



(51) International Patent Classification:

H04N 5/44 (2011.01) *G08C 23/04* (2006.01)
H01H 9/02 (2006.01) *H04N 21/422* (2011.01)

(21) International Application Number:

PCT/EP2017/069785

(22) International Filing Date:

04 August 2017 (04.08.2017)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

A 2016/12425 02 September 2016 (02.09.2016) TR

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(TR).(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,

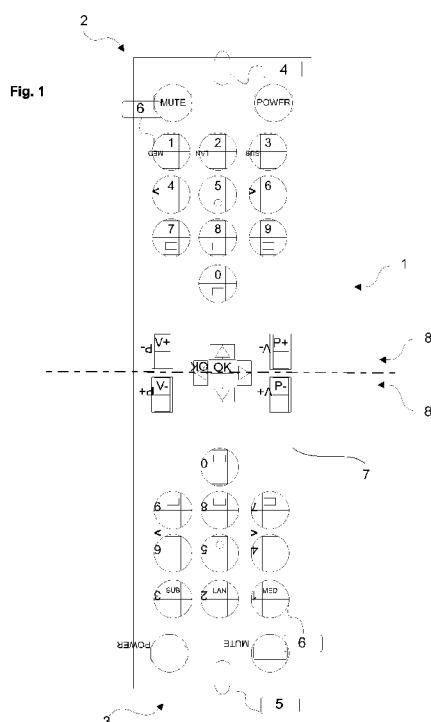
AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ,
CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO,
DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN,
HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP,
KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME,
MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ,
OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA,
SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN,
TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ,
UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ,
TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,
MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
KM, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(54) Title: IMAGE DISPLAY DEVICE REMOTE CONTROLLER WITH DOUBLE-SIDE USABILITY



(57) Abstract: The present invention relates to an image display device remote control device capable of effecting activation of different functions in double-sided symmetry to allow double-side usability. The present invention more particularly relates to a remote controller (1) comprising a first longitudinal end (2), a second longitudinal end (3) and an operation area (7) with a plurality of function keys (6) effectuating activation of different functions associated with an image display device, said remote controller (1) further comprising more than one transmitter (4, 5).



Description**IMAGE DISPLAY DEVICE REMOTE CONTROLLER WITH DOUBLE-SIDE
USABILITY**

- [0001] The present invention relates to an image display device remote control device capable of effecting activation of different functions in double-sided symmetry to allow double-side usability.
- [0002] Digital and interactive TV systems provide a comprehensive amount of TV channels and programs leading to the general outcome that the operation of the image display device is effectuated by means of a remote control provided with advanced functions, for instance in the form of specially dedicated keys for entering textual input, allowing setting of certain parameters or in the form of menu item shortcut buttons for more facilitated usage.
- [0003] Among others, one of the prior art disclosures in the technical field of the present invention may be referred to as US6094156, which discloses a remote controller adapted for use with an entertainment system of a type including a monitor or TV as well as providing functions such as Internet access or other functions requiring a keyboard and/or a mouse.
- [0004] The remote controller of US6094156 includes a folding housing and can be operated in a closed or opened configuration. A first limited set of control inputs are provided on the outer surface of the housing. The housing may be opened, thereby doubling the surface area of the remote controller, to expose a keyboard and mouse type multi-directional controller. First and second wireless transmitters are oriented at 90 degrees to each other and respectively controlled by the first set of control inputs and the keyboard and mouse. The remote controller may be conveniently held in one hand of a user when in the folded or closed position and conveniently rested on the lap of the user or arm of a sofa when in the opened position and used as a keyboard.
- [0005] On the other hand, the present invention provides a system by which an image display device is operated such that a remote controller having a first longitudinal end and a second longitudinal end can be alternatively used to perform the same function in general. The device of the present

invention is therefore devised under the recognition that visually impaired people or people viewing a broadcast program in a relatively dark room can use the remote controller irrespective of whether it has the right orientation with the IR transmitter being pointed towards the IR receiver on an appropriate location of the television frame proximate the panel thereof.

[0006] The present invention therefore provides a remote controller that can effectuate several control functions as a double-sided symmetrical unit as provided by the characterizing features defined in Claim 1.

