Title: SYSTEM AND METHOD FOR BI-DIRECTIONAL ADVERTISEMENT

Abstract: This invention relates to a system and a method for bi-directional advertisement, which allow a user to surely recognize advertisements provided from a server using a data terminal device connected to a communication network, a telephone connected to a public switched telephone network (PSTN) or a bi-directional television connected to a bi-directional network. Also, this invention provides a method comprising the steps of: connecting to a bi-directional advertisement server through an Internet connection; authorizing use of a bi-directional advertisement site from a server if a user inputs the user’s personal information; providing bi-directional ads to the authorized user; receiving ad keyword, which consists of voice or character selected and transmitted by the user, into the server; recognizing the ad keyword as a voice type if the ad keyword provided to the server is in the form of voice; comparatively operating the recognized ad keyword with voice parameter extracted from a voice parameter database; comparatively operating the ad keyword with ad parameter of an ad database if the ad keyword provided to the server is in the form of character; notifying the comparatively operated result to the user through a data terminal device; and providing the user with various benefits according to the comparatively operated result.
SYSTEM AND METHOD FOR BI-DIRECTIONAL ADVERTISEMENT

TECHNICAL FIELD

The present invention relates to a system and a method for bi-directional advertisement, and more particularly, to a system and a method for bi-directional advertisement, which allow a user to surely recognize advertisements provided from a bi-directional advertisement server through a data terminal device connected to a network, a telephone connected to a public switched telephone network (PSTN) or a bi-directional television.

BACKGROUND ART

In general, there are lots of advertisement methods using a television, an Internet, a wire or wireless telephone and a portable telephone. Through one of the methods, advertisements are shown by a click of the mouse, shown in full-motion picture, or is heard in a voice before connection of a telephone line.

However, the conventional advertisement methods make users receive the advertisement not in an active manner but in a passive manner.

In particular, banner advertisement has a low rate of click because the users are reluctant to have the desired screen be changed to another screen by the click of banner.

Furthermore, in case of free call using a free-internet phone, there is a problem that it does not focus on advertisement but focuses on a speech line connection with the other party by dialing and cannot check whether or not the users recognize the advertisement surely.
DISCLOSURE OF THE INVENTION

It is, therefore, an object of the present invention to provide a system and a method for bi-directional advertisement, which allow a user to recognize advertisements easily and actively by that the user pronounces, inputs as character or clicks using a mouse only ad keyword of contents of advertisement, which the user sees or hears through bi-directional ad service provided via a data terminal device connected to a communication network, a telephone connected to a public switched telephone network (PSTN) or a bi-directional television connected to a bi-directional network.

To achieve the above object, the present invention provides a system comprising: a data terminal device connected to a communication network; and a server for providing bi-directional advertisement to the data terminal device.

Alternatively, the present invention provides a system comprising: a telephone connected to a public switched telephone network (PSTN); and a server for providing bi-directional advertisements to the telephone.

Alternatively, the present invention provides a system comprising: a bi-directional television connected to a bi-directional network; and a server for providing bi-directional advertisements through the bi-directional television.

According to an embodiment, the present invention provides a method comprising the steps of: connecting to a bi-directional advertisement server through an Internet connection; authorizing use of a bi-directional advertisement site from a server if a user inputs the user's personal information; providing bi-directional ads to the authorized user; receiving ad keyword, which consists of voice or character selected and transmitted by the user, into the server; recognizing the ad keyword as a
voice type if the ad keyword provided to the server is in the form of voice; comparatively operating the recognized ad keyword with voice parameter extracted from a voice parameter database; comparatively operating the ad keyword with ad parameter of an ad database if the ad keyword provided to the server is in the form of character; notifying the comparatively operated result to the user through a data terminal device; and providing the user with various benefits according to the comparatively operated result.

According to another embodiment, the present invention provides a method comprising the steps of: connecting a telephone to a server through a public switched telephone network (PSTN); authorizing use of a bi-directional ad site from the server when a user inputs the user's personal information; temporarily providing bi-directional advertisements to the user, who directly connects to the server, if the user does not want to be authorized; extracting advertisement from an ad database and outputting to the user's telephone if authorized; transmitting ad keyword received from the user, who heard the output advertisement, to the server; recognizing the transmitted ad keyword as a voice type; comparatively operating the recognized ad keyword with voice parameter extracted from a voice parameter database; notifying the comparatively operated result to the user's telephone; and providing the user with benefits according to the comparatively operated result.

