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Libkind et al.

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(54) **SYSTEM AND METHOD FOR CALL PLACEMENT USING A TELEVISION SET-TOP BOX**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(22) Filed: **Jul. 3, 2014**

Related U.S. Application Data

(63) Continuation of application No. 13/655,341, filed on Oct. 18, 2012, now abandoned, which is a continuation of application No. 11/968,283, filed on Jan. 2, 2008, now abandoned.

(60) Provisional application No. 60/883,201, filed on Jan. 3, 2007.

(51) **Int. Cl.**

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H04N 21/2543	(2011.01)
H04N 21/47	(2011.01)
H04N 21/4788	(2011.01)

(52) **U.S. Cl.**
CPC ***H04N 21/6187*** (2013.01); ***H04N 21/2543*** (2013.01); ***H04N 21/47*** (2013.01); ***H04N 21/4788*** (2013.01); ***H04N 21/6168*** (2013.01)

(58) **Field of Classification Search**
CPC H04N 21/478; G06Q 30/02
See application file for complete search history.

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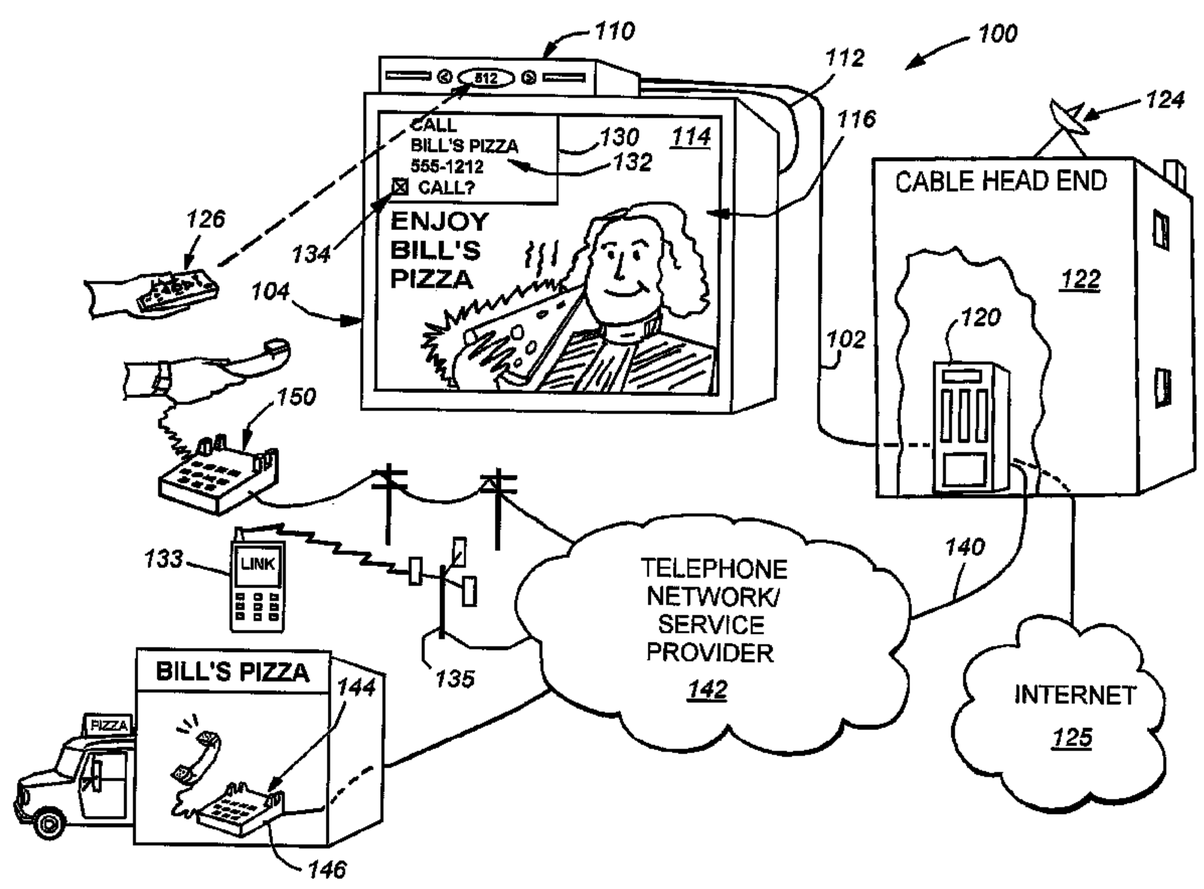
Primary Examiner — Jun Fei Zhong
(74) *Attorney, Agent, or Firm* — Lawrence G. Fridman, Esq

(57) **ABSTRACT**

A call-placement service is provided for a cable television set top box (STB). The STB is interconnected to a television display and via a cable link to a server at a cable television provider head end. The STB includes an onboard application that presents a menu to the subscriber allowing access to a list of telephone numbers and downloadable content providers. The head end includes a service application that selects an appropriate telephone provider and transmits the telephone numbers to the provider. The telephone provider connects to the subscriber and detects whether the subscriber can receive an SMS message. If so, the provider connects to the target and detects whether the target can accept the call or send an SMS message. If so, the telephone system connects the call between the subscriber and the target of passes an SMS message to the user's that may contain a link for content download.

17 Claims, 19 Drawing Sheets



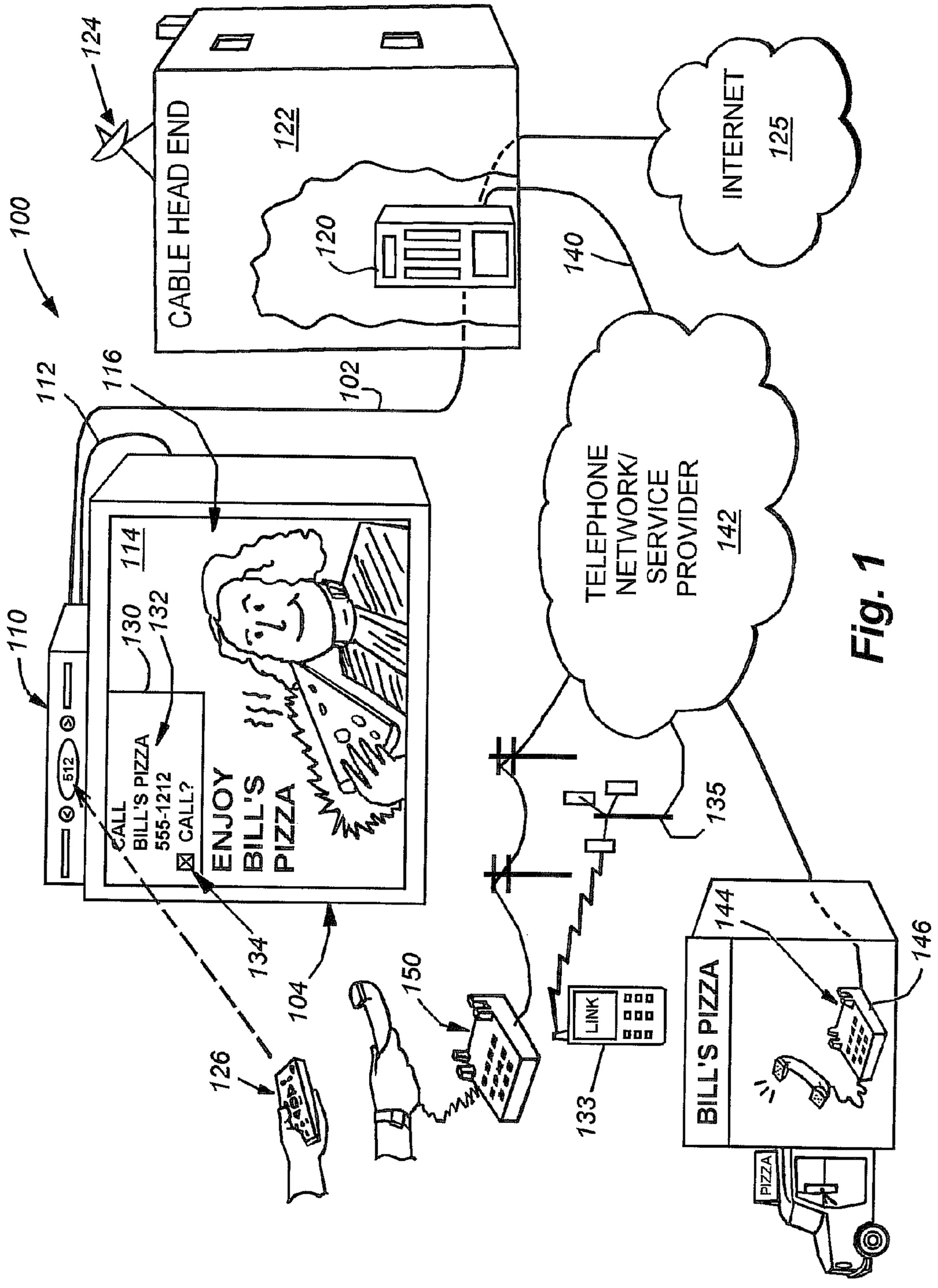

100
124
122
CABLE HEAD END
120
140
INTERNET
125
112
116
102
110
114
130
132
512
CALL
BILL'S PIZZA
555-1212
CALL?
ENJOY
BILL'S
PIZZA
134
104
126
150
TELEPHONE
NETWORK/
SERVICE
PROVIDER
142
135
LINK
133
144
146
BILL'S PIZZA
PIZZA

Fig. 1

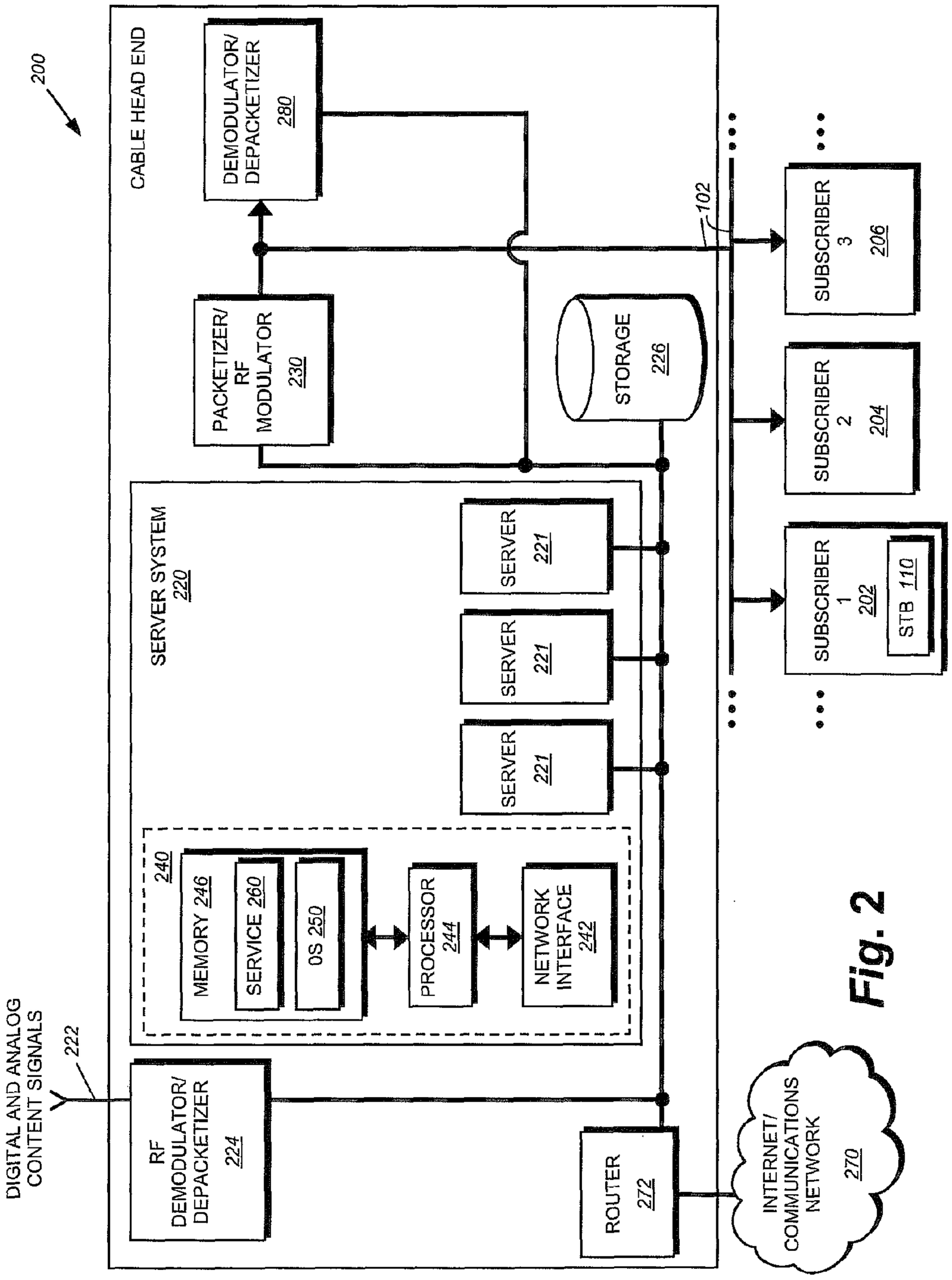

200
CABLE HEAD END
DEMODULATOR/ DEPACKETIZER 280
PACKETIZER/ RF MODULATOR 230
STORAGE 226
102
SERVER SYSTEM 220
SERVER 221
SERVER 221
SERVER 221
240
MEMORY 246
SERVICE 260
OS 250
PROCESSOR 244
NETWORK INTERFACE 242
DIGITAL AND ANALOG CONTENT SIGNALS
222
RF DEMODULATOR/ DEPACKETIZER 224
ROUTER 272
INTERNET/ COMMUNICATIONS NETWORK 270
SUBSCRIBER 1 202
STB 110
SUBSCRIBER 2 204
SUBSCRIBER 3 206

Fig. 2

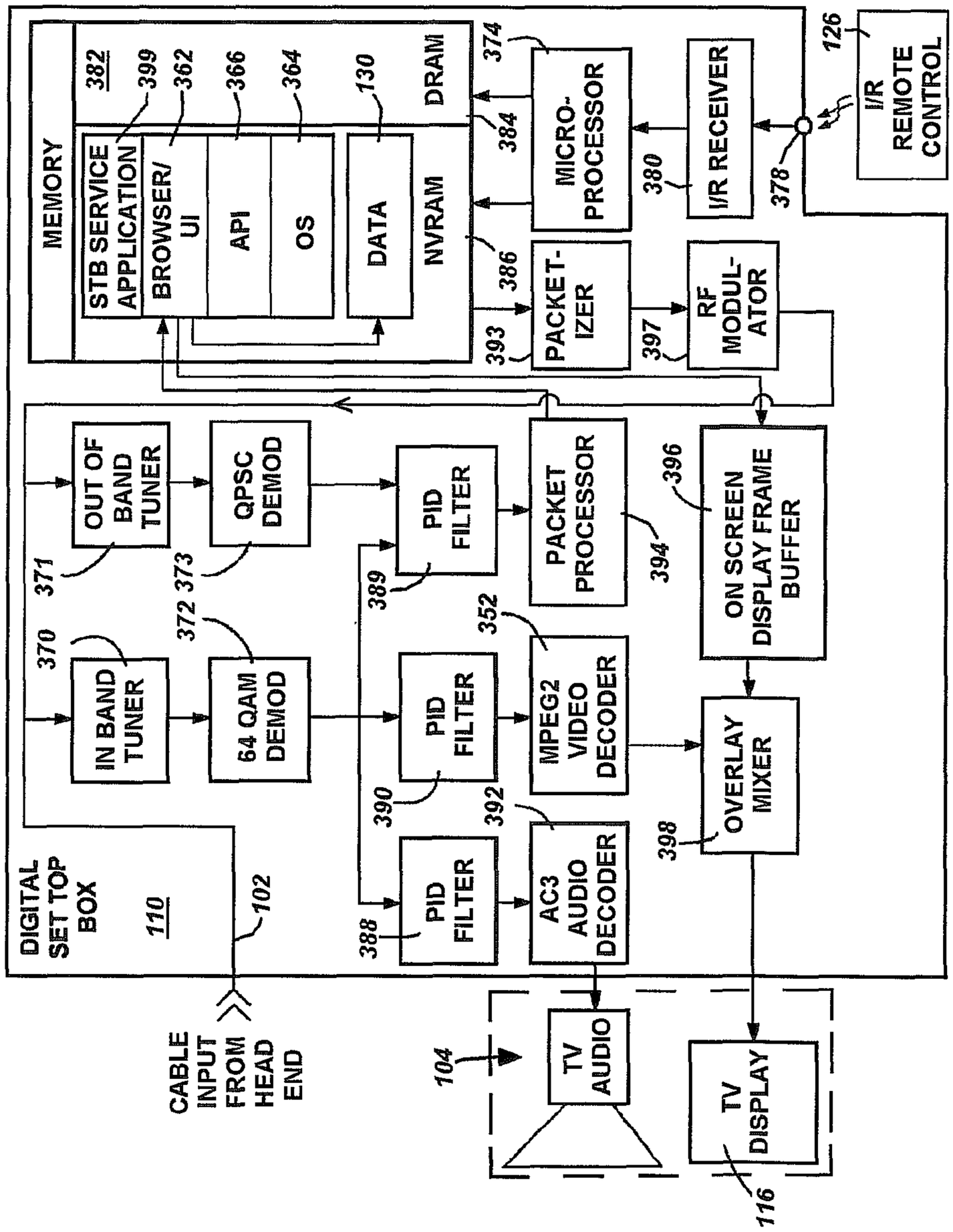

DIGITAL SET TOP BOX 110
102
CABLE INPUT FROM HEAD END
MEMORY
382
STB SERVICE APPLICATION
399
BROWSER/ UI
362
API
366
OS
364
DATA
NVRAM
130
DRAM
374
384
MICRO-PROCESSOR
380
I/R RECEIVER
378
126
I/R REMOTE CONTROL
386
PACKET-IZER
393
RF MODUL-ATOR
397
OUT OF BAND TUNER
371
QPSC DEMOD
373
PID FILTER
389
PACKET PROCESSOR
394
396
ON SCREEN DISPLAY FRAME BUFFER
IN BAND TUNER
370
64 QAM DEMOD
372
PID FILTER
390
352
MPEG2 VIDEO DECODER
OVERLAY MIXER
398
PID FILTER
388
392
AC3 AUDIO DECODER
104
TV AUDIO
TV DISPLAY
116

