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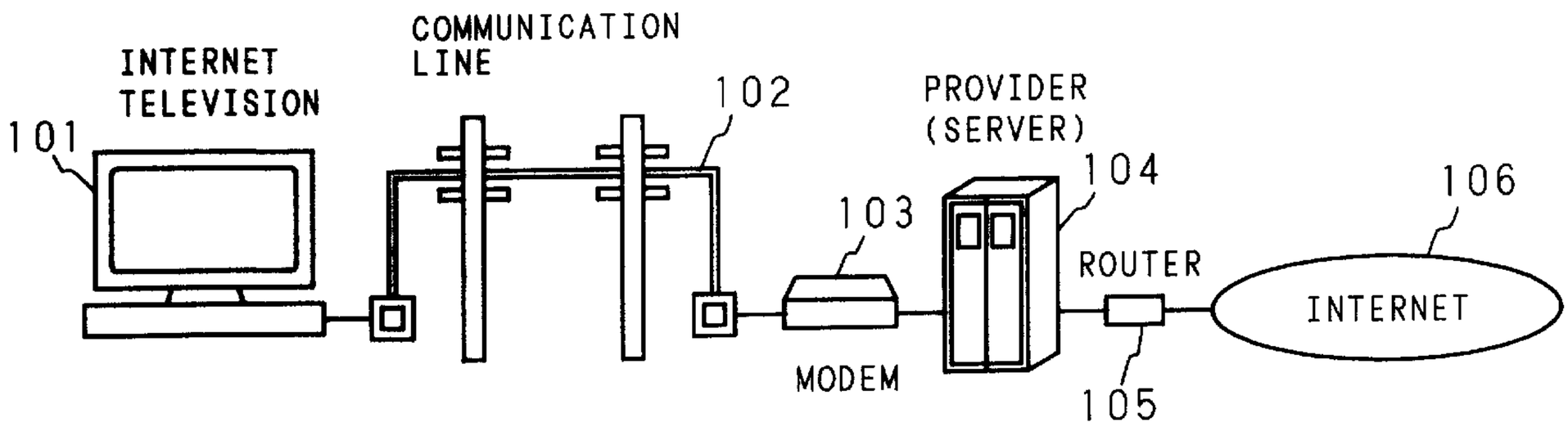
(54) **APPAREIL D'AFFICHAGE D'INFORMATION DE L'INTERNET**
(54) **INTERNET INFORMATION DISPLAYING APPARATUS**



(57) Appareil d'affichage d'information de l'Internet comprenant un SIF (7) afin de produire un signal vidéo à partir du signal de télévision reçu par un syntoniseur (1); un haut-parleur (12) pour générer le signal sonore sous la forme d'un son audible; un modem (16) pour transmettre et recevoir les données numériques sur une ligne téléphonique en convertissant les données numériques en un signal numérique par son à l'émission, et en démodulant le signal de la porteuse en fonction du son à la réception pour produire des données numériques; un amplificateur de porteuse (17) pour produire en sortie le signal de porteuse en fonction du son d'émission/réception du modem (16); et un circuit mélangeur (11) pour transmettre au haut-parleur le signal sonore produit sur la ligne téléphonique et le générer sous la forme d'un son audible. Même lorsqu'un signal de télévision est en train d'être reçu et que le son est produit par le haut-parleur (12), l'état de la ligne téléphonique permet de reconnaître facilement l'établissement d'une communication.

(57) An Internet information displaying apparatus, comprises an SIF (7) for outputting a video signal by extracting from the television signal received by a tuner (1); a speaker (12) for generating the sound signal as audible sound; modem (16) for transmitting and receiving the digital data through a telephone line by converting the digital data into a carrier signal by sound in transmitting, and by demodulating the carrier signal by sound into digital data at receiving; carrier amplifier (17) for outputting the carrier signal by the transmitting/receiving sound of the modem (16); and mixing circuit (11) for giving sound signal generated in the telephone line to the speaker (12) and generating as audible sound. Even when a television signal is being received and the sound is outputted from the speaker, the connection condition by telephone line is easily recognizable.

ABSTRACT OF THE DISCLOSURE

An Internet information displaying apparatus, comprises an SIF (7) for outputting a video signal by extracting from the television signal received by a tuner (1); a speaker (12) for generating the sound signal as audible sound; modem (16) for transmitting and receiving the digital data through a telephone line by converting the digital data into a carrier signal by sound in transmitting, and by demodulating the carrier signal by sound into digital data at receiving; carrier amplifier (17) for outputting the carrier signal by the transmitting/receiving sound of the modem (16); and mixing circuit (11) for giving sound signal generated in the telephone line to the speaker (12) and generating as audible sound. Even when a television signal is being received and the sound is outputted from the speaker, the connection condition by telephone line is easily recognizable.

TITLE OF THE INVENTION

INTERNET INFORMATION DISPLAYING APPARATUS

BACKGROUND OF THE INVENTION

The present invention relates to an Internet information displaying apparatus for receiving information through the Internet, taking in the information, converting into video signals, and displaying on a CRT display or the like.

Recently, owing to the wide popularity of personal computers, information is transmitted and received widely by using the Internet.

The Internet is a network of multiple computers connected on a global scale, and various pieces of readable information are stored in individual computers. These pieces of information include E-mails, various programs, and home pages, which can be communicated in two ways. The home page corresponds to the title and table of contents of a piece of information, and by selecting a graphic pattern (icon) or a word on the home page, the necessary information can be reviewed.

Therefore, recently, more an more users are using the Internet as the site of information presentation. It is the WWW (World Wide Web) that is noticed as the server for providing such information.

The reason why the WWW server is drawing attention is

mainly due to the wide spread of the client software (browser) for retrieving information by using a graphical menu. By the development of such browser, it becomes easier to search information on the network, and the traffic volume to the WWW server increased rapidly, and the users have come to notice as the publicity media, and many users have come to use.

To read information of the WWW server, as mentioned above, the browser is needed. For example, the browser is disclosed in pages 164 to 167 of "Internet Handbook for Corporate Users", an extra output of Nikkei Communications published by Nikkei BP (November 30, 1994).

On the other hand, to review the information of WWW server by the Internet, conventionally, it was necessary to install the browser in the personal computer.

FIG. 1 is a schematic diagram showing a conventional connection example of computer and Internet. In this connection example, a personal computer 107 is connected to a communication line 102 through a modem 108 or a terminal adapter, and through the communication line 102, it is further connected to a modem 103 or a terminal adapter of a provider which is a connection service firm. The modem 103 is connected to a server 104 which is the computer of the provider.

The server 104 is connected to the Internet 106 around

the clock through a router 105 for setting a trunk route.

From the personal computer 107, a telephone call is made when necessary, and a connection is made to the Internet 106 through the server 104 of the provider (dial-up connection).

Among those not owning personal computer, there are many people wanting to use the Internet, but not daring to buy a personal computer. Some are hesitant to operate the personal computer. Among those people, it seems many people want to use the Internet, if possible, without using the personal computer.

In such background, lately, the Internet television allowing to use the Internet easily by the television receiver is proposed. That is, the Internet information is displayed by using the television receiver in the general household as the display of the personal computer. Accordingly, without having to purchase a personal computer, only a device for receiving the Internet information is built in or attached to the television receiver, and such device is easy to handle as compared with the personal computer, and the television receiver functions its original purpose while not reviewing the Internet information, which is very convenient for the user.

However, to review the information of WWW server of the Internet by such television receiver, it is necessary to connect once to the provider through the communication line.

Only by connecting the communication line with the provider, the information can be acquired.

This connection by the communication line is made through a modem, and the users of personal computer who make communications can judge if connection is made or not as follows. That is, since the modem is sending data by sound signal and can be monitored, it is judged if the data is communicated or the telephone is connected by the sound.

Incidentally, when a function for receiving the Internet is incorporated in the television receiver, it is possible to wait while watching the television broadcast while connecting to the provider, and such function is generally desired because the user can wait without being bored until connected.

However, in case of receiving a television broadcast by television receiver or the like, it is usual for the sound of the television broadcast to be cast on a speaker of a receiver. In such case, in connecting a communication line, the judgment as to whether the connection is made by the sound from the modem or not cannot be made because the sound from the modem cannot be heard due to the casting through the speaker of the sound from the television broadcast.

The above fact is the same not only in the case of viewing the television program on the television broadcast but also while viewing the video signals from the VTR (video

tape recorder) or LD (laser disk) player.

The present invention has been developed in the light of the situation as above, and its principal object is to make the connection condition by telephone line easily recognizable even under the condition where the video signal such as a television signal is being received and the sound is outputted from the speaker in an Internet information displaying apparatus like a television receiver equipped with Internet receiving function.

BRIEF SUMMARY OF THE INVENTION

The first aspect of an Internet information displaying apparatus according to the present invention comprises: television signal receiving means for receiving a television signal; video signal outputting means for outputting a video signal by extracting from the television signal received by the television signal receiving means; displaying means for displaying the video signal outputted by the video signal outputting means; sound signal outputting means for outputting a sound signal by extracting from the television signal received by the television signal receiving means; audible sound generating means for generating the sound signal as audible sound outputted by the sound signal outputting means; modulating/demodulating means for transmitting and receiving the digital data through a

telephone line by converting the digital data into a carrier signal by sound in transmitting, and by demodulating the carrier signal by sound into digital data at receiving; data converting means for transmitting digital data to the modulating/demodulating means and receiving digital data from the modulating/demodulating means, and converting said received digital data into a video signal; converted video signal outputting means for outputting the output from the data converting means to the displaying means; carrier signal outputting means for outputting the carrier signal by the transmitting/receiving sound of the modulating/demodulating means; and telephone line sound outputting means for giving sound signal generated in the telephone line to the audible sound generating means and generating as audible sound.

The second aspect of the Internet information displaying apparatus according to the present invention is that the first aspect further comprises: character signal generating means for generating a character signal and outputting it to the displaying means; and character signal generation controlling means for detecting a transmitting/receiving condition of the digital data by the modulating/demodulating means, and controlling the character signal generating means so as to generate a character signal to indicate the transmitting/receiving condition.

Further, the third aspect of the Internet information

displaying apparatus according to the present invention is characterized in that, in the first and the second aspects, the telephone line sound outputting means inputs the signal including the carrier signal from the carrier signal outputting means, and outputs it by mixing with the sound signal to the audible sound generating means.

Further, the fourth aspect of the Internet information displaying apparatus according to the present invention is that the first aspect further comprise sound volume controlling means for controlling the sound signal outputting means.

Further, the fifth aspect of the Internet information displaying apparatus according to the present invention is characterized in that, in the fourth aspect, the sound volume controlling means controls the output level of the sound signal from the sound signal outputting means to become lower in case of mixing the output from the telephone line sound outputting means and outputting it to the audible sound generating means.

Further, the sixth aspect of the Internet information displaying apparatus according to the present invention is characterized in that, in the fourth aspect, the sound volume controlling means controls to make the output level of the sound signal from the sound signal outputting means "0" in case of mixing the output from the telephone line sound

outputting means and outputting it to the audible sound generating means.

The seventh aspect of the Internet information displaying apparatus according to the present invention comprises: television signal receiving means for receiving a television signal; video signal outputting means for outputting a video signal by extracting from the television signal received by the television signal receiving means; displaying means for displaying the video signal outputted by the video signal outputting means; sound signal outputting means for outputting a sound signal by extracting from the television signal received by the television signal receiving means; audible sound generating means for generating the sound signal as audible sound outputted by the sound signal outputting means; dial sound generating means for generating a signal of the dial sound from a telephone line; modulating/demodulating means for transmitting and receiving the digital data through a telephone line by converting the digital data into a carrier signal by sound at transmitting, and by demodulating the carrier signal by sound into digital data at receiving; data converting means for transmitting digital data to the modulating/demodulating means and receiving digital data from the modulating/demodulating means, and converting the received digital data into a video signal; converted video signal outputting means for

outputting the output from the data converting means to the displaying means; carrier signal outputting means for outputting the carrier signal by the transmitting/receiving sound of the modulating means; and telephone line sound outputting means for outputting the dial sound signal and the carrier signal to the audible sound generating means.

The eighth aspect of the Internet information displaying apparatus according to the present invention is that the seventh aspect further comprises: character signal generating means for generating a character signal, and outputting it to the displaying means; and character signal generation controlling means for detecting a transmitting/receiving condition of the digital data by the modulating/demodulating means, and controlling the character signal generating means so as to generate a character signal to indicate the transmitting/receiving condition.

Further, the ninth aspect of the Internet information displaying apparatus according to the present invention is characterized in that, in the seventh and eighth aspects, the telephone line sound outputting means controls to make the signal level of the dial sound to be outputted lower according to the dial sound signal generated by the dial sound generating means.

Further, the tenth aspect of the Internet information displaying apparatus according to the present invention is

characterized in that, in the seventh and eighth aspects, the telephone line sound outputting means controls to make the signal level of the dial sound to be outputted lower in case the dial sound outputted from the dial sound generating means is a pulse type.

Further, the eleventh aspect of the Internet information displaying apparatus according to the present invention is characterized in that, in the seventh and eighth aspects, the telephone line sound outputting means inputs the signal including the carrier signal from the carrier signal outputting means, and outputs it by mixing with the sound signal to the audible sound generating means.

Further, the twelfth aspect of the Internet information displaying apparatus according to the present invention is characterized in that, in the seventh and eighth aspects further comprises pseudo dial sound generating means for outputting a signal of pseudo dial sound instead of the dial sound from the telephone line sound outputting means.

