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Alperin

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(54) **SOCIALLY NETWORKED TELEVISION EXPERIENCE**

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(73) Assignee: **Qwest Communications International Inc.**, Denver, CO (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

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(22) Filed: **Jul. 14, 2014**

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Related U.S. Application Data

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(51) **Int. Cl.**

H04N 21/24	(2011.01)
H04N 7/173	(2011.01)
H04N 21/4788	(2011.01)
H04N 21/442	(2011.01)
H04N 21/25	(2011.01)
H04N 21/658	(2011.01)
H04N 21/258	(2011.01)

(52) **U.S. Cl.**

CPC ***H04N 21/25875*** (2013.01); ***H04N 7/17336*** (2013.01); ***H04N 21/2407*** (2013.01); ***H04N 21/252*** (2013.01); ***H04N 21/44222*** (2013.01); ***H04N 21/4788*** (2013.01); ***H04N 21/6582*** (2013.01)

(58) **Field of Classification Search**

CPC H04N 21/4622; H04N 7/17318; H04N 21/4782; H04N 21/8586; H04N 21/4788

See application file for complete search history.

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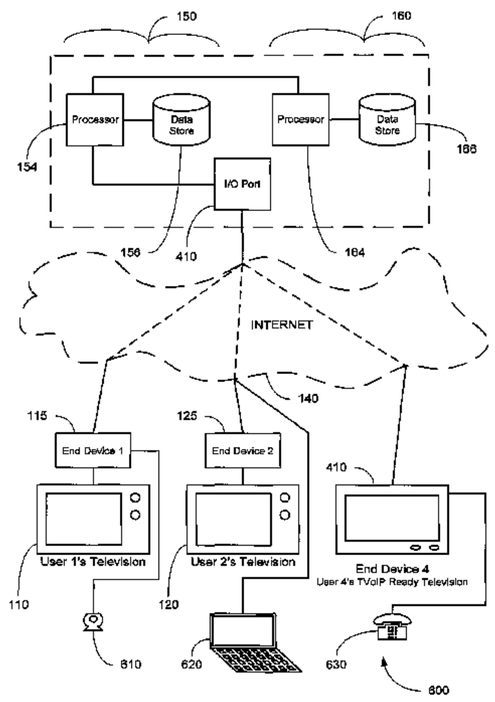
(57) **ABSTRACT**

In one embodiment, a system for providing social interaction opportunities for people watching television is presented. The system includes: a television data source which transmits television data streams for reception by end devices, each end device being represented by an equipment code; a plurality of end devices, including a first user's end device and a second user's end device, each end device configured to receive a television data streams, and each user represented by an identifier code; and an interactive-information server configured to: store, at the first user's behest, the identifier code of the second user; monitor which of the television data streams is being received by the first end device; monitor which of the television data streams is being received by the second end device; and notify the first user when the first end device and the second end device are receiving the same television data stream.

18 Claims, 13 Drawing Sheets



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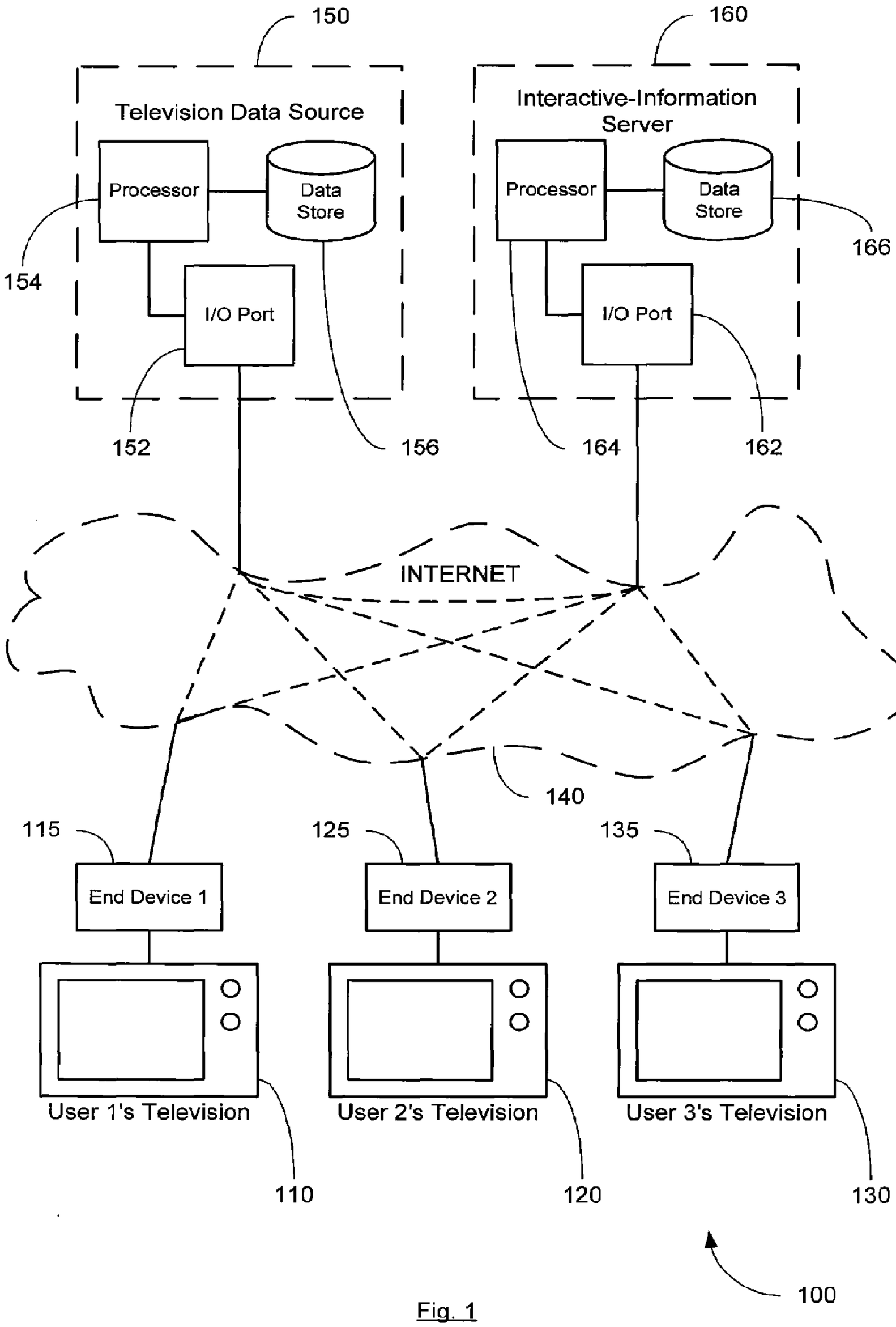
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Television Data Source
Processor
Data Store
I/O Port
154
152
156
160
Interactive-Information Server
Processor
Data Store
I/O Port
166
164
162
INTERNET
140
115
125
135
End Device 1
End Device 2
End Device 3
User 1's Television
User 2's Television
User 3's Television
110
120
130
100

Fig. 1

210 ID Code	220 Equip. Code	230 CID Code	240 CID IP Addr.	250 TV Data Stream	260 Relat. ID Codes	270 Relat. Equip. Code
0052	**16.3.105.108**	**wc365**		**RMRCNBC104**	0144	11.2.101.101
					5280	13.3.121.171
					0069	
					1234	19.156.185.123
					0058	**12.4.60.189**
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					6431	164.25.89.2
0055	5.123.56.245			WCRNHSN184		
0056						
0057	10.5.156.138			WCRNHSN184		
0058	**12.4.60.189**	**pc**	**12.4.60.190**	**RMRCABC109**	0004	
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					6057	135.79.246.8

200

Fig. 2

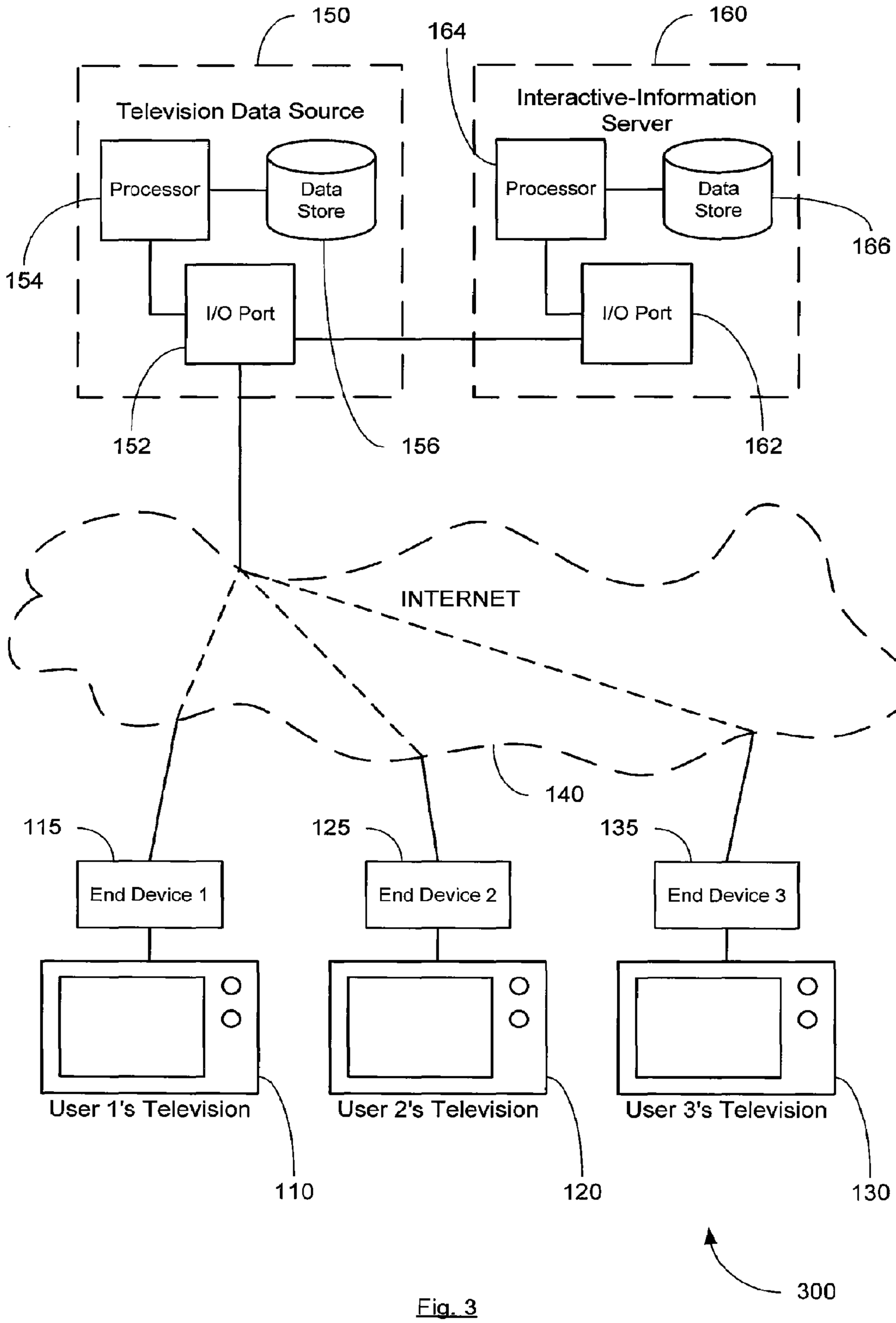
150
164
160
Television Data Source
Interactive-Information Server
Processor
Data Store
Processor
Data Store
154
166
I/O Port
I/O Port
152
156
162
INTERNET
140
115
125
135
End Device 1
End Device 2
End Device 3
User 1's Television
User 2's Television
User 3's Television
110
120
130
300

