephone system connection **270**, as well as the removable portable memory unit **600** of the library may be broken out into separate components. (FIG. **6***b* shows a removable portable hard disk memory **600'** with removable cartridges **614**.) Therefore, the home subsystem may have as many as five separate components which communicate with each other. The two, three, four or five separate components which make up the home subsystem can communicate with each other in a variety of ways, including hardwired connection **615**, RF transceiver **604** and other wireless methods.

RF communications are preferred in the home because it allows the separate components to be located throughout the home without restriction. The data communicated between the units is preferably secure data. In addition, the library **262** may provide power to the viewer **266** through the hard wire communication link **615**.

To receive and strip the data from the video signal at the consumer's home, either a cable interface device or cable connector is used. The cable connector device includes a tuner **613**, while the cable interface device makes use of existing tuning equipment in the home. In either configuration, data is stripped from the video signal and stored at the subscriber's location in the library **262**. The phone connector **270**, and modem **611** initiate telephone calls and transmit ordering and billing information to the Operations Center or billing and collection system. The home library **262** is the intelligent component of the home subsystem, incorporating the hardware and software necessary to store the text data, generate menus and effect the purchase transactions. In addition to an RF transceiver **604**, the home library **262** also includes the necessary jacks and connections to allow the system to be connected to the viewer **266**. As shown in FIG. **6***b*, the library communicates the text data to the viewer in a secure format which requires a key **605** for decryption. The text is generally only decrypted page by page just before viewing.

a. The Video Connector

FIG. **7** shows the flow of the processes performed by the video connector **212**. The video connector receives the video signal **608**, tunes to the channel containing the text data **612**, strips the text data from the video signal **616**, and communicates the text data stream to logic components in the library **620**.

The connection to the video distribution system is preferably a cable connector to a cable television delivery system, as shown in FIG. **6***b*. The cable connector includes a data stripper circuit **617**, which accepts video input from either a set top converter, TV or VCR **601**, or an optional tuner block **613** that receives the CATV signal through the cable connector **212'**. The data stripper circuit **617** strips data out of the video, and outputs a digital bit stream to the digital logic portion **609** of the library unit **262**. The data is embedded in the video signal either in the vertical blanking interval or the active video portion in an encrypted and compressed format. The data stripper circuit **617** can be placed inside the set top converter box **601**, TV, or in the library unit. The data stripper circuit **617** outputs the digital bit stream to be used by the library digital logic **609**.

The video connector **212** may also contain a channel tuner module **613** that can tune to the video channel and provide access to the video that contains the data to be stripped. Using the optional tuner module **613**, a set top converter, VCR, or TV tuner is not needed in the home subsystem. The optional tuner module **613** would instead receive the CATV signal directly through the cable connector **212'**.

b. Library

An embodiment of the library **212** for a two unit home subsystem is shown in both FIG. **6***b* and FIG. **8**. The embodiment shown includes the following optional parts the video connector **212**, phone connector **270**, RF transceiver **604**, and battery pack **624** in addition to a removal portable memory **600'**, microprocessor **628**, instruction memory unit **632**, digital logic **636**, and power unit **640**.

The library **262** contains a digital logic section **609** (not shown in FIG. **8**) which includes the microprocessor **628**, the digital logic **636** and the instruction memory unit **632**. The microprocessor **628** is preferably a secure microprocessor such as the Mot SC21 device sold by Motorola. The digital logic section **609** will receive the serial digital bit stream from the data stripper circuit **617** and process the data. Error correction will also be performed by the digital logic section **609** and the data will be checked for proper address. If the address of the data is correct and the library **262** is authorized to receive the data, the data will be transferred to the memory storage unit **600**, **600'**. Authorization to receive the data is provided by the cable headend or another distribution point. An authorization code may be sent in the serial digital bit stream. The digital logic section **609** will send appropriate text and graphical data to the memory storage unit **600**, **600'**. It transfers this data in a compressed and encrypted format and the data remains stored in a compressed and encrypted format.

i. Memory Storage Unit

The memory storage unit of the library is preferably a removable portable memory unit **600** (as shown in FIGS. **6***a*, **6***b* and **8**). A variety of options are available for memory storage: a hard disk drive, such as an 80 megabyte, a 200 megabyte, a hard disk with removable platters, and CD ROM. Referring to FIG. **6***b*, a hard disk drive unit **600'** which contains removable platters may also be used. This

would provide virtually unlimited library storage capacity. Data will be stored in the memory storage unit in a compressed and encrypted format. As is also shown in FIG. **6***b*, the data will also contain a key or unique ID number that matches the ID or key of the viewer **266**. This matching of a unique key or ID number prevents unauthorized transfer of text data from the memory storage unit to an unauthorized viewer. Small memory devices such as smart cards, electronic memory cards or PCM CIA cards (personal computer memory card industry association) may also be used to store the data.

ii. Power Circuitry

As shown in FIGS. **6***b* and **8**, the library **262** will accept power from either AC wall power or optional battery power. It is preferred that the power circuitry provide all the voltage necessary from either the battery **624** or AC unit for the various circuitry in the library. Preferably the power circuitry will also provide power to the viewer through a single data cable when connected to the viewer. The power circuitry will recharge the battery using AC power when in operation. With the optional battery unit **624** installed, the library **262** becomes a portable unit and can still provide power to the viewer **266**. In order to extend battery life, power conservation measures may be utilized, such as shutting down the memory system when not in use. When the viewer unit **266** is being utilized and the library circuitry is not being utilized, virtually all power may be shut down to the library **262**.

iii. Connection to the Public Telephone System

The connection to the telephone system is preferably provided by a modem **611**. Various available modems may be used to perform this function. As shown in FIG. **6***b*, cellular phone or PCN phone connections **611'** may also be provided. When the home subsystem is first initialized, the modem will be used to transfer the name and credit card information of the consumer to the billing and collection subsystem. The telephone connection **270** may be utilized each time a book is purchased by a consumer to complete and record the transaction. The telephone connection **270** may also be used as a means for receiving the text data from the operations center, by-passing the video distribution system. The phone connection **270** may be a separate unit as shown in FIG. **6***b*.

iv. Library Processing

FIG. **9** shows an example of some basic processing performed by the library **262** on the data stream received from the video connector **212** or stripper circuit **617**. First the data stream is checked for error correction by block **650**. If an error is detected, block **654** de-interleaves the data followed by block **658** running a FEC (Forward Error Correcting) algorithm. The combination of block **650**, **654** and **658** perform the error correction needed on the data stream. If no error correction is necessary the data proceeds to block **662** where packets are individually checked for packet address.