Further, the thirteenth aspect of the Internet information displaying apparatus according to the present invention is characterized in that, in the twelfth aspect, the telephone line sound outputting means outputs the signal of pseudo dial sound generated by the pseudo dial sound generating means according to the dial sound signal generated by the dial sound generating means.

Further, the fourteenth aspect of the Internet information displaying apparatus according to the present invention is characterized in that, in the twelfth aspect, the telephone line sound outputting means outputs the signal of pseudo dial sound generated by the pseudo dial sound generating means instead of the dial sound signal from the telephone line sound outputting means, in case the dial sound from the dial sound generating means is a pulse type.

Further, the fifteenth aspect of the Internet information displaying apparatus according to the present invention is characterized in that, in the twelfth aspect, the telephone line sound outputting means inputs the signal including a carrier signal from the carrier signal outputting means, and outputs it by mixing with the sound signal to the audible sound generating means.

The above and further objects and features of the invention will more fully be apparent from the following detailed description with accompanying drawings.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

FIG. 1 is a schematic diagram showing the conventional example of connection of a computer with Internet;

FIG. 2 is a schematic diagram showing an example of connection of an Internet television as an Internet information displaying apparatus according to the present

invention with Internet;

FIG. 3 is a block diagram showing an example of constitution of the first embodiment of the Internet information displaying apparatus according to the present invention;

FIG. 4A is a flow chart showing an example of operation of the first embodiment of the Internet information displaying apparatus according to the present invention;

FIG. 4B is a flow chart showing an example of operation of the first embodiment of the Internet information displaying apparatus according to the present invention;

FIG. 5A is a schematic diagram showing an example of screen display of the first embodiment of the Internet information displaying apparatus according to the present invention;

FIG. 5B is a schematic diagram showing an example of screen display of the first embodiment of the Internet information displaying apparatus according to the present invention;

FIG. 5C is a schematic diagram showing an example of screen display of the first embodiment of the Internet information displaying apparatus according to the present invention;

FIG. 6 is a flow chart showing an example of operation of the second embodiment of the Internet information

displaying apparatus according to the present invention;

FIG. 7 is a time chart showing an example of operation of the second embodiment of the Internet information displaying apparatus according to the present invention;

FIG. 8 is a block diagram showing the constitution of the third embodiment of the Internet information displaying apparatus according to the present invention;

FIG. 9 is a flow chart showing an example of operation of the third embodiment of the Internet information displaying apparatus according to the present invention;

FIG. 10A is a schematic diagram showing an example of screen display of conventional Internet information displaying apparatus;

FIG. 10B is a schematic diagram showing an example of screen display of conventional Internet information displaying apparatus;

FIG. 10C is a schematic diagram showing an example of screen display of conventional Internet information displaying apparatus;

FIG. 11 is a block diagram showing an example of constitution of the fourth embodiment of the Internet information displaying apparatus according to the present invention; and

FIG. 12 is a time chart showing an example of operation of the fourth embodiment of the Internet information

displaying apparatus according to the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Hereinafter, embodiments of the present invention will be illustrated with reference to the drawings.

FIG. 2 is a schematic diagram showing an example of connection of an Internet television as an Internet information displaying apparatus according to the present invention with Internet.

According to this connection example, the Internet television 101 is connected with a communication line 102. In the Internet television 101, a modem is built in. The communication line 102 is connected with a modem 103 or a terminal adapter of a provider which is a connection service company, and the modem 103 is connected to a server 104 which is a computer of the provider.

The server 104 is connected to the Internet 106 around the clock, and is connected to the Internet 106 through a router 105 for setting the trunk route.

By predetermined operation, telephone call operation is automatically made from the Internet television 101, and connection is made with the Internet 106 through the server 104 of the provider (dial up connection).

FIG. 3 is a block diagram showing an example of constitution of the first embodiment of the Internet

television receiver as the Internet information displaying apparatus according to the present invention.

In FIG. 3, reference numeral 1 is a tuner, which carries out channel selection of the television wave inputted from the antenna 100 by the control from a microcomputer 14. The television wave selected by the tuner 1 is converted into an intermediate frequency by a VIF (video intermediate frequency) circuit 2 and given to a video detector 3. In the video detector 3, the video signal is detected, and outputted to the first switching unit 5 by amplified with the video amplifier 4.

To a first switching unit 5, there are inputted an output of the above video amplifier 4, an output of an OSD circuit 15 to be described later, and an output of a video output amplifier 19 for amplifying the video signal outputted by an Internet circuit 18. The first switching unit 5 outputs one of video signals to a CRT (cathode ray tube) 6 under control of the microcomputer 14.

Reference numeral 7 shows an SIF (sound intermediate frequency) circuit which detects an SIF signal from the output of the VIF circuit 2 and gives to a sound detector 8. In the sound detector 8, the sound signal is detected, and outputted to the second switching unit 10 by amplified with a sound amplifier 9.

To the second switching unit 10, there are inputted the

output of the above sound amplifier 9 and an output of an sound output amplifier 20 for amplifying the sound signal outputted by the Internet circuit 18 to be described later. The second switching unit 10 outputs one of sound signals to a mixing circuit 11 by the control of the microcomputer 14.

To the mixing circuit 11, the output of the second switching unit 10 as described above and an output of a carrier amplifier 17 as described later are inputted, and the both are mixed to output to a speaker 12. Whereas the speaker 12 is shown in FIG. 3, there may be provided a headphone, earphone, etc. which generate audible sound instead of the above or in combination.

Reference numeral 13 shows a remote control unit or an operating unit of the front panel of the television receiver 1 (both not shown). By operating it with user, various instructions can be given to the microcomputer 14. The microcomputer 14 carries out various controls of the television receiver 1 according to the diversified instructions given from the outside by the user.

Reference numeral 15 shows the on-screen display circuit (hereinafter to be referred to as OSD circuit), which generates various on-screen character signals under control of the microcomputer 14 and outputs it to the first switching unit 5 as described above.

Reference numeral 16 is a modem, which is connected to a

telephone line, and 17 is a carrier amplifier for amplifying the carrier sound from the modem 16.

Reference numeral 18 shows the Internet circuit, which receives an information data of Internet given from the modem 16 and converts it to a video signal, and outputs sound signal. The video signal outputted from the Internet circuit 18 is amplified by the video output amplifier 19 and outputted to the first switching unit 5. The sound signal outputted from the Internet circuit 18 is amplified by the sound output amplifier 20 and outputted to the second switching unit 10.

Next, the operation of the television receiver as the Internet information displaying apparatus of the present invention as above is explained.

At first, in viewing television broadcast, when the user operates the operating unit 13 to select the desired channel, a tuning voltage adapted to the selected channel is supplied to the tuner 1 from the microcomputer 14. And, the television signal of the selected channel is inputted to the VIF circuit 2, and the video signal is extracted by the video detector 3 and inputted to the video amplifier 4. On the other hand, in the SIF circuit 7, an SIF signal is detected from the output of the VIF circuit 2, and further, in the sound detector 8 the sound signal is extracted and supplied to the sound amplifier 9.

While the television broadcast is received, the television receiver outputs a video signal to the CRT 6 through connection of the first switching unit 5 to the video amplifier 4 by the microcomputer 14. By connecting the second switching unit 10 to the sound amplifier 9, the microcomputer 14 supplies a sound signal to the speaker 12 through the mixing circuit 11. With respect to the sound signal, adjustment of the sound volume is feasible by controlling the sound amplifier 9. This can be realized by the control of the sound amplifier 9 by the microcomputer 14 through operation of the operating unit 13 by the user.

On the other hand, in case the channel has been selected, the microcomputer 14 controls the OSD circuit 15 so as to generate a character signal to indicate the channel number. As a result, the character signal is outputted to the first switching unit 5 from the OSD circuit 15. At this time, the microcomputer 14 controls so that the first switching unit 5 inputs the character signal outputted from the OSD circuit 15 and outputs it to the CRT 6.

The OSD circuit 15 can carry out various displays of not only the channel character as described above but also the displays in connection with the sound volume adjustment, various adjustment modes, etc.

Next, with respect to the operation of the television receiver as an Internet information displaying apparatus of

the present invention in the case of receiving Internet information, the operation is explained with reference to the flow chart of FIG. 4A and FIG. 4B.

At first, when the user operates the operating unit 13 to select an Internet connection mode (S1), the microcomputer 14 controls the OSD circuit 15 so as to switch over the display from the screen of receiving the television broadcast to the Internet menu screen (to show various information menus such as traveling, stock, etc.). When the user operates the operating unit 13 to select the desired information from the menu screen (S2), the microcomputer 14 transfers the data to the Internet circuit 18, and the Internet circuit 18 causes the modem 16 to start connection of the telephone line with the provider (S3). At this time, the microcomputer 14 changes over the menu screen to the television broadcast screen.

In case of not being the Internet connection mode, the screen remains receiving the television broadcast (S10).

When the modem 16 connects the telephone line (connected with the provider), carrier sound is outputted from the modem 16 (S4). Simultaneously with it, the information to indicate the start of connection of the telephone line is transmitted from the modem 16 to the Internet circuit 18, and further the information is supplied to the microcomputer 14.

On receipt of the information, the microcomputer 14

controls to lower the output level of the sound amplifier 9 for amplifying the sound signal of the television broadcast to a predetermined level. The sound signal whose sound volume has been lowered to a predetermined level by the sound amplifier 9 and the carrier sound outputted from the modem 16 are mixed by a mixing circuit 11, given to the speaker 12, and generated as audible sound (S5). By such operation, due to the automatic lowering of the sound volume of television broadcast, the carrier sound of the modem 16 can be heard even when the user is viewing the television broadcast.

Furthermore, in order to allow the user to hear the carrier sound more clearly, the output level of the carrier amplifier 17 is simultaneously controlled by the microcomputer 14 to increase the level of the carrier sound, thereby making it possible for the user to hear the carrier sound of the modem 16 more clearly. And furthermore, it may be so arranged that, by setting the output level of the sound amplifier 9 to "0", the sound signal of the television broadcast is muted to make only the carrier sound of the modem 16 outputted from the speaker 12.

From the microcomputer 14, a character signal indicating the fact of telephone line being connected is generated in the OSD circuit 15 and displayed by CRT 6 along with the television signal (S6). With respect to the example of display in this case, a message 32 "Connection is in

progress. Please wait for a while." is displayed on the lower part of the screen 30, as shown in the schematic diagram of FIG. 5A. Alternatively, besides the message 32, a timer 31 may be displayed to give indication of the connecting time. In addition, in carrying out sound volume adjustment, the change of the signal having the mixture of the carrier sound and the sound signal may be allowed for the user to recognize visually by bar display outputted from the OSD circuit 15.

Further, when the telephone line is connected to the other party (provider), the data of the Internet information is received from the modem 16, so that the information to indicate completion of connection of the telephone line is transmitted to the microcomputer 14 through the Internet circuit 18 (S7).

By this operation, the microcomputer 14 controls the sound amplifier 9 and returns the sound volume of the television signal so as not to output the carrier sound (S8). Further, as shown in the schematic diagram of FIG. 5B, by OSD circuit 15, the connection time is displayed by the message 34 "Connection has been completed" and the display of the timer 33 (S9).

In case of the connection with the Internet, the data from the modem 16 are received in the Internet circuit 18 and the video signal and sound signal are outputted. The video

signal is supplied to the first switching unit 5 through the video output amplifier 19, and the sound signal is supplied to the second switching unit 10 through the sound output amplifier 20, by which the information of the Internet can be received through the CRT 6 and the speaker 12.

In case the connection of the telephone line cannot be made in a predetermined time (no telephone line is connected) (S11), the microcomputer 14 controls the sound amplifier 9 in a manner to return the sound volume of the sound signal of the television signal to the original state to prevent the carrier sound from being outputted (S8). Furthermore, as shown in the schematic diagram of FIG. 5C, by the OSD circuit 15, the connection time is displayed by the message 36 "Connection has failed" and the display of the timer 35 (S9).

By the operation of the television receiver as an Internet information displaying apparatus of the present invention as above, the user can confirm the telephone line connection status by both sound and visual sense.

By the way, by the speaker 12, the connecting state of the telephone line is made audible not only in the carrier sound as described above but also in a sound of dialing (dial sound). The telephone line includes a pulse dial type and a tone dial type, which respectively show different dial sounds. Of these, the pulse dial is a type to generate pulses by the switch which mechanically turns ON/OFF.

Accordingly, when the dial sound is outputted from the speaker 12, a problem occurs such that "pop noise" is generated to give unpleasant sound output.

In view of the above, in the second embodiment of the Internet information displaying apparatus of the present invention, the following countermeasures are taken to decrease the unpleasant sound. Hereinafter, explanation is given in reference to the flow chart of FIG. 6 and the time chart of FIG. 7.

In this second embodiment, the constitution itself is the same as that of Embodiment 1 shown in FIG. 3 above, and the different portions are only a part of the software controls of the microcomputer 14. Accordingly, in the following description, only the different portions are explained.

FIG. 6 is a flow chart showing the operation of the second embodiment. In the flow chart of the first embodiment shown in FIG. 4A and FIG. 4B above, the step S4 and the step S5 are different, and in other steps the same operations are conducted, and therefore, the explanation on the part of the same operation is omitted.

At first, the operation until the modem 16 connects the telephone line with the provider (S3) is the same as that of the first embodiment. When the telephone line is connected, the microcomputer 14 confirms whether the present telephone

line is a pulse type or a tone type (S100). In case of it being a pulse type, the microcomputer 14 confirms whether the present time is the period during which the modem 16 is generating the dial sound or not (dialing or not) (S101).

