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(54) Method for transmitting signals to a consumer electronics device and intermediate device for this transmission

(57) A method for transmitting signals from a data carrier (31) to at least one consumer electronic device (1) is described. The method is characterized in that a signal from the data carrier (31) is received at an intermediate device (2) via a short-range radio frequency technology (5) and is transmitted from the intermediate device (2) to the at least one consumer electronics device (1) via wireless communication (4). In addition an intermediate device for transmission of signals from a data carrier (31) to a consumer electronics device (1), wherein the intermediate device (2) comprises at least one communication interface (22) for transmitting signals to the consumer electronics device (1) is described. The intermediate device (2) is characterized in that the intermediate device further comprises at least one communication unit (21) for receiving signals from a data carrier (31) via short-range radio frequency transmission (5).

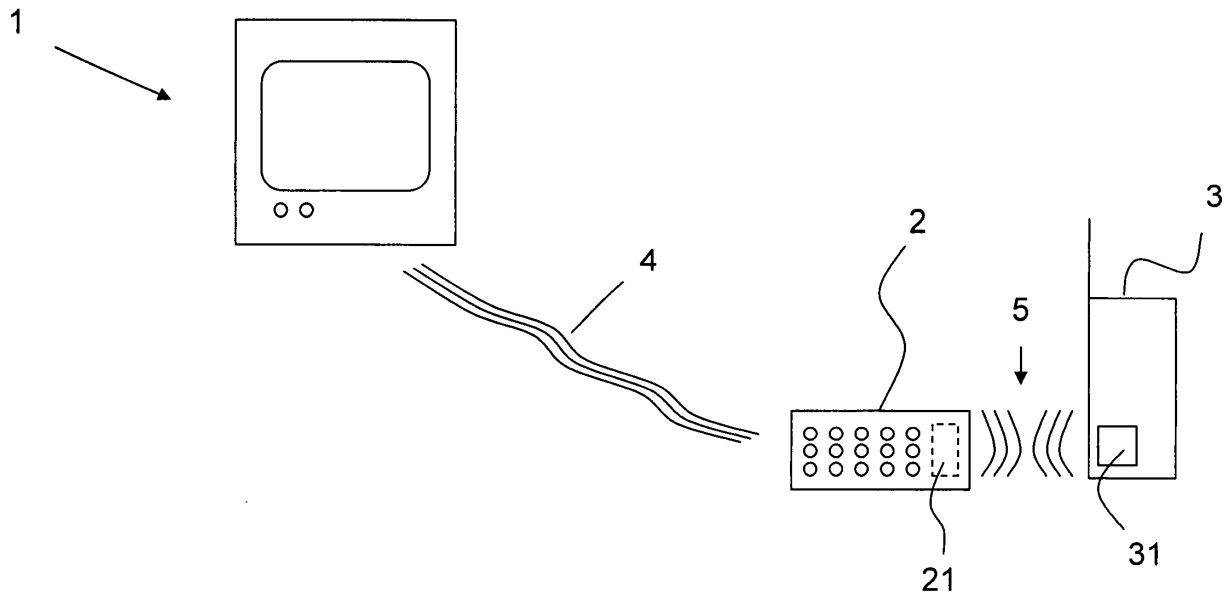

FIG. 1

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Description

[0001] The present invention relates to a method for transmitting signals to a consumer electronics device as well as to an intermediate device for this transmission, in particular a remote control for a consumer electronics device.

[0002] For communication between devices and transmission of signals to devices several standards and technologies are being used. Recently, short-range radio frequency communication is being used more frequently and in various fields. For authentication and identification purposes for example radio frequency identification RFID is used. For establishing peer-to-peer communications between devices, which are in the close vicinity to each other the so called near field communication NFC has been developed, which combines contactless identification or RFID (Radio Frequency Identification) and interconnection technologies. The short distance, which has to be observed for both the near field RFID or the NFC, increases the security of data transmission. In some cases, however, the mandatory short distance to the device may be regarded as being disturbing and inconvenient for the user. In WO 2006/035331 A1 a method and device for near field communication is described. According to the disclosure of that document consumer electronics devices may be equipped with NFC capabilities.

