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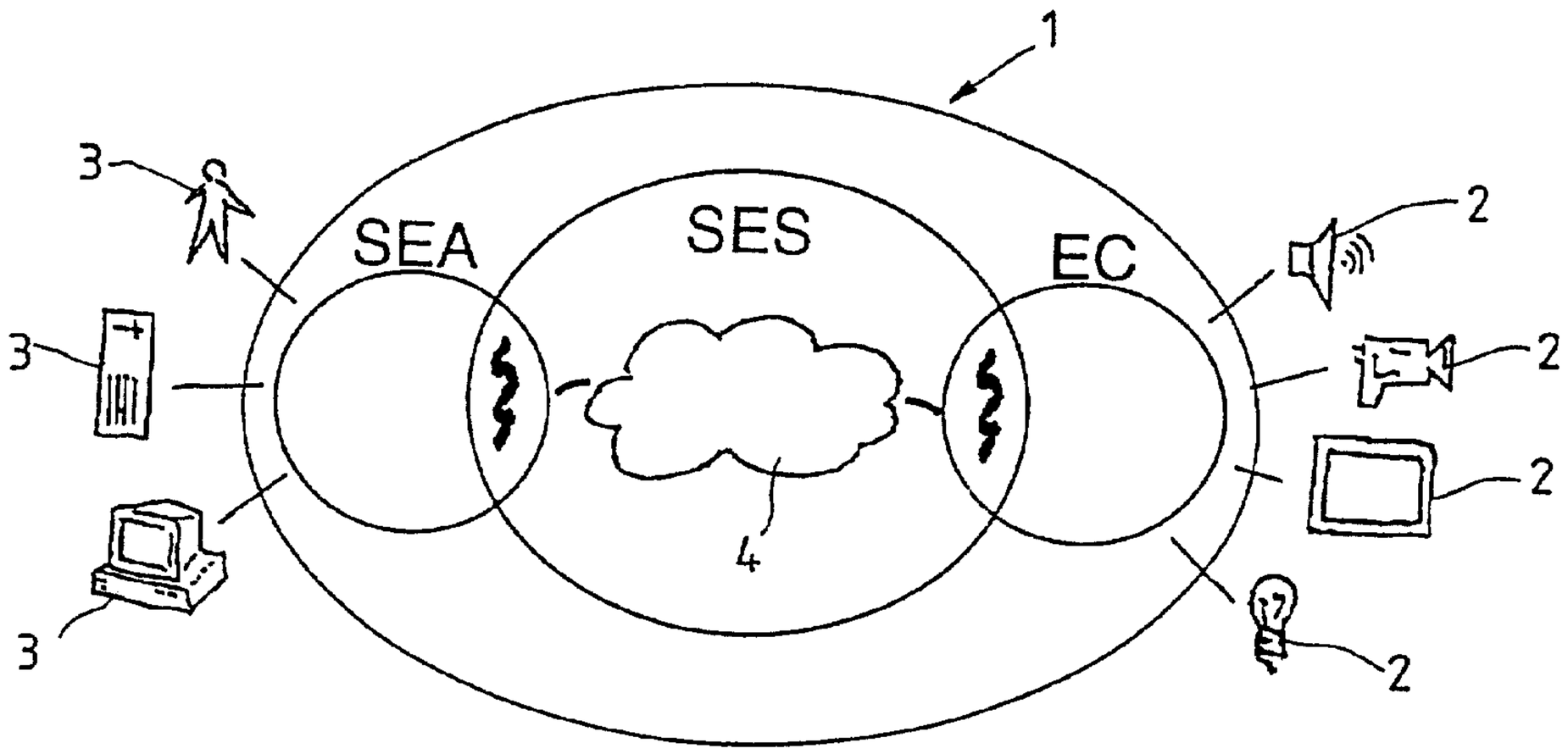
(54) **PROCEDE ET DISPOSITIF POUR LA CONDUITE UNIFORME DES COMPLEXES FERROVIAIRES**

(54) **A PROCESS AND A DEVICE FOR DRIVING TERMINALS UNIFORMLY**



(57) To make a wide variety of types of terminals (2) from a wide variety of manufacturers almost interchangeable and able to be driven uniformly, especially so that a consistent exchange of data and information is possible between different train station systems and the like, the invention provides a process for uniformly driving terminals (2), especially optical and/or acoustic information systems that can be used preferably in the area of train station systems, including monitors, cameras, loud-speakers, folding indicators, sensor and/or update elements and the like, wherein on the part of at least one control device (3,3'), terminals (2) are grouped into terminal classes by their logic functionality by means of a standardized terminal adapter (STA), connected to a terminal controller (TC) over a standardized terminal interface (STI) and driven physically by the terminal controller (TC).

ABSTRACT

To make a wide variety of types of terminals (2) from a wide variety of manufacturers almost interchangeable and able to be driven uniformly, especially so that a consistent exchange of data and information is possible between different train station systems and the like, the invention provides a process for uniformly driving terminals (2), especially optical and/or acoustic information systems that can be used preferably in the area of train station systems, including monitors, cameras, loud-speakers, folding indicators, sensor and/or update elements and the like, wherein on the part of at least one control device (3,3'), terminals (2) are grouped into terminal classes by their logic functionality by means of a standardized terminal adapter (STA), connected to a terminal controller (TC) over a standardized terminal interface (STI) and driven physically by the terminal controller (TC).

(Fig. 1)

A PROCESS AND A DEVICE FOR DRIVING TERMINALS UNIFORMLY

This invention concerns a process and a device for driving terminals uniformly, especially optical and/or acoustic information systems that can be used preferably in the area of railroad station systems, including monitors, cameras, loud-speakers, folding indicators, sensor and/or updating devices and the like.

In some infrastructures, it is now normal for a large number of sensor and/or update elements to be assigned to a large number of function-oriented devices, including lighting systems, air-conditioning and ventilation systems, shading units, heating systems, communications systems, including surveillance cameras, monitors, emergency call systems and loud-speakers, water and pumping systems and the like. It is also common for not only the respective devices themselves, but also the sensor and/or update elements to be procured at different times, belong to different generations and have different interfaces and response methods.

One special application of this invention is in the field of railroad station systems, where different optical and/or acoustic information systems are used for passenger information, and terminals like monitors, loud-speakers, folding indicators, video boards and the like, are supplied with the corresponding information and controlled by the control systems provided.

The Deutsche Bahn [German Railroads], for example, is still currently using passenger information systems from a wide variety of manufacturers in its train stations, so that almost every station is unique in terms of the passenger information system used. The same is true of the control devices that exist in the train stations to control the passenger information systems and their terminals, which include different computer systems and networks, and are basically adapted to the local circumstances of a station. Because of these conditions, exchanging data and supplying data for passenger and travel information between individual train stations is usually inconsistent. Data of interest for passenger information include, for

example, schedule data in terms of actual and projected data that inform passengers when the trains are running, and about delays, connections and the like, for example.

Standardization and integration efforts to control information systems terminals used in train stations have thus far failed, since the interfaces between the control devices and the terminals of the information systems connected to them in the train station systems are only accessible proprietarily, and it is not possible to change information systems for cost reasons. Thus, it can happen that older terminals that are still in train station systems must be connected to newer control devices. The problem here is that generally the documentation for these terminals is no longer around because of their age, and therefore the drive to integrate these terminals is difficult and sometimes completely impossible.

In view of this state of the art, the problem of this invention is based on providing a process for driving terminals of the type mentioned at the beginning which makes it possible for different types of terminals from different types of manufacturers to be exchanged in almost any way with one another and makes them able to be driven uniformly, especially so that it is possible to exchange changing data and information between various information systems and terminals in a way that is consistent and simple.

The invention solves this problem with a process for uniformly driving terminals, especially optical and/or acoustic information systems that can be used preferably in the field of train station systems, including monitors, cameras, loud-speakers, folding indicators, sensor and/or update elements and the like, wherein on the part of at least one control device, terminals are grouped in terminal classes in terms of their logic functionality by means of a standardized terminal adapter, are connected to a terminal controller over a standardized terminal interface and are physically driven by the terminal controller.

According to the invention, the terminals to be driven are driven by at least one control device, and the terminals are advantageously grouped into terminal logic classes, for example in terminals for outputting a train line, whether it is acoustic or optical, or in terminals for processing continual streams of data, for example surveillance cameras and monitors for

video data. With the control device, the terminals are driven according to the basic logic functionalities in the respective terminal class, i.e., without knowledge of the exact physical properties of the individual terminals. The basic logic functionalities and properties given on the part of the control device are fed to the terminal controller over the standardized terminal interface in the invention, and it finally drives the exact physical properties of the terminals selectively. That way, terminals from a wide variety of types and manufacturers can be driven uniformly, and can be changed almost any way with one another, which makes very consistent data and information exchange possible between different information systems and terminals. The process in the invention also creates a new standard, which can be used advantageously for future new developments in the field of terminals as well, so that new developments can be adapted with no problem by existing information systems.

Advantageously, the standardized terminal adapter is connected bidirectionally to the terminal controller over the standardized terminal interface, in one preferred embodiment unidirectionally. This makes it possible for the control device to respond to several terminals via the respective terminal controller, for example to give a track message over several loud-speakers or loud-speaker systems that are spread out. Both a natural message and a synthetic message that is combined from different partial stored messages can be given over the loud-speaker.