Fig. 3

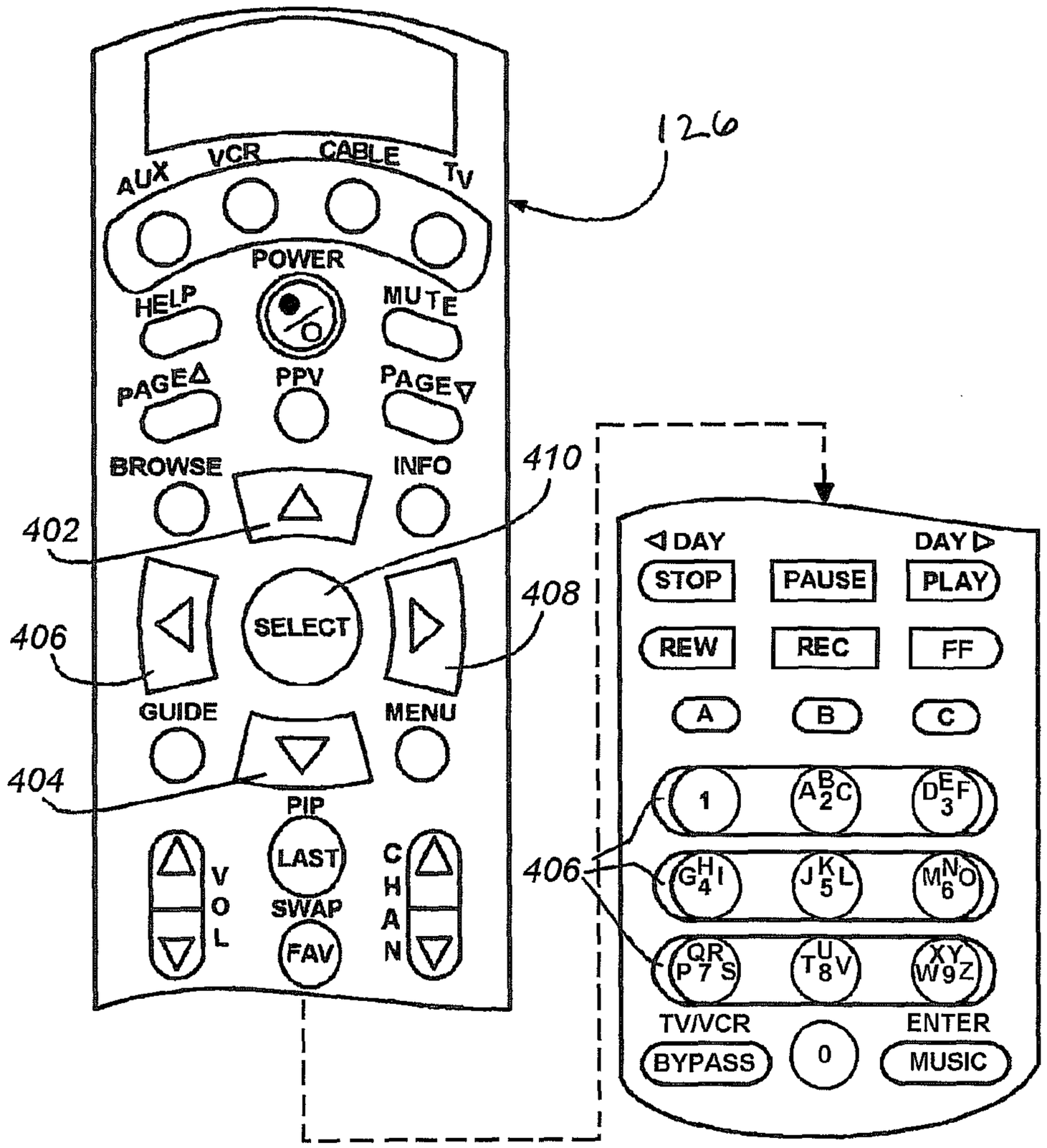

126
AUX
VCR
CABLE
TV
POWER
HELP
MUTE
PAGE△
PPV
PAGE▽
BROWSE
INFO
410
402
408
406
SELECT
GUIDE
MENU
404
PIP
LAST
SWAP
FAV
VOL
CHAN
406
◁ DAY
DAY ▷
STOP
PAUSE
PLAY
REW
REC
FF
A
B
C
1
A B C 2
D E F 3
G H I 4
J K L 5
M N O 6
Q R P 7 S
T U 8 V
X Y W 9 Z
TV/VCR
ENTER
BYPASS
0
MUSIC

Fig. 4

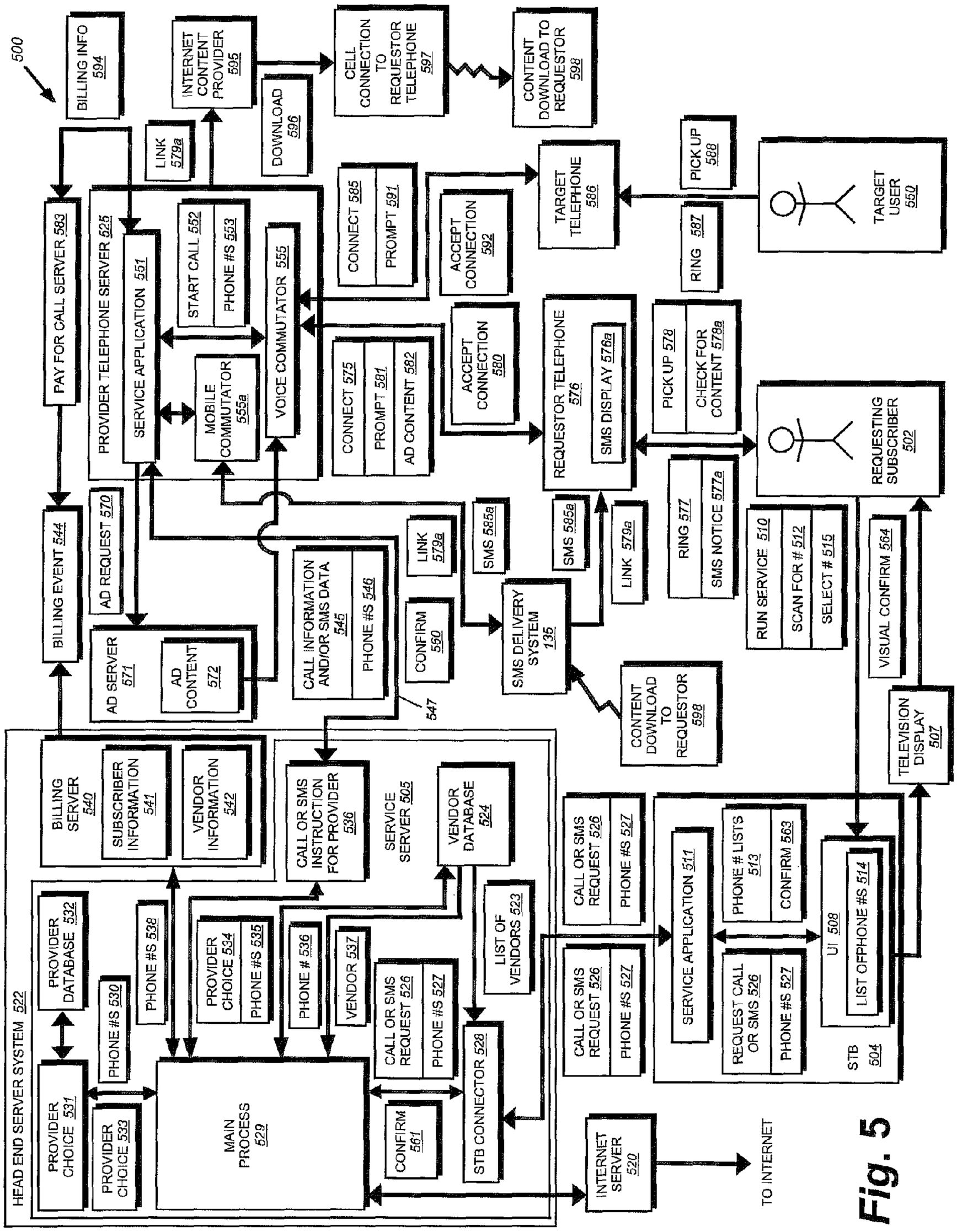

500
BILLING INFO 594
INTERNET CONTENT PROVIDER 595
CELL CONNECTION TO REQUESTOR TELEPHONE 597
CONTENT DOWNLOAD TO REQUESTOR 598
LINK 579a
DOWNLOAD 596
PICK UP 588
TARGET USER 550
TARGET TELEPHONE 586
CONNECT 585
PROMPT 591
ACCEPT CONNECTION 592
RING 587
PAY FOR CALL SERVER 583
PROVIDER TELEPHONE SERVER 525
SERVICE APPLICATION 551
START CALL 552
PHONE #S 553
VOICE COMMUTATOR 555
MOBILE COMMUTATOR 555a
CONNECT 575
PROMPT 581
AD CONTENT 582
ACCEPT CONNECTION 580
REQUESTOR TELEPHONE 576
SMS DISPLAY 576a
PICK UP 578
CHECK FOR CONTENT 578a
REQUESTING SUBSCRIBER 502
BILLING EVENT 544
AD REQUEST 570
AD SERVER 571
AD CONTENT 572
CALL INFORMATION AND/OR SMS DATA 545
PHONE #S 546
CONFIRM 560
LINK 579a
SMS 585a
SMS DELIVERY SYSTEM 135
SMS 585a
LINK 579a
RING 577
SMS NOTICE 577a
RUN SERVICE 510
SCAN FOR # 512
SELECT # 515
VISUAL CONFIRM 564
TELEVISION DISPLAY 507
547
CONTENT DOWNLOAD TO REQUESTOR 598
BILLING SERVER 540
SUBSCRIBER INFORMATION 541
VENDOR INFORMATION 542
CALL OR SMS INSTRUCTION FOR PROVIDER 536
SERVICE SERVER 505
VENDOR DATABASE 524
CALL OR SMS REQUEST 526
PHONE #S 527
SERVICE APPLICATION 511
PHONE # LISTS 513
CONFIRM 563
REQUEST CALL OR SMS 526
PHONE #S 527
UI 508
LIST OFPHONE #S 514
STB 504
HEAD END SERVER SYSTEM 522
PROVIDER DATABASE 532
PROVIDER CHOICE 531
PROVIDER CHOICE 533
PHONE #S 530
PHONE #S 538
PROVIDER CHOICE 534
PHONE #S 535
PHONE # 536
VENDOR 537
LIST OF VENDORS 523
CALL OR SMS REQUEST 526
PHONE #S 527
MAIN PROCESS 529
CONFIRM 561
STB CONNECTOR 528
INTERNET SERVER 520
TO INTERNET

Fig. 5

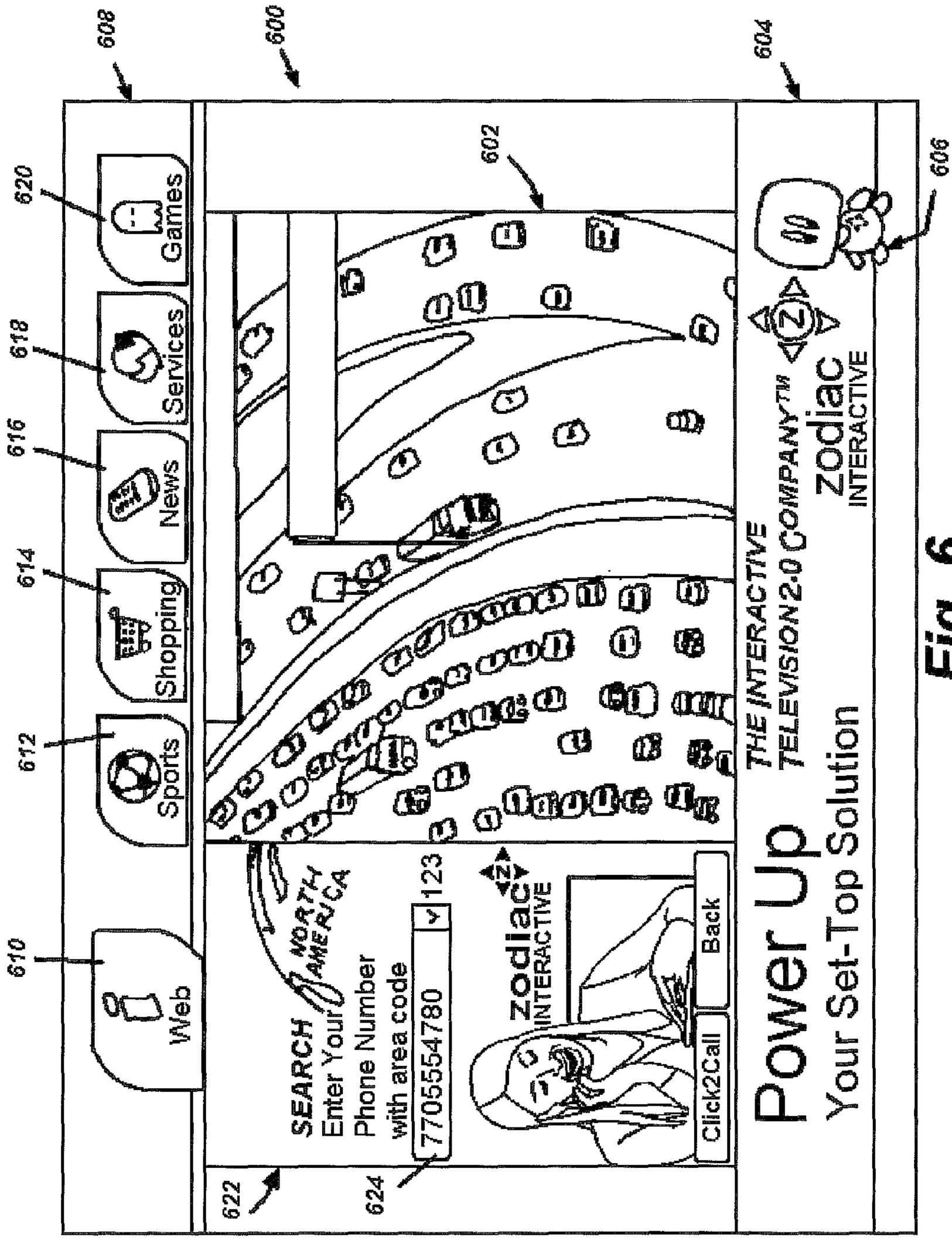

608
600
604
602
606
620
Games
618
Services
616
News
614
Shopping
612
Sports
610
Web
SEARCH
Enter Your
Phone Number
with area code
7705554780
123
NORTH AMERICA
zodiac
INTERACTIVE
THE INTERACTIVE
TELEVISION 2.0 COMPANY™
zodiac
INTERACTIVE
Power Up
Your Set-Top Solution
Click2Call
Back
622
624

Fig. 6

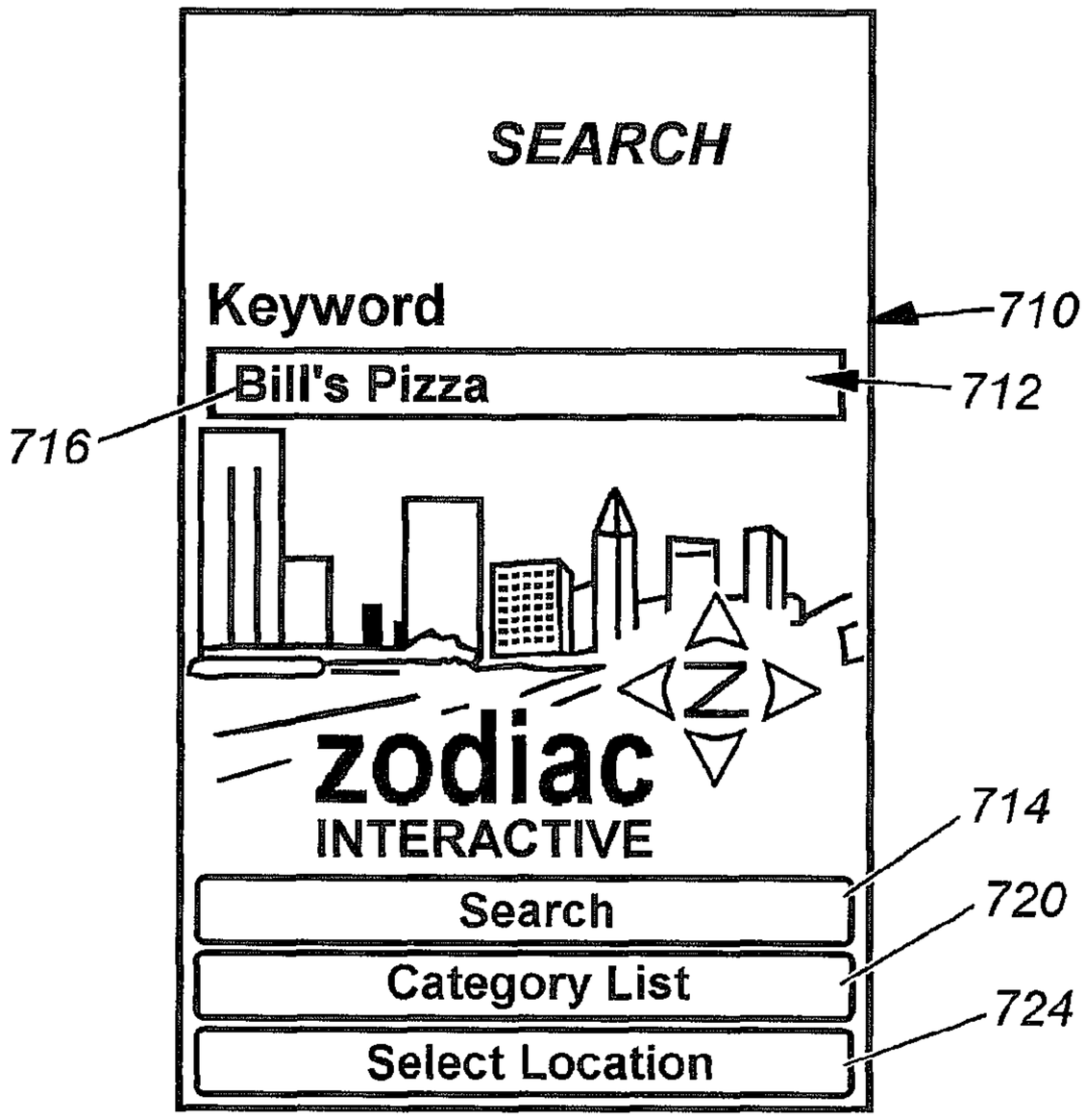

SEARCH
Keyword
Bill's Pizza
zodiac
INTERACTIVE
Search
Category List
Select Location
710
712
714
716
720
724