If the address is a unique address, block **666** checks whether the address of the packet matches the library box ID number. The library box ID number is a unique number associated with that library **262** which is used to ensure security of the data. Block **670** determines whether an electronic file has already been opened into which the data packet can be saved. If no data file has been opened then block **674** opens a new data file for that packet. If an electronic file has been opened, then the packet is saved in that electronic file on disk, block **678**. Next, the process checks to see if this is the last packet for a particular book for a particular textual data block being received **682**. If it is the last packet of information, then the electronic file is closed and the directory of available electronic files is updated **686**. Following either block **682** or **686**, the process returns to receive another data packet from the data stream received from the data stripper block.

With the packet address is checked and the address is determined to be a broadcast address, the process determines the type of message that is being sent **690**. The message is then stored in appropriate electronic message file **694** and the process is returned to block **650** to receive another data packet and perform another error check.

Using the process of FIG. **9**, the library is able to receive, store and update directories related to the textual data and graphical data that can be used to depict pictures in a given book. Variations of the processes are possible depending on the format of the data and operating system of the library **262**.

FIG. **10** shows an example of the processing of information requests from the viewer **266** at the library **262**. Information requests from the viewer **266** are received either through the cable connecting the viewer **266** to the library **262** or through wireless transmissions such as RF. It is possible in some embodiments for subscribers' requests to come from a set top converter box **602**.

Information requests received from the viewer **266** generally fall into three categories: (1) directory data of books stored in the library **262**, (2) index of all available books on the system, and (3) requests for a specific book (Block **700**). Process block **704** answers a request from the viewer **266** for a directory of data showing the books stored at the viewer **266**. The directory of data is sent to the viewer **266** so that it may be displayed to the subscriber. Process block **708** handles requests from the viewer **266** for an index of all available books on the system. The library **262** will obtain an index of all the available books on the system and transmit that index, process **712**, with menu information to the viewer box. Process block **716** replies to a request from the viewer **266** for a specific book. The library **262** opens an electronic file for the specific book requested by the viewer **266** and transmits the record or transmits the information on a packet-by-packet basis to the viewer, **720**. This process of transmitting the specific book, record, or packets to the viewer continues until the last record or packet has been sent, **724**.

In addition to the processes shown on FIG. **10** in handling a request for a specific book, the library **262** also orders and receives specific books from the operations center **250** using the process as described in **716**. Following a request for a specific book which is not stored at the library **262**, the library **262** will proceed to determine the next available time the book will be on the video distribution system **208** and ensure reception and storage of that book (process not shown). In performing this process the library **262** will transmit to the viewer information on when it will obtain the text data for the book so that the subscriber may view the book. In addition to timing information, price and other ordering information may also be passed by the library unit **262** to the subscriber.

c. The Viewer

FIG. **11** is a block diagram of a viewer **266** showing its internal components. The viewer **266** of FIG. **11** is similar to the viewer **266** depicted in FIG. **6***b*. The viewer **266** is designed to physically resemble a bound book. The viewer **266** is made up of five primary components and four optional components: (1) LCD display **602**, (2) digital circuitry (not shown), (3) video graphics controller **607'**, (4) controls **740**, (5) book memory **728**, (6) optional power

supply circuitry **736**, (7) optional battery **603'**, (8) optional RF transceiver **604**, and (9) optional cellular or mobile communicator (not shown).

(1) A high resolution LCD screen, preferably of VGA quality, is used by the viewer **266** to display text and graphic images. The screen is preferably the size of one page of a book.

(2) Digital circuitry that includes a secure microprocessor **621**, instruction memory **732**, and digital logic. Data is transferred to the viewer **266** in compressed and encrypted format. The secure microprocessor **621** compares the ID number of the viewer **266** with the incoming data stream and only stores the text data if the ID number of the viewer **266** matches that within the incoming data stream. It is preferred that the viewer **266** not output text data or other data and that the data is decompressed and decrypted only at the moment of viewing and only for the current page being viewed. These measures are preferred because they provide additional security against unauthorized access to data.

(3) A video graphics controller **607'** that is capable of assisting and displaying VGA quality text and graphic images is included in the viewer **266**. The graphics controller **607'** is controlled by the digital circuitry described above. Text may be displayed in multiple font sizes.

(4) The viewer **266** of FIG. **11** has touch panel controls **740**. The controls **740** allow the consumer to select stored books and books from catalogues, move a cursor, and turn pages in a book. Typically, the preferred controls include forward and reverse page buttons **741**, a ball **743** for cursor movement, a selection button **745**, a current book button **747** and a bookmark button **749** (see FIG. **14***a*).

(5) Book memory **728** for at least one book or more of text is included in the viewer **266**. The memory **728** stores text and any graphics which represent pictures in a book. The memory **728** can also store menu graphics data. Two different memory **728** devices may be used in the viewer **266**, one for the instructions for the microprocessor **621** in the digital circuitry and a second type of memory may be used for the book memory **728**. Various memory devices available on the market may be used such as, ROM, RAM or a small hard disk. Since a book requires approximately 0.6 megabytes of storage, a small hard disk providing approximately 60 MBytes of storage provides memory to store approximately 100 books. Text for books may be stored in various font sizes so that larger or smaller fonts may be recalled from memory **728** as desired.