As a result, when the time is a dial pulse generating period, the microcomputer 14 controls so that the sound volume of the dial sound of the telephone line becomes smaller (S102). This dial sound is outputted by mixing with the sound signal of the television broadcast from the speaker 12 (S103). This processing is continued for the period in which the dial sound is generated. When the dial pulse generating period elapses, the microcomputer 14 controls to make the sound volume of the dial sound of the telephone line larger (S104). And, this dial sound of the telephone line and the sound signal of the television broadcast are mixed and outputted from the speaker 12 (S105). Needless to say, it is allowable for the telephone line condition to be on-screen displayed.

In the meantime, in case the telephone line is a tone type, the step may be advanced from step S100 to step S104 and the dial sound directly outputted with enlarged sound volume or applied in the same manner as in the pulse type.

When the above condition is viewed by the time lapse, the condition becomes as in the time chart shown in FIG. 7. Namely, according to the pulse type, during the

non-connection with the Internet (a), the condition is somewhat muted, in the period of dialing the telephone line (b), the output sound volume of the modem 6 is small, in the period (c) which is the communication stage with the provider, the output sound volume of the modem 16 becomes large, and in the Internet connected period (d), it is muted. On the other hand, in the tone type, in the period of dialing the telephone line (b) and the period of communication with a provider, the output sound volume of the modem 6 is enlarged.

According to the second embodiment as above, the pop noise caused by the pulse type dial sound can be decreased.

Besides the embodiments mentioned above, there may be the third embodiment whose constitution example is shown in the block diagram of FIG. 8.

In the block diagram shown in FIG. 8, a DSP (digital signal processor) 37 is added to the constitution of the first embodiment to generate pseudo sound. The DSP 37 may be that built in the modem, or that additionally provided as a extra circuit.

Hereinafter, based on the block diagram of FIG. 8 and the flow chart of FIG. 9, the operation of the third embodiment is explained.

However, in the flow chart shown in FIG. 9 of the third embodiment, the only point of change is that the step S102 shown in the flow chart of FIG. 6 in the second embodiment as

described above is changed to the step 106 which generates the pseudo tone, and other operations are unchanged.

Accordingly, in case the telephone line is a pulse type and dial sound is generated, in the dial pulse generating period, under control of the microcomputer 14, DSP 37 generates the sound simulating dial sound like "pip-pop-pa" in a tone type and outputs it to the speaker 12. At this time, the actually generated dial sound is controlled so as not to be outputted under control of the carrier amplifier 17 by the microcomputer 14. As to this pseudo tone, it may be so arranged as to output tone type sound corresponding to the pulse type sound, or utterly different effect sound.

As described in detail above, according to the third embodiment of the present invention, even in case the user is viewing the television broadcast, the connection operation condition of the telephone line can be confirmed by the dial sound.

By the way, in an ordinary television receiver, it is not the case for all the video signals received as television broadcast to be displayed but only the range called an effective scanning region in horizontal direction is displayed on the CRT 6. Namely, the period for scanning in horizontal direction is 63.5 μs of which the video signal is in the period of 54.6 μs. In a television receiver, display is made only for about 49 μs of the period (to be called an

effective scanning line region) excluding the period of 5% at both ends of the video signal period (over-scanning region).

On the other hand, in the Internet information, due to the display of characters and pictures over full screen areas, when the images are converted into video signals, they are formed as video signals including an over-scan region, as previously mentioned. Accordingly, there is a problem that partial characters and picture images in the original Internet information come into the overscan region to make the screen image invisible with a television receiver (ref. FIG. 10B).

In order to prevent such a phenomenon, the Internet displaying apparatus of the present invention is designed in the following manner. Namely, in order to display the Internet information on the CRT 6 of a television receiver in the same manner as for displaying on a monitor for a personal computer, it may be arranged to make display on a screen of 640 dots in the horizontal direction and 480 dots in the vertical direction. To the convenience, because the number of the effective scanning lines in the vertical direction of the television receiver is 480, this can be easily realized.

In order to obtain such screen size, the 640 dots in the horizontal direction may be met by the video signal region of one clock (0.07 μs) × 640 = 44.8 μs because one clock is 14.3 MHz. This comes within the effective horizontal

scanning line region of 49 μs which means that all the Internet information is to be displayed (ref. FIG. 10A).

By the way, when display is made as described above, the discontinued points of the video signals are also to be displayed, in which case the right and left periods having no video signal are set to black levels. However, as the video signal level shows sharp changes at the border line between the video signal and the black level, voltage fluctuation occurs in the high voltage circuit.

Here, explanation is made on the voltage fluctuation of the high voltage circuit. When a video signal level is developed suddenly from the black level, though no beam current of CRT 6 runs on a black level, on generation of a video signal, the beam current naturally flows out. And, as a high voltage is supplied to the CRT 6 from the high voltage circuit, the high voltage changes due to the flow of the beam current. This high voltage circuit is supplied from the fly back transformer (FBT), and a deflection operation in the horizontal direction is to be made from the FBT.

Accordingly, when the high voltage fluctuates, the deflection current in the horizontal deflection also changes, in other words, the amplitude changes, with the result that the size of the picture image in the horizontal direction (lateral direction) changes to give bend of picture images (ref. FIG. 10A). Especially, such defect is remarkable at the boundary

of the video signals.

In a wide television receiver having an aspect ratio of 16:9, for example, the screen may be displayed in division into two areas. Concretely, there may be arranged to display a video signal of television broadcast on one screen, and a video signal of the Internet on the other screen. Even in such a case, it may be so arranged for the video signal obtained from the Internet information to be displayed with addition of the white level on the right and left boundaries as described above.

In view of the situation as mentioned above, the Internet information displaying apparatus of the present invention has also a function to make the boundary of the screen in which the Internet information is displayed less conspicuous. Hereinafter, the fourth embodiment of the Internet information displaying apparatus of the present invention having such function is concretely explained.

FIG. 11 is a block diagram showing an example of constitution of the fourth embodiment, which is made by remodelling a part of the block diagram of FIG. 3 which shows the constitution of the first embodiment abovementioned. Namely, in the block diagram shown in FIG. 3, the video signal outputted from the Internet circuit 18 is directly inputted to the video output amplifier 19, but in this fourth embodiment, a switch 21 is provided between the Internet

circuit 18 and the video amplifier 19. This switch 21 is connected at one input end to the level setting volume 23, and at the other input end to the Internet circuit 18, with the output end connected to the video amplifier 19. And, by an output (switching signal) of the two input logic (OR) circuits 22, the switch 21 is controlled. To one input of the logic circuit 22 is inputted a BLK pulse from the Internet circuit 18, and to the other input an HBLK pulse is inputted from the non-illustrated horizontal deflection circuit, respectively.

The constitution of other portions is the same as that of the first embodiment shown in FIG. 3.

Next, the operation of this fourth embodiment is explained with reference to the time chart of FIG. 12.

When a telephone line is connected and the Internet information is sent to the Internet circuit 18 through the modem 18, the Internet circuit 18 converts the Internet information (digital data) into a video signal and outputs it to the switch 21.

Also, to the other input end of the switch 21, a DC level which has been adjusted by the level setting volume 23 is inputted. This DC level is set so that the white level of the video signal becomes 30% - 50%.

On the other hand, from the Internet circuit 18, there is outputted as shown by (b) in FIG. 12, the blanking (BLK)

pulse corresponding to the converted video signal period which is shown by (a) in FIG. 12. Also, the horizontal blanking (HBLK) pulse as shown by (c) in FIG. 12 for blanking the preceding and succeeding periods of the horizontal synchronizing signal is formed in the non-illustrated horizontal deflection circuit. These BLK pulse and HBLK pulse are inputted to the logic circuit 22, where a switching signal for switching the switch 21 as shown by (b) in FIG. 12 is outputted.

Accordingly, when the switch 21 is controlled by the switching signal which is an output signal of the logic circuit 22, the switch 21 outputs the video signal from the Internet circuit 18 to the video output amplifier 19 for the period in which the switching signal is "H", and switches the white level set by the level setting volume 23 to output to the video output amplifier 19 during the period in which the switching signal is "L". By this operation, there is supplied to the video output amplifier 19 from the switch 21 a DC level voltage in which a white level is set to a video signal as shown by (e) in FIG. 12.

The output from the video output amplifier 21 is outputted to the CRT 6 and displayed as described above. Accordingly, as shown in the above FIG. 10C, the right and left portions of the video signal are displayed as the predetermined white level (gray color), and the boundary with

the video signal becomes less conspicuous.

As described above, according to the fourth embodiment, bend of picture images at the boundary between the video signal and the right and left blanking periods can be prevented, and the boundary thereof becomes less remarkable.

In the foregoing embodiments, description is made on the cases of the Internet information displaying apparatus of the present invention being applied to the television receiver, but the application is not limited to it. For example, reverse to the above embodiment, the Internet information display may be realized by incorporating a function as a television receiver on an ordinary personal computer with which Internet communication is feasible.

As this invention may be embodied in several forms without departing from the spirit of essential characteristics thereof, the present embodiments is therefore illustrative and not restrictive, since the scope of the invention is defined by the appended claims rather than by the description preceding them, and all changes that fall within metes and bounds of the claims, or equivalence of such metes and bounds thereof are therefore intended to be embraced by the claims.

Claims

1. An Internet information displaying apparatus, comprising:

television signal receiving means for receiving a television signal;

video signal outputting means for outputting a video signal by extracting from the television signal received by said television signal receiving means;

displaying means for displaying the video signal outputted by said video signal outputting means;

sound signal outputting means for outputting a sound signal by extracting from the television signal received by said television signal receiving means;

audible sound generating means for generating the sound signal as audible sound outputted by said sound signal outputting means;

modulating/demodulating means for transmitting and receiving the digital data through a telephone line by converting the digital data into a carrier signal by sound at transmitting, and by demodulating the carrier signal by sound *into digital data at receiving*;

data converting means for transmitting digital data to said modulating/demodulating means and receiving digital data from said modulating/demodulating means, and converting the

received digital data into a video signal;

converted video signal outputting means for outputting the output from said data converting means to said displaying means;

carrier signal outputting means for outputting the carrier signal by the transmitting/receiving sound of said modulating/demodulating means; and

telephone line sound outputting means for giving sound signal generated in the telephone line to said audible sound generating means and generating as audible sound.

2. The Internet information displaying apparatus as set fort in Claim 1, wherein said telephone line sound outputting means inputs the signal including the carrier signal from said carrier signal outputting means, and outputs it by mixing with said sound signal to said audible sound generating means.

3. The Internet information displaying apparatus as set forth in Claim 1, further comprising sound volume controlling means for controlling said sound signal outputting means.

4. The Internet information displaying apparatus as set forth in Claim 3, wherein said sound volume controlling means controls the output level of the sound signal from said sound

signal outputting means to become lower in case of mixing the output from said telephone line sound outputting means and outputting it to said audible sound generating means.

5. The Internet information displaying apparatus as set forth in Claim 3, wherein said sound volume controlling means controls to make the output level of the sound signal from said sound signal outputting means "0" in case of mixing the output from said telephone line sound outputting means and outputting it to said audible sound generating means.

6. The Internet information displaying apparatus as set forth in Claim 1, further comprising:

character signal generating means for generating a character signal, and outputting it to said displaying means; and

character signal generation controlling means for detecting a transmitting/receiving condition of the digital data by said modulating/demodulating means, and controlling said character signal generating means so as to generate a character signal to indicate the transmitting/receiving condition.

7. The Internet information displaying apparatus as set fort in Claim 6, wherein said telephone line sound outputting

means inputs the signal including the carrier signal from said carrier signal outputting means, and outputs it by mixing with said sound signal to said audible sound generating means.

8. The Internet information displaying apparatus as set forth in Claim 6, further comprising sound volume controlling means for controlling said sound signal outputting means.

9. The Internet information displaying apparatus as set forth in Claim 8, wherein said sound volume controlling means controls the output level of the sound signal from said sound signal outputting means to become lower in case of mixing the output from said telephone line sound outputting means and outputting it to said audible sound generating means.

10. The Internet information displaying apparatus as set forth in Claim 8, wherein said sound volume controlling means controls to make the output level of the sound signal from said sound signal outputting means "0" in case of mixing the output from said telephone line sound outputting means and outputting it to said audible sound generating means.

11. An Internet information displaying apparatus, comprising:

television signal receiving means for receiving a television signal;

video signal outputting means for outputting a video signal by extracting from the television signal received by said television signal receiving means;

displaying means for displaying the video signal outputted by said video signal outputting means;

sound signal outputting means for outputting a sound signal by extracting from the television signal received by said television signal receiving means;

audible sound generating means for generating the sound signal as audible sound outputted by said sound signal outputting means;

dial sound generating means for generating a signal of the dial sound from a telephone line;

modulating/demodulating means for transmitting and receiving the digital data through a telephone line by converting the digital data into a carrier signal by sound at transmitting, and by demodulating the carrier signal by sound into digital data at receiving;

data converting means for transmitting digital data to said modulating/demodulating means and receiving digital data from said modulating/demodulating means, and converting the received digital data into a video signal;

converted video signal outputting means for outputting

the output from said data converting means to said displaying means;

carrier signal outputting means for outputting the carrier signal by the transmitting/receiving sound of said modulating/demodulating means; and

telephone line sound outputting means for outputting the dial sound signal and the carrier signal to said audible sound generating means.