Fig. 3

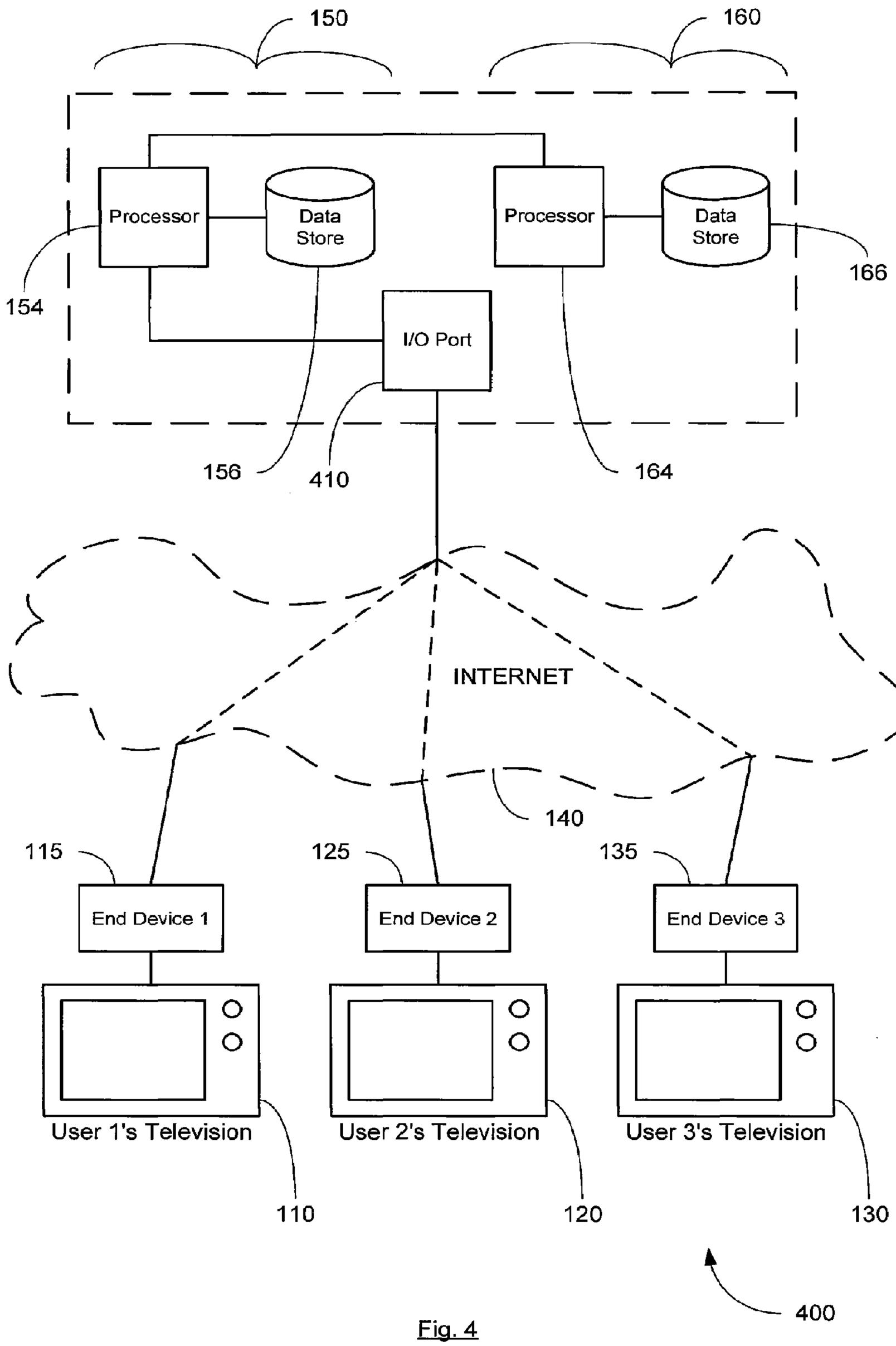
150
160
Processor
Data Store
Processor
Data Store
166
154
I/O Port
156
410
164
INTERNET
140
115
125
135
End Device 1
End Device 2
End Device 3
User 1's Television
User 2's Television
User 3's Television
110
120
130
400

Fig. 4

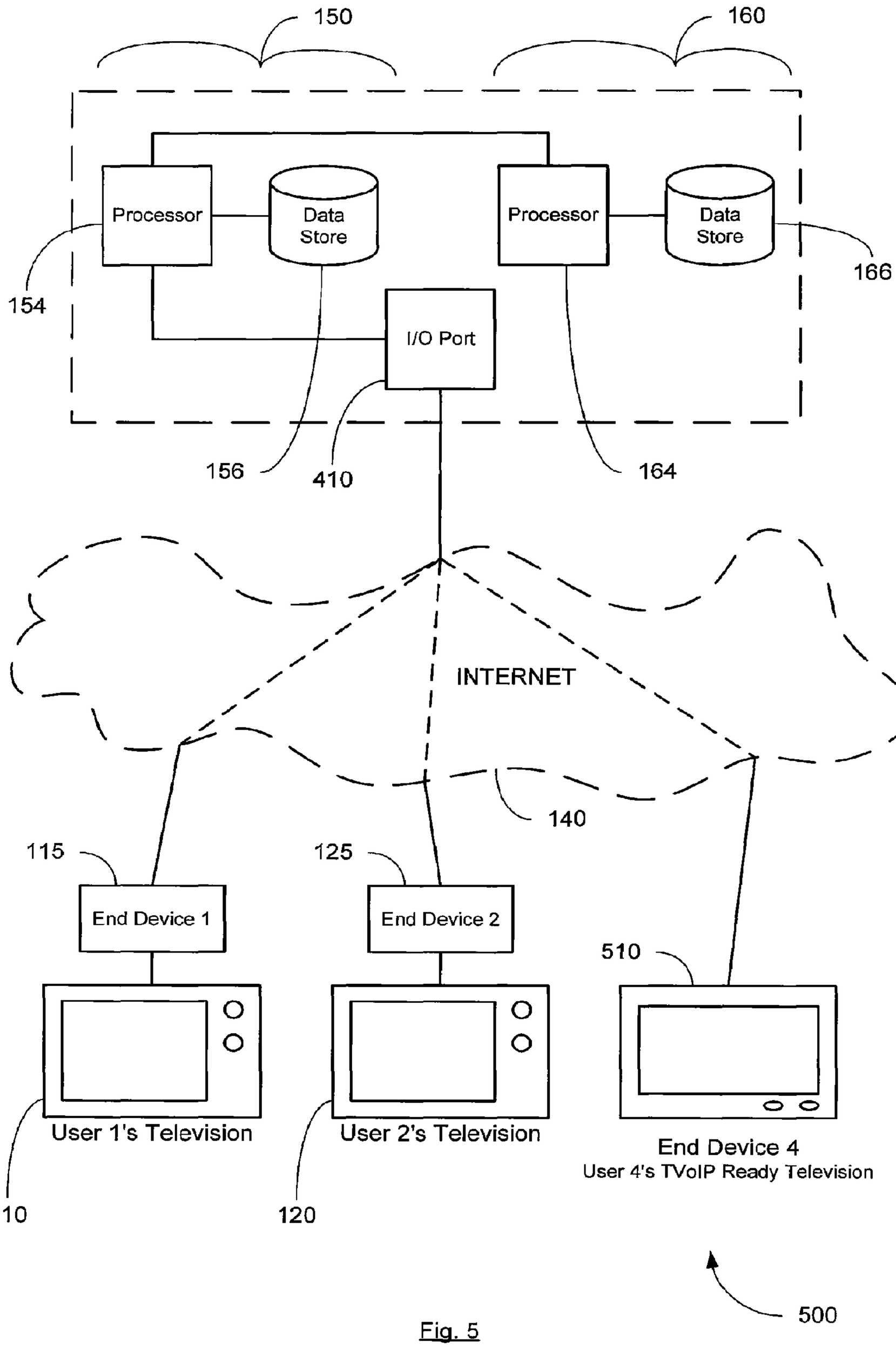
150
160
Processor
Data Store
Processor
Data Store
154
166
I/O Port
156
410
164
INTERNET
140
115
125
510
End Device 1
End Device 2
User 1's Television
User 2's Television
End Device 4
User 4's TVoIP Ready Television
110
120
500

Fig. 5

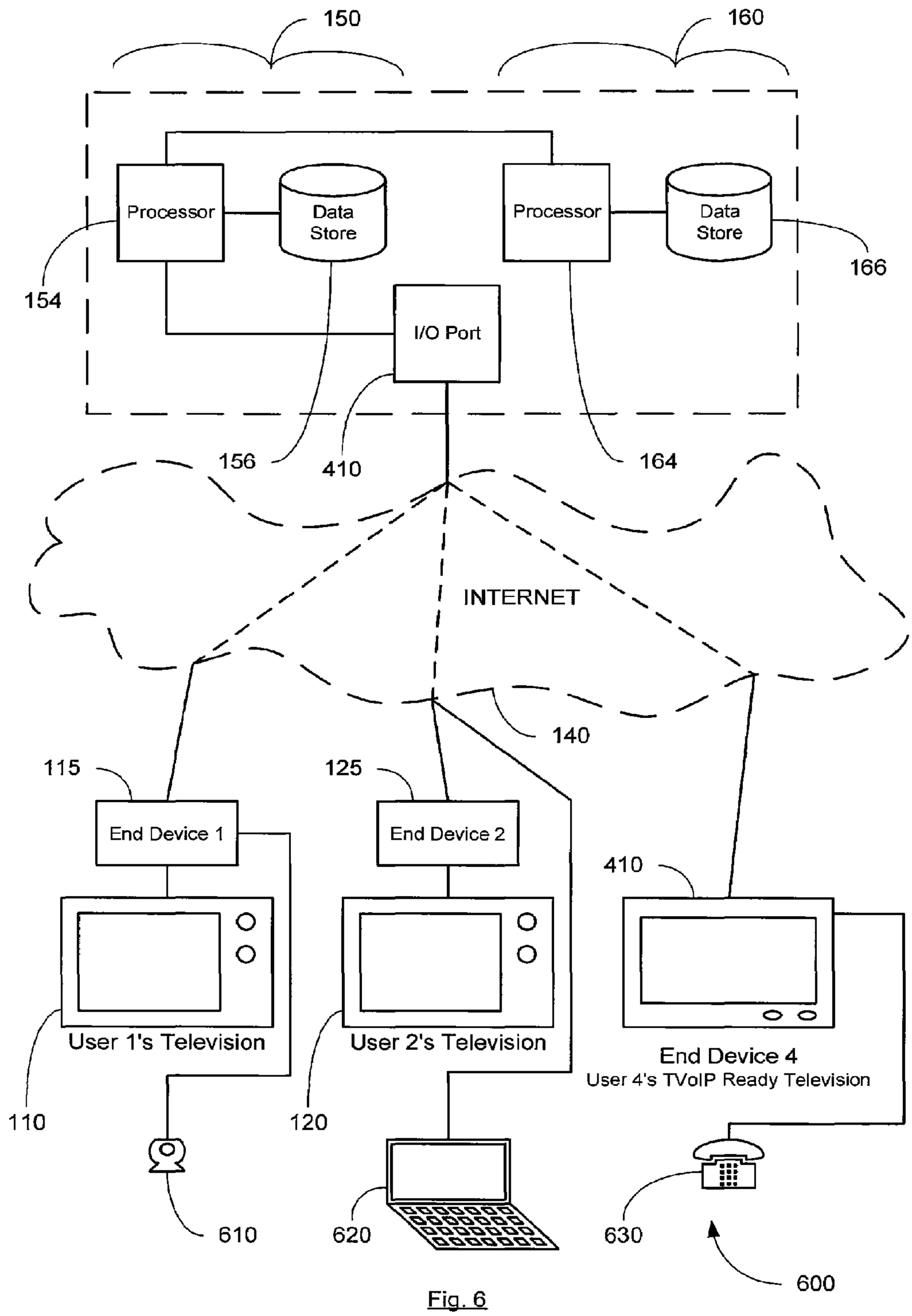
150
160
Processor
Data Store
Processor
Data Store
166
154
I/O Port
156
410
164
INTERNET
140
115
125
End Device 1
End Device 2
410
User 1's Television
User 2's Television
End Device 4
User 4's TVoIP Ready Television
110
120
610
620
630
600