Fig. 7

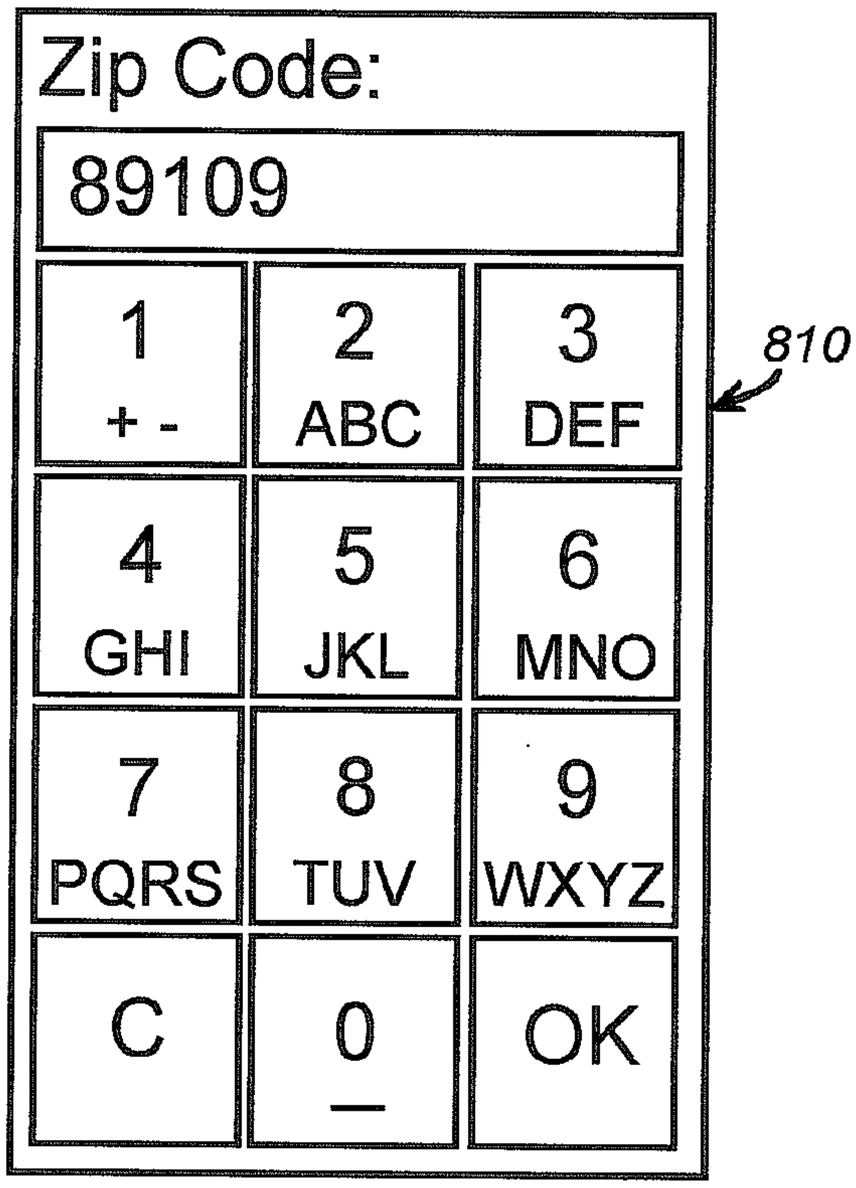

Zip Code:
89109
1
+ -
2
ABC
3
DEF
4
GHI
5
JKL
6
MNO
7
PQRS
8
TUV
9
WXYZ
C
0
OK
810

Fig. 8

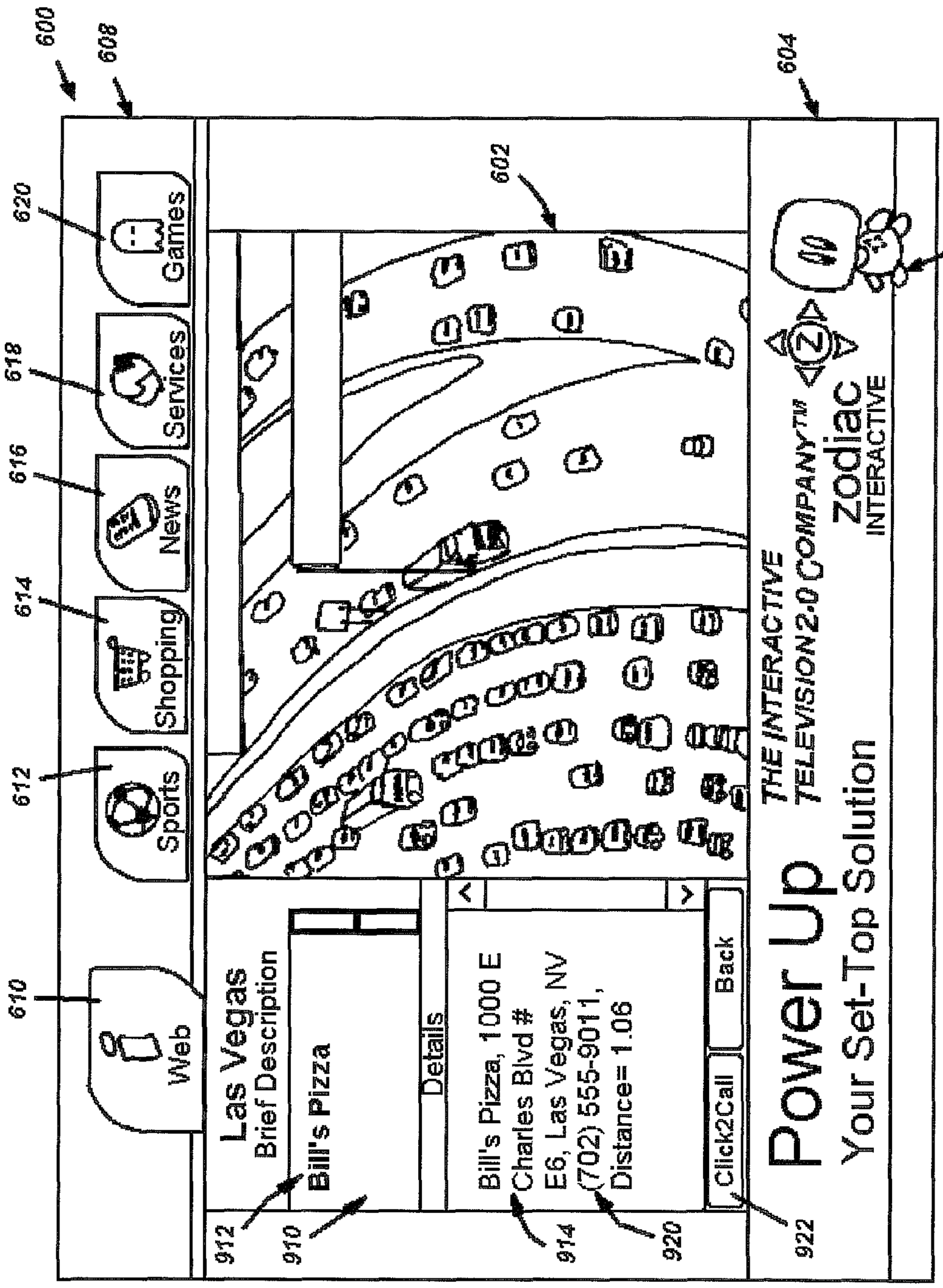

600
608
604
602
606
620
Games
618
Services
616
News
614
Shopping
612
Sports
610
Web
THE INTERACTIVE
TELEVISION 2.0 COMPANY™
zodiac
INTERACTIVE
Power Up
Your Set-Top Solution
Las Vegas
Brief Description
Bill's Pizza
Details
Bill's Pizza, 1000 E
Charles Blvd #
E6, Las Vegas, NV
(702) 555-9011,
Distance= 1.06
Click2Call
Back
912
910
914
920
922

Fig. 9

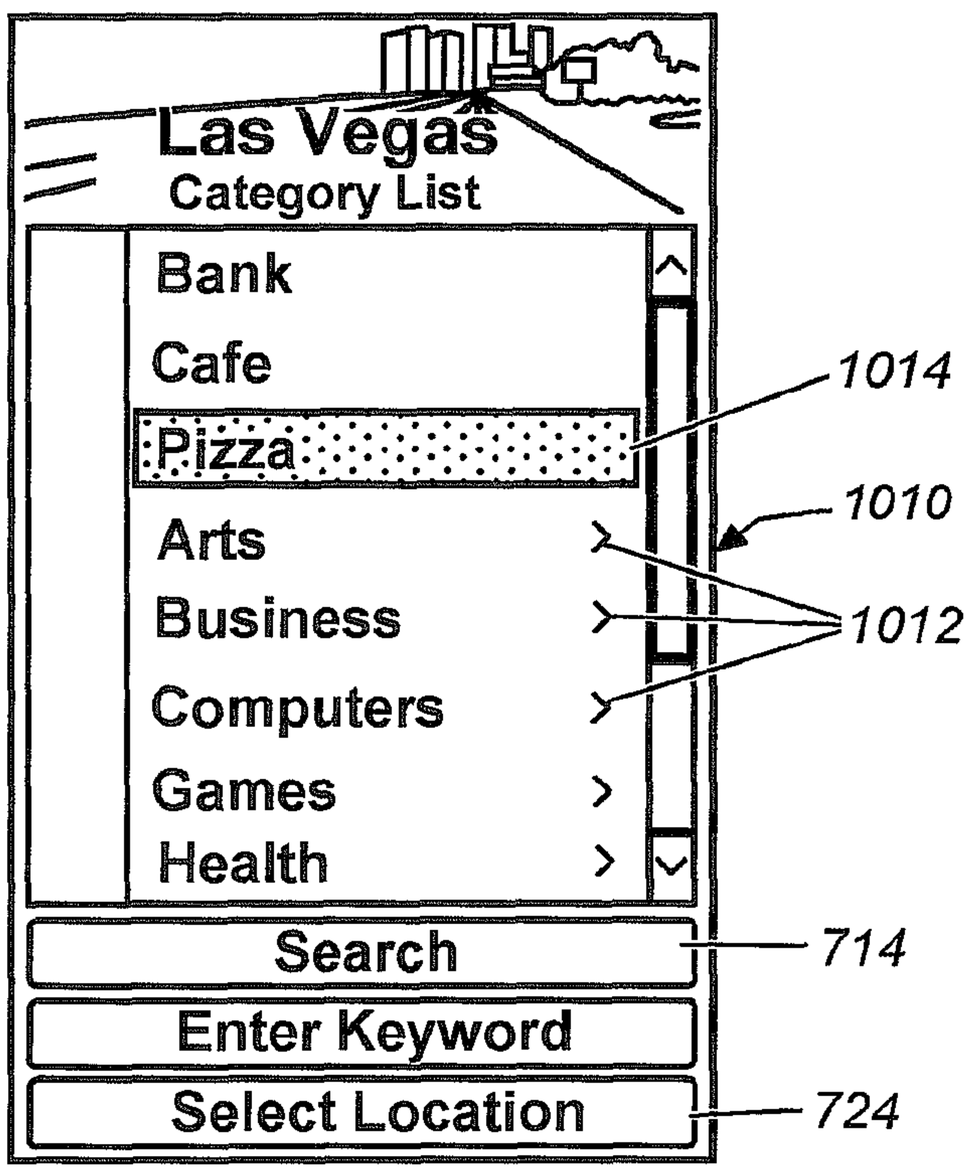

Las Vegas
Category List
Bank
Cafe
Pizza
Arts
Business
Computers
Games
Health
Search
Enter Keyword
Select Location
1014
1010
1012
714
724

Fig. 10

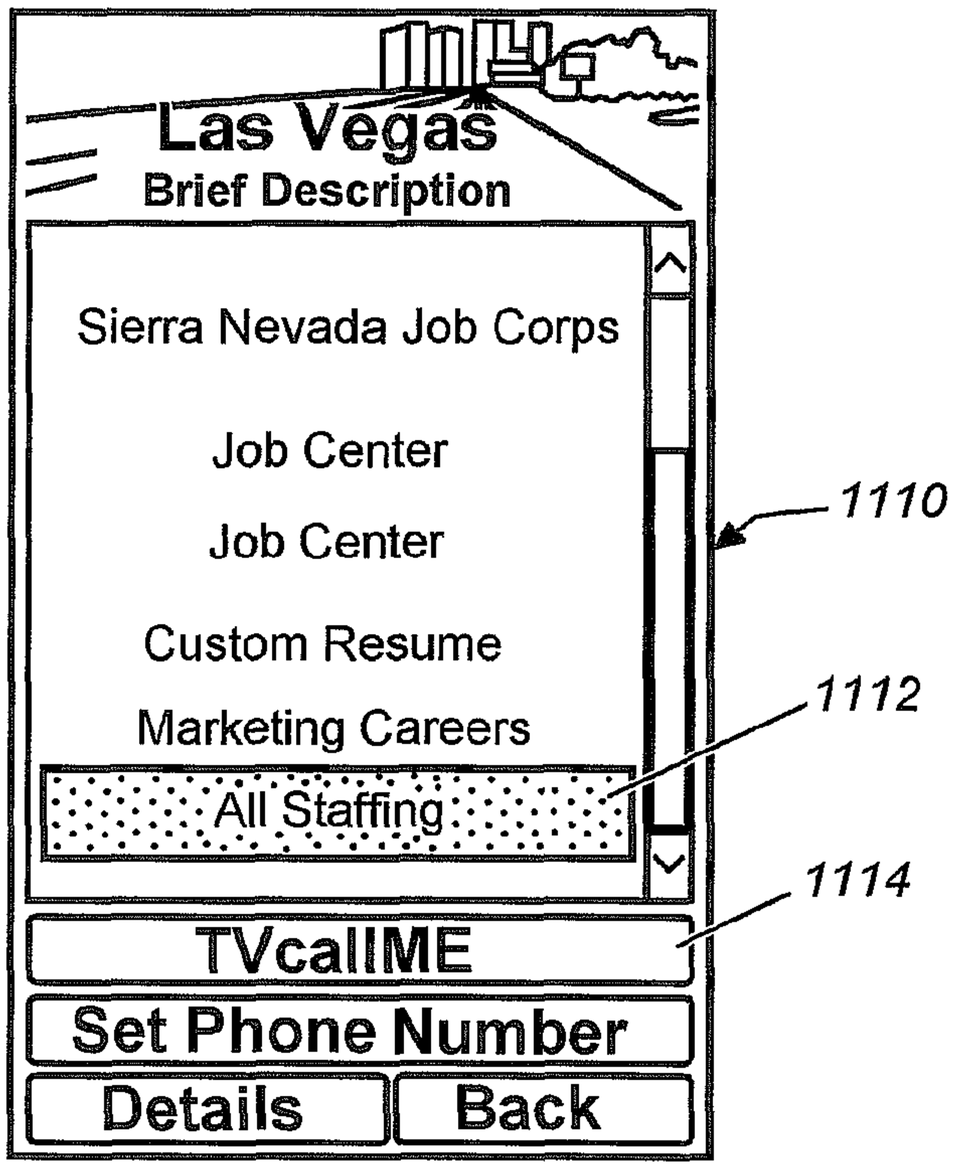

Las Vegas
Brief Description
Sierra Nevada Job Corps
Job Center
Job Center
Custom Resume
Marketing Careers
All Staffing
1110
1112
1114
TVcallME
Set Phone Number
Details
Back