[0003] A user trying to make use of either of the communication technologies RFID or NFC with consumer electronics devices such as a television set or a stereo system, is in general not close to the device, when data, which may be transmitted via short-range radio frequency communication may be required at the device.

[0004] Hence, the user will have to approach the device and provide the data carrier from which the signal is to be transmitted to the consumer electronics device close to the device.

[0005] The problem of the present invention is thus to provide a solution which allows convenient, yet secure transmission of signals to a consumer electronics device.

[0006] The invention is based on the finding that an intermediate device is provided, which can communicate with the consumer electronics device as well as with a data carrier from which signals are to be transmitted to the consumer electronics device and which is separate from the consumer electronics device and thus can be places close to the user.

[0007] According to a first aspect, the problem underlying the present invention is solved by a method for transmitting signals from a data carrier to at least one consumer electronics device. The method is characterized in that a signal from the data carrier is received at an intermediate device by a short-range radio frequency technology and is transmitted from the intermediate device to the at least one consumer electronics device via wireless communication.

[0008] The consumer electronic device may be a television set or a stereo system as well as other entertainment devices. For operation of such consumer electronics devices input, such as control information or data relating to media or the user is necessary at the consumer electronics device. The necessary information or data may be provided to the consumer electronics device from a data carrier. Such a data carrier can be a storage device, preferably in the form of a memory card or an identification card. It is, however, also possible to use other data carriers, such as CDs or DVDs with the present invention. According to the inventive method a signal indicative of or transmitting the actual data or information is received from the data carrier at an intermediate device. The transmission from the data carrier to the intermediate device is performed via a short-range radio frequency technology. The usage of a short-range radio frequency technology allows for increased security in data and information transmission and can also be affected with low energy consumption. From the intermediate device the data or information is transmitted via a signal from the intermediate device to the consumer electronics device via a wireless communication. By using wireless communication such as infrared or radio transmission, the relative position of the intermediate device to the consumer electronics device is not limited to a short distance, which would be required for short-range radio frequency technologies, such as NFC or RFID. Thereby the intermediate device can be placed at a position convenient for the user of the electronics device. Hence, a short distance between the intermediate device and the user holding the data carrier can be realized. Over such a short distance the signal transmission from the data carrier to the intermediate device via short-range radio frequency technology can be employed.

[0009] The interposition of an intermediate device between a consumer electronics device and a data carrier thus increases the flexibility of the user to transmit data and information from the data carrier to the consumer electronics device. The intermediate device may be a set box or a hand-held device, such as a remote control for the consumer electronics device. In particular, the latter device, i.e. the remote control, in general is in the vicinity of the user currently using the consumer electronics device. A data or information transmission from a data carrier held by the user to the intermediate device can thus be performed via short-range radio frequency technology without necessitating the user to change his position.

[0010] According to one embodiment the short-range radio frequency technology is a radio frequency identification (RFID) transmission. In this case, the data carrier will be a RFID tag. The intermediate device according to this embodiment will comprise a RFID reader. The RFID tag may be passive or active. The RFID tag may be inserted or installed in a different device of the user, such as the mobile phone of the user. On the RFID tag in particular identification and authentication information of the user may be stored. By reading this information from the RFID tag via the RFID reader in the intermediate device, a user may authenticate himself towards the consumer

electronics device or an application performed on the consumer electronics device. The authentication or identification information obtained from the RFID tag at the intermediate device will be transmitted to the consumer electronics device via radio transmission or via infrared transmission.

