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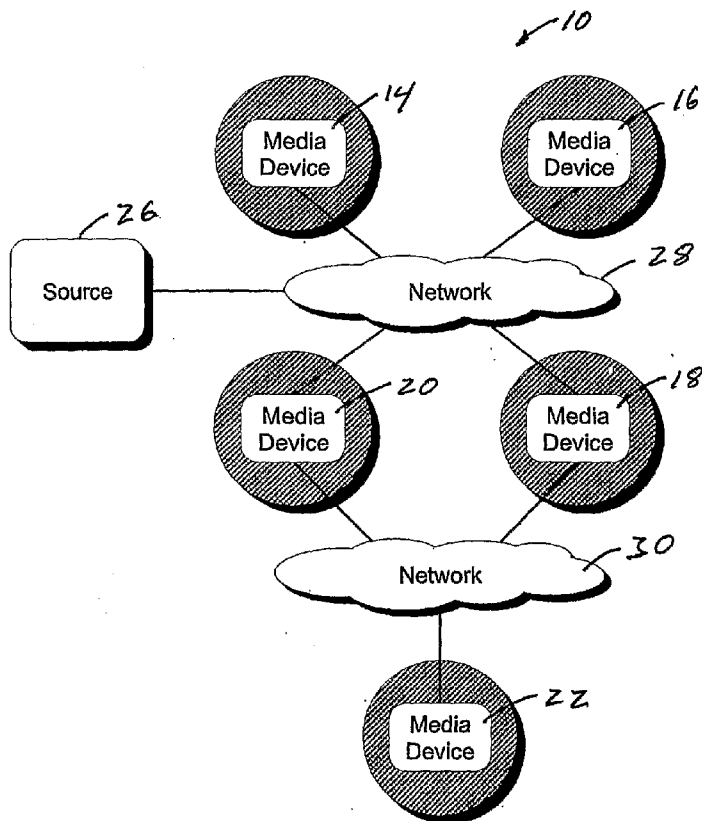
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(54) Title: METHOD AND SYSTEM OF CONTROLLING MEDIA DEVICES CONFIGURED TO OUTPUT SIGNALS TO SURROUNDING AREA



(57) Abstract: A system of controlling media devices configured for outputting signals to a surrounding area. The system including a control strategy for controlling operation of the media devices to execute operations according to a common schedule and a communications strategy for use in communicating the control strategy between the media devices in such a manner as to facilitate distribution of the control strategy to the media devices desired to operate according to the common timeline.

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## METHOD AND SYSTEM OF CONTROLLING MEDIA DEVICES CONFIGURED TO OUTPUT SIGNALS TO SURROUNDING AREA

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

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The present invention relates to methods and systems of controlling media devices configured to output signals to a surrounding area.

#### 2. Background Art

Media devices may be configured to output signals to a surrounding  
10 area. The surrounding area may be generally characterized as an ambient environment proximate the media devices from which an occupant may receive the outputted signals. For example, the media devices may be audio type devices configured to emit audio signals, a lighting type device configured to emit lighting signals, a video type device configured to emit lighting and video signals, and/or  
15 any other type of device having a suitable configuration.

One problem faced with such media devices relates to controlling the operation thereof. In particular, it may be difficult to coordinate action of multiple media devices to operate according to a common schedule or plan. It may also be difficult to program the operation of the media devices after the media devices are  
20 manufactured and deployed in a network.

### SUMMARY OF THE INVENTION

One non-limiting aspect of the present invention relates to overcoming the above-identified deficiencies by providing a means for coordinating action of multiple media devices and/or by easing programming of media devices  
25 after deployment in a network.

One non-limiting aspect of the present invention relates to a system of controlling media devices configured for outputting signals to a surrounding area. The system may include a control strategy for controlling operation of the media devices, a communications strategy for coordinating communication between the media devices, and a source configured to distribute the control strategy and the communications strategy to at least one of the media devices. The communications strategy may be configured to specify communication of the control strategy from at least one of the media devices to another of the media devices.