Fig. 6

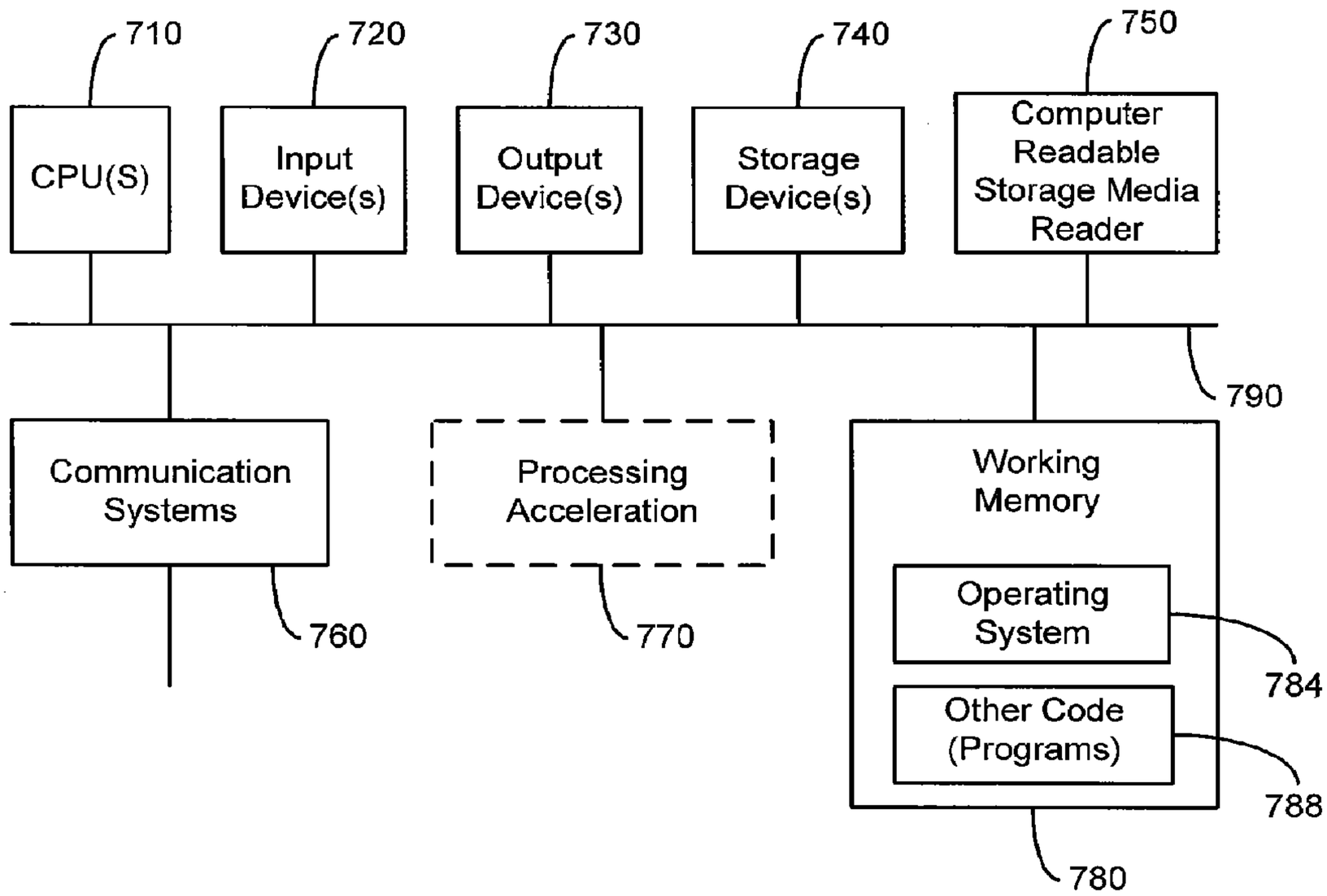
710
720
730
740
750
CPU(S)
Input Device(s)
Output Device(s)
Storage Device(s)
Computer Readable Storage Media Reader
790
Communication Systems
760
Processing Acceleration
770
Working Memory
Operating System
784
Other Code (Programs)
788
780
700

Fig. 7

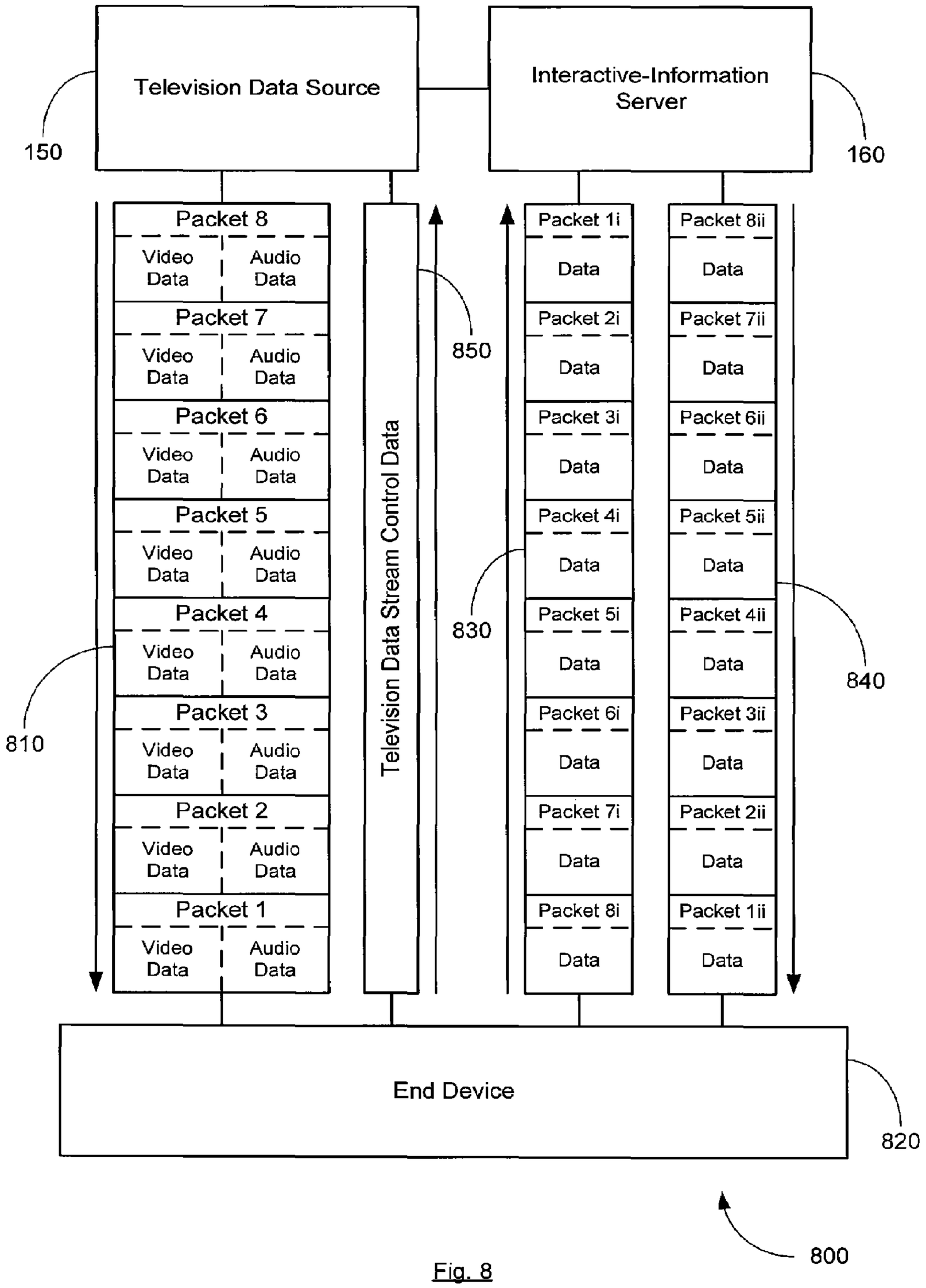
Television Data Source
Interactive-Information Server
150
160
Packet 8
Video Data
Audio Data
Packet 7
Packet 6
Packet 5
Packet 4
Packet 3
Packet 2
Packet 1
Television Data Stream Control Data
850
830
840
810
Packet 1i
Packet 8ii
Data
Packet 2i
Packet 7ii
Packet 3i
Packet 6ii
Packet 4i
Packet 5ii
Packet 5i
Packet 4ii
Packet 6i
Packet 3ii
Packet 7i
Packet 2ii
Packet 8i
Packet 1ii
End Device
820
800