In another advantageous embodiment of the invention, a protocol suitable for text, audio and/or video data transfer is used for communication between the standardized terminal adapter and the control device, for example a multimedia communications protocol like H.323 using TCP/IP (Transmission Control Protocol/Internet Protocol). Advantageously, text, audio and/or video data are transferred between the control device and the terminal controller over the standardized terminal interface. In another advantageous embodiment of the invention, the data are transferred coded, and the coding is preferably done in G.7xx format for digital coded acoustic signals and in H.26x format for coded image information. Different qualities of coded signals, in terms of bandwidth, resolution and the like, are kept variable.

The H.323 format is a recommendation of the International Telecommunications Union (ITU) and sets the standards for multimedia communication over local networks (LAN), enterprise networks (Enterprise Net works/EN), urban networks (Metropolitan Area Networks, MAN) and wide area networks (Wide Area Networks, WAN). Multimedia communication for the Internet can also be used on the basis of the H.323 format. The standardized H.323 format supplies a platform for text, audio and/or video data transfer over so-called packet networks, like IP (Internet Protocol) for example or IPX (Internet Packet Exchange). Terminals and technical software applications in the multimedia field from a wide variety of manufacturers can be addressed with this standard and integrated with one another. The use of the H.323 format allows communication without having to worry about compatibility of the different terminals or applications. The H.323 format is thus extremely flexible in terms of the possibilities of combining different types of communication. Besides pure telephony via IP, called voice-over IP, image telephony, simultaneous audio and data communication and simultaneous audio, video and data communication are used. The H.323 format is designed to be modular. Thus, many communications protocols already prefabricated and proven in practice are used. For the real-time capability needed by audio and/or video applications, the H.323 format has modules that use the real-time protocol (RTP) and the real-time-control protocol (RTCP). To make and break connections, for example, the Q.932 protocol used for ISDN services is available in H.323 format, for data communication, modules in the T.120 protocol family, for example.

In another advantageous embodiment of the invention, to view optic information on terminals like monitors or folding indicators, basic functions, like delete at least part of a message, turn on, change or add information or partial information, set and/or query current information or partial information, query terminal status and query error diagnosis are used. Moreover, it is an advantage of the control device that status changes can be detected and removed, and maintenance measures can be introduced or carried out. These functions are called up by the control device in the invention. Communication between the control device and the terminal controller takes place via messages on the logic plane that need no knowledge of the physical properties of the respective terminal. Messages can be sent on the part of the terminal controller to the control device independently. The messages or data to be exchanged can be

converted into the form of telegrams in terminal-specific control commands (basic commands) for the terminal controller via the standardized terminal adapter. The process in the invention thus not only simplifies the drive, but also standardizes the operating capacity of different terminals through the logic drive of terminals on the part of a control device. Thus, for example, error messages triggered by the terminal can carry the same logic name, but have different meanings depending on the respective terminal. Thus, for example, error message "XYZ" from terminal A can mean "paper out," while the same error message from terminal B means "cash cassette full." The process in the invention decodes the messages in the terminal into uniform logic error messages on the part of the control device.

To display acoustic information on terminals like systems for outputting fixed texts, loud-speaker systems with audio coupling or loud-speakers, the respective loud-speaker circuits are advantageously driven by the terminal controller to trigger the text to be voiced. In systems with audio coupling, the texts to be voiced are advantageously dynamically transmitted over an existing network in the area of the information system or forwarded by it. The loud-speaker circuit is driven by the respective terminal controller. The audio signals to be output are advantageously fed into the respective terminal via the terminal controller by an audio interface existing on the standardized terminal adapter. If there is more than one service for viewing acoustic information on the terminal, a common terminal controller is advantageously driven logically to control these services by two standardized terminal adapters separated from one another.

The problem is solved by the invention with a generic device to drive terminals uniformly, which consists of a terminal controller for physical control of different terminals and a standardized terminal adapter for logic control of the terminal on the part of at least one control device, wherein the terminal controller and the standardized terminal adapter are connected to one another via a standardized terminal interface.

In another advantageous embodiment of the invention, the terminal controller and the standardized terminal adapter are designed as modules separated spatially from one another, so that the terminal controller can be connected on the part of a terminal and the standardized

terminal adapter can be connected on the part of a control device. Spatial separation of the terminal controller and the standardized terminal adapter makes it possible to use the infrastructure existing on site in terms of already existing wiring, and makes it possible to use the device in the invention, especially on terminals and control devices that have limited space available for more module components,. The device in the invention has the advantage of untangling the driving complexity. The existing infrastructure, generally in the form of bell wires, would not allow a driving process, especially since the transmission bandwidth of bell lines is extremely limited. With the process in the invention, to drive terminals uniformly over existing bell lines, if necessary, only the physical control signals for the terminals need to be transmitted, so that the transmission bandwidth of the bell lines available is sufficient. Advantageously, both the terminal controller and the standardized terminal adapter have a standardized terminal interface.

In another advantageous embodiment of the invention, the standardized terminal interface is designed as an interprocess interface, preferably a Berkley Socket. Advantageously, the standardized terminal interface has interfaces for connection to a communications network, preferably an Application Programming Interface (API), a LONWorks, an RS232, an RS485, a V.24 or the like, for example, an interface for connection to a radio LAN. Due to the possibility of connecting to these bus systems, it is also possible to use wiring that already exists in the field of train station systems for installed terminals of information systems. Preferred transmission media are Ethernet-capable and hence, for example TCP/IP-capable transmission media like twisted pairs, preferably category 5/6, or coaxial lines, radio LANs and the like. Advantageously, the connection between the standardized terminal adapter and a control device, for example a computer working as a server, is a connection based on the H.323 format, over which the standardized terminal adapter receives information received by the control device for passenger information, for example, train delays, track messages, changes in arrivals and departures, connection possibilities and the like, and converts it into corresponding logic drives for the terminals, for example into acoustic voice signals coded with G.7xx or video signals coded with H.26x like moving images and the like.

Other details, features and advantages of the invention will be explained in greater detail

below using examples of embodiment shown in the Figures.

Fig. 1 shows the basic design of the device in the invention;

Fig. 2 shows the basic function of the device in the invention;

Fig. 3a shows the basic design of a first form of embodiment of the device in the invention;

Fig. 3b shows the basic design of another form of embodiment of the device in the invention;

Fig. 3c shows the basic sequence of communication for the device in Fig. 3a;

Fig. 3d shows the basic sequence of communication for the device in Fig. 3b;

Fig. 4 shows a block diagram of the basic functionality of the device in the invention;

Fig. 5 shows a block diagram of the functionality of the device in the invention in detail;

Fig. 6 shows a block diagram of how the standardized terminal adapter of the device in the invention works

Fig. 7a shows a block diagram of how the terminal controller of the device in the invention works using a folding indicator and

Fig. 7b shows a block diagram of how the terminal controller of the device in the invention works using a monitor.

Fig. 1 shows the basic design of a device 1 for uniformly driving terminals 2 that are used in the field of train station systems for optical and/or acoustical passenger information. Device 1 consists of a terminal controller TC for physical control of different terminals 2 and a standardized terminal adapter STA for logic control of terminal 2 on the part of different control devices 3, where the terminal controller TC and the standardized terminal adapter STA are connected to one another over a standardized terminal interface STI by means of a bidirectional communication link 4.

Device 1 separates the logic processing of the information supplied by control device 3 from the terminal-specific technology. The standardized terminal adapter STA describes the terminal in terms of a logic drive in such a way that functionally equal terminals are grouped into terminal families, for example acoustic terminals 2 and optical terminals 2 of information systems in the form of loud-speakers and video monitors or folding indicators, as shown in

Fig. 2. Physical control of the terminal 2 is exclusively by the terminal controller TC. The standardized terminal adapter STA and the terminal controller TC are connected bidirectionally to one another over the standardized terminal interface STI, which is designed as API or another physical transmission medium, like V.24, LONWorks, RS485 or RS232. The standardized terminal interface and its communication link 4 guarantee a uniform basis for driving all terminals 2 and hence their interchangeability.

Fig. 2 shows how terminals 2 of information systems used in train station systems can be driven by means of device 1 on the part of a control device 3 in a uniform, standardized way. Device 1 creates a separation between a logic and standardized drive by control device 3, here in the form of a so-called station server 3', and a physical terminal drive.

Fig. 3a shows a form of embodiment of device 1, in which the terminal controller TC and the standardized terminal adapter STA are designed as a uniform integrated module. Fig. 3 shows a form of embodiment of device 1 in which the terminal controller TC and the standardized terminal adapter STA are designed as modules spatially separated from one another.

With the device shown in Fig. 3a, communication takes place between the terminal controller TC and the standardized terminal adapter STA internally over the standardized terminal interface STI.

In the device shown in Fig. 3b, both the terminal controller TC and the standardized terminal adapter STA have a standardized terminal interface STI, and the connection between the terminal controller TC and the standardized terminal adapter is made over a communications network, generally of the existing infrastructure, i.e. bell lines.

Fig. 3c shows the basic communication sequence of one form of embodiment of device 1 in Fig. 3a, in which the terminal controller TC and the standardized terminal adapter STA are designed as a uniform integrated module. An application 19 running on the station server 3, 3' to drive a terminal 2 accesses a bidirectional communications link 20 over an interprocess

interface 21, here a Berkley Socket, which obtains access to the bus system of the server 3, 3', here an ISA bus 23, via the driver marked 22. On the terminal side, the terminal controller TC accesses the bus system 24 via a driver 24; via processing logic 25, the information to be exchanged on the part of the application 13 with the terminal 2 for driving is fed to the existing input/outputs 26 by the terminal controller TC, which is in turn controlled by the processing logic 25 on the part of the terminal controller TC. The inputs/outputs 26 of the terminal controller TC are designed here as digital inputs/outputs.