12. The Internet information displaying apparatus as set forth in Claim 11, wherein said telephone line sound outputting means controls to make the signal level of the dial sound to be outputted lower according to the dial sound signal generated by said dial sound generating means.

13. The Internet information displaying apparatus as set forth in Claim 11, wherein said telephone line sound outputting means controls to make the signal level of the dial sound to be outputted lower in case the dial sound outputted from said dial sound generating means is a pulse type.

14. The Internet information displaying apparatus as set forth in Claim 11, wherein said telephone line sound outputting means inputs the signal including the carrier

signal from said carrier signal outputting means, and outputs the same by mixing with said sound signal to said audible sound generating means.

15. The Internet information displaying apparatus as set forth in Claim 11, further comprising pseudo dial sound generating means for outputting a signal of pseudo dial sound instead of the dial sound from said telephone line sound outputting means.

16. The Internet information displaying apparatus as set forth in Claim 15, wherein said telephone line sound outputting means outputs the signal of pseudo dial sound generated by said pseudo dial sound generating means according to the dial sound signal generated by said dial sound generating means.

17. The Internet information displaying apparatus as set forth in Claim 15, wherein said telephone line sound outputting means outputs the signal of pseudo dial sound generated by said pseudo dial sound generating means instead of the dial sound signal from said telephone line sound outputting means, in case the dial sound from said dial sound generating means is a pulse type.

18. The Internet information displaying apparatus as set forth in Claim 15, wherein said telephone line sound outputting means inputs the signal including the carrier signal from said carrier signal outputting means, and outputs it by mixing with said sound signal to said audible sound generating means.

19. The Internet information displaying apparatus as set forth in Claim 11, further comprising:

character signal generating means for generating a character signal, and outputting it to said displaying means; and

character signal generation controlling means for detecting a transmitting/receiving condition of the digital data by said modulating/demodulating means, and controlling said character signal generating means so as to generate a character signal to indicate the transmitting/receiving condition.

20. The Internet information displaying apparatus as set forth in Claim 19, wherein said telephone line sound outputting means controls to make the signal level of the dial sound to be outputted lower according to the dial sound signal generated by said dial sound generating means.

21. The Internet information displaying apparatus as set forth in Claim 19, wherein said telephone line sound outputting means controls to make the signal level of the dial sound to be outputted lower in case the dial sound outputted from said dial sound generating means is a pulse type.

22. The Internet information displaying apparatus as set forth in Claim 19, wherein said telephone line sound outputting means inputs the signal including the carrier signal from said carrier signal outputting means, and outputs the same by mixing with said sound signal to said audible sound generating means.

23. The Internet information displaying apparatus as set forth in Claim 19, further comprising pseudo dial sound generating means for outputting a signal of pseudo dial sound instead of the dial sound from said telephone line sound outputting means.

24. The Internet information displaying apparatus as set forth in Claim 23, wherein said telephone line sound outputting means outputs the signal of pseudo dial sound generated by said pseudo dial sound generating means according to the dial sound signal generated by said dial

sound generating means.

25. The Internet information displaying apparatus as set forth in Claim 23, wherein said telephone line sound outputting means outputs the signal of pseudo dial sound generated by said pseudo dial sound generating means instead of the dial sound signal from said telephone line sound outputting means, in case the dial sound from said dial sound generating means is a pulse type.

26. The Internet information displaying apparatus as set forth in Claim 23, wherein said telephone line sound outputting means inputs the signal including the carrier signal from said carrier signal outputting means, and outputs it by mixing with said sound signal to said audible sound generating means.

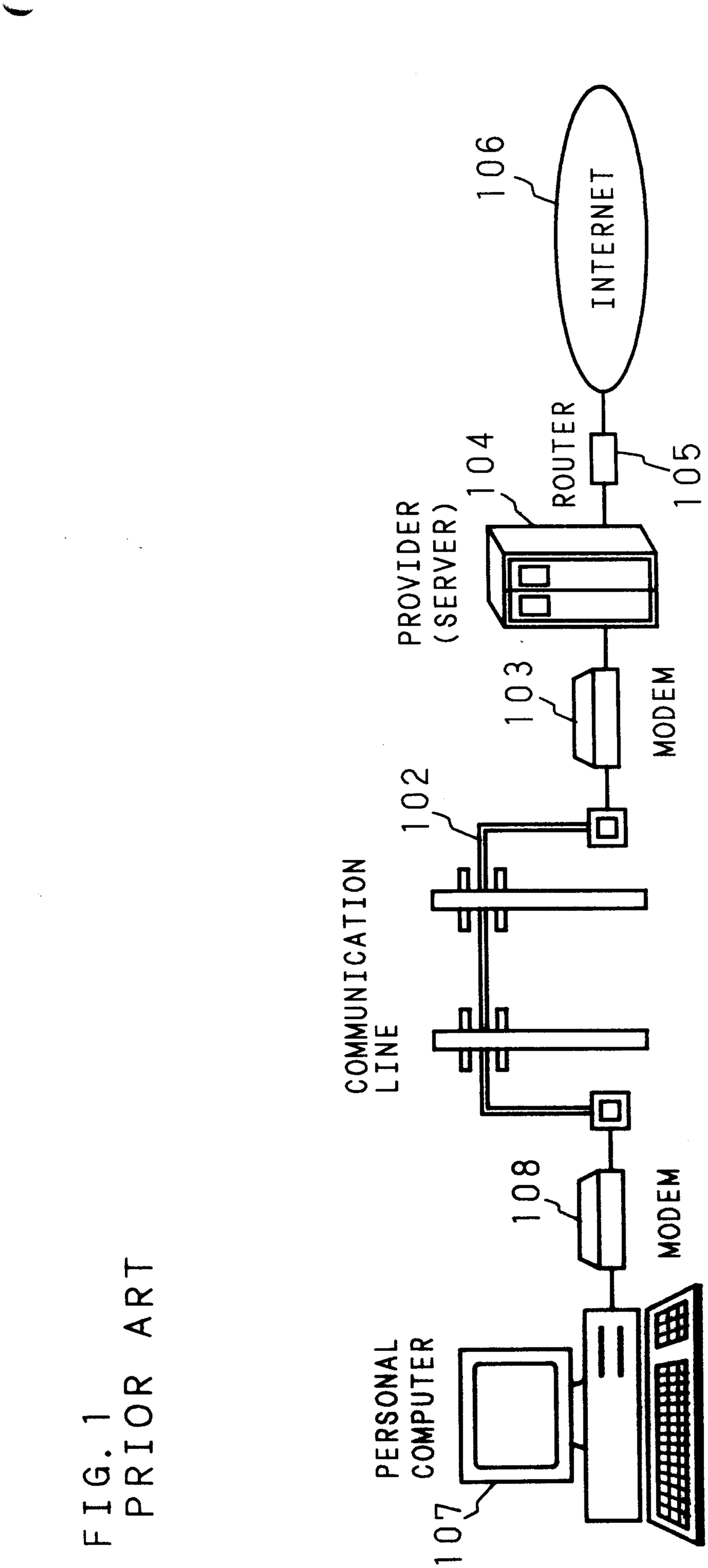


FIG. 1
PRIOR ART

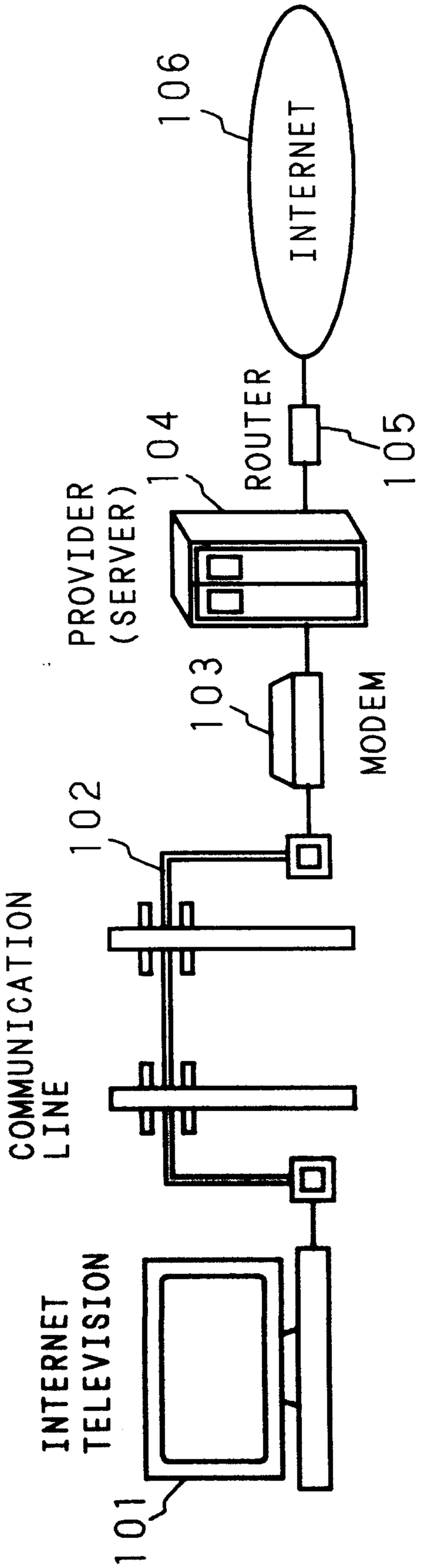

INTERNET
106
ROUTER
105
PROVIDER
(SERVER)
104
MODEM
103
COMMUNICATION
LINE
102
INTERNET
TELEVISION
101

FIG. 2

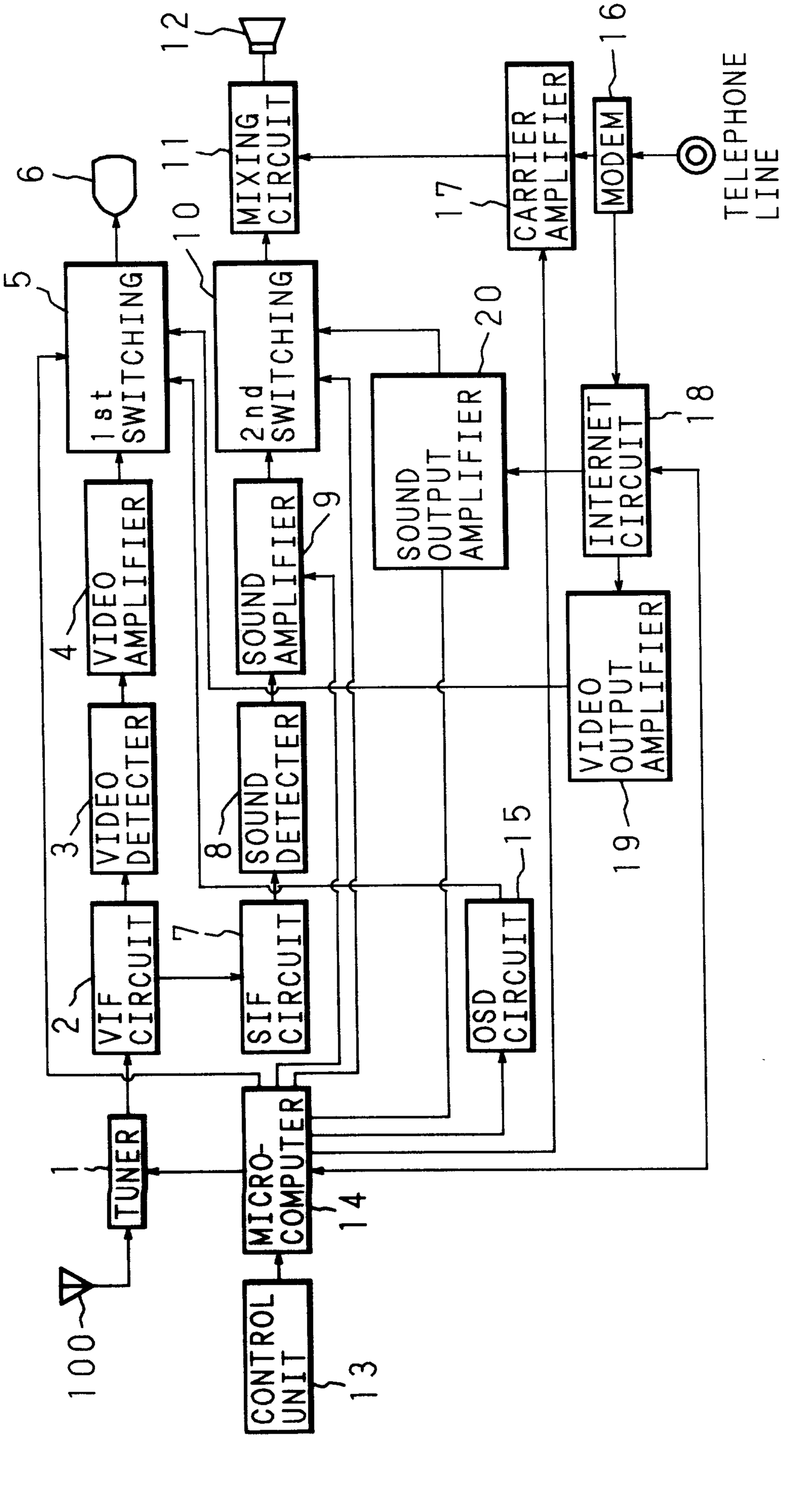
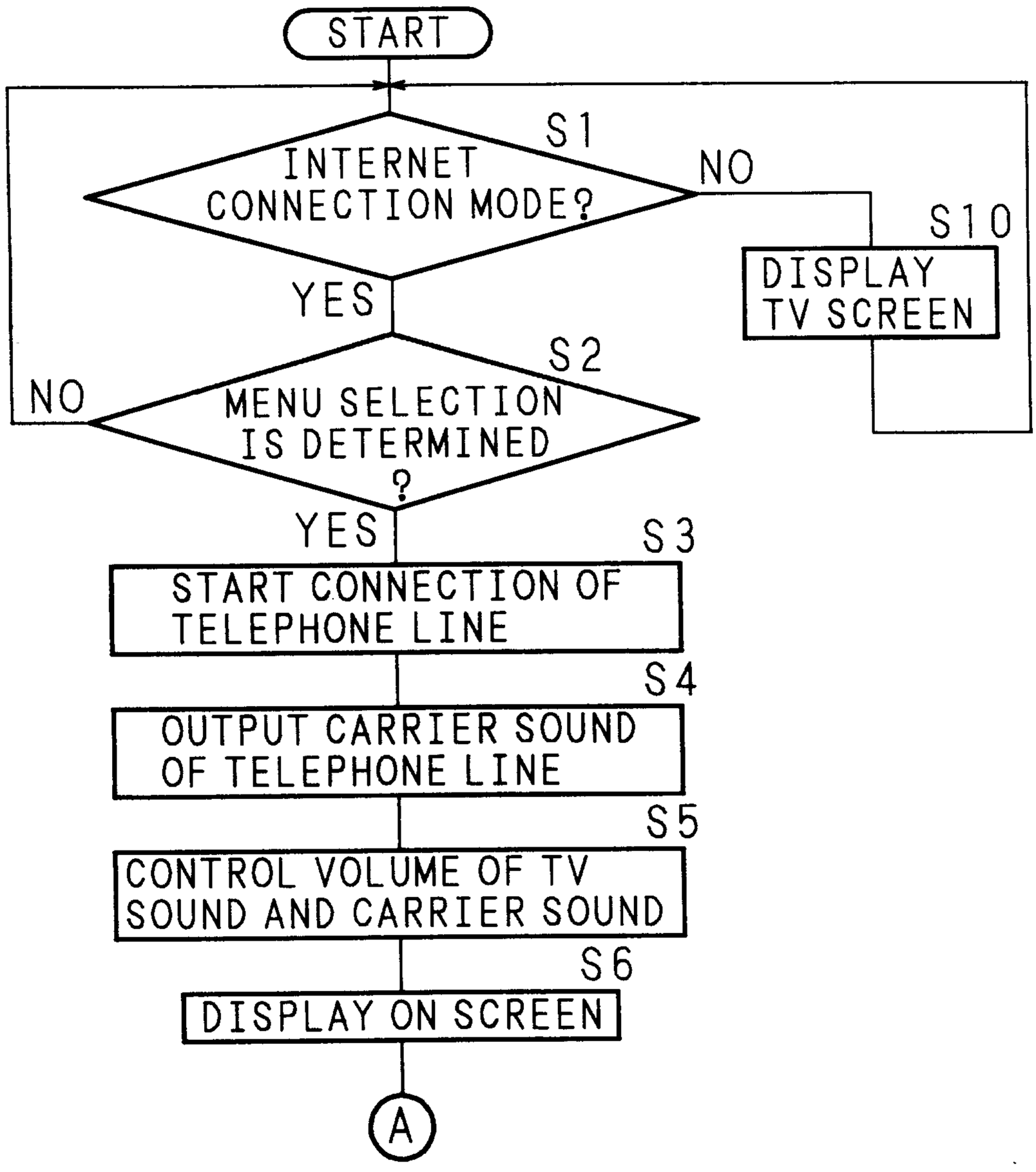