(6) Power supply circuitry **736** in the view will accept power from either an AC power source or from an optional battery **603'**, or the library **262**. The power supply circuitry provides the necessary voltages to accommodate the various systems within the viewer **266**.

(7) An optional battery **603'** is provided in the preferred embodiment. The battery **603'** is automatically recharged when AC power is available.

(8) An optional RF transceiver **604** which provided two-way data link between the viewer **266** and other components of the home subsystem can also be included in the viewer **266**.

(9) Also, the viewer **266** may include a cellular transceiver (not shown) for mobile communications.

The viewer **266** of FIG. **11** has parts available for providing a library connection **744**, electronic card memory **748**, CD ROM units **752**, and a portable memory unit **756** (such as that shown in FIG. **6***b* **600'**). Various electronic memory cards such as PCM CIA can be used with this viewer **266**.

Security, low power consumption and excellent display technology are desired features of the viewer **266** design. The viewer **266** should be lightweight and portable. The viewer **266** contains a software operating system that allows books to be stored, read and erased and includes the capability to order books and retain them in memory for a predefined period of time determined by the system operator. The software can be configured to allow the book to be read during a period of time (i.e., two weeks) and then automatically erased, read once and erased, or held in memory permanently. Each viewer **266** has a unique key **605**. All of the data storage is encrypted with the key **605** for an individual viewer **266** to prevent more than one viewer device **266** accessing the text file or book file.

FIG. **12** is a flow diagram of some of the processes executed by the viewer **266**. Generally, the viewer **266** receives inputs from the subscriber through touch panel controls **740**. The subscriber's information requests are then processed **800** by the viewer **266**.

If the subscriber requests a menu of available books, process block **804** will select a book menu. Process block **808** will open the electronic files which list the books that are available (related to the category of topic of the menu) and display the menu with the names of the available books.

If the subscriber selects a particular book to read, then process block **812** will process the selection and determine the electronic file that contains the specific book. Process block **816** will open the file for that specific book and normally access the first page. (If a pointer has already been set in that books electronic file, the process may default to that printer.) Process block **820** will then determine which page needs to be displayed. Process block **820** will determine whether a next page, previous page or a bookmarked page needs to be displayed. If the pointer for the electronic file is not in the correct location then process block **828** will move the pointer and obtain the previous page of data from the stored file. Otherwise, process block **824** will normally obtain the next page of text from the stored electronic file. Process block **832** will decrypt and decompress the text data and send the data to the video display. The video display will generally have a video display memory associated with it and process block **832** will send the data directly to that video display memory. The circuitry for the display then completes the process of displaying the page of text.

If the subscriber, through the controls **740**, requests (from process block **800**) that the power be turned off, then the process, **836**, of turning the power off will be initiated. Process block **840** saves the pointer in memory to the page number in the book that the viewer **266** is currently reading. Process block **844** closes all the electronic files and signals the power circuitry to shut down the power to the various circuits in the viewer **266**. With these examples of basic processes the viewer **266** is able to display book selections and display text from those books.

d. Menu System

It is preferred that the electronic book system have a menu system for selecting features and books from the electronic book system. The operating software and memory required for the menu system is preferably located at the viewer **266**. However, it can also be located at the library or the library and the viewer **266** can share the software and memory needed to operate the menu system. Since the menus are usually displayed on the viewer **266** and it is preferred that the viewer **266** be capable of operating in the absence of the library, the basic software and memory to create the menus is more conveniently located at the viewer **266**.

The preferred menu system is a system which allows sequencing between menus and provides menu graphics for graphical displays such as on the viewer **266**. In a system

which uses a set top converter these menus may also be displayed on a television screen. In the simplest embodiment, the menus provide just basic text information for the subscriber to choose from. In more sophisticated embodiments, the menus provide visual displays and icons to assist the subscriber. The system uses a composite signal containing menu data related to categories of textual data. The operations center has a means for creating menu text data relating to the textual data. The operations center has a means for producing a composite signal containing video data, menu data, and textual data. The textual data can include the menu text data, whereby the composite signal contains menu text data. The system has a selecting means for selecting a portion of text which comprises a means for generating menus using the menu text data created by the operations center. The system comprises a means for providing graphical data wherein the composite signal includes graphical data. The means for generating menus comprises a menu graphics generator and the system includes a memory **728** which can also store menu graphics data. Menu options regarding categories of text data are displayed and may be chosen.

FIG. **13** depicts a menu system with sequencing. The primary menus in the system are an introductory menu **850**, a main menu **854** and various submenus **858**. In the embodiment shown, there are three levels of submenus. In certain instances one or two submenus is sufficient to easily direct the subscriber to the selection or information requested. However, there are features in which three or more submenus makes the user interface more friendly for the subscriber. Each level of submenus may consist of various menus. The particular menu displayed depends on the selection by the subscriber on the previous shown menu. An example of this tree sequence of menus are the help submenus **887**, **888**. Depending upon the specific help requested, a different menu is displayed.

An example of an introductory menu **850** is shown on FIG. **14***a*. Generally the introductory menu **850** introduces the viewer **266** to the system and provides initial guidance and instruction. The introductory menu **850** is followed by a main menu **854**, an example of which is shown in FIG. **14***b*. The main menu provides the viewer **266** with the basic selection or features available in the system. For example, FIG. **14***b* shows that the viewer **266** is able to choose by a point and click method, six available options; (1) free previews, (2) books you can order, (3) books in your library, (4) your current book, (5) help, and (6) other system features. Following a selection on the main menu, a submenu is shown.