Fig. 8

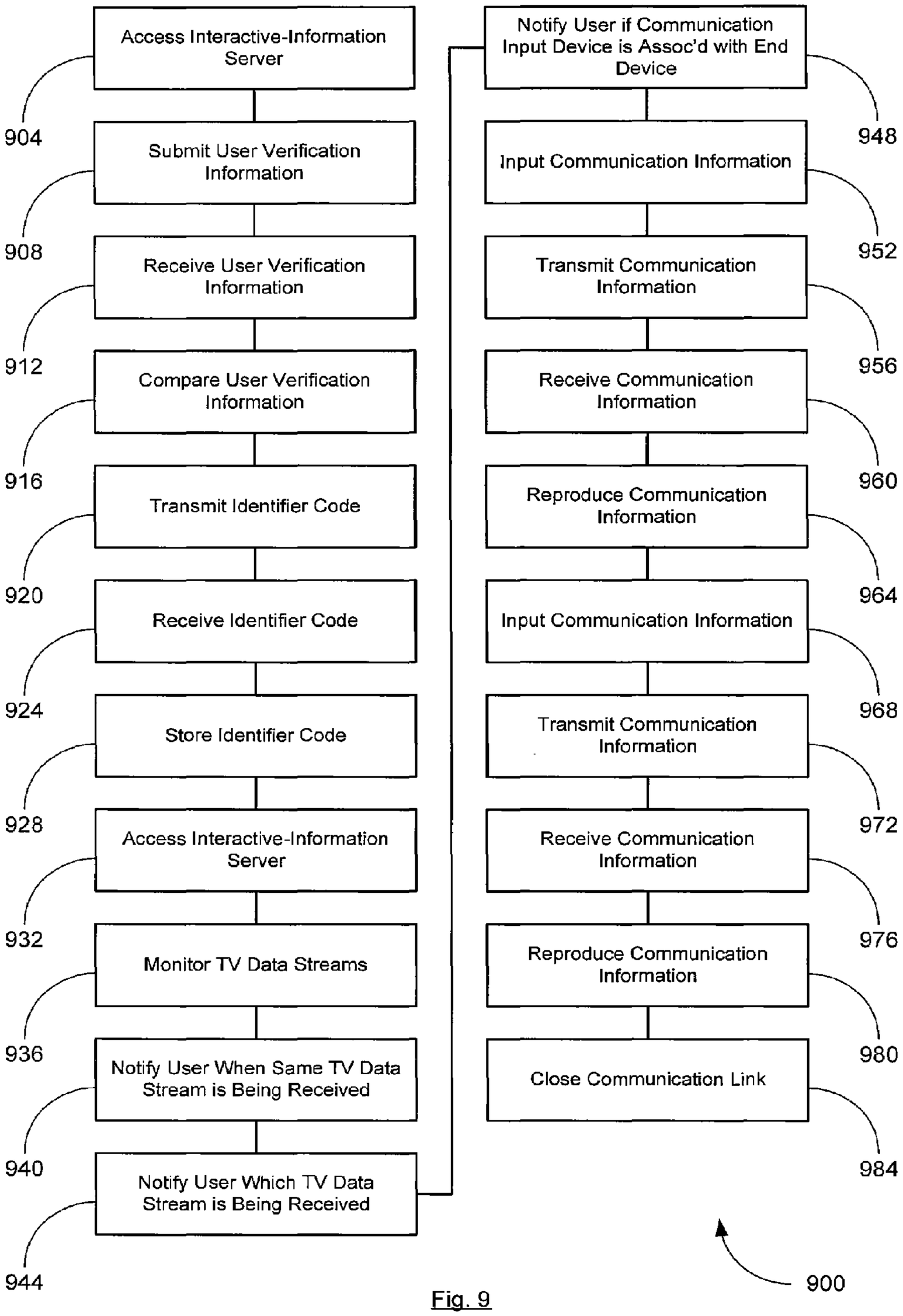
Access Interactive-Information Server
904
Submit User Verification Information
908
Receive User Verification Information
912
Compare User Verification Information
916
Transmit Identifier Code
920
Receive Identifier Code
924
Store Identifier Code
928
Access Interactive-Information Server
932
Monitor TV Data Streams
936
Notify User When Same TV Data Stream is Being Received
940
Notify User Which TV Data Stream is Being Received
944
Notify User if Communication Input Device is Assoc'd with End Device
948
Input Communication Information
952
Transmit Communication Information
956
Receive Communication Information
960
Reproduce Communication Information
964
Input Communication Information
968
Transmit Communication Information
972
Receive Communication Information
976
Reproduce Communication Information
980
Close Communication Link
984
900

Fig. 9

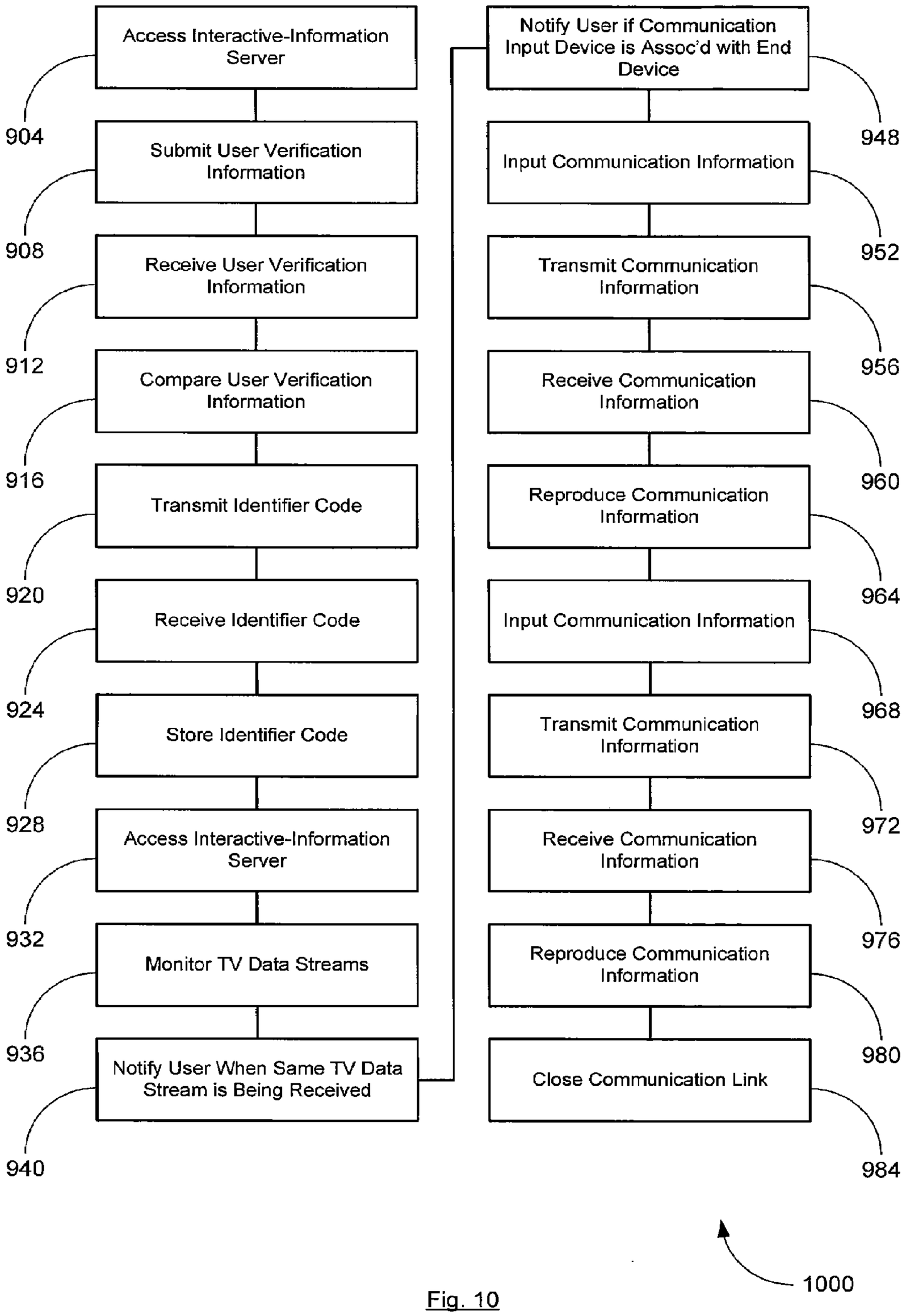
Access Interactive-Information Server
904
Submit User Verification Information
908
Receive User Verification Information
912
Compare User Verification Information
916
Transmit Identifier Code
920
Receive Identifier Code
924
Store Identifier Code
928
Access Interactive-Information Server
932
Monitor TV Data Streams
936
Notify User When Same TV Data Stream is Being Received
940
Notify User if Communication Input Device is Assoc'd with End Device
948
Input Communication Information
952
Transmit Communication Information
956
Receive Communication Information
960
Reproduce Communication Information
964
Input Communication Information
968
Transmit Communication Information
972
Receive Communication Information
976
Reproduce Communication Information
980
Close Communication Link
984
1000

Fig. 10

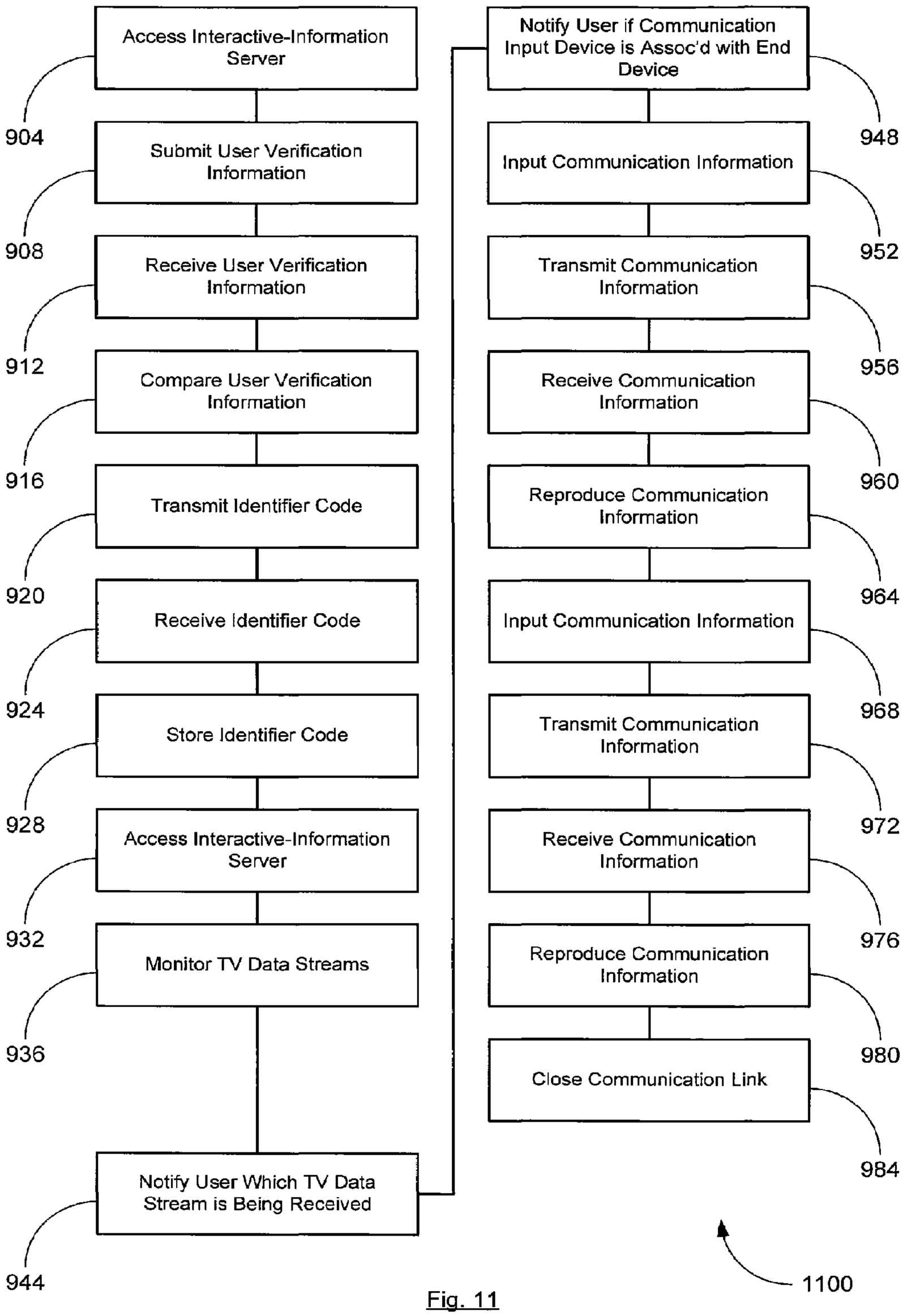
Access Interactive-Information Server
904
Submit User Verification Information
908
Receive User Verification Information
912
Compare User Verification Information
916
Transmit Identifier Code
920
Receive Identifier Code
924
Store Identifier Code
928
Access Interactive-Information Server
932
Monitor TV Data Streams
936
Notify User Which TV Data Stream is Being Received
944
Notify User if Communication Input Device is Assoc'd with End Device
948
Input Communication Information
952
Transmit Communication Information
956
Receive Communication Information
960
Reproduce Communication Information
964
Input Communication Information
968
Transmit Communication Information
972
Receive Communication Information
976
Reproduce Communication Information
980
Close Communication Link
984
1100

