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(54) **Remote control system and a related mobile user terminal**

(57) The present invention relates to a remote control system for controlling a controllable application of a plurality of controllable applications by means of a mobile user terminal. The mobile user terminal uses a specific code set of instructions for controlling each controllable application of said plurality of controllable applications. Each controllable application of said plurality of controllable applications is associated with a tag having a unique tag-identifier.

The mobile user terminal is adapted to read the tag-identifier of the tag associated with a controllable application over a communications interface and a code set control part is adapted to provide the mobile user terminal with a code-set of instructions for controlling said controllable application based on the tag-identifier of the tag that is associated with the controllable application.
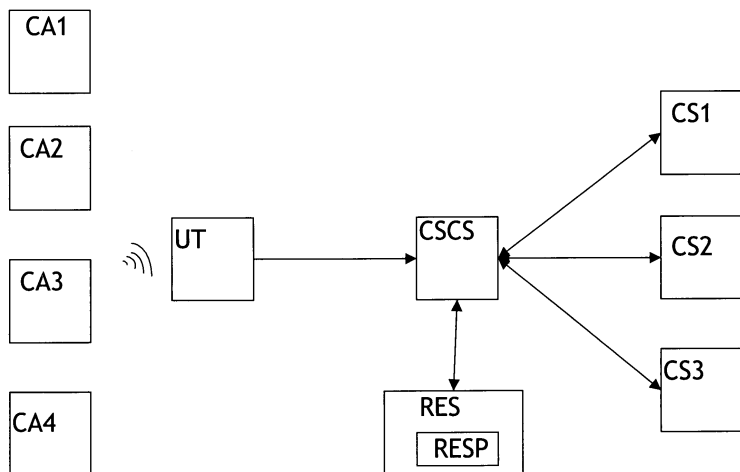
FIG.1

EP 2 073 183 A1

Description

[0001] The present invention relates to a Remote control system according to the preamble of claim 1 and a mobile user terminal according to the preamble of claim 4.

[0002] Such a Remote control system and a mobile user terminal is already known in the art, e.g. from "US patent US 2007/0050054". Therein, a Remote control system, for controlling a controllable application of a plurality of controllable applications such as a TV, a DVD player, a home theater and a set-top box by means of a mobile user terminal is disclosed. This mobile user terminal using a dedicated virtual remote control, called a specific code set of instructions, for controlling such a controllable application, of the plurality of controllable applications. Such a virtual remote control can be downloaded through a computer based down loading process, for instance via a website providing with all kinds of possible dedicated virtual remote controls, referred to as specific code set of instructions.

[0003] A disadvantage is that the specific code set of instructions dedicated to a specific application such as a home theater of a specific brand and type specifically needs to be searched for. A lot of variations in such code sets exists, namely for each brand and type of device a dedicated separate specific code set of instructions is required. Hence it is quite awkward to find the right code set for the device to be controlled and subsequently retrieve this code set.

[0004] Furthermore, due to the fact that programming a universal remote can be a fairly complex procedure, it is most often performed by technically minded individuals, although non-technical users can often operate the remote after it has been programmed.

[0005] An object of the present invention is to provide a Remote control system of the above known type but wherein the retrieval and installation of a new code set is less complex and more user-friendly.

[0006] According to the invention, this object is achieved by the remote control system according to claim 1, the mobile user terminal according to claim 4 and the code set control server according to claim 6.

[0007] Indeed, by associating a tag having a unique tag-identifier to each controllable application of a plurality of controllable applications, reading such a tag-identifier of the tag associated with the controllable application to be controlled over a communications interface of a mobile user terminal and subsequently a code set control server providing the mobile user terminal with a code-set of instructions for controlling the controllable application of the plurality of controllable applications based on the tag-identifier that is associated with the controllable application.

[0008] Another characterizing feature of the present invention is described in claim 2, claim 7 and claim 8.

[0009] The remote control system further comprises a resolution part that is adapted to resolve a network location of associated specific code set associated to the tag-

identifier of the tag associated to the controllable application that is subject to control. Hence the resolution part determines based on the tag-identifier of the tag associated to the subject controllable application, the location in the network where the code set of instructions is stored. For instance the tag-identifier can be looked up in a table that contains a list of tag identifiers with associated network locations. A network location may be expressed in a Unified Resources Locator, further referred to as URL.

[0010] A further characterizing feature of the present invention is described in claim 3.

