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(54) **ADVERTISEMENTS IN AN END-USER CONTROLLED PLAYBACK ENVIRONMENT**

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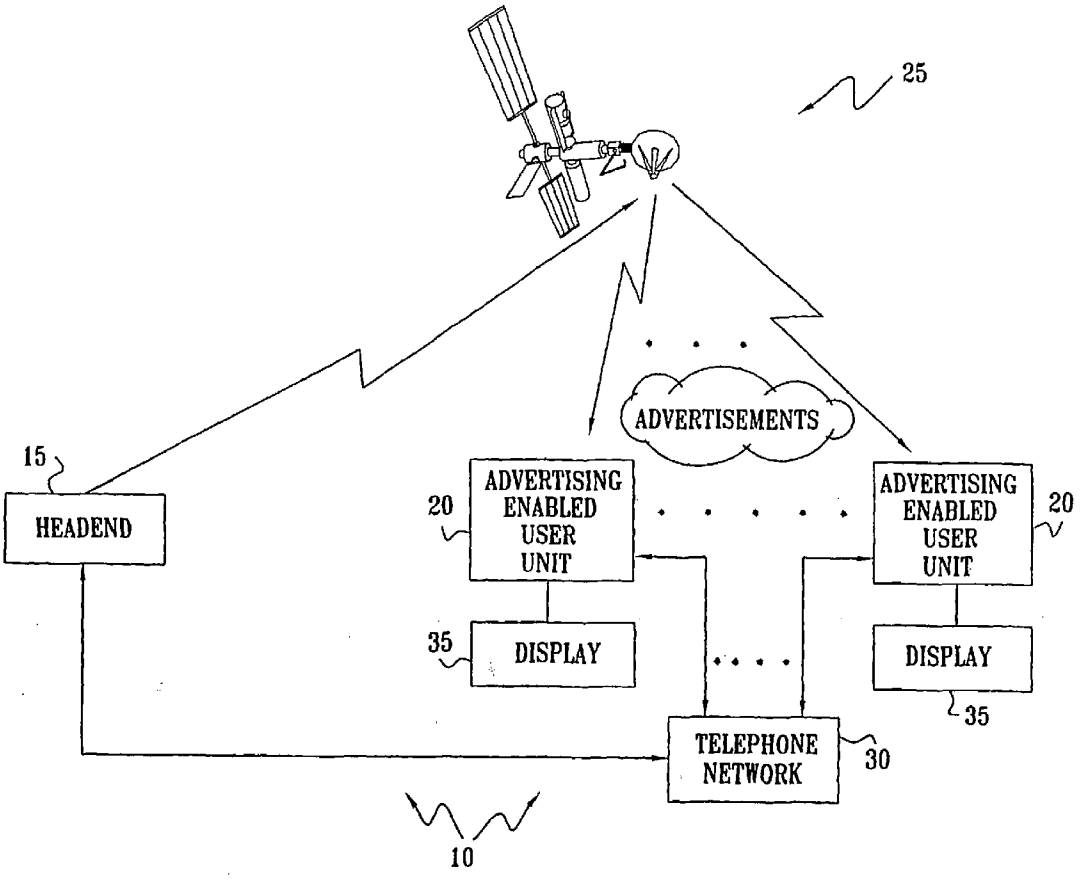
(57) **ABSTRACT**

This invention discloses a method for displaying advertisements transmitted to a user unit, the method includes receiving, at the user unit, at least one advertisement tagged with a delay tag indicating whether display of the at least one advertisement can be delayed and only if the delay tag allows delaying display of the at least one advertisement, storing the at least one advertisement at the user unit, retrieving the at least one advertisement and displaying the at least one advertisement. A billing system for reporting a commercial broadcast to a multiplicity of users is also disclosed.



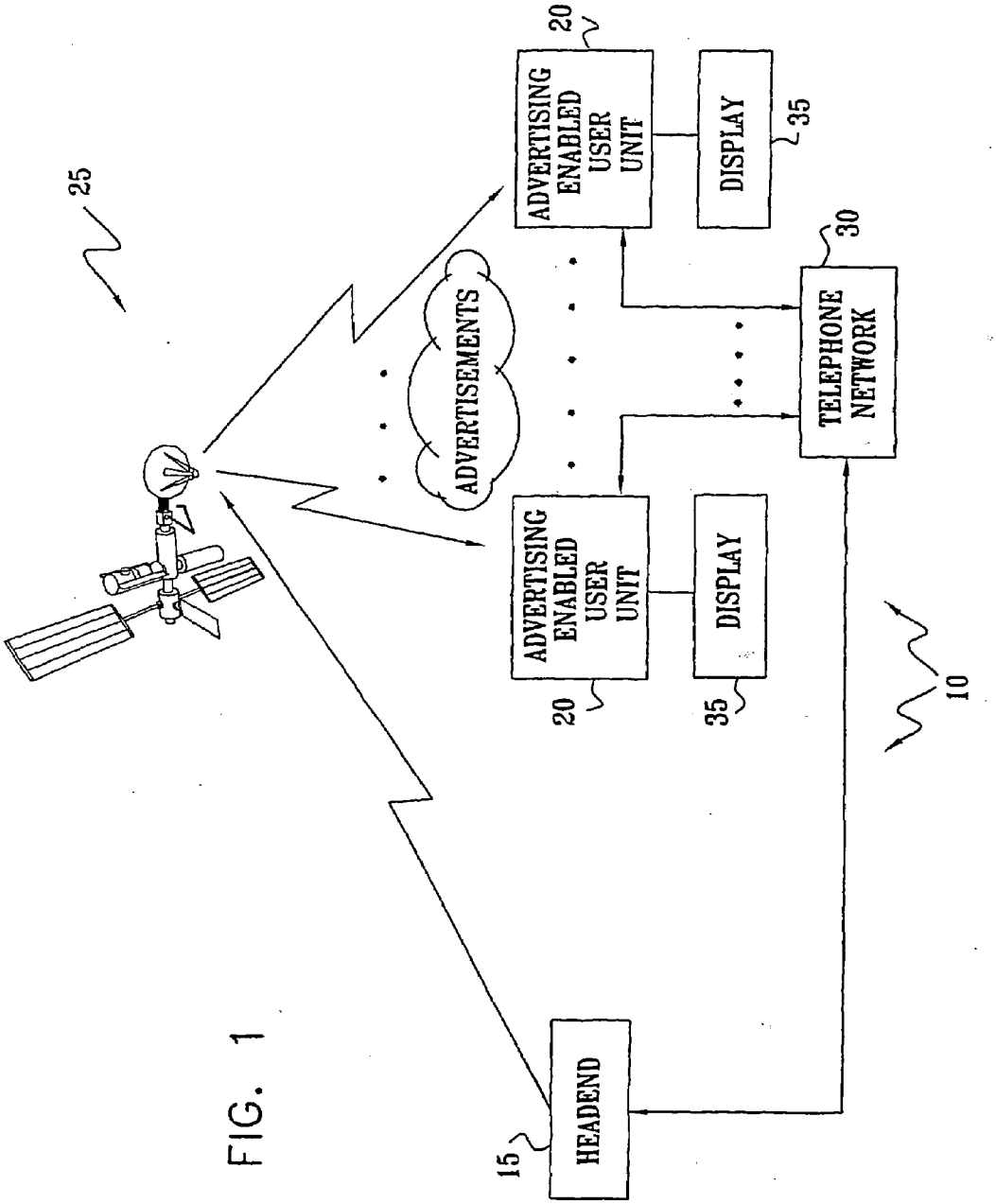
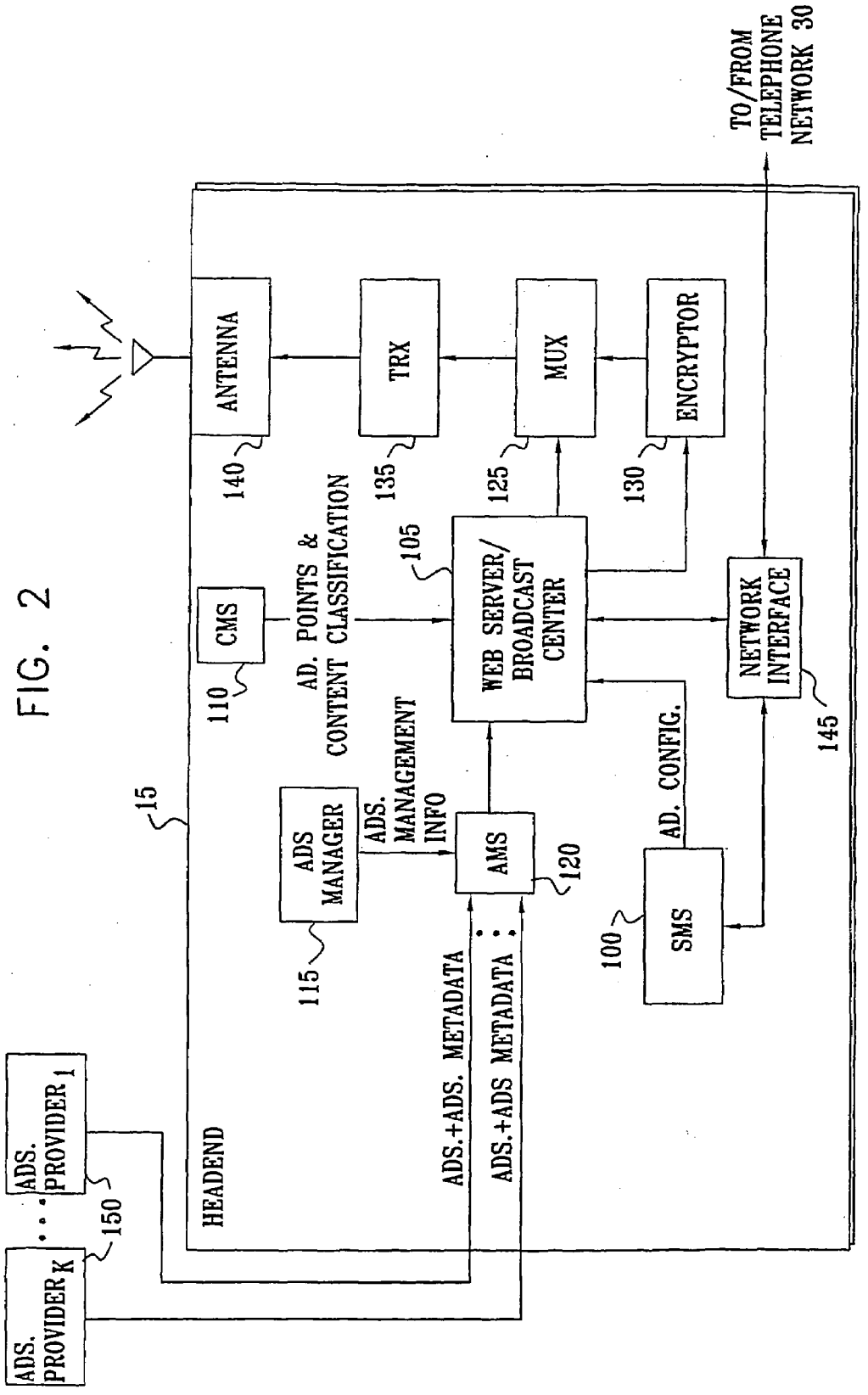

25
ADVERTISEMENTS
ADVERTISING ENABLED USER UNIT
20
DISPLAY
35
TELEPHONE NETWORK
30
ADVERTISING ENABLED USER UNIT
20
DISPLAY
35
10
HEADEND
15

FIG. 1

FIG. 2


TO/FROM TELEPHONE NETWORK 30
ANTENNA
TRX
MUX
ENCRYPTOR
140
135
125
130
CMS
110
AD. POINTS & CONTENT CLASSIFICATION
105
WEB SERVER/ BROADCAST CENTER
NETWORK INTERFACE
145
15
ADS MANAGER
115
ADS. MANAGEMENT INFO
AMS
120
AD. CONFIG.
SMS
100
HEADEND
ADS.+ADS. METADATA
ADS.+ADS METADATA
ADS. PROVIDER 1
ADS. PROVIDER K
150

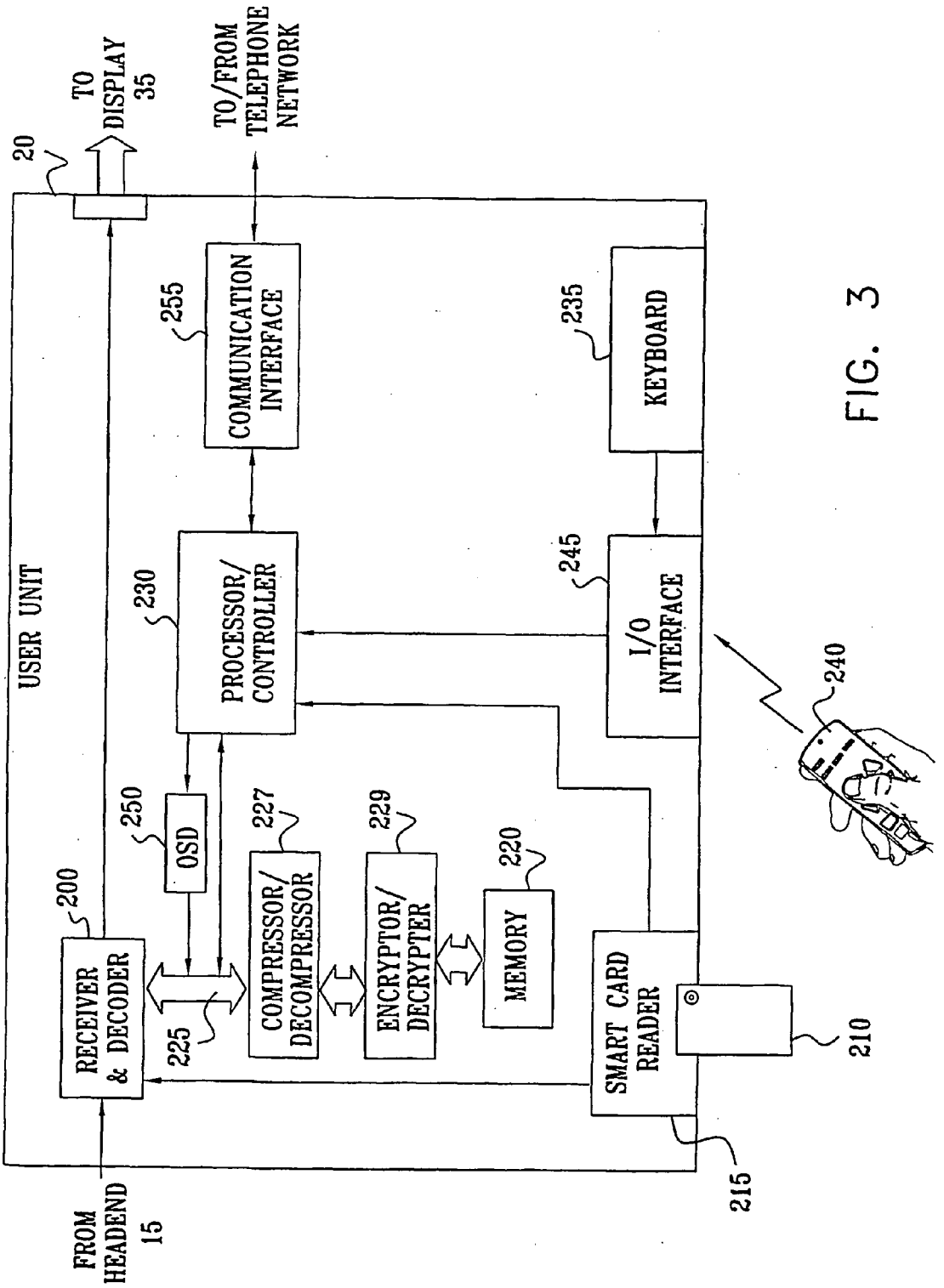

USER UNIT
20
TO DISPLAY 35
TO/FROM TELEPHONE NETWORK
255
COMMUNICATION INTERFACE
235
KEYBOARD
230
PROCESSOR/ CONTROLLER
245
I/O INTERFACE
240
250
OSD
227
COMPRESSOR/ DECOMPRESSOR
229
ENCRYPTOR/ DECRYPTER
220
MEMORY
200
RECEIVER & DECODER
225
SMART CARD READER
210
215
FROM HEADEND 15