Fig. 11

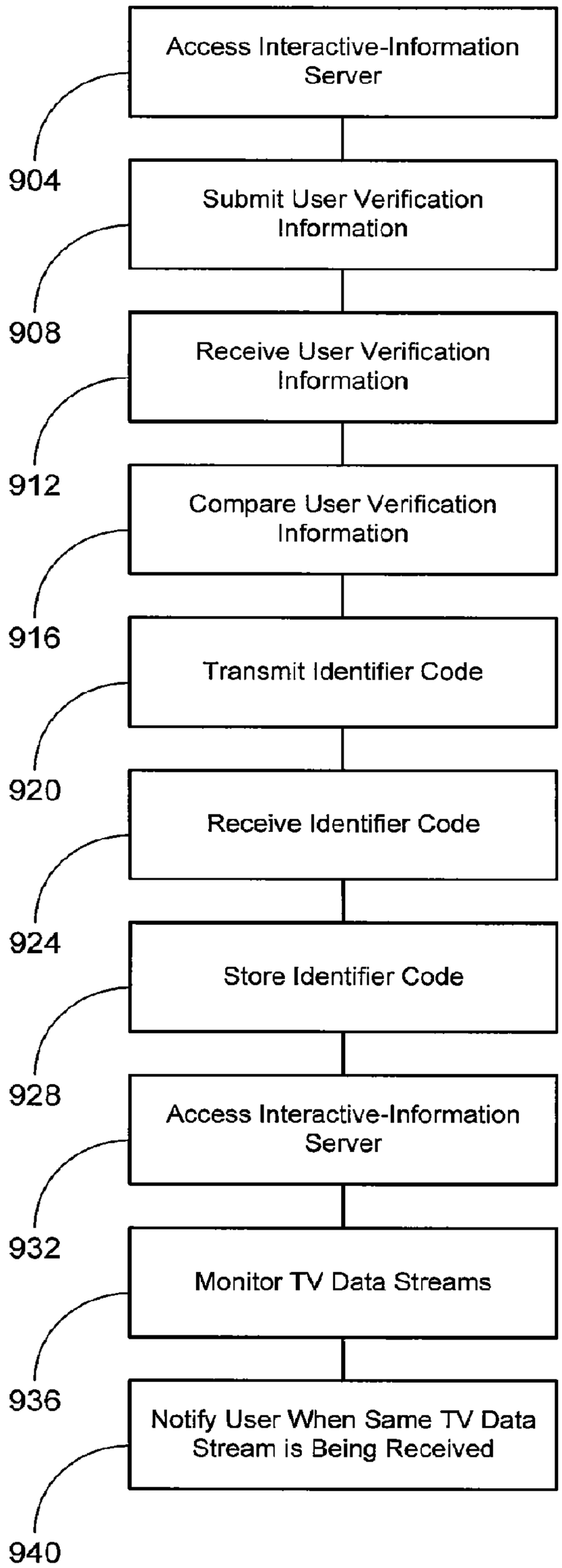
Access Interactive-Information Server
904
Submit User Verification Information
908
Receive User Verification Information
912
Compare User Verification Information
916
Transmit Identifier Code
920
Receive Identifier Code
924
Store Identifier Code
928
Access Interactive-Information Server
932
Monitor TV Data Streams
936
Notify User When Same TV Data Stream is Being Received
940
1200

Fig. 12

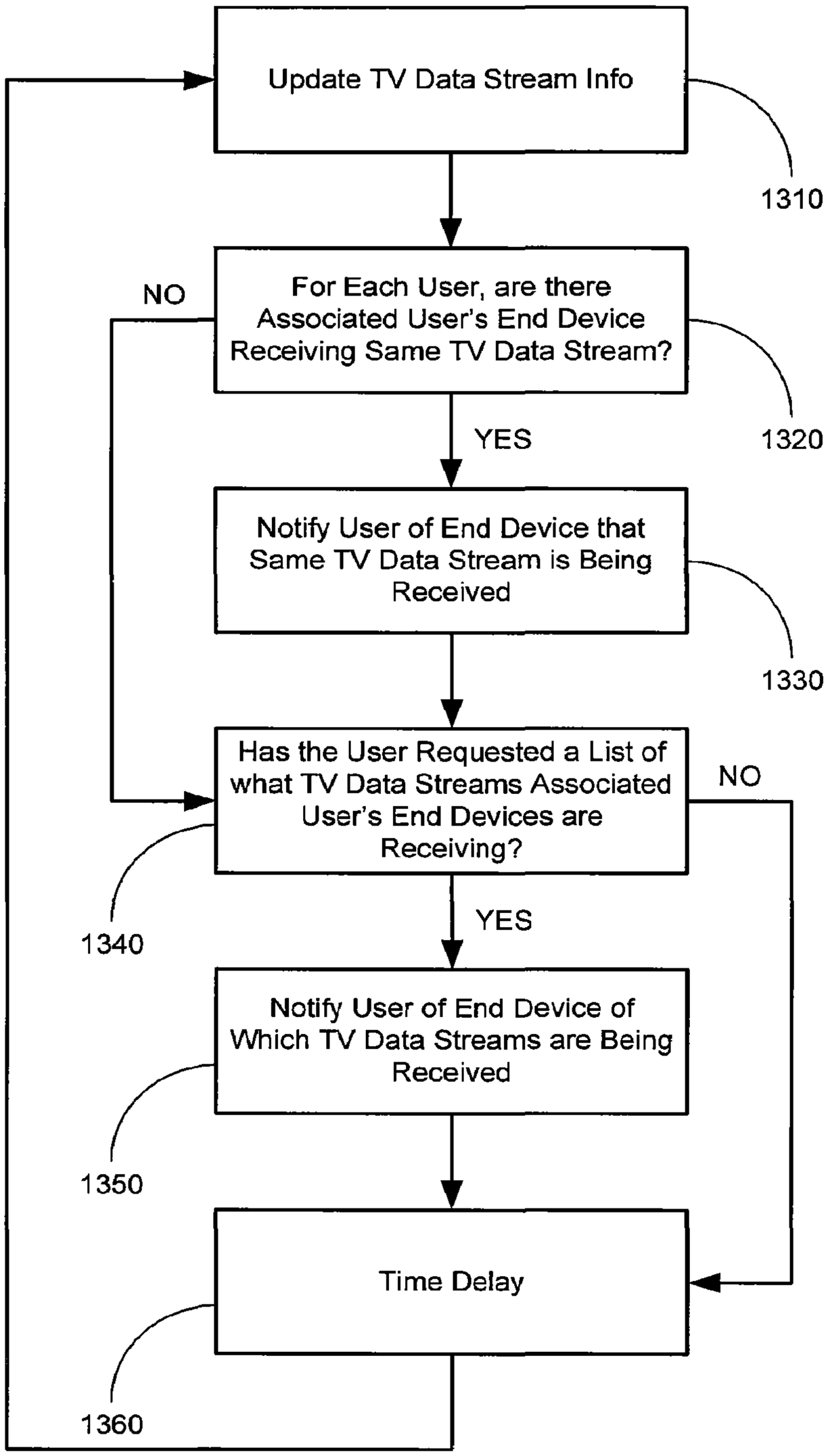
Update TV Data Stream Info
1310
For Each User, are there Associated User's End Device Receiving Same TV Data Stream?
NO
YES
1320
Notify User of End Device that Same TV Data Stream is Being Received
1330
Has the User Requested a List of what TV Data Streams Associated User's End Devices are Receiving?
NO
1340
YES
Notify User of End Device of Which TV Data Streams are Being Received
1350
Time Delay
1360
1300

Fig. 13

SOCIALLY NETWORKED TELEVISION EXPERIENCE

CROSS REFERENCE TO RELATED APPLICATION

This application is a continuation of U.S. patent application Ser. No. 11/383,620, filed May 16, 2006 by Jordan Alperin and entitled, "Socially Networked Television Experience", which is hereby incorporated by reference in its entirety for all purposes.

BACKGROUND OF THE INVENTION

Watching television is a common activity by many people. Some television shows, both popular and less well known, are socially discussed intensely by watchers for many days following their broadcast. These shows include soap operas, reality television shows, award shows, sporting events, and other types of programs. However, the actual watching of the show is usually somewhat less social and involves merely watching the show as an individual or a small group.

Currently, if a watcher wants to discuss a television show with another person while the show is occurring, the watcher must communicate with the other person by some mode initiated on their own, without knowledge of whether or not the other person is watching the same show, or if the other person is even interested in communicated regarding the show. The systems and methods of the present invention provide solutions to these and other problems.

SUMMARY OF THE INVENTION

In one embodiment, a system for providing social interaction opportunities for people watching television is provided. The system may have a television data source, a plurality of end devices, and an interactive-information server. The television data source may be configured to transmit at least one of a plurality of television data streams for reception by a plurality of end devices. Each end device may be represented by an equipment code. The plurality of end devices may include a first end device used by a first user and a second end device used by a second user. Each end device may be configured to receive at least one of the plurality of television data streams. Each user may be represented by an identifier code. In some embodiments, the system may also have a communication input device. The communication input device may be associated with at least one end device, and may be configured to communicate with at least one end device which may not be associated with the communication input device.