One non-limiting aspect of the present invention relates to a system of controlling media devices configured for outputting signals to a surrounding area. The system may include a control strategy for controlling operation of the media devices to execute operations according to a common schedule and a communications strategy for use in communicating the control strategy between the media devices in such a manner as to facilitate distribution of the control strategy to the media devices desired to operate according to the common timeline.

One non-limiting aspect of the present invention relates to a method of controlling media devices. The method may include configuring the media devices to output signals to a surrounding area according to instructions included within a control strategy and electronically distributing the control strategy to the media devices through a network communication medium.

The above features and advantages, along with other features and advantages of the present invention, are readily apparent from the following detailed description of the invention when taken in connection with the accompanying drawings.

## BRIEF DESCRIPTION OF THE DRAWINGS

The present invention is pointed out with particularity in the appended claims. However, other features of the present invention will become more apparent

and the present invention will be best understood by referring to the following detailed description and the accompany drawings in which:

FIGURE 1 illustrates a system in accordance with one non-limiting aspect of the present invention; and

5                   FIGURE 2 illustrates a flowchart of a method for use in controlling the media devices in accordance with one non-limiting aspect of the present invention.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT(S)

10                   FIGURE 1 illustrates a system 10 in accordance with one non-limiting aspect of the present invention. The system 10 may include a number of media devices 14-22 configured to emit signals to a surrounding area (shown with shading). A source 26 may be included for providing instructions and other signals to the media devices 14-22 over one or more networks 28-30.

15                   The networks 28-30 may be wireline and/or wireless networks suitable for facilitating communications between the source 26 and media devices 14-22. The source 26 and media devices 14-22 may include features to facilitate communications with the networks 28-30. In particular, the source 26 and media devices 14-22 may include wireless features for facilitating wireless communications between each other. Optionally, more than one network 28-30 may be used to  
20                   communication with some of the media devices 14-22, such as in a network mesh environment.

25                   The media devices 14-22 may be generally characterized as any unit capable of emitting audio, visual, and/or audio-visual (video) signals to the surrounding areas. The media devices 14-22 may include memories, processors, communication interfaces, and other features to facilitate the operation thereof. The media devices 14-22 may be located in close proximity to each other and/or distributed over distant geographical areas.

One or more of the media devices 14-22 may be a lighting fixture. The lighting fixture may be configured to emit light and/or other visual signals to the surrounding area. The lighting fixtures may be controlled to perform any number of operations, including operations associated with theatrical lighting maneuvers. The lighting fixtures may be configured controlled according to any number of standards and protocols, including those specified in the DMX-512 protocol defined by the United States Institute for Theatre Technology, Inc. (USITT), which is hereby incorporated in its entirety.

One or more of the media devices 14-22 may be an audio unit configured to emit audio signals to the surrounding area. The audio unit may include a memory or other feature for receiving and storing audio tracks. A playlist of other set of instructions may be provide to direct playback of the audio tracks to the surrounding area. Alternatively, the audio units may be configured to tune to particular buffered or real-time audio streams for broadcasting to the surrounding area. The audio unit may be a banner type speak unit, such as that specified in United States Patent Application Number 11/209,794, entitled Speaker Assembly For A Structural Pole And Method Of Mounting The Same, which is hereby incorporated in its entirety.

One or more of the media devices 14-22 may be a video unit configured to emit video signals to the surrounding area. The video unit may include a television screen or other display and an audio source to facilitate emitting audio-video signals to the surrounding area. The video unit may include a memory or other feature for storing video clips for subsequently playback to occupants in the surrounding area and/or otherwise configured for streaming video. Alternatively, the video units may be configured to tune to particular buffered or real-time video streams for broadcasting to the surrounding area. The video unit may be configured to receive video signals from a service provider or other entity.