FIG. 3

FIG. 4

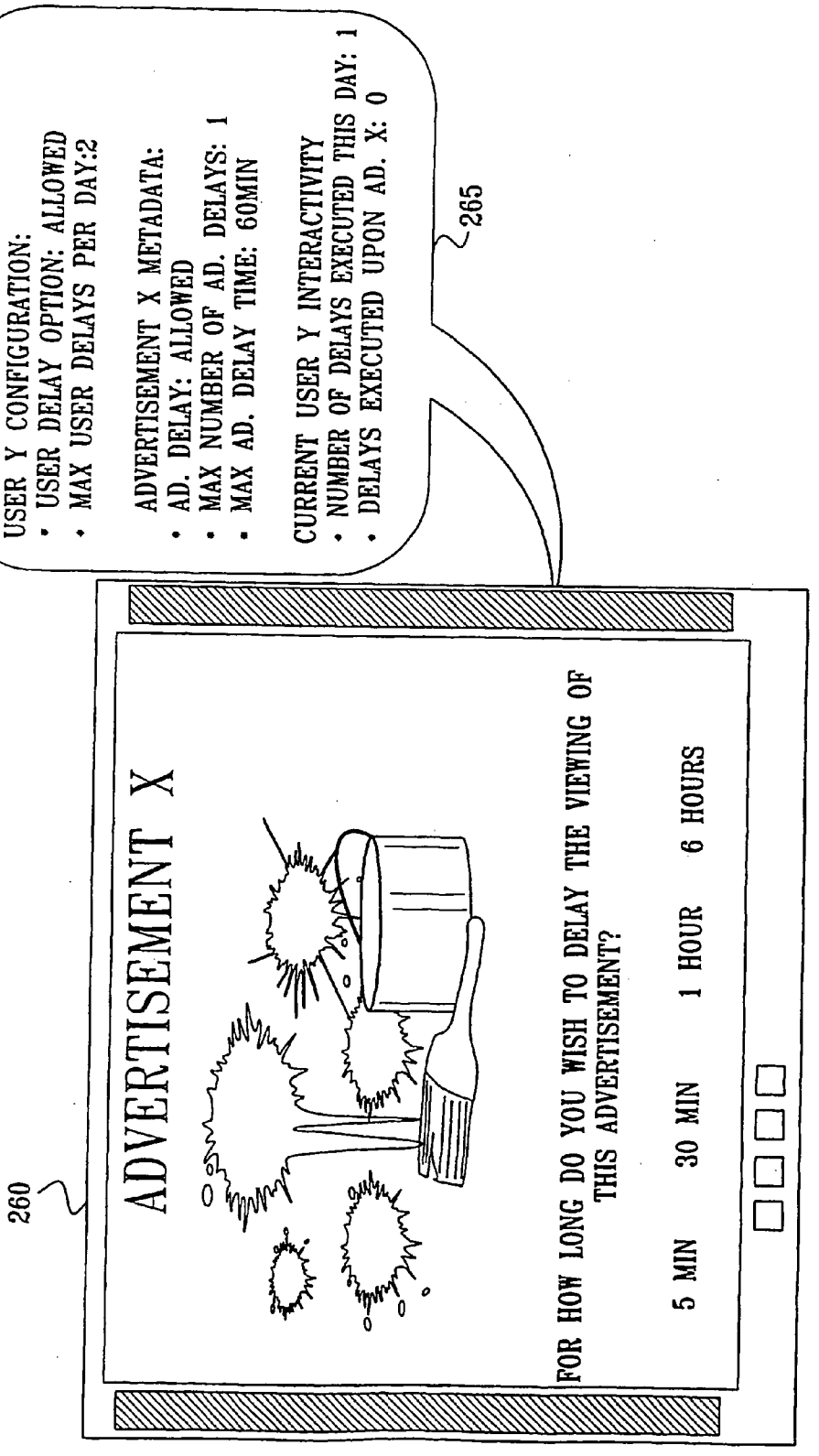

DEVICE MEMORY
USER Y CONFIGURATION:
• USER DELAY OPTION: ALLOWED
• MAX USER DELAYS PER DAY:2
ADVERTISEMENT X METADATA:
• AD. DELAY: ALLOWED
• MAX NUMBER OF AD. DELAYS: 1
• MAX AD. DELAY TIME: 60MIN
CURRENT USER Y INTERACTIVITY
• NUMBER OF DELAYS EXECUTED THIS DAY: 1
• DELAYS EXECUTED UPON AD. X: 0
265
260
ADVERTISEMENT X
FOR HOW LONG DO YOU WISH TO DELAY THE VIEWING OF THIS ADVERTISEMENT?
5 MIN
30 MIN
1 HOUR
6 HOURS

FIG. 5

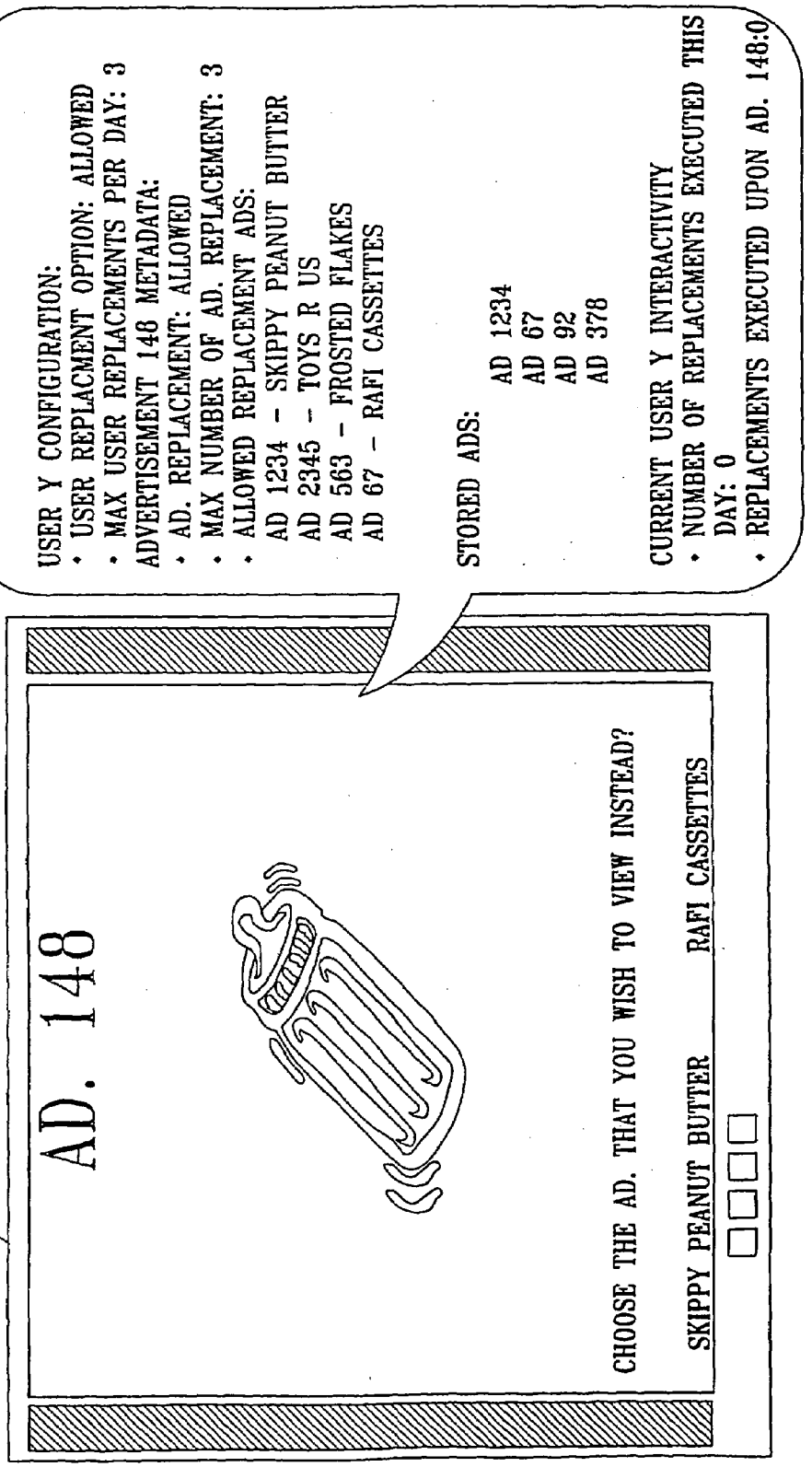

270
AD. 148
CHOOSE THE AD. THAT YOU WISH TO VIEW INSTEAD?
SKIPPY PEANUT BUTTER
RAFI CASSETTES
275
DEVICE MEMORY
USER Y CONFIGURATION:
• USER REPLACMENT OPTION: ALLOWED
• MAX USER REPLACEMENTS PER DAY: 3
ADVERTISEMENT 148 METADATA:
• AD. REPLACEMENT: ALLOWED
• MAX NUMBER OF AD. REPLACEMENT: 3
• ALLOWED REPLACEMENT ADS:
AD 1234 - SKIPPY PEANUT BUTTER
AD 2345 - TOYS R US
AD 563 - FROSTED FLAKES
AD 67 - RAFI CASSETTES
STORED ADS:
AD 1234
AD 67
AD 92
AD 378
CURRENT USER Y INTERACTIVITY
• NUMBER OF REPLACEMENTS EXECUTED THIS DAY: 0
• REPLACEMENTS EXECUTED UPON AD. 148:0

FIG. 6

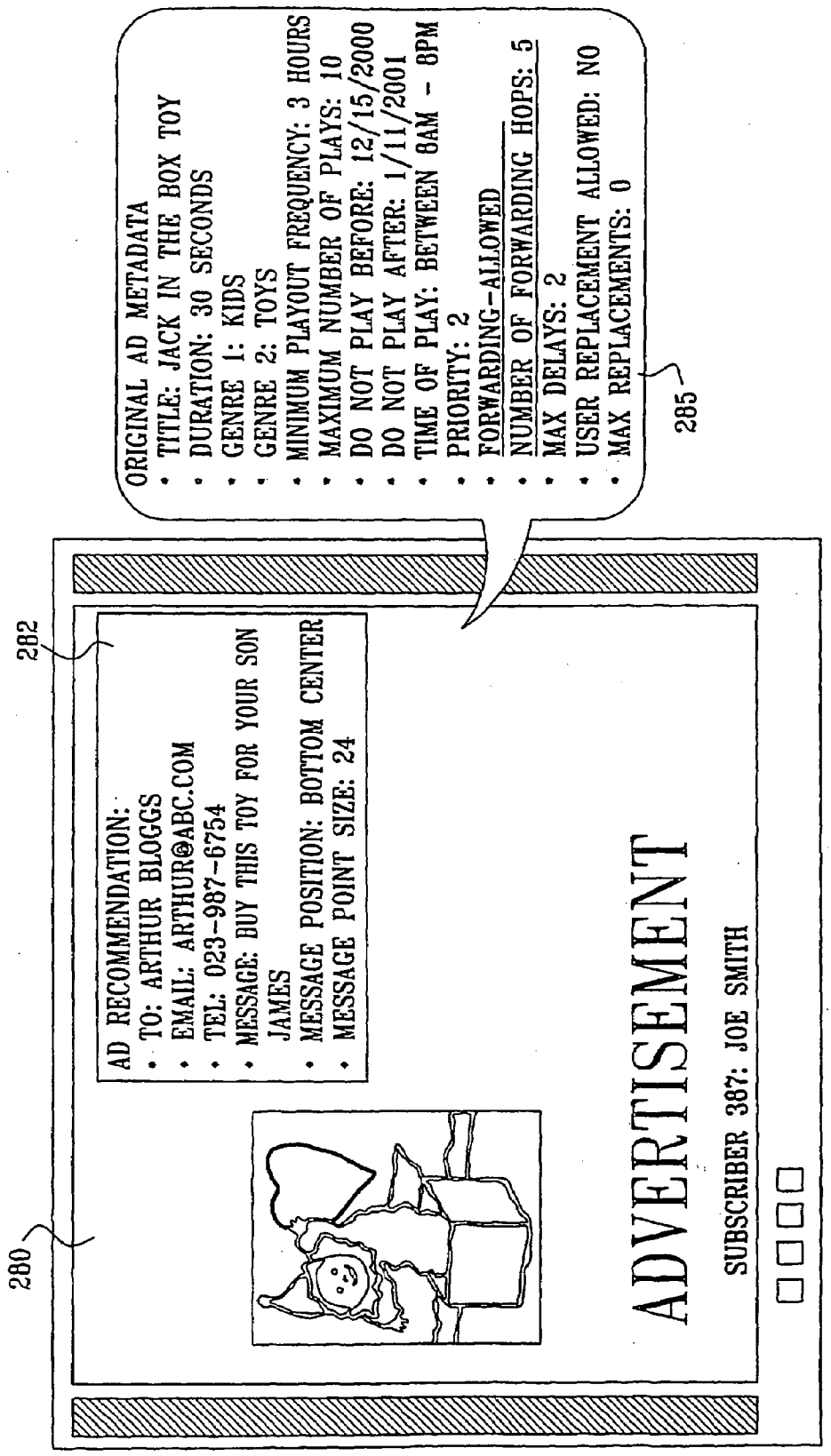

280
282
AD RECOMMENDATION:
• TO: ARTHUR BLOGGS
• EMAIL: ARTHUR@ABC.COM
• TEL: 023-987-6754
• MESSAGE: BUY THIS TOY FOR YOUR SON JAMES
• MESSAGE POSITION: BOTTOM CENTER
• MESSAGE POINT SIZE: 24
ADVERTISEMENT
SUBSCRIBER 387: JOE SMITH
ORIGINAL AD METADATA
• TITLE: JACK IN THE BOX TOY
• DURATION: 30 SECONDS
• GENRE 1: KIDS
• GENRE 2: TOYS
• MINIMUM PLAYOUT FREQUENCY: 3 HOURS
• MAXIMUM NUMBER OF PLAYS: 10
• DO NOT PLAY BEFORE: 12/15/2000
• DO NOT PLAY AFTER: 1/11/2001
• TIME OF PLAY: BETWEEN 8AM - 8PM
• PRIORITY: 2
• FORWARDING-ALLOWED
• NUMBER OF FORWARDING HOPS: 5
• MAX DELAYS: 2
• USER REPLACEMENT ALLOWED: NO
• MAX REPLACEMENTS: 0
285

FIG. 7

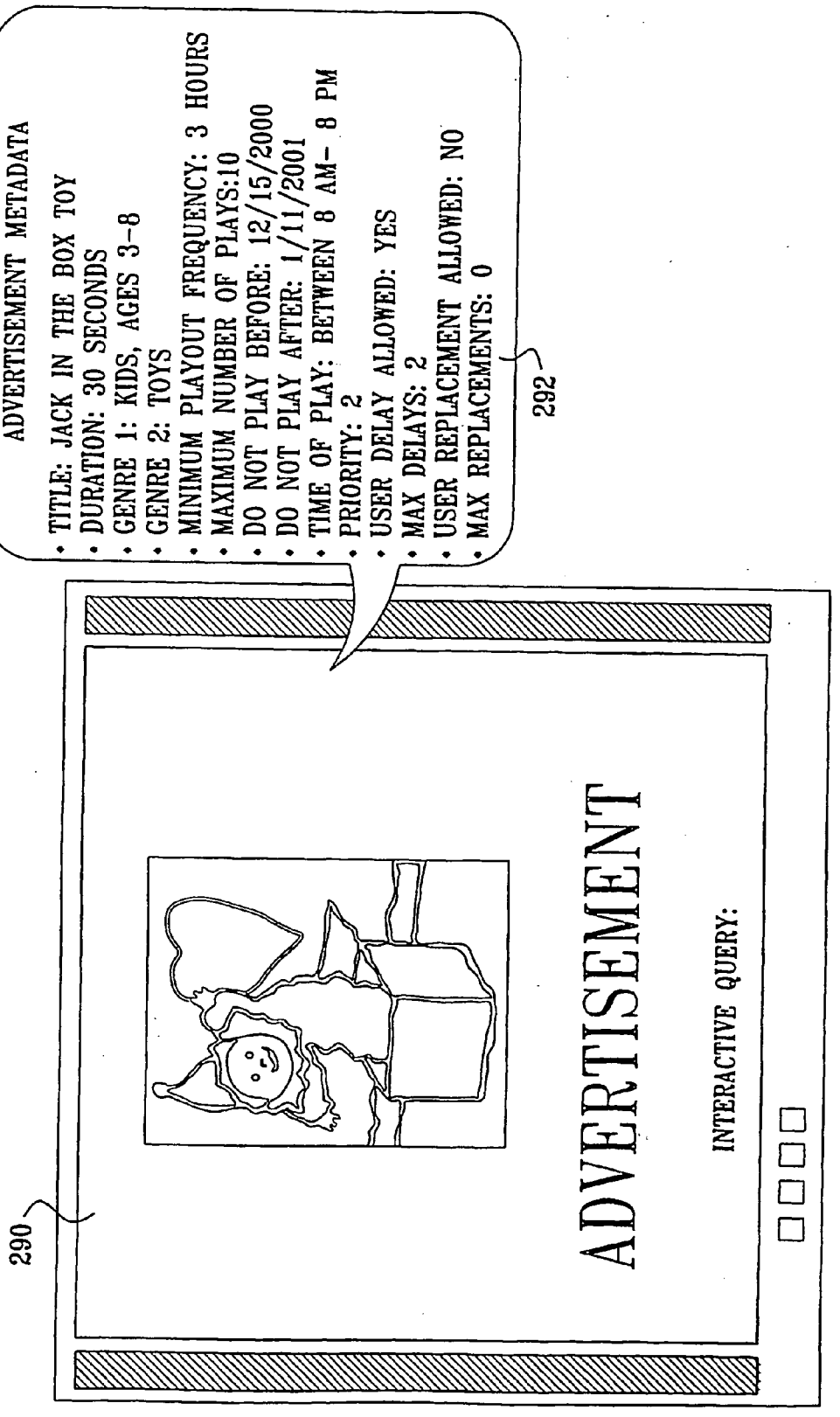

ADVERTISEMENT METADATA
• TITLE: JACK IN THE BOX TOY
• DURATION: 30 SECONDS
• GENRE 1: KIDS, AGES 3-8
• GENRE 2: TOYS
• MINIMUM PLAYOUT FREQUENCY: 3 HOURS
• MAXIMUM NUMBER OF PLAYS:10
• DO NOT PLAY BEFORE: 12/15/2000
• DO NOT PLAY AFTER: 1/11/2001
• TIME OF PLAY: BETWEEN 8 AM- 8 PM
• PRIORITY: 2
• USER DELAY ALLOWED: YES
• MAX DELAYS: 2
• USER REPLACEMENT ALLOWED: NO
• MAX REPLACEMENTS: 0
292
290
ADVERTISEMENT
INTERACTIVE QUERY:

FIG. 8

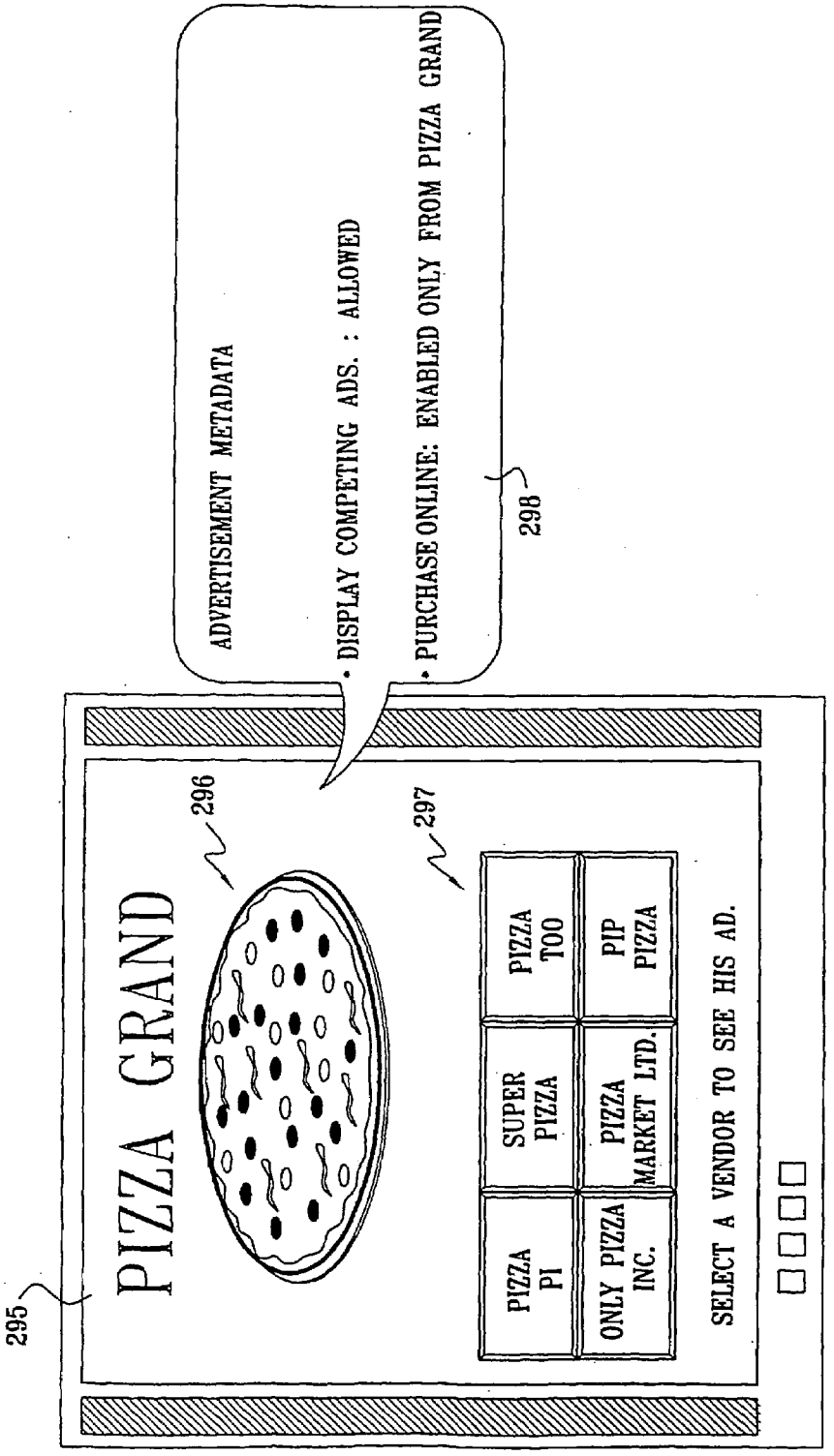

ADVERTISEMENT METADATA
• DISPLAY COMPETING ADS. : ALLOWED
• PURCHASE ONLINE: ENABLED ONLY FROM PIZZA GRAND
298
295
PIZZA GRAND
296
297
PIZZA PI
SUPER PIZZA
PIZZA TOO
ONLY PIZZA INC.
PIZZA MARKET LTD.
PIP PIZZA
SELECT A VENDOR TO SEE HIS AD.

FIG. 9A

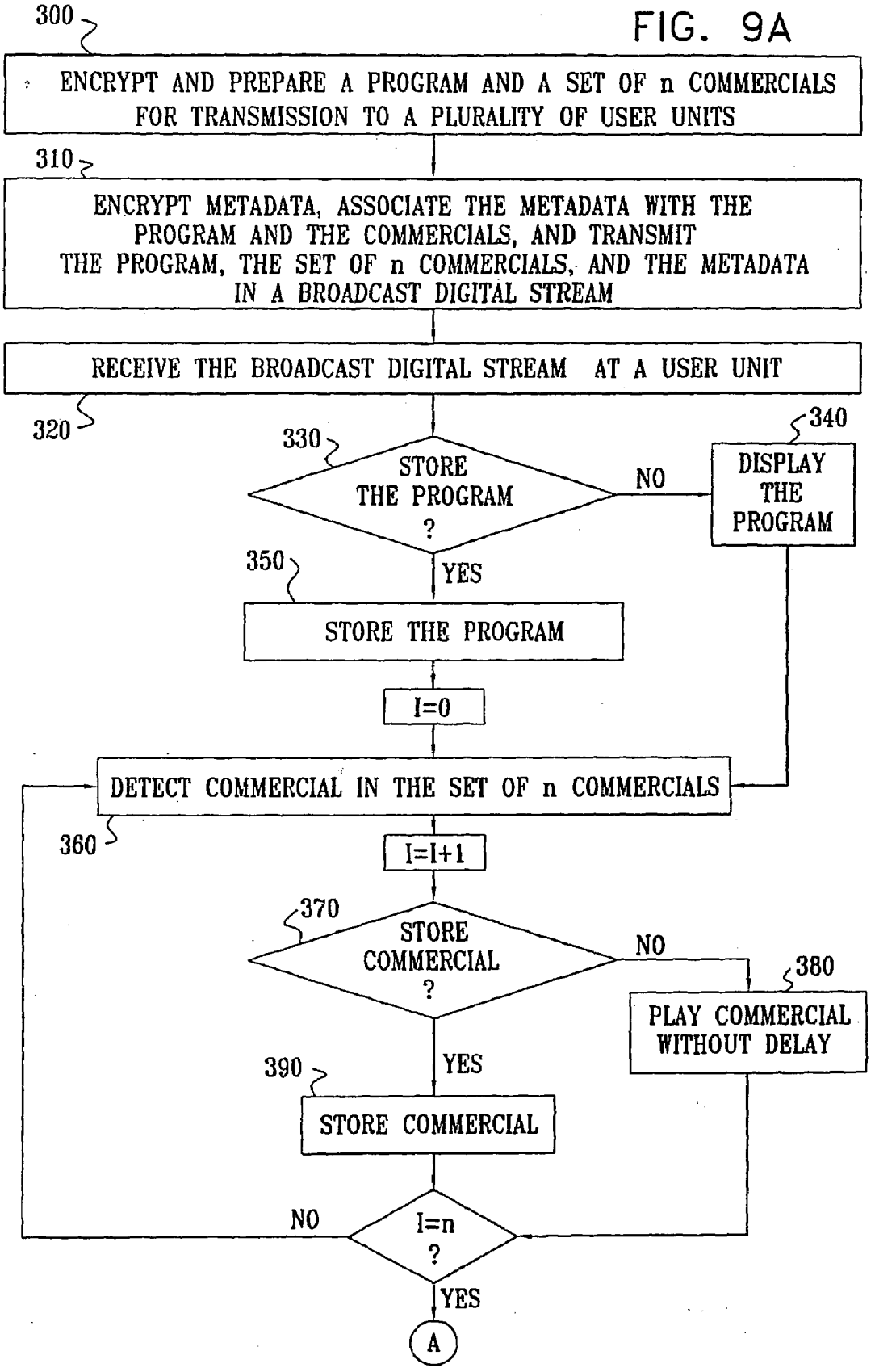

300
ENCRYPT AND PREPARE A PROGRAM AND A SET OF n COMMERCIALS FOR TRANSMISSION TO A PLURALITY OF USER UNITS
310
ENCRYPT METADATA, ASSOCIATE THE METADATA WITH THE PROGRAM AND THE COMMERCIALS, AND TRANSMIT THE PROGRAM, THE SET OF n COMMERCIALS, AND THE METADATA IN A BROADCAST DIGITAL STREAM
RECEIVE THE BROADCAST DIGITAL STREAM AT A USER UNIT
320
330
STORE THE PROGRAM ?
NO
340
DISPLAY THE PROGRAM
YES
350
STORE THE PROGRAM
I=0
DETECT COMMERCIAL IN THE SET OF n COMMERCIALS
360
I=I+1
370
STORE COMMERCIAL ?
NO
380
PLAY COMMERCIAL WITHOUT DELAY
YES
390
STORE COMMERCIAL
NO
I=n ?
YES
A

FIG. 9B

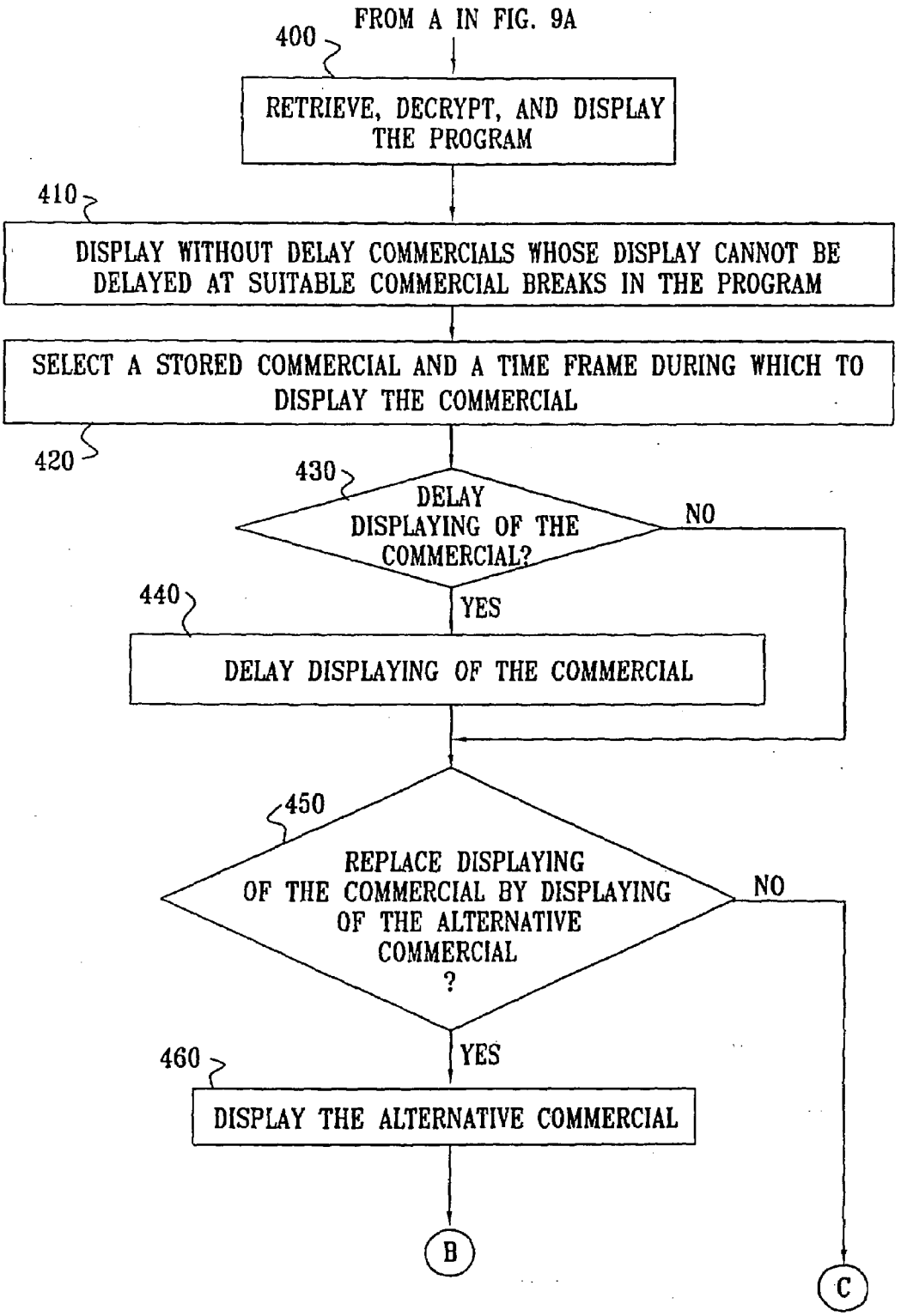

FROM A IN FIG. 9A
400
RETRIEVE, DECRYPT, AND DISPLAY THE PROGRAM
410
DISPLAY WITHOUT DELAY COMMERCIALS WHOSE DISPLAY CANNOT BE DELAYED AT SUITABLE COMMERCIAL BREAKS IN THE PROGRAM
SELECT A STORED COMMERCIAL AND A TIME FRAME DURING WHICH TO DISPLAY THE COMMERCIAL
420
430
DELAY DISPLAYING OF THE COMMERCIAL?
NO
YES
440
DELAY DISPLAYING OF THE COMMERCIAL
450
REPLACE DISPLAYING OF THE COMMERCIAL BY DISPLAYING OF THE ALTERNATIVE COMMERCIAL ?
NO
YES
460
DISPLAY THE ALTERNATIVE COMMERCIAL
B
C

FIG. 9C

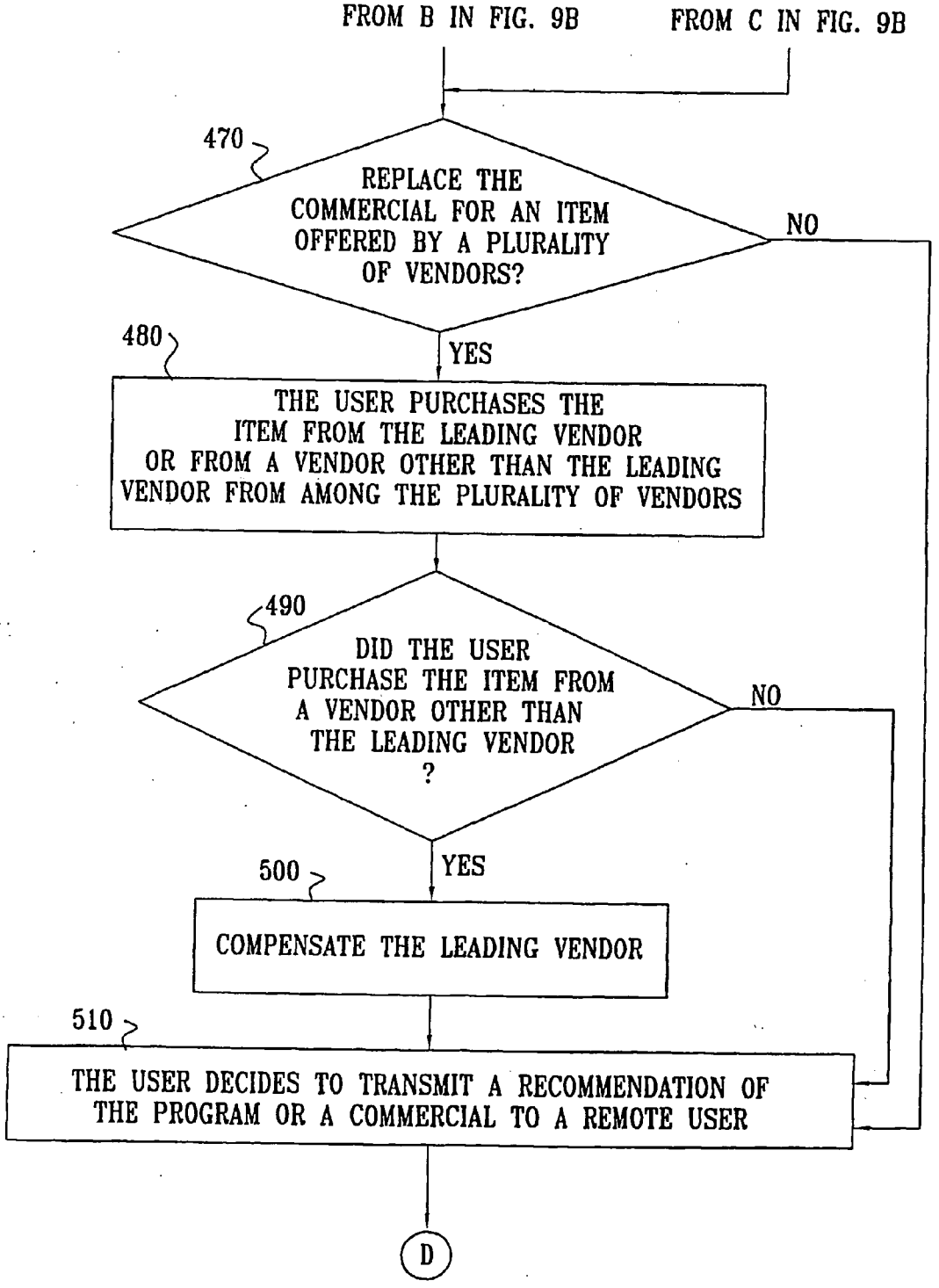

FROM B IN FIG. 9B
FROM C IN FIG. 9B
470
REPLACE THE COMMERCIAL FOR AN ITEM OFFERED BY A PLURALITY OF VENDORS?
NO
YES
480
THE USER PURCHASES THE ITEM FROM THE LEADING VENDOR OR FROM A VENDOR OTHER THAN THE LEADING VENDOR FROM AMONG THE PLURALITY OF VENDORS
490
DID THE USER PURCHASE THE ITEM FROM A VENDOR OTHER THAN THE LEADING VENDOR ?
NO
YES
500
COMPENSATE THE LEADING VENDOR
510
THE USER DECIDES TO TRANSMIT A RECOMMENDATION OF THE PROGRAM OR A COMMERCIAL TO A REMOTE USER
D