According to a further embodiment, the present invention provides a method comprising the steps of: connecting the bi-directional television to a server through the bi-directional network; authorizing use of a bi-directional ad site from the server when a user inputs the user's personal information using web sites, a telephone or the bi-directional television; extracting advertisement from an ad database and outputting to
the user's bi-directional television if authorized; outputting ad keyword of contents of
the advertisement as a superimposed caption; transmitting ad keyword received from
the user, who saw the output superimposed caption of advertisement, to the server;
recognizing the transmitted ad keyword as a voice type; comparatively operating the
recognized ad keyword with voice parameter extracted from a voice parameter
database; notifying the comparatively operated result to the user's bi-directional
television; and providing the user with benefits according to the comparatively
operated result.

BRIEF DESCRIPTION OF THE DRAWINGS

Further objects and advantages of the invention can be more fully understood
from the following detailed description taken in conjunction with the accompanying
drawings in which:

Fig. 1 is a view of a configuration of a system for bi-directional advertisement
according to the present invention;

Fig. 2 is a view of a database for the system for bi-directional advertisement
according to the present invention;

Fig. 3 is a flow chart for embodying a method for bi-directional advertisement
according to a preferred embodiment of the present invention;

Fig. 4 is a flow chart for embodying a method for bi-directional advertisement
according to another preferred embodiment of the present invention; and

Fig. 5 is a flow chart for embodying a method for bi-directional advertisement
according to a further preferred embodiment of the present invention.
BEST MODE FOR CARRYING OUT THE INVENTION

The present invention will now be described in connection with preferred embodiments with reference to the accompanying drawings.

As shown in Fig. 1, a system for bi-directional advertisement according to the present invention includes a data terminal device 10 connected to a communication network for providing bi-directional advertisements, a telephone 20 connected to public switched telephone network (PSTN) for providing bi-directional advertisements, a bi-directional television 90 connected to a bi-directional network, and a server 80 for providing bi-directional advertisements.

The server 80 includes a data line connecting unit 30, a telephone-processing unit 40, a voice recognition unit 50, an arithmetic unit 60, a database 70 and a bi-directional network connecting unit 95.

The data terminal device 10 allows a bi-directional advertisement site to exist on the basis of Window NT, Linux, Unix server and has a specific TCP/IP address. The data line connecting unit 30 receives ad keyword of a bi-directional ad homepage, which is displayed on a monitor of the data terminal device 10 connected to the communication network, in the form of click of the mouse, character signal or voice signal. In case of voice signal, it is transmitted to the voice recognition unit 50, and in case of click of the mouse or character signal, it is directly transmitted to the arithmetic unit 60 without going through the voice recognition unit 50.

Further, the data line connecting unit 30 serves to show the operation result of the arithmetic unit 60 on the bi-directional advertisement homepage.

The telephone-processing unit 40 has a built-in program embodying a CTI
(Computer Telephony Integration) board to be connected with a user’s telephone. The data line connecting unit 30 provides the user with ad information, which is stored in the database 70, as audio signal through the telephone 20 connected to the public switched telephone network (PSTN) and transmits the ad keyword, which the user inputs through the telephone 20, to the voice recognition unit 50.

Furthermore, when the user inputs button of the telephone 20, the data line connecting unit 30 directly transmits it to the arithmetic unit 60 through DTMF (Dual Tone Multi Frequency) of the telephone 20.

The voice recognition unit 50 recognizes the ad keyword transmitted from the data line connecting unit 30, the telephone processing unit 40 or the bi-directional network connecting unit 95, directly connects to an voice parameter database 72 and transmits to the arithmetic unit 60 to comparatively operate the recognized ad keyword with voice parameter exercised in an off-line state.

The arithmetic unit 60 applies algorithm for voice end-point detection to the ad keyword input through the data line connecting unit 30 to collect only contents that the user pronounced, and compares the collected contents of advertisement with the exercised voice parameter being in the database 70. The comparison result is notified to the user by the data terminal device 10 through the data line connecting unit 30 or by the telephone 20 through the telephone-processing unit 40. Moreover, after recognizing the ad keyword input through the bi-directional network connecting unit 95 in the voice type, the arithmetic unit 60 comparatively operates the ad keyword with the exercised voice parameter being in the database 70.