TUNER
VIF CIRCUIT
VIDEO DETECTER
VIDEO AMPLIFIER
1st SWITCHING
MIXING CIRCUIT
2nd SWITCHING
SOUND AMPLIFIER
SOUND DETECTER
SIF CIRCUIT
SOUND OUTPUT AMPLIFIER
CARRIER AMPLIFIER
MODEM
TELEPHONE LINE
INTERNET CIRCUIT
VIDEO OUTPUT AMPLIFIER
OSD CIRCUIT
MICRO-COMPUTER
CONTROL UNIT
100
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20

FIG. 3

FIG. 4A


START
S1
INTERNET CONNECTION MODE?
NO
S10
DISPLAY TV SCREEN
YES
S2
NO
MENU SELECTION IS DETERMINED ?
YES
S3
START CONNECTION OF TELEPHONE LINE
S4
OUTPUT CARRIER SOUND OF TELEPHONE LINE
S5
CONTROL VOLUME OF TV SOUND AND CARRIER SOUND
S6
DISPLAY ON SCREEN
A

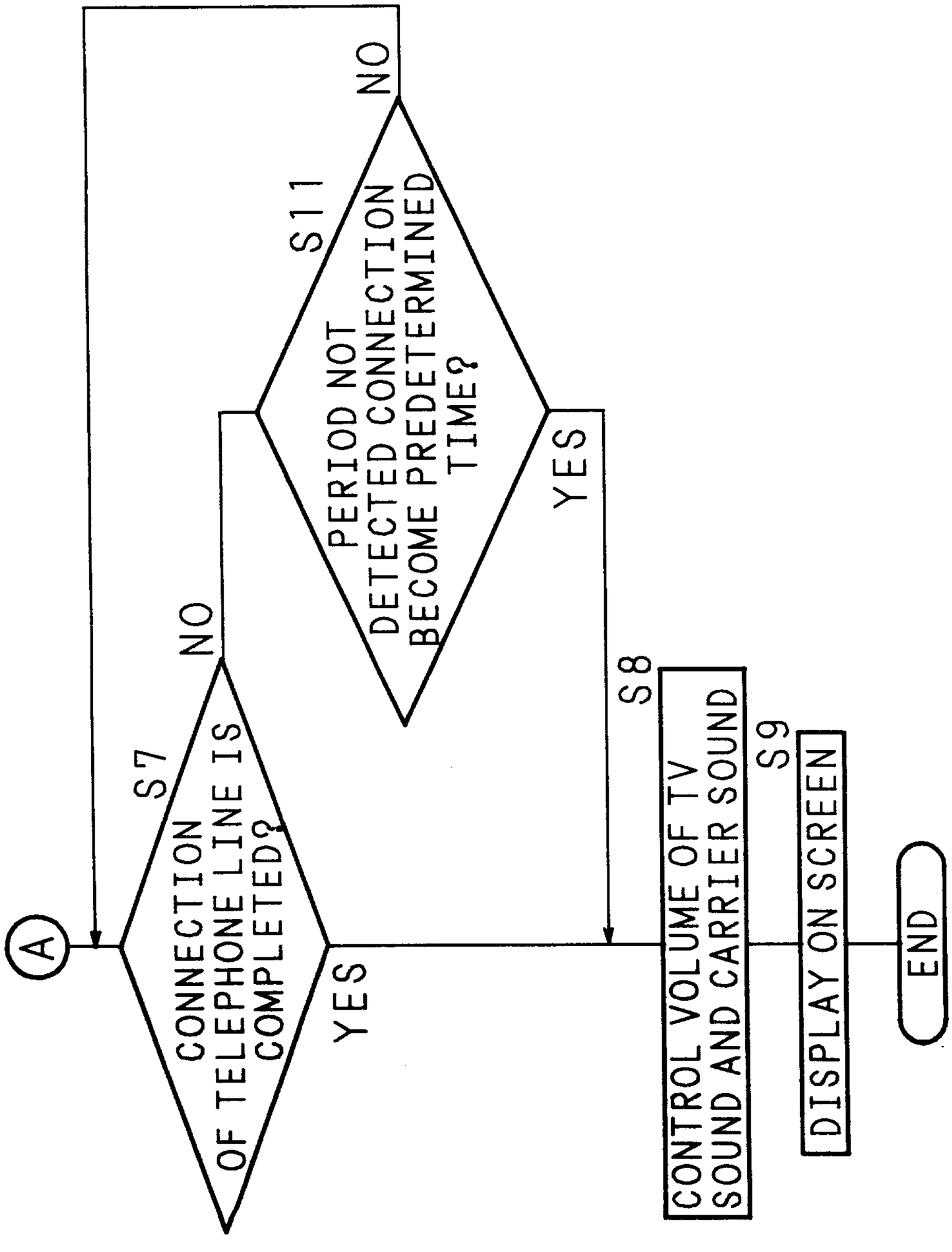

S11
PERIOD NOT DETECTED CONNECTION BECOME PREDETERMINED TIME?
NO
YES
S7
CONNECTION OF TELEPHONE LINE IS COMPLETED?
NO
YES
A
S8
CONTROL VOLUME OF TV SOUND AND CARRIER SOUND
S9
DISPLAY ON SCREEN
END