[0011] The Remote control system further comprises a code set retrieving part adapted to retrieve the code set from a network element CS1, CS2, CS3 in the internet identified by the unique network location of associated specific code set.

[0012] Such a network location for instance may be identified with a URL.

[0013] A further characterizing feature of the present invention is described in claim 5.

[0014] The mobile user terminal further may comprise a control interface, which is adapted to send control signals towards the controllable device based on the code-set of instructions over a second communications interface. The control interface may be an infrared, Bluetooth or any other short range communications interface. Hence the control signals defined in the code set of instructions may be sent over this infrared -, Bluetooth or other short range interface from the mobile user terminal towards the subject controllable device.

[0015] Further characterizing embodiments of the present Remote control system and a mobile user terminal are mentioned in the appended claims.

[0016] It is to be noticed that the term 'comprising', used in the claims, should not be interpreted as being restricted to the means listed thereafter. Thus, the scope of the expression 'a device comprising means A and B' should not be limited to devices consisting only of components A and B. It means that with respect to the present invention, the only relevant components of the device are A and B.

[0017] Similarly, it is to be noticed that the term 'coupled', also used in the claims, should not be interpreted as being restricted to direct connections only. Thus, the scope of the expression 'a device A coupled to a device B' should not be limited to devices or systems wherein an output of device A is directly connected to an input of device B. It means that there exists a path between an output of A and an input of B which may be a path including other devices or means.

[0018] The above and other objects and features of the invention will become more apparent and the invention itself will be best understood by referring to the following description of an embodiment taken in conjunction with the accompanying drawings wherein:

Fig. 1 represents a Remote control system according to the present invention.

[0019] In the following paragraphs, referring to the drawing, a remote control system will be described wherein an implementation of the method according to the present invention is executed.

[0020] In the first paragraph the elements of the network in the figure are described, in the second paragraph, the interconnections between all before described Network elements are defined and in a later paragraph the actual execution o the present invention, i.e. the remote control of a controllable application in a Remote control system will be described.

[0021] First the Remote control system comprises a plurality of controllable applications CA1, CA2, CA3, CA4 which for instance respectively may be a Television, a home theater, a set top box and a media system. Each of the controllable applications of the plurality of controllable applications CA1, CA2, CA3, CA4 is associated with a tag having a unique tag-identifier.

[0022] Further the system comprises a mobile user terminal UT having a near field communications interface, such as RFID for reading a tag-identifier associated to a tag, a control communications interface for exchanging control signals with a controllable application such as an infrared control interface. Alternatively any other short range interface such as Bluetooth, WiFi, ZigBee or DSRC may be applied. Furthermore the mobile user terminal may either have or not have a touch screen for flexibly displaying all control options of the subject controllable device and enabling the user for to control the controllable device via the existing user interface of the mobile user terminal UT.

[0023] The system further comprises a code set control part CSCP that is , adapted to provide the mobile user terminal UT with a code-set of instructions for controlling a controllable application of the plurality of controllable applications CA1, CA2, CA3, CA4 based on the tag-identifier of the tag being associated with the controllable application, for instance controllable application CA1.

[0024] The remote control system further comprises a resolution part that is adapted to resolve a network location of associated specific code set associated to the tag-identifier.

[0025] The remote control system additionally may comprise a code set retrieving part that is adapted to retrieve the code set from a network element in the internet identified by the network location of associated specific code set. The code set may be stored in a table in the network where the table contains unique combinations of tag-identifier associated with a code set.

[0026] The mobile user terminal UT is coupled to the controllable application over application over a (near field) communications interface, such as NFC, EPC or any other contact less communication interface, for reading a tag-identifier of a tag associated with a controllable application. Furthermore, the mobile user terminal is coupled to any of the controllable applications over a near field communications interface such as infrared, Bluetooth, WiFi, ZigBee or DSRC.

[0027] The mobile user terminal UT is coupled to the code set control server CSCS over a mobile communication interface such as GSM, CDMA a mobile data connection such as GPRS, GPRS edge or UMTS.

[0028] The code set control servers CSCS further is coupled to a plurality of code set servers CS1, CS2, CS3 over a Web Service, further referred to as WS.

[0029] Additionally the code set control server CSCS is coupled over a WS to a resolution server RES.

[0030] In order to explain the present invention it is assumed that a user possess amongst others a certain type of TV and a home theatre with DVD player. The user wants to control his TV and DVD-player by using his RFID enabled mobile phone instead of using the TV remote controller.