The source 26 may be generally characterized as any unit capable of generating instructions for controlling operations of the media devices 14-22. The source 26 may include memories, processors, and other features for executing any

number operations, including a communication feature to facilitate electronic communications with the media devices 14-22. The source 26 may be configured to receive and/or generate a control strategy for controlling operations of the media devices 14-22 and a communications strategy for controlling communications  
5 between the media devices 14-22 and source 26.

The source 26 may be a standalone feature having applications for use in controlling the media devices 14-22 and/or the source 26 itself may be a application, such as that run by a computer or other processing means, which may be executed by the computer for directly or indirectly controlling operation of the  
10 media devices 14-22. The source 26 may be a software program, logic, or other feature embodied in a computer readable medium or other suitable medium. The source 26, while shown as a feature separate from the media devices 14-22, may reside on one or more of the media devices 14-22 and need not be a separate feature.

The source 26 may be configured to receive or store a show schedule  
15 or other feature associated with formatting multiple operations of the media devices 14-22. The show schedule may include a timeline and corresponding operations to be executed at particular intervals or events. Queues, macros, and other features may be included within the show schedule to facilitate changing operations and other parameters associated with adjusting or otherwise varying operation of the media  
20 devices 14-22 to correspond with the show schedule.

The control strategy may be based on the show schedule or other set of events for controlling operations of one or more of the media devices 14-22. Multiple control strategies may be generated and distributed to the media devices 14-22 to control the operation thereof. In particular, if the system 10 includes  
25 different types of the media devices 14-22, multiple control strategies may be provided for each type of media device 14-22. Optionally, a common control strategy may be distributed to multiple media devices 14-22 to control the media devices 14-22 to cooperatively execute a number of operations according to a predefined schedule, such as to execute an audio, lighting, or video show where

operations of multiple media devices 14-22 are coordinated according to a common schedule.

The communications strategy may be used to control communications between the media devices 14-22. The communications strategy may include features for coordinating delivery of the control strategy to other media devices 14-22. For example, the communications strategy may be used to facilitate delivery of one or more control strategies to one or more media devices 14-22 so as to permit the media devices to be deployed in the system 10 without having the control strategy loaded prior to the deployment thereof and/or to facilitate distribution of changes to the control strategy without requiring the source 26 to directly communicate with each media device 14-22. The communications strategy may include instructions for transporting particular control strategies to media devices 14-22 associated therewith, such as to permit multiple control strategies to be transported to the same or different media devices 14-22.

The communications strategy may be used to control communications of newly added media devices with deployed media devices 14-22 and the source 26. The newly added media devices 14-22 may be configured to register or otherwise contact the deployed media devices 14-22 when attempting to enter the system 10. The deployed media devices 14-22 may consult the communication strategy and request information from the newly added media devices 14-22 to determine whether the newly added media devices 14-22 are to be added to the system 10. The other media devices 14-22 may authenticate or otherwise restrict access to the control strategy to media devices 14-22 meeting desired security parameters. The communications strategy may specify an authentication process and other procedures for use in verify access to the control strategy. The approved media devices 14-22 may then be transferred the communications strategy to coordinate communications with other media devices in the system.

Once approved for addition to the system, the newly added media devices may retrieve one or more control strategies from the source 26 and/or other media devices 14-22 according to instruction included within the communications

strategy. In this manner, the present invention is able to dynamically build an environment wherein media devices 14-22 may be freely added and controlled without requiring registration and authentication with the source 26 or other system administrators.

5                   The source 26 may be configured to receive and/or generate a network integrity strategy. The network integrity strategy may be used to monitor the media devices 14-22 in the system 10 and to determine whether the monitored media devices 14-22 are operation according to the desired control strategy. The network integrity strategy may be configured to periodically poll the media devices  
10 14-22 and to determine whether media devices 14-22 have been added or removed from the system 10.

FIGURE 2 illustrates a flowchart 40 of a method for use in controlling the media devices. The method associated with the flowchart 40 may be embodied in a computer readable medium, software application, or other logically  
15 functioning element to execute the operation described below. The method may be executed through operation of the source 26 and/or media devices 14-22 and require each such feature to be configured or otherwise suitably arranged to support the operations described below.