The interactive-information server may be configured to store, at the direction of the first user, an identifier code representing the second user; monitor which of the plurality of television data streams is being received by the first end device; monitor which of the plurality of television data streams is being received by the second end device; and notify the first user when the same television data stream is being received by both the first end device and the second end device. In some embodiments, the interactive-information server may be further configured to determine the first user is using the first end device and that the second user is using the second end device. In some embodiments, the interactive-information server may also be configured to notify the first user if a communication input device is associated with the second end device.

In another embodiment, a system for providing social interaction opportunities for people watching television is provided. The system may have a television data source, a plurality of end devices, and an interactive-information server. The television data source may be configured to transmit at least one of a plurality of television data streams for reception by a plurality of end devices. Each end device may be represented by an equipment code. The plurality of end devices may include a first end device used by a first user and a second end device used by a second user. Each end device may be configured to receive at least one of the plurality of television data streams. Each user may be represented by an identifier code. In some embodiments, the system may also have a communication input device. The communication input device may be associated with at least one end device, and may be configured to communicate with at least one end device which may not be associated with the communication input device.

The interactive-information server may be configured to store, at the direction of the first user, an identifier code representing the second end user; monitor which of the plurality of television data streams is being received by the second end device; and notify the first user of which television data stream is being received by the second end device. In some embodiments, the interactive-information server may be further configured to determine the first user is using the first end device and that the second user is using the second end device. In some embodiments, the interactive-information server may also be configured to notify the first user if a communication input device is associated with the second end device.

In another embodiment, a method for providing social interaction opportunities for people watching television is provided. The method may have steps for storing, at the direction of a first user of a first end device, an identifier code representing a second user; monitoring which of a plurality of television data streams is being received by the first end device; monitoring which of the plurality of television data streams is being received by a second end device used by the second user; and notifying the first user of which television data stream is being received by the second end device. In some embodiments, the method may also have a step for notifying the first user when the same television data stream is being received by both the first end device and the second end device. In some embodiments, the method may also have a step for notifying the first user if a communication input device is associated with the second end device.

BRIEF DESCRIPTION OF THE DRAWINGS

The present disclosure is described in conjunction with the appended figures:

FIG. **1** is a block diagram of one system which provides social interaction opportunities for people watching television, having multiple televisions and end devices, as well as a television data source and an interactive-information server which are not in direct communication with each other;

FIG. **2** is a portion of a sample database of information that might be stored by an interactive-information server;

FIG. **3** is a block diagram of a system similar to that in FIG. **1**, except the television data source and the interactive-information server are in direct communication;

FIG. **4** is a block diagram of a system similar to that in FIG. **3**, except the television data source and the interactive-information server are subsystems of a larger system;

FIG. **5** is a block diagram of a system similar to that in FIG. **4**, except one of the televisions and end devices has been replace with a TVoIP ready television;

FIG. **6** is a block diagram of a system similar to that in FIG. **5**, except each end device has an associated communication input device;

FIG. **7** is a block diagram of an exemplary computer system capable of being used in at least some portion of the systems of the present invention, or implementing at least some portion of the methods of the present invention;

FIG. **8** is a diagram of a television data stream being transmitted by a television data source to an end device and a parallel stream of notification data being transmitted from an interactive-information server to the end device;

FIG. **9** is a diagram of a method of providing social interaction opportunities for people watching television which allows users to use communication input devices and notifies a user when the same television data stream is being received by another end device, what television data streams are being received by other end devices, and whether or not a particular end device has a communication input device associated with it;

FIG. **10** is a diagram of a method, similar to the method in FIG. **9**, which does not notify a user of which television data streams are being received by other end devices which are not receiving the same television data stream;

FIG. **11** is a diagram of a method, similar to the method in FIG. **9**, which does not notify a user when the same television data stream is being received by another end device;

FIG. **12** is a diagram of a method, similar to the method in FIG. **9**, which does not notify a user which television data streams are being received by another end device and which does not allow users to use communication input devices; and

FIG. **13** is a flow diagram of a process that might be used by the interactive-information server, or other portion of the system, to determine when to notify a user than another end device is receiving the same television stream, or to determine when to notify the user of which television data streams are being receives by other end devices.

In the appended figures, similar components and/or features may have the same reference label. Further, various components and/or features of the same type may be distinguished by following the reference label by a letter that distinguishes among the similar components and/or features. If only the first reference label is used in the specification, the description is applicable to any one of the similar components and/or features having the same first reference label irrespective of the letter suffix.

DETAILED DESCRIPTION OF THE INVENTION

The ensuing description provides preferred exemplary embodiments only, and is not intended to limit the scope, applicability or configuration of the disclosure. Rather, the ensuing description of the preferred exemplary embodiments will provide those skilled in the art with an enabling description for implementing a preferred exemplary embodiment. It is understood that various changes may be made in the function and arrangement of elements without departing from the spirit and scope of the invention as set forth in the appended claims.

Specific details are given in the following description to provide a thorough understanding of the embodiments. However, it will be understood by one of ordinary skill in the art that the embodiments may be practiced without these specific details. For example, circuits, systems, networks, processes, and other components may be shown in block diagram form in order not to obscure the embodiments in unnecessary detail. In other instances, well-known circuits, processes, algorithms, structures, and techniques may be shown without unnecessary detail in order to avoid obscuring the embodiments.

Also, it is noted that individual embodiments may be described as a process which is depicted as a flowchart, a flow diagram, a data flow diagram, a structure diagram, or a block diagram. Although a flowchart may describe the operations as a sequential process, many of the operations can be performed in parallel or concurrently. In addition, the order of the operations may be re-arranged. A process is terminated when its operations are completed, but could have additional steps not included in a figure. A process may correspond to a method, a function, a procedure, a subroutine, a subprogram, etc. When a process corresponds to a function, its termination corresponds to a return of the function to the calling function or the main function.

The term "machine-readable medium" includes, but is not limited to portable or fixed storage devices, optical storage devices, wireless channels and various other mediums capable of storing, containing or carrying instructions and/or data. A code segment or machine-executable instructions may represent a procedure, a function, a subprogram, a program, a routine, a subroutine, a module, a software package, a class, or any combination of instructions, data structures, or program statements. A code segment may be coupled to another code segment or a hardware circuit by passing and/or receiving information, data, arguments, parameters, or memory contents. Information, arguments, parameters, data, etc. may be passed, forwarded, or transmitted via any suitable means including memory sharing, message passing, token passing, network transmission, etc.

Furthermore, embodiments may be implemented by hardware, software, firmware, middleware, microcode, hardware description languages, or any combination thereof. When implemented in software, firmware, middleware or microcode, the program code or code segments to perform the necessary tasks may be stored in a machine readable medium. A processor or processors may perform the necessary tasks.

In one embodiment, a system for providing social interaction opportunities for people watching television is provided. The system may have a television data source ("TDS"), a plurality of end devices, and an interactive-information server ("IIS"). Some embodiments may also have at least one communication input device.

The TDS may be configured to transmit at least one of a plurality of television data streams for reception by the plurality of end devices, wherein each end device is represented by an equipment code. The TDS may be a computer configured to convert digital or analog television signals into television data streams. For instance, a computer may receive traditional television signals from a source such as broadcast, cable or satellite and convert such signals into television data streams. In some embodiments, each traditional television channel will be converted into a single television data stream. In some embodiments, the TDS may be a Television over Internet Protocol ("TVoIP") server. Transmission of the television data streams may possibly occur over the internet, an intranet, and/or another medium capable of carrying transmitted data to end devices.

The end devices, including a first end device used by a first user and a second end device used by a second user, may each be configured to receive at least one of the plurality of television data streams. Each user may be represented by an identifier code and the end devices may be, for example, a television set-top box configured to receive at least one television data stream and convert the data stream into a signal that may be received and displayed by a television. The tele-

vision set-top box may convert a television data stream into separate audio and video signals, where the audio signals, once converted, may be mono, stereo, or multi-channel signals. The video signals, once converted, may be a composite, s-video, or component signal. Some end devices may be TVoIP ready televisions that may or may not conduct similar conversion operations to display the television data streams. Other possible end devices include personal computers and portable electronic devices. Each end device may be represented by an equipment code, and the equipment code may be an alpha-numeric string. The alpha-numeric string may be a Media Access Control address ("MAC address") or an Internet Protocol address ("IP address").

The IIS may be configured to store, at the direction of the first user, an identifier code representing the second user; monitor which of the plurality of television data streams is being received by the first end device; monitor which of the plurality of television data streams is being received by the second end device used by the second user represented by the identifier code; notify the first user which television data stream is being received by the second end device; and notify the first user when the same television data stream is being received by both the first end device and the second end device. The IIS may be a computer in communication with the TDS and/or a computer in communication with the plurality of end devices. The identifier code may be alpha-numeric string, and in some embodiments may be a username, e-mail address, handle, or alias. Notifying the first user when the same television data stream is being received by both the first end device and the second end device may involve transmitting notification data for reception by the second end device. In some embodiments the IIS may further be configured to determine that the first end device is being used by the first user, and that the second end device is being used by the second user.

In some embodiments, a communication input device may be associated with at least one end device and may be configure to communicate with at least one end device which is not associated with the communication input device. In some embodiments, the communication input device may be integral with the end device it is associated with. This may especially be the case in embodiments where the end device is a personal computer or an entertainment console. The IIS may be configured, in embodiments employing communication input devices, to notify the first user if a communication input device is associated with the second end device.

In another embodiment, a method for providing social interaction opportunities for people watching television is provided. The method may have steps for storing, at the direction of a first user of a first end device, an identifier code representing a second user; monitoring which of a plurality of television data streams is being received by the first end device; monitoring which of the plurality of television data streams is being received by a second end device used by the second user; and notifying the first user of which television data stream is being received by the second end device. In some embodiments, the method may also have a step for notifying the first user when the same television data stream is being received by both the first end device and the second end device. In some embodiments, the method may also have a step for notifying the first user if a communication input device is associated with the second end device.

Turning now to FIG. **1**, a block diagram is shown of one system **100** which provides social interaction opportunities for people watching television. The system includes multiple televisions **110**, **120**, **130**, each used by different users. Each of these televisions is respectively associated with multiple end devices **115**, **125**, **135**, which may be set-top boxes. Each of the end devices **115**, **125**, **135** are in communication with the Internet **140**. Through the Internet **140**, the end devices **115**, **125**, **135** are in communication with both a TDS **150** and an IIS **160**. Both the TDS **150** and the IIS **160** may have an input/output ("I/O") port **152**, **162**, a processor **154**, **164** and a data store **156**, **166**.

In this embodiment, methods and systems of the invention may be used to provide social interaction opportunities for people watching television. For example, each user may be receiving a different television data stream from the TDS **150**. The TDS **150** may store television data on its data store **156**, and transmit the television data streams from its I/O port **152**, over the Internet **140**, for reception by the end device **115**, **125**, **135**. Each of the end devices **115**, **125**, **135** may receive the different television data stream and convert it into a video signal and audio signal. The audio and video signals may then be transmitted from the end devices **115**, **125**, **135** to each respective television **110**, **120**, **130** for perception by users of the televisions **110**, **120**, **130**.