Fig. 3 shows the basic function sequence of device 1 in Fig. 3d, in which the terminal controller TC and the standardized terminal adapter STA are designed as modules separated spatially from one another.

According to Fig. 3c, an application 19 running on the station server 3, 3' is fed on the part of the station server 3,3' over the server's internal bidirectional communications link 20 to the interprocess interface 21 designed as a Berkley Socket, which accesses the bus system 23 via driver 22. The processing logic 27 can access the bus system 23 via driver 24 of the terminal controller TC and thus exchange data with the application running on the station server 3,3'. In Fig. 3d, the processing logic 27 of the terminal controller TC goes over an interface, not shown here, with driver 29 to a bus system 30, which accesses the inputs and outputs 26 driving the terminal 2 via a corresponding driver 31 of processing logic 28. The bus system 30, here a LON bus, thus makes it possible to use an already existing infrastructure, generally in the form of bell wires, over interfaces responding to the LON driver 29, 31 on the part of the processing logic 27 and 28.

Figure 4 shows a block diagram with the basic functionality of the drive device 1, consisting of a terminal controller TC and the logic drive 6 on the part of the standardized terminal adapter STA, between which the standardized terminal interface STI is defined. Physically, the standardized terminal interface STI is designed as an interprocess interface (Berkley Socket). Under the interprocess interface, an adaptation device, not shown here, is placed, which for a distributed drive device 1, corresponding to Fig. 3b in which the terminal controller TC is separated from the standardized terminal adapter STA, drives a

communication network 5, here a LON bus or an RS485, which permits the use of wiring that already exists to terminals already installed.

The standardized terminal adapter STA gives the different terminals uniform behavior and layout. To do so, the standardized terminal adapter has interfaces in its processing logic 6 to the station server 3', which supplies the technical information, here train lines with current information on incoming and outgoing trains. The standardized terminal adapter also has a module 7 (call control) to create a connection design, preferably in H.245 format. This creates a connection between module 7 (call control) and a gatekeeper 8, which determines how a connection is made on the part of the processing logic 6 and controls how the medium available for such connection will be used, for example by establishing access priorities. The gatekeeper 8 thus determines the quality of the connection, for example in terms of transmission bandwidths of acoustic signals to be transmitted or the resolution of graphics or moving pictures to be transmitted. Thus, for example, within the framework of a video camera used for surveillance, first standard individual low-resolution images are transmitted at predetermined intervals of time and, if necessary, when damage occurs, high-resolution moving pictures are transmitted continually. The gatekeeper 8 thus controls, like a digital TK system used in the field of telecommunications, or permits the display of high-resolution graphics with moving picture transmissions or a digitally coded voice signal via corresponding terminals 2. It goes back to the dynamic bandwidth management of the H.323 format. Bandwidth management in H.323 format on corresponding terminals also makes it possible to transmit by voice in different qualities and to control cameras. Cameras can be switched by control module 7 (call control) via the gatekeeper 6 to individual image transmission to obtain rough image information from the camera and to real-time image transmission to get more precise, selective image information.

The standardized terminal adapter STA also has a memory module 10, which handles the corresponding addressing of the terminals along with a so-called directory server 9, here an X500 or LDAP. The directory server 9 also has an image table, which determines how individual elements to be displayed, here the elements of a train line, should be processed and converted. For a train display with high-resolution graphics, logos of transporters are filed as

bitmaps in the image table of the directory server 9. In addition to the position of the logo of a transporter on the train display, the technical layout of the display for the respective terminal can be changed uniformly for all terminals using the memory module 10 (cache).

As shown in Fig. 4, the connections between the standardized terminal adapter are made via TCP or UDP. The connection 11 between the terminal controller TC and terminal 2 is terminal-specific and determined on the part of terminal 2. As can be seen from Fig. 4, the standardized terminal adapter, the terminal controller TC and terminal 2 form a so-called H.323 end point which is clearly established and defined in H.323 format.

Fig. 5 shows how existing information, here train lines 1 to n, is prepared by the processing logic 12 on the part of the station server 3' in H.323 format and is forwarded to the standardized terminal adapter STA over corresponding interfaces for display, announcement, video surveillance, telephony and the like, as a prepared data set. The station server 3' receives train lines over a communication network based on the H.323 format, which has specific additions for train station systems, for example the ITB format developed by the Deutsche Bahn [German Railroads], which is based on H.323 and has applications-specific supplements. The train lines are like the counterpart to the schedule boards, i.e., a data set with fields for train number, type, platform, arrival and departure time and the like. From these train lines, the station server 3' generates corresponding drive instructions for different terminal families, for example for optical or acoustic terminals 2. And it differentiates between displays with one line and those with multiple lines. On a one-line display, conflict management must make sure that a punctual train overwrites the display of a very late train and then reproduces the display. It must also make sure by corresponding announcements that passengers who are waiting for the late train do not inadvertently get on the train that meanwhile left on time.

The standardized terminal adapter prepares the data set obtained from the station server 3' according to the different terminal classes, like optical or acoustic terminals. A technical layout is prepared according to the information obtained from the station server 3' using a database from the memory module 10 and the directory server 9. The standardized terminal

adapter thus creates a virtual image 13 of the terminal 2, which is forwarded to the terminal controller TC over the standardized terminal interface STI. The terminal controller TC accepts the technical layout as a virtual image in the form of a data set at the standardized terminal interface STI and prepares it specifically for the existing terminal 2, as is explained below using Fig. 7a and 7b for optical information systems.

Terminal 2 is divided hierarchically, from a logic standpoint, into a display with one or more pages with one or more regions, each with different properties. A terminal 2 is described by the fact that it can contain one or more pages. These pages can be described independently of one another. Over the standardized terminal interface STI, any page can become a page currently shown on the display. Each page can contain one or more regions. Depending on the physical possibilities, the region can be defined in its dimensions beforehand over the standardized terminal interface. Each region has different properties. Thus, for example, on a palette display, a region is defined by a palette with different folding pages. Therefore the region can contain only codes that are assigned to a folding page on the physical terminal 2. On a high-resolution graphics display, a region can have the following properties, for example: codes, character chain, bitmap and video or movie. Codes are replaced in the terminal controller TC by contents reserved there, character chains with format instructions such as font, font size, font color and font attributes, which are converted into corresponding graphics by the terminal controller TC. Bitmaps can be taken directly by the terminal controller TC and displayed on the corresponding region of the terminal 2. If the terminal 2 supports the display of moving graphics, these can also be displayed directly. For this, the terminal 2 has video or movie-type regions. For the video type, the terminal controller obtains a continual stream of data over the standardized terminal interface, which codes moving pictures according to the H.323 format, for example in H.26x. The movie type is a subfunction of the video type, where the data stream here from the terminal controller 2 is already in the form of a file. That way, the data stream is reduced on the standardized terminal interface STI, since the moving pictures must only be transmitted once, which does not have to take place under real-time conditions.

Fig. 6 shows the processing logic 6 of the standardized terminal adapter, which has the job of

extracting the information in the data set from a logic data set provided by the respective station server 3', here in the form of a train line, according to the respective terminal class. It is prepared on the basis of the technical layout and transferred into the regions of the terminal 2 provided for it. For this, the individual fields of the data set are converted with an interpreter. The field content is prepared by a sequence of standard commands for each field element in the data sets and is transferred into the logic or virtual image 13 of the terminal 2. The database used for this is created on the basis of the directory server 9, an X.500 server or an LDAP server. The directory server 9 allows central data to be held for all terminals 2. To prevent unnecessary communication between the directory server 9 and the terminals 9, the commands are stored in the interim in the memory module 10, the cache of the standardized terminal adapter STA.

Figs. 7a and 7b show the basic functionality of the terminal controller TC for driving the terminals 2. Depending on the physical possibilities of the terminal 2, the information from the virtual image 13 of terminal 2 is given to the terminal controller TC over the standardized terminal interface STI. For the folding indicator shown in Fig. 7, the processing logic 6 of the standardized terminal adapter STA has a table with print on individual folding pages. Depending on the contents of the region, the corresponding folding-page number is found and transmitted to the terminal controller as a code number for the region. The data is stored, as already explained, by the directory server 9 and the memory module 10 (cache). With terminal 2, shown in Fig. 7b, a monitor that can display high-resolution graphics, either a bitmap or pure text is produced as a character chain, which is transmitted to the terminal controller TC over the standardized terminal interface STI by the standardized terminal adapter STA from the contents of the field for the virtual image 13. For certain field contents/regions, there can be databases and a bitmap provided for the individual values in the directory server 9 and memory module 10, for example logos for transporters.

The terminal controller TC receives the data for the different, physically similar classes of terminals. These data are prepared and displayed by the terminal controller for the respective specific terminal. For the folding indicator shown in Fig. 7a, this means that the code numbers for individual regions are converted into set commands for step motors in the

folding palette. This corresponds to the code number of a folding position within the palette. On the monitor in Fig. 7b which can show high-resolution graphics, for each region, code numbers, character chains or bitmaps are given for contents filed permanently in the terminal controller TC,. A continual stream of data can also be supplied by the station server 3' over the standardized terminal interface STA, which can be interpreted by the terminal controller TC as video data, using H.26x coding. That way, there is fading of moving advertisements on a train display or another monitor.

On acoustic terminals 2, not shown here, the continual stream of data has acoustic information coded by G.7XX as part of the H.323 format. The regions are interpreted as elements of a synthetic announcement by the terminal controller, so that any announcement can be composed from pre-stored speech elements.