FIG. 9D

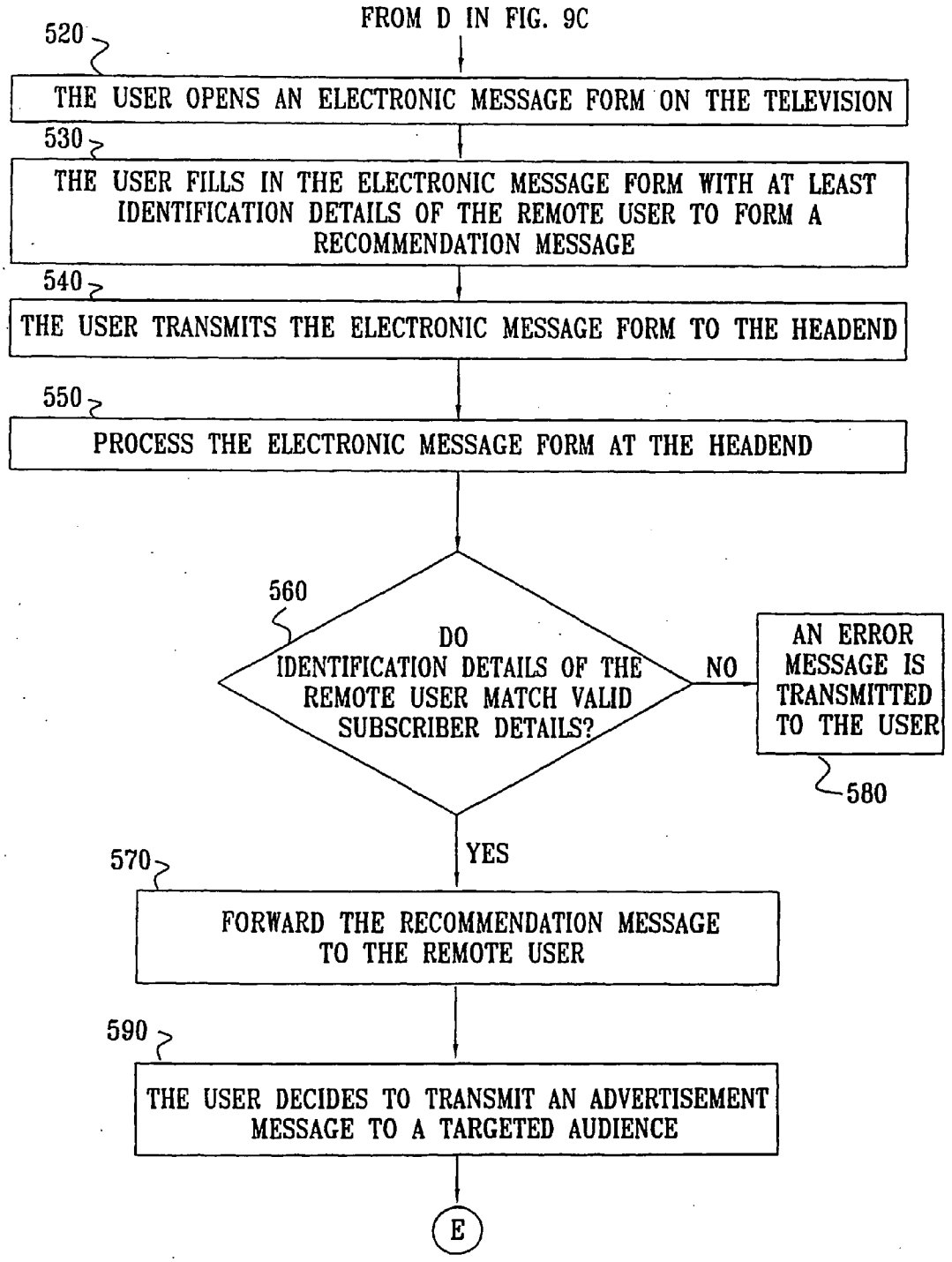
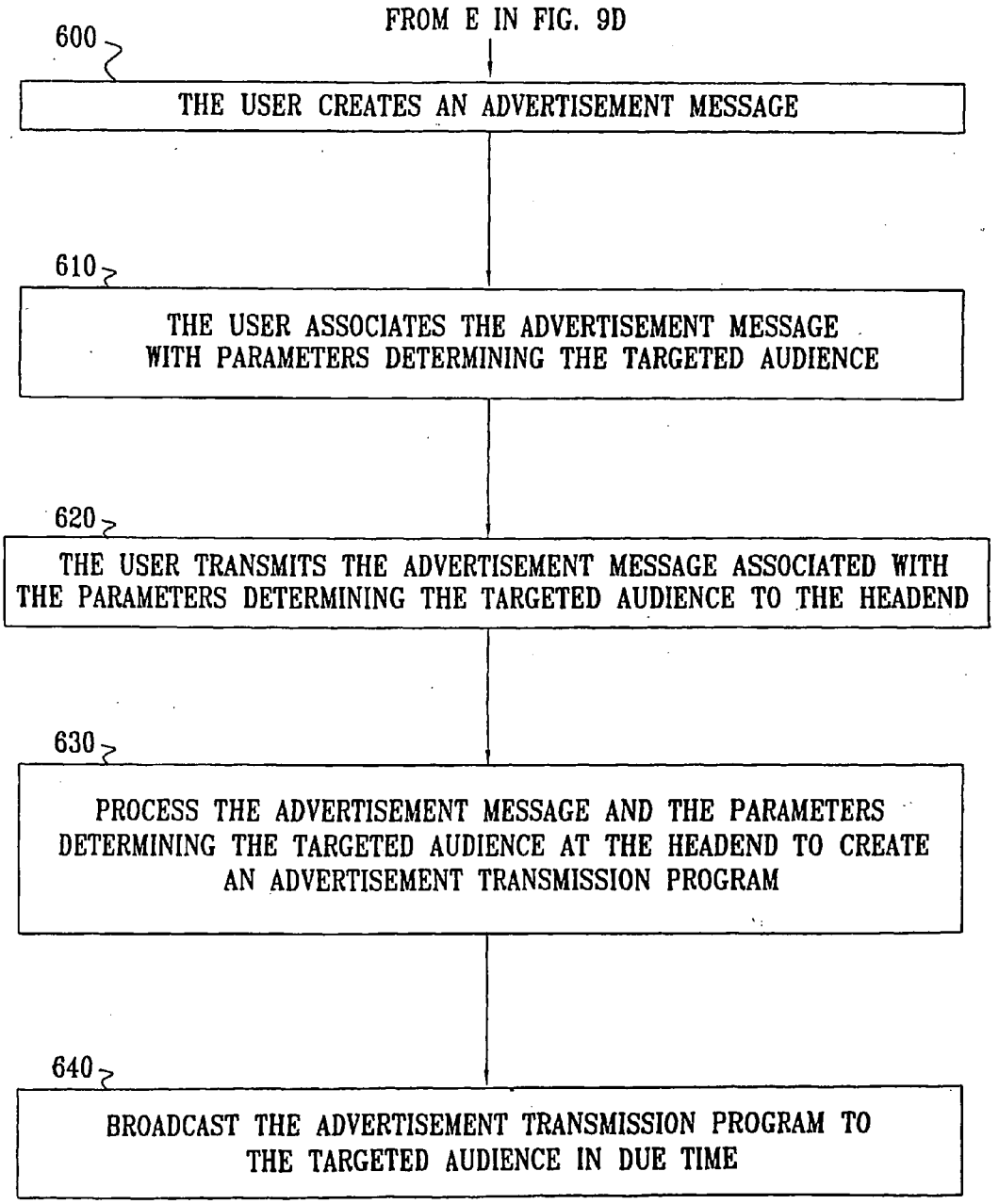

FROM D IN FIG. 9C
520
THE USER OPENS AN ELECTRONIC MESSAGE FORM ON THE TELEVISION
530
THE USER FILLS IN THE ELECTRONIC MESSAGE FORM WITH AT LEAST IDENTIFICATION DETAILS OF THE REMOTE USER TO FORM A RECOMMENDATION MESSAGE
540
THE USER TRANSMITS THE ELECTRONIC MESSAGE FORM TO THE HEADEND
550
PROCESS THE ELECTRONIC MESSAGE FORM AT THE HEADEND
560
DO IDENTIFICATION DETAILS OF THE REMOTE USER MATCH VALID SUBSCRIBER DETAILS?
NO
AN ERROR MESSAGE IS TRANSMITTED TO THE USER
580
YES
570
FORWARD THE RECOMMENDATION MESSAGE TO THE REMOTE USER
590
THE USER DECIDES TO TRANSMIT AN ADVERTISEMENT MESSAGE TO A TARGETED AUDIENCE
E

FIG. 9E


FROM E IN FIG. 9D
600
THE USER CREATES AN ADVERTISEMENT MESSAGE
610
THE USER ASSOCIATES THE ADVERTISEMENT MESSAGE WITH PARAMETERS DETERMINING THE TARGETED AUDIENCE
620
THE USER TRANSMITS THE ADVERTISEMENT MESSAGE ASSOCIATED WITH THE PARAMETERS DETERMINING THE TARGETED AUDIENCE TO THE HEADEND
630
PROCESS THE ADVERTISEMENT MESSAGE AND THE PARAMETERS DETERMINING THE TARGETED AUDIENCE AT THE HEADEND TO CREATE AN ADVERTISEMENT TRANSMISSION PROGRAM
640
BROADCAST THE ADVERTISEMENT TRANSMISSION PROGRAM TO THE TARGETED AUDIENCE IN DUE TIME

ADVERTISEMENTS IN AN END-USER CONTROLLED PLAYBACK ENVIRONMENT

FIELD OF THE INVENTION

[0001] The present invention generally relates to digital television.

BACKGROUND OF THE INVENTION

[0002] Conventional techniques for digital television recording which are available today typically enable recording of programs and advertisements or commercials associated with the programs. Conventional techniques, such as techniques using a standard home video cassette recorder (VCR), allow manual manipulation of programs and advertisements or commercials associated with the programs.

[0003] Some aspects of technologies that may be useful in understanding the present invention are described in the following patents and patent applications:

[0004] U.S. Pat. Nos. 5,414,773 and 5,715,315 to Handelman which describe a CATV system including a CATV network, a multiplicity of subscriber units, apparatus for transmitting over said CATV network encrypted information individually addressed to a subscriber unit and apparatus associated with each of the multiplicity of subscriber units for decoding the encrypted information addressed thereto;

[0005] U.S. patent application Ser. No. 09/515,118 to Wachtfogel et al and corresponding published PCT Application WO 00/01149 both assigned to NDS Limited which describe a digital television recording method comprising: broadcasting a television program associated with a broadcaster set of parameters enabling access to a first set of predetermined portions of the program; operating an agent for determining whether to record the program and for associating with the program, upon recording of the program, an agent set of parameters enabling access to a second set of predetermined portions of the program; storing the program together with the broadcaster set of parameters and the agent set of parameters to generate an addressable program; retrieving at least a portion of the addressable program; displaying the at least a portion of the addressable program to a user; receiving from the user a user set of parameters enabling access to a third set of predetermined portions of the addressable program; editing the addressable program to include said user set of parameters enabling access to the third set of predetermined portions of the addressable program thereby generating an edited addressable program; and storing the edited addressable program; and

[0006] Israel Patent Application 121230, submitted 3 Jul. 1997 and corresponding published PCT Application WO 99/01984 both assigned to NDS Limited which describe one system for using intelligent agents to customize an electronic program guide (EPG) based on user behavior.

[0007] U.S. Provisional Patent Applications 60/179,968 and 60/176,215 to Wachtfogel et al, the disclosures of which are hereby incorporated herein by reference, describe automated targeting and provisioning of advertisements in an end-user controlled playback environment.

[0008] The disclosures of all references mentioned above and throughout the present specification are hereby incorporated herein by reference.

SUMMARY OF THE INVENTION

[0009] The present invention seeks to provide improved methods and apparatus for manipulating programs and commercials and for enabling interactive operations on programs and commercials.

[0010] The existing techniques for dealing with advertisements do not enable useful manipulations of the programs and the commercials, such as controlling displaying of commercials, delaying displaying of commercials, selecting commercials to be displayed, and so forth.

[0011] The existing techniques also do not enable interactive operations such as transmission of recommendations to watch programs or commercials to friends. Thus, it is appreciated that techniques that will enable such manipulations and interactive operations will be highly desired.

[0012] In a preferred embodiment of the present invention, a program and a set of commercials to be played during program breaks are encrypted and prepared at a headend for transmission to a plurality of user units. Metadata to be associated with the program and the commercials is preferably encrypted for protection and transmitted together with the program and the set of commercials in a broadcast digital stream.

[0013] The metadata preferably includes data relating the commercials to the program and to other possible programs or pieces of broadcast content, content-related data that provides information about the program, and various types of tags, such as the following: delay tags indicating whether display of the commercials can be delayed; tags indicating valid vendors associated with frames displaying advertised items in order to prevent replacement of a commercial for an item offered by a plurality of vendors; and replacement tags indicating whether replacement of displaying commercials by displaying of alternative commercials associated therewith is allowed. If replacement of commercials for an item offered by a plurality of vendors is enabled, the metadata may also include links associating commercials with selection icons associated with a leading vendor from among a plurality of vendors.

[0014] The broadcast digital stream is preferably received at a user unit and, based upon predetermined criteria or criteria determined in real-time, the program may be displayed without delay or stored in the user unit for future display to a user of the user unit.

[0015] The commercials are preferably detected and stored or displayed without delay. The user is preferably enabled to manipulate stored commercials and/or interact with the commercials once such stored commercials are detected. The user may thus perform at least one of the following operations: delay displaying of a commercial; replace displaying of the commercial by displaying of an alternative commercial; and operate a selection icon to purchase the item from the leading vendor or from a vendor other than the leading vendor from among the plurality of vendors. In a case where the user purchases the item from a vendor other than the leading vendor, the leading vendor may be compensated. The user may also preferably transmit a recommendation of the program or a commercial to a remote user and/or transmit an advertisement message to a targeted audience.

[0016] There is thus provided in accordance with a preferred embodiment of the present invention a method for displaying advertisements transmitted to a user unit, the method including receiving, at the user unit, at least one advertisement tagged with a delay tag indicating whether display of the at least one advertisement can be delayed, and only if the delay tag allows delaying display of the at least one advertisement: storing the at least one advertisement at the user unit, retrieving the at least one advertisement, and displaying the at least one advertisement.

[0017] Further in accordance with a preferred embodiment of the present invention the method also includes displaying the at least one advertisement without delay if the delay tag does not allow delaying display of the at least one advertisement.

[0018] Still further in accordance with a preferred embodiment of the present invention the delay tag also indicates whether a user of the user unit can control display of the at least one advertisement, and the displaying includes, only if the delay tag indicates that the user can control display of the at least one advertisement: retrieving the at least one advertisement in response to a selection made by the user, and displaying the at least one advertisement.

[0019] Additionally in accordance with a preferred embodiment of the present invention the delay tag also indicates a maximum allowed delay time period for displaying the at least one advertisement, and the displaying includes displaying the at least one advertisement after the maximum allowed delay time period elapses if the at least one advertisement had not been displayed before the maximum allowed delay time period elapsed.

[0020] Moreover in accordance with a preferred embodiment of the present invention the delay tag also indicates a non-advertising programming (NAP) threshold defining a maximum amount of NAP that may be displayed before the at least one advertisement must be displayed, and the displaying includes determining an amount of NAP that has already been displayed, and displaying the at least one advertisement without delay if the amount of NAP that has already been displayed is greater than or equal to the NAP threshold.