Block 44 relates to providing one or more of the media devices 14-22  
20 into a desired arrangement. The media devices 14-22 may be arranged in a particular manner depending on the operations it may perform. For example, if one or more of the media devices 14-22 are lighting fixtures, the lighting fixtures may be arranged around a stage or otherwise grouped for providing lighting show. If the one or more of the media devices are banner speakers, the banner speakers may be  
25 arranged along a street, boardwalk, or other pedestrian area where it may be desirable to broadcast audio signals. If the media devices 14-22 are video units, the video units may be arranged in a viewing array or other arrangement to facilitate the viewing thereof. Any number or media devices 14-22 may be provided.

Block 44 relates to determining a communications strategy to define communications between the media devices 14-22 and the source 26. The communications strategy may define protocols and other features for controlling communications and insuring network integrity, as described below in more detail.

5 The communications strategy may be distributed from the source 26 to one or more of the media devices 14-22 and/or directly from one or more of the media devices 14-22, such as if one of the media devices 14-22 is pre-loaded with the communications strategy.

Block 46 relates to determining one or more control strategies to control operations of the media devices 14-22. The control strategy may include any number or parameters, rules, and features for each particular media device. Multiple control strategies may be provided for any number of media devices 14-22. The control strategy may be used to coordinate activities of the media devices 14-22 according to a common schedule or plan.

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For example, if the media devices 14-22 are lighting fixtures, the control strategy may specify execution of particular operations at particular intervals so as to provide a lighting show. If the media devices 14-22 are banner speakers, the control strategy may specify playback of particular audio tracks at predefined intervals so as to provide audio messaging capabilities and/or the control strategy may control the banner speakers to tune to particular buffered or real-time audio streams for broadcasting. If the media devices 14-22 are video units, the control strategy may specify playback of stored video and/or tuning to buffered or real-time video streams for playback.

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Block 48 relates to distributing the control and communications strategies to each media devices 14-22 in the system. The strategies may be distributed from the source 26 to one or more of the media devices 14-22 through an hopped, ad hoc, point-to-point, point-to-many, peer-to-peer, or other delivery process. In addition to or in place thereof, one or more of the media devices 14-22 may be configured to distribute the strategies directly to the other media devices 14-22, and thereby, eliminate the need to include the source 26 in the system.

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One aspect of the present invention relates to the ability of the system 10 to dynamically support adding media devices 14-22 to the system 10. As such, distributing the strategies to the media devices 14-22 may include distributing the strategies to media devices 14-22 attempting to become part of the system 10. The  
5 media devices 14-22 attempting to become part of the system 10 may include basic or common communication features to facilitate communications with one or more of the media devices 14-22 and/or source 26.

The communications strategies already associated with the deployed media devices 14-22 may include features for controlling when the new media  
10 devices 14-22 should be added to the system. A registration strategy or other authentication process may be provided within the communication strategy to facilitate this determination. Information, identifying characteristics, and other data may be verified before permitting the new media device 14-22 to become part of the system 10. Once added, the control strategies appropriate to the new media device  
15 14-22 may then be distributed thereto from one of the media devices 14-22 and/or source 26.

Block 50 relates to providing network integrity control strategy to facilitate verifying network integrity. The strategy may include instructions for ascertaining the number of media devices 14-22 operating in the system 10 and  
20 whether the operations thereof are being executed according to the parameters defined in the corresponding control and communication strategies. The source 26 and/or one or more of the media devices 14-22 may include the network integrity strategy and be configured to coordinate the operations associated therewith.