Fig. 11

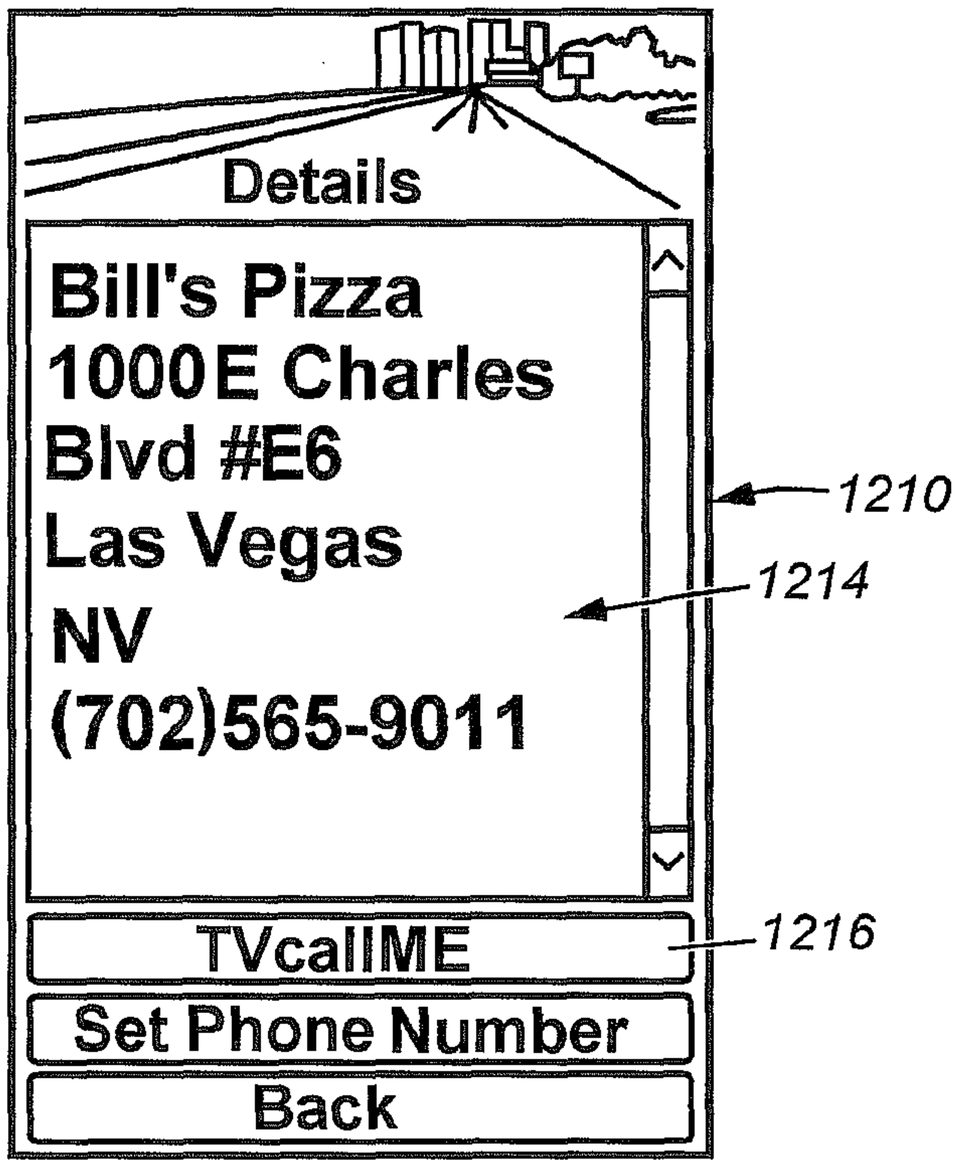

Details
Bill's Pizza
1000E Charles
Blvd #E6
Las Vegas
NV
(702)565-9011
1210
1214
TVcallME
1216
Set Phone Number
Back

Fig. 12

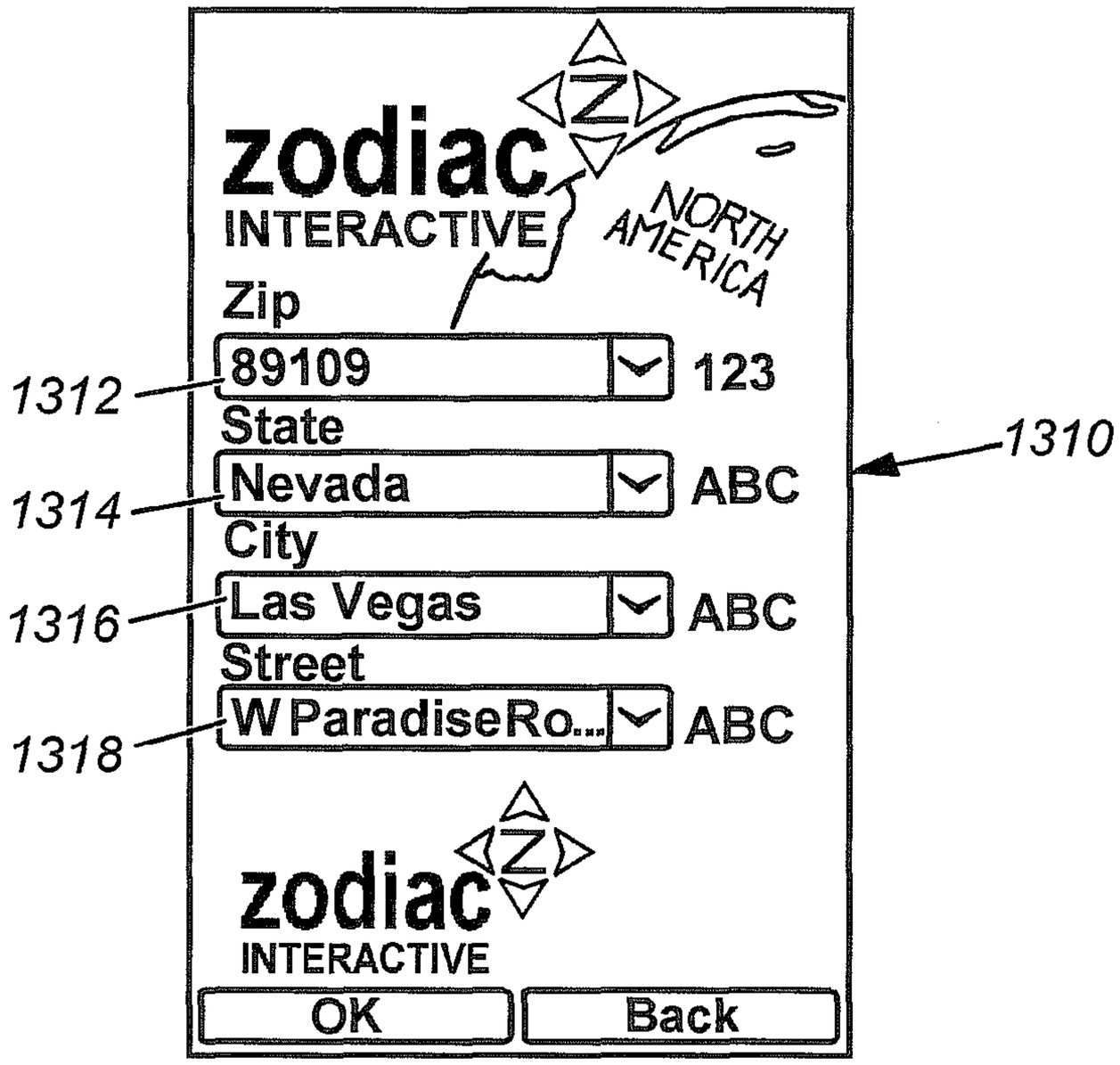

zodiac
INTERACTIVE
NORTH AMERICA
Zip
89109
123
State
Nevada
ABC
City
Las Vegas
ABC
Street
W Paradise Ro...
ABC
zodiac
INTERACTIVE
OK
Back
1312
1314
1316
1318
1310

Fig. 13

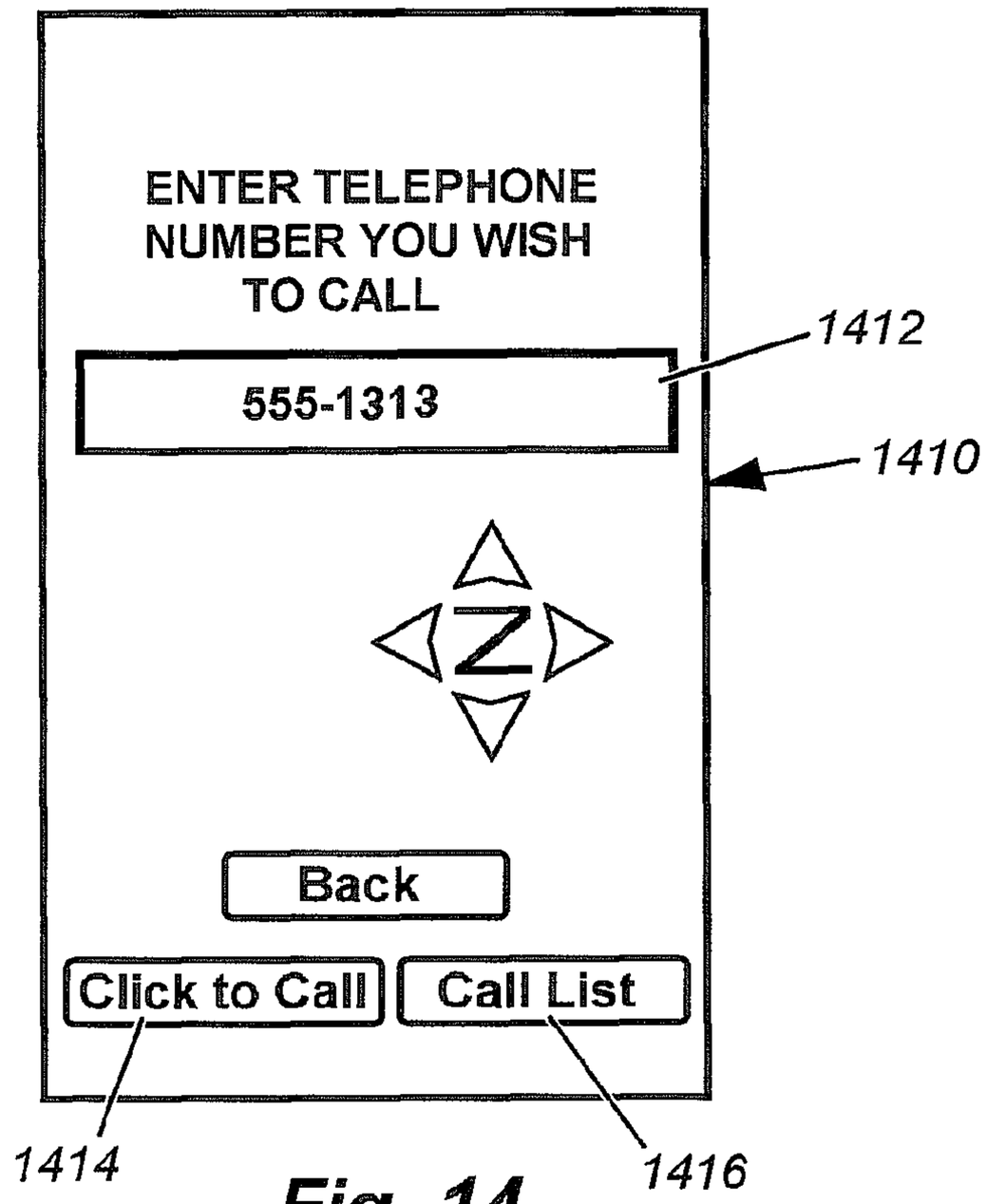

ENTER TELEPHONE NUMBER YOU WISH TO CALL
555-1313
1412
1410
Back
Click to Call
Call List
1414
1416

Fig. 14

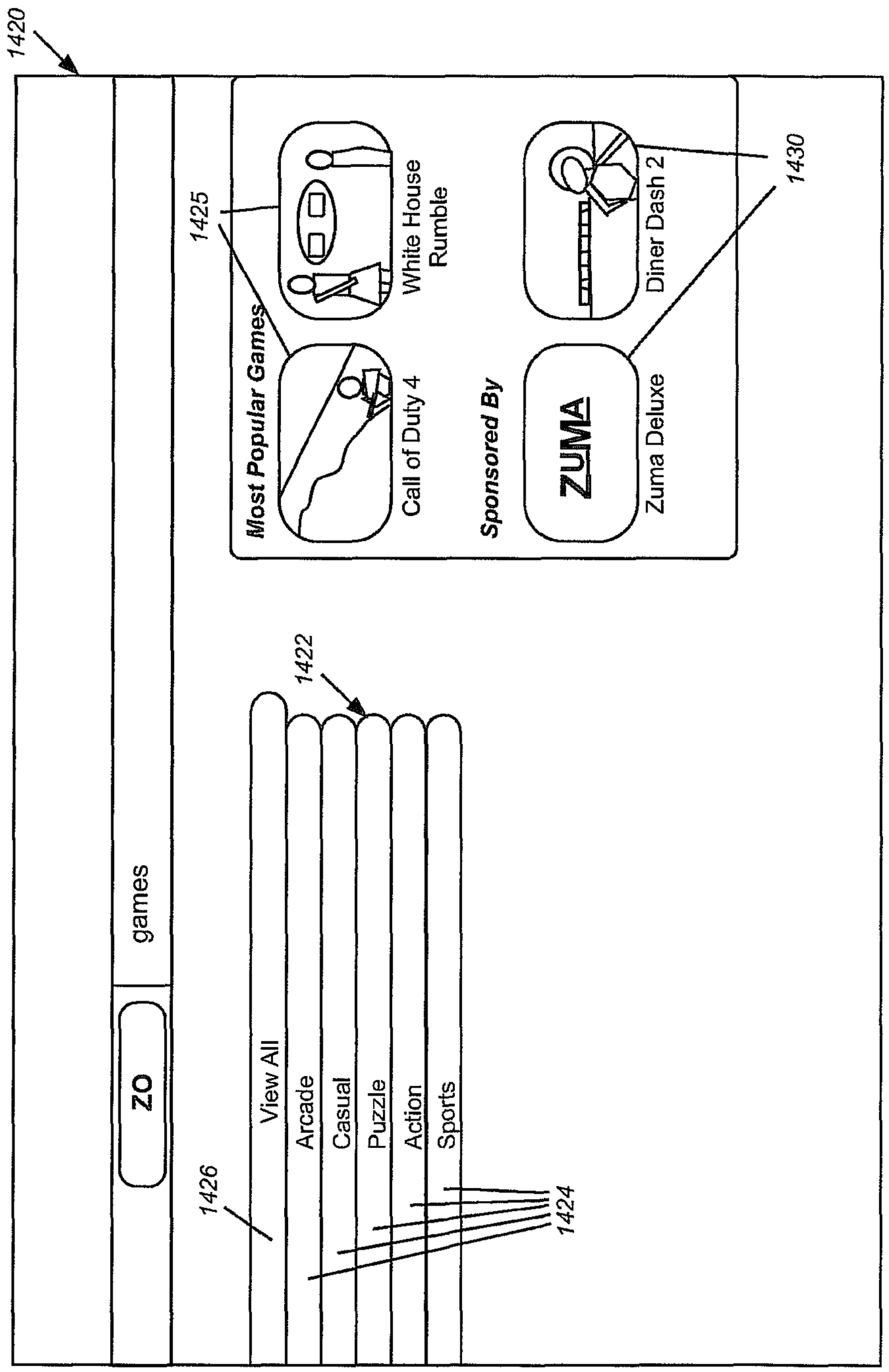

1420
1425
1430
White House Rumble
Diner Dash 2
Most Popular Games
Call of Duty 4
Sponsored By
ZUMA
Zuma Deluxe
1422
games
ZO
1426
View All
Arcade
Casual
Puzzle
Action
Sports
1424

Fig. 14A

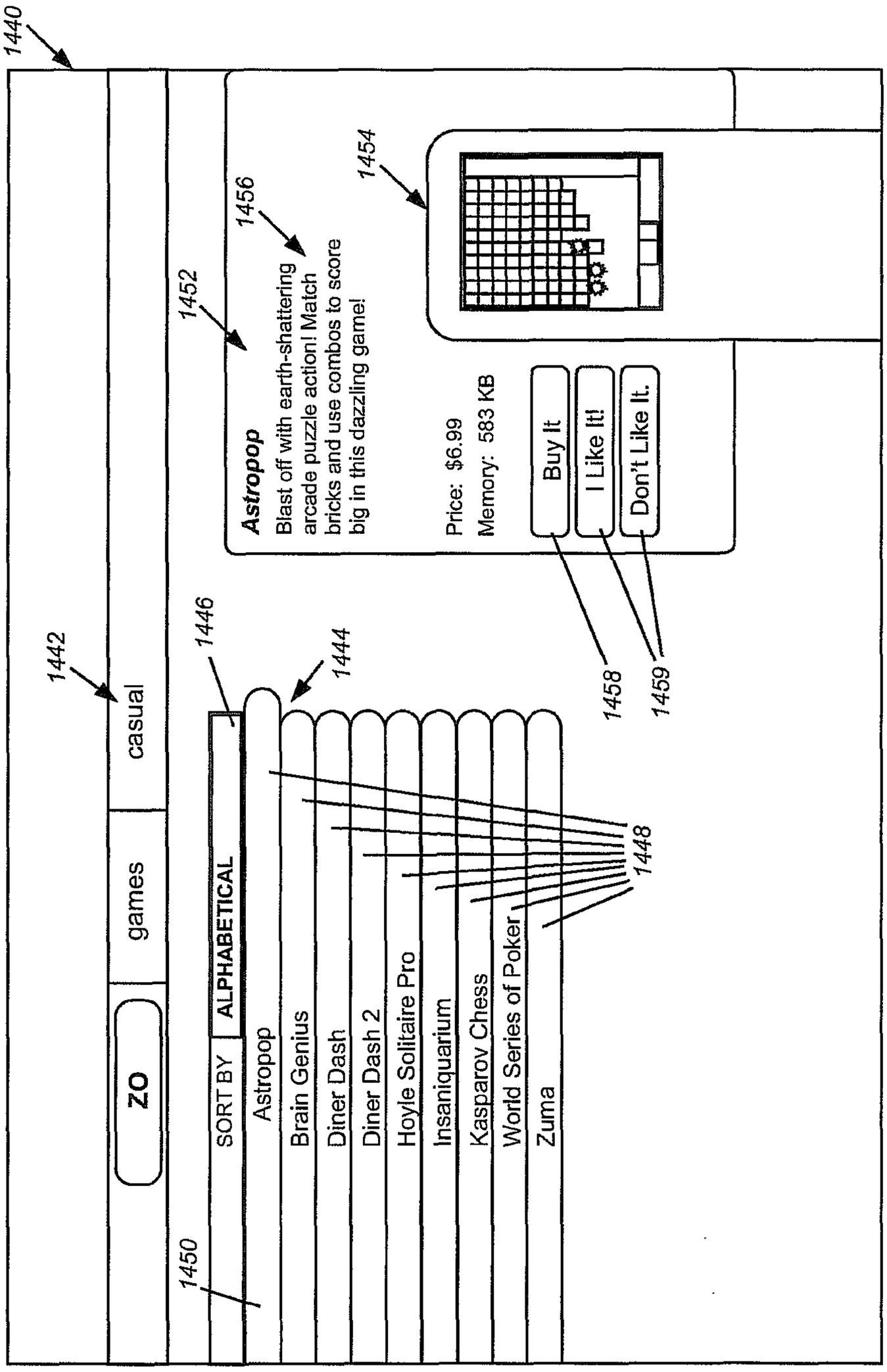

1440
1442
games
casual
ZO
1450
SORT BY
ALPHABETICAL
1446
1444
Astropop
Brain Genius
Diner Dash
Diner Dash 2
Hoyle Solitaire Pro
Insaniquarium
Kasparov Chess
World Series of Poker
Zuma
1448
1452
1456
1454
Astropop
Blast off with earth-shattering arcade puzzle action! Match bricks and use combos to score big in this dazzling game!
Price: $6.99
Memory: 583 KB
Buy It
I Like It!
Don't Like It.
1458
1459