List of Reference Numbers

	1	Drive device	TC terminal controller
	2	Terminal	STA standardized terminal adapter
	3	Control device	STI standardized terminal interface
5	3'	Station server	
	4	Communications link	
	5	Communications network	
	6	STA processing logic	
	7	STA call control	
10	8	Gatekeeper	
	9	Directory server	
	10	Memory module (cache)	
	11	Communications link	
	12	Processing logic	
15	13	Virtual image	
	14	Controls	
	15	Controls	
	16	Communications link	
	17	Communications link	
20	18	Communications link	
	19	Application	
	20	Communications link	
	21	Interface	
	22	Driver	
25	23	Bus system	
	24	Driver	
	25	TC processing logic	
	26	Inputs/outputs	
	27	Processing logic	
30	28	Processing logic	

29 Driver

30 Bus system

31 Driver

CLAIMS

1. A process for uniformly driving terminals, especially of optical and/or acoustic information systems that can be used preferably in the field of train station systems, including monitors, cameras, loud-speakers, folding indicators, sensor and/or upgrade elements and the like, wherein on the part of at least one control device (3,3') terminals (2) are grouped in terminal classes by their logic functionalities by means of a standardized terminal adapter (STA), connected to a terminal controller (TC) via a standardized terminal interface (STI) and physically driven by the terminal controller (TC).

2. The process in Claim 1, characterized by the fact that the standardized terminal adapter (STA) is connected bidirectionally to the terminal controller (TC) over the standardized terminal interface (STI).

3. The process in Claim 1, characterized by the fact that the standardized terminal adapter (STA) is connected unidirectionally to the terminal controller (TC) over the standardized terminal interface (STI).

4. The process in one of Claims 1 to 3, characterized by the fact that for communication between the standardized terminal adapter (STA) and the control device (3,3'), a protocol suitable for text, audio and/or video data transfer, preferably a multimedia communications protocol, is used.

5. The process in Claim 4, characterized by the fact that the protocol is used in H.323 format, preferably using TCP/IP.

6. The process in one of Claims 1 to 5, characterized by the fact that text data are transferred over the standardized terminal interface (STI) between the standardized terminal adapter (STA) and the terminal controller (TC).

7. The process in one of Claims 1 to 5, characterized by the fact that audio data are transferred over the standardized terminal interface (STI) between the standardized terminal adapter (STA) and the terminal controller (TC).

8. The process in one of Claims 1 to 5, characterized by the fact that video data are transferred over the standardized terminal interface (STI) between the standardized terminal adapter (STA) and the terminal controller (TC).

9. The process in one of Claims 6 to 8, characterized by the fact that the data are transferred coded, preferably in G.7xx format and in H.26x format.

10. The process in one of Claims 1 to 9, characterized by the fact that status information from the terminals (2) can be input by the control device (3, 3').

11. The process in one of Claims 1 to 10, characterized by the fact that remote-maintenance measures can be introduced or carried out by the control device (3, 3').

12. A device for uniformly driving terminals (2), especially of optical and/or acoustic information systems that can be used preferably in the field of train station systems, including monitors, cameras, loud-speakers, folding indicators, sensor and/or update elements, and the like, consisting of a terminal controller (TC) for physical control of different terminals (2) and a standardized terminal adapter (STA) for logic control of the terminals (2) on the part of at least one control device (3, 3'), wherein the terminal controller (TC) and the standardized terminal adapter (STA) can be connected to one another over a standardized terminal interface (STI).

13. The device in Claim 12, characterized by the fact that the standardized terminal adapter (STA) and the terminal controller (TC) are connected bidirectionally.

14. The device in Claim 12, characterized by the fact that the standardized terminal adapter (STA) and the terminal controller (TC) are connected unidirectionally.

15. The device in one of Claims 12 to 14, characterized by the fact that the terminal controller (TC) and the standardized terminal adapter (STA) are designed as modules spatially separated from one another.

16. The device in one of Claims 12 to 14, characterized by the fact that the terminal controller (TC) and the standardized terminal adapter (STA) each have a standardized terminal interface (STI).

17. The device in one of Claims 12 to 16, characterized by the fact that the standardized terminal interface (STI) is designed as an interprocess interface, preferably a Berkley Socket, which can be connected over at least one interface to a communications network, preferably over an RS232, an RS485, an API, a V.24, a radio LAN or a LON bus.

18. The device in Claim 17, characterized by the fact that the standardized terminal interface (STI) is wired in twisted pairs, preferably category 5/6.