[0021] Further in accordance with a preferred embodiment of the present invention the amount of NAP is defined by an accumulated time of display of NAP.

[0022] Still further in accordance with a preferred embodiment of the present invention the delay tag is assigned a guaranteed delivery attribute that forces the at least one advertisement to be displayed eventually.

[0023] Additionally in accordance with a preferred embodiment of the present invention the delay tag is assigned the guaranteed delivery attribute in response to a payment for assigning the guaranteed delivery attribute.

[0024] There is thus provided in accordance with another preferred embodiment of the present invention a method for displaying advertisements transmitted to a user unit, the method including receiving, at the user unit, at least one advertisement tagged with a tag indicating a non-advertising programming (NAP) threshold which defines a maximum amount of NAP that may be displayed before the at least one advertisement must be displayed, determining an amount of NAP that has already been displayed at the user unit, and displaying the at least one advertisement without delay if the amount of NAP that has already been displayed at the user unit is greater than or equal to the NAP threshold.

[0025] Further in accordance with a preferred embodiment of the present invention t the amount of NAP is defined by an accumulated time of display of NAP.

[0026] Still further in accordance with a preferred embodiment of the present invention t the NAP includes a plurality of categorized NAP elements $NAP_1, \ldots, NAP_n$ having n separate weight factors where n is an index, and the amount of NAP is defined by a weighted sum of time of display of all the categorized NAP elements $NAP_1, \ldots, NAP_n$.

[0027] Additionally in accordance with a preferred embodiment of the present invention each of the plurality of categorized NAP elements $NAP_1, \ldots, NAP_n$ is associated with a service-level determining a quality-of-service (QoS).

[0028] Moreover in accordance with a preferred embodiment of the present invention t each weight factor i in the n separate weight factors is inversely related to an amount of payment for a corresponding NAP_i.

[0029] Further in accordance with a preferred embodiment of the present invention each weight factor i in the n separate weight factors is inversely proportional to an amount of payment for a corresponding NAP_i.

[0030] Still further in accordance with a preferred embodiment of the present invention the amount of NAP is directly related to a number of viewing points that are accumulated by a user viewing the NAP.

[0031] Additionally in accordance with a preferred embodiment of the present invention the displaying includes: determining that the at least one advertisement is currently at the top of a play-list queue of advertisements to be displayed, and displaying the at least one advertisement without delay in accordance with a result of the determining.

[0032] There is thus provided in accordance with another preferred embodiment of the present invention a method for displaying advertisements transmitted to a user unit, the method includes: receiving, at the user unit, at least one advertisement associated with at least one alternative advertisement, the at least one advertisement being tagged with a replacement tag indicating whether a user of the user unit is allowed to replace displaying of the at least one advertisement by displaying of the at least one alternative advertisement, and displaying one of the at least one advertisement and the at least one alternative advertisement in accordance with a value of the replacement tag and a selection of the user:

[0033] Further in accordance with a preferred embodiment of the present invention the method also including, prior to the displaying: determining that the at least one advertisement and the at least one alternative advertisement are not competing advertisements, and performing the displaying based, at least in part, on a result of the determining.

[0034] Still further in accordance with a preferred embodiment of the present invention the replacement tag also provides an archiving indication indicating which one of the at least one advertisement and the at least one alternative advertisement is to be archived, and the method also includes archiving one of the at least one advertisement and the at least one alternative advertisement based on the archiving indication.

[0035] Additionally in accordance with a preferred embodiment of the present invention the archiving includes archiving one of the at least one advertisement and the at least one alternative advertisement in response to payment by an advertiser of a corresponding one of the at least one advertisement and the at least one alternative advertisement.

[0036] There is thus provided in accordance with another preferred embodiment of the present invention a method for enabling a first user to transmit a recommendation of a transmitted program to a second user via a communication network, the method includes: opening an electronic message form on a display, the electronic message form including an identification of the transmitted program if the transmitted program is at least one of the following highlighted, marked, and viewed by the first user, filling in the electronic message form to form a recommendation message, the filling in including filling in at least identification details of the second user, transmitting, via the communication network, the electronic message form to a headend of the communication network, processing, at the headend, the electronic form to match the identification details of the second user with valid subscriber details, and forwarding the recommendation message to the second user in response to a positive match of the identification details of the second user with valid subscriber details.

[0037] Further in accordance with a preferred embodiment of the present invention the filling in also includes filling in authorization data authorizing the headend to bill the first user for the second user viewing the transmitted program in response to the recommendation message.

[0038] Still further in accordance with a preferred embodiment of the present invention the authorization data includes a selection of a method of payment.

[0039] Additionally in accordance with a preferred embodiment of the present invention the method of payment includes one of the following payment from a bank account, payment by a credit card, and payment by debiting a smart card.

[0040] Moreover in accordance with a preferred embodiment of the present invention the filling in also includes filling in program related information including at least one of the following a title of the transmitted program, an identification of a recommended episode, a date and a time of creation of the recommendation message, parental rating of the transmitted program, and a viewing rating assigned to the transmitted program by the first user.

[0041] Further in accordance with a preferred embodiment of the present invention the transmitted program includes an advertisement.

[0042] Still further in accordance with a preferred embodiment of the present invention the processing includes verifying an entitlement of the first user to provide the recommendation message to the second user.

[0043] Additionally in accordance with a preferred embodiment of the present invention the verifying is performed at least one of the following: the headend, a removable security element at a user unit operated by the first user, and a removable security element at a user unit operated by the second user.

[0044] Moreover in accordance with a preferred embodiment of the present invention at least one of the removable security elements includes a smart card.

[0045] Further in accordance with a preferred embodiment of the present invention the processing includes verifying an entitlement of the second user to receive the recommendation message from the first user.

[0046] Still further in accordance with a preferred embodiment of the present invention the method also includes attaching a video clip message to the recommendation message prior to the transmitting the electronic message form to the headend.

[0047] Additionally in accordance with a preferred embodiment of the present invention the method also includes assigning the transmitted program a high viewing priority for the second user in response to the forwarding the recommendation message to the second user.

[0048] Moreover in accordance with a preferred embodiment of the present invention the high viewing priority includes a highest viewing priority.

[0049] Further in accordance with a preferred embodiment of the present invention the forwarding includes: transmitting the recommendation message to the second user if the second user is served by the headend, and transmitting the recommendation message to an information service provider that serves the second user if the second user is not served by the headend.

[0050] Still further in accordance with a preferred embodiment of the present invention a method also including enabling the second user to block reception of the recommendation message.

[0051] There is thus provided in accordance with another preferred embodiment of the present invention a payment method for a pay television system, the method includes billing a user by a sum of money which is a calculated by subtracting, from a predetermined price for a program, a result of a substitution of an actual duration-of-display of advertisements associated with the program in a predetermined arithmetic function that correlates the predetermined price for the program to a predetermined duration-of-display of advertisements associated with the program.

[0052] There is thus provided in accordance with still another preferred embodiment of the present invention a method for counteracting replacement of advertisements for an item offered by a plurality of vendors, the method includes associating a frame displaying the item with a tag indicating a valid vendor, and preventing replacement of the item by other than the valid vendor.

[0053] Further in accordance with a preferred embodiment of the present invention a method also including, prior to the associating, encrypting the tag.

[0054] There is thus provided in accordance with another preferred embodiment of the present invention a method for replacing advertisements for an item offered by a plurality of vendors, the method includes: displaying an advertisement of the item associated with a selection icon associated with a leading vendor from among the plurality of vendors, displaying offers to purchase the item by the leading vendor and by vendors from the plurality of vendors other than the leading vendor upon selection of the selection icon, and compensating the leading vendor for a purchase of the item from a vendor other than the leading vendor.

[0055] Further in accordance with a preferred embodiment of the present invention the compensating includes at least one of the following: crediting an account of the leading vendor, and crediting an amount of advertisements of the leading vendor.

[0056] There is thus provided in accordance with another preferred embodiment of the present invention a personal advertisement method for enabling a user to transmit an advertisement message to a targeted audience, the method includes: creating an advertisement message, associating the advertisement message with parameters determining the tar-

geted audience, transmitting the advertisement message associated with the parameters determining the targeted audience to a headend, processing, at the headend, the advertisement message and the parameters determining the targeted audience to create an advertisement transmission program scheduled for broadcast to the targeted audience, and broadcasting the advertisement program to the targeted audience.

[0057] Further in accordance with a preferred embodiment of the present invention the method also includes associating the advertisement message with parameters determining at least one of the following: an expiration date of the advertisement message, a delivery mode determining a priority of broadcast of the advertisement transmission program, and a method of payment for broadcasting the advertisement transmission program.

[0058] Still further in accordance with a preferred embodiment of the present invention the parameters determining the targeted audience include at least one of the following an age group of viewers, residence areas of viewers, a pre-specified field of interest of viewers, an income level of viewers, gender of viewers, and types of programs being watched by viewers.

[0059] Additionally in accordance with a preferred embodiment of the present invention the method of payment includes one of the following: payment from a bank account, payment by a credit card, and payment by debiting a debit card.

[0060] Moreover in accordance with a preferred embodiment of the present invention the debit card includes a smart card.

[0061] There is thus provided in accordance with another preferred embodiment of the present invention a method for detecting a broadcast commercial in a broadcast digital stream, the method includes detecting indicia in metadata added to the broadcast digital stream, the indicia indicating at least one of the following a start point of the commercial, an end point of the commercial, and a presence point within the commercial.

[0062] There is thus provided in accordance with still another preferred embodiment of the present invention a method for detecting a broadcast commercial in a broadcast digital stream, the method includes performing an analysis on content of the broadcast digital stream to detect parameters characterizing the commercial.

[0063] Further in accordance with a preferred embodiment of the present invention, the parameters include at least one of the following: an indication of a sequence of a length typical to a broadcast commercial, an indication of a repetition of a sequence of a length typical to a broadcast commercial, an indication of a sequence of a length typical to a broadcast commercial at predetermined times known to be likely to include commercial breaks, an indication of a sequence of a length typical to a broadcast commercial between program events, and an indication of a sequence of a length typical to a broadcast commercial within a program event.

[0064] There is thus provided in accordance with another preferred embodiment of the present invention a method for detecting a broadcast commercial in a broadcast digital stream, the method includes performing an analysis on a user behavior during display of the broadcast digital stream to detect behavior characteristics associated with user behavior during display of commercials.

[0065] There is thus provided in accordance with still another preferred embodiment of the present invention a method for storing a broadcast commercial for future display to a user, the method including determining whether to store the broadcast commercial based upon at least one of the following a predetermined preference of the user for an item being advertised in the commercial, a previous purchase of an item being advertised in the commercial, and correspondence of at least one characteristic associated with the commercial to user profile information, and storing the broadcast commercial in response to a result of the determining.

[0066] There is thus provided in accordance with yet another preferred embodiment of the present invention a method for displaying a stored broadcast commercial to a user, the method including determining whether to display the broadcast commercial based upon at least one of the following metadata associated with content displayed to the user which indicates when a potential commercial occurs, a required frequency of a commercial break, a time of day, a time window during which the broadcast commercial is valid, analysis of an event, a request of the user, and an indication of the user that he has viewed enough, and displaying the broadcast commercial in response to a result of the determining.

[0067] There is thus provided in accordance with another preferred embodiment of the present invention a method for selecting a stored broadcast commercial for displaying to a user, the method includes determining whether to select the broadcast commercial based upon at least one of the following a number of times the commercial has already been displayed to the user, a number of times other commercials advertising the same item advertised by the commercial have already been displayed to the user, a type of product advertised in the commercial, an event currently being viewed, an offer induced by metadata, a relation to other commercials, a predetermined date, and position in a sequence of teaser commercials, and selecting the commercial for displaying to the user in response to a result of the determining.

[0068] There is thus provided in accordance with still another preferred embodiment of the present invention a method for protecting metadata added to a broadcast digital stream, the method includes encrypting the metadata prior to broadcast to users, and enabling decrypting of the metadata in response to performance of an authorization procedure.

[0069] Further in accordance with a preferred embodiment of the present invention the authorization procedure includes at least one of the following an authentication procedure authenticating a transmitting entity, and a co-dependency procedure correlating the metadata to content.

[0070] There is thus provided in accordance with another preferred embodiment of the present invention a billing method associated with a broadcast commercial broadcast to a multiplicity of users, the method including receiving reports corresponding to the commercial from at least some of the plurality of users, and performing at least one of the following in response to the receiving crediting the at least some of the plurality of users by an amount of credit, and charging an advertiser of the commercial by an amount of charge.

[0071] Further in accordance with a preferred embodiment of the present invention the amount of credit includes a predetermined amount of credit.

[0072] Still further in accordance with a preferred embodiment of the present invention the predetermined amount of credit includes a fixed amount of credit.

[0073] Additionally in accordance with a preferred embodiment of the present invention the amount of charge is proportional to a number of the reports.

[0074] There is thus provided in accordance with another preferred embodiment of the present invention a method for enabling a user to search advertisements transmitted to a user unit, the method including receiving, at the user unit, a plurality of advertisements including at least a sub-group of advertisements in which each advertisement is associated with an advertisement category tag categorizing the advertisement according to types of items advertised in the advertisement, and displaying, in response to a selection made by the user when viewing at least one advertisement from the sub-group of advertisements, identification elements of all advertisements in the sub-group, each identification element in the sub-group enabling the user to select an advertisement associated therewith.

[0075] Further in accordance with a preferred embodiment of the present invention the displaying includes simultaneously displaying the identification elements of at least some of the advertisements in the sub-group.

[0076] Still further in accordance with a preferred embodiment of the present invention each identification element includes at least one of the following an icon identifying an advertisement in the sub-group, an index identifying an advertisement in the sub-group, a code identifying an advertisement in the sub-group, an image from an advertisement in the sub-group, and a video clip of an advertisement in the sub-group.

[0077] Additionally in accordance with a preferred embodiment of the present invention the identification elements are arranged in a mosaic display.

[0078] There is thus provided in accordance with another preferred embodiment of the present invention a method for purchasing an item via a communication network, the item being offered by a plurality of vendors and advertised in advertisements provided by the plurality of vendors, the method includes determining one of the plurality of vendors as a leading vendor in response to a payment by the leading vendor, displaying the advertisements of the item and an offer to purchase the item from the leading vendor, and enabling users to purchase the item via the communication network only from the leading vendor.

[0079] There is thus provided in accordance with still another preferred embodiment of the present invention a method for deleting a stored broadcast commercial, the method includes determining whether to delete the broadcast commercial based upon at least one of the following: a predetermined elapsed time period of the broadcast commercial, a number of times the broadcast commercial has been displayed, in response to receipt of an erase signal, a request of a user not to present commercials of a particular vendor, and a payment made to prevent the stored broadcast commercial from being deleted, and deleting the broadcast commercial in response to a result of the determining.

[0080] Further in accordance with a preferred embodiment of the present invention the deleting includes transmitting a delete trigger signal in a secure mode.

[0081] There is thus provided in accordance with another preferred embodiment of the present invention a user unit for displaying transmitted advertisements, the user unit including a receiver operative to receive at least one advertisement tagged with a delay tag indicating whether display of the at least one advertisement can be delayed, a memory, a display, and a controller operatively associated with the receiver, the memory and the display and operative to store the at least one advertisement in the memory only if the delay tag allows delaying display of the at least one advertisement, and to retrieve the at least one advertisement from the memory for displaying the at least one advertisement on the display.

[0082] There is thus provided in accordance with still another preferred embodiment of the present invention a user unit for displaying transmitted advertisements, the user unit including a receiver operative to receive at least one advertisement tagged with a tag indicating a non-advertising programming (NAP) threshold which defines a maximum amount of NAP that may be displayed on a display before the at least one advertisement must be displayed, and a controller operatively associated with the receiver and operative to determine an amount of NAP that has already been displayed, and to provide the at least one advertisement without delay to the display for display thereby if the amount of NAP that has already been displayed is greater than or equal to the NAP threshold.

[0083] There is thus provided in accordance with yet another preferred embodiment of the present invention a user unit for displaying transmitted advertisements, the user unit including a receiver for receiving at least one advertisement associated with at least one alternative advertisement, the at least one advertisement being tagged with a replacement tag indicating whether a user of the user unit is allowed to replace displaying of the at least one advertisement by displaying of the at least one alternative advertisement, and a controller operatively associated with the receiver and operative to provide one of the at least one advertisement and the at least one alternative advertisement to a display for display thereby in accordance with a value of the replacement tag and a selection of the user.

[0084] There is thus provided in accordance with another preferred embodiment of the present invention a user unit for enabling a first user to transmit a recommendation of a transmitted program to a second user via a communication network, the user unit including a processor operative to generate an electronic message form and to provide the electronic message form to an on-screen display (OSD) unit for display on a display, the electronic message form including an identification of the transmitted program if the transmitted program is at least one of the following highlighted, marked, and viewed by the first user, an input/output (I/O) interface operatively associated with the processor and operative to receive from the first user information filling in the electronic message form for producing a recommendation message, the information including at least identification details of the second user, and a communication interface operatively associated with the processor and operative to transmit the electronic message form including the information to a headend of the communication network for forwarding by the headend to the second user in response to a positive match of the identification details of the second user with valid subscriber details.