[0011] According to a further embodiment the short-range radio frequency technology may be a communication according to the NFC standards. Also in this case the data carrier may be of the active or passive kind. The data carrier, which will function as the target of the NFC communication may be included in a different device. For example the NFC target may be inserted or installed in a mobile phone of the user. The NFC reader will be integrated within the intermediate device. For passive NFC targets, the reader within the intermediate device can be activated to emit a short-range radio signal that powers up a microchip on the target. Thereby data stored on the target can be transmitted. The NFC communication may also be used to connect a device holding the data carrier, i.e. the NFC target, to the intermediate device. In that case the two devices can be interconnected, via for example BlueTooth, and transmission to the intermediate device and ultimately to the consumer electronics device will be possible. The data read from the NFC target may include additional information over mere identification and authentication data. The data carrier may for example have the media to be rendered at the consumer electronics device stored.

[0012] According to one embodiment the intermediate device generates the field for transmission of signals from the data carrier. In this case the tag or target used as the data carrier may be passive. This embodiment is beneficial as the tag may be of simple structure and for example inserted into a device such as a mobile terminal, e.g. mobile phone.

[0013] Preferably, the intermediate device processes the signal received from the data carrier for transmission to the consumer electronics device. Such a processing may include authentication of a user based on authentication information received via the short-range radio frequency communication from the data carrier. In this embodiment for example a RFID tag may be included or inserted within a mobile terminal, e.g. mobile phone. If this terminal is brought into the close vicinity of the intermediate device, user information, in particular authentication information may be transmitted to the intermediate device. If the authentication information does not comply with security rules stored at the intermediate device, no further transmission of the received data to the consumer electronics device will be performed. The authentication process may alternatively be performed at the consumer electronics device.

[0014] In addition or alternatively to an authentication progress within the intermediate device, the processing of the signal at the intermediate device may also be performed, so that the signal will be suitable for the transmission technology or communication used between the intermediate device and the consumer electronics device. In particular, frequency changes may be necessary in order to use radio transmission from the intermediate device to the consumer electronics device.

[0015] In a preferred embodiment the wireless communication between the intermediate device and the computer electronics device is also used for transmission of control signals to the consumer electronics device. Such control signals may originate from the data carrier or from control logic implemented within the intermediate device. In the latter case, the intermediate device may for example be a remote control for the consumer electronics device.

[0016] According to a further aspect, the present invention relates to an intermediate device for transmission of signals from a data carrier to a consumer electronics device. The intermediate device comprises at least one communication interface for transmitting signals to the consumer electronics device. The intermediate device further comprises at least one communication unit for receiving signals from a data carrier via short-range radio frequency transmission.

[0017] According to one embodiment the intermediate device comprises a processing unit for converting signals received at the communication unit to signals for transmission via the communication interface. The communication unit can be a radio frequency identification reader or a near field communication initiator.

[0018] Preferably, the intermediate device is a remote control for a consumer electronics device.

[0019] Features and advantages which are described with respect to the inventive method also apply to the intermediate device, where appropriate, and vice versa.

[0020] The present invention will now be explained again with reference to the enclosed figures, wherein

Figure 1 shows a setup, wherein the inventive method can be used; and

Figure 2 shows a schematic view of the individual units of one embodiment of the intermediate device.

[0021] In Figure 1, a consumer electronics device is depicted as a television set 1. A remote control 2 acting as an intermediate device is provided for controlling the television 1. In addition, a mobile terminal 3 is shown, wherein a data carrier 31 is inserted. The remote control 2 comprises a communication unit, which can be realized as an RFID or an NFC reader 21. The remote control 2 communicates with the television 1 via a radio transmission channel 4. The communication between the remote control 2 and the mobile telephone 3 is performed via a short-range radio frequency communication 5.

