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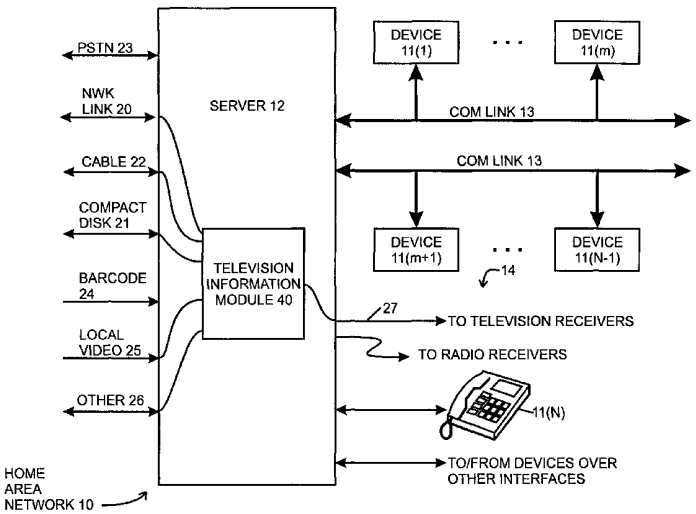
(54) Title: HOME AREA NETWORK INCLUDING ARRANGEMENT FOR DISTRIBUTING TELEVISION PROGRAMMING OVER LOCAL CABLE



(57) Abstract: A television program distribution arrangement is described for use in connection with a server in a home area network, the television program distribution arrangement being configured to distribute television programming over a local video link. The television program distribution arrangement comprises a television progamming information receiver module, a television programming information assembler module, and a control module. The television programming information receiver module is configured to receive television programming information from a plurality of sources. The television programming information assembler module is configured to assemble said television programming information as received by the television programming information receiver module into a unitary set of channels for channels for transmission over the local link. The control module is configured to control the television programming information receiver module and the television programming information assembler module.

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HOME AREA NETWORK INCLUDING ARRANGEMENT FOR DISTRIBUTING TELEVISION PROGRAMMING OVER LOCAL CABLE

INCORPORATION BY REFERENCE

U. S. Patent Application Serial No. 09/365,726, filed August 3, 1999, in the name of Richard Edson, entitled "Multi-Service In-Home Network With An Open Interface" and assigned to the assignee of this application, incorporated by reference.

U. S. Provisional Patent Application Serial No. 60/193,813, filed March 31, 2000, in the name of Theodore F. Tabloski, et al., entitled "Home Area Network" and assigned to the assignee of this application, incorporated by reference.

U. S. Patent Application Serial No. 09/649,493, filed August 28, 2000, in the name of Peter A. Kaczowka, entitled "System And Method For Providing Translucent Region Over A Video Program For Display By A Video Display Device" and assigned to the assignee of this application, incorporated by reference.

U. S. Patent Application Serial No. _____ , filed on even date herewith in the names of Alexander Vasilevsky, et al., entitled "System And Method For Providing Video Programming Information To Television Receivers Over A Unitary Set Of Frequencies" (Attorney Docket No. UCN-005) and assigned to the assignee of this application, incorporated by reference.

FIELD OF THE INVENTION

The invention relates generally to the field of user-premises or home area networking, to allow different types of systems and/or communications devices to utilize one in-home network to communicate with each other and to access a number of external communication services, and more specifically to systems and methods of providing video programming information from a plurality of sources to television receivers over a unitary set of channels to which the television receivers are adapted to tune.

BACKGROUND OF THE INVENTION

U. S. Patent Application Serial No. 09/365,726, filed August 3, 1999, in the name of Richard Edson, entitled "Multi-Service In-Home Network With An Open Interface" (hereinafter "the Edson application") and U. S. Provisional Patent Application Serial No. 60/193,813, filed March 31, 2000, in the name of Theodore F. Tabloski, et al., entitled "Home Area Network" (hereinafter "the Tabloski, et al., application") describe various embodiments of an in-home network and server therefor that provides a number of services. Generally, one of the services is to distribute video

program information to, for example, television receivers for viewing thereon. In one embodiment, the video program information may be provided by one or more of a number of sources, including, for example, over-the-air broadcast, a cable provider or a digital satellite provider, and the server generally distributes the video program information to the television receivers over a cable connection that defines a unitary set of channels to which the television receives are adapted to tune. It is also desirable to allow the server to also receive video program information from one or more secondary sources, such as a local video source, and integrate that video program information with the video program information from the other source(s), over the same unitary set of channels.

SUMMARY OF THE INVENTION

The invention provides a new and improved system for and method of providing, in connection with a home area network that includes a home server, television programming information to television receivers over a cable connection local to the home containing the home area network.