The present invention contemplates an intelligent multiplexed  
25 communication environment having distributed control, monitoring and reporting for use in audio, video and lighting systems. For example, a homeland security application may include playback units installed in light poles at regular intervals down a street. Once programmed and content delivered, the light pole may play the scripted content synchronized with other light poles. The only way a light pole could  
30 quit playing audio is if power fails. Battery backup and solar recharging systems

could be installed at each light pole to support uninterrupted playback. Reliability may be further strengthened by the wireless connectivity of 900 feet, meaning that on average 5 directly adjacent light poles would have to fail before global scripting updates would be halted.

5                   A mission critical digital signage application may offer stand-a-lone players updated by master scripts and content from a central FTP server. Playback logs are forwarded to the FTP server nightly so they may be utilized for billing purposes as verification that the content played. Optionally, distributed monitoring features, i.e., multiple controllers requesting status of the same player, may be  
10 included to monitor the players. The distribute monitoring features may be configured to send alerts immediately when players fail their diagnostics. With the ability to incorporate such monitoring features into the players, the present invention is able to utilize redundancy from the number of other players on the network and the player can be identified as beginning to fail or failed well in advance of it being  
15 noticed. Reliability is strengthened by not relying on one central monitoring system to perform the diagnostics.

                  A retail, architectural, themed and performance venue application may include lighting systems supported by a number of processors distributed to each lighting device. The processors may be use in conjunction with a software  
20 package that allows users the ability create custom light shows, and/or capture existing lighting shows from any DMX lighting console. The information may then uploaded to the hand size processors connected to the lighting devices. Lastly the software may also allow monitoring of the lighting device verifying that the data arrived at the fixture and the device is performing properly. Optionally, the same  
25 light show may be distributed to all the hand sized processors and then pushed along the network to other processors. Should any processor fail to perform properly all processors will recognize the failure. If a new processor is added to the network it will connect to the nearest processor, retrieve the light show script, and data on which it should be monitoring.

A global scheduling script application may include a global script created as an image on a central server and then automatically distributed across all controllers (i.e. audio, video or lighting) on the network. The global scripting software may reside on a central computer that recognizes the type of controllers coming online and automatically adds them to the scripting interface so they can be scheduled. Since all controllers monitor each other, only controllers verified as online will be forwarded the global script information. The distribution of the script will be performed in a mesh pattern so as not allow any one controller to interfere in the transfer process. Newly authenticated controllers, as brought online, may simply request the latest global script from the nearest controller and receive both the script and the content from the adjacent device.

Each playback device may be a stand-a-lone unit that does not require any support from any other device to perform its duties. Source content (audio - MP3 files, videos - MPEG2 files, and lighting (show files) may be all stored on the individual player type. A global script (that may or may not consist of scheduling for all types of player content) may be created on a primary software package and then automatically distributed to all players allowing synchronization across the differing content players.

In another application, rather than have devices monitor each other, manufacturers may incorporate a feature called "Watch Dog" that watches for communication through an on board processor. If communication stops the device automatically reboots. After the device comes back on line it will send an email notifying the network administrator or store manager that it rebooted. Optionally, each device may monitor each other and then share its log files (data base) with all other control devices on the network. In this way all controllers know exactly what the other is doing and what processes it should be checking. If a failure is recognized intelligence is incorporated in the software that recognizes that at least one networked controller reported the error therefore none of the others have to do it. This may be helpful to check if a device drops off the network.

In another application, during setup, and then at periodic intervals, a master log from all controllers may be forwarded to a central database. A routine may then be activated that takes the data (data based) and transfers it to all controllers on the system letting them know who they should had been receiving  
5 telemetry from and who they should be sending telemetry to. This action may be a double check to make sure every controller on the network is being recognized.

As required, detailed embodiments of the present invention are disclosed herein; however, it is to be understood that the disclosed embodiments are merely exemplary of the invention that may be embodied in various and alternative  
10 forms. The figures are not necessarily to scale, some features may be exaggerated or minimized to show details of particular components. Therefore, specific structural and functional details disclosed herein are not to be interpreted as limiting, but merely as a representative basis for the claims and/or as a representative basis for teaching one skilled in the art to variously employ the present invention.