[0022] If an application run at the television 1 requires information or data, for example information or data on the user of the remote control 2 and the mobile phone 3, a respective request may be displayed on the display of the television 1. Alternatively, such a request may be

transmitted to the remote control 2 for display on a respective display means of the remote control 2. The display means are not shown in Figure 1. The required data or information may specifically be authentication information or data. Such data is normally stored on data carriers and is not available to the user for manual input via the remote control 2. For example, a user identification code may be stored on the data carrier 31 within the mobile phone 3. Upon receipt of the specific request for information at the remote control 2 or after initiation of a respective request by the user on the remote control 2, a communication channel between the communication unit 21 and the data carrier 31 may be established. This communication may be initiated by powering an antenna provided within the communication unit 21. A magnetic field generated by this antenna will provide sufficient power to the data carrier 31 for transmission of data stored thereon. The data may specifically be the user identification code. Upon receipt of the user identification code at the remote control 2 the code may be transmitted to the television 1. If the user identification code matches a preset value or a preset authentication rule at the television 1, the application run on the television 1 may be performed further. If, however, the user identification is found to be different from the expected value, the application on the television 1 may be stopped.

[0023] As the remote control 2 is not attached to the television 1 by wire or other physical means, it can be positioned in a place close to the user. As other control functions, such as power on/power off are performed via the remote control 2 the user will have this device close to him when using the television 1. The communication unit 21 or reader is therefore also close to the user. It will therefore be easy for the user to identify himself towards an application run on the television 1. This authentication can be performed by merely bringing the mobile phone 3 close to the remote control 2.

[0024] As many mobile phones 3 are already equipped with identification means such as data carriers, which are RFID-enabled, no changes have to be done to the mobile terminal 3 in order to use the data carrier 31 provided therein for the inventive method.

[0025] According to a second embodiment of the present invention, the communication between the data carrier 31 and the reader 21 may be NFC based. In this embodiment it is also possible to use a different device other than a remote control as an intermediate device. Once an NFC connection is established between the mobile telephone 3 and the remote control 2 or other intermediate device, data stored on the mobile telephone 3 may be transmitted via the remote control 2 or intermediate device to the television 1. If a user for example downloaded a video from the internet, it may be stored on memory means of the mobile telephone 3. Via the NFC communication connection to the intermediate device or remote control 2, this data may be transmitted and ultimately be received at the television 1 for display. In this case the request for data will not be generated by an application run on the television.

[0026] In Figure 2, one embodiment of the inventive intermediate device 2 is shown. The intermediate device 2 comprises a communication unit 21 as well as a communication interface 22. Interposed in between the communication unit 21 and the communication interface 22 a processing unit 23 is provided.

[0027] The communication unit 21 may be a radio frequency identification reader or a near field communication initiator. The communication interface 22 may be a radio frequency transmission unit or an infrared transmission unit.

[0028] The signal or data received by the communication unit 21 may be forwarded to the processing unit 23. In the processing unit 23 the received data or signal can be transformed to comply with transmission requirements for transmission via the communication interface 22. In addition or alternatively the processing unit 23 may execute authentication verification steps, wherein authentication rules are verified with authentication data received from the communication unit 21. If no compliance with the authentication rules is determined, the transmission of the data or signals to the communication interface 22 may be interrupted.

[0029] Even though the present invention has been described in detail with respect to an intermediate device represented by a remote control for a consumer electronics device, the invention is not limited to this embodiment. Rather, the intermediate device may also be represented by a processing unit, which can establish a wireless communication to the consumer electronics device. The control of the consumer electronics device via the intermediate device is hence not mandatory.

[0030] In the present invention an intermediate device is provided to function as a relay station for signals received from a data carrier such as an RFID tag or an NFC target and hence makes the operation of a consumer electronics device comfortable for the user even if data from external data carriers is required at the consumer electronics device.

Claims

1. Method for transmitting signals from a data carrier (31) to at least one consumer electronic device (1), **characterized in that** a signal from the data carrier (31) is received at an intermediate device (2) via a short-range radio frequency technology (5) and is transmitted from the intermediate device (2) to the at least one consumer electronics device (1) via wireless communication (4).