FIG. **13** shows ten available primary or first level submenus. They are (1) account set up **862**, (2) free previews **866**, (3) books in your library **872**, (4) books you can order **878**, (5) your current book **884**, (6) help **887**, (7) available features **890**, (8) messages **893**, (9) account information **896** (10) outgoing message submenu **898**. FIG. **14***c* is an example of a first level submenu for books in your library **872**. This "Book In Your Library" submenu shows six available books by title and author and provides the subscriber with the ability to check a different shelf of books or return to the main menu. FIGS. **14***d* and **14***e* show other submenus for books that may be ordered using the "Books You Can Order" submenu.

The "Account Set Up Menu" **862** and further submenu us related to account set up (which provide instructions and account input **864**) are shown in FIGS. **14***f* through FIG. **14***m*. These submenus allow initialization of an account at the operations center and orders to be charged to credit cards. The submenus include the ability to enter data related to your credit cards.

Free previews for books **866** are also provided by submenus (**868**, **870**). Examples of the free preview menus are shown in FIG. **14***n*, FIG. **14***o*, and FIG. **14***p*.

Referring to FIG. **13**, submenus are shown on the "Books In Your Library" submenu **872** and are preferably broken into shelf numbers with submenus for each shelf **874**, **876**. The submenus on the "Books You Can Order" submenu **878** is similarly broken out into submenus by shelves **880**, **882**. These shelves may each be a category or genre of books. Books may be grouped into categories such as best sellers, novels, fiction, romance, etc. See FIG. **14***d*.

Referring to FIG. **13**, the submenu for "Your Current Book" allows a subscriber to select a current book **884** and then determine what page to view. This selection is confirmed with submenu **885**. The help submenu provides the subscriber with additional help screens **888**. The submenus for available features **890** are preferably broken out into a separate submenu for each feature **891**, **892**.

Referring to FIG. **13**, messages can also be sent with the electronic book selection and delivery system. A level one message screen provides the subscriber with the ability to select from the various pending messages he has **893**. Each message is then shown on a separate submenu screen **894**, **895**. An example of such a submenu is shown in FIG. **14***q*.

Referring to FIG. **13**, account information is shown on a level one submenu **896** and then follow-on submenus show the recent orders and your account balance **897**. There is also a level one submenu for outgoing messages **898** which has a follow-on submenu used as an input screen **899**.

In addition to the specific features and submenus described in FIG. **13** and FIG. **14***a* through FIG. **14***q*, many other variations and features are possible. FIG. **14***r* is an example of a main menu with additional features and submenus available.

When a book is finally selected for viewing on the system it will appear on the screen as shown in FIG. **14***s* for the title and FIG. **14***t* for a page of text.

III. The Billing and Collection System

The billing and collection system utilizes the latest technology in electronic transaction and telephone switching to track orders, authorize deliveries, bill consumers, and credit publishers automatically. The telephone calls initiated by the phone connector are received by the billing and collection system which responds immediately without human intervention by placing the order and charging the consumers credit card account. Data is compiled periodically and publishers are credited for sales of their books. The billing and collection system may also connect with subscribers through two-way cable connections, cellular or other communication means.

It is preferred that the billing and collection system communicate with the operations center to track changes in available books and to provide statistical data to the operations center.

IV. Library and Bookstore System

The electronic book system can be modified to be used at public libraries and bookstores. FIG. **15** shows one possible arrangement of components for a public library or bookstore location. The main unit at public library or bookstore is the file server **900**. The file server **900** is a large electronic memory unit that can store thousands of books. Various electronic storage means may be used in the file servers, such as hard disks and read-write CD ROMs and read only CD ROMs.

The system comprises five components; a converter or video connector **904**, a controller **908**, a viewer **912**, and a

catalog printer **916**. The software for controlling the system is primarily located in the controller. The converter or video connector **904** is similar to those described above. In this configuration the controller unit **908** monitors the data being transferred to the file server by the converter **904**. The controller **908** is preferably provided with a viewing screens and several control buttons. When it is necessary to have a larger screen to perform more sophisticated controlling of the system a viewer may be connected to the controller **908** and the viewer screen and controls may be used.

The controller **908** is only able to download books to the viewer **912** which are authorized to receive books from the particular file server. For security reasons it is not desirable that the public viewer **912** have access to more than one file server. In this way, security can be maintained over the text data for books. It is preferred that the public viewer **912** be limited to receiving one or two books at a time from the controller **908**. When the user of the public viewer **912** needs a new or additional book he returns the viewer **912** to the library where he receives a new book from the controller **908**.

In order to track the books that are available on the file server, the titles of the available books may be printed on a catalog printer **916**. The catalog printer **916** is connected to the library controller **908** and the titles of the books are downloaded to the catalog printer **916**. None of the coded text for any of the books can be printed using the controller **908** and catalog printer **916** of this system. In order to maintain security over the data, none of the book data is allowed to be downloaded to the printer. Once a complete printout of available book titles, magazines, or other textual material is complete, a hard copy of the catalog **920** can be maintained at the file server.

The system shown may also be used at bookstores. The bookstores can rent the public viewer **912** to customers with the text for one or two books loaded onto the viewer **912**. The viewer **912** may be provided with an automatic timeout sequence. The timeout sequence would erase the textual data for the books after a certain period of time, for example, two weeks. It is expected that after a period of time (perhaps within two weeks) the renter would return the public viewer **912** to the bookstore and receive additional books for viewing. Using this arrangement, it is also possible for the bookstore to (permanently) sell a viewer **912** to a regular customer. The customer then returns to the bookstore from time to time to receive textual data for a book which the customer can then store permanently on his own viewer **912**. Various other configurations are possible for bookstores and libraries using the file server and viewer **912** described.