Fig. 14B

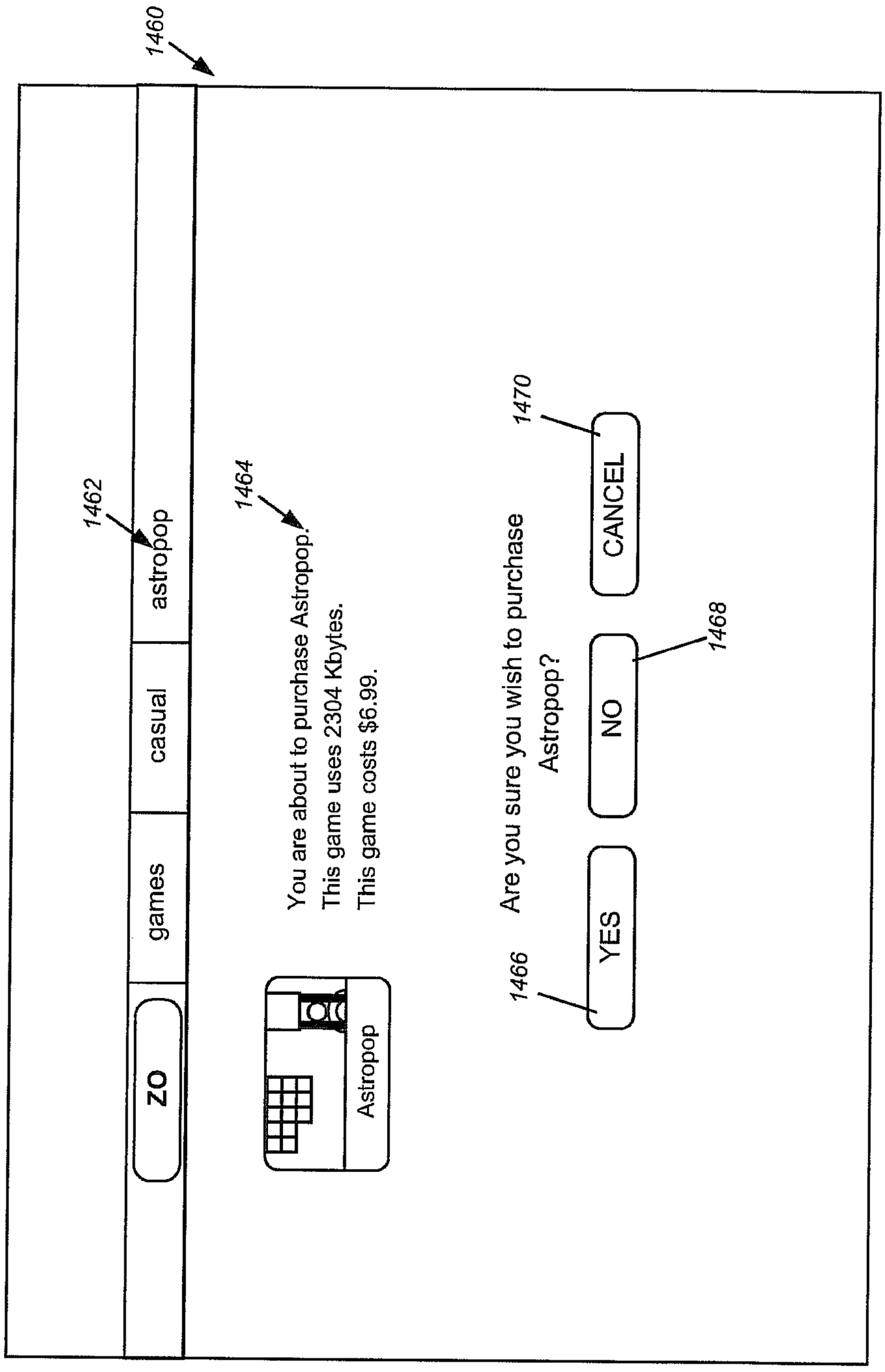

1460
games
casual
astropop
1462
1464
You are about to purchase Astropop.
This game uses 2304 Kbytes.
This game costs $6.99.
1470
Are you sure you wish to purchase Astropop?
YES
NO
CANCEL
1466
1468
ZO
Astropop

Fig. 14C

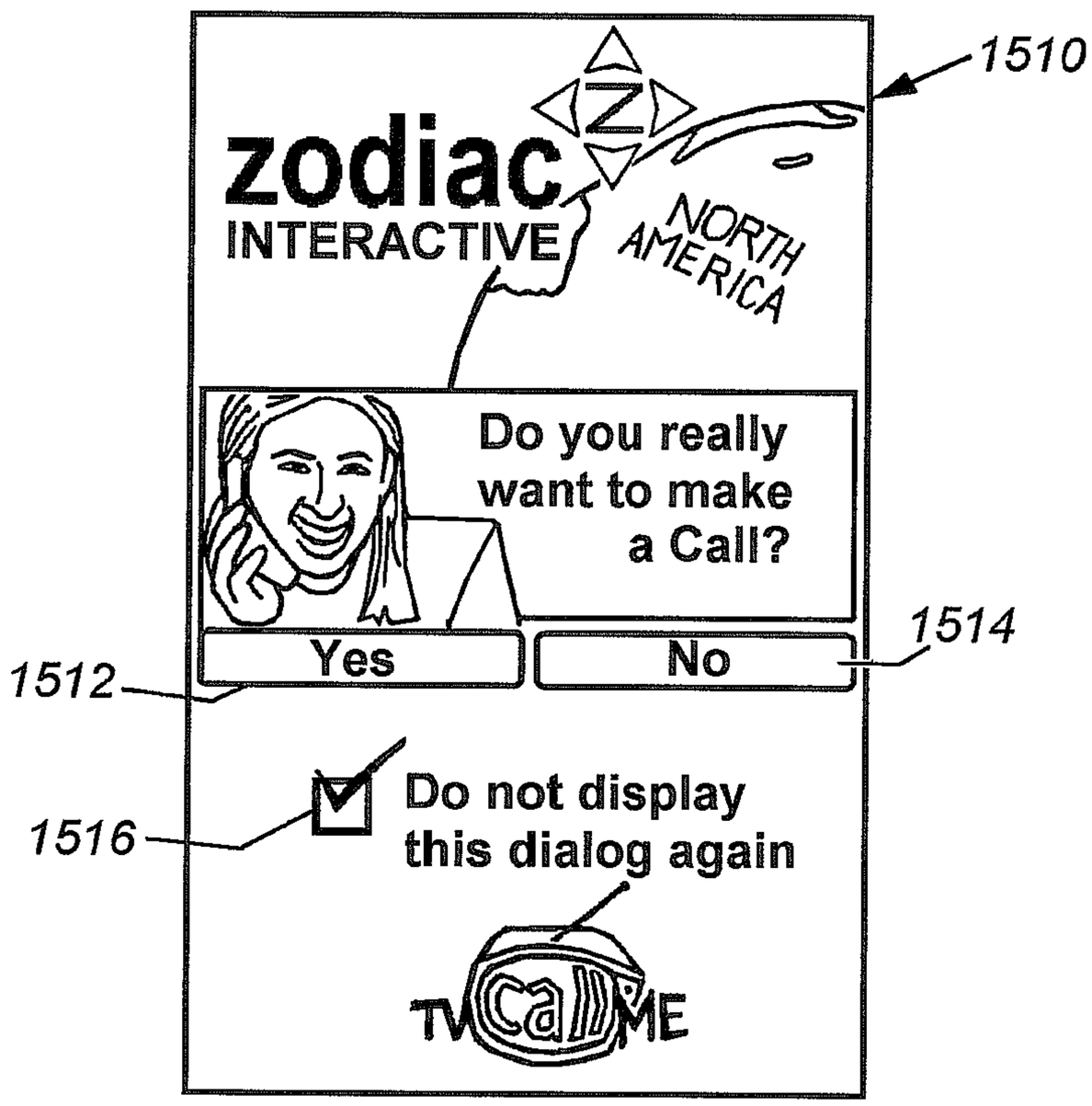

1510
zodiac
INTERACTIVE
NORTH AMERICA
Do you really want to make a Call?
Yes
No
1512
1514
1516
Do not display this dialog again
TV Call ME

Fig. 15

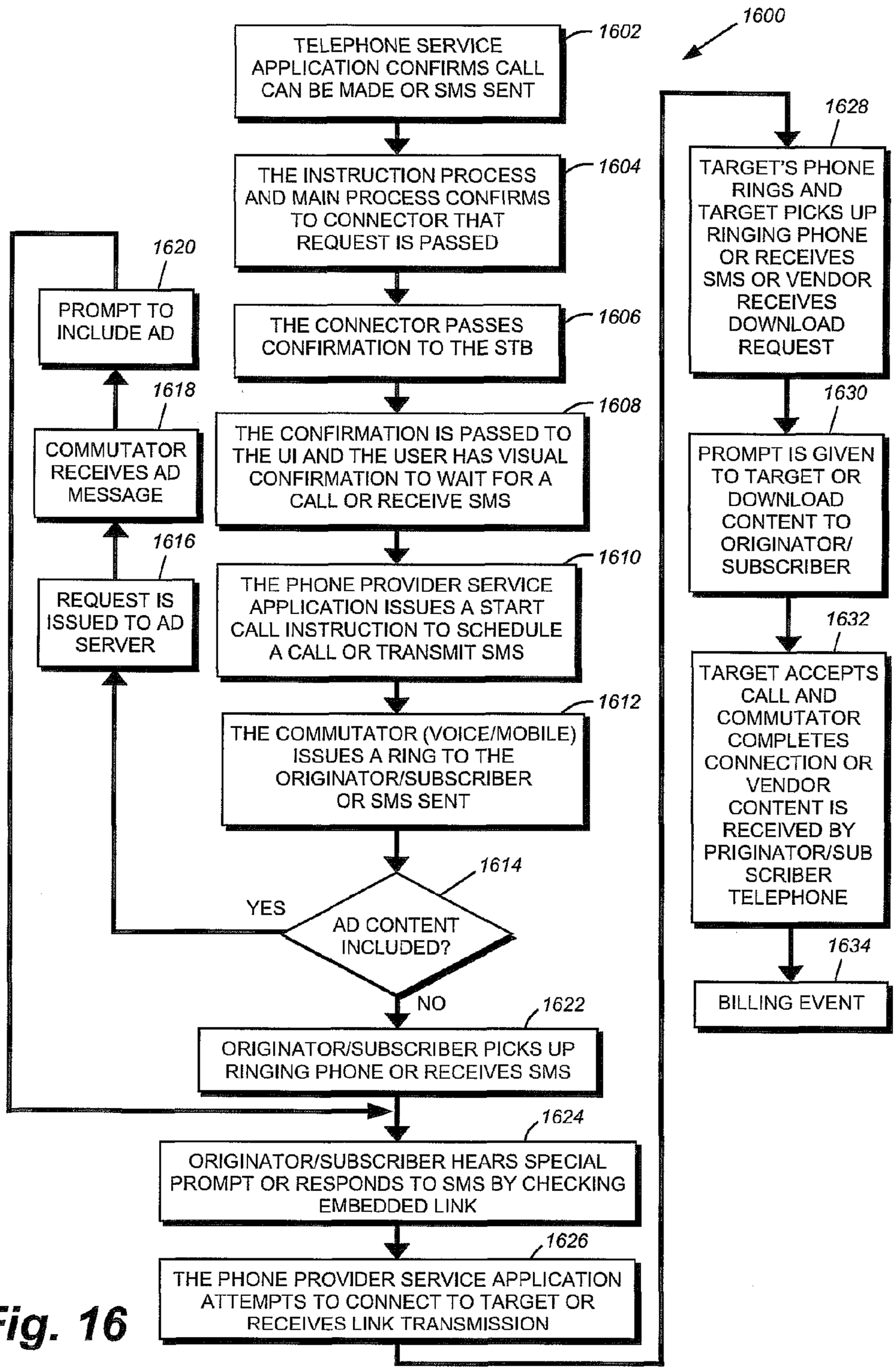

1600
TELEPHONE SERVICE APPLICATION CONFIRMS CALL CAN BE MADE OR SMS SENT
1602
THE INSTRUCTION PROCESS AND MAIN PROCESS CONFIRMS TO CONNECTOR THAT REQUEST IS PASSED
1604
THE CONNECTOR PASSES CONFIRMATION TO THE STB
1606
THE CONFIRMATION IS PASSED TO THE UI AND THE USER HAS VISUAL CONFIRMATION TO WAIT FOR A CALL OR RECEIVE SMS
1608
THE PHONE PROVIDER SERVICE APPLICATION ISSUES A START CALL INSTRUCTION TO SCHEDULE A CALL OR TRANSMIT SMS
1610
THE COMMUTATOR (VOICE/MOBILE) ISSUES A RING TO THE ORIGINATOR/SUBSCRIBER OR SMS SENT
1612
AD CONTENT INCLUDED?
1614
YES
NO
REQUEST IS ISSUED TO AD SERVER
1616
COMMUTATOR RECEIVES AD MESSAGE
1618
PROMPT TO INCLUDE AD
1620
ORIGINATOR/SUBSCRIBER PICKS UP RINGING PHONE OR RECEIVES SMS
1622
ORIGINATOR/SUBSCRIBER HEARS SPECIAL PROMPT OR RESPONDS TO SMS BY CHECKING EMBEDDED LINK
1624
THE PHONE PROVIDER SERVICE APPLICATION ATTEMPTS TO CONNECT TO TARGET OR RECEIVES LINK TRANSMISSION
1626
TARGET'S PHONE RINGS AND TARGET PICKS UP RINGING PHONE OR RECEIVES SMS OR VENDOR RECEIVES DOWNLOAD REQUEST
1628
PROMPT IS GIVEN TO TARGET OR DOWNLOAD CONTENT TO ORIGINATOR/ SUBSCRIBER
1630
TARGET ACCEPTS CALL AND COMMUTATOR COMPLETES CONNECTION OR VENDOR CONTENT IS RECEIVED BY PRIGINATOR/SUB SCRIBER TELEPHONE
1632
BILLING EVENT
1634

Fig. 16

SYSTEM AND METHOD FOR CALL PLACEMENT USING A TELEVISION SET-TOP BOX

RELATED APPLICATIONS

This application is a continuation of the currently pending U.S. application Ser. No. 13/655,341 filed Oct. 18, 2012 which is a continuation of U.S. application Ser. No. 11/968,283, Filed: Jan. 2, 2008, which claims the benefit of the U.S. Provisional Application Ser. No. 60/883,201, filed Jan. 3, 2007, entitled SYSTEM AND METHOD FOR CALL PLACEMENT USING A TELEVISION SET-TOP BOX, the entire disclosure of which is herein incorporated by reference.

FIELD OF THE INVENTION

This invention relates to communications systems and more particularly communications systems that employ two-way digital television hardware.

BACKGROUND OF THE INVENTION

Cable television service has become a dominant vehicle for the delivery of electronic entertainment content throughout the United States, and in many parts of the world. Modern cable systems, which were originally designed to deliver analog RF television signals now largely deliver encoded digital data at very high speeds over a conventional, low-loss coaxial cable—or a combination of fiber-optic and coaxial cables with appropriate interfaces therebetween. These signals are employed in two-way communication between a cable subscriber and the operator, also known as the cable "head end." One common form of two-way communication is the cable modem, (generally termed DOCSIS) in which signals are encoded into a network protocol, such as TCP/IP and transmitted between a network-equipped computer and a server system at the head end that connects to a larger network, such as the well-known Internet via various gateway switches and routers. Other techniques for two-way communication involving the receipt by a subscriber of digital television content and a return path for data from the subscriber also exist, including DAVIC, Satellite dial-back, IPTV, among others.