2. Method according to claim 1, **characterized in that** the short-range radio frequency technology (5) is a radio frequency identification (RFID) transmission or a near field communication (NFC).

3. Method according to claim 1 or 2, **characterized in that** the intermediate device (2) generates the field for transmission of signals from the data carrier (31).

4. Method according to anyone of claims 1 to 3, **characterized in that** the intermediate device (2) processes the signal received from the data carrier (31) for transmission to the consumer electronics device (1).

5. Method according to anyone of claims 1 to 4, **characterized in that** the wireless communication (4) between the intermediate device (2) and the consumer electronics device (1) uses IR- or radio-transmission.

6. Method according to anyone of claims 1 to 5, **characterized in that** the intermediate device (2) uses the wireless communication (4) also for transmitting control signals to the consumer electronics device (1).

7. Method according to anyone of claims 1 to 6, **characterized in that** the data carrier (31) is a radio frequency identification (RFID) tag or a near field communication (NFC) target and is preferably included in a mobile communication device (3), in particular a mobile phone or a personal digital assistant (PDA).

8. Intermediate device for transmission of signals from a data carrier (31) to a consumer electronics device (1), wherein the intermediate device (2) comprises at least one communication interface (22) for transmitting signals to the consumer electronics device (1), **characterized in that** the intermediate device further comprises at least one communication unit (21) for receiving signals from a data carrier (31) via short-range radio frequency transmission (5).

9. Intermediate device according to claim 8, **characterized in that** the intermediate device (2) comprises a processing unit (23) for converting signals received at the communication unit (21) to signals for transmission via the communication interface (22).

10. Intermediate device according to claims 8 or 9, **characterized in that** the communication unit (21) is a radio frequency identification (RFID) reader or a near field communication (NFC) initiator.

11. Intermediate device according to claims 8 to 10, **characterized in that** the intermediate device (2) is a remote control for the consumer electronics device (1).