V. Use Of Set Top Converter

Existing set top converter boxes such as those made by Scientific Atlanta or General Instruments are presently unequipped to handle the book selection system of the present invention. Although set top converters may be built which include the library functions, hardware modifications are necessary in order to use the book selection system with existing set top converter technology.

FIGS. **16***a* and **16***b* are examples of hardware modification. A port is used to attach hardware upgrades described below to a set top terminal. Two upgrades are possible to set top converters **601** to assist in receiving and selecting electronic books. A menu generation card upgrade (FIG. **16***a*) and an information download unit (FIG. **16***b*). Each of these upgrades may be connected to the set top terminal unit through an upgrade port. A four wire a cable, ribbon cable or the like may be used to connect the upgrade to the set top converter **601**.

A card addition **950** to a set top converter **601** is depicted in FIG. **16***a*. The card **950** shown provides the additional functionality needed to utilize the book selection system with existing set top converter **601** technology. The card **950** may be configured to slip inside the frame of a set top terminal and become part of the set top terminal, an advanced set top terminal. The primary functions the card **950** adds to the set top converter **601** are the interpreting of data signals, generating of menus, sequencing of menus, and, ultimately, the ability of the viewer **912** to select a book using either the television or a viewer **912**. The card **950** also provides a method for a remote location, such as the cable headend, to receive information on books ordered. The books ordered information and control commands may be passed from the cable headend to the card **950** using telephone lines.

The primary components of the card **950** are a PC chip CPU **952**, a VGA graphic controller **954**, a video combiner **956**, logic circuitry **958**, NTSC encoder **960**, a receiver **962**, demodulator (not shown), and a dialer **611'**. The card **950** operates by receiving the data text signal from the cable headend through the coaxial cable. The logic circuitry **958** of the card **950** receives data **964**, infrared commands **966**, and synchronization signals (not shown) from the set top converter **601**. Menu selections made by the viewer **912** on the remote control are received by the set top converter's **601** IR equipment and passed through to the card **950**. The card **950** interprets the IR signal and determines the book (or menu) the subscriber has selected. The card **950** modifies the IR command to send the information to the set top converter **601**. The modified IR command contains the channel information needed by the set top converter **601**. Using the phone line **968** and dialer **611'**, the card **950** is able to transmit books ordered information to the cable headend. It is also possible to receive the books over the telephone lines and by-pass the video distribution system.

These commands are passed through the interface linking the set top terminal's microprocessor with the microprocessor of the hardware upgrades. In this way, subscriber inputs, entered through the set top terminal keypad or remote control, can be transferred to any of the hardware upgrades for processing and responses generated therein can then be sent back to the set top terminal for display. In the preferred embodiment the IR commands **966** are transferred from set top terminal **601** to hardware upgrade.

Hardware upgrades may include a microprocessor, interactive software, processing circuitry, bubble memory, and a long-term memory device. In addition to these basic components, the hardware upgrade may make use of an additional telephone modem or CD-ROM device.

The information download hardware upgrade **1001** (shown in FIG. **16***b*) allows the subscriber to download large volumes of information from the operations center or cable headend using the set top converter **601 601**. The hardware upgrade **1001** will enable subscribers to download data, such as books and magazines, to local storage. Primarily, the hardware upgrade **1001** is an additional local storage unit **1003** (e.g., hard disk, floppy, optical disk or magnetic cartridge and may include a microprocessor **1005**, instruction memory **1007**, and a random access memory **1009**, as shown in FIG. **16***b*). Preferably, a small portable viewer **912** is also provided with the upgrade **1001** to enable downloaded text to be read without the use of a TV.

The downloadable information may be text or graphics supplied by the operations center or cable headend. With this upgrade, books may be downloaded and read anywhere with the portable reader. Using this upgrade, books may be

downloaded and stored in compressed form for later decompression. The books would be decompressed only at the time of viewing. Important text that the public desires immediate access may made available through this system. Text such as the President's speech, a new law, or a recent abortion decision rendered by the Supreme Court may be made immediately available.

In the preferred embodiment, book ordering information is stored at each set top terminal until it is polled by the cable headend using a polling request message format. An example of a polling request message format consists of six fields, namely: (1) a leading flag at the beginning of the message, (2) an address field, (3) a subscriber region designation, (4) a set top terminal identifier that includes a polling command/response (or P/F) bit, (5) an information field, and (6) a trailing flag at the end of the message. A similar response frame format for information communicated by the set top terminal to the cable headend in response to the polling request may be used.

FIG. **17** shows a preferred set top terminal that includes a data receiver **617'** and a data transmitter **1011**. The data transmitter provides upstream data communications capability between the set top terminal **601** and the cable headend. Upstream data transmissions are accomplished using the polling system described and, using a data transmitter **1011**. Both receiver **617'** and transmitter **1011** may be built into the set top terminal **601** itself or added through an upgrade module. Regardless of the specific hardware configuration, the set top terminal's data transmission capabilities may be accomplished using the hardware shown in FIG. **17**.

FIG. **17** shows RF signals, depicted as being received at by a data receiver **617'** and tuner **613** working in unison. Both of these devices are interfaced with the microprocessor **1013**, which receives inputs **1015**, from the subscriber, either through a set top terminal's keypad, a remote control unit or viewer **912**. All cable signals intended for reception on the subscriber's TV are accessed by the tuner **613** and subsequently processed by the processing circuitry **1017**. This processing circuitry **1017** typically includes additional components (not shown) for descrambling, demodulation, volume control and remodulation on a Channel 3 or 4 TV carrier.

Data targeted to individual set top terminals is received by the data receiver **617'** according to each set top terminal's specific address or ID. In this way, each addressable set top terminal only receives its own data. The data receiver **617'** may receive set top terminal **601** specific data in the information field of the signal frame described or on a separate data carrier located at a convenient frequency in the incoming spectrum.