As shown in Fig. 2, the database 70 constructed in the server 80 is constituted by a user information database 71, a voice parameter database 72, a cyber money
database 73 and an ad database 74.

The user information database 71 stores the user’s personal information after authorizing the user to use the bi-directional advertisement service.

The voice parameter database 72 stores the ad keyword provided by an advertiser in the form of voice parameter exercised in the off-line state, and then sets data for extracting voice parameter to be comparatively operated when the ad keyword input by the user is recognized as voice in the voice recognition unit 50.

If the ad keyword recognized in the voice recognition unit 50 and the voice parameter extracted in the voice parameter database 72 are comparatively operated and are identical with each other, the cyber money database 73 sets data for providing various benefits such as free call by payment of cyber money, reduction of charge of information utilization, supply of electronic cash and provision of giveaway.

The ad database 74 stores audio files, in which various kinds of sentences including core words of advertisements provided by the advertiser, full-motion files and advertisement parameters exercised in the off-line state and sets data for extracting the corresponding ad data when the user uses the advertisement service through the data terminal device 10, the telephone 20 or the bi-directional television 90.

After connecting the television and the server, which are connected to the bi-directional network, the bi-directional network connecting unit 95 extracts advertisement from the ad database 74 of the server 80, provides it to the bi-directional television 90, receives the ad keyword input by the user and transmits it to the voice recognition unit 50.

A preferred embodiment of the system for bi-directional advertisement according to the present invention will be described hereinafter referring to Fig. 3.
First, when the user connects to the bi-directional advertisement server through the data terminal device 10 connected to an Internet (Step S31), a bi-directional advertisement homepage is displayed on the data terminal device 10 (Step S32). The system for bi-directional advertisement checks whether or not the user is one of members (Step S33), and if not, registers as a member (Step S34), and then, stores the user’s personal information in the user information database 71 (Step S35).

If the user is one of the members, the server provides the bi-directional advertisement service (Step S36) and the ad keyword of the bi-directional ad homepage, which is displayed on the monitor of the data terminal device 10, selected by the user is transmitted to the server 80 in the form of click of the mouse, character signal or audio signal (Step S37).

The ad keyword transmitted to the data line connecting unit 30 of the server 80, if it is input in the form of voice, is transmitted to the voice recognition unit 50 and recognized (Step S38). If the ad keyword is input in the form of the click of the mouse or character signal, it is directly transmitted to the arithmetic unit 60.

The recognized ad keyword and the voice parameter extracted from the voice parameter database 72 are comparatively operated with each other (Step S39) and the comparatively operated result is notified to the user’s data terminal device 10 through the data line connecting unit 30 (Step S40). According to the success number of the voice recognition recorded in the user’s information, the user is provided with various benefits such as free call using cyber money, supply of electronic cash, provision of giveaway or the likes.

After recognizing the ad keyword and the relative contents of the advertisement received through the data terminal device as they are, when the user
inputs it using the keyboard, the benefits such as cyber money is provided in proportion to an input speed and accuracy.

Meanwhile, another preferred embodiment according to the present invention will be described hereinafter referring to Fig. 4.

First, the user inputs a certain telephone number using the telephone 20 connected to the PSTN to connect to the bi-directional advertisement server (Step S41). The system for bi-directional advertisement according to the present invention checks whether or not the user is one of members of the bi-directional advertisement site (Step S42). If the user is not the member, after taking the procedure for registering as a member (Step S43), the system stores the user's information into the user information database 71 (Step S44). Also, non-registered users can temporarily utilize the bi-directional advertisement service by directly connecting to the server if the user does not want to register as a member. If the user is one of the members, after authorizing use of the ad service, the system outputs the advertisement extracted from the ad database 74 of the server 80 to the telephone (Step S45).

After hearing the advertisement, when the user inputs ad keyword verbally, the input ad keyword is transmitted to the server 80 (Step S46), and then, the voice recognition unit 50 recognizes the transmitted ad keyword in the form of voice (Step S47). The arithmetic unit 60 comparatively operates the recognized ad keyword with the voice parameter extracted from the voice parameter database 72 (Step S48), and notifies the comparatively operated result to the user's telephone 20 through the telephone-processing unit 40 (Step S49). According to the success number of the voice recognition recorded in the user's information, the user is provided with various benefits such as free call using cyber money and reduction of charge of information
utilization.