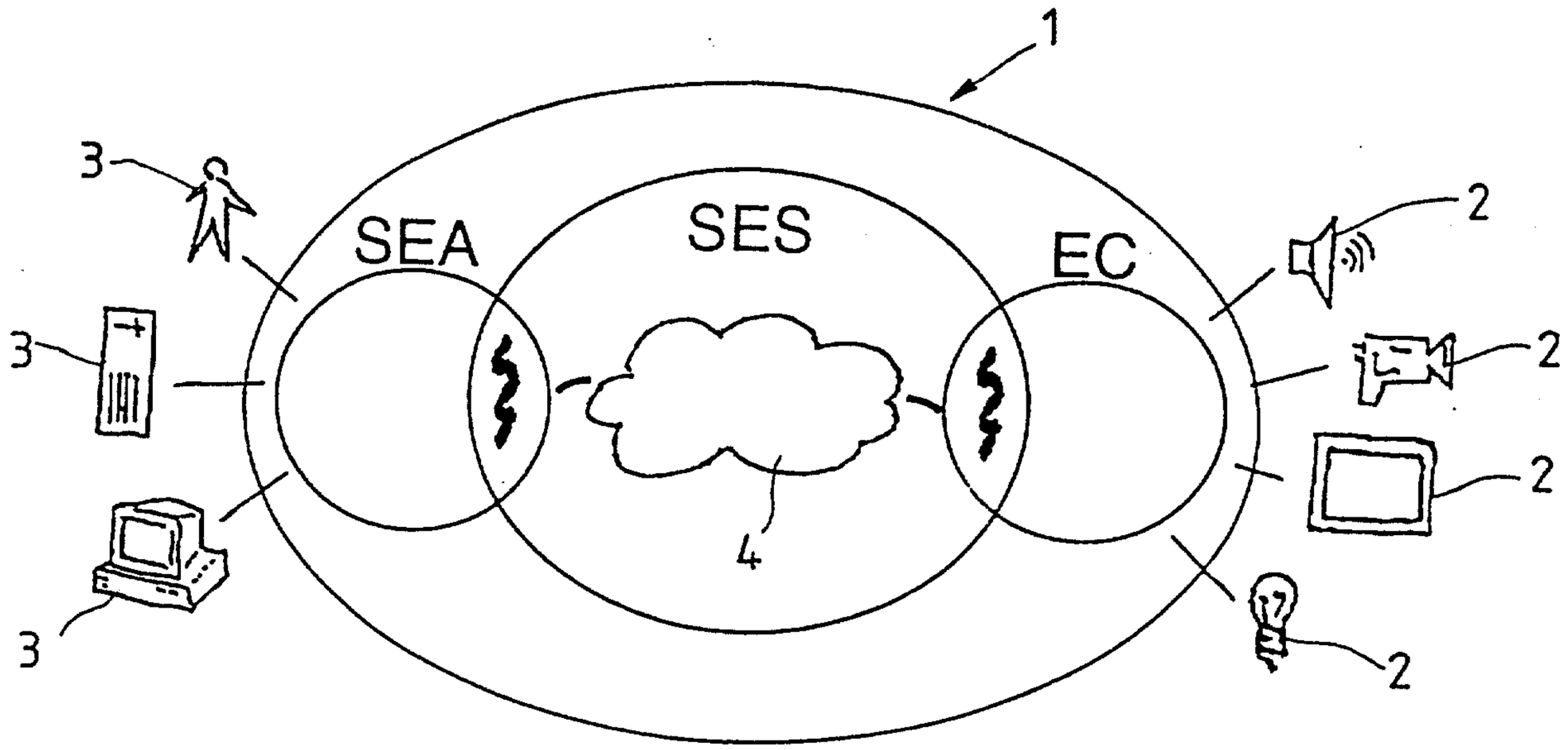


Fig. 1

Fig. 3a

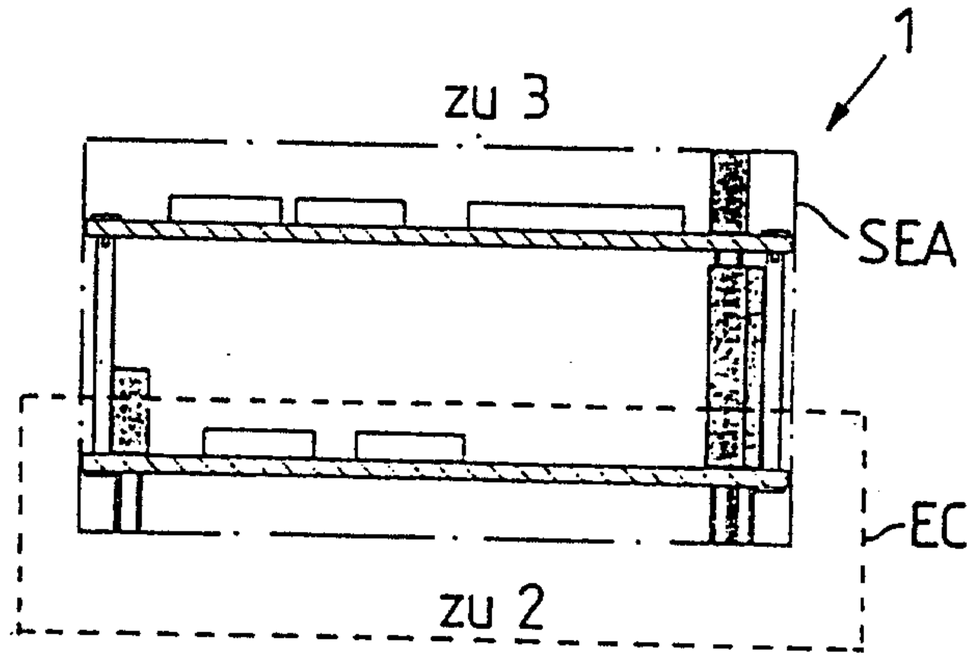
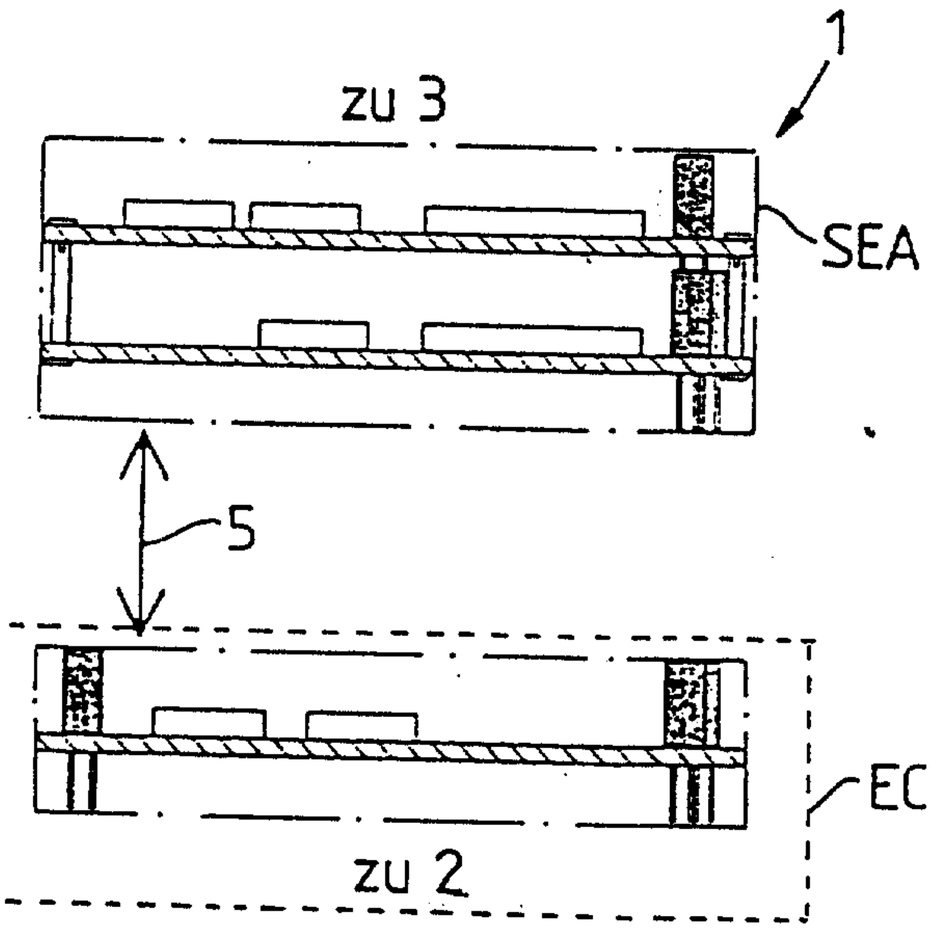


Fig. 3b



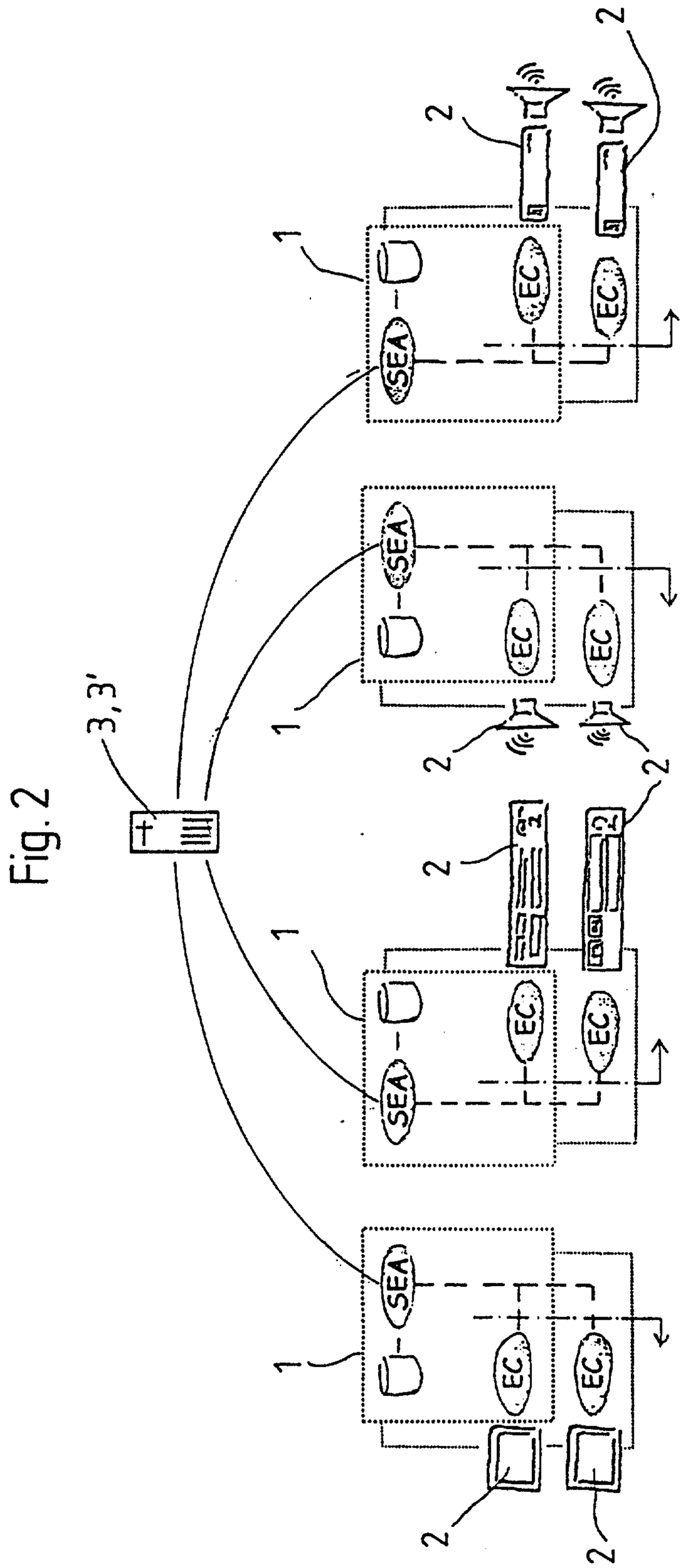
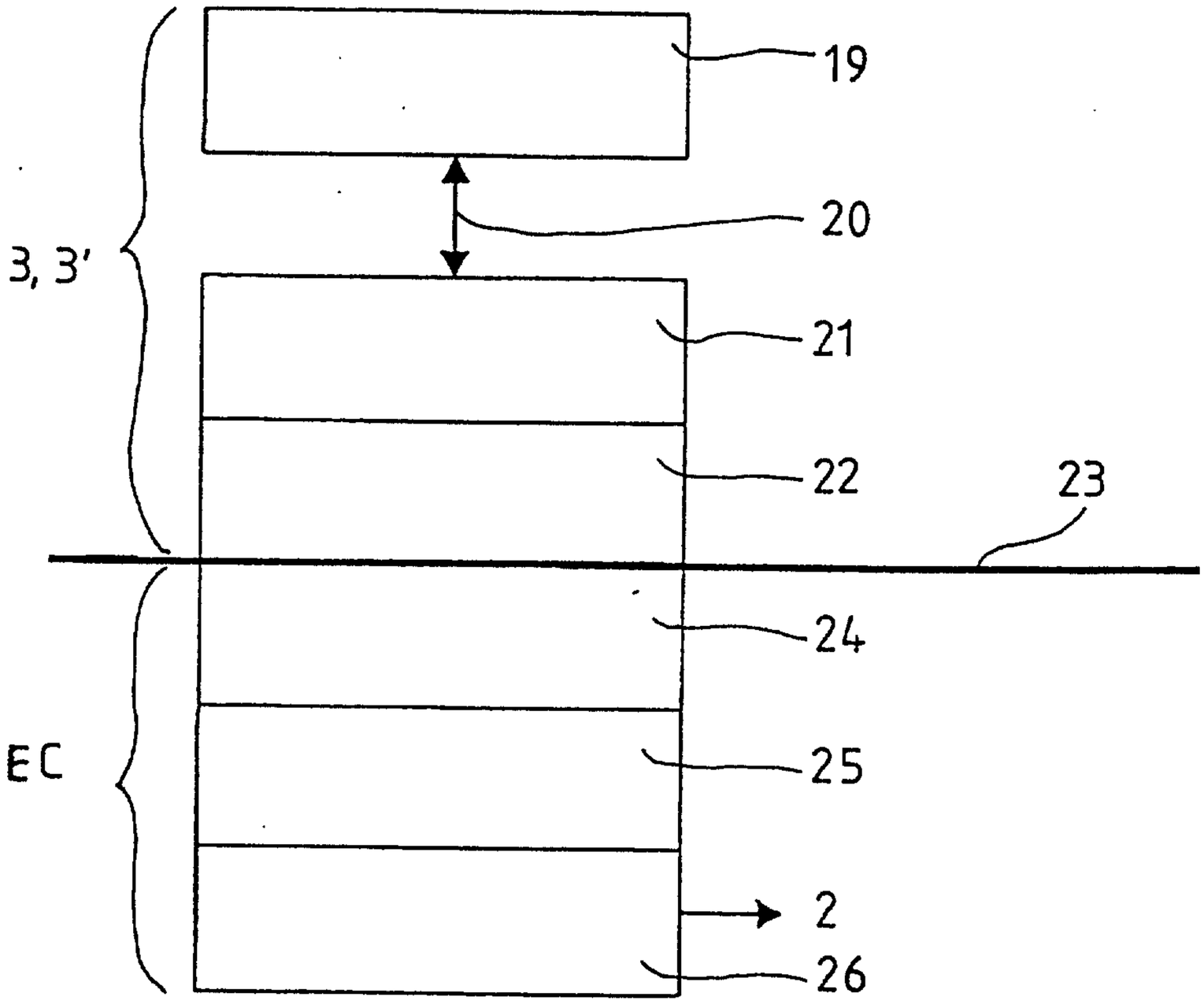