In brief summary, the invention provides a television program distribution arrangement for use in aconnection with a server in a home area network, the television program distribution arrangement being configured to distribute television programming over a local video link. The television program distribution arrangement comprises a television programming information receiver module, a television programming information assembler module, and a control module. The television programming information receiver module is configured to receive television programming information from a plurality of sources. The television programming information assembler module is configured to assemble said television programming information as received by the television programming information receiver module into a unitary set of channels for transmission over the local link. The control module is configured to control the television programming information receiver module and the television programming information assembler module.

BRIEF DESCRIPTION OF THE DRAWINGS

This invention is pointed out with particularity in the appended claims. The above and further advantages of this invention may be better understood by referring to the following description taken in conjunction with the accompanying drawings, in which:

FIG. 1 depicts a home area network including an arrangement for providing television programming information to television receivers over a cable connection local to the home area network; and

FIG. 2 depicts a functional block diagram of a portion of a home server that provides television program information providing arrangement useful in the home area network depicted in FIG. 1.

DETAILED DESCRIPTION OF AN ILLUSTRATIVE EMBODIMENT

FIG. 1 depicts a home area network 10 including an arrangement for providing television programming information to television receivers over cable connection that is local to the home area network, constructed in accordance with the invention. Generally, the home area network 10 facilitates the connection of a plurality of household appliances, devices, television and radio receivers, telephone sets, and other facilities (generally "devices") 11(1) through 11(N) (generally identified by reference numeral 11(n)) to a home server 12 over one or more digital communication links generally identified by reference numeral 13 and one or more analog communication links generally identified by reference numeral 14. The home server 12 can also connect to a number of external connections, including a central office in the public switched telephony network (PSTN) over a PSTN link 23, a network such as the Internet over a network link 20, a cable connection (for use in providing cable television, telephony, Internet and other services as will be apparent to those skilled in the art) over cable link 22, a compact disk player over a compact disk link 21, a barcode reader over barcode link 24, a local video source 25, and perhaps other devices (such as devices providing information via satellite and the like, home security devices, and so forth) over other links generally identified by reference numeral 26.

As described in, for example, the aforementioned Edson and Tabloski, et al, applications, the devices 11(n) can transfer information among themselves over the respective communication link 13, 14 to which they are connected. In addition, the devices 11(n) connected to one communication link 13, 14 can transfer information to devices connected to another communication link 13, 14 and between the devices 11(n) and the PSTN, network, cable, etc., through the server 12; in that operation, if one device 11(n') is connected to an analog communication link 14 and another device 11(n") (n"≠n') is connected to a digital communication link 13, the server 12 can perform a digital to analog or analog to digital conversion as necessary. In addition, the server 12 operates to store information received from the PSTN, network, cable, and devices 11(n) for later transmission over the PSTN, network, cable, etc., and later transmission to the devices 11(n). The information transferred over communication links 13 is preferably in digital form, as is the information stored on the server. On the other hand, information may be transferred over other connections in digital or analog form as appropriate.

The devices 11(n) that can be connected to the home area network 10 can include a number of types of appliances, including but not limited to devices such as personal computers, personal digital assistant (PDA) devices, telephony devices (illustratively device 11(N)), and home entertainment devices such as radio and television receivers, DVD, compact disk, video and audio tape and record players, and the like. In addition, devices 11(n) that can be connected to the home area network can include lighting, heating and cooling, and similar systems, as well as appliances such as stoves and ovens. If a particular device is a "legacy" device, that is, a device that itself does not have an interface that can be connected to a digital communication link 13, that legacy device can be provided with a suitable interface to allow it to be so connected.

Generally, the home area network 10 operates to allow information to be stored on the server 12, transferred among the devices 11(n), and transferred from or to a number of external sources or destinations, including, for example, sources or destinations over a network such as the Internet or the public switched telephony network (PSTN), cable or satellite television or radio, music sources such as compact disks. The information may comprise any form of information, including, for example, audio information, image and video information, information in text form, control information for, for example, controlling one device from another or from the server 12 in relation to, for example, occurrence of certain events, computer programs, and so forth. The home area network can be used to, for example, transfer audio information from sources to destinations such as the server 12 for storage or to various devices 11(n) for playing. Similarly, the home area network 10 can be used to transfer image or video information from sources to destinations such as the server 12 for storage or to various devices 11(n) for display. In addition, the home area network 10 can be used to transfer control information to control controllable devices, such as lighting, appliances such as stoves and ovens, heating and cooling systems, alarm systems and the like.

The communication links 13 may be in any form, including a hard link such as a wire, optical fiber or other arrangement for transferring electrical, optical or other signals among the appliances. Alternatively or in addition, communication links 13 may comprise wireless links, such as but not limited to infrared links or links provided by signals in other parts of the electro-magnetic spectrum. Communication links 13 may comprise communication links specially provided for the home area network 10, and/or they may include pre-existing links such as telephone lines, wiring provided for, for example, AC power distribution, and the like.