If the user uses the telephone to use the free call service, also non-authorized users can connect to the bi-directional advertisement server to utilize the advertisement service, and be benefited by cyber money or free call as much as they used the corresponding ad service.

Furthermore, if the user uses the data terminal device or a free internet phone through the telephone, the system for bi-directional advertisement provides bi-directional advertisement at the early stage of call to make the free call possible, and keeps the free call if the ad keyword input by the user during call and the voice parameter stored in the parameter database are identical.

Meanwhile, a further preferred embodiment according to the present invention will be described hereinafter referring to Fig. 5.

First, the user connects to the bi-directional network to connect the bi-directional television 90 and the server 80 (Step S51). After that, the system for bi-directional advertisement checks whether or not the user is one of members (Step S52), and if not, the user registers personal information through the telephone or the web site (Step S53). The user's personal information is stored in the user information database 71 (Step S54). If the user is one of the members, the bi-directional advertisement server authorizes the user to use the bi-directional ad service, outputs the advertisement extracted from the ad database 74 of the server 80 to the bi-directional television 90 (Step S55). When the keyword of the corresponding advertisement is output as a superimposed caption (Step S56), the user inputs verbally the ad keyword that the user saw through the superimposed caption on the bi-directional television, and the advertisement system receives it as a voice type (Step
S57). The input ad keyword is transmitted to the server 80 (Step S58), the transmitted ad keyword is recognized in the voice recognition unit 50 as the voice type (Step S59). After the voice recognition, the arithmetic unit 60 comparatively operates the recognized ad keyword with the voice parameter extracted from the voice parameter database 72 (Step S60). The operation result is notified to the user’s bi-directional television 90 through the bi-directional network connecting unit 95 (Step S61). According to the success number of the voice recognition recorded in the user’s TCP/IP address or the user’s membership information, various benefits such as provision of cyber money is provided.

While the present invention has been described with reference to the particular illustrative embodiments, it is not to be restricted by the embodiments but only by the appended claims. It is to be appreciated that those skilled in the art can change or modify the embodiments without departing from the scope and spirit of the present invention.

As described above, according to the present invention, the user can recognize advertisements more easily and actively by inputting ad keyword of the contents of the bi-directional advertisements, which the user saw and heard through the data terminal device connected to the network, the telephone connected to the PSTN or the bi-directional television connected to the bi-directional network, in the form of click of the mouse, audio signal and character signal. Additionally, the advertiser can check whether or not the user recognizes surely, thereby obtaining large effectiveness of advertising.
What is claimed is:

1. A system for bi-directional advertisement comprising:
   a data terminal device connected to a communication network; and
   a server for providing bi-directional advertisement to the data terminal device.

2. The system for bi-directional advertisement as claimed in claim 1, wherein
   the server includes:
   a data line connecting unit for connecting the data terminal device for
   providing predetermined bi-directional advertisement to the server;
   a voice recognition unit for recognizing ad keyword transmitted from the data
   line connecting unit;
   an arithmetic unit for comparatively operating the ad keyword recognized as
   voice with voice parameter stored in the database; and
   a database storing information for providing the bi-directional advertisement
   using the data terminal device.

3. The system for bi-directional advertisement as claimed in claim 2, wherein
   the database includes:
   a user information database storing users’ personal information;
   a voice parameter database having voice parameter inside exercised in an off-
   line state to recognize the ad keyword input by the user;
   a cyber money database setting data for providing various benefits of free call
   by cyber money, reduction of charge of information utilization, supply of electronic
cash and provision of giveaway; and

an ad database storing advertisements provided by an advertiser, the ad
database setting data for extracting advertisement when the user's data terminal device
is connected to an Internet.

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4. The system for bi-directional advertisement as claimed in claim 2, wherein
the data line connecting unit directly transmits the ad keyword to the arithmetic unit
without transmitting it to the voice recognition unit if the ad keyword input by the user
is input in the form of character signal or click of the mouse.

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5. A system for bi-directional advertisement comprising:
a telephone connected to a public switched telephone network (PSTN); and
a server for providing bi-directional advertisements to the telephone.

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6. The system for bi-directional advertisement as claimed in claim 5, wherein
the server includes:
a telephone processing unit extracting advertisement stored in the database and
transmitting it to a user through the telephone connected to the PSTN, the telephone
processing unit transmitting ad keyword input by the user for voice recognition;

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a voice recognition unit recognizing the ad keyword transmitted from the
telephone processing unit, the voice recognition unit transmitting it for comparatively
operating;

an arithmetic unit for comparatively operating the recognized ad keyword with
voice parameter extracted from the database; and
a database storing information for providing bi-directional advertisements using the telephone.