Fig. 2

Fig. 3c



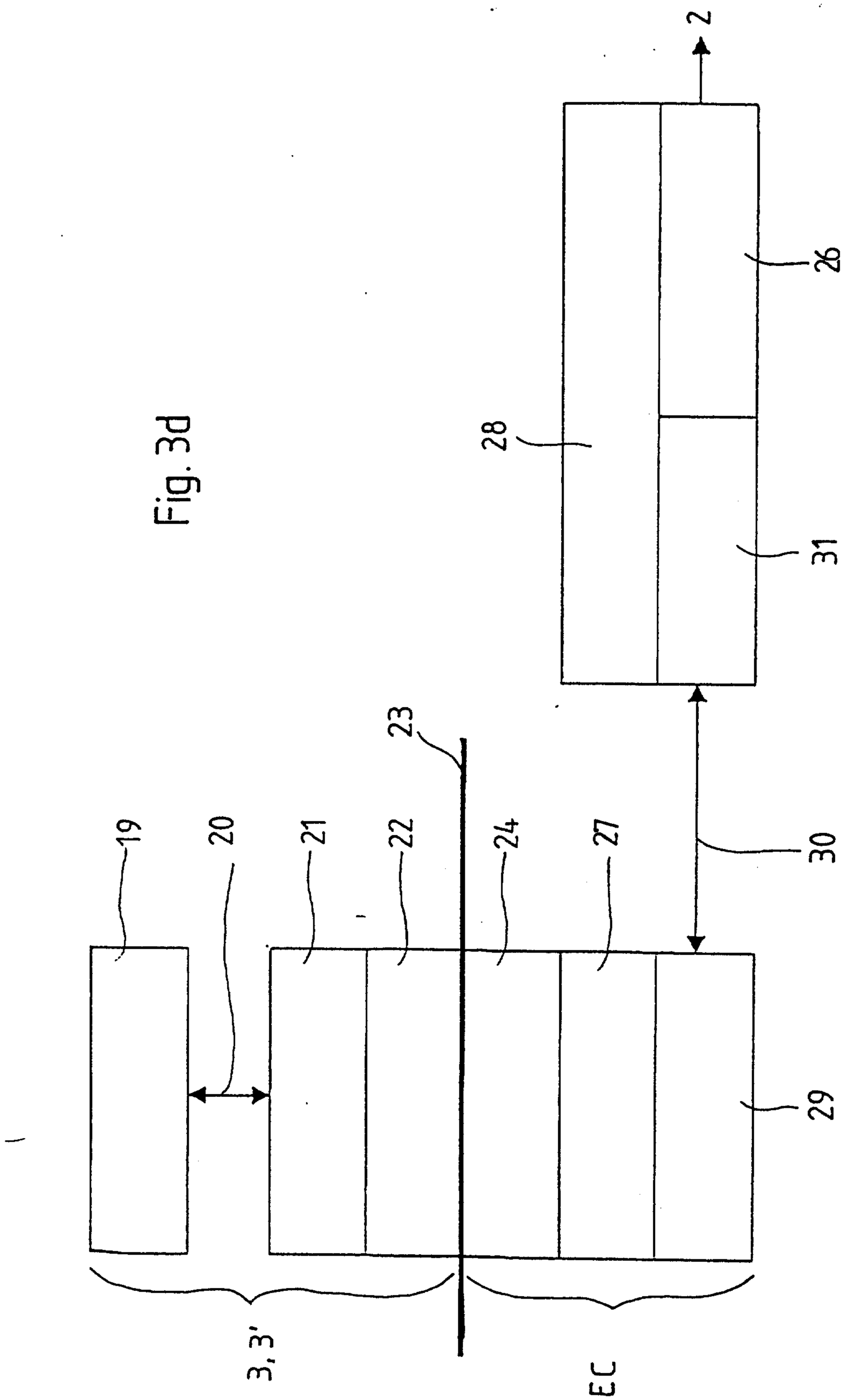


Fig. 3d

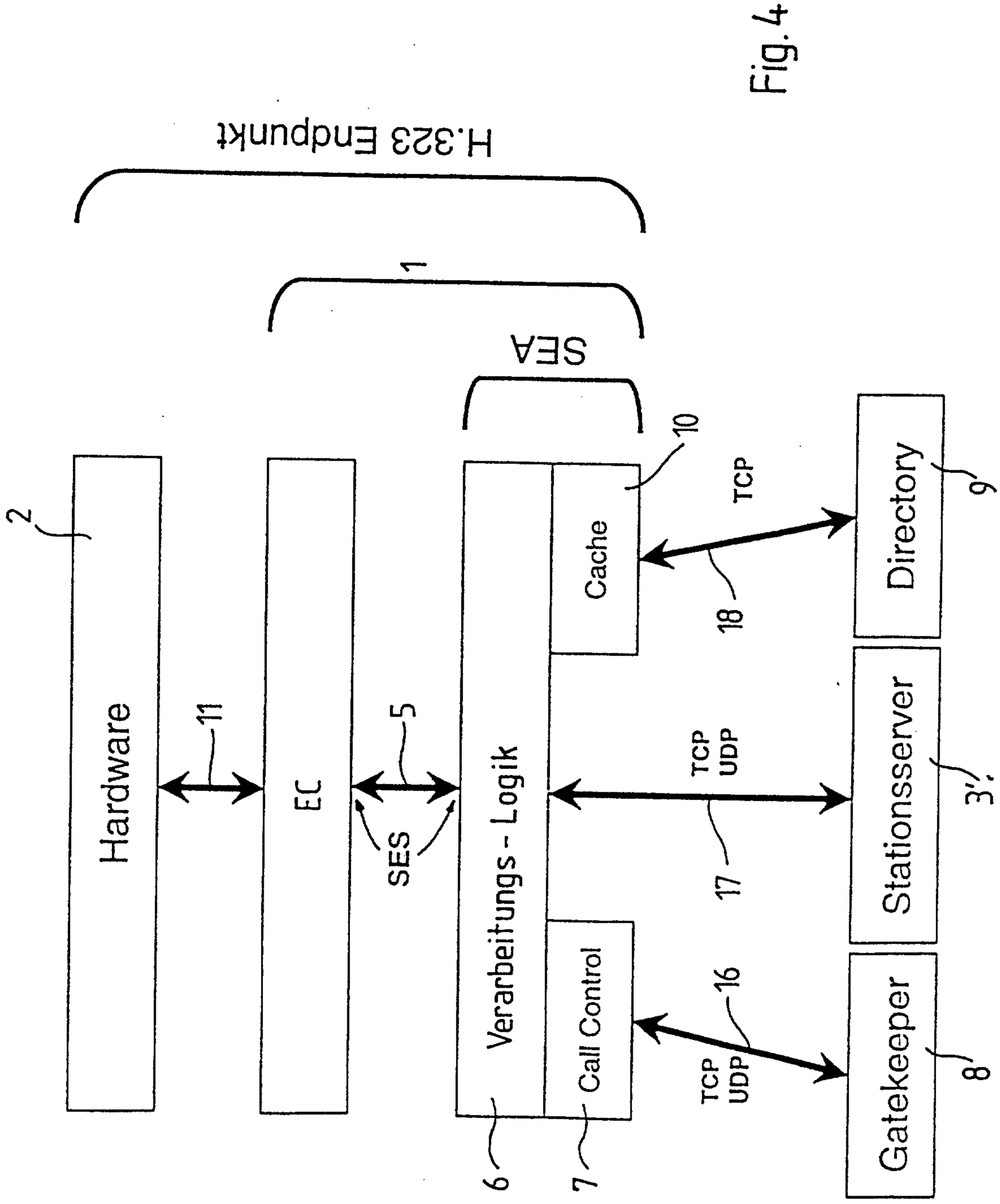

H.323 Endpunkt
RAS
SEA
10
2
Hardware
11
EC
5
SES
Verarbeitungs - Logik
Cache
TCP
18
TCP
UDP
17
Directory
9
Stationsserver
3'
Call Control
16
TCP
UDP
Gatekeeper
8
6
7