15 While embodiments of the invention have been illustrated and described, it is not intended that these embodiments illustrate and describe all possible forms of the invention. Rather, the words used in the specification are words of description rather than limitation, and it is understood that various changes may be made without departing from the spirit and scope of the invention.

## WHAT IS CLAIMED IS:

1. A system of controlling media devices configured for outputting signals to a surrounding area, the system comprising:
  - a control strategy for controlling operation of the media devices;
  - 5 a communications strategy for coordinating communication between the media devices;
  - a source configured to distribute the control strategy and the communications strategy to at least one of the media devices; and
  - wherein the communications strategy specifies communication of the control strategy from at least one of the media devices to another of the media devices.
- 10 2. The system of claim 1 wherein the communications strategy specifies instructions for transporting the control strategy from at least one of the media devices to another of the media devices not receiving the control strategy from the source.
- 15 3. The system of claim 1 wherein the communications strategy specifies a distribution plan for distributing the control strategy from the media devices receiving the control strategy from the source to the other media devices.
- 20 4. The system of claim 1 wherein at least a portion of the media devices are lighting fixtures and the control strategy is configured to control operations of the lighting fixtures.
5. The system of claim 1 wherein at least a portion of the media devices are audio units and the control strategy is configured to control operations of the audio units.
- 25 6. The system of claim 5 wherein the control strategy includes controlling playback of audio tracks stored on each media device.

7. The system of claim 6 further comprising an audio distribution source configured to distribute the audio tracks to one or more of the media devices.

8. The system of claim 7 wherein the communications strategy includes instructions for communicating the audio tracks from at least one media devices to another media device.

9. The system of claim 1 wherein at least a portion of the media devices is a video unit configured to displaying images and emit sounds.

10. The system of claim 1 wherein at least one of the media devices includes an initialization strategy for obtaining the control and communications strategies from another one of the media devices.

11. The system of claim 10 wherein the initialization strategy is activated when the media devices execute an initialization operation.

12. The system of claim 11 wherein the source is configured to instruct the media devices to execute the initialization operation.

13. The system of claim 1 wherein at least one of the media devices includes a network integrity strategy for monitoring integrity of one or more of the other media devices.

14. The system of claim 1 wherein the control strategy includes features for operating the media devices in a concerted fashion in order to execute a show strategy.

15. A system of controlling media devices configured for outputting signals to a surrounding area, the system comprising:

a control strategy for controlling operation of the media devices to execute operations according to a common schedule; and

a communications strategy for use in communicating the control strategy between the media devices in such a manner as to facilitate distribution of the control strategy to the media devices desired to operate according to the common timeline.

5                   16.    The system of claim 15 wherein the media devices are lighting fixtures and the control strategy is configured to execute operations of the lighting fixtures.

                  17.    The system of claim 15 wherein the media devices are audio units and the control strategy is configured to execute operations of the audio units.

10                  18.    The system of claim 17 wherein the control strategy includes controlling playback of audio tracks stored on each media device.

                  19.    The system of claim 18 further comprising an audio distribution strategy to facilitate distributing audio tracks stored on one or more of the media devices to another one of the media devices.

15                  20.    A method of controlling media devices, the method comprising:

                  configuring the media devices to output signals to a surrounding area according to instructions included within a control strategy; and

                  electronically distributing the control strategy to the media devices  
20 through a network communication medium.

                  21.    The method of claim 20 further comprising distributing the control strategy from a network programming source to the media devices.

                  22.    The method of claim 20 further comprising distributing the control strategy from one media devices to another media device.

23. The method of claim 20 further comprising distributing different control strategies to one or more media devices.

24. The method of claim 20 further comprising providing a network communication strategy for coordinating communications between the  
5 media devices so as to facilitate the distribution of the control strategy.

25. The method of claim 24 further comprising configuring the network communication strategy to automatically identify media devices attempting access to a network associated with the network communication medium and to distribute the control strategy thereto.