[0085] There is thus provided in accordance with still another preferred embodiment of the present invention a billing system in a pay television system, the billing system including a processor operative to calculate a sum of money by subtracting, from a predetermined price for a program, a result of a substitution of an actual duration-of-display of advertisements associated with the program in a predetermined arithmetic function that correlates the predetermined price for the program to a predetermined duration-of-display of advertisements associated with the program, and account-

ing apparatus operatively associated with the processor and operative to bill the user by the sum of money

[0086] There is thus provided in accordance with yet another preferred embodiment of the present invention a transmission system for counteracting replacement of advertisements for an item offered by a plurality of vendors, the system including a multiplexer operative to associate a frame displaying the item with a tag indicating a valid vendor, and a transmitter operatively associated with the multiplexer and operative to transmit the frame in association with the tag.

[0087] There is thus provided in accordance with another preferred embodiment of the present invention a user unit for replacing advertisements for an item offered by a plurality of vendors, the user unit including a display, and a processor operatively associated with the display and operative to display on the display an advertisement of the item associated with a selection icon associated with a leading vendor from among the plurality of vendors and offers to purchase the item by the leading vendor and by vendors from the plurality of vendors other than the leading vendor upon selection of the selection icon, and to compensate the leading vendor for a purchase of the item from a vendor other than the leading vendor.

[0088] There is thus provided in accordance with still another preferred embodiment of the present invention a user unit for enabling a user to transmit an advertisement message to a targeted audience, the user unit including an input/output (I/O) interface, a processor operatively associated with the I/O interface and operative to create an advertisement message in response to input inputted via the I/O interface and to associate the advertisement message with parameters determining the targeted audience, and a communication interface operatively associated with the processor and operative to transmit the advertisement message associated with the parameters determining the targeted audience to a headend for creating an advertisement transmission program to be broadcast to the targeted audience and for broadcasting the advertisement program to the targeted audience.

[0089] There is thus provided in accordance with yet another preferred embodiment of the present invention a user unit for detecting a broadcast commercial in a broadcast digital stream, the user unit including a receiver operative to receive the broadcast digital stream including the broadcast commercial, and a detector operatively associated with the receiver and operative to detect indicia in metadata added to the broadcast digital stream, the indicia indicating at least one of the following a start point of the commercial, an end point of the commercial, and a presence point within the commercial.

[0090] There is thus provided in accordance with another preferred embodiment of the present invention a user unit for detecting a broadcast commercial in a broadcast digital stream, the user unit including a receiver operative to receive the broadcast digital stream including the broadcast commercial, and a processor operatively associated with the receiver and operative to perform an analysis on content of the broadcast digital stream to detect parameters characterizing the commercial.

[0091] There is thus provided in accordance with still another preferred embodiment of the present invention a user unit for detecting a broadcast commercial in a broadcast digital stream, the user unit including a receiver operative to receive the broadcast digital stream including the broadcast commercial, and a processor operatively associated with the receiver and operative to perform an analysis on a user behavior during display of the broadcast digital stream to detect behavior characteristics associated with user behavior during display of commercials.

[0092] There is thus provided in accordance with yet another preferred embodiment of the present invention an apparatus for storing a broadcast commercial for future display to a user, the apparatus including a processor operative to determine whether to store the broadcast commercial based upon at least one of the following a predetermined preference of the user for an item being advertised in the commercial, a previous purchase of an item being advertised in the commercial, and correspondence of at least one characteristic associated with the commercial to user profile information, and a memory operatively associated with the processor and operative to store the broadcast commercial in response to a determination to store the broadcast commercial which is provided by the processor.

[0093] There is thus provided in accordance with another preferred embodiment of the present invention an apparatus at a user unit that is operative to enable displaying of a stored broadcast commercial to a user, the apparatus including a processor operative to determine whether to display the broadcast commercial based upon at least one of the following metadata associated with content displayed to the user which indicates when a potential commercial occurs, a required frequency of a commercial break, a time of day, a time window during which the broadcast commercial is valid, analysis of an event, a request of the user, and an indication of the user that he has viewed enough, and an on-screen display (OSD) unit operatively associated with the processor and operative to provide the broadcast commercial to a display for displaying the broadcast commercial on the display in response to a determination to display the broadcast commercial which is provided by the processor.

[0094] There is thus provided in accordance with still another preferred embodiment of the present invention an apparatus at a user unit that is operative to enable selection of a stored broadcast commercial for displaying to a user, the apparatus including a processor operative to determine whether to select the broadcast commercial based upon at least one of the following a number of times the commercial has already been displayed to the user, a number of times other commercials advertising the same item advertised by the commercial have already been displayed to the user, a type of product advertised in the commercial, an event currently being viewed, an offer induced by metadata, a relation to other commercials, a predetermined date, and position in a sequence of teaser commercials, and retrieval apparatus operatively associated with the processor and operative to select the commercial for displaying to the user in response to a determination to select the broadcast commercial which is provided by the processor.

[0095] There is thus provided in accordance with yet another preferred embodiment of the present invention an apparatus for protecting metadata added to a broadcast digital stream, the apparatus including an encryptor operative to encrypt the metadata to provide encrypted metadata prior to broadcast to users, and a processor operatively associated with the encryptor and operative to add authorization information to the encrypted metadata, wherein decryption of the metadata is enabled only in response to performance of an authorization procedure utilizing the authorization information.

[0096] There is thus provided in accordance with another preferred embodiment of the present invention a billing system including a receiver operative to receive, from at least one user, reports corresponding to a commercial broadcast to a multiplicity of users, and accounting apparatus operatively associated with the receiver and operative to perform at least one of the following in response to reception of the reports crediting the at least one user by an amount of credit, and charging an advertiser of the commercial by an amount of charge.

[0097] There is thus provided in accordance with still another preferred embodiment of the present invention an apparatus at a user unit that is operative to enable a user to search advertisements transmitted to the user unit, the apparatus including a receiver operative to receive a plurality of advertisements including at least a sub-group of advertisements in which each advertisement is associated with an advertisement category tag categorizing the advertisement according to types of items advertised in the advertisement, and a display, and a processor operatively associated with the display and the receiver and operative to display on the display, in response to a selection made by the user when viewing at least one advertisement from the sub-group of advertisements, identification elements of all advertisements in the sub-group, each identification element in the sub-group enabling the user to select an advertisement associated therewith.

[0098] There is thus provided in accordance with yet another preferred embodiment of the present invention a system for enabling purchase of an item via a communication network, the item being offered by a plurality of vendors and advertised in advertisements provided by the plurality of vendors, the system including a receiver operative to receive the advertisements with a determination of one of the plurality of vendors as a leading vendor in response to a payment by the leading vendor, and a processor operatively associated with the receiver and operative to display on a display the advertisements and an offer to purchase the item from the leading vendor while enabling users to purchase the item via the communication network only from the leading vendor.

[0099] There is thus provided in accordance with another preferred embodiment of the present invention an apparatus at a user unit that is operative to enable deletion of a stored broadcast commercial, the apparatus including a memory in which the broadcast commercial is stored, and a processor operatively associated with the memory and operative to provide a determination whether to delete the broadcast commercial based upon at least one of the following: a pre-determined elapsed time period of the broadcast commercial, a number of times the broadcast commercial has been displayed, in response to receipt of an erase signal, a request of a user not to present commercials of a particular vendor, and a payment made to prevent the stored broadcast commercial from being deleted, and to delete the broadcast commercial in response to the determination.

BRIEF DESCRIPTION OF THE DRAWINGS

[0100] The present invention will be understood and appreciated more fully from the following detailed description, taken in conjunction with the drawings in which.

[0101] FIG. **1** is a simplified pictorial illustration of a preferred implementation of a digital television system constructed and operative in accordance with a preferred embodiment of the present invention;

[0102] FIG. **2** is a simplified pictorial illustration of a preferred implementation of a headend in the digital television system of FIG. **1**;

[0103] FIG. **3** is a simplified pictorial illustration of a preferred implementation of a user unit in the digital television system **10** of FIG. **1**;

[0104] FIG. **4** is a simplified pictorial illustration of a preferred implementation of a television screen showing delay options for advertisements that may be available to a user of the user unit of FIG. **3**;

[0105] FIG. **5** is a simplified pictorial illustration of a preferred implementation of a television screen showing advertisement selection options that may be available to a user of the user unit of FIG. **3**;

[0106] FIG. **6** is a simplified pictorial illustration of a preferred implementation of a television screen showing an example of an electronic message form that may be available to a user of the user unit of FIG. **3**;

[0107] FIG. **7** is a simplified pictorial illustration of a preferred implementation of a television screen showing an example of an advertisement message for transmission to a targeted audience;

[0108] FIG. **8** is a simplified pictorial illustration of a preferred implementation of a television screen showing an arrangement of competing advertisements of a plurality of vendors offering similar items; and

[0109] FIGS. **9A-9E**, taken together, comprise a simplified flowchart illustration of a preferred method of operation of the apparatus of FIGS. **1-3**.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

[0110] Reference is now made to FIG. **1**, which is a simplified pictorial illustration of a digital television system **10** constructed and operative in accordance with a preferred embodiment of the present invention.

[0111] The digital television system **10** preferably includes a headend **15** that transmits programs and advertisements or commercials to a plurality of advertising enabled user units **20** via a distribution medium such as a satellite **25**. It is appreciated that any other appropriate distribution medium or combination of distribution media may be used in place of or in addition to the satellite **25**. Without limiting the generality of the foregoing, appropriate distribution media may include any one or appropriate combination of the following: a telephone system, such as, for example, a public switched telephone system (PSTN) or a private telephone system; and cables such as, for example, coaxial cables or fiber optic cables.

[0112] The plurality of user units **20** may preferably communicate with the headend **15** via a return path that may be provided, for example, via a telephone network **30**. Preferably, each user unit **20** is operatively associated with a display **35**, such as a television display, for displaying the programs and advertisements or commercials transmitted from the headend **15**.

[0113] The terms "advertisement" and "commercial" are interchangeably used throughout the specification and claims to include any form of broadcast information that is used to promote sale of an item or a product. An advertisement or commercial may thus include, for example, any one or more of the following, either separately or in any appropriate com-

bination: a video clip; a still image; and audio such as, for example, audio associated with a video clip and/or a still image.

[0114] Reference is now additionally made to FIG. **2**, which is a simplified pictorial illustration of a preferred implementation of the headend **15** in the digital television system **10** of FIG. **1**. It is appreciated that the elements shown in FIG. **2** may be implemented in any appropriate combination of hardware and software, as is well known in the art.

[0115] The headend **15** preferably includes the following elements: a subscriber management system (SMS) **100**, a world-wide-web (WWW) server or a broadcast center **105**; a content manager system (CMS) **110**; advertisements (Ads) manager **115**; an advertisement (Ad) management system (AMS) **120**; a multiplexer (MUX) **125**; an encryptor **130**; a transmitter (TRX) **135**; an antenna **140**; and a network interface **145**.

[0116] Preferably, the headend **15** communicates with an Ads or commercials generator **150** or with a plurality thereof. The Ads generators **150** may include generators (not shown) of commercials that are to be transmitted by the headend **15** to the user units **20**. The generators of commercials may include, for example, film production equipment, video cameras and computers (all not shown) as is well known in the art. The Ads generators **150** preferably provide the commercials and metadata associated with the commercials to the AMS **120** which is preferably operative to apply management commands based on instructions provided by the Ads manager **115**. The AMS **120** is preferably operative to provide the commercials to the broadcast center **105**.

[0117] The term "metadata" is used throughout the specification and claims to include explanatory "text" and/or information and/or flags, icons and pointers to information that pertain to content in a digital broadcast stream and to users of the content, where the content in the broadcast digital stream typically includes television programs and/or commercials, but may also include other types of broadcast information such as the following: multimedia; audio; still images; computer-generated data and/or files; information from world wide web (WWW sites; and video clips. The contents of the metadata may thus preferably pertain to at least one of the following: an individual user or a plurality of users; and a piece of content or a plurality of pieces of content. The term "user" is used throughout the specification and claims to include a client/subscriber user or a broadcaster/operator user.

[0118] The metadata may be used to enable operations of users on the programs and/or the commercials and/or other pieces of content and selection of scenes or portions from the programs and/or the commercials and/or the other pieces of content. For example, metadata may include one or more of the following: tags or pointers that point at locations in a program and at scenes within a program where a commercial must be played and also at programs and commercials; an indication of a genre of a program that enables to select suitable commercials to be played in commercial breaks or after specific scenes within the program; Ads configurations; content-related data that provides information about a program and is to be presented to a user, for example, in banners and overlays; and accumulated viewing information that enables a determination whether and when to display commercials and which commercials to display.

[0119] The term "Ad configuration" is used throughout the specification and claims to include attributes that are assigned to an advertisement and are tailored on a per user basis. Ad configurations are preferably generated by the SMS **100** and provided by the SMS **100** to the broadcast center **105**, for example, according to users profile information, according to requests from users, or according to any other suitable criteria. One of the attributes assigned to each advertisement may include location of the advertisement in a play-list queue of advertisements to be displayed.

[0120] The broadcast center **105** preferably receives from the CMS **110** content classifications and a table associating viewing points with each commercial. The content classifications are preferably associated with classification of content items as programs or commercials. The viewing points preferably provide a weight to viewing of each commercial thereby quantifying commercial display time. For example, accumulation of a predetermined number of viewing points of commercials during a predetermined time period such as 8 hours by a viewer, may entitle the viewer to view programs without having to view additional commercials for two more hours. Alternatively, the viewing points may be associated with content and not with commercials as described herein below.

[0121] Preferably, the broadcast center **105** associates the content classifications to commercials and programs to be transmitted to the user units **20**, and viewing points as required and Ads configurations to the commercials, thereby generating content that is prepared for transmission to the user units **20**. Then, the broadcast center **105** preferably provides a portion of the content, which is to be encrypted, prepared for transmission to the user units **20**, to the encryptor **130**. The broadcast center **105** preferably provides the rest of the content, which is not to be encrypted, prepared for transmission to the user units **20**, to the MUX **125**.

[0122] The output of the encryptor **130** preferably includes an encrypted bit stream that is also preferably provided to the MUX **125**. The MUX **125** is preferably operative to combine the content provided thereto by the broadcast center **105** with the encrypted bit stream provided by the encryptor **130** to produce a multiplexed digital stream of encrypted and non-encrypted information. The multiplexed digital stream is preferably provided to the transmitter **135** for broadcasting to the user units **20** via the antenna **140**.

[0123] The terms "encrypt" and "decrypt" in all of their forms are used throughout the specification and claims to include all forms of information encryption/decryption ranging from simple scrambling/descrambling to hard encryption/decryption. In an analogous form, the term "encryptor" is used throughout the specification and claims to include apparatus that encrypts information, and the term "decrypter" is used throughout the specification and claims to include apparatus that decrypts information.

[0124] It is appreciated that the broadcast center **105** and the SMS **100** may communicate with the user units **20** over the telephone network **30** via the network interface **145**, or through any other appropriate means. Typically, the telephone network **30** is used for the return path from the user units **20** to the headend **15**, but it is appreciated that the headend **15** may also transmit information to the user units **20** via the telephone network **30**.

[0125] Reference is now made to FIG. **3** which is a simplified pictorial illustration of a preferred implementation of a user unit **20** in the digital television system **10** of FIG. **1**, the user unit **20** being constructed and operative in accordance with a preferred embodiment of the present invention.

[0126] The user unit **20** is preferably operative to receive transmissions broadcast from the headend **15** of FIG. **1** at a receiver and decoder unit **200**. Preferably, transmissions that are intended for immediate display are decrypted in the receiver and decoder **200** and provided to the display **35** of FIG. **1** for display thereon via an output port **205**. It is appreciated that the receiver and decoder unit **200** may decrypt the transmissions, for example, under control of a removable security element, such as a smart card **210** that may be accessed via a smart card reader **215**.

[0127] Preferably, transmissions that are not intended for immediate display are provided to a high capacity memory **220** for storage therein, for example, via a communication bus **225** and under control of a controller or processor **230**. The processor **230** may preferably receive instructions from a user operating a keyboard **235** or a remote control **240** via an input/output (I/O) interface **245**.

[0128] It is appreciated that the user unit **20** may optionally include a compressor/decompressor **227** and an encryptor/decrypter **229** for respectively compressing and encrypting the transmissions that are not intended for immediate display prior to storage in the memory **220**. Upon retrieval of stored information from the memory **220**, the encryptor/decrypter **229** preferably decrypts any retrieved encrypted information and the compressor/decompressor **227** preferably decompresses any retrieved compressed information.

[0129] Preferably, the processor **230** may provide messages and information to be overlaid on the display **35** to an on-screen-device (OSD) **250**. The OSD **250** is preferably operative to prepare the messages and the information to be overlaid on the display **35** in a format suitable for display on the display **35**, and to provide formatted messages and information to the display **35** via the communication bus **225**. The processor **230** may also provide information and requests of the user to be transmitted to the headend **15** of FIG. **1** to a communication interface **255** that may include, for example, a modem.