Fig. 4

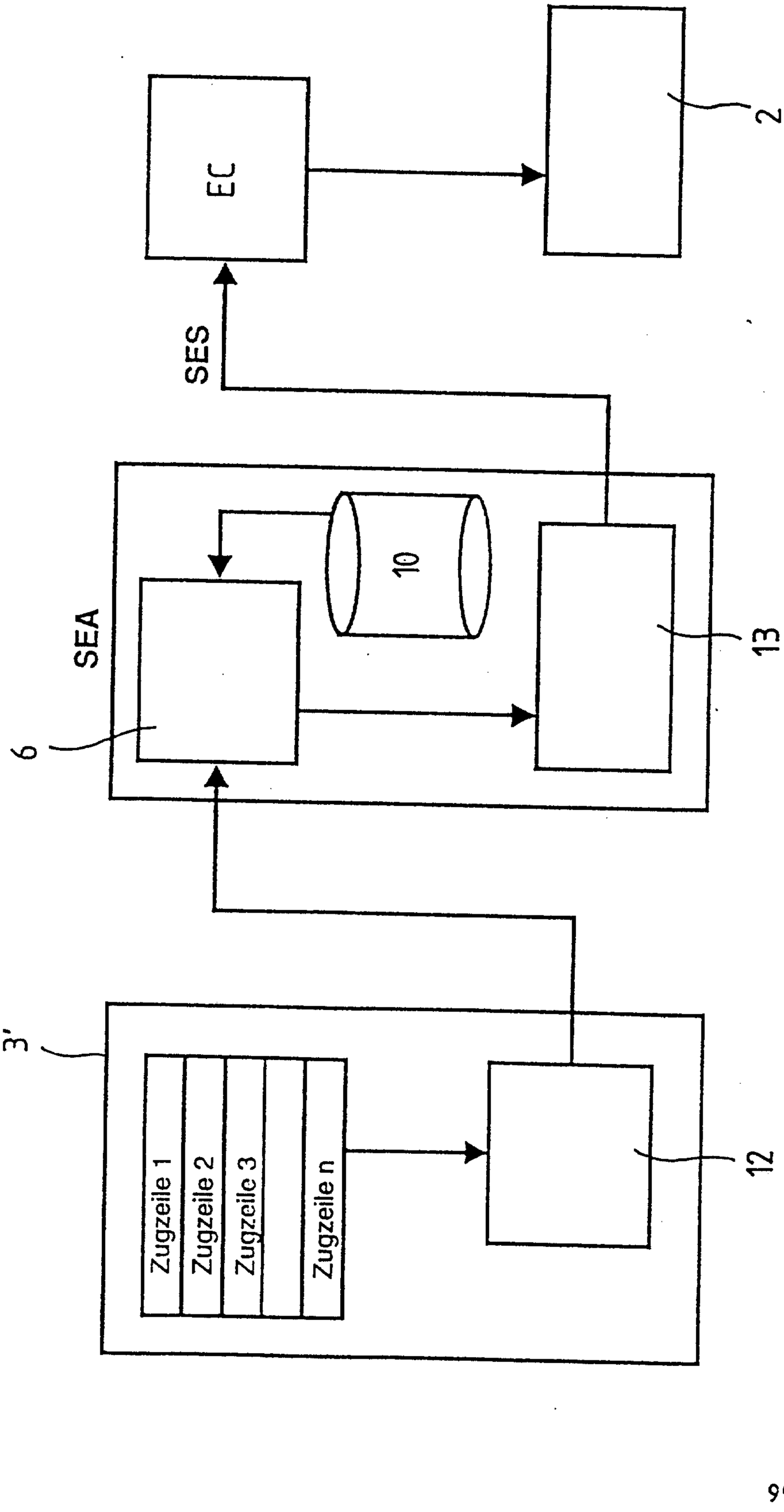

EC
2
SES
SEA
10
13
6
3'
Zugzeile 1
Zugzeile 2
Zugzeile 3
Zugzeile n
12

Fig. 5

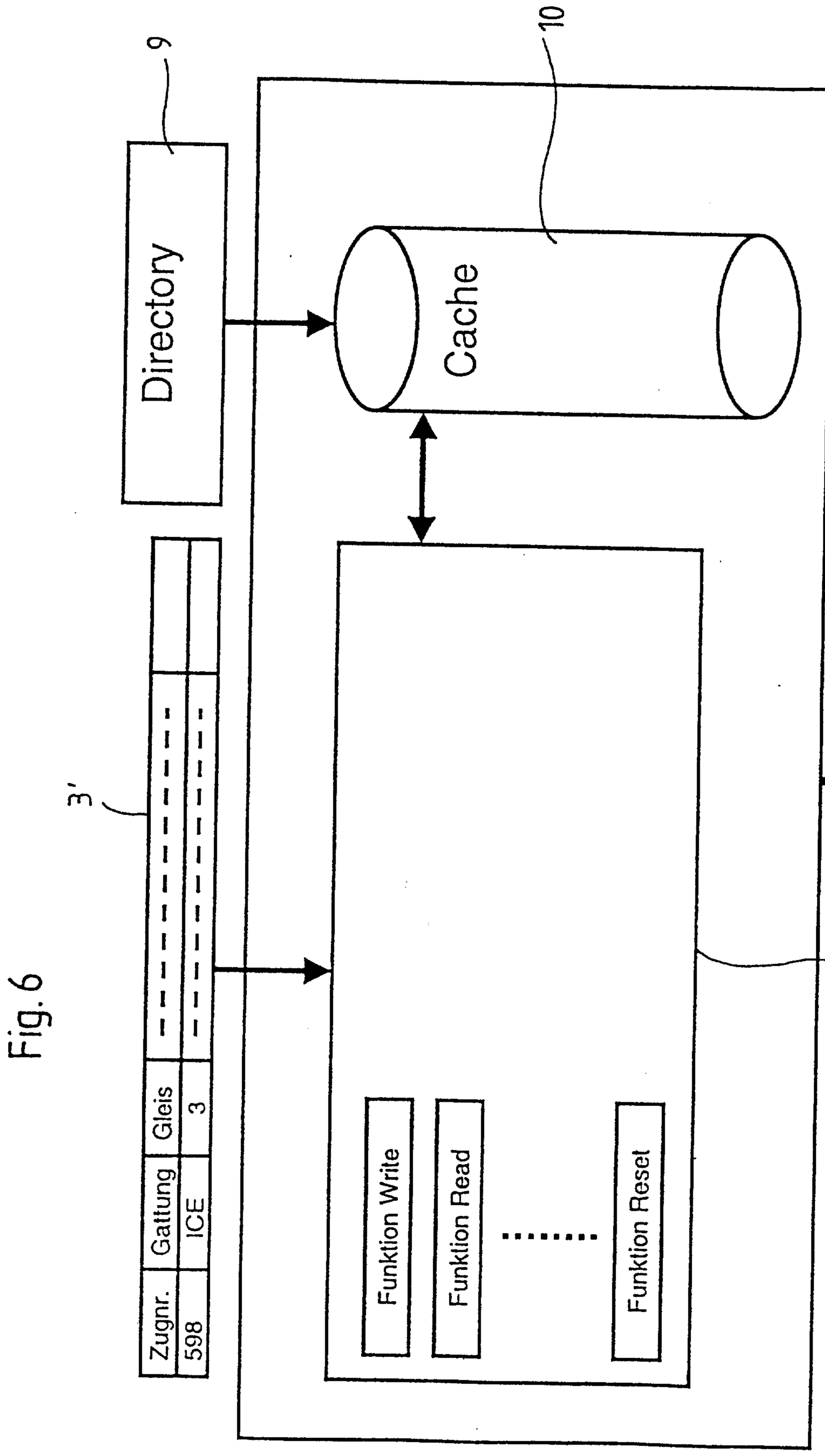

10
9
Directory
Cache
3'
SES
5
6
EC
Funktion Write
Funktion Read
Funktion Reset
Zugnr.
Gattung
Gleis
598
ICE
3