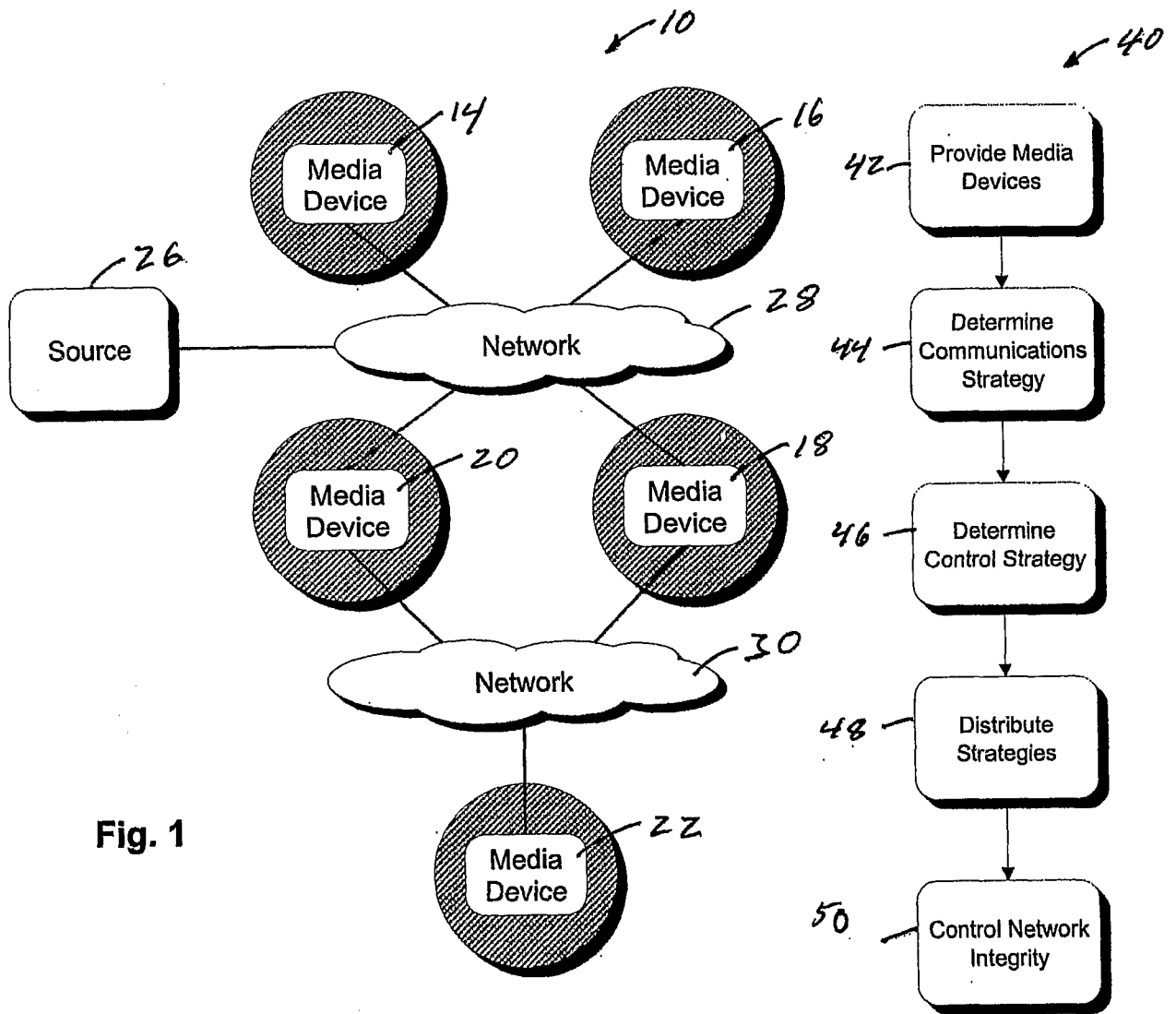


Fig. 1

Fig. 2