In one example, a first user may be using the first end device **115** to watch television **110**. A second user may be using the first end device **125** to watch television **120**. The IIS **160**, may, at the direction of the first user, store an identifier code representing the second user. This may occur when the first user logs into a web-site or other user interface which may interact with the IIS **160**. Such an interaction might occur through the use of a personal computer or an interface accessed through an end device and/or a television. It may also occur through the use of a portable electronic device such as a mobile phone, personal data assistant, BlackBerry™ or GoodLink™ device.

Once the first user begins communication with the IIS **160**, the user may submit identifier codes of other possible users of end devices. These other users may be users with which the first user may desire to communicate with regarding television data streams watched by the other users. Once identifier codes have been submitted by the first user, they may be stored by the IIS **160** in the data store **166** as being related to the first user. The data store **166** will thus possibly contain a listing of users, each possibly identified by an identifier code, and each also having a list of identifier codes associated therewith that represent other users. For the purpose of an example, in one embodiment the first user may store identifier codes for a second user using end device **125** and a third user using end device **135**.

IIS **160** may monitor which television data streams are being transmitted by TDS **150**, and being received by end devices **115**, **125**, **135**. Alternatively, IIS **160** may monitor end devices **115**, **125**, **135** to determine which television data streams are being received by end devices **115**, **125**, **135**. IIS **160** may continually update data store **166** with data representing what different television data streams are being received by end devices **115**, **125**, **135**. The IIS **160** may determine that the which users are using which end devices, and temporarily store the identifier code representing the user which is using end device **115**, **125**, **135**. In this way, the IIS **160** may have stored at data store **166** a list of identifier codes representing users which are using end devices. For each user using an end device the data store **166** may also contain a list of equipment codes identifying the end device being used by the users; a list of related identifier codes for each user; and another list of equipment codes, wherein each equipment code in this list identifies the end device used by the related users.

FIG. **2** is an example of a portion of data **200** which might be stored at IIS **160** in some embodiments. In column **210** the identifier code representing a user is stored. In column **220** the

equipment code representing an end device used by the user is stored. In this particular embodiment the equipment code is shown as the end device's IP address, though other identifiers are possible. Note that in relation to some users, the equipment code field is empty. In some embodiments this may indicate that the user is currently not using an end device. In column **230** a code representing what type of communication input device the user has associated with the end device they are using. Note that in relation to some users, the communication input device code field is empty. In some embodiments this may indicate that no communication input device is associated with the end device. In reference to FIG. **2**, wc365' may represent a certain model web-camera. 'voip12' may represent a certain type of Voice over Internet Protocol phone. 'pc' may represent an IBM™ clone personal computer. 'mac' may represent a Macintosh™ personal computer. In column **240** a communication input device code is shown. In this particular embodiment the communication input device code is shown as the communication input device's IP address, though other identifiers are possible.

In column **250** the television data stream which is being received by the end device being used by the user is stored. This information may be obtained by the IIS **160** through monitoring and/or querying the TDS **150**. Note that in relation to some users, the communication input device code field is empty. In some embodiments this may indicate, as above, that the user is currently not using an end device. In this particular embodiment the television data stream is identified by an alpha-numeric code. Other types of identifiers are possible within the scope of the invention.

In column **260**, identifier codes of related users are listed. These identifier codes may be related to the user represented by the identifier code in column **210** because the user directed the IIS **160** to store identifier codes for the related users. These related users may be people for whom the user wishes to know which television data stream they are watching, or when they are watching the same television data stream as the user. In column **270**, equipment codes of the end device being used by the related users may be stored. Note that in relation to some related users, this field may be empty because the user is not currently using an end device to receive a television data stream. In some embodiments, fewer or more types of data columns may be present, or the data may be stored in some other format, possibly a database format known in the art. For instance, in some embodiments, column **270** may not be present as the data contained therein is merely repetitive of data stored elsewhere in the data store. Namely, the related equipment code in column **270** can be found in column **220** in reference to the primary user whose identifier code is found in column **210**.

In further reference to FIG. **2**, certain information has been bolded for explanatory reasons. Note that one of the related identifier codes for identifier code '0052' is '0058.' In some embodiments of the invention, '0058' may be stored at the direction of the '0052' user. '0058' may represent a user for whom the '0052' user wishes to know which television data stream they are watching, or when they are watching the same television data stream as the '0052' user. In embodiments where the system or method only informs a user when another specified user is receiving the same television data stream, the system or method may not take any action in the state represented by FIG. **2**. In other embodiments, where the system or method allows a user to determine what television data stream another user is receiving, the '0052' user may be able to interact with an end device to receive a video and/or audio representation of which television data stream is being received by '0052''s related users.

In the example shown by FIG. **2**, such a system or method would allow the '0052' user to possibly call up a list of the television data stream being received by end devices being used by the '0144' user, the '5280' user, the '0069' user, the '1234' user, and the '0058' user. In the specific case of the '0058' user, the end device being used by the '0052' user may display a notification that the '0058' user is watching the 'RMRCABC109' television data stream. Some embodiments may conduct a lookup of a name associated with the related user's identifier code and display the name rather than the identifier code. For instance, 'Seymore B. McCluckey' may be displayed rather than '0058' if that is the name of the user represented by '0058.' Some embodiments may also conduct a lookup of a name associated with the television data stream, and display the name rather than the alpha-numeric representation of the television data stream. For instance, 'ABC™' may be displayed rather than 'RMRCABC109' if that is the name of the traditional television station converted into television data stream 'RMRCABC109.' Furthermore, in some embodiments, another lookup may be conducted where the content of the television data stream is determined so a description of such may be displayed. In some embodiments this may be the specific television program that is being transmitted in the television data stream. So in some embodiments, for example, the following might be displayed when user '0052' requests information on what user '0058' is watching: "Seymore B. McCluckey—ABC—National Nightly News." The lookups described above may occur at a variety of systems or some combination thereof. For example, the IIS **160** may conduct user name lookups, but the IIS **160** may communicate with the TDS **150** to conduct a television data stream name and program information lookup.

FIG. **3** is a block diagram of a system **300** similar to that in FIG. **1**, except the TDS **150** and the IIS **160** are in direct communication. The embodiment may be advantageous when the IIS **160** and the TDS **150** are in close physical proximity to each other or are operated by the same entity. In such a configuration, the IIS **160** will communicate with the TDS **150** by use of a trunk connection or other connection to monitor which television data stream is being transmitted to each of the plurality of users so monitored.

FIG. **4** is a block diagram of a system **400** similar to that in FIG. **3**, except the television data source and the interactive-information server are subsystems of a larger system. For the same reasons described above or otherwise, it may be advantageous in some embodiments to combine the TDS **150** and IIS **160** as subsystems of a larger system as shown in FIG. **4**. In such a configuration, the TDS **150** and IIS **160** may share the same input and output port **310**.

FIG. **5** is a block diagram of a system **500** similar to that in FIG. **4**, except end device **135** and television **130** have been replaced by a fourth end device **145**, here a TVoIP ready television. In this embodiment, the TVoIP ready television may incorporate the functionality of the end device **135** and the television **130** within one physical unit.

FIG. **6** is a block diagram of a system **600** similar to that in FIG. **5**, except each end device has an associated communication input device. A communication input device **610** is shown in communication with end device **115**. In FIG. **6**, the communication input device **610** is shown as a web-camera. In some embodiments, the communication input device **610** may be in direct communication with the end device **115**, and facilitate communication with another end device or communication input device associated with a different end device.

A communication input device **620** is shown associated with, but not in direct communication with, end device **125**. In FIG. **6**, the communication input device **620** is shown as a

laptop or notebook computer. In some embodiments, the communication input device **620** may be more directly in communication with the Internet than with the end device **125**, and facilitate communication with another end device or communication input device associated with a different end device.

A communication input device **620** is shown associated with, but not in direct communication with, end device **410**. In FIG. **6**, the communication input device **630** is shown as a Voice over Internet Protocol telephone. As shown in this embodiment, the communication input device **630** may be in direct communication with the internet. In other embodiments the communication input device **630** may be more directly in communication with the Internet than with the end device **135**, and facilitate communication with another end device or communication input device associated with a different end device.

FIG. **7** is a block diagram illustrating an exemplary computer system **700** in which at least portions of embodiments of the present invention may be implemented. This example illustrates a computer system **700** such as may be used, in whole, in part, or with various modifications, to provide the functions of the TDS **150**, IIS **160**, End Devices **115**, **125**, **135**, **410**, communication input devices **610**, **620**, **630** and/or other components of the invention such as those discussed above. For example, various functions of the IIS **150** may be controlled by the computer system **700** including, merely by way of example, monitoring television data streams being transmitted and/or notifying users of what television data stream another user is receiving.

The computer system **700** is shown comprising hardware elements that may be electrically coupled via a bus **790**. The hardware elements may include one or more central processing units **710**, one or more input devices **720** (e.g., a mouse, a keyboard, etc.), and one or more output devices **730** (e.g., a display device, a printer, etc.). The computer system **700** may also include one or more storage device **740**. By way of example, storage device(s) **740** may be disk drives, optical storage devices, solid-state storage device such as a random access memory ("RAM") and/or a read-only memory ("ROM"), which can be programmable, flash-updateable and/or the like.

The computer system **700** may additionally include a computer-readable storage media reader **750**, a communications system **760** (e.g., a modem, a network card (wireless or wired), an infra-red communication device, a Bluetooth™ device, etc.), and working memory **780**, which may include RAM and ROM devices as described above. In some embodiments, the computer system **700** may also include a processing acceleration unit **770**, which can include a digital signal processor, a special-purpose processor and/or the like.

The computer-readable storage media reader **750** can further be connected to a computer-readable storage medium, together (and, optionally, in combination with storage device(s) **740**) comprehensively representing remote, local, fixed, and/or removable storage devices plus storage media for temporarily and/or more permanently containing computer-readable information. The communications system **760** may permit data to be exchanged with a network, system, computer, and/or other component described above.

The computer system **700** may also comprise software elements, shown as being currently located within a working memory **780**, including an operating system **784** and/or other code **788**. It should be appreciated that alternate embodiments of a computer system **700** may have numerous variations from that described above. For example, customized hardware might also be used and/or particular elements might be implemented in hardware, software (including portable software, such as applets), or both. Furthermore, connection to other computing devices such as network input/output and data acquisition devices may also occur.

Software of computer system **700** may include code **788** for implementing any or all of the function of the various elements of the architecture as described herein. For example, software, stored on and/or executed by a computer system such as system **700**, can provide the functions of the TDS **150**, IIS **160**, End Devices **115**, **125**, **135**, **410**, communication input devices **610**, **620**, **630** and/or other components of the invention such as those discussed above. Methods implementable by software on some of these components will be discussed below in more detail.

FIG. **8** is a diagram **800** of a television data stream **810** being transmitted by a TDS **150** to an end device **820**, an outward stream of data **830** being transmitted from end device **820** to an IIS **160**, and an inward stream of data **840** being transmitted from IIS **160** to end device **820**. This embodiment also shows a television data stream control instruction **850** being transmitted by end device **820** to TDS **150**.