Any received data includes information regarding books and menus available for selection. The subscriber may enter a series of commands **1015** using a keypad or remote control in order to choose a channel or program. Upon receipt of such commands, the set top terminal's microprocessor **1013** instructs the tuner to tune to the proper frequency of the channel carrying data and subsequently instructs the processing circuitry **1017** to begin descrambling of this data.

Upon selection of a book, the microprocessor **1013** stores any selection information in local memory (not shown) for later data transmission back to the cable headend. The set top terminal's microprocessor **1013** coordinates all CATV signal reception and also interacts with various upstream data transmission components. Typically, the data transmitter **1011** operates in the return frequency band between 5 and 30 MHz. In an alternative embodiment, the frequency band of 10 to 15 MHz may be used. Regardless, however, of the frequency band used, the data transmitter **1011** sends information to the cable headend in the information field of the response frame described. Those skilled in the art will recognize that a number of variations and combinations of the above-described set top terminal hardware components may be used to accomplish upstream data transmissions.

VI. Books-On-Demand System

The electronic book system described may also be configured in a book-on-demand style. FIG. **18***a* shows one example of a configuration for a book-on-demand system. A book on demand system requires more powerful two-way communications between the consumer's home, bookstore or library and either the operations center or a distribution site **1020** such as the cable headend. This type of two-way communication can be provided by the hardware shown in FIG. **17** and described above.

Referring to FIG. **18***a*, in a book-on-demand system, the subscriber selects the book to be download from an available menu of books. The available menu is usually sent to the subscriber location by the distribution site **1020**. After his selection, information about his selection (or request) is then communicated to either a distribution point **1020** (such as a cable headend) or the operations center. Upon receipt of this request, the needed textual and graphical information for the book is spooled and sent to the subscriber. In this manner, books are only sent when requested by the subscriber and are sent immediately upon demand for the book.

In order to support such a demand system, the text delivery and distribution must be conducted on a strong nodal architectured distribution system, such as, a video-on-demand cable or telephone television system, or through use of individual telephone calls on the public telephone system.

The book-on-demand system allows for a greater selection of books to the subscriber and limits the amount of communicated book data that is unnecessary or unneeded. It also provides the book to the subscriber in a much timelier fashion.

In addition to a stronger distribution system, a book-on-demand system requires a distribution point **1020** to have more sophisticated equipment to spool out the textual information. This can be accomplished using file server technology **1024** for storing the books and ATM **1028** or telephone-type switching (not shown) to distribute the textual information. The file server **1024** and distribution technology that can be used in configuring such a book-on-demand system is described in U.S. Pat. No. 5,262,875 and U.S. Pat. No. 5,218,695, cited above.

FIG. **18***a* shows an embodiment for a book-on-demand system that utilizes file server technology. In addition to books, the embodiment of FIG. **18***a* will support distribution of nearly any digital data. Books or textual files are received from publishers **282** and other sources through local feeds **1032**, ATM **1028**, or by satellite dish **1036**. The data is then stored in memory **1040** at the file server **1024**. Preferably, distribution point **1020** is a cable headend that receives requests from subscribers and delivers text to subscribers over a two-way communication system (such as a video-on-demand system (VOD) **1044**).

The library unit **262** can be connected to either a basic premium-type service cable system **1048**, a near video-on-demand type cable system (or pay-per-view (PPV) **1052**) or a video-on-demand cable system **1044**. In connecting with either of these three systems the library **262** may access the cable directly or may access the system through a set top terminal **601'**, **601"**, or **601"'**.

Using the two-way video-on-demand system **1044**, a subscriber is able to request a specific book title and receive that text immediately following its request. To accomplish this, the distribution point **1020** transmits a list of available books through the cable delivery system to the library **262**. The library **262** displays the list of available books on a menu or similar format. As described earlier, it is preferred that the library **262** use menus which list categories of available books to form its request from the distribution point **1020**. After selecting a book the library **262** then sends a request signal on the two-way communication system **1044** back to the distribution point **1020**. This request signal can be handled in two ways. Either the library **262** initiates the request or the distribution point **1020** polls the various libraries on to the two-way system **1044**. Upon receiving the request for the book title, the text associated with that book title is transmitted to the library **262** using the two-way cable system **1044**.

FIG. **18***b* is an expanded view of an operations center **250** that supports a regional or national book-on-demand system. In fact, the operations center **250** shown supports distribution of nearly any digital data. The operations center **250** supports multiple feeds to receive digital information by tape **1060**, **1060'**, ATM **1028**, or satellite **1036**. The information is processed through an input MUX **1064** and a small file server **1068** before reaching the master file server **1072**. Digital data such as books received from publishers **282** is then stored on the master file server **1072**. It is preferred that the digital data is stored compressed in a standard format such as MPEG2.

A system controller **1076** provides control over the regional or national book-on-demand system. Books may be packaged into groups to provide feeds to various cable headends. In addition, scheduling and marketing research are conducted at the operations center **250**. In order to handle the scheduling and market research, book buy data is received at the operations center **250** through a multiplexer **1082**. Book buy information can be provided by the operation center **250** to the billing and collection subsystem.

The operations center **250** is also equipped to insert messages or advertisements into the file server. These messages or advertisements will eventually be received by the subscribers.

The master file server **1072** uses an output multiplexer **1080** and ATM **1028** as well as satellite connections to distribute digital data. In the preferred embodiment, cable headends receive text data on books from the master file server **1080** through the output multiplexer **1028** and an ATM system **1028**. After receiving the digital book data, the cable headends store the books in a local file server **1024**. FIG. **18***a*'s distribution point **1020** is an example of a cable headend which may receive data from the operations center **250** of FIG. **18***b* through an ATM hookup **1088** or satellite hookup.