7. The system for bi-directional advertisement as claimed in claim 6, wherein the database includes:

a user information database storing the users’ personal information;

a voice parameter database having voice parameter inside exercised in an off-line state to recognize the ad keyword input by the user;

a cyber money database setting data for providing various benefits of free call by cyber money, reduction of charge of information utilization, supply of electronic cash and provision of giveaway; and

an ad database storing advertisements provided by an advertiser, the ad database setting data for extracting advertisement when the user’s telephone is connected to the server.

8. A system for bi-directional advertisement comprising:

a bi-directional television connected to a bi-directional network; and

a server for providing bi-directional advertisements through the bi-directional television.

9. The system for bi-directional advertisement as claimed in claim 8, wherein the server includes:

a bi-directional network connecting unit extracting advertisement stored in the database and transmitting it to a user through the bi-directional television connected to
the bi-directional network, the bi-directional network connecting unit transmitting ad keyword input by the user for voice recognition;

a voice recognition unit recognizing the ad keyword transmitted from the bi-directional network connecting unit, the voice recognition unit transmitting it for comparatively operating;

an arithmetic unit for comparatively operating the recognized ad keyword with voice parameter extracted from the database; and

a database storing information for providing bi-directional advertisements using the bi-directional television.

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10. The system for bi-directional advertisement as claimed in claim 9, wherein the database includes:

a user information database storing the users’ personal information;

a voice parameter database having voice parameter inside exercised in an offline state to recognize the ad keyword input by the user;

a cyber money database setting data for providing various benefits of free call by cyber money, reduction of charge of information utilization, supply of electronic cash and provision of giveaway; and

an ad database storing advertisements provided by an advertiser, the ad database setting data for extracting advertisement when the user’s bi-directional television is connected to the server.

11. A method for bi-directional advertisement using a data terminal device connected to a communication network, the method comprising the steps of:
connecting to a bi-directional advertisement server through Internet connection;

authorizing use of a bi-directional advertisement site from a server if a user inputs the user’s personal information;

providing bi-directional ads to the authorized user;

receiving ad keyword, which consists of voice or character selected and transmitted by the user, into the server;

recognizing the ad keyword as a voice type if the ad keyword provided to the server is in the form of voice;

comparatively operating the recognized ad keyword with voice parameter extracted from a voice parameter database;

comparatively operating the ad keyword with ad parameter of an ad database if the ad keyword provided to the server is in the form of character;

notifying the comparatively operated result to the user through a data terminal device; and

providing the user with various benefits according to the comparatively operated result.

12. A method for bi-directional advertisement using a telephone connected to a public switched telephone network (PSTN), the method comprising the steps of:

connecting a telephone to a server through a public switched telephone network (PSTN);

authorizing use of a bi-directional ad site from the server when a user inputs the user’s personal information;
temporarily providing bi-directional advertisements to the user, who directly
connects to the server, if the user does not want to be authorized;
extracting advertisement from an ad database and outputting to the user’s
telephone if authorized;
transmitting ad keyword received from the user, who heard the output
advertisement, to the server;
recognizing the transmitted ad keyword as a voice type;
comparatively operating the recognized ad keyword with voice parameter
extracted from a voice parameter database;
notifying the comparatively operated result to the user’s telephone; and
providing the user with benefits according to the comparatively operated result.

13. A method for bi-directional advertisement using a bi-directional
television connected to a bi-directional network, the method comprising the steps of:
connecting the bi-directional television to a server through the bi-directional
network;
authorizing use of a bi-directional ad site from the server when a user inputs
the user’s personal information using web sites, a telephone or the bi-directional
television;
extracting advertisement from an ad database and outputting to the user’s bi-
directional television if authorized;
outputting ad keyword of contents of the advertisement as a superimposed
caption;
transmitting ad keyword received from the user, who saw the output
superimposed caption of advertisement, to the server;
    recognizing the transmitted ad keyword as a voice type;
    comparatively operating the recognized ad keyword with voice parameter
extracted from a voice parameter database;
    notifying the comparatively operated result to the user's bi-directional
television; and
    providing the user with benefits according to the comparatively operated result.