[0130] The communication interface **255** is preferably operative to communicate with the headend **15** via the telephone network **30** of FIG. **1**. Alternatively, the communication interface **255** may include any other suitable communication means that enable callback to the headend **15**. For example, and without limiting the generality of the foregoing:

[0131] the communication interface **255** may include a very small aperture terminal (VSAT) (not shown), in which case the communication interface **255** communicates with the headend **15** via the satellite **25** of FIG. **1**;

[0132] alternatively or additionally, the communication interface **255** may include a cellular telephone (not shown), in which case the communication interface **255** communicates with the headend **15** via a wireless communication network (not shown); and

[0133] further alternatively or additionally, the communication interface **255** may include a cable modem (not shown), in which case the communication interface **255** communicates with the headend **15** via coaxial cables or fiber optic cables (not shown).

[0134] The operation of the apparatus of FIGS. **1-3** is now briefly described. Programs, commercials and metadata associated with the programs and the commercials are preferably broadcast from the headend **15**. At the user units **20**, the programs and commercials are preferably displayed on the displays **35**, or stored for later display in the user units **20**. The user units **20** then preferably enable users to manipulate the programs and the commercials and to perform interactive operations on the programs and commercials as described below.

[0135] The metadata may preferably be protected by encrypting the metadata in the encryptor **130** prior to broadcast to users thereby producing encrypted metadata. The transmitter **135** then transmits the encrypted metadata in association with the broadcast digital stream to the user units **20**. At the user units **20**, decrypting of the metadata is enabled in response to performance of an authorization procedure, for example, in removable security elements associated with the user units **20**. The authorization procedure may preferably include at least one of the following: an authentication procedure authenticating a transmitting entity; and a co-dependency procedure correlating the metadata to content. Such protection of the metadata preferably prevents tampering with the metadata, or makes such tampering difficult.

[0136] When a broadcast digital stream including program material associated with at least one broadcast commercial and metadata is received at one of the user units **20**, herein after referred to as "the addressed user unit **20**", the receiver and decoder **200** at the addressed user unit **20** preferably receives the broadcast digital stream and detects the at least one broadcast commercial in order to enable interactivity with the at least one commercial and manipulations on the at least one commercial. The at least one commercial may preferably be detected by the processor **230** in the addressed user unit **20** which searches and detects indicia in the metadata that indicate at least one of the following: a start point of each commercial; an end point of each commercial; and a presence point within a commercial.

[0137] Alternatively, the processor **230** may detect the at least one commercial by performing an analysis on content of the broadcast digital stream to detect parameters characterizing the at least one commercial. The characterizing of the at least one commercial may include at least one of the following: an indication of a sequence of a length typical to a broadcast commercial; an indication of a repetition of a sequence of a length typical to a broadcast commercial; an indication of a sequence of a length typical to a broadcast commercial at predetermined times known to be likely to include commercial breaks; an indication of a sequence of a length typical to a broadcast commercial between program events; and an indication of a sequence of a length typical to a broadcast commercial within a program event.

[0138] Further alternatively, the processor **230** may detect the at least one commercial by performing an analysis on a user behavior during display of the broadcast digital stream to detect behavior characteristics associated with user behavior during display of commercials. Such user behavior may include, for example, frequent changes of channels, e.g., every 1-2 seconds.

[0139] It is appreciated that the at least one commercial may be broadcast in a plurality of forms, such as in configurations having various lengths, for example, a 30 seconds length or a 15 seconds length. In such a case, detection of the at least one commercial preferably includes detection of a current configuration of the at least one commercial.

[0140] In a preferred embodiment of the present invention the at least one commercial is tagged with a delay tag associated with the addressed user unit **20** and indicating whether a user of the addressed user unit **20** may delay display of the at least one commercial. Preferably, the processor **230** at the addressed user unit **20** analyzes the delay tag, and if the delay

tag does not allow delaying display of the at least one commercial, the processor **230** preferably prevents storage of the at least one commercial and instructs the receiver and decoder **200** to display the at least one commercial on the display **35** without delay.

[0141] If, however, the delay tag allows delaying display of the at least one commercial, the processor **230** preferably stores the at least one commercial in the memory **220**, optionally after compression and encryption in the compressor/decompressor **227** and the encryptor/decrypter **229** respectively. At a later time, and according to criteria predetermined or determined in real-time, the processor **230** preferably retrieves the at least one commercial from the memory **220**, decrypts and decompresses the at least one commercial as necessary, and enables displaying of the at least one commercial on the display **35**.

[0142] It is appreciated that the delay tag may also indicate whether a user of the addressed user unit **20** can control display of the at least one commercial. In such a case, and only if the delay tag indicates that the user can control display of the at least one commercial, the at least one commercial may be retrieved from the memory **220** and displayed on the display **35** in response to a selection made by the user.

[0143] The delay tag may also preferably indicate a maximum allowed delay time period for displaying the at least one commercial. In such a case, the processor **230** preferably imposes display of the at least one commercial after the maximum allowed delay time period elapses if the at least one commercial had not been displayed before the maximum allowed delay time period elapsed.

[0144] It is appreciated that a value assigned to the delay tag may be dependent on the length of the at least one commercial. For example, a standard 30 seconds length commercial may be delayed while a shorter commercial may not be delayed. Typically, a broadcast digital stream may include commercials having various lengths. Alternatively, the length of the at least one commercial may be defined by a separate commercial length tag that may be associated with the delay tag.

[0145] The at least one commercial received at the addressed user unit **20** may alternatively or additionally be tagged with a tag indicating a non-advertising programming (NAP) threshold which defines a maximum amount of NAP that may be displayed before the at least one commercial must be displayed. It is appreciated that the tag indicating a NAP threshold may be one of the following: separate from the delay tag; embodied in the delay tag; and associated with the delay tag.

[0146] Preferably, in a case where the at least one commercial is tagged with a tag indicating a NAP threshold, the processor **230** may determine an amount of NAP that has already been displayed at the addressed user unit **20**, and provide the at least one commercial to the display **35** at the addressed user unit **20** for display thereon without delay if the amount of NAP that has already been displayed at the addressed user unit **20** is greater than or equal to the NAP threshold.

[0147] The amount of NAP may be defined by an accumulated time of display of NAP. Alternatively, the NAP may be composed of a plurality of categorized NAP elements $NAP_1, \ldots, NAP_n$ having n separate weight factors where n is an index, and the amount of NAP may be defined by a weighted sum of time of display of all the categorized NAP elements $NAP_1, \ldots, NAP_n$.

[0148] It is appreciated that each of the plurality of categorized NAP elements $NAP_1, \ldots, NAP_n$ may be associated with a service-level determining a quality-of-service (QoS). Alternatively, each weight factor i in the n separate weight factors may be inversely related, such as by being inversely proportional, to an amount of payment for a corresponding NAP_i. In such a way, a time period during which a user views a pay television program, which is typically free of commercials because the user has already paid for the pay television program, will have little influence on the timing of display of the at least one commercial.

[0149] It is appreciated that the NAP threshold may be related directly to the number of viewing points that are accumulated by the user of the addressed user unit **20**. In such a case, the more viewing points the user accumulates by viewing commercials within a first time period, the more NAP is available to the user during a second time period.

[0150] In a case where viewing points as mentioned above with reference to FIG. **2** are associated with content, the NAP preferably corresponds to an amount of viewing points accumulated by the user viewing the NAP. Thus, when an amount of NAP that has already been displayed at the addressed user unit **20** exceeds the NAP threshold, that is when a current accumulation of viewing points exceeds a predetermined threshold of viewing points that corresponds to the NAP threshold, the at least one commercial must be displayed.

[0151] The delay tag may preferably be assigned a guaranteed delivery attribute that forces the at least one commercial to be displayed eventually, even if display of the at least one commercial is delayed. The delay tag is preferably assigned the guaranteed delivery attribute at the headend **15** in response to a payment for assigning the guaranteed delivery attribute, such payment being typically made by advertisers of the at least one commercial.

[0152] An example showing a preferred implementation of a television screen **260** displaying delay options available to the user for a commercial tagged with delay tags and metadata **265** associated with the commercial is depicted in FIG. **4**.

[0153] In another preferred embodiment of the present invention at least one advertisement associated with at least one alternative advertisement is transmitted from the headend **15** and received at the receiver and decoder **200**. The at least one advertisement is preferably tagged with a replacement tag indicating whether the user is allowed to replace displaying of the at least one advertisement by displaying of the at least one alternative advertisement.

[0154] Preferably, the processor **230** analyzes the replacement tag to determine that the at least one advertisement and the at least one alternative advertisement are not competing advertisements. Then, if the at least one advertisement and the at least one alternative advertisement are not competing advertisements, the processor **230** enables display of one of the at least one advertisement and the at least one alternative advertisement in accordance with a value of the replacement tag and a selection of the user.

[0155] It is appreciated that the replacement tag may also provide an archiving indication indicating which one of the at least one advertisement and the at least one alternative advertisement is to be archived. In such a case, one of the at least one advertisement and the at least one alternative advertisement may be archived based on the archiving indication. Preferably, archiving of one of the at least one advertisement and the at least one alternative advertisement is performed in response to a payment by an advertiser associated with a

corresponding one of the at least one advertisement and the at least one alternative advertisement.

[0156] An example showing a preferred implementation of a television screen **270** displaying Ad selection options available to the user and metadata **275** associated with the Ad selection options is depicted in FIG. **5**.

[0157] In accordance with yet another preferred embodiment of the present invention the user is enabled to transmit a recommendation of a transmitted program to a remote user of a remote user unit **20** (both not shown). It is appreciated that the transmitted program may include an advertisement.

[0158] Preferably, the user instructs the processor **230**, via the I/O interface **245** by using the keyboard **235** or the remote control **240**, to open an electronic message form on the display **35**. The processor **230** then preferably generates the electronic message form and provides the electronic message form to the OSD **250** for display thereby on the display **35**. It is appreciated that the generated electronic form may already include an identification of the transmitted program if the transmitted program is at least one of the following: highlighted; marked; and viewed by the user.

[0159] Preferably, the user fills in the electronic message form to form a recommendation message. It is appreciated that the user may preferably fill in the electronic message form at least identification details of the remote user. The user may also preferably attach a video clip message to the recommendation message.

[0160] Once the recommendation message is ready, and upon an instruction provided by the user, the processor **230** preferably provides the electronic message form to the communication interface **255** which preferably transmits the electronic message form to the headend **15** via the telephone network **30**. At the headend **15**, the electronic message form is preferably processed, for example at the SMS **100**, to match the identification details of the remote user with valid subscriber details. The headend **15** preferably forwards the recommendation message to the remote user in response to a positive match of the identification details of the remote user with valid subscriber details.

[0161] It is appreciated that the headend **15** may also assign the transmitted program a high viewing priority for the remote user upon forwarding the recommendation message to the remote user. The high viewing priority may include a highest viewing priority.

[0162] Preferably, the user may also fill in the electronic message form authorization data authorizing the headend **15** to bill the user for the remote user viewing the transmitted program in response to the recommendation message. The authorization data may preferably include a selection of a method of payment. The method of payment preferably includes one of the following: payment from a bank account; payment by a credit card; and payment by debiting a debit card such as, for example, a smart card or any other appropriate debit card.

[0163] Additionally, the user may also fill in program related information that includes at least one of the following: a title of the transmitted program; an identification of a recommended episode; a date and a time of creation of the recommendation message; parental rating of the transmitted program; and a viewing rating assigned to the transmitted program by the user.

[0164] It is appreciated that prior to forwarding the recommendation message to the remote user, a verification check may be performed to verify an entitlement of the user to provide the recommendation message to the remote user. The verification check is preferably performed at least one of the following: the headend; the smart card **210** at the user unit **20** operated by the user; and a removable security element, such as a smart card, at the remote user unit **20**. Furthermore, an additional verification check may preferably be performed to verify an entitlement of the remote user to receive the recommendation message from the user.

[0165] It is appreciated that the headend **15** preferably transmits the recommendation message to the remote user only if the remote user is served by the headend **15**. If the remote user is not served by the headend **15**, the headend **15** may transmit the recommendation message to an information service provider (ISP) (not shown) that serves the remote user, in which case the ISP may transmit the recommendation message to the remote user. It is appreciated that the remote user is preferably enabled to block reception of the recommendation message regardless of the recommending entity or the entity that transmits the recommendation message.

[0166] An example showing a preferred implementation of a television screen **280** displaying an example of an electronic message form **282** and metadata **285** associated with a message filled in the electronic message form is depicted in FIG. **6**.

[0167] In accordance with still another preferred embodiment of the present invention the user is enabled to transmit an advertisement message to a targeted audience. In such a case, the user may create an advertisement message by entering suitable inputs via the keyboard **235** or the remote control **240**. The inputs of the user preferably include a description of the advertisement message and parameters determining the targeted audience, where the parameters determining the targeted audience may include, for example, any one or more of the following: an age group of viewers; residence areas of viewers; a pre-specified field of interest of viewers; an income level of viewers; gender of viewers; and types of programs being watched by viewers. It is appreciated that other appropriate parameters determining the targeted audience may alternatively be used.

[0168] Preferably, the inputs of the user are provided to the processor **230** via the I/O interface **245**, and the processor **230** preferably creates the advertisement message and associates the advertisement message with the parameters determining the targeted audience. Then, the processor **230** preferably provides the advertisement message associated with the parameters determining the targeted audience to the communication interface **255** which is operative to transmit the advertisement message associated with the parameters determining the targeted audience to the headend **15**.

[0169] At the headend **15**, the advertisement message and the parameters determining the targeted audience are preferably processed, for example in the broadcast center **105**, to create an advertisement transmission program scheduled for broadcast to the targeted audience. The advertisement transmission program is then broadcast to the targeted audience in accordance with a programmed schedule of transmission.

[0170] It is appreciated that the user may also input parameters determining at least one of the following: an expiration date of the advertisement message; a delivery mode determining a priority of broadcast of the advertisement transmission program; and a method of payment for broadcasting the advertisement transmission program. The method of payment may include one of the following: payment from a bank account; payment by a credit card; and payment by debiting a

debit card. The debit card may preferably include a smart card, such as the smart card **210**.

[0171] A television screen **290** displaying an example of an advertisement message for transmission to a targeted audience and metadata **292** associated with the advertisement message is depicted in FIG. **7**. Further examples of advertisement messages for transmission to a targeted audience are described in U.S. Provisional Patent Applications 60/179,968 and 60/176,215 to Wachtfogel et al the disclosures of which are incorporated herein by reference.

[0172] In accordance with a preferred embodiment of the present invention a broadcast commercial that is received at the receiver and decoder **200** may be stored for future display to the user and then, based on criteria predetermined or determined in real-time, selected and displayed on the display **35**. It is appreciated that storage of the broadcast commercial is preferably enabled only if there is no limitation that requires display of the commercial immediately and/or prevents storage of the commercial.

[0173] If storage of the commercial is enabled, the processor **230** preferably determines whether to store the broadcast commercial based upon at least one of the following: a predetermined preference of the user for an item being advertised in the commercial; a previous purchase of an item being advertised in the commercial; and correspondence of at least one characteristic associated with the commercial to user profile information. Then, upon the processor **230** determining to store the broadcast commercial, the commercial is preferably stored in the memory **220**, optionally after compression and encryption in the compressor/decompressor **227** and the encryptor/decrypter **229** respectively.

[0174] Once the commercial is stored in the memory **220**, the processor **230** may determine whether to select the broadcast commercial based upon at least one of the following: a number of times the commercial has already been displayed to the user, a number of times other commercials advertising the same item advertised by the commercial have already been displayed to the user; a type of product advertised in the commercial, an event currently being viewed; an offer induced by the metadata; a relation to other commercials; a predetermined date; and position of the commercial in a sequence of teaser commercials. Then, upon the processor **230** determining to select the broadcast commercial, the processor **230** preferably selects the commercial and places the commercial in a high priority in a display queue.

[0175] Preferably, the processor **230** determines whether to currently display the broadcast commercial based upon at least one of the following: metadata associated with content displayed to the user which indicates when a potential commercial occurs; a required frequency of a commercial break; a time of day; a time window during which the broadcast commercial is valid; analysis of an event; a request of the user, and an indication of the user that he has viewed enough. Once the processor **230** determines that the commercial can currently be displayed, the commercial is preferably provided to the OSD unit **250** which provides the commercial to the display **35** for displaying thereon.

[0176] It is appreciated that due to limitations of storage capacity at the addressed user unit **20** and/or other criteria, there may be a requirement to delete stored broadcast commercials. In such a case, the processor **230** may preferably determine whether to delete a stored broadcast commercial based upon at least one of the following: a pre-determined elapsed time period of the broadcast commercial; a number of times the broadcast commercial has been displayed; in response to receipt of an erase signal; a request of the user (if allowed) not to present commercials of a particular vendor; and a payment made to prevent the stored broadcast commercial from being deleted. Then, upon the processor **230** determining to delete the broadcast commercial, the commercial is preferably deleted from the memory **220** in the addressed user unit **20**, for example, by the processor **230** transmitting a delete trigger signal in a secure mode.

[0177] The apparatus of FIGS. **1-3** also preferably enables counteracting replacement of advertisements for an item offered by a plurality of vendors so that an advertiser will not be able to tamper with advertisements of other advertisers. Alternatively, and under certain conditions, the apparatus of FIGS. **1-3** may enable replacement of advertisements for an item offered by a plurality of vendors, typically in association with a compensation for an advertiser whose advertisement has been replaced.