What is claimed is:

1. A system for transmitting, receiving, and selecting textual data wherein the textual data is transmitted in a video formatted composite signal, the system comprising:

means for producing the composite signal using textual data and menu data, the composite signal being formatted as a video signal containing the textual data and the menu data;

means, connected to the producing means, for transmitting the composite signal;

a means for receiving the composite signal; and

a means, connected to the receiving means, for selecting a portion of the textual data using the menu data and at least one submenu, the selecting means comprising:

means for receiving a subscriber entry indicating a portion of textual data.

2. The system of claim **1** wherein the selecting means further comprises:

means for extracting the contained textual data from the composite signal; and

means, connected to the extracting means, for choosing a portion of the extracted textual data.

3. The system of claim **1** wherein the selecting means further comprises:

means for choosing a portion of the textual data transmitted with the composite signal; and

means, connected to the choosing means, for extracting only the chosen portion of textual data from the composite signal.

4. The system of claim **1** further comprising:

means, connected to the selecting means, for displaying the selected portion of textual data.

5. The system of claim **1** wherein the means for producing the composite signal comprises an encoder.

6. The system of claim **1** wherein the means for transmitting comprises a broadcast television transmitter.

7. The system of claim **1** wherein the text data is sent without any video and fills an entire channel of video and wherein the means for transmitting comprises a cable television transmitter.

8. The system of claim **1** further comprising a means, connected to the means for producing a composite signal, for providing graphical data;

wherein the composite signal includes the graphical data.

9. The system of claim **1** wherein at least one level of submenus is used and wherein at least one submenu exists in each level of submenus.

10. The system of claims **1** wherein the menu data comprises menu text data and menu graphics data.

11. The system of claim **7** wherein the entire channel of video comprises a channel's frequency bandwidth.

12. The system of claim **1** wherein the means for producing the composite signal places the textual data into the vertical blanking interval of the video signal and wherein the selecting means further comprises a vertical blanking interval extractor to select a portion of the textual data.

13. A system for transmitting, receiving, and selecting text by title wherein textual data is organized into packets of data and transmitted in a video formatted composite signal, the system comprising:

means for producing the composite signal from textual data, the composite signal being formatted as a video signal containing the textual data;

means, connected to the producing means, for transmitting the composite signal;

a means for receiving the composite signal; and

a means, connected to the receiving means, for selecting a portion of the textual data, comprising:

means for receiving a subscriber entry indicating a title, wherein the title correlates to a portion of textual data;

means for extracting packets of data from the composite signal; and

means, connected to the extracting means, for choosing packets of data.

14. A system for transmitting, receiving, and selecting text by title wherein textual data is transmitted in a video formatted composite signal, the system comprising:

means for producing the composite signal from textual data, the composite signal being formatted as a video signal containing the textual data;

means, connected to the producing means, for transmitting the composite signal;

a means for receiving the composite signal;

a means, connected to the receiving means, for selecting a portion of the textual data, comprising:

means for receiving a subscriber entry indicating a title, wherein the title correlates to a portion of textual data; and

a means, connected to the selecting means, for displaying the selected portion of textual data, comprising:

a means for generating text from the selected portion of the textual data.

15. A system for transmitting, receiving, and selecting text by title wherein textual data is transmitted in a video formatted composite signal, the system comprising:

means for producing the composite signal from textual data, the composite signal being formatted as a video signal containing the textual data;

means, connected to the producing means, for transmitting the composite signal;

a means for receiving the composite signal;

a means, connected to the receiving means, for selecting a portion of the textual data, comprising:

means for receiving a subscriber entry indicating a title, wherein the title correlates to a portion of textual data; and

a set top terminal with a memory for storage of the selected textual data; and

means, connected to the selecting means, for displaying the selected portion of textual data, wherein the means for displaying comprises a television.

16. The system of claim **14** wherein the means for displaying comprises a portable, hand-held viewer.

17. A system for transmitting, receiving, and selecting text by title wherein textual data is transmitted in a video formatted composite signal, the system comprising:

means for producing the composite signal from textual data, the composite signal being formatted as a video signal containing the textual data, comprising:

an operations center for pooling textual data to be included in the composite signal;

means, connected to the producing means, for transmitting the composite signal;

a means for receiving the composite signal; and

a means, connected to the receiving means, for selecting a portion of the textual data, comprising:

means for receiving a subscriber entry indicating a title, wherein the title correlates to a portion of textual data.

18. The system of claim **17** wherein the operations center comprises:

means for receiving a textual data;

means, connected to the receiving means, for compressing the textual data; and

means, connected to the compressing means, for encrypting the compressed textual data.

19. A system for transmitting, receiving, and selecting text wherein the text is transmitted in a video formatted composite signal, the system comprising:

means for producing the composite signal from textual data, the composite signal being formatted as a video signal containing the textual data, the producing means comprising an operations center for pooling textual data to be included in the composite signal, the operations center comprising:

means for creating menu text data relating to the textual data wherein the textual data includes the menu text data and whereby the composite signal further contains menu text data;

means, connected to the producing means, for transmitting the composite signal;

a means for receiving the composite signal; and

a means, connected to the receiving means, for selecting a portion of the textual data wherein the selecting means comprises means for generating menus using the menu text data created by the operations center.

20. The system of claim **19** wherein the means for generating menus comprises a menu graphics generator.

21. The system of claim **19** wherein the means for generating menus comprises a means for sequencing the generated menus.

22. The system of claim **19** wherein the means to generate menus comprises:

means for extracting textual data to be used in generating menus; and

means, connected to the extracting means, for generating text from the extracted textual data.