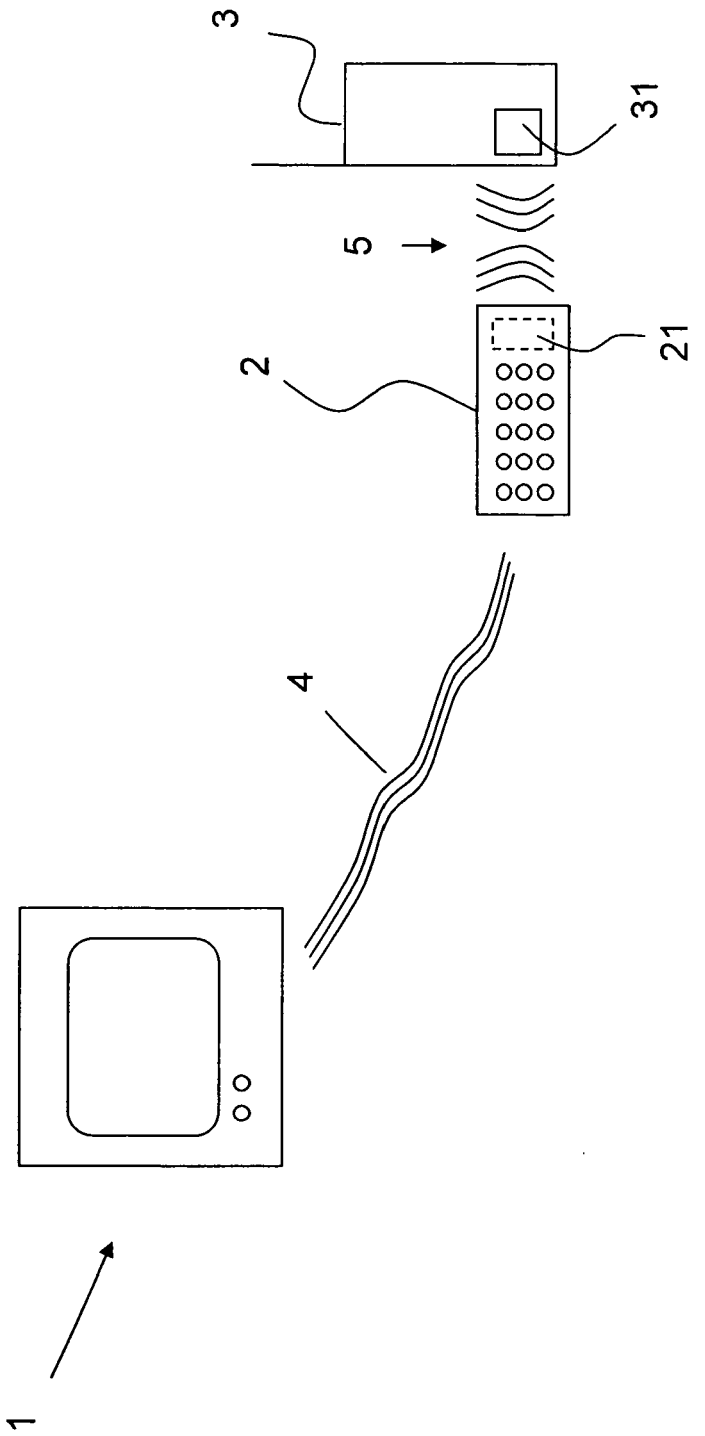
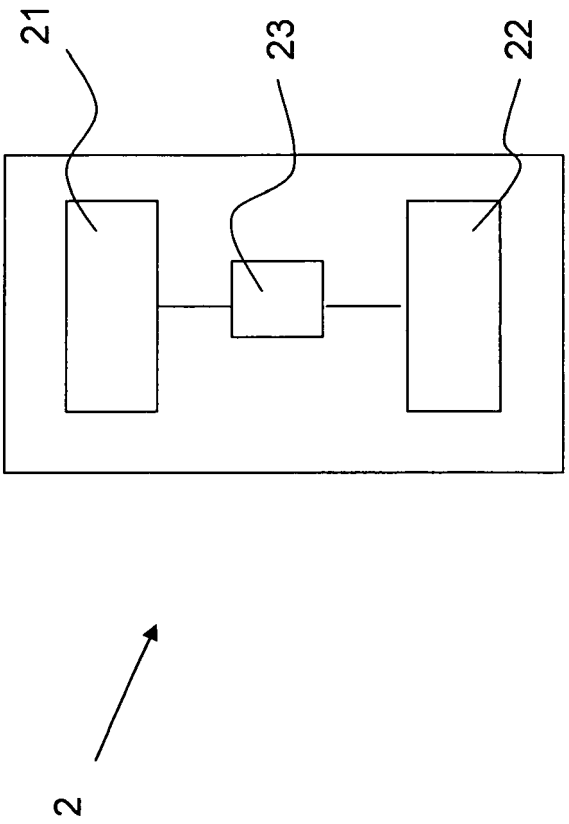


FIG. 1

FIG. 2



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EUROPEAN SEARCH REPORT

Application Number
EP 07 00 3127

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y	US 2005/246738 A1 (LOCKETT DAVID [US] ET AL) 3 November 2005 (2005-11-03) * paragraph [0175] - paragraph [0182] * * paragraph [0188] * * paragraph [0191] * -----	1,2,4-11 3	INV. G08C17/02
Y	US 7 116 229 B1 (MIRAMONTES OSCAR [US]) 3 October 2006 (2006-10-03) * column 3, line 45 - column 4, line 16 * * column 4, line 57 - column 5, line 16 * * column 6, line 8 - line 24 * -----	3	

TECHNICAL FIELDS SEARCHED (IPC)

G08C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	22 June 2007	Pham, Phong

CATEGORY OF CITED DOCUMENTS

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US 7116229 B1	03-10-2006	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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Patent documents cited in the description

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