[0178] In a case where replacement of advertisements for an item offered by a plurality of vendors must be prevented, the MUX **125** preferably associates a video frame displaying the item with a tag indicating a valid vendor, and the transmitter **135** preferably transmits the frame in association with the tag indicating the valid vendor. It is appreciated that the tag indicating the valid vendor may be encrypted prior to association with the frame. Thus, an entity that may want to replace the advertisement of the item by an advertisement of a vendor other than the valid vendor must detect the tag and decrypt it, it being appreciated that such operations are typically difficult.

[0179] The ability to counteract replacement of advertisements for an item offered by a plurality of vendors preferably enables secure purchasing of items via a communication network utilizing the digital television system **10**. Preferably, one of a plurality of vendors offering similar items may be determined as a leading vendor in response to a payment made by the leading vendor. Then, advertisements of the item and an offer to purchase the item from the leading vendor may be displayed to users of the user units **20** together with advertisements and offers to purchase the item from vendors other than the leading vendor. The users may then be enabled to purchase the item via the communication network only from the leading vendor.

[0180] In a case where replacement of advertisements for an item offered by a plurality of vendors is required, an advertisement of the item may be transmitted in association with a selection icon associated with a leading vendor from among the plurality of vendors. The advertisement of the item is then displayed on the display **35**, and upon selection of the selection icon by the user, offers to purchase the item by the leading vendor and by vendors from the plurality of vendors other than the leading vendor are displayed on the display **35**. Then, if the user purchases the item from a vendor other than the leading vendor by ordering the item through the headend **15**, the processor **230**, or the SMS **100** preferably compensates the leading vendor for the purchase of the item from a vendor other than the leading vendor.

[0181] It is appreciated that display of advertisements of a plurality of vendors, whether replacement of advertisements is or is not enabled, requires a mechanism that enables the user to search advertisements transmitted to the addressed user unit **20**. In such a case, advertisements provided by the plurality of vendors and related to similar items may preferably be tagged with an advertisement category tag categoriz-

ing the advertisements according to a type of the items being advertised in the advertisements prior to transmission to the user units **20**. The advertisements related to the similar items thus form a sub-group of advertisements from among all advertisements transmitted to the user units **20**, and the user may access the sub-group by performing a search based on an item name or other characteristics. It is appreciated that the sub-group of advertisements, as well as all the advertisements transmitted to the user units **20**, may preferably be associated with different programs.

[0182] Preferably, the sub-group of advertisements, together with additional advertisements, is received at the addressed user unit **20**. Then, identification elements of all ads in the sub-group are preferably displayed in response to a selection made by the user when viewing at least one advertisement from the sub-group of ads. Preferably, identification elements of at least some of the ads in the sub-group are displayed simultaneously, for example, in a mosaic display arrangement.

[0183] It is appreciated that each identification element in the sub-group enables the user to select an advertisement associated therewith. Preferably, each identification element includes at least one of the following: an icon identifying an advertisement in the sub-group; an index identifying an advertisement in the sub-group; a code identifying an advertisement in the sub-group; an image from an advertisement in the sub-group; and a video clip of an advertisement in the sub-group.

[0184] An example showing a preferred implementation of a television screen **295** displaying a leading vendor advertisement **296**, a mosaic arrangement **297** of competing advertisements of a plurality of vendors offering similar items, and metadata **298** associated with the leading vendor advertisement **296** is depicted in FIG. **8**.

[0185] In a case where the leading vendor must be compensated, the compensation for leading vendor may include at least one of the following: crediting an account of the leading vendor; and crediting an amount of advertisements of the leading vendor. The crediting of an amount of advertisements of the leading vendor typically includes a free-of-charge increase of the number of times advertisements of the leading vendor are displayed within a time period, or a free-of-charge display of additional advertisements of the leading vendor.

[0186] In accordance with a preferred embodiment of the present invention the user may be credited for viewing commercials and advertisers may be charged for receiving from the user indications of interest in items advertised in the commercials. For crediting the user, the processor **230** may, for example, calculate a sum of money which is a result of substituting an actual duration-of-display of advertisements associated with a program in a predetermined arithmetic function that correlates a predetermined price PR for the program to a predetermined duration-of-display DD of advertisements associated with the program.

[0187] The predetermined arithmetic function may be, for example, a linear function of the type $Y=A*X$, where $A=PR/DD$. If advertisements are displayed at the user unit **20** for an actual duration-of-display X_0, the user may be credited by an amount $Y_0=A*X_0$. Alternatively, rather than being billed by the sum of money PR for viewing the program, the user may be billed by a lower sum $PR-Y_0$. It is appreciated that the present invention is not limited by the type of predetermined arithmetic function that is used, and that any appropriate function may be used.

[0188] Crediting the user for viewing advertisements thus creates a mechanism of billing that is correlated to an amount of advertisements being displayed to the user. Preferably, the billing of the user is carried out by the smart card **210** or by the SMS **100**, as is well known in the art.

[0189] If the user transmits to the headend **15**, for example via the telephone network **30**, reports corresponding to a commercial broadcast to a multiplicity of users, the broadcast center **105** may preferably perform at least one of the following: credit the user by an amount of credit; and charge an advertiser of the commercial by an amount of charge. It is appreciated that the amount of credit may include a predetermined amount of credit, such as a fixed amount of credit, or may be proportional to a number of the reports. It is further appreciated that additional reports including, for example, information regarding which commercials have been stored at the addressed user unit **20** and when commercials that have been stored at the addressed user unit **20** have been displayed, may also be reported back to the headend **15**, and advertisers may either be charged for the additional reports or receive the additional reports free of charge.

[0190] Reference is now made to FIGS. **9**A-**9**E which together constitute a simplified flowchart illustration of a preferred method of operation of the apparatus of FIGS. **1**-**3**.

[0191] Preferably, a program and a set of commercials to be displayed during program breaks are encrypted and prepared at a headend for transmission to a plurality of user units (step **300**). Metadata to be associated with the program and the commercials is preferably encrypted for protection and transmitted together with the program and the set of commercials in a broadcast digital stream (step **310**).

[0192] The metadata may include delay tags indicating whether display of the commercials can be delayed. Additionally, the metadata may include tags indicating valid vendors associated with frames displaying advertised items in each commercial in order to prevent replacement of a commercial for an item offered by a plurality of vendors. Alternatively, if replacement of commercials for an item offered by a plurality of vendors is enabled, the metadata may include links associating the commercial with a selection icon associated with a leading vendor from among a plurality of vendors.

[0193] Further additionally, the metadata may include replacement tags indicating whether replacement of displaying commercials by displaying of alternative commercials associated therewith is allowed.

[0194] The broadcast digital stream is preferably received at a user unit (step **320**) and based upon predetermined criteria or criteria determined in real-time (step **330**), the program may be displayed without delay (step **340**) or stored in the user unit for future display to a user of the user unit (step **350**).

[0195] In order to manipulate the commercials and/or interact with the commercials, each commercial in the set of commercials is preferably detected (step **360**), for example, by detecting indicia in the metadata that indicate at least one of the following: a start point of the commercial; an end point of the commercial; and a presence point within the commercial. Alternatively, each commercial may be detected by performing an analysis on content of the broadcast digital stream to detect parameters characterizing the commercial or by performing an analysis on a user behavior during display of the broadcast digital stream to detect behavior characteristics associated with user behavior during display of commercials.

[0196] Once the commercials are detected, a processor in the user unit preferably determines which of the commercials to play without delay and which of the commercials to store (step **370**). Commercials to be played without delay are preferably played sequentially and without delay in commercial breaks in the program (step **380**). Commercials to be stored are preferably stored, for example, in a high capacity memory (step **390**), optionally after compression and encryption in a compressor/decompressor and an encryptor/decrypter respectively. It is appreciated that storage of the commercials may be performed, for example, in accordance with parameters associated with the commercials, such as a broadcaster set of parameters, an agent set of parameters and a user set of parameters as described in U.S. patent application Ser. No. 09/515,118 to Wachtfogel et al (corresponding to published PCT Application WO 00/01149), the disclosure of which is incorporated herein by reference.

[0197] It is appreciated that a determination whether to store each commercial is preferably first made by checking whether display of the commercial can be delayed and then made based, for example, upon at least one of the following: a predetermined preference of the user for an item being advertised in the commercial; a previous purchase of an item being advertised in the commercial; and correspondence of at least one characteristic associated with the commercial to user profile information.

[0198] Preferably, when the user decides to view the program that is stored in the user unit, the program is preferably retrieved from the memory, decrypted, decompressed and displayed on a television at the user unit (step **400**). Commercials whose display cannot be delayed are preferably displayed without delay at suitable commercial breaks in the program (step **410**).

[0199] As display of the program progresses, the processor preferably selects a stored commercial for displaying to the user and selects a time frame during which to display the commercial (step **420**).

[0200] Selection of the stored commercial is preferably performed in response to a determination based upon at least one of the following: a number of times the commercial has already been displayed to the user; a number of times other commercials advertising the same item advertised by the commercial have already been displayed to the user; a type of product advertised in the commercial; an event currently being viewed; an offer induced by the metadata; a relation to other commercials; a predetermined date; and position in a sequence of teaser commercials. Selection of the time frame during which to display the commercial is preferably performed in response to a determination based upon at least one of the following: metadata associated with content displayed to the user which indicates when a potential commercial occurs; a required frequency of a commercial break; a time of day; analysis of an event; a request of the user, and an indication of the user that he has viewed enough.

[0201] If the user is allowed to delay displaying of the commercial (step **430**), the user may perform a selection which delays display of the commercial (step **440**).

[0202] If the user is allowed to replace displaying of the commercial by displaying of an alternative commercial (step **450**) the user may select displaying of one of the commercial and the alternative commercial (step **460**).

[0203] If replacement of commercials for an item offered by a plurality of vendors is allowed (step **470**), the user may indicate a selection by, for example, operating a selection icon, and may purchase the item from the leading vendor or from a vendor other than the leading vendor from among the plurality of vendors (step **480**). In a case where the user purchases the item from a vendor other than the leading vendor (step **490**), the leading vendor may be compensated (step **500**), via the headend, for the purchase of the item from a vendor other than the leading vendor.

[0204] It is appreciated that users may be compensated for viewing of commercials by billing the users by a sum which decreases with an amount of commercials viewed by the users and/or by crediting the users by an amount of credit in response to providing feedback reports on the commercials. It is further appreciated that advertisers may be charged for receiving feedback reports on the commercials from the users.

[0205] Preferably, during or after viewing the program or a commercial, the user may decide to transmit a recommendation of the program or a commercial to a remote user (step **510**). In such a case, the user may open an electronic message form on the television (step **520**) which preferably already includes an identification of the program if the program is at least one of the following: highlighted; marked; and viewed by the user, and fill in the electronic message form with at least identification details of the remote user to form a recommendation message (step **530**). The electronic message form is then transmitted to the headend (step **540**).

[0206] At the headend, the electronic form is processed to match the identification details of the remote user with valid subscriber details (step **550**), and if the identification details of the remote user match valid subscriber details (step **560**) the recommendation message is preferably forwarded to the remote user (step **570**). It is appreciated that if the identification details of the remote user do not match valid subscriber details, an error message is preferably transmitted to the user (step **580**).

[0207] Preferably, during, before, or after viewing the program or a commercial, the user may also preferably decide to transmit an advertisement message to a targeted audience (step **590**). In such a case, the user may create an advertisement message (step **600**), associate the advertisement message with parameters determining the targeted audience (step **610**) and transmit the advertisement message associated with the parameters determining the targeted audience to the headend (step **620**).

[0208] At the headend, the advertisement message and the parameters determining the targeted audience are preferably processed to create an advertisement transmission program scheduled for broadcast to the targeted audience (step **630**), and broadcast to the targeted audience in due time (step **640**).

[0209] It is appreciated that various features of the invention which are, for clarity, described in the contexts of separate embodiments may also be provided in combination in a single embodiment. Conversely, various features of the invention which are, for brevity, described in the context of a single embodiment may also be provided separately or in any suitable subcombination. For example, the method described with reference to FIGS. **9A-9E** need not be carried out as a whole or following the sequence described above, but rather in accordance with preferences of the user of the user unit. Thus, the user may, for example, only decide to delay display of a commercial associated with the program and resume viewing of the program. The commercial is then stored in the memory in response to a selection of the user of delaying

display of the commercial, and retrieved from the memory and displayed after a predetermined delay period or a delay period selected by the user.

[0210] The user may also decide, at a time when a commercial associated with an alternative commercial is about to be displayed, to select viewing the alternative commercial.

[0211] Furthermore, at a time when a commercial that enables purchase of an item via communication with the headend is displayed, the user may check whether the item may be purchased from vendors other than the leading vendor, and purchase the item from the leading vendor or from a vendor other than the leading vendor.

[0212] At any appropriate stage, the user may decide to transmit a recommendation of the program or a commercial to a remote user in which case the user may follow the procedure described above with reference to transmission of recommendations of programs or commercials.

[0213] Similarly, the user may decide, at any appropriate stage, to transmit an advertisement message to a targeted audience in which case the user may follow the procedure described above with reference to transmission of advertisement messages to target audiences.

[0214] It is appreciated that various features of the invention which are, for clarity, described in the contexts of separate embodiments may also be provided in combination in a single embodiment. Conversely, various features of the invention which are, for brevity, described in the context of a single embodiment may also be provided separately or in any suitable subcombination. It is further appreciated that persons skilled in the art will be capable of implementing various features of the present invention that are presented as any of hardware, firmware, or software in any appropriate one or combination of hardware, firmware, and software.

[0215] It will be appreciated by persons skilled in the art that the present invention is not limited by what has been particularly shown and described hereinabove. Rather the scope of the invention is defined only by the claims which follow:

1-84. (canceled)

85. A personal advertisement method for enabling a user of a broadcast system which comprises a headend to transmit an advertisement message to a targeted audience, the method comprising:

the user of the broadcast system performing the following:

creating an advertisement message;

associating the advertisement message with at least one targeted audience selection parameter; and

transmitting said advertisement message and said at least one targeted audience selection parameter to the headend; and

performing the following at the headend:

processing the advertisement message and the at least one targeted audience selection parameter to create an advertisement transmission program for broadcast to the targeted audience; and

broadcasting the advertisement transmission program to the targeted audience based, at least in part, on the at least one targeted audience selection parameter.

86. The method according to claim **85** and also comprising:

the user also performing the following:

associating the advertisement message with at least one parameter determining at least one of the following: an expiration date of the advertisement message; a delivery mode determining a priority of broadcast of the advertisement transmission program; and a method of payment for broadcasting the advertisement transmission program.

87. The method according to claim **85** and wherein said at least one targeted audience selection parameter comprises at least one of the following: an age group of viewers; a residence area of a viewer; a pre-specified field of interest of viewers; an income level of viewers; gender of viewers; and types of programs being watched by viewers.

88. The method according to claim **86** and wherein said method of payment comprises one of the following: payment from a bank account; payment by a credit card; and payment by debiting a debit card.

89. The method according to claim **88** and wherein the debit card comprises a smart card.

90. The method according to claim **85** and wherein the advertisement message comprises at least one of the following:

a video clip;

a still image; and

audio.

91. The method according to claim **85** and wherein the advertisement message comprises a combination comprising at least two of the following:

a video clip;

a still image; and

audio.

92. A user unit for enabling a user of a broadcast system which comprises a headend to transmit an advertisement message to a targeted audience, the user unit comprising:

an input/output (I/O) interface;

a processor operatively associated with the I/O interface and operative to create an advertisement message in response to user input received via the I/O interface and to associate the advertisement message with at least one targeted audience selection parameter; and

a communication interface operatively associated with the processor and operative to transmit said advertisement message and said at least one targeted audience selection parameter to the headend for creating an advertisement transmission program for broadcast to the targeted audience based, at least in part, on the at least one targeted audience selection parameter.

93. The user unit according to claim **92** and wherein said processor is also operative to associate the advertisement message with at least one parameter determining at least one of the following: an expiration date of the advertisement message; a delivery mode determining a priority of broadcast of the advertisement transmission program; and a method of payment for broadcasting the advertisement transmission program.

94. The user unit according to claim **92** and wherein said at least one targeted audience selection parameter comprises at least one of the following: an age group of viewers; a residence area of a viewer; a pre-specified field of interest of viewers; an income level of viewers; gender of viewers; and types of programs being watched by viewers.

95. The user unit according to claim **93** and wherein said method of payment comprises one of the following: payment from a bank account; payment by a credit card; and payment by debiting a debit card.

96. The user unit according to claim **95** and wherein the debit card comprises a smart card.

97. The user unit according to claim **92** and wherein the advertisement message comprises at least one of the following:

a video clip;

a still image; and

audio.

98. The user unit according to claim **92** and wherein the advertisement message comprises a combination comprising at least two of the following:

a video clip;

a still image; and

audio.

99. A user unit for enabling a user of a broadcast system which comprises a headend to transmit an advertisement message to a targeted audience, the user unit comprising:

means for input/output;

means for creating an advertisement message in response to user input received via the means for input/output and for associating the advertisement message with at least one targeted audience selection parameter; and

means for transmitting said advertisement message and said at least one targeted audience selection parameter to the headend for creating an advertisement transmission program for broadcast to the targeted audience based, at least in part, on the at least one targeted audience selection parameter.

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