FIG. 4B

FIG. 5A

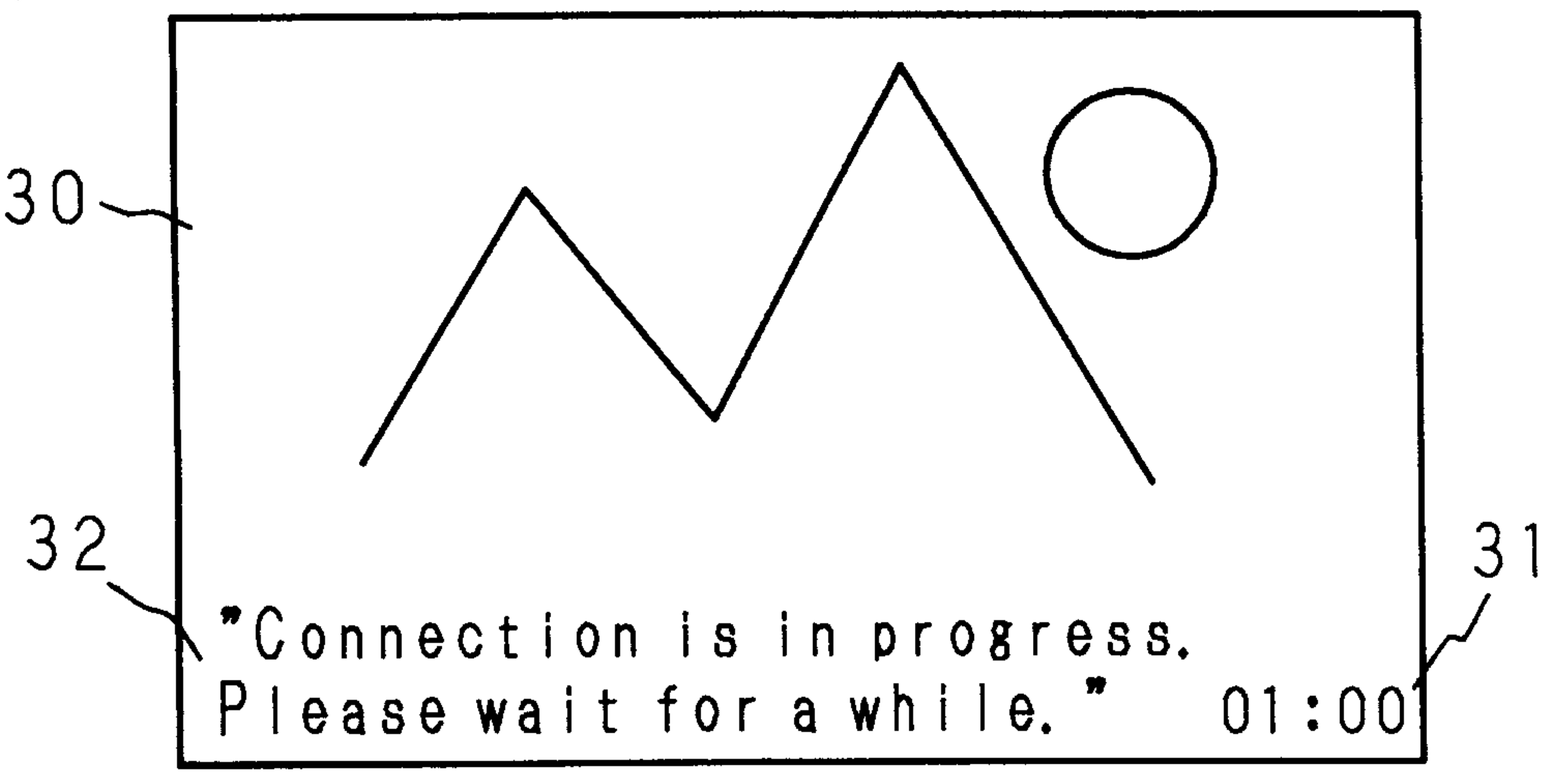


FIG. 5B

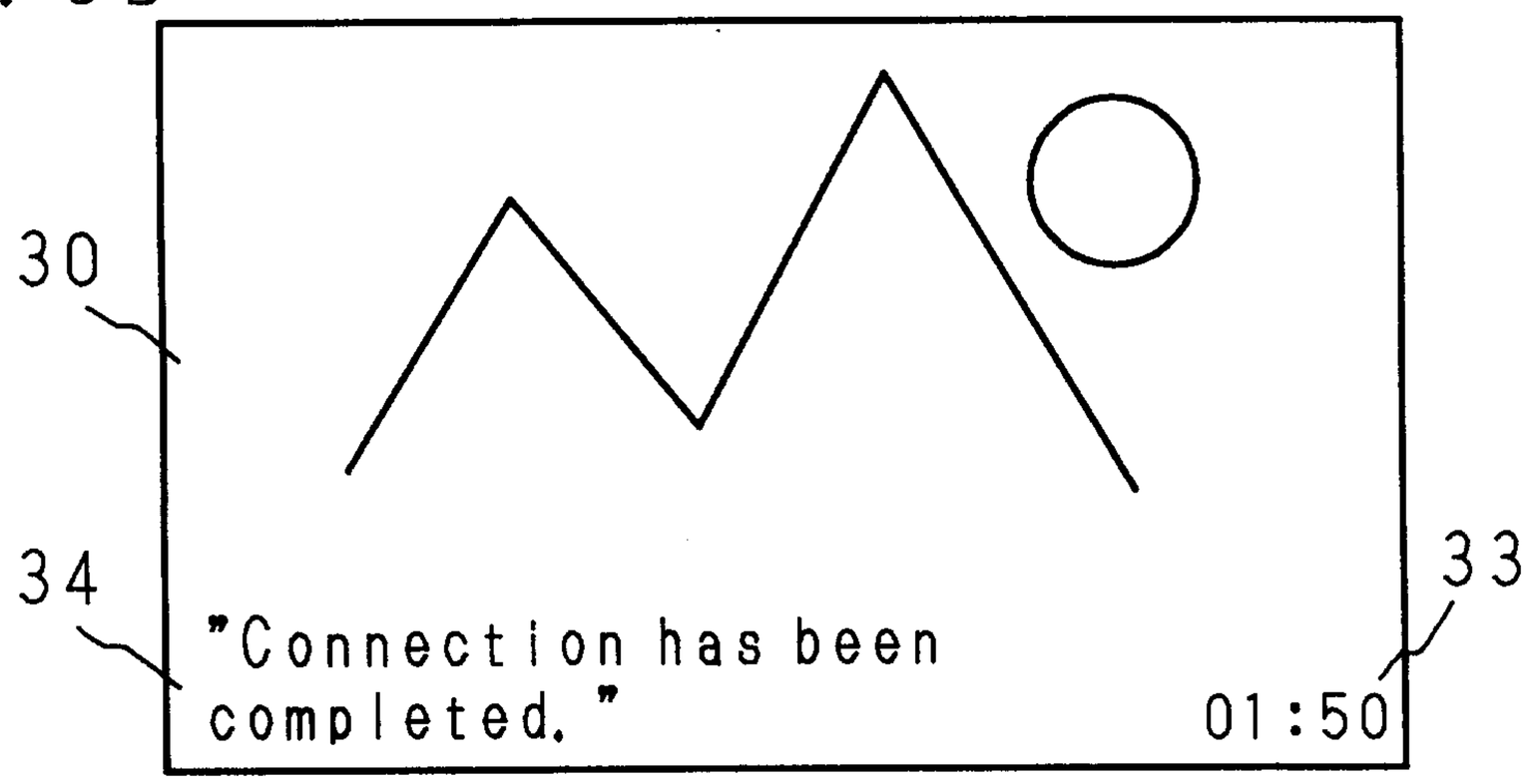


FIG. 5C

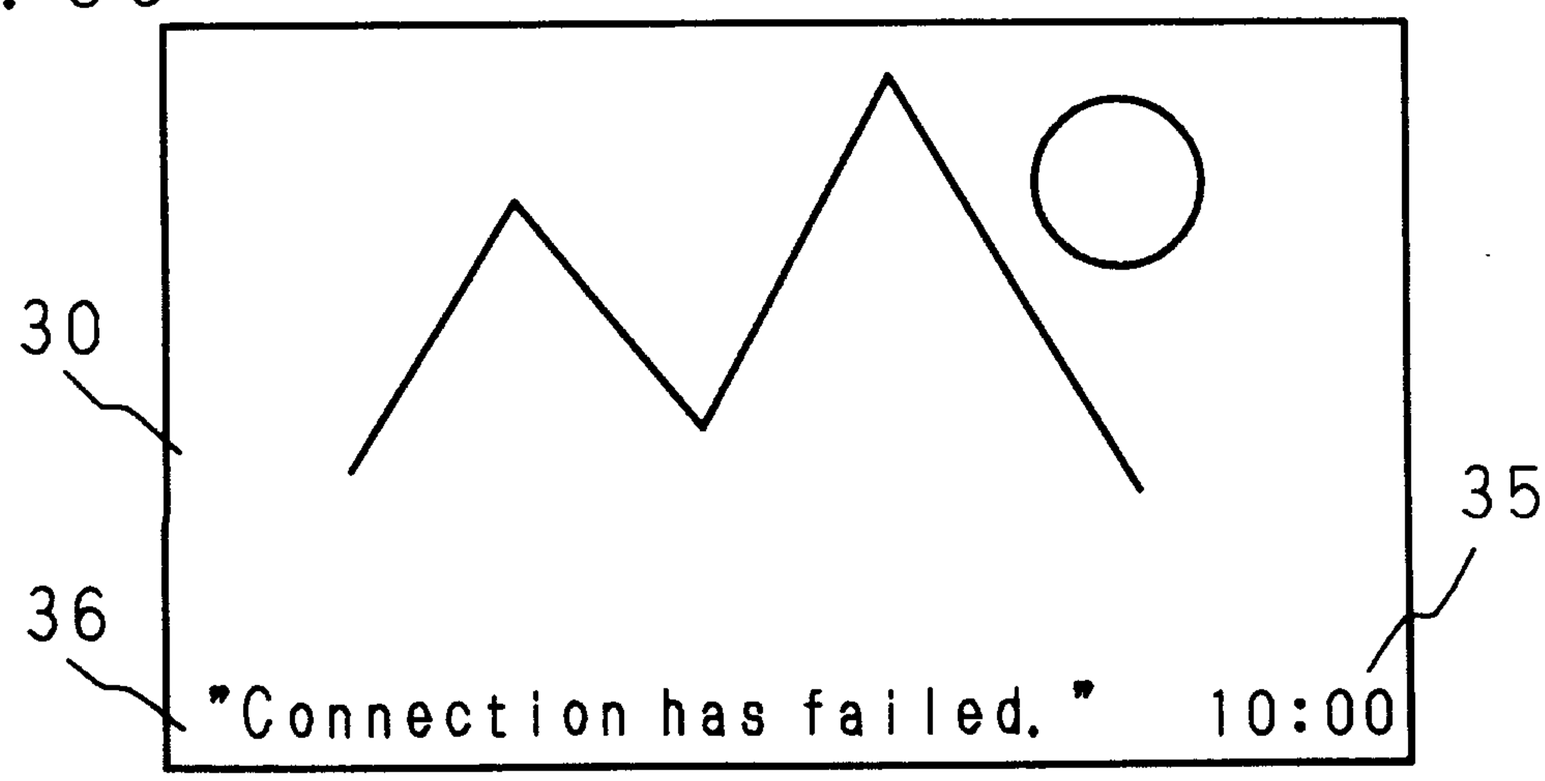
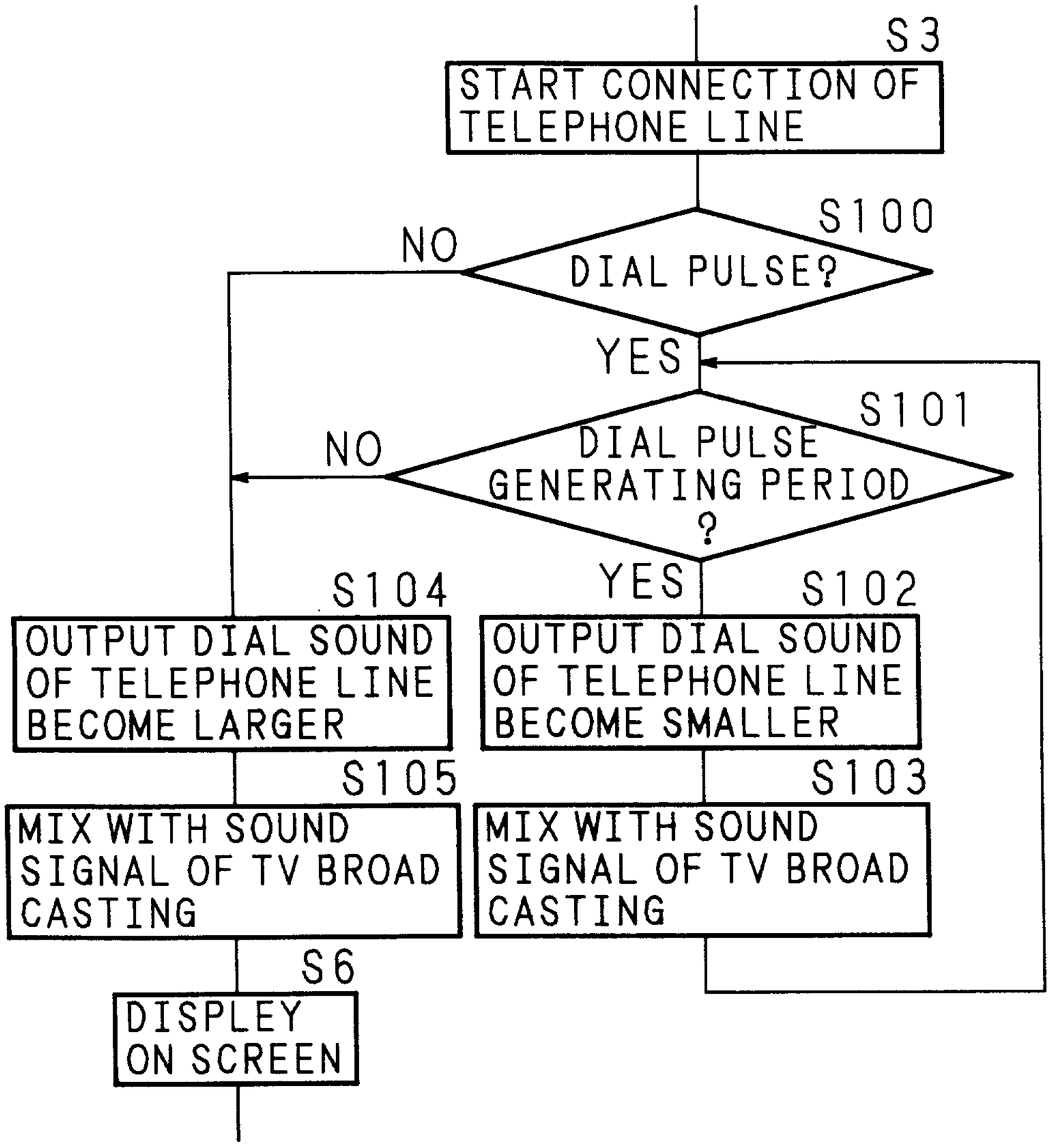


FIG. 6


S3
START CONNECTION OF TELEPHONE LINE
S100
DIAL PULSE?
NO
YES
S101
DIAL PULSE GENERATING PERIOD ?
NO
YES
S104
OUTPUT DIAL SOUND OF TELEPHONE LINE BECOME LARGER
S102
OUTPUT DIAL SOUND OF TELEPHONE LINE BECOME SMALLER
S105
MIX WITH SOUND SIGNAL OF TV BROAD CASTING
S103
MIX WITH SOUND SIGNAL OF TV BROAD CASTING
S6
DISPLEY ON SCREEN