23. A system for transmitting, receiving, and selecting text wherein the text is transmitted in a video formatted composite signal, wherein the text data is sent without any video and fills an entire channel of video, the system comprising:

means for producing the composite signal from textual data, the composite signal being formatted as a video signal containing the textual data;

means, connected to the producing means, for transmitting the composite signal, comprising a cable television transmitter:

a means for receiving the composite signal comprising a cable connector and the cable connector comprising a means for extracting textual data from the video formatted composite signal; and

a means, connected to the receiving means, for selecting a portion of the textual data.

24. A system for transmitting, receiving, and selecting text by title wherein textual data is transmitted in a video formatted composite signal, the system comprising:

means for producing the composite signal from textual data, the composite signal being formatted as a video signal containing the textual data;

means, connected to the producing means, for transmitting the composite signal;

a means for receiving the composite signal;

a means, connected to the receiving means, for selecting a portion of the textual data, comprising:

means for receiving a subscriber entry indicating a title, wherein the title correlates to a portion of textual data; and

a modem, connected to the selecting means, for enabling bidirectional telephone communication between the selection means and remote locations.

25. The system of claim **24** further comprising a billing system located remotely from the selecting means, wherein the modem communicates with the billing system.

26. A system for transmitting, receiving, and selecting text by title wherein textual data is transmitted in a video formatted composite signal over a transmission medium, the system comprising:

means for producing the composite signal from textual data, the composite signal being formatted as a video signal containing the textual data;

means, connected to the producing means, for transmitting the composite signal, wherein the transmission medium is a bidirectional cable system;

a means for receiving the composite signal;

a means, connected to the receiving means, for selecting a portion of the textual data, comprising:

a means for receiving a subscriber entry indicating a title,

wherein the title correlates to a portion of textual data; and

a means for transmitting information over the bidirectional cable system.

27. The system of claim **26** further comprising a billing system connected to the bidirectional cable system and wherein the selecting means transmits information about the selected portion of textual data over the bidirectional cable system.

28. A method for distributing text material using a transmission medium comprising the steps of:

coding text material and menu data onto a composite signal;

transmitting the composite signal over a transmission medium;

receiving the composite signal from the transmission medium; and

selecting text material coded onto the composite signal using a menu system, wherein the menu system includes at least one submenu, comprising the steps of:

receiving a subscriber entry; and

correlating the subscriber entry to a portion of the text material coded onto the composite signal.

29. The method of claim **28** further comprising the step of extracting the text data wherein the step of extracting occurs before the step of selecting.

30. The method of claim **28** wherein the menu system includes at least one level of submenus and at least one submenu in each level of submenus.

31. The method of claims **28** wherein the menu data comprises menu text data and menu graphics data, and wherein the menu data is used by the menu system.

32. A method for distributing text material in text data form using a video signal and a transmission medium, wherein the text data is in a data packet format, comprising the steps of:

coding text data representing text material onto a video signal;

transmitting the video signal over a transmission medium;

receiving the video signal from the transmission medium; and

selecting text coded onto the video signal, the step selecting comprising the steps of:

receiving a subscriber entry indicating a title; and

correlating the subscriber entry to a portion of the text data coded onto the video signal; and

extracting data packets from the video signal and choosing one or more of the extracted data packets.

33. A method for distributing text material in text data form using a transmission medium comprising:

coding text data representing text material onto a composite signal;

transmitting the composite signal over a transmission medium;

receiving the composite signal from the transmission medium;

coding menu graphics onto a composite signal;

selecting text coded onto the composite signal, comprising:

receiving a subscriber entry indicating a title;

correlating the subscriber entry to a portion of the text data coded onto the composite signal;

storing the selected text; and

displaying the stored text wherein the menu graphics are used in the selecting step.

34. A method for distributing text material in text data form using a video signal and a transmission medium comprising:

creating menu text data;

coding text data onto a video signal, wherein menu text data is coded onto the video signal;

transmitting the video signal over a transmission medium;

receiving the video signal from the transmission medium; and

selecting text coded onto the video signal, comprising generating menus from the menu text data.

35. A system for transmitting, receiving, and selecting text wherein the text is placed on a video formatted composite signal produced from a textual signal containing textual data, a menu signal containing menu data related to categories of the textual data, and from a video signal containing video data, the composite signal transmitted to a receiver for menu generation and text selection, comprising:

means for producing a composite signal from the textual signal, the menu signal and the video signal, the composite signal formatted as a video signal and containing the video data, the menu data and the textual data;

means, connected to the producing means, for transmitting the composite signal over a first transmission medium;

means for receiving the composite signal from the transmission medium;

means, connected to the receiving means, for displaying menu options regarding categories of text data;

means, connected to the displaying means, for choosing a displayed menu option;

an authorization means, in communication with the choosing means and receiving means, for granting authorization to receive the chosen category of text data;

a communication means, connected to the choosing means and receiving means, for communication with the authorization means;

a memory means, connected to the receiving means, for storing textual data;

a selection means, connected to communication means, memory means, and receiving means, to direct the selecting, receiving, and storing of the chosen category of text data.

36. The system of claim **35**, wherein the authorization means and communication means each comprise a modem for telephonic communication.

37. The system of claim **36**, wherein the authorization means and communication means both comprise a multiplexer and demultiplexer for wired digital communication.

38. The system of claim **35**, wherein the selecting means further comprises means for compiling data on books read by a subscriber and the communication means further comprises means for transferring the data on books read to the authorization means.

39. A method for receiving selected text upon demand at a viewing location wherein text is associated with an available book title and a text source stores the text, comprising:

creating a list of titles of available books wherein a book is available if the text associated with the book is available for transmission;

transmitting the list of titles of available books;

selecting a title from the transmitted list of titles;

communicating the selected title to the text source; and

transmitting the text associated with the selected title from the text source to the viewing location.

40. The method of claim 39 wherein the titles of available books are categorized, and the step of selecting a title comprises:

generating a menu which lists categories of available books; and

choosing a category of available books from the generated menu; and

listing books within the chosen category of available books.

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