Each device 11(n) connected to a digital communication link 13 preferably includes or is provided with an interface (not separately shown) that enables it to transmit information, in the form

of message packets to, and/or receive information in the form of message packets from each other and the home server 12 over the respective communication link 13. When a device 11(n) receives message packets containing information, it can use the information as described below.

Generally, the server 12 includes a number of components (not separately shown), including components for processing, storing and retrieving data in digital form, and for converting data between digital and analog form. With particular reference to the instant invention, the home area network 10, and, in particular, server 12, provides an arrangement whereby video program information provided by, for example, a local video source over local video link 25, can be integrated with video program information provided by a cable provider over cable link 22, and distributed to the television receivers over a unitary set of channels. The unitary set of channels will conform to the set of channels over which the cable provider normally provides video program information, and which are tunable by the television receivers to which the server 12 provides the video program information. For example, if the cable provider provides video program over a set of channels arbitrarily numbered 1 through N, the video program information arrangement essentially removes the video program information provided by the cable provider for one channel "n," and substitute for some or all of the channel "n" video program information that is received over the local video link 25 in that channel. Accordingly, the video program information arrangement will provide, to the television receivers connected to the server 12, a composite video signal for channels 1 through "n-1" and "n+1" through N as provided by the cable provider, and a substituted video image signal for channel "n" as generated by the server's video program information arrangement. The video program information arrangement described herein does not provide, in the substituted channel, a substitute audio signal for the substituted channel, but a substitute audio signal may be provided using arrangements not described herein.

The video program information from the local video link 25 may completely substitute for the video program information from the cable provider in the substituted channel. Alternatively, the video program information from the local video link 25 may substitute for a portion of the video program information from the cable provider, in a window in, for example, a picture-in-picture format, in the channel, with the video program information from the local video link 25 being displayed in a region of the video screen of predetermined size, with the video program information from the cable provider being displayed in the rest of the video screen. As another alternative, the video program information from the cable provider may be displayed in a small region of the video screen, with the video program information from the local video link 25 being displayed in the rest

of the video screen. The video program information from the local video link 25 may be any form of video program information, including, for example, information from one or more cameras to facilitate monitoring of areas of the home, such as for security, baby or child monitoring and other operations that will be apparent to those skilled in the art.

The home server 12 includes a television information module 40 to provide television program information to the one or more television receivers that are located in, for example, the home that includes the home area network 10. The television program information provided by the television information module 40 may be in digital form, in which case it may be distributed over, for example, one or more of the communication links 13 to devices 11(n). Those of the devices 11(n) that are capable of displaying one or both of the video component and/or audio component of the television program information can, under control of a user, receive the information and display and/or play the respective component. Instead or in addition, the television program information provided by the television information module 40 may be in analog form, in which case it may be transmitted over local cable connection 27 to, for example, television receivers (not separately shown), that may be located in the home that includes the home area network 10. As a further alternative, the television program information provided by the television information module may be broadcast as a low-power wireless signal that can be received by a nearby television receiver.

The television program information provided by television information module 40 may originate from a number of sources. For example, the television information module 40 may receive television program information, comprising one or both of the video and/or audio components, from a cable provider, satellite connection or the like over the cable link 22. The television information module 40 may also receive television program information over, for example, a network such as the Internet over the network link 20. The television information module 40 may also receive video information, which will include the video component and may also include the audio component of video program information, over local video link 25. The audio information received over the compact disk link 21 may also be provided to the television information module 40, which may use the audio information as the audio component of video program information.

The television information module 40 may also receive miscellaneous image information from a number of sources, that it may use as the video component of television program information provided to the television receivers. For example, the miscellaneous image information may be in any convenient image format, such as the well-known JPEG, GIF or bitmap formats, which the

television information module 40 can process to convert as necessary to a form in which it can be used as video program information for provision to the television receivers.

In addition, the television information module 40 may receive textual information, which it can process to convert to a form in which it can be used as video program information for provision to the television receivers. For example, the textual information may be in the form of Web pages encoded in HTML form, Emails, or other textual information that may be received over, for example, network link 20. The textual information may also be in the form of digital books which may be received over the network link 20, compact disk link 21, or other links 26. Textual information may also be generated by the server 12 itself, and may include, for example, notifications regarding changes of status of security alarm systems, notifications of incoming telephone calls and notifications of other occurrences as will be apparent to those skilled in the art.

The television information module 40 may also receive other forms of information which it may use as video programming information to be provided to the television receivers, as will be apparent to those skilled in the art.

Generally, if the television program information provided by the television information module 40 corresponds to, for example, the television program information received from the cable link 22, which comprises television program information for a plurality of channels, which may be arbitrarily identified by channels 1 through N (where "N" is an integer; generally channel "n"), the television information module 40 may substitute television program information from another source for some or all of the television program information for a selected channel n' prior to providing the television program information to the television receivers. Substituted television program information can be such as to substitute for the entire television program information, or the entire video or audio component thereof, in the selected channel n'. In that case, if, for example, the substituted television program information is to substitute for the video component of the television program information in the selected channel n', the television information module 40 can delete the video component in channel n' as received from the cable link 22 and insert the substituted television program information in channel n' before providing television program information to the television receivers.