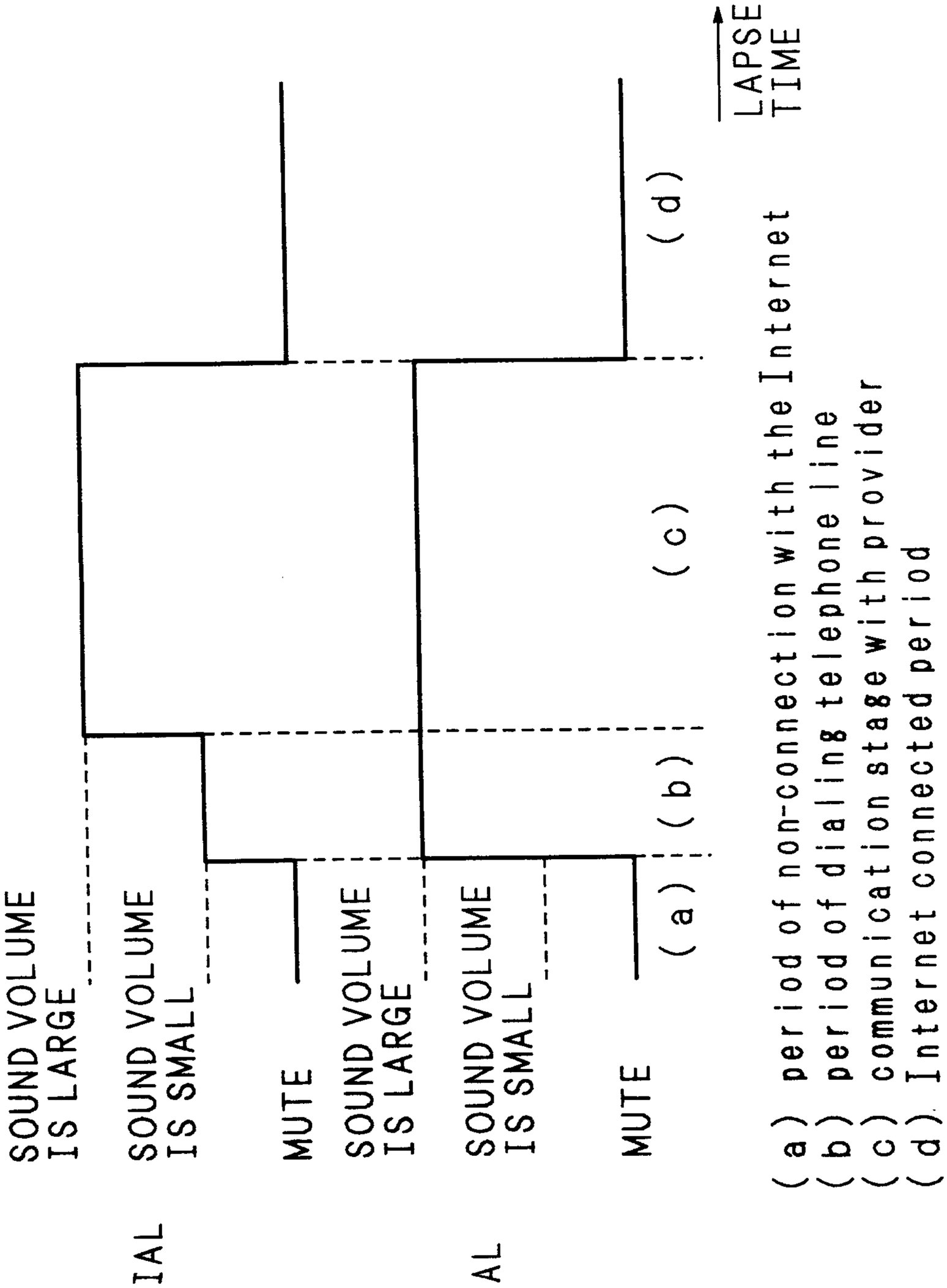

SOUND VOLUME IS LARGE
SOUND VOLUME IS SMALL
MUTE
SOUND VOLUME IS LARGE
SOUND VOLUME IS SMALL
MUTE
(a)
(b)
(c)
(d)
LAPSE TIME
(a) period of non-connection with the Internet
(b) period of dialing to telephone line
(c) communication stage with provider
(d) Internet connected period
PULSE DIAL
TONE DIAL

FIG. 7

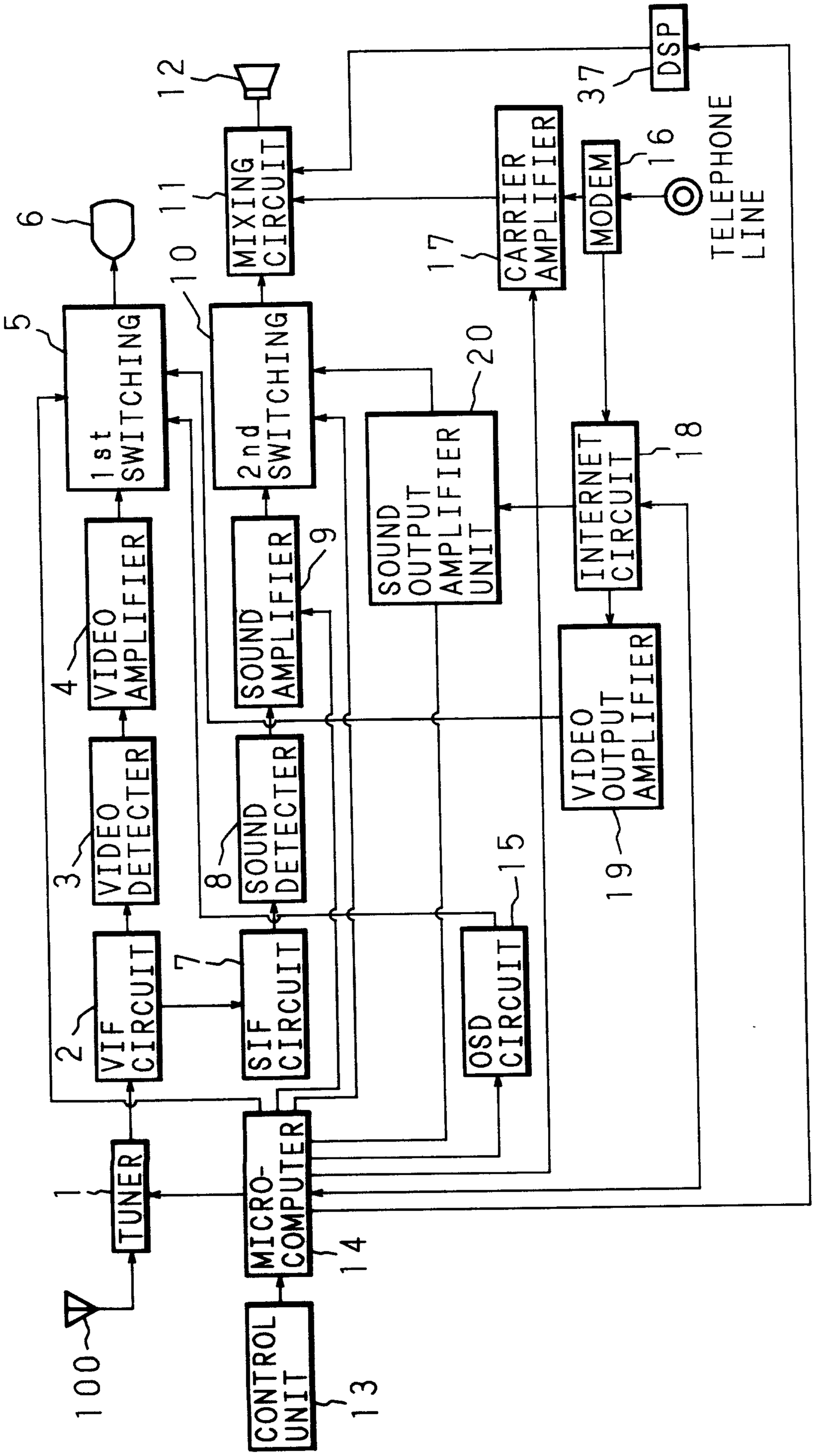

TUNER
VIF CIRCUIT
VIDEO DETECTER
VIDEO AMPLIFIER
1st SWITCHING
MIXING CIRCUIT
12
6
5
4
3
2
1
11
10
SIF CIRCUIT
SOUND DETECTER
SOUND AMPLIFIER
2nd SWITCHING
7
8
9
MICRO-COMPUTER
CONTROL UNIT
OSD CIRCUIT
SOUND OUTPUT AMPLIFIER
CARRIER AMPLIFIER
MODEM
DSP
INTERNET CIRCUIT
VIDEO OUTPUT AMPLIFIER
TELEPHONE LINE
14
13
15
20
17
16
37
18
19
100

FIG. 8

FIG. 9

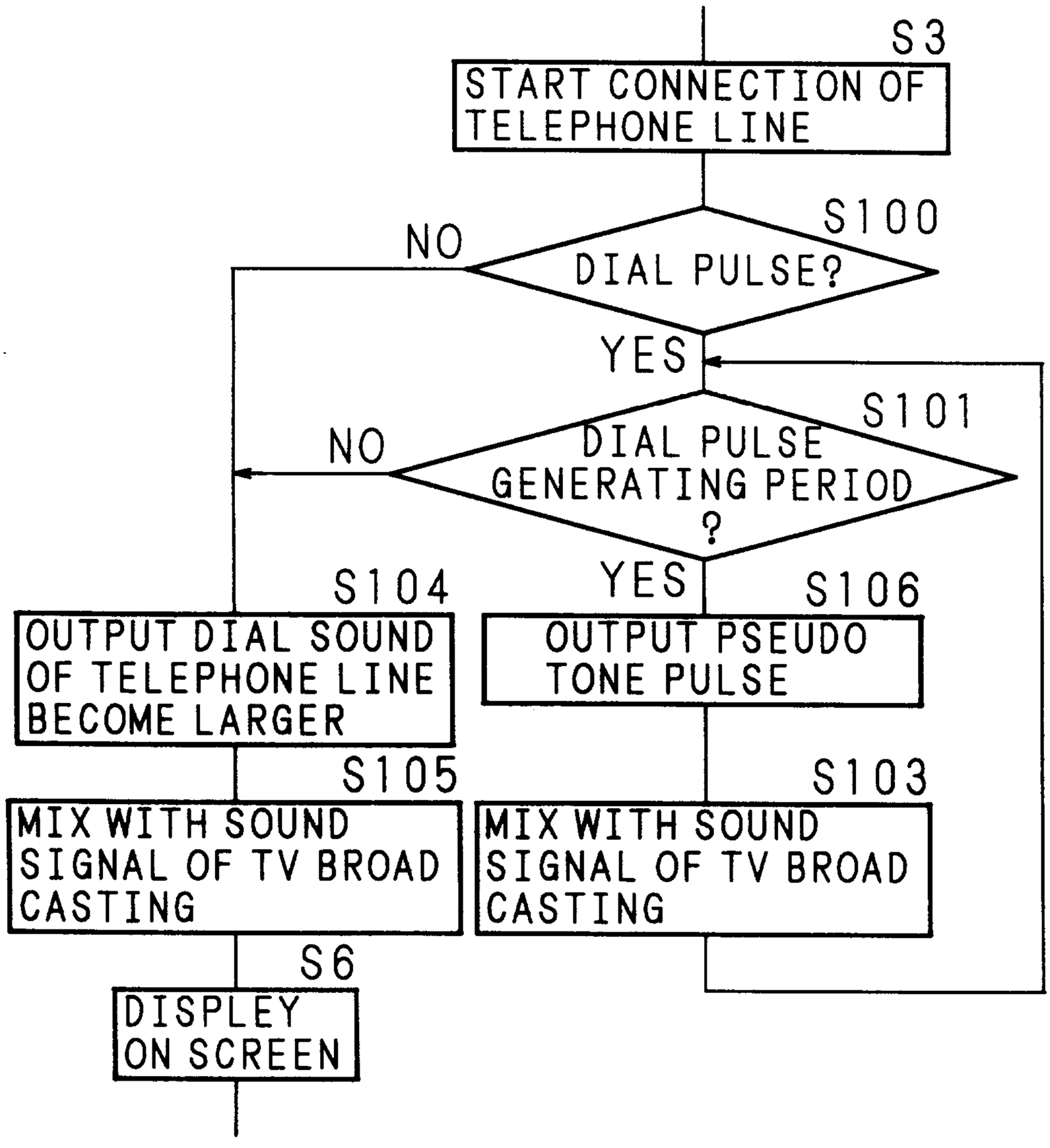

S3
START CONNECTION OF TELEPHONE LINE
S100
DIAL PULSE?
NO
YES
S101
DIAL PULSE GENERATING PERIOD ?
NO
YES
S104
OUTPUT DIAL SOUND OF TELEPHONE LINE BECOME LARGER
S106
OUTPUT PSEUDO TONE PULSE
S105
MIX WITH SOUND SIGNAL OF TV BROAD CASTING
S103
MIX WITH SOUND SIGNAL OF TV BROAD CASTING
S6
DISPLEY ON SCREEN