14. The method for bi-directional advertisement as claimed in one of claims
10 to 13, wherein in the comparatively operating step, the user is provided with
benefits of free call by cyber money, reduction of charge of information utilization
according to the success number of the voice recognition that the ad keyword input by
the user and the voice parameter being in the voice parameter database are identical.

15. The method for bi-directional advertisement as claimed in claim 11,
wherein when the user inputs ad keyword using a keyboard after recognizing ad
keyword and contents related with advertisement transmitted through a data terminal
device, the user is provided with cyber money according to input speed and accuracy.

16. The method for bi-directional advertisement as claimed in claim 12,
wherein in the authorizing step, also non-authorized users can connect to the bi-
directional ad server for using the bi-directional ad service and be provided with
benefits of free call and reduction of charge of information utilization.
17. The method for bi-directional advertisement as claimed in claims 11 or 12, wherein in case that the user uses a free call service through the data terminal device or the telephone, the system for bi-directional advertisement provides bi-directional advertisements at the early stage of call to make the free call possible, and extends the time of free call if the ad keyword input by the user during call and the voice parameter stored in the parameter database are comparatively operated and identical.
Fig. 2

- 71: user information database
- 72: voice parameter database
- 73: cyber money database
- 74: ad database
Fig. 3

Start

S31  connect to the server through the data terminal device

S32  display ad homepage

S33  check whether or not a user is one of members?

Yes

S36  provide bi-directional ad service

S37  transmit ad keyword to the server

S38  recognize the ad keyword

S39  comparatively operate

S40  notify the comparatively operated result

End

No

S34  register the user as a member

S35  store in the user information database
Fig. 4

Start

S41: connect to the server using the telephone

S42: check whether or not a user is one of members?

No

S43: register the user as a member

Yes

S45: output advertisement extracted from the server to the telephone

S46: transmit ad keyword to the server

S47: recognize the ad keyword

S48: comparatively operate

S49: notify the comparatively operated result

End
Fig. 5

Start

S51: connect to the server through the bi-directional television

S52: check whether or not a user is one of members?

Yes

S53: register the user as a member

No

S55: output advertisement extracted from the server to the bi-directional television

S56: output ad keyword of the advertisement as a superimposed caption

S57: input the ad keyword

S58: transmit the ad keyword to the server

S59: recognize the ad keyword

S60: comparatively operate

S61: notify the comparatively operated result

End
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

IPC7 G06F 17/60

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC7 G06F 17/60, 11/34, 3/14, IPC6 H4M 3/42

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>US6047322 A (Ukiah Software, Inc.) 4. April. 2000 FIG 1, 2, 3, 4, 5, 7, 9-11 ABSTRACT; CLAIMS 1, 2, 3, 4, 7, 10, 13, 17, 19-21</td>
<td>1-17</td>
</tr>
<tr>
<td>Y</td>
<td>US6052122 A (TELE-PUBLISHING, Inc.) 18. April. 2000 FIG 1, 2, 3, 4, 5, ABSTRACT; CLAIMS 1, 2, 3, 4, 7, 10, 13-18</td>
<td>1-17</td>
</tr>
<tr>
<td>A</td>
<td>US6058179 A (MUREX SECURITIES, Ltd.) 24. MAY. 2000 FIG 1, 2, 3, 4, 5, 6, 7, 10-21 ABSTRACT; CLAIMS 1, 2, 3, 4, 5, 13-20-, 24-32</td>
<td>1-17</td>
</tr>
<tr>
<td>A</td>
<td>US6029195 A (Herz ; Frederick, S. M.) 22. FEB. 2000 FIG 1, 2, 3, 4, 5, 6 ABSTRACT; CLAIMS 1-15</td>
<td>1-17</td>
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</table>

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:
  "A" document defining the general state of the art which is not considered to be of particular relevance
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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

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Date of the actual completion of the international search
26 FEBRUARY 2001 (26.02.2001)

Date of mailing of the international search report
27 FEBRUARY 2001 (27.02.2001)

Name and mailing address of the ISA/KR
Korean Industrial Property Office
Government Complex-Taejon, Dunsan-dong, So-ku, Taejon Metropolitan City 302-701, Republic of Korea
Facsimile No. 82-42-472-7140

Authorized officer
LEE, Un Cheol

Telephone No. 82-42-481-5784

Form PCT/ISA/210 (second sheet) (July 1998)