Television data stream **810** may consist of multiple consecutive packets of data, for example, packets 1 through 8 as shown on FIG. **8**. Each packet may contain both audio and video data. End device **820** may convert television data stream **820** into audio and video signals for transmission to another device such as a television. In other embodiments, the end device may be a personal computer or TVoIP ready television, and may itself more directly reproduce the video and audio represented by the television data stream **810**.

Television Data Stream Control Instruction **850** may be an intermittent signal sent from end device **820** to TDS **150** when a user initiates a change in television data streams that the user wishes to receive. For example, a user may push a button a remote control device associated with end device **820** to initiate a change in which television data stream **810** is being sent to end device **820**. The end device may be configured to receive the signal from the remote control and send a television data stream control instruction **850** to TDS **150**. TDS **150** may then change which television data stream **810** is being transmitted to end device **820**.

In embodiments where IIS **160** queries end devices to determine when television data stream **810** is being received by the end devices, outward stream of data **830** may be data requested by IIS **160** which represents what television data stream **810** end device **820** is receiving. In embodiments where IIS **160** communicates more directly with TDS **150** to determine which television data stream **810** a particular end device **820** is receiving, outward stream of data **830** may be communication information transmitted by a communication input device associated with end device **820**. Outward stream of data **830** may also be instructions from end device **820** to IIS **160** to transmit information representing what television data streams are being received by other users. Incoming stream of data **840** may be representative of such information, or may also be notification data regarding when a specified user of another end device is receiving the same television data stream **810** as the user of end device **820**.

FIG. **9** is a diagram of a method **900** of providing social interaction opportunities for people watching television which allows users to use communication input devices and notifies a user when the same television data stream is being received by another end device; what television data streams are being received by other end devices; whether or not a particular end device has a communication input device associated with it; and also allows users of end devices to communicate with each other. At block **904**, a user accesses IIS

160. The use then submits user verification information such as a username and password at block **908**. At block **912**, IIS **160** receives the user verification information. IIS **160** compares the user verification information to information stored in a data store at or in communication with IIS **160** at block **916**. The stored information may be information collected from the user during initiation of services with a service provider. The user may be able to modify the user verification information in some embodiments to personalize the verification procedure.

At block **920**, the user submits an identifier code of another user whom the user wishes to know when they are receiving the same television data stream and/or what television data stream they are receiving. IIS **160** receives the identifier code at block **924** and stores the identifier code at block **928**.

At block **932**, the user may access IIS **160**. This may occur automatically when the user of accesses TDS **150** with an end device and instructs TDS **150** to transmit a television data stream. In some embodiments, the user may be required to log into the end device, possibly using an input mechanism which instructs IIS **160** that the specific user is using the end device. In other embodiments, the IIS **160** may determine that a specific user is using the end device because of what television data stream the end device is receiving and the habitual television data stream receiving tendencies of the user in the past. In some embodiments, the end device may be associated with only one user (a single person household), and thus when an end device is in use, IIS **160** may know that the end device is being used by that user.

At block **936**, IIS **160** may monitor which television data stream is being received by the user and the associated users represented by the identifier codes transmitted by the user at block **920**. IIS **160** may notify the user when an associated user's end device is receiving the same television data stream at block **940**. In some embodiments, at block **944**, in response to a user requesting such information, IIS **160** may transmit information representative of which television data streams are being received by associated end devices. Possibly, IIS **160** may transmit this information whenever a user first initiates use of an end device. The end device may then reproduce this information as video or audio information receivable by the user from the end device or a device associated therewith. At block **948**, some embodiments of the invention will notify the user if a communication input device is associated with an associated end device.

At block **952**, if the user has a communication input device associated with the end device being used, the user may input communication information for transmission to another end device or communication input device associated with another end device at block **956**. The other end device or communication input device may receive the communication information at block **960**, and reproduce such information using video or audio at block **960**. The user using the other end device or communication input device may then respond in kind or otherwise at blocks **968**, **972**, **976**, **980**. This process may repeat itself as the users communicate back and forth until such time as either one or both of the users close the communication link at block **984**.

FIG. **10** is a diagram of a method **1000**, similar to the method in FIG. **9**, which does not notify a user of which television data streams are being received by other end devices which are not receiving the same television data stream.

FIG. **11** is a diagram of a method **1100**, similar to the method in FIG. **9**, which does not notify a user when the same television data stream is being received by another end device.

FIG. **12** is a diagram of a method **1200**, similar to the method in FIG. **9**, which does not notify a user which television data streams arc being received by another end device and which does not allow users to use communication input devices.

FIG. **13** is a flow diagram of a process **1300** that might be used by the interactive-information server, or other portion of the system, to determine when to notify a user than another end device is receiving the same television stream, or to determine when to notify the user of which television data streams are being receives by other end devices. At block **1310**, an IIS **160** may update its data store which reflects which users are using which end devices and what television data streams are being received by each end device. This may occur because a TDS **150** transmits information to IIS **160** whenever this information changes, or it may occur because IIS **160** queries either TDS **150** or end devices. At block **1320**, IIS **160** determined whether for each user there is an associated user who's end device is receiving the same television data stream as the user. If yes, at block **1330**, IIS **160** may notify the user that the same television data stream is being received by another user. If no, or after notifying the user that the associated user's end device is receiving the same television data stream, IIS **160** will determine, at block **1340**, whether or not a user has requested a list of what television data streams associated user's end devices are receiving. In some embodiments the user may merely request information regarding what a particular user's end device is receiving. If a user has requested such information, at block **1350** IIS **160** will notify the user of which television data stream is being received by the associated user's end device. If no request has been made, or after such notification has been made, at block **1360** a time delay may occur at IIS **160** before the process **1300** repeats itself. In some embodiments, a time delay may not occur, for example in those embodiments where IIS **160** is not querying other systems, but rather receives information as it changes elsewhere in the invention. In such embodiments, IIS **160** may conduct the described process whenever updated information is received.

The invention has now been described in detail for the purposes of clarity and understanding. However, it will be appreciated that certain changes and modifications may be practiced within the scope of the appended claims.

What is claimed is:

1. A system for providing social interaction opportunities for people watching television, the system comprising:

a television data source configured to transmit at least one of a plurality of television data streams for reception by a plurality of end devices, wherein each end device is represented by an equipment code;

the plurality of end devices, including a first end device used by a first user and a second end device used by a second user, wherein each end device is configured to receive at least one of the plurality of television data streams, and each user is represented by an identifier code; and

an interactive-information server configured to:

store, at the direction of the first user, an identifier code representing the second user;

monitor which of the plurality of television data streams is being received by the first end device, by communicating with the television data source;

monitor which of the plurality of television data streams is being received by the second end device, by communicating with the television data source;

notify the first user when the same television data stream is being received by both the first end device and the second end device, wherein notifying the first user comprises:

transmitting notification data regarding when the second user of the second end device is receiving the same television data stream as the first user of the first end device; and

displaying a notification on the first end device that the second end device is receiving the same television data stream.

2. The system for providing social interaction opportunities for people watching television of claim **1**, wherein the interactive-information server is further configured to:

receive, from the first user, at least one identifier code associated with another user; and

store the identifier code in a memory module.

3. The system for providing social interaction opportunities for people watching television of claim **2**, wherein the interactive-information server is further configured to notify the second user when the same television stream is being received by both the first end device and the second end device.

4. The system for providing social interaction opportunities for people watching television of claim **3**, wherein the interactive-information server is further configured to:

receive, in the first end device, communication information from the first user directed to the second user via the first communication input device;

transmit the communication information from the first end device to the second end device; and

reproduce the communication information on a display associated with the second device.

5. The system for providing social interaction opportunities for people watching television of claim **4**, wherein the interactive-information server is further configured to:

receive, in the second end device, communication information from the second user directed to the first user via the second communication input device;

transmit the communication information from the second end device to the first end device; and

reproduce the communication information on a display associated with the first end device.

6. The system for providing social interaction opportunities for people watching television of claim **1**, wherein the identifier code is an alpha-numeric string.

7. The system for providing social interaction opportunities for people watching television of claim **1**, wherein the equipment code is an alpha-numeric string.

8. The system for providing social interaction opportunities for people watching television of claim **1**, wherein the interactive-information server is selected from a group consisting of:

a computer in communication with the television data source; and

a computer in communication with the plurality of end devices.

9. The system for providing social interaction opportunities for people watching television of claim **1**, wherein the interactive-information server is further configured to:

determine the first end device is being used by the first user; and

determine the second end device is being used by the second user.

10. The system for providing social interaction opportunities for people watching television of claim **1**, wherein the interactive-information server is further configured to store information about the type of the communication input device associated with the second end device.

11. The system for providing social interaction opportunities for people watching television of claim **1**, wherein the communication input device is configured to communicate with at least one end device which is not associated with the communication input device.

12. A system for providing social interaction opportunities for people watching television, the system comprising:

a television data source configured to transmit at least one of a plurality of television data streams for reception by a plurality of end devices, wherein each end device is represented by an equipment code;

the plurality of end devices, including a first end device used by a first user and a second end device used by a second user, wherein each end device is configured to receive at least one of the plurality of television data streams, and each user is represented by an identifier code; and

an interactive-information server configured to:

store, at the direction of the first user, an identifier code representing the second end user;

monitor which of the plurality of television data streams is being received by the second end device, by communicating with the television data source;

notify the first user when the same television data stream is being received by both the first end device and the second end device, wherein notifying the first user comprises:

transmitting notification data regarding when the second user of the second end device is receiving the same television data stream as the first user of the first end device; and

displaying a notification on the first end device that the second end device is receiving the same television data stream.

13. The system for providing social interaction opportunities for people watching television of claim **12**, wherein the interactive-information server is further configured to:

receive, from the first user, at least one identifier code associated with another user; and

store the identifier code in a memory module.

14. The system for providing social interaction opportunities for people watching television of claim **13**, wherein the interactive-information server is further configured to notify the second user when the same television stream is being received by both the first end device and the second end device.

15. The system for providing social interaction opportunities for people watching television of claim **12**, wherein the interactive-information server is further configured to store information about the type of the communication input device associated with the second end device.

16. The system for providing social interaction opportunities for people watching television of claim **12**, wherein the communication input device is configured to communicate with at least one end device which is not associated with the communication input device.

17. A computer implemented method of providing social interaction opportunities for people watching television, wherein the method comprises:

storing, at the direction of a first user of a first end device, an identifier code representing a second user;

monitoring which of a plurality of television data streams is being received by the first end device, by communicating with the television data source;

monitoring which of the plurality of television data streams is being received by a second end device used by the second user, by communicating with the television data source;

notifying the first user when the same television data stream is being received by both the first end device and the second end device, wherein notifying the first user comprises:

transmitting notification data regarding when the second user of the second end device is receiving the same television data stream as the first user of the first end device; and

displaying a notification on the first end device that the second end device is receiving the same television data stream.

18. The computer implemented method of providing social interaction opportunities for people watching television of claim **17**, wherein the method further comprises the first user transmitting communication information to the communication input device associated with the second end device via the first communication input device.

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