FIG. 10A
PRIOR ART

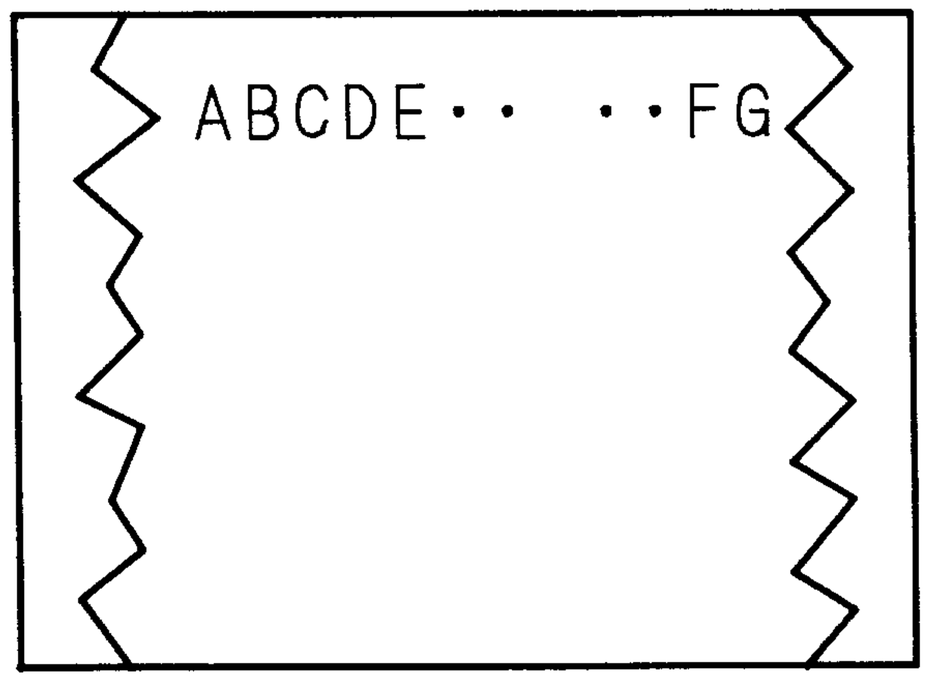


FIG. 10B
PRIOR ART

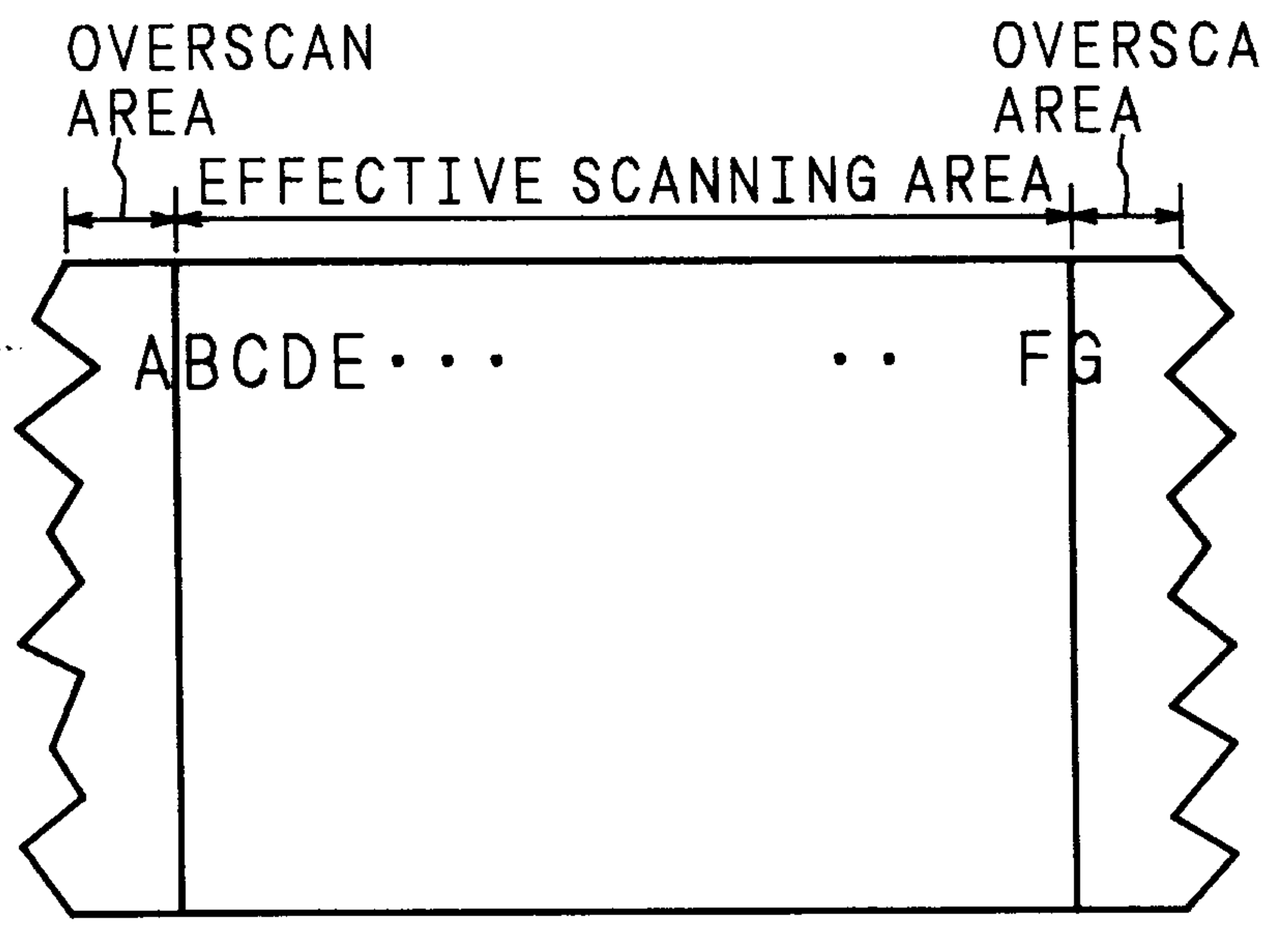


FIG. 10C
PRIOR ART

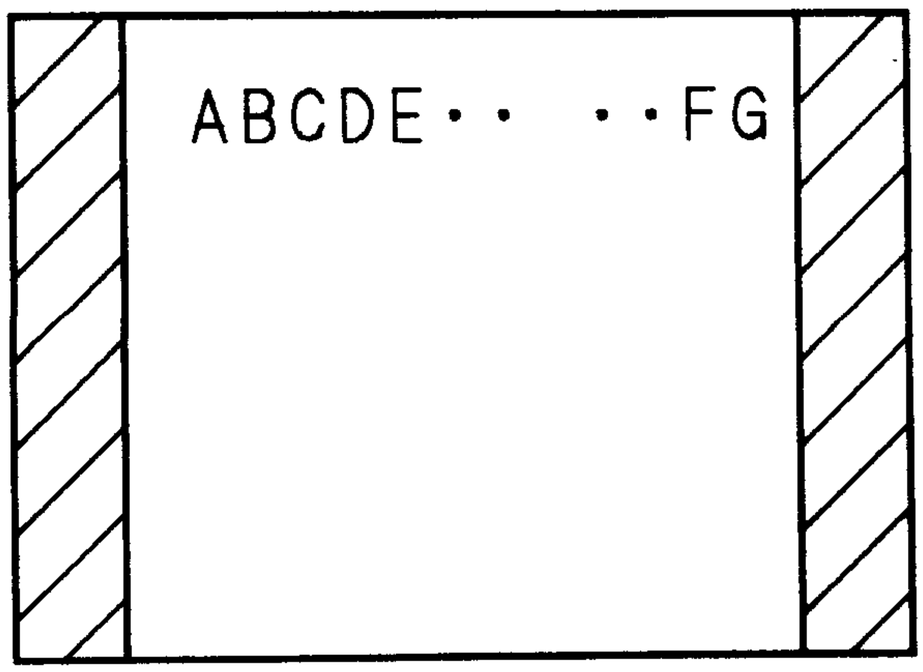
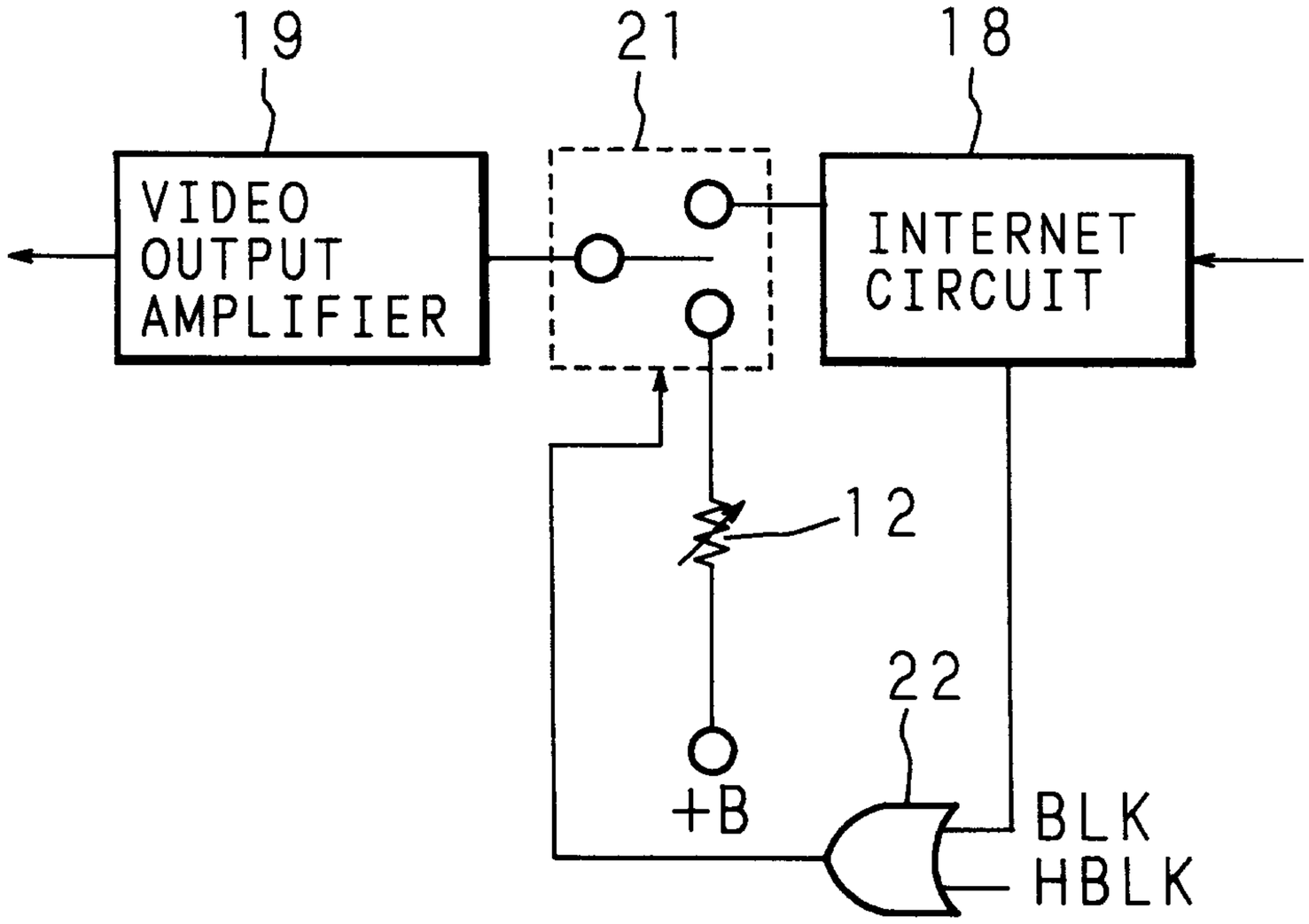


FIG. 11


19
21
18
VIDEO
OUTPUT
AMPLIFIER
INTERNET
CIRCUIT
12
22
+B
BLK
HBLK

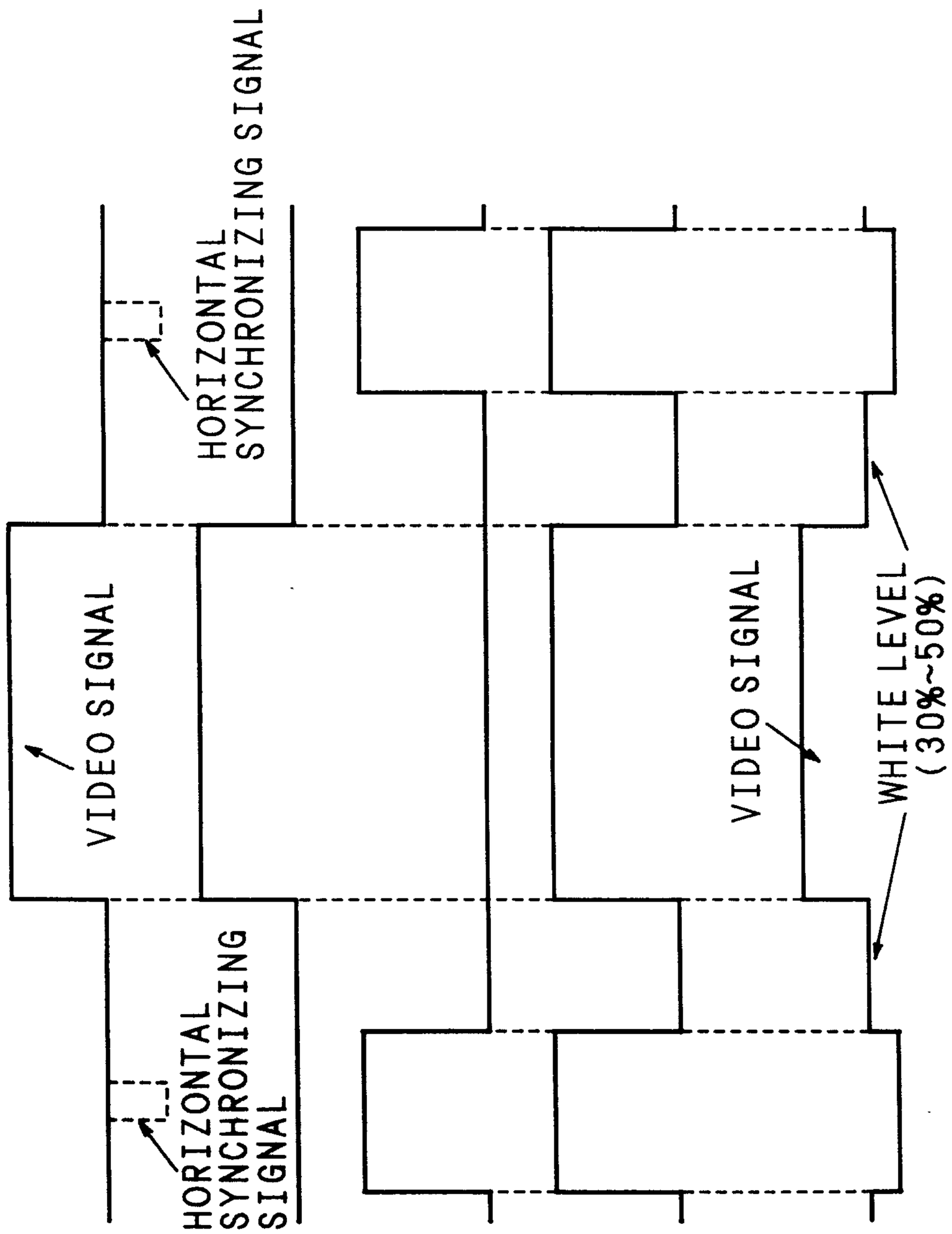

VIDEO SIGNAL
HORIZONTAL SYNCHRONIZING SIGNAL
VIDEO SIGNAL
WHITE LEVEL (30%~50%)
VIDEO SIGNAL
HORIZONTAL SYNCHRONIZING SIGNAL
(a)
(b)
(c)
(d)
(e)

FIG. 12