Another increasingly common application involving both one way (from head-end to subscriber) and two-way communication is the delivery of so-called digital cable service. In a digital cable implementation, the subscriber receives broadcast television signals in digital form via TCP/IP or another communication protocol. The digital signal is typically received at the subscriber's location by a digital set top box. The set top box is, in essence, a small computer that converts received digital signals into NTSC (or another format) signal capable of being displayed on a conventional television. Most set top boxes, in fact, provide a variety of output connectors that deliver the video signal to a television or display monitor in a variety of formats including S-video, composite and component. Such boxes also deliver audio based upon a number of outputs. This delivered audio can be encoded for delivery to a tuner capable of providing multi-channel playback (e.g. surround sound).

Since a set top box is a networked computing device, it affords the subscriber many options not available in conventional analog cable arrangements. Taking advantage of the availability of two-way digital communication over the line, the set to box can act as a portal through which the subscriber can interact with the head-end server and remote network

beyond. In a basic application, the subscriber can direct requests to the server so as to deliver, for example, on-demand entertainment content, that is accessed from the server's associated storage system (or a remote storage system), and streamed to the subscriber over the cable. This content can be viewed in real time or stored for buffering and/or later replay in a storage medium (flash memory, disk, etc) associated with the set top box.

Of course virtually all set top boxes accommodate a remote control, that transmits IR and/or RF signals to the box to operate its various functions. Typically set top box functions are displayed via menu screens that often emulate the look and feel of a personal computer's graphical user interface (GUI) display. The remote allows the user to scroll through menu items and highlight the item of interest. Remotes often include a conventional cursor that can be moved about the screen via a four-way toggle to more closely match the point-and-click experience of a personal computer.

Many set top boxes and cable providers now provide functioning web browsers that are accessed by the appropriate remote control buttons and/or menu screens that are displayed on the television. These browsers support certain interactive functions allow entered subscriber requests to be delivered from the server's storage or from the Internet.

Give the interactive nature of currently available set top boxes (or other internal and external devices with set-top-box two-way functionality) and two-way digital cable (or other two-way-digital) television service, it is desirable to afford the subscriber the widest range of available interactive services, particularly where these services can be accommodated by existing hardware. The provision of additional services offers the service provider an opportunity to deliver a more competitive product and, possibly, obtain income from the provision of a new feature. The user is provided with a further convenience that improves their viewing experience and well-being.

It is also recognized that television showcases new and existing goods and services and often invites the viewer to contact the advertiser to purchase these goods and services. A system and method that makes that process easier and more reliable is highly desirable.

Furthermore, the use of mobile or cellular telephones is now extremely common and most available telephones support Short Message Service (SMS) or "text" messaging applications and include small graphical user interface (GUI) display screens for creating and reading such messages (as well as other activities, such as picture/video viewing, games and the like). An SMS message (or simply, "SMS") is convenient was to communicate without need of a voice exchange. Moreover, SMS messages can include embedded hyperlinks (also simply termed, "link(s)") that are transmitted back to a service provider and allow responses from an Internet based content provider via the cellular network. These responses can include downloads to the cellular telephone of requested content from the provider. A technique that further facilitates downloads of such content is also desirable.

SUMMARY OF THE INVENTION

This invention overcomes the disadvantages of the prior art by providing a call-placement service that is provided in connection with a cable television set top box (STB) or any device with STB two-way receipt and transmit functions. The STB is interconnected to a television display and via a cable link (typically RF coaxial) to a server at a cable television provider head end. The STB includes an onboard application that presents a menu to the subscriber allowing access to a list

of telephone numbers or descriptors linked to telephone numbers (such as a restaurant name). These numbers can be provided via a database search using a search engine that communicates with a user interface (UI) of the STB. The database can be a general Internet database or can be a specific database of targets—for example, a list of vendors of goods and services in the subscriber's local area. When the subscriber selects a target to call, his or her telephone number is provided along with the selected target's telephone number and these are delivered to the head end and an instruction on whether to connect the numbers via telephone or send an SMS message to the to the STB subscriber's target phone. This SMS message can include a link that enables the subscriber to download content listed on a selected menu of goods, services, and/or content downloads related to the target. The head end includes a service application with a main process that selects an appropriate telephone provider to complete the call and transmits the telephone numbers to the provider in a predetermined format. The information is received by the telephone provider, which connects to the subscriber, and detects whether the subscriber is able and willing to accept the call or SMS message. If so, and SMS is not used the provider connects to the target, and detects whether the target is able and willing to accept the call. If so, the telephone system connects the call between the subscriber and the subscriber and the target.

The telephone provider and/or the cable provider can capture the telephone number information and other information related to the subscriber and the target to generate billing event. Billing can be based on any or all of the following: subscription fees from subscribers and/or selected vendors; the provision of advertising messages paid for by vendors or others that are played or text-messaged to telephone users before the call is completed; and pay-per-call charges that are borne by subscribers and/or selected vendors or simply delivered for free as a value-added service.

In illustrative embodiments, the subscriber enters his or her telephone number into the UI of the STB and this number is stored for future call-placement events. The subscriber may also enter his or her location data and the search for vendors and other targets (including, but not limited to specific merchandise items, services and/or software application downloads) that may, or may not be, limited to those in locations near the subscriber. This geographical, limitation is particularly useful when contacting locally based vendors, such as restaurants and home-delivery-based businesses. Lists of vendors and other targets can also be organized in a menu based on, categories from which the subscriber can select a particular target.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention description below refers to the accompanying drawings, of which:

FIG. **1** is a diagram showing an overview of the inventive set top box call-placement system and method according to an illustrative embodiment of this invention;

FIG. **2** is a block diagram of an exemplary cable television head end employed to deliver services according to an illustrative embodiment;

FIG. **3** is a is a block diagram of an exemplary cable television set top box employed to deliver services according to an illustrative embodiment;

FIG. **4** is a diagram of a typical hand-held remote control including keypad buttons that may be used to command a set top box user interface carry out call-placement functions according to an illustrative embodiment;

FIG. **5** is a block diagram showing the various functional components of a call-placement system and the information passed therebetween according to various embodiments of this invention;

FIG. **6** is a diagram of an exemplary television screen display including panes that allow the user to access and manipulate various services including a call-placement service according to an embodiment of this invention, the depicted pane allowing the user subscriber to enter his or her access telephone number;

FIG. **7** is a diagram of an exemplary keyword search pane used to search for call targets via the Internet or a stored list of possible call targets in association with the screen display of FIG. **6**;

FIG. **8** is a diagram of an exemplary alphanumeric data entry keypad window used to enter data in the various panes of the screen display of FIG. **6**;

FIG. **9** is a diagram of an exemplary television screen display in accordance with FIG. **6** including a search results pane that displays the name and information of a search target to be called;

FIG. **10** is a diagram of an exemplary category list pane used to locate listed call targets in association with the screen display of FIG. **6**;

FIG. **11** is a diagram of an exemplary expanded category pane derived from clicking a specific category in the category list pane of FIG. **10**, and used to locate listed call targets in association with the screen display of FIG. **6**;

FIG. **12** is a diagram of an exemplary call target details pane including the telephone number of a call target listed in the category list pane of FIG. **10**, in association with the screen display of FIG. **6**;

FIG. **13** is a diagram of an exemplary user location data-setting pane in association with the screen display of FIG. **6**;

FIG. **14** is a diagram of an exemplary target telephone number entry pane used in association with the screen display of FIG. **6**;

FIG. **14**A is a diagram of an exemplary target SMS (text message) entry pane allowing the user to access and download various content to their mobile or SMS-enabled telephone after receiving a requested SMS message from the head end and interconnected providers as used in association with the screen display of FIG. **6**;

FIG. **14**B is a diagram of the exemplary SMS entry pane of FIG. **14**A wherein the user has navigated to a menu showing downloadable game selections available via SMS messaging;

FIG. **14**C is a diagram of the exemplary prompt screen wherein the user can confirm selection of a game from the pane of FIG. **14**B to be downloaded via SMS messaging;

FIG. **15** is a diagram of an exemplary call-placement confirmation pane in association with the screen display of FIG. **6**; and

FIG. **16** is a flow diagram of a procedure for connecting a call within a telephone service provider and thereafter generating a billing event.

DETAILED DESCRIPTION

I. General Overview

FIG. **1** details a simplified general overview of a set-to-box-based call-placement system **100** according to an illustrative embodiment. The system **100** consists of a plurality of user/subscriber locations, each served by a cable television data link **102**. Each subscriber location typically includes at least one television or display monitor **104** capable of receiving broadcast video. In this embodiment, the television is interconnected to a set top box (STB) **110** that converts the RF

signal received over the cable link **102** into a video signal, based upon the well-known NTSC standard, or another acceptable standard. This video signal is delivered to the television **104** via an interconnect **112**. The STB **110** in this embodiment displays transmitted video content **114** on the television screen **116**, which is received (either in real time or from a prior STB-stored broadcast) from the cable television head end **120**, which in this example, is housed in a cable television facility **122**. The delivered video content is stored on storage devices contained within or networked to the head end **120** and/or is received over wires/fiber optic cables, and via RF communication (for example via a satellite link **124**).

As depicted, the television **104** is currently displaying an advertisement for a product or service (pizza in this example) that the subscriber has an interest in. Alternatively, as will be described below, the interest may be in a product, service or telephone user that is unrelated to the presently broadcast content, but that has a known telephone number, or is accessible by search using Internet/network searching facilities available via the STB's native browser. These interest facilities are typically delivered via the cable link **102** from the head end **120** using a connection to the Internet **125** or another information network (for example a local database or proxy cache server). In either case, the subscriber accesses/displays and manipulates a window **130** on the television screen **116**. In this example, a remote control **126** that transmits IR or RF signals to the STB **110** is employed to display and manipulate the window **130**. This window **130** can contain a variety of data **132**, provided in a variety of graphical and organizational formats. In general, the window allows the name and/or telephone number of a desired vendor, Internet content provider, (or other telephone user, such as a friend relative or acquaintance), or (as described below) a target item for SMS delivery to be displayed within the window **130** or elsewhere on the screen **116**. The window also contains a prompt and/or button **134**, which the user can highlight and activate with his or her remote control **126**. The user's clicking upon the screen window button **134** allows the user to place a telephone call to the named telephone user.

The request is passed to the head end **120** using a number of alternative methodologies and protocols described further below. At the head end, a call manager provides calling instructions via a link **140** to an off-site or internal telephone service provider **142**. The calling instructions direct the completion of a call between the telephone **144** of a target user (vendor, service, individual) **146** and the requesting subscriber's telephone **150**. The process for placement and connection of the call over the network **142** is highly variable and described further below. In general, the two parties are connected in response to the user's request to place a call that is routed through the STB **110** to the head end **120** and hence to the telephone system **142**.

Alternatively, the request by the user via the STB **110** can be for a predetermined content available for download to, for example, a cellular telephone **133** of the user, which s equipped with a display that is capable of receiving an SMS message. As shown, this SMS message contains a link (LINK) embedded in other text (that may also include promotional or advertising content, by which downloadable content can be accessed and vended to the telephone **133**. The SMS request is routed through the STB **110** to the head end **120** and hence to the telephone system **142** (which may define multiple providers as part of the broader land and wireless public telephone network) that eventually links to the nearest cell site **135** in the user's cellular network. Any downloadable content derived from clicking the SMS-delivered link is vended from an Internet-based or other source via the cell site

Appropriate procedures for deriving revenue as a result of the service are also described below.

II. System Components

Having described a general overview of the basic system components and the generalized procedure, those components will now be described in further detail. FIG. **2**, shows a generalized cable television system **200** into which the present invention may be incorporated. In general, the system **200** transmits signals comprising video and audio information from a cable head-end **120** onto a coaxial cable transmission medium that defines the link **102** with cable subscribers **202**, **204**, **206**. Signal boosters (not shown) may be provided for amplifying and distributing the signals to the plurality of locations. At least one of the subscriber locations, such as the location **202**, includes the above-described, call-placement-enabled digital STB **110**. It should be noted that, while a wired cable television system is employed in the illustrative embodiment, the present invention does not require coaxial cable as the physical transmission medium, as signals can alternatively be transmitted over any transmission medium, including wireless means such as so-called "wireless cable" broadcasts, two-way digital satellite communication, duplex-type communication devices (e.g. satellite/cable down and telephone up), ipTV devices, and so on, so long as an adequate return path is provided for transmitting data from the subscriber back to the head end or a similar base location. To this end, the term STB, as used herein can be applied broadly to include any circuitry, either separate from or integral with a display device (e.g. built into a television or monitor), that provides set-top box (STB) functions. Such functions comprise the ability to receive and decode digital television content for display, and a mechanism that allows the viewing subscriber to transmit information back to the provider of the digital television content or an entity related to the provider.

The head-end **200** includes a head-end local area network (LAN) **210**, interconnected to a server system **220**. In fact a number of discrete, networked servers (or clusters of servers) **221** can be included in this system including a download server, a content server, a billing server, an access control server, and other information servers all residing on the LAN, for controlling the overall operation of the head-end **120** via an Ethernet connection to the various components therein. The head end content is sourced in a variety of ways. Digital and analog content can be received in real time via a data link **222** that can include a satellite receiver, fiber optic communication link or coaxial transmission line. Content received via RF transmission is demodulated, and the demodulated digital signals are depacketized (using an RF demodulator/depacketizer **224**) and delivered onto the LAN (or another communication channel) via an appropriate interface (not shown). Signals received in other forms (e.g. fiber optic digital transmission) are, likewise depacketized). The appropriate server function directs these signals to a storage device **226** on the LAN **210** that stores the content for subsequent playback. Content can also be streamed by the server in real time to the subscribers without storage where appropriate. In this example, the head end **120** broadcasts digital Content to subscribers using a packetizer/RF modulator **230** which modulates the streams onto analog channels and injects the signals onto the cable transmission medium **102**. An appropriate interface (not shown) connects the server system/LAN with the packetizer/RF modulator **230**. Note, for simplicity, a single LAN is shown. With multiplexing of multiple, packetized digital signals, hundreds of digital channels may be

injected onto a single coaxial medium, although at present, a mixture of analog and digital channels will likely be transmitted.

While a single, universal LAN **210** is shown connecting all parts of the system **200**, in practice, a number of separate communication links can be employed, each serving a particular aspect of the overall system. For example, a dedicated fiber optic link can be provided between an electro-optical or digital magnetic tape reader (not shown) that serves broadcast content and the broadcast transmission components. For simplicity, such components are exemplified by the depicted universal storage system **226** and universal LAN **210**. Storage can be organized in any acceptable way including a plurality of magnetic disks arranged according to a network-attached storage (NAS) or storage area network (SAN) organization. This can be combined with electro-optical and/or digital magnetic tape players where appropriate. In general, the arrangement for a head end described herein is merely exemplary of a variety of possible arrangements of hardware, software and communication resources that are known to those of ordinary skill.

With reference to the server system **220**, at least one server is responsible for providing the call placement service (and possibly other functions) of this invention. This server (dashed box **240**), whose basic components are shown, consists of a network interface **242** for communication over the LAN, a processor **244** and an online memory **246**. The memory **246** includes an operating system (OS) **250** that controls the handling of data and files by the processor, and the passage of data to and from the LAN **210**, among other functions. The operating system can be based on any commercially available platform including, but not limited to Linux, Microsoft Windows NT, Windows Professional and the like. This memory **246** also contains the call placement service application **260** according to an illustrative embodiment. As will be described the service application **260** can consist of many components that reside on one or more servers within the head end. Likewise, some functions may reside on the STB application as will be described below. For example, some functions may require the tracking of call information for billing purposes and these functions may reside, in part, on a billing server. Some other functions may require the delivery of Internet search results, and these may reside on a dedicated search server that receives Extensible Markup Language (XML), Hypertext Markup Language (HTML), or other delivery protocol (etc.) information via the Internet (or another communications network) **270** through a gateway router **272**, which connects to the LAN **210**.

The cable link **102** supports bidirectional communication. Hence, subscribers communicate via the STB using a return path that sends cable RF signals into an RF Demodulator and depacketizer **280**. The resultant digital information is provided to the LAN **210** using an appropriate network interface (not shown) and delivered to the proper application(s) in the server system **220**. In the example of call placement, the request to place a call is delivered to the call service and then appropriate commands are passed to the functions across the individual servers to carry out the request. The request will eventually require information to be sent over the Internet/external network **270** to selected telephone service providers in a predetermined format. This is described in detail below.

Referring now to FIG. **3**, the internal organization of a typical subscriber STB **110**. For the purposes of this implementation, the STB need not be modified or enhanced. It is desirable, however that the STB comprises a type or model having the capability of accepting downloaded programming or a modified programming memory, such as a FLASH memory, which contains the desired call-placement functionality according to this invention. The software contemplated for use in the STB includes a browser/user interface (UI) **362**, which communicates with an operating system **364** of the STB **110** by placing calls through an application programming interface (API) **366**, as described in more detail below.

The exemplary STB **110** includes an in-band tuner **370** and an out-of-band tuner **371**, along with appropriate demodulators **372** and **373**, respectively. A microprocessor **374** controls the tuning operation of the tuners **370** and **371** based on commands received from a subscriber via an input device such as a keypad or an infrared (or RF) remote control device **126**, as described below. To this end, the set-top box **110** includes an infrared sensor **378** connected to an infrared receiver **380** which provides the command signaling information to the microprocessor **374**. A memory system **382** includes an appropriate operating system (OS) **364** stored therein, and may include a combination of volatile dynamic RAM **384** and non-volatile RAM (NVRAM) **386**.

In accordance with digital broadcasts wherein digitized channels are multiplexed as data packets onto a six megahertz analog channel, the set-top box **28** also includes at least three packet identification (PID) filters **388**, **389**, **390** to extract the appropriate encoded data packets for a user-selected digital channel. Based on the user-selected display, audio and other requirements, the microprocessor **374** writes an identification value to each of the set of PID filters **388**, **389**, and **390**, whereby the filters pass only those packets corresponding to that value. As shown, one of the PID filters, filter **388**, provides the filtered packets to an audio decoder **392** which decodes the digital audio data (encoded according to the AC3 format in this example), while another PID filter **390** provides filtered packets (MPEG2 encoded) to the video decoder **352**. The audio and video signal can be output in a variety of other formats that are supported by appropriate circuitry, connectors and decoders.