Similarly, if the substituted television program information is to substitute for the audio component of the television program information in the selected channel n', the television information module 40 can delete the audio component in channel n' as received from the cable link 22 and insert the substituted television program information in channel n' before providing the

television program information to the television receivers. On the other hand, if the substituted television program information substitutes for only a portion of the television program information received over the cable link 22 in that channel n', the substituted television program information may be substituted in such a way as to be shown in a window in the television program, such as to display it as a "picture in a picture." In any case, the television information module 40 can scale the substituted television program information as necessary to fit either the window, if the substituted television program information is to substitute for a portion of the television program information in the channel n' as received over the cable link 22, or to fit the screens of the television receivers to which the television information module 40 provides the television program information.

In addition to receiving television program, information and providing it to the television receivers, the television information module 40 can store television program information for later retrieval, as, for example, a video recorder.

With this background, a functional block diagram of the one embodiment of television information module 40 is depicted in FIG. 2. With reference to FIG. 2, the television information module 40 includes a plurality of elements, including a television program information receiver module 41, a television program information buffer store 42, two video effects modules including a substitute television program information control module 43 a translucent video image control module 44, a television program recording control module 45, and a television program information assembler module 47, all under control of a control module 47. The television program information receiver module 41 receives the television program information from the various sources, as described above, and provides them to other modules. In addition, the television program information receiver module 41 may convert either or both of the video component or audio component of the television program information to digital form for storage in the television program information buffer store 42. The television program information stored in the buffer store 42 may be processed by the other modules immediately or shortly after being stored therein, as will be described below. Alternatively, or in addition, the television program information stored in the buffer store 42 may remain in the buffer store 42 for later retrieval, as in, for example, a video recorder. The television program information receiver module 41 may store television program information from, for example, all of the channels that are received over the cable link 21 in the television program information buffer store 42, or one or more selected channels. In one embodiment, the television program information buffer store 42 is in the form of a frame buffer.

The video effects modules operate to process television program information received from the cable link 22 and buffered in the television program information buffer store 42 to provide selected video effects. The substitute television program information control module 43 operates to substitute television program information for television program information received over the cable link 22 in one or more of the respective channels. An illustrative circuit for substitute television program information control module 43 is described in U. S. Patent Application Serial No. _____, filed on even date herewith (Attorney's docket no. UCN-005) in the names of Alexander Vasilevsky, et al., entitled "System And Method For Providing Video Programming Information To Television Receivers Over A Unitary Set Of Frequencies," assigned to the assignee of the present invention and incorporated herein by reference. The substitute television program information control module 43, under control of the control module 46, operates to substitute one or both of the video and audio component of the television program information in one or more of the channels n', n",... television program information for which has been received over the cable link 22 and stored in the buffer store 42. The substitute television program information control module 43 can receive substitute television program information from the television program information receiver module 41 and substitute it in the buffer store 42 for some or all of the television program information received from the cable link 22 for respective channel(s) n', n",... as described in the aforementioned patent application.

The control module 47 can provide control information to the substitute television program information control module 43. The control information can identify, for example, the channel or channels in which substitute television program information is to be provided, and, for each such channel, the source from which the substitute television program information is to be obtained. In addition, if, for a particular channel n', n", the substitute television program information is to be substituted for a portion of the television program information in the channel as received from the cable link 22, the control information provided by the control module can indicate the location and size of the window in which the substitute television program information is to be displayed. The substitute television program information control module 43 can use the location information to control particular locations in the buffer store 42 in which it (that is, the substitute television program information control module 43) will store substitute television program information. In addition, substitute television program information control module 43 can use the size information to scale the substitute television program information as necessary so that the substitute television program information will fit into the window. The video pipeline information 43 can also use the

size and location information to disable the television program information receiver module 41 from storing television program information received from the cable link 22 for the respective channel in the storage locations in the buffer store 42 in which substitute television program information is to be stored.

The control module 47 may receive information from, for example, a viewer viewing the channel on a television receiver, in which case the viewer can control source of substitute television program information, the channel in which the substitute television program information is to be provided, whether the substitute television program information is to be substituted for all of the television program information as received from the cable link 22, and, if not, the size and location of the window in which the substitute television program information is to be displayed. In addition, the information provided by the viewer may include the identification of the channel or channels in which substitute television program information is to be provided. Furthermore, the information provided by the viewer may include the particular source of substitute television program information that is to be displayed in a particular channel, in which case different channels can display substitute television program information from different sources. It will be appreciated that, in absence of information from the viewer for controlling any particular aspect, the control module 47 may instead make use of default information. In addition, for some types of information, such as information relating to change in status of a home security system, notifications regarding incoming telephone calls, and the like, the substitute television program information control module 43 can enable those types of information to be displayed in all of the channels.