[0031] The user first intends to switch on his television. Thereto he touches with his mobile user device, being for instance a PDA, a smart-phone, a PSP or other mobile user device. The tag reading device in this case an RFID tag-reader incorporated in the smart-phone UT, at touching the tag associated to the television with the tag-reader of the smart-phone the tag-identifier, i.e. the RFID-identifier is read by the smart-phone UT. When the RFID enabled mobile handheld touches the TV, a question pops up on the mobile screen, "do you want to control this TV by the mobile handheld?" After pressing "yes", the retrieved RFID is sent to the code set control server CSCS together with the mobile ID of the smart-phone UT.

[0032] The code set control server CSCS first resolves the RFID into an identification controllable application (in this case it should be the TV of brand Y and Type X), and then optionally consults an Authentication server to check whether that the mobile handheld is permitted to control this TV. Subsequently, the code set control server CSCS provides the mobile user terminal UT, i.e. the smart-phone with a code-set of instructions for controlling the controllable application CA1, i.e. the television based on the tag-identifier of the tag being associated with the television CA1.

[0033] The resolving of the tag-identifier, RFID may also be dealt with by a the Resolution server RES where the resolution server comprises a resolution part RESP that is adapted to resolve a network location of associated specific code set associated to the tag-identifier. Hence by using the tag-identifier of the television as a reference for looking up this tag-identifier in a table containing a list of tag-identifiers associated with network locations expressed in URL's, the exact location of the code set of instructions corresponding to controllable application CA1 can be determined. The resolution part then looks up the tag-identifier of the television in the table and finds a URL that identifies the location of code set instruction of the television CA1. The code set control server CSCS then by means of the code set retrieving part retrieves the code set from a network element in the internet identified by said network location of associated specific code set, i.e. the URL determined by the resolution part which for instance is code set server CS2.

[0034] Alternatively the code set control server may also contain a table of tag-identifiers with associated instruction code sets.

[0035] Then the code set control server CSCS sends the code set back to the RFID enabled mobile user terminal UT. The control application of the mobile user terminal UT then is able to control the television CA1 using the code-set of instructions obtained from a Code set control server CSCS. The display of the smart phone UT is used to display all or part of the control options of the television so that the user can choose and select the desired control option via corresponding keys of the keyboard or soft keys as displayed on a touch screen. The corresponding selected control signal is sent towards the television over the second control interface, for instance the commonly used Infrared control interface. The retrieved code set of instructions for controlling the Television may depending on the memory of the mobile user terminal UT either be stored on the device or not in case of no or little memory capabilities.

[0036] For subsequently controlling the DVD player CA2 another code set of instructions is required and hence the corresponding code set of instruction is to be retrieved in the same way as for the code set of the television CA1. After touching the associated tag of the DVD player CA2 the corresponding tag-identifier is read from the tag over a near field communications interface. Subsequently the tag-identifier of the DVD player CA2 together with the mobile id is sent towards the code set control part CSCP of the code set control server CSCS that provides the smart phone UT with a code-set of instructions for controlling the DVD-player CA2 based on said tag-identifier of said tag being associated with the DVD -player CA2.

[0037] Either the code set control server CSCS retrieves the code set of instructions from a table containing a plurality of tag-identifiers where each tag identifier is associated with a code set of instructions or the resolution part RESP incorporated in the code set server CSCS resolve the network location of associated specific code set associated to the tag-identifier from a table that contains the association of the tag-identifier of the DVD player CA2 and the location of the corresponding code set of instructions. The result from this resolving is URL2 which points to files on, assume, code server CS1.

[0038] The code set retrieving part subsequently retrieves the code set of instructions from network element CS1 in the internet identified by said network location of associated specific code set here referred to by URL2.

[0039] Then the code set control server CSCS sends the code set back to the RFID enabled mobile handheld. The control application of the mobile user terminal UT then is able to control the DVD-player CA2 using the code-set of instructions obtained from a Code set control server CSCS. The display of the smart phone UT is used to display all or part of the control options of the DVD-player so that the user can choose and select the desired control option via corresponding keys of the keyboard or soft keys as displayed on a touch screen. The corresponding selected control signal is sent towards the DVD-player CA2 over the second control interface, for instance the commonly used Infra-red control interface.