A third PID filter **389** is provided to extract in-band and out-of-band data directed to the operation of the set-top box **110**. A packet processor **394** handles those packets. The set-top box is also equipped with an on-screen display frame buffer (OSD) **396** capable of superimposing alphanumeric characters, other symbols and bitmap graphics over a displayed image. To accomplish this superimposition, an overlay **398** is provided to appropriately combine the video outputs of the video decoder **352** and the OSD **396**.

The STB **110** functions when the user provides an appropriate and valid command to it. For example, in response to a digital channel selection command, the microprocessor tunes the in-band tuner **370** to an appropriate analog channel based on the digital channel selected by the subscriber. If a digital channel was selected, a table or the like stored in the memory **382** determines the analog channel that carries the digital channel's packets, along with the packet identification numbers corresponding to that channel, for writing into the PID filters **388** and **390**. Once the PLDs have been written, the audio and video decoders **352** and **392** will receive the appropriate packets and decode and output appropriate signals. As described below with reference to the present invention, some of the packets will include images and alphanumeric data associated with the call-placement service of this invention.

Manipulation of the STB **110** is provided by the above-described, hand-held remote control **126**, with an exemplary keypad shown in FIG. **4**. The exemplary keypad includes four directional (up, down, left and right cursor) buttons, **402**. **404**, **406** and **408**, respectively, and a "SELECT" button **410**. These buttons will generally allow the subscriber to navigate/scroll through various menus and options presented, includ-

ing the call-placement service of this invention. The typical remote control input device **126** will also provide the normal complement of TV-related buttons including the depicted volume adjustment, channel adjustment, mute, etc. Other buttons such as those for control of a videocassette recorder also may be provided. The remote control is preferably wireless, e.g., an infrared or RF-based remote control, but of course alternatively may be wired. The remote **126** also includes an alphanumeric keypad **406** that may be useful in entering requested phone number and text data. Moreover, alternate input devices need not be remote, but may for example, be provided as a keypad (not shown) on the STB **110**.

To implement the call-placement service of this invention a browser application **362** has been downloaded into the memory **382** of the STB, along with application program interfaces APIs **366** for interfacing the browser **362** to the operating system **364**. The browser enables the user to interact with data servers at the head end, and otherwise request data and retrieve it for display using XML, HTML, or other accepted protocols. For example, the memory may include an implementation of a Java virtual machine, running Java programming language scripts. A packetizer **393**, or other data handling mechanism, is interconnected with the memory **382** and processor **374** via an appropriate interface bus (not shown). This packetizer **393** converts data to be sent on the return path to the head end into formatted data packets. These packets are converted by the RF modulator **397** into an appropriate cable-compatible RF signal, and transmitted over the cable link **102** to the head end for receipt by the servers.

Also placed in memory, in association with the browser **366** is the STB-installed call-placement service application **399**. The application may include a provider-specific API that contains majority of the instructions and data required to carry out a call placement, in the manner of an internet telephony service that resides on a personal computer (such as the commercially available Skype system). However, more choice of providers is available to the user and cable provider where the STB application **399** is simply an agent that carries the input data on call-placement to the head end server system **220**, which then acts upon it, choosing the appropriate call provider and instructing the provider to place the call. The basic information provided by the agent will be the user's telephone number, which is entered upon placing the call using the screen, or has been previously stored, and the target phone number or some identifying information about the target that allows the head end to look up the target's telephone phone number and the type of call to be placed back to the requestor/subscriber—be it a voice call or an SMS message. This approach will be described in further detail below. However, the basic principles are also applicable to a provider-specific application loaded onto the STB memory **382**. In an embodiment, the agent can enable transmission of the information back to the head end on a reserved channel, so that this information automatically becomes associated by the server system with a call placement request.

III. Call-Placement Process

Referring now to FIG. **5**, the procedure for call placement, choice of telephone service provider and tracking of billing/revenue generation is now provided in further detail. The process **500** is illustrated in view of the functional blocks residing in each of the servers shown in FIG. **5**. A subscriber **502** is shown. The subscriber is viewing the television display **507**, which interacts with the STB functionality **506**. The STB call placement user interface (UI) **508** is displayed on the television in response to a "Run" request **510**, typically transmitted via the hand-held remote. An exemplary UI display **600** is shown in FIG. **6**. This display **600** consists of a main video window **602**, the size of which can vary. This window **602** displays broadcast content that is currently running on the selected channel. The main window **602** is overlaid with peripheral panes each having particular information. The size, shape, placement and content of each pane are highly variable in alternate embodiments. In this example, an optional bottom pane **604** showing the name of the service provider and its company logo **606** is displayed. The upper pane **608** provides a plurality of user-selectable icons **610**, **612**, **614**, **616**, **618** and **620**, which allow the user to select predetermined services and content that appear, for example in the left hand, interactive pane **622**. In this example, the pane has been instructed to perform a call-placement procedure. The underlying function that triggers the call: placement is not shown, but can be any acceptable button or icon. In this example, the STB application **511** is configured to store the user's phone number. In some cases, such as a first-time use of the service, or a new STB installation, the user's phone number is not stored. In such cases, the application **511** requests entry in the dialog box **624**. The user then begins searching for a desired target phone number. (**512** in FIG. **5**).

The UI service application **511** provides the search pane **710** to the UI **508**, as shown in FIG. **7**. It includes a keyword search window **712** into which the user can enter (via the remote's alphanumeric keypad **406**), or via a data entry screen **810** (FIG. **8**). The data entry screen buttons are navigated by arrows on the remote and clicked by the select button in a well-known manner. Alternatively a keyboard-style remote can be employed to enter data. Once an appropriate keyword **716** is entered, the user then' clicks the search button **714** on the search pane **710** (FIG. **7**). This generates the resulting pane **910** in FIG. **9** with an information regarding the of the search target. The details of the target may be provided in the window **914** below. Note that a number of results may be displayed in the upper window **912**, where a plurality of similar names are located. Notably, the details include (or can be limited to) the target's phone number **920**. This, and other searched phone numbers (list **514**) are provided by the UI to the user in the screen pane **910**. The search results can be generated as a result of a conventional Internet search carried out by the Internet server **520** at the head end **522**, or the search results can be based upon a search of internal target lists (typically vendor lists **523**) that are stored within the head-end's databases (vendor database **524**). Basic target lists can also be stored locally at the STB **504**.

The service application **511** (FIG. **5**) or another function at the head end extracts (step **513**), the phone number from the search results and stores it for eventual return to the head end. The capture of the phone number can be based upon its placement in a predetermined phone number field in the search results, or it can be obtained by optical character recognition (OCR), or other available text scanning functions. At this time, the user can select this target (step **515**) click the calling button **922** to place a call to this location.

Before describing the call-placement process in detail, further functions available to the user will now be described. Referring to the search pane **710** (FIG. **7**), a category list button **720** is provided. By clicking the category list button **720**, the user calls up a list of predetermined categories that are displayed in the category list pane **1010** in FIG. **10**. The categories are listed. These are either user-defined categories and/or defined by the cable operator as part of the vendor list. Some categories include an expansion arrow **1012** that allows a pane **1110** (FIG. **11**) with multiple entries from the selected category to be displayed. The selected entry **1112** can be highlighted, and the user can proceed immediately to call-

placement by clicking the button **1114**. Note, if one or more entries do not contain phone number information, then the call button **114** may not be available in the pane **1110**, requiring the user to first enter the pane **910** of FIG. **9** to determine whether a phone number exists or can be scanned from the search data. Where a category contains only one entry (such as the exemplary pizza entry **1014** in FIG. **10**), then clicking this category places the user in the pane **1210** of FIG. **12**, which shows the details **1214** of the target and a call can be made by clicking the call button **1016**.

Searching for call targets can be narrowed based upon the user's location. The location is entered, changed or checked using the select location button **724** in, for example, panes **710** and **1010**. The location pane **1310** contains fields **1312**, **1314**, **1316** and **1318** that allow the user to check and update his or her zip code, State, city and street name. This can be used by internal functions within the search engine to select only vendors within a certain range, unless otherwise instructed. The use can set such limits within a preference screen (not shown) or the limits can be set automatically by the cable operator.

It should be clear that there are several ways for a user to locate a desired target for call placement, or to place a call to a general Internet search target once located. In an exemplary embodiment, search targets, and their phone number information are available from a list established by the cable operator, typically in cooperation with the vendors themselves. More general Internet searching to find targets may also be permitted. The extent to which a requesting subscriber is allowed to call outside an established list is often dependent upon the billing and advertisement scheme adopted by the cable operator.

In some embodiments, the user may simply enter a target number (a friend or relative not in a vendor list) without searching or navigating categories, by calling up a number entry pane **1410** as shown in FIG. **14**. Note that the category pane **1010** may, in fact, include a selection for "enter number." Once the user opens the pane **1410**, he or she enters the desired target phone number in the box **1412** using the above-described data-entry techniques, and requests the call by clicking the call button **1214**. Optionally, the user can also access a call list via a call list button **1416** that he or she creates with names and associated phone numbers. Highlighting a name would place it in the box **1412**.

Before call-placement is requested by any of the above techniques, the user may optionally be presented with a confirmation pane **1510** that allows the user to confirm that he or she wishes to place a call by clicking the Yes button **1512**. By clicking No button, the user cancels the call and returns to a previous pane. The pane **1510** also includes a check box that allows the user to omit the confirmation screen in the future. This pane and any further screen (e.g. a Call-Placed pane—not shown) provides visual feedback to placing a request. A further pane may be issued by the head-end, via the telephone service provider **525** (FIG. **5**) that confirms that the call is going through, and possible displaying appropriate billing information. This part of the process will be described below in detail.

Returning again to the description of the call-placement procedure **500**, once the call-placement or SMS message request has been made, that request **526** is transferred from the UI **508** through the STB service application **511** along with the target's and requesting subscriber's phone numbers and instructions on whether to place a call or send SMS **527** (or other identifiers from which the head end can access these phone numbers). The request and phone numbers **526**, **527** are passed by the call-placement server's (**505**) STB connector **528** in the head end **522**. In the case of an SMS request, the data sent by the STB to the head end, and on to the service provider(s) from the head end (as described in further detail below) contains a telephone number for the requestor/subscriber/cable user's mobile or cellular telephone, a conventional SMS short code for the phone by which messaging can occur, a content ID that indicates the requested content to be downloaded or other service, and (optionally) an a telephone type/capability code (also termed an "Asset ID" of the SMS-enabled telephone). The type/capability code describes the general features available on the given mobile/cellular telephone. For example, if a telephone is not capable of playing games or playing back MP-3 recordings, then this would be encoded in the type/capability code (either directly or by directing the system to a lookup table of phone types and associated capabilities), and allow the system and vendors to decide whether such content types can be downloaded—or even listed in the appropriate menus for the subscriber to choose from.

The STB connector **528** selectively interfaces this subscriber with the call-placement service application. The service application includes a main process **529** that controls call placement, subscriber identification, transfer of billing data and other functions described herein. The main process **529** receives the call request **526** and applicable requesting subscriber and target phone numbers **527**. The process resolves the phone numbers **530**, and passes them to a choice process **531** that chooses the best provider for the particular call. Assuming multiple phone providers are available, the choice process **531** consults a provider database **532**, and derives the information necessary to make the choice. The basis of a provider choice can be based upon the provider's ability to access the target (and subscriber) phone numbers, the rates charged for placing the call, and other internal criteria, such as that provider's billing relationship with the cable provider.

Once a choice of provider **533** is made, it is passed to the main process **529**, which then passes the provider choice **534** and the requesting subscriber/target phone numbers **535** to a process **536** that generates appropriate call instructions or SMS messaging instructions for the selected provider. The instructions may be a standardized format (e.g. user telephone number-SMS short code-content ID-(optional) telephone type/capability code (for SMS messaging)) or they may be formatted in a manner that is specifically adapted by the provider to handle calls placed by the call-placement service. The main process **529** may also draw appropriate information from the vendor database **524**. The vendor phone number or other identifying information **536** is passed to the database **524**, which returns the vendors specific data, possibly including any billing parameters for that vendor (alternatively these may be stored in the billing server **540** described below). This information may be used to apply billing charges (for, example, a pay-per-click-type arrangement wherein a charge is applied to the vendor for each call placed), and to determine whether the vendor is an accepted contact. In some cases, where only accepted vendors may be contacted, the main process **529** will interrupt the call-placement process and notify the requesting subscriber that the call is not permitted by issuing a message in an appropriate pane through the UI **508**. More often, the absence of a vendor in the database may result in a charge being applied to the subscriber instead of a vendor. The subscriber may be notified by an appropriate confirmation message that he or she is being charged for the call. In each case, the subscriber and vendor phone numbers **538** (as well as any other needed information) are passed to the billing server, which contains billing information regarding subscribers **541** and vendors. Further

details relative to possible billing procedures are described below. In general, the placement of a call typically creates a billing even **544**, which requires payment of a charge by the vendor, the subscriber, or both.

Referring again to the call instruction process **536**, when placement of the call is approved by the main process **529**, and all applicable information for billing, etc. has been collected by the billing server **540**, the call-placement information **545** required by the selected provider and the requesting subscriber/target phone numbers and/or applicable subscriber/requestor SMS data **546** are passed to the telephone service provider's call server **525**. This server may general purpose server or may be dedicated to the handling of calls placed by the cable company's subscribers. The server **525** may be part of a separate telephone service provider, or, part of the cable company's operation. The link **547** to the server **525** may be a dedicated network connection or can be part of a public network, such as the Internet. It is contemplated that the telephone service provider may transmit phone calls over a variety of media and may employ intermediate telephone carriers in completing the call between the subscriber **502** and the target **550**. Note that the internal arrangement of the telephone service provider's system is highly variable, and the depicted implementation is shown only by way of example.

Upon receiving the request **545** and the phone numbers and/or SMS data **546**, the telephone service provider's server **525** passes the information to a service application **551** that responds to the properly issued request. The calling procedure that follows is described with reference also to the flow diagram of FIG. **16**. The procedure **1600** begins with the service provider's service application **551** confirming that a call can be made or an SMS received (step **1602**), and passing a confirmation **560** to the Cable head end server **505**. The main process **529** then records the confirmation, which may be used to generate billing information in the billing server **540**. The confirmation **561** is also passed to the STB connector **528** confirming that the request has been successfully placed with the phone service provider (step **1604**). The confirmation **562** is then passed back to the STB to confirm that the subscriber's request has been processed successfully in the STB service application **511** (step **1606**). The UI **508** is then instructed by a confirmation **563** that is displayed in an appropriate pane on the television screen **507**. This provides a visual confirmation for the user to await the call (step **1608**). A confirmation is not required in some cases of this implementation. A confirmation of the SMS to be delivered can also be made where downloaded content to the subscriber's telephone is requested.

On the phone provider server side (**525**), the service application **551** issues a Start Call instruction **552** and the phone numbers **553** to a voice commutator process **555** (step **1610**), or SMS data to mobile/wireless commutator **555***a*. The voice commutator process **555** then issues a ring, or the mobile commutator issues an SMS message **585***a* to the telephone **576** (which can be either a conventional or cellular telephone) of the requesting subscriber/originator **502** (step **1612**). In the case of an SMS, the mobile commutator **555***a* and service application **551** issue an appropriate link with the SMS related to the content the requester has expressed interest in. The call request and applicable information may cause the service application to generate predetermined advertisement messages, which are meant to be played in conjunction with a call prompt that is provided to the requesting subscriber. This may be triggered by call information (**545**) or the phone numbers/SMS data (**546**). For example, the advertisers may agree to pay for some or all of the call-placement service in return for the inclusion of its advertisement(s) on the telephone. The subscriber may also enter into a plan in which he or she agrees to receive advertisements in, return for no calling cost or a reduced calling cost. Likewise, text messages received via SMS **585***a* may include advertising or promotional content along with the requested SMS information/links. When the decision to include advertising content is made (decision step **1614**), the service application **551** issues an ad request **570** (step **616**) to an advertisement server **571**, which receives the request (step **1618**) vends the appropriate ad content to the commutator at the appropriate time (or to a buffer for subsequent playback) (step **1620**).

The commutator then connects (**575**) to the originator/subscriber's telephone **576**. The subscriber's telephone rings (**577**) or a notification and text of an SMS (**577***a*) is issued to the SMS display screen **576***a* of a cellular-type phone, and the subscriber either picks up (**578**), thereby connecting the subscriber **502** to the telephone service (step **1622**) or alternatively, the subscriber'can click (**578***a*) the delivered link to generate return message with the link data (LINK **579***a*) in the form of a download request o download content associated with the link to his or her cellular/mobile telephone (**576**). The download request (LINK **579***a*) typically passes back through the requestor/subscriber's cellular network (via the SMS Delivery system, which can be enabled employing the cell site **135**), and is returned to an appropriate Internet content provider **595**, which vends requested downloaded content **596** via a celhilar connection **597** the carries the downloaded content back to the subscriber/requestor's cellular phone (**598**). In one embodiment, as shown, the clicked-upon lhik data (LINK **579***a*) is passed back up the cellular pathway (via site **135**) to the provider **525**, where the mobile commutator **555***a* (which contains/accesses the Internet address of linked providers) passes it onto the Internet, to be received and acted upon by the appropriate downloadable content provider **595**. As noted above, the pathways by which a call, SMS request, link and/or download is/are transmitted between the service and the subscriber. **502** (and to the target **550**) can pass through a number of different types of communication systems including a wireless system, a wired, switched telephone system and an IP-telephony system implemented over public and private networks.

Note that vended content downloaded to the requestor's cellular phone need not be limited to software or media (MP-3 music files, ringtones, etc.) The user may also request informational items, such as directions, movie, schedules, weather reports and the like. Some of this content may be free or provided as a part of the subscriber's regular cable plan.