The translucent video image control module 44 operates to provide a translucent region in the video component of the television program information stored in the buffer store 42. An illustrative circuit for substitute television program information control module 43 is described in U. S. Patent Application Serial No. 09/649,493, filed August 28, 2000, in the name of Peter A. Kaczowka entitled "System And Method For Providing Translucent Region Over A Video Program For Display By A Video Display Device," assigned to the assignee of the present invention and incorporated herein by reference. As described in that application, the translucent video image control module 44 provides a translucent region that partially obscures the video image from, for example, the cable link 22 for a particular channel. The substitute television program information control module 43 can, for example, insert an image from another source into the translucent region. The translucent region surrounding the image inserted by the substitute television program information control module 43 can serve to provide enhanced contrast between the video image from

the cable link 22 and the image inserted by the substitute television program information control module 43, so that the image inserted by the substitute television program information control module 43 may be more easily viewed. As with the substitute television program information control module 43, the translucent video image control module 44 operates under control of control information provided by the control module 47.

It will be appreciated that the television information module 40 may include video effects modules other than or in addition to the substitute program information control module 43 and translucent video image control module 44. For example, the television information module 40 may provide video effects modules that can process television program information buffered in the buffer store 42 to change colors, to introduce visual artifacts such as moire patterns, and other effects that will be apparent to those skilled in the art.

The television program recording control module 45 controls storage of television program information associated with one or more channels provided thereto by the television program information receiver module 41 in a buffer store for later retrieval. The television program recording module 45 effectively enables the server 12 to operate as a video recorder. As with the video effects modules, the television program recording control module 45 operates under control of control information provided thereto by the control module 47, which, in turn, may comprise default control information and/or control information based on information provided by a viewer. The information provided by a viewer may include information as to the day, time period and channel(s) for which television program information is to be recorded. Alternatively, the information provided by a viewer for a particular program may include information as to the program, by name or other identifier, and the television program recording control module 45 may itself determine the day, time period and channel during which television program information for that program will be provided. In either case, the television program recording control module 45 can provide the television program information for the channel(s) to be recorded to a video store 48 for storage. The video store may comprise any arrangement for recording information in analog and/or digital form, including, for example, magnetic tape, or digital form, including, for example, magnetic disks. If the television program information to be recorded is provided to the television program recording control module 45 in digital form, and the television program information is to be recorded in analog form, the television program recording control module 45 can convert the television program information as received from the television program information receiver module 41 to analog form. Similarly, if the television program information to be recorded is provided to the television program

recording control module 45 in analog form, and the television program information is to be recorded in digital form, the television program recording control module 45 can convert the television program information as received from the television program information receiver module 41 to digital. form.

As noted above, the television program recording control module 45 can also retrieve previously-recorded television program information to be provided to the television receivers that are connected to the server 12 for viewing. In that operation, the television program recording control module 45 can retrieve the previously-recorded television program information from the video store and, for example, provide it to, for example, the substitute television program information control module 43, which, in turn, can substitute the television program information from the television program recording control module 45 in a selected channel, as described above, for subsequent transmission to the television receivers connected to the server 12. If the previously-recorded television program information was recorded in analog form, the television program recording control module 45 can convert it to digital form before providing it to the substitute television program information control module 43. The television program recording control module 45 also retrieves previously-recorded television program information in response to control information provided thereto by the control module 47.

The television information module 40 can include modules for performing other services as will be appreciated by those skilled in the art.

The television program information assembler module 46, under control of the control module 47, receives television program information from a number of sources, including the television program information receiver module 41, the television program information buffer store 42, the substitute television program information control module 43, and the television program receiver control module 45, and other modules (if any) as necessary and generates a signal in the unitary set of channels for transmission to the television receivers connected to the server 12.

The invention provides a number of advantages. In particular, the invention provides an arrangement for providing a home area network that includes a television information module that can distribute television program information received from one or more sources to television receivers connected thereto in a home in a unitary set of channels. The television information module can also provide a number of services, including merging television program information from a number of sources into the unitary set of channels, substituting television program information from one channel for some or all of television program information as necessary in a

channel received from another source. The television information module can also record television program information as received from a source for later retrieval and viewing.

It will be appreciated that a system in accordance with the invention can be constructed in whole or in part from special purpose hardware or a general purpose computer system, or any combination thereof, any portion of which may be controlled by a suitable program. Any program may in whole or in part comprise part of or be stored on the system in a conventional manner, or it may in whole or in part be provided in to the system over a network or other mechanism for transferring information in a conventional manner. In addition, it will be appreciated that the system may be operated and/or otherwise controlled by means of information provided by an operator using operator input elements (not shown) which may be connected directly to the system or which may transfer the information to the system over a network or other mechanism for transferring information in a conventional manner.