[0040] Alternatively the user may both touch both the DVD player and the TV and press "yes" afterwards, so that 2 RFIDs and the mobile ID could be sent to the code set control server CSCS. In this case, after receiving the consolidated 2 code set both for the DVD player and the TV, the mobile user terminal UT should be able to control those 2 applications simultaneously.

[0041] The main message flow is more or less the same as described in the first scenario.

[0042] This invention in this way provides with a system to enable a personal mobile handheld to remotely and seamlessly control one or more independent devices and appliances.

[0043] Additionally it also possible to authenticate control to predetermined mobile user devices for controlling a limited set of user devices for instance the devices within a certain household. This authentication device may then intercept and authenticate a request for a code set of instructions or ignore the request in case control is not allowed.

[0044] A final remark is that embodiments of the present invention are described above in terms of functional blocks. From the functional description of these blocks, given above, it will be apparent for a person skilled in the art of designing electronic devices how embodiments of these blocks can be manufactured with well-known electronic components. A detailed architecture of the contents of the functional blocks hence is not given.

[0045] While the principles of the invention have been described above in connection with specific apparatus, it is to be clearly understood that this description is merely made by way of example and not as a limitation on the scope of the invention, as defined in the appended claims.

Claims

1. Remote control system for controlling a controllable application of a plurality of controllable applications (CA1, CA2, CA3, CA4) by means of a mobile user terminal (UT), said mobile user terminal (UT) using a specific code set of instructions for controlling each controllable application of said plurality of controllable applications (CA1, CA2, CA3, CA4), **CHARACTERISED IN THAT** each controllable application of said plurality of controllable applications (CA1, CA2, CA3, CA4) is associated with a tag having a unique tag-identifier, and that said system further comprises:

   a. a mobile user terminal (UT) adapted to read said tag-identifier of said tag associated with a controllable application over a (near field) com-

munications interface; and

b. a code set control part (CSCP), adapted to provide said mobile user terminal (UT) with a code-set of instructions for controlling said controllable application (CA1) of said plurality of controllable applications (CA1, CA2, CA3, CA4) based on said tag-identifier of said tag being associated with said controllable application (CA1).

2. Remote control system according to claim 1, **CHARACTERISED IN THAT** said Remote control system further comprises a resolution part (RES) adapted to resolve a network location of associated specific code set associated to said tag-identifier.

3. Remote control system according to claim 2, **CHARACTERISED IN THAT** said Remote control system further comprises a code set retrieving part adapted to retrieve said code set from a network element in the internet identified by said network location of associated specific code set.

4. Mobile User terminal (UT), for use in a system according to any of claim 1 to claim 3, said user terminal (UT) comprising a tag reading part (TAG_READ), adapted to read a tag-identifier associated to a tag, **CHARACTERISED IN THAT** said user terminal further comprises:

a. a code-set requesting apart (REQ_CSET), adapted to request a code-set for controlling a controllable application (CA1) of said plurality of controllable applications (CA1, CA2, CA3, CA4) based on a tag-identifier associated to a controllable application (CA1) of said plurality of controllable applications (CA1, CA2, CA3, CA4); and

b. control application (CONTR_APPL), adapted to control said controllable application (CA1) using said code-set of instructions obtained from a Code set control server (CSCS) based on said tag-identifier of a tag being associated with said controllable application.

5. Mobile User terminal according to claim 4, **CHARACTERISED IN THAT** said mobile user terminal (UT) further comprises a control interface, adapted to send control signals towards said controllable device base on said code-set of instructions over a second communications interface.

6. Code-set Control Server (CSCS), for use in a system according to any of claim 1 to claim 3, said Code-set Control Server comprising a code set provisioning part (CODE_PROV), adapted to provide said mobile user terminal (UT) with a code-set of instructions for controlling said controllable application of said plu-

rality of controllable applications (CA1, CA2, CA3, CA4) based on said tag-identifier of said tag associated with said controllable application.

7. Code-set Control Server (CSCS), according to claim 6, **CHARACTERISED IN THAT** said code set control server (CSCS) further comprises a resolution part, adapted to resolve a network location of associated specific code set associated to said tag-identifier.