With reference briefly to FIGS. **14**A-C, the STB can be arranged to allow selection of SMS message-based services for the user's/subscriber's cellular telephone (or other SMS-enabled device). As part of a user setup procedure, the type of telephone can be entered, either the STB or head end can include a database of phone types and their available features. This can be used to derive the above-described telephone capabilities/type ID (Asset ID), which defines the telephone's available content. For example, certain telephones may be equipped to play MP-3 music files while others cannot. The system can tailor the contents of the menus in the SMS service panes based upon which content and/or media can be handled by the user's phone type. Any content classified as not available is either blocked from possible download or fully omitted from any menus.

In FIG. **14**A, the user has selected and SMS application and navigates until he or she is presented by the STB UI with the pane **1420**. This pane **1420** contains a menu **1422** of available game types. The user can use his or her remote control to

select one of the listed types of games via screen buttons **1424**. Alternatively, the user can select to view all available games via the View All button **1426**. Notably, the screen can contain promotions and buttons to specific games (or other content) being promoted (**1428**), as well as thumbnails naming sponsors. Each of these links can be clicked upon in one embodiment, allowing content, information and special promotions (discounts, etc) to be downloaded.

In FIG. **14**B, the pane **1440** has changed to indicate that the user has selected a particular game type (casual as indicated in the header box **1442**). The games are sorted in a menu **1444** by an appropriate format as the user selects (Alphabetical in this example, by clicking menu tab **1446**. The listed games **1448** are shown as a set of buttons **1448**, which the user can click to select the desired game. In this example, the user has selected the first game button **1450**. The selected game is shown in the right hand box **1452**, with a graphical example of the games appearance on a telephone display (**1454**) and a description of the game and the price of the download **1456**. It is assumed that the user has (or can provide) account data to complete the purchase. Of course, different types of content may employ differing menu arrangements and content information. The box **1452** includes a button **1458** that allows purchase of the game. In this example, there are also buttons **1459**, with which the user can express an opinion as to whether he/he likes or dislikes the game. This information can be used to help refine the list of future game offerings.

Pressing the "Buy It" button in FIG. **14**B calls up the pane **1460** in FIG. **14**C. The selected game now appears in the header box **1462** and the user is informed that he or she is about to purchase the game content (along with file size, price and other relevant information in the) in the window **1464**. The user can confirm or reject the purchase by clicking the respective buttons **1466** or **1468**. Cancel **1470** allows the user to revert to an earlier pane.

Once the user press the "Yes" confirmation button in the pane **1460**, the transaction has occurred and the user's account will be charged by the cable provider or another vendor who receives the data from the cable provider via a message over the Internet (or by another technique). Now the user must carry out the physical process of placing the game (or other purchased content) into his or her telephone. To simplify the process for the user, the "yes" button triggers transmission from the STB of the above-described SMS message request with the user's cellular telephone number, SMS short code, requested content ID, and optional telephone type/capability ID. The SMS request is processed as described above and the provider transmits back the SMS message related to the vendor's content. The message contains a link to the vendor that allows the user, when receiving the message on his or her telephone to easily click the link, prompt the vendor to download, and receive, the download of the selected game (or other content). In this manner, the user can shop for and select games and other content from a large, easy-to-use, and graphically descriptive, "big" screen of the television, and then receive the selected game with minimum effort (one click) required on the actual telephone interface.

With reference again to FIG. **5**, upon answering (picking up) the exemplary voice call, the voice commutator **555** receives an accept signal (**580**). At this time, the subscriber is provided with a special prompt **581** (step **1624**) by the server **525**. The prompt **581** may include a message stating that a call is about to be completed to the requested target or an SMS with instructions to click to download content from a provider, which the subscriber responds to by clicking. If advertisements are to be included (via decision step **1614**) the ad content **582** is played or can be textually displayed at this time. The prompts issued herein may require the recipient to enter a code or press a phone key to accept the connection. This is particularly useful where a party may incur charges for the connection. The message in the prompt may include any applicable charge information. In general, the acceptance may entail voice recognition to ensure that a human user has answered the call. The user may be asked to say "yes" or "no" to accept or deny the call, respectively.

In the case of a voice call between subscriber/requestor and target, the subscriber's prompt message is complete, the voice commutator **555** then connects (**585**) to the target telephone **586**, or the service provider the clicked link transmission from the subscriber's telephone (step **1626**). The target's telephone rings (**587**), and the target picks up (**588**), thereby connecting the target **550** to the telephone service (step **1628**). Alternatively, in this step (**1628**) the vendor receives the link information requesting a download of specific content from the subscriber's telephone. Upon answering the call the commutator receives an accept signal (**580**). At this time, the subscriber is provided with a special prompt **591** (step **1630**) by the server **525**. The prompt **591** may include a message stating that a call is about to be completed to the requesting subscriber/originator. Alternatively, the target vendor downloads content to the telephone of the subscriber. The target **550** may be asked to enter a code or key. In certain instances, the target may also receive an advertising message—for example, where both the requesting subscriber/originator and the target are non-business subscribers to the cable call-placement service. When all messages are completed, at the target side, the commutator receives an accept acknowledgment (**592**). The commutator then opens communication between the parties and such communication continues until one party hangs up or (optionally) a time limit is reached (step **1632**). Alternatively, the content is received at the subscriber's telephone and the SMS transaction is complete.

It should be clear that the SMS-based function of the invention is advantageous in that it allows a user to enter a transaction with a click of his or her television remote, and then perform the commit to the transaction via the television SIB rather than the more cumbersome process of exchanging multiple text messages to request and download content to a telephone. That is, traditional content transaction on cellular telephones employ a two-stage commit process in which the user first transmits interest in a service, the provider/vendor then provides a first message confirming the transaction. To be certain, the user must then respond to another message asking if he or she is sure of the confirmation to purchase. A second message must be transmitted back to the vendor again confirming the transaction before download begins. In the present invention, the user need respond to only one text message that is initiated via the more-visually rich television interface.

In an embodiment of the invention, the telephone service provider may not have information on whether the subscriber telephone and/or target telephone is enabled to receive calls on, for example, a pay-per-call basis. The provider may initiate a call, and if the call is denied by the local telephone system servicing a party, then the system may return a call-access denied message to the requesting subscriber. This message may be returned by telephone, or through a message passed from the phone system to the head end and back to the UI of the STB. Part of the process for determining whether a call is blocked is to use voice recognition to determine whether a human voice answers the initial call.

The procedure **1600** completes with a billing event **544** (step **1634**). In practice, the act of creating a billing entry may occur at any point during the process, but call connection

affords a good opportunity to generate a billing entry, it is now confirmed that the parties are communication. The service application may generate a bill that is administered by a pay-for-call server **593**. The billing information for either the requesting subscriber **502** or target **550** can be provided to the server, which either creates a bill to be presented to a party, or retains a record, and forwards the data back to cable provider's billing server **540**, which generates a bill for a selected party, or otherwise attends to payment for the service. The telephone service and the cable provider typically share in the revenue generated from a bill—issued either by the telephone service or by the cable provider. In alternate arrangements, some or all revenue may be generated by advertisements. In other arrangements subscription fees generated by the cable provider and/or the telephone service may provide revenue for the call-placement service. Revenue may also be generated by charging fees to vendors to be included in the vendor database **524** as described above. As noted above, in an SMS-transaction, the billing event may entail a charge to the subscribers cable account or a direct charge from the content vendor, with some reimbursement for the referral of business to the cable provider from the content vendor.

In summary, it should be clear that a wide variety of revenue-generation implementations can be adopted in connection with this novel invention. Where appropriate, such implementations may track the data of individual call events and provide charges based on each event (e.g. pay-per-click/call). Other implementation may rely mainly upon subscription fees from the subscriber and/or vendors, others by simply providing this as a value added service, still other implementations may rely upon advertising revenues—or a combination of implementations may be employed.

The foregoing has been a detailed description of illustrative embodiments of the invention. Various modifications and additions can be made without departing from the spirit and scope if this invention. Each of the various embodiments described above may be combined with other described embodiments in order to provide multiple features. Furthermore, while the foregoing describes a number of separate embodiments of the apparatus and method of the present invention, what has been described herein is merely illustrative of the application of the principles of the present invention. For example, while illustrative embodiments of the invention are implemented using a set top box, a variety of cable-connected appliances can be employed in alternate embodiments. Likewise, the particular configuration of the set top box is highly variable, and the depicted SIB should be taken by way of example of a number of different types, models and configurations of STB. In addition, the division of functions between the STB and the head end service server is highly variable. In alternate embodiments most functions can be implemented at the head end, or most functions, including basic search engine functions can be carried out on the STB. Likewise, search functions, billing functions and other aspects of the invention can be carried out by third party vendors interconnected over a private or public network. In addition, terms which describe system components such as a "commutator" should be taken broadly to include any mechanism that carries out such functions as call placement and/or messaging based upon the underlying program of a service application or procedure. The nature of the service application and procedure is, likewise, highly variable. Also, while the terms "mobile" and "cellular" are used herein to describe telephones capable of receiving and transmitting messaging services and downloaded content, these terms should be taken broadly to include and type of wireless device, or other text-message/SMS-capable device—including so Called wireless local area network "Wi-Fi" devices, satellite-based communicators, personal e-mail devices, personal digital assistants, laptop computers, networked desktop computers, and other like communication devices. However, while the term "SMS" is used herein to described a form of text-message communication, it should be taken broadly to include other equivalent formats and protocols that than be used in conjunction with a mobile device having the ability to display text message data. Accordingly, this description is meant to be taken only by way of example, and not to otherwise limit the scope of this invention.

What is claimed is:

1. A system for placing calls between a requesting subscriber of a cable television service and a target recipient comprising:

a device having a display and set top box (STB) transmit and receive functions communicably associated with a head end of the cable television service for transmitting data to said head end and receiving data from said head end;

a user interface (UI) that enables the requesting subscriber to access and manipulate menus on the display, the menus providing information related to placement of calls and information related to call targets; and

a service application implemented in a server at the head end, the service application:

receiving from said device a request, made by said requesting subscriber, to connect a telephone of the requesting subscriber to a telephone of the target recipient;

providing to a telephone service provider instructions for connecting said telephone of said requesting subscriber and said telephone of said target recipient over a telephone network; and

receiving from the telephone service provider confirmation that the telephones of said requesting subscriber and said target recipient can be connected, and providing said confirmation to said device for display thereon,

wherein said request comprises an identification of said target recipient, and said service application extracts a phone number for the target recipient to be used in said instructions to said telephone service provider;

at said head end, selecting one of at least two telephone service providers to be used for connecting said requesting subscriber to said target recipient;

providing, from said service application at said head end, to said selected telephone service provider, instructions for connecting said telephone of said requesting subscriber and said telephone of said target recipient over a telephone network, said instructions including said telephone number of said target recipient; and

at the head end, receiving information from the telephone service provider indicating whether the telephones of said requesting subscriber and said target recipient can be connected;

wherein the information from the telephone service provider based on making an initial call to said target recipient, receiving an initial response from said target recipient, and using voice recognition methods to determine whether said initial response was pre-recorded or was made by a voice of a live person in real time;

if said initial response is determined to be made by the voice of a live person in real time, generating a confirmation message;

if said initial response is determined to be pre-recorded or not made by the voice of a live person in real time, generating a call access denied message;

providing said confirmation message or said call access denied message, from said head end, to said device, for display thereon; and

if said confirmation message was received, connecting said telephones of said requesting subscriber and said target recipient over said telephone network,

wherein said request made by said requesting subscriber comprises, while displaying an identifier of said target recipient as part of a broadcast delivered from said head end to said device using said STB receive function, selecting said target recipient to be a recipient associated with said identifier,

wherein said device further includes an onscreen display frame buffer causing said menus to be overlaid over a display of said broadcast, and

wherein transmission of data from said device to said head end is carried over a reserved channel of said cable television service.

2. The system as set forth in claim **1**, wherein the menus include information related to predetermined vendors of goods and services.

3. The system as set forth in claim **2**, wherein the information related to predetermined goods and services is organized according to categories.

4. The system as set forth in claim **1**, wherein the detail information related to predetermined targets includes telephone number information, the system further comprising a process that locates and transmits the telephone number information to the head end for use in creating said instructions.

5. The system as set forth in claim **4**, wherein the service application is constructed and arranged to generate a billing event in response to a request to place a call by the requesting subscriber.

6. The system as set forth in claim **5**, wherein the billing event comprises at least one of (a) a pay-per-call billing charge and (b) a delivery of advertising content to the requesting subscriber over the telephone of the subscriber, wherein the service application and/or the cable television service automatically capture the telephone number information and other information related to the requesting subscriber and to the target recipient to generate the billing event.

7. The system as set forth in claim **1**, wherein the UI is constructed and arranged to enable the requesting subscriber to access and select a service on a messaging menu delivered to the display through the head end;

wherein user selection of a service causes the service application to issue an SMS request to the telephone service provider, requesting that an SMS message related to content in the messaging menu to be delivered to the telephone of the userrequesting subscriber;

wherein the messaging menu includes listings of selectable content adapted for download to the telephone of the requesting subscriber and the SMS message includes a download link that enables the user requesting subscriber to download the content from a content vendor;

wherein the SMS request includes a telephone number associated with the telephone of the requesting subscriber, an SMS short code and an indicia of the content requested by the requesting subscriber; and

wherein the SMS request further includes a telephone type/capability ID associated with the telephone of the requesting subscriber and the service application is constructed and arranged to limit types of content to download based upon available capabilities of the telephone of the requesting subscriber based upon the telephone type/capability ID.

8. The system as set forth in claim **1**, wherein: the UI includes a menu of available items and services for sale and to enables the requesting subscriber to access and select a service from the menu; and

the service application at the head end receives the selection of the requesting subscriber, and provides to the display of the device a purchase confirmation menu that when confirmed by the requesting subscriber using the UI, comprises an affirmative confirmation of a purchase of one of the items and services.

9. A method for placing calls between a requesting subscriber of a cable television service and a target recipient, the method comprising the steps of:

providing a device having a display and set top box (STB) transmit and receive functions communicably associated with a head end of the cable television service for transmitting data to said head end and receiving data from said head end;

accessing and manipulating, using a user interface (UI), menus on the display, the menus provide information related to placement of calls and information related to call targets;

selecting, using the UI, a desired target recipient;

providing to a service application implemented in a server at the head end a request to connect a telephone of the requesting subscriber to a telephone of the target recipient, the request comprising an identification of the target recipient;

based on said identification of the target recipient, extracting a phone number for the target recipient;

at said head end, selecting one of at least two telephone service providers to be used for connecting said requesting subscriber to said target recipient;

providing, from said service application at said head end, to said selected telephone service provider, instructions for connecting said telephone of said requesting subscriber and said telephone of said target recipient over a telephone network, said instructions including said telephone number of said target recipient; and

at the head end, receiving information from the telephone service provider indicating whether the telephones of said requesting subscriber and said target recipient can be connected;

wherein the information from the telephone service provider based on making an initial call to said target recipient, receiving an initial response from said target recipient, and using voice recognition methods to determine whether said initial response was pre-recorded or was made by a voice of a live person in real time;

if said initial response is determined to be made by the voice of a live person in real time, generating a confirmation message;

if said initial response is determined to be pre-recorded or not made by the voice of a live person in real time, generating a call access denied message;

providing said confirmation message or said call access denied message, from said head end, to said device, for display thereon; and

if said confirmation message was received, connecting said telephones of said requesting subscriber and said target recipient over said telephone network,

wherein said selecting the desired target recipient comprises, while displaying an identifier of said target recipient as part of a broadcast delivered from said head end to said device using said STB receive function, selecting said target recipient to be a recipient associated with said identifier,

wherein said device further includes an onscreen display frame buffer causing said menus to be overlaid over a display of said broadcast, and

wherein transmission of data from said device to said head end is carried over a reserved channel of said cable television service.

10. The method as set forth in claim **9**, wherein the step of accessing and manipulating includes navigating menus that include information related to predetermined vendors of goods and services.

11. The method as set forth in claim **10** further comprising, in response to said providing a request to connect said telephone of the requesting subscriber to said telephone of the target recipient, generating a billing event.

12. The method as set forth in claim **11**, wherein the billing event comprises at least one of (a) a pay-per-call billing charge and (b) a delivery of advertising content to the requesting subscriber over the telephone of the requesting subscriber.

13. The method as set forth in claim **9**, wherein the step of accessing and manipulating includes navigating to and selecting a service on a messaging menu delivered through the head end, and wherein the step of selecting a desired target recipient causes an SMS message related to content in the messaging menu to be delivered to the telephone of the requesting subscriber as an SMS message.

14. The method as set forth in claim **13**, wherein the messaging menu includes listings of selectable content adapted for download to the telephone of the requesting subscriber and the SMS message includes a download link that enables download of the content from a content vendor.

15. The method as set forth in claim **14**, wherein the step of providing a request includes issuing an SMS request to the telephone service provider, requesting that said SMS message related to said content be delivered to the telephone of the requesting subscriber, wherein the SMS request includes a telephone number associated with the telephone of the requesting subscriber, an SMS short code and an indicia of the content requested by the requesting subscriber.

16. The method as set forth in claim **15**, wherein the SMS request further includes a telephone type/capability ID associated with the telephone of the requesting subscriber, said method further comprising said service application limiting types of content to download based upon availability capabilities of the telephone of the requesting subscriber based upon the telephone type-capability ID.

17. The method as set forth in claim **9**, wherein said step of selecting one of said at least two telephone service providers is based on at least one of the following criteria:

telephone service provider's ability to access the telephone numbers of the requesting subscriber and the target recipient;

rates charged for connecting the requesting subscriber and the target recipient; and

the telephone service provider's billing relationship with a provider of said cable television service.

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