The foregoing description has been limited to a specific embodiment of this invention. It will be apparent, however, that various variations and modifications may be made to the invention, with the attainment of some or all of the advantages of the invention. It is the object of the appended claims to cover these and such other variations and modifications as come within the true spirit and scope of the invention.

What is claimed as new and desired to be secured by Letters Patent of the United States is:

CLAIMS

1. A television program distribution arrangement for use in connection with a server in a home area network, the television program distribution arrangement being configured to distribute television programming over a local video link, the television program distribution arrangement comprising:

A. a television programming information receiver module configured to receive television programming information from a plurality of sources;

B. a television programming information assembler module configured to assemble said television programming information as received by the television programming information receiver module into a unitary set of channels for transmission over the local link; and

C. a control module configured to control the television programming information receiver module and the television programming information assembler module.

2. A television program distribution arrangement as defined in claim 1 in which one of said sources provides television programming information over a unitary set of channels, the television programming information assembler module being configured to remove at least some of the television programming information from at least one of the channels and substitute television programming information from another of said sources in the at least one of the channels.

3. A television programming information distribution arrangement as defined in claim 2 in which the at least one of the channels is selectable in response to channel selection information from a user.

4. A television programming distribution arrangement as defined in claim 2 in which one of the sources is a local programming source.

5. A television programming distribution arrangement as defined in claim 2 in which said one of said sources comprises a cable television programming provider.

6. A television programming distribution arrangement as defined in claim 2 in which said one of said sources comprises a satellite television programming provider.

7.A television programming distribution arrangement as defined in claim 2 in which said other of said sources comprises a pre-recorded television programming information source.

8. A television programming distribution arrangement as defined in claim 7 in which said pre-recorded television programming information source comprises a video cassette recorder.

9. A television programming distribution arrangement as defined in claim 7 in which said pre-recorded television programming information source comprises a digital video disk.

10. A television program distribution arrangement as defined in claim 1 further comprising a television programming information storage module, the control module being further configured

to selectively enable television programming information received by said television programming information receiver module from one of said sources to be stored in the television programming information storage module, and thereafter retrieved from the television programming information storage module and provided to the television programming information assembler module for use by the television programming information receiver module in assembling the television programming information.

11. A method of controlling a server in a home area network to provide television programming information over a local video link, the method comprising:

A. a television programming information receiving step of receiving television programming information from a plurality of sources;

B. a television programming information assembling step of assembling said television programming information as received by the television programming information receiver module into a unitary set of channels for transmission over the local link.

12. A method as defined in claim 11 in which one of said sources provides television programming information over a unitary set of channels, the television programming information assembling step including the steps of removing at least some of the television programming information from at least one of the channels and substituting television programming information from another of said sources in the at least one of the channels.

13. A method as defined in claim 12 in which the at least one of the channels is selectable in response to channel selection information from a user, the television programming information assembling step including the steps of receiving the channel selection information and using the channel selection information in assembling the television programming information.

14. A method as defined in claim 12 in which one of the sources is a local programming source.

15. A method as defined in claim 12 in which said one of said sources comprises a cable television programming provider.

16. A method as defined in claim 12 in which said one of said sources comprises a satellite television programming provider.

17. A method as defined in claim 12 in which said other of said sources comprises a pre-recorded television programming information source.

18. A method as defined in claim 17 in which said pre-recorded television programming information source comprises a video cassette recorder.

19. A method as defined in claim 17 in which said pre-recorded television programming information source comprises a digital video disk.

20. A method as defined in claim 11 including

A. a television program information storage step of selectively storing television programming information received by said television programming information receiver module from one of said sources in a television programming information storage module, and

B. a television program information retrieval step of retrieving previously-recorded television programming information from the television programming information storage module for use in assembling the television programming information during the television programming information assembling step.

21. A computer program product for use in connection with a programmable device to provide a television program distribution arrangement for use in connection with a server in a home area network, the television program distribution arrangement being configured to distribute television programming over a local video link, the computer program product comprising a device readable medium having encoded thereon:

A. a television programming information receiver module configured to enable the device to receive television programming information from a plurality of sources;

B. a television programming information assembler module configured to enable the device to assemble said television programming information as received by the television programming information receiver module into a unitary set of channels for transmission over the local link; and

C. a control module configured to enable the device to control the television programming information receiver module and the television programming information assembler module.

22. A computer program product as defined in claim 21 in which one of said sources provides television programming information over a unitary set of channels, the television programming information assembler module being configured to enable the device to remove at least some of the television programming information from at least one of the channels and substitute television programming information from another of said sources in the at least one of the channels.

23. A computer program product as defined in claim 22 in which the at least one of the channels is selectable in response to channel selection information from a user.