8. Resolution server, for use in a system according to claim 2 or claim 3, said resolution server comprising a resolution part (RESP), adapted to resolve a network location of associated specific code set associated to said tag-identifier.
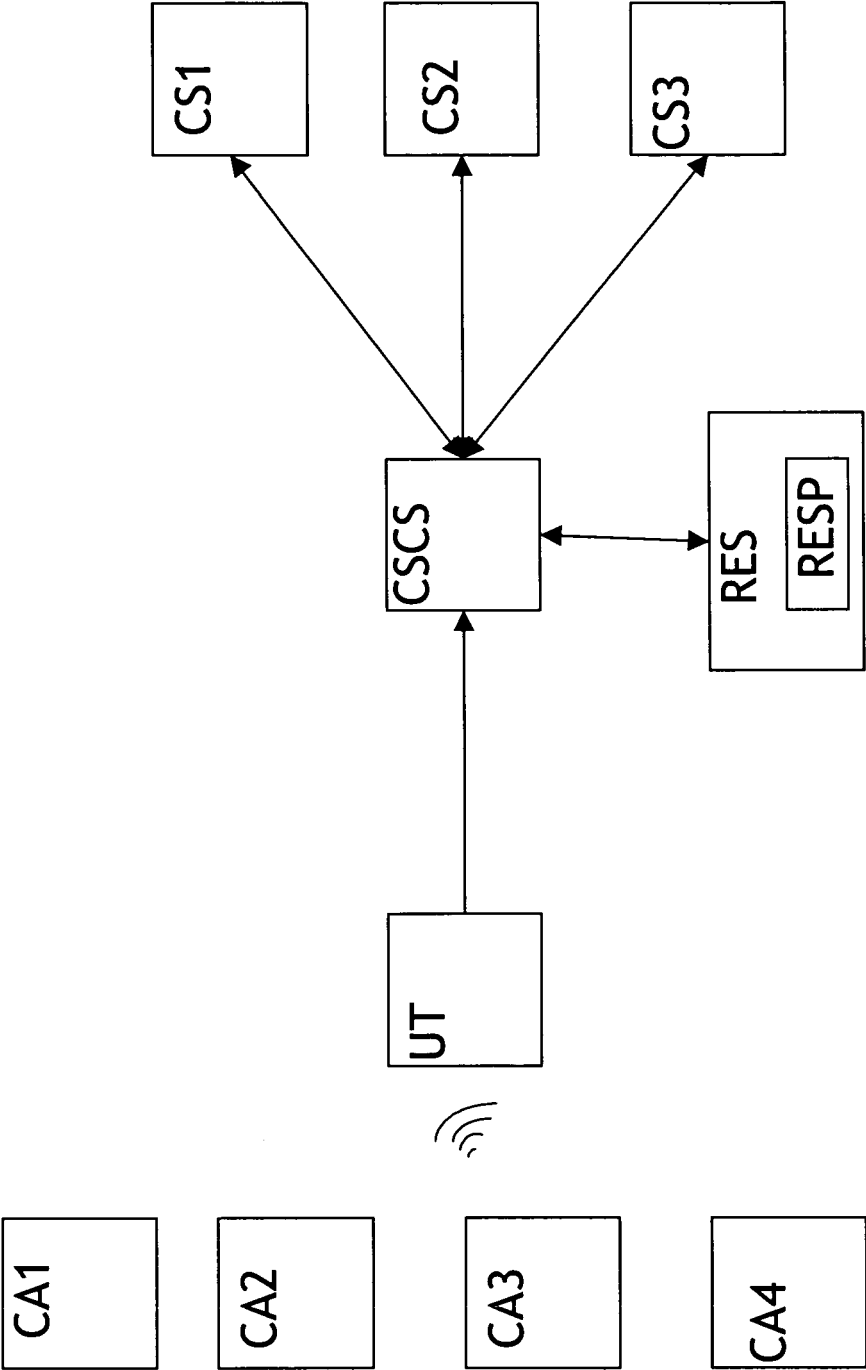
FIG.1

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 07 29 1614

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2005/036325 A (UNIVERSAL ELECTRONICS INC [US]; HUANG STEVE LANPING [US]; HAYES PATRIC) 21 April 2005 (2005-04-21) * page 8, line 20 - page 13, line 2 * * page 22, line 1 - page 24, line 31 * -----	1-8	INV. G08C19/28
X	US 2006/087433 A1 (SHELLER NATHAN J [US]) 27 April 2006 (2006-04-27) * paragraph [0006] - paragraph [0007] * * paragraph [0011] - paragraph [0022] * * paragraph [0029] - paragraph [0030] * * paragraph [0039] - paragraph [0049] * -----	1,4-6	
			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	15 July 2008	Pham, Phong

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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15-07-2008

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

REFERENCES CITED IN THE DESCRIPTION

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