Fig.6

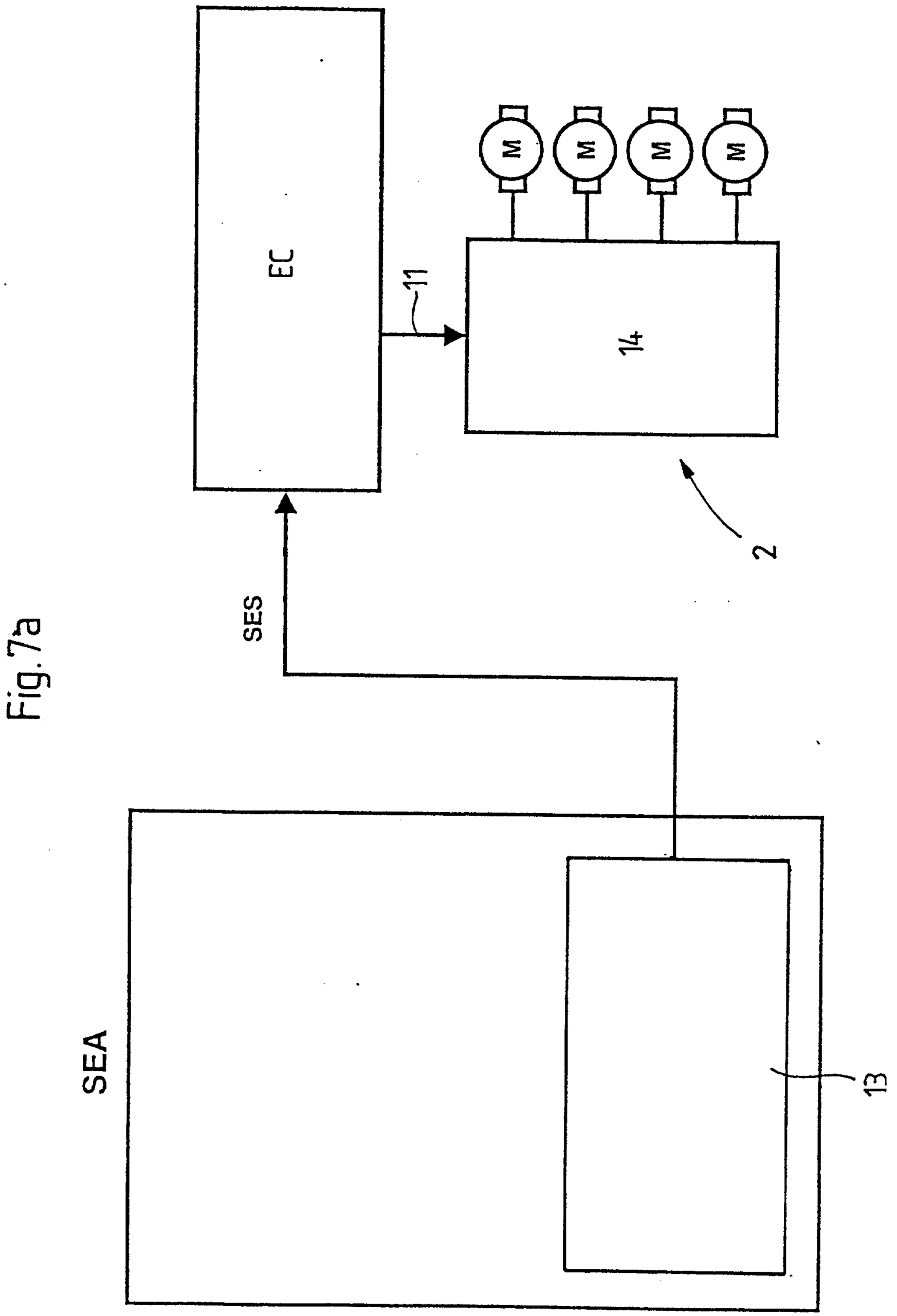


Fig. 7a

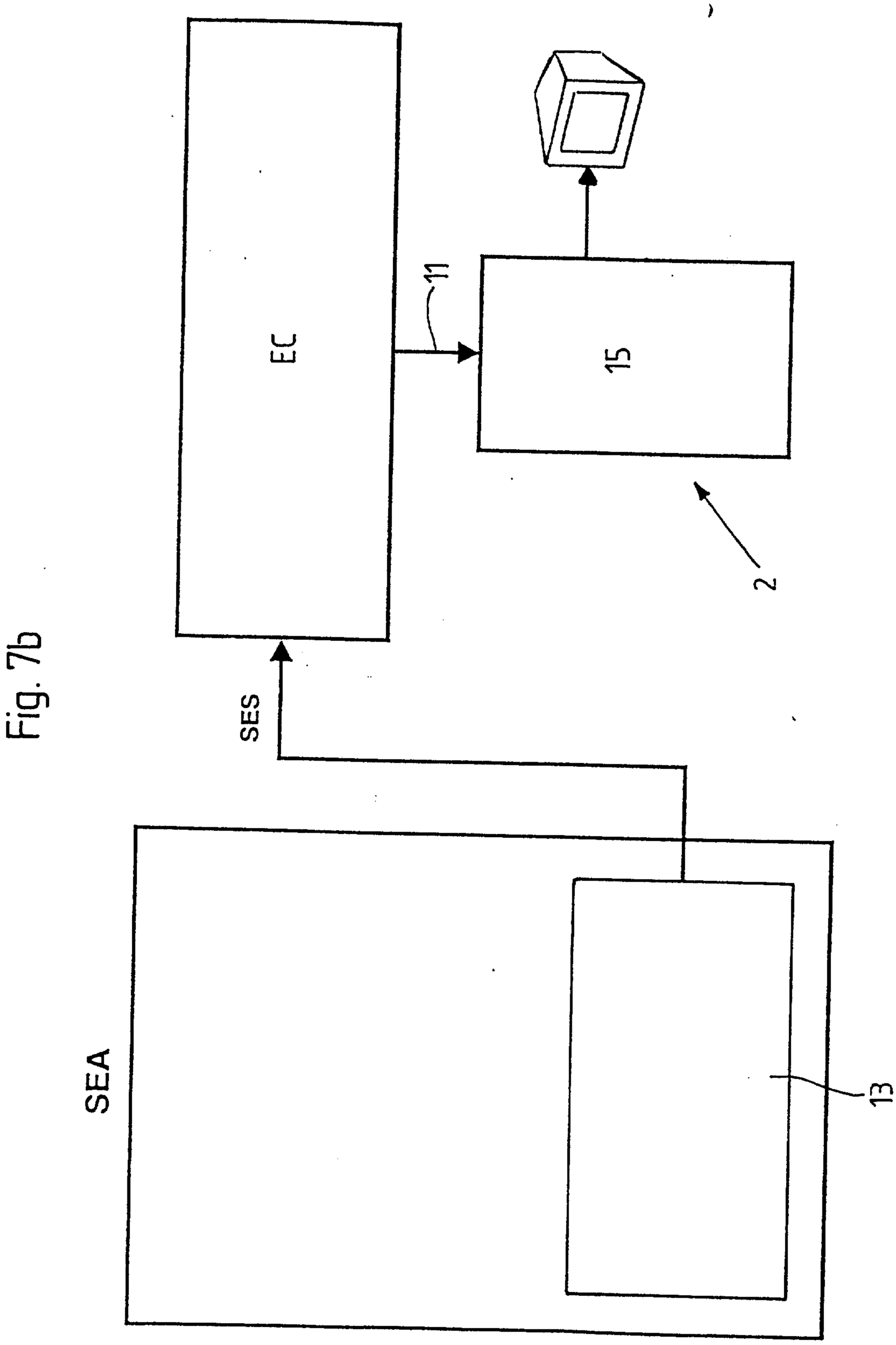
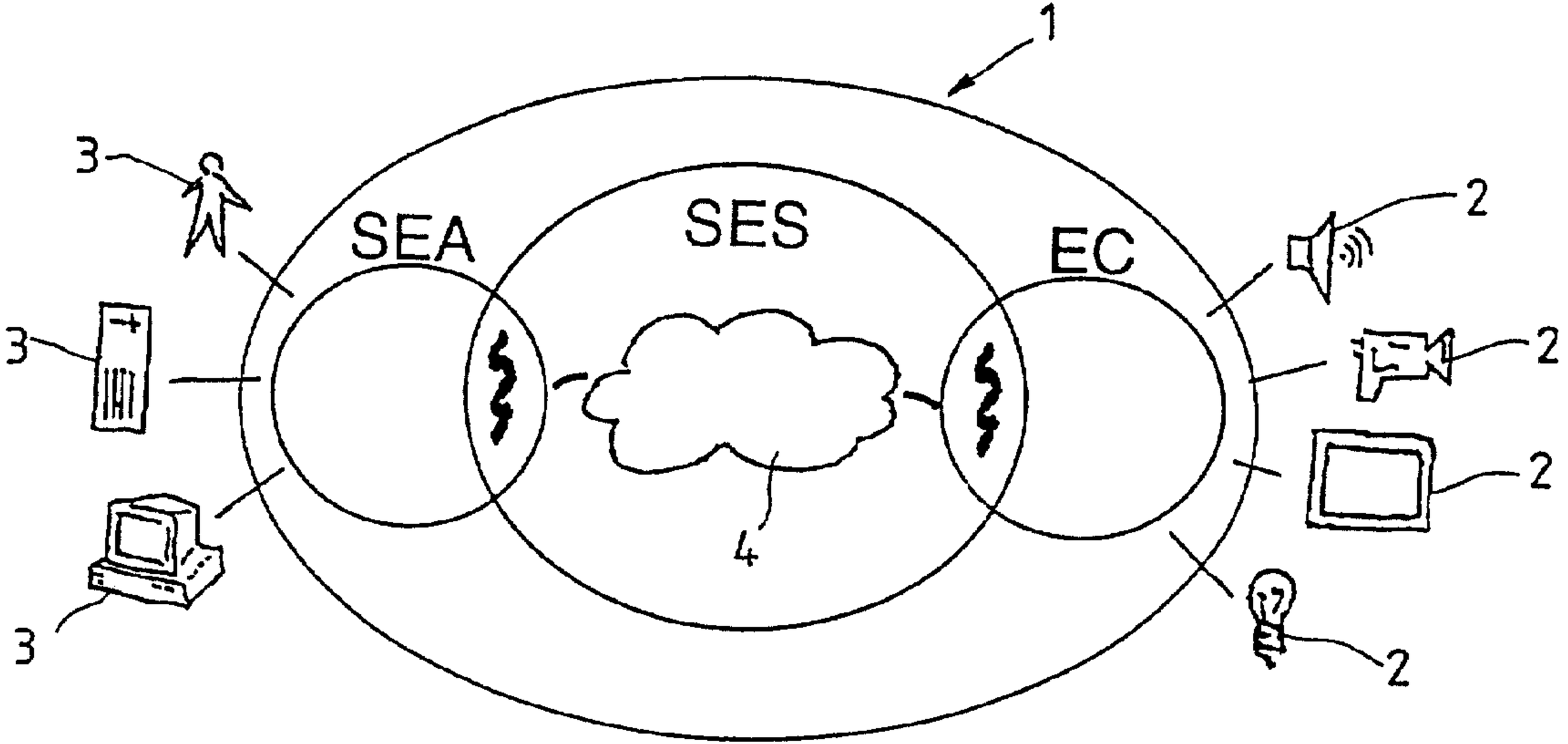


Fig. 7b


1
SEA
SES
EC
2
2
2
2
3
3
3
4