24. A computer program product as defined in claim 22 in which one of the sources is a local programming source.

25. A computer program product as defined in claim 22 in which said one of said sources comprises a cable television programming provider.

26. A computer program product as defined in claim 22 in which said one of said sources comprises a satellite television programming provider.

27.A computer program product as defined in claim 22 in which said other of said sources comprises a pre-recorded television programming information source.

28. A computer program product as defined in claim 27 in which said pre-recorded television programming information source comprises a video cassette recorder.

29. A computer program product as defined in claim 27 in which said pre-recorded television programming information source comprises a digital video disk.

30. A computer program product as defined in claim 21 further comprising a television programming information storage module, the control module being further configured to enable the device to selectively enable television programming information received by said television programming information receiver module from one of said sources to be stored in the television programming information storage module, and thereafter retrieved from the television programming information storage module and provided to the television programming information assembler module for use by the television programming information receiver module in assembling the television programming information.

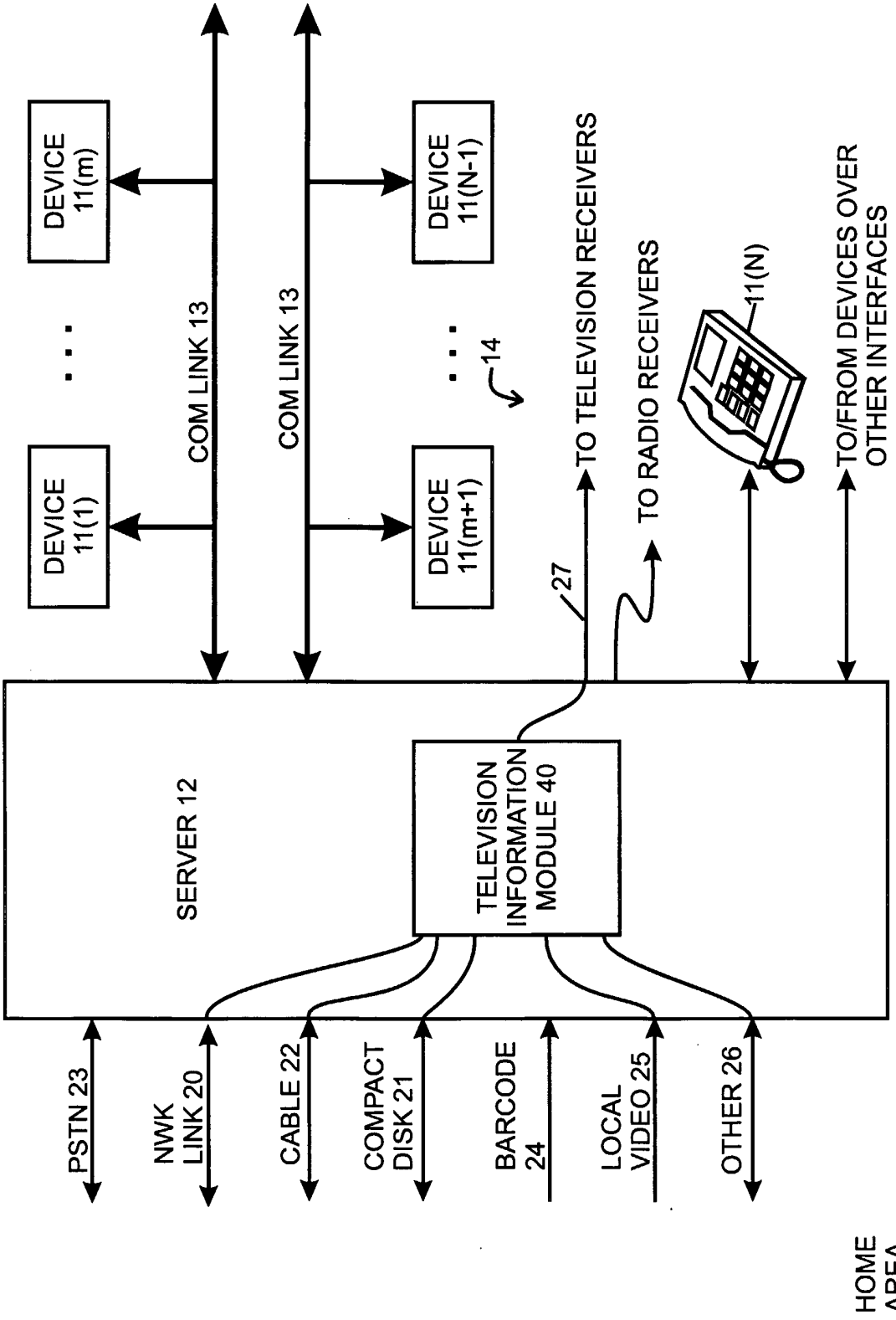
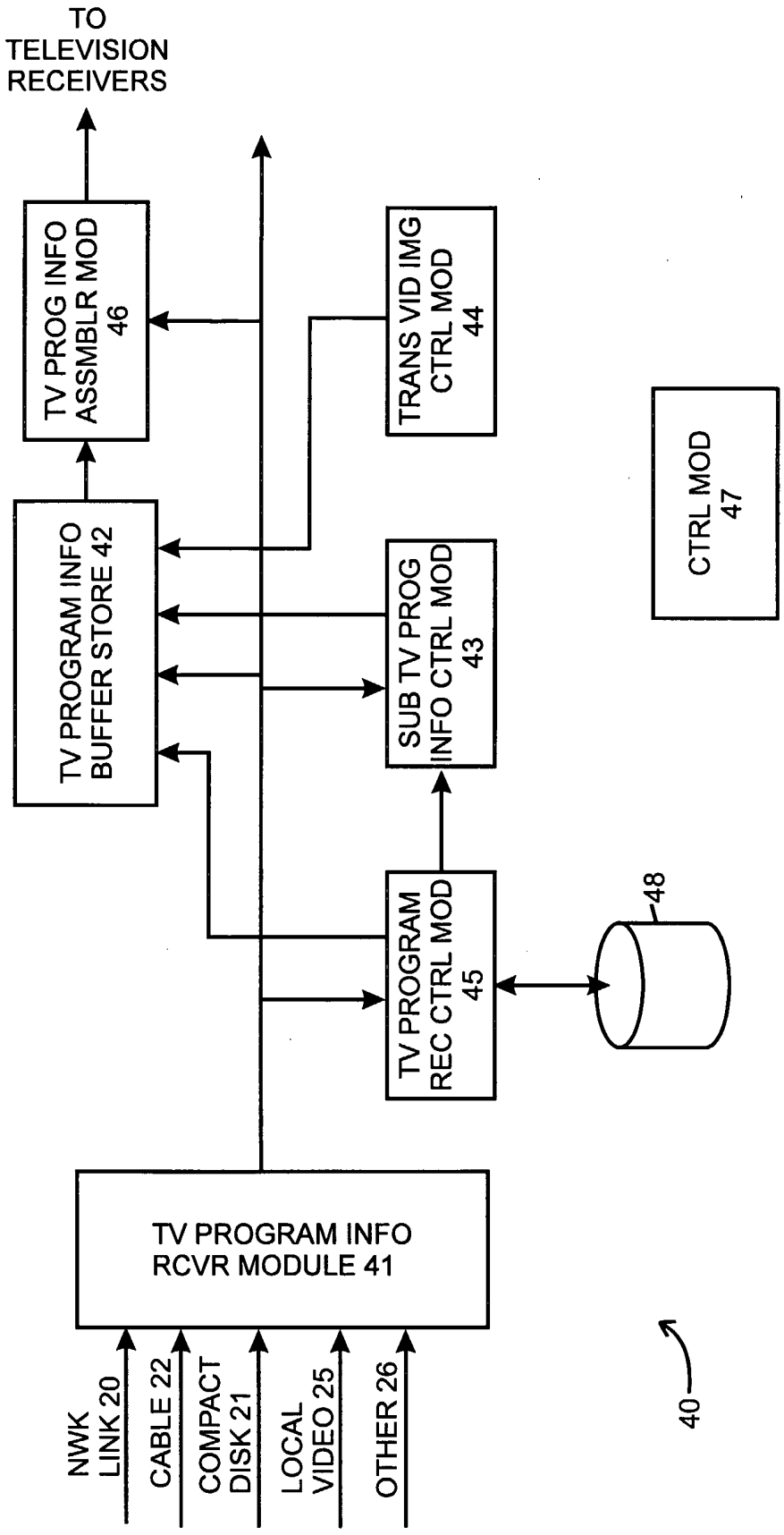

DEVICE 11(m)
DEVICE 11(1)
COM LINK 13
COM LINK 13
DEVICE 11(N-1)
DEVICE 11(m+1)
14
TO TELEVISION RECEIVERS
TO RADIO RECEIVERS
11(N)
TO/FROM DEVICES OVER OTHER INTERFACES
27
SERVER 12
TELEVISION INFORMATION MODULE 40
PSTN 23
NWK LINK 20
CABLE 22
COMPACT DISK 21
BARCODE 24
LOCAL VIDEO 25
OTHER 26
HOME AREA NETWORK 10

FIG. 1


TO TELEVISION RECEIVERS
TV PROG INFO ASSMBLR MOD 46
TRANS VID IMG CTRL MOD 44
CTRL MOD 47
TV PROGRAM INFO BUFFER STORE 42
SUB TV PROG INFO CTRL MOD 43
48
TV PROGRAM REC CTRL MOD 45
TV PROGRAM INFO RCVR MODULE 41
NWK LINK 20
CABLE 22
COMPACT DISK 21
LOCAL VIDEO 25
OTHER 26
40