[0007] Primary object of the present invention is hence to provide a remote controller offering a more practical remote control unit functional in controlling the operation of an image display device irrespective of whether a first or second longitudinal side thereof is pointed towards said image display device.

[0008] The present invention proposes a remote controller comprising with two longitudinal ends and an operation area. Two transmitters at longitudinal ends are simultaneously operable in response to a function key press on the operation area and the latter symmetrical usage by identical sub-areas.

[0009] Accompanying drawings are given solely for the purpose of exemplifying a remote controller by which an image display device is operable, whose advantages over prior art were outlined above and will be explained in brief hereinafter.

[0010] The drawings are not meant to delimit the scope of protection as identified in the claims nor should they be referred to alone in an effort to interpret the scope identified in said claims without recourse to the technical disclosure in the description of the present invention.

[0011] Fig. 1 demonstrates a general schematic view of a remote controller according to the present invention.

[0012] Fig. 2 demonstrates a general diagram according to which the image display device of the invention executes the method of operation of the remote controller according to the present invention.

[0013] The following numerals are assigned to different parts being referred to in the detailed description:

1. Remote controller
2. First longitudinal end
3. Second longitudinal end
4. First transmitter
5. Second transmitter
6. Function key
7. Operation area
8. Sub-area

[0014] The present invention proposes an image display device or a set-top box receiving programs via satellite, cable or terrestrial broadcasting for instance in the form of separate subscription formats. A set-top box may typically contain a plurality of tuner inputs, operating in connection with an image display device. Alternatively, the image display device itself can receive programs using built-in tuners.

[0015] Digital and interactive TV systems provide a comprehensive amount of TV channels and programs. A conventional structure receiving program contents receives a transport stream via a tuner. The image display device in accordance with the invention can be connected to a set-top box and can therefore be capable of receiving and tuning to signals of different generations (e.g. DVB-T and DVB-T2, DVB-S and DVB-S2, DVB-C and DVB-C2).

[0016] The present invention provides a system by which an image display device is operated such that a remote controller having a first longitudinal end (2) and a second longitudinal end (3) is alternatively usable to perform several conventional functions such as selection of a channel by pressing a dedicated function key (6) irrespective of whether it has the right orientation with an IR transmitter being pointed towards an IR receiver on an appropriate location of the image display device.

[0017] A problem associated with conventional remote controllers (1) can be suggested as the inability of the users to directly determine the accurate functional orientation of the remote controller, i.e. to determine the longitudinal side with the IR transmitter. This is particularly true for visually impaired people or people viewing a broadcast program in a relatively dark

room. This can cause a certain degree of momentary disturbance particularly prior to turning on of the television in a fully dark room (or for visually impaired persons) because a tactile verification is necessary and the users generally try to identify a certain key by their finger, the exact location of which in the structural layout of the remote controller they are already familiar with and which is thereby indicative of the longitudinal orientation of the controller.

[0018] In accordance with the present invention, the remote controller (1) has a first transmitter (4) at a first longitudinal end (2) thereof and a second transmitter (5) at a second longitudinal end thereof, said two transmitters are simultaneously operated as will be delineated hereinafter: The remote controller (1) conventionally features a plurality of function keys (6) conventionally including dedicated channel keys. The remote controller (1) typically comprises an operation area (7) on which said function keys (6) are disposed. The operation area (7) is divided into two symmetrical sub-areas (8) such that the two sub-areas (8) have rotational symmetry with respect to the origin, i.e. the central point of the operation area (7) at which the longitudinal and transversal axes intersect in an equidistant manner from the longitudinal and transversal edges. Accordingly, the layout of the remote controller (1) ensures that the configuration of the function keys (6) remains unchanged after rotation of 180 degrees about the origin. Therefore, the remote controller (1) will always be correctly aligned to operate the image display device irrespective of the first or second longitudinal ends (2, 3) being directed to the television.

[0019] In accordance with the invention, each sub-area (8) has a group of function keys (6) which are identically configured in the manner that position of two functions keys (6) with the same function remains unchanged after rotation of 180 degrees. However, when a given function key (6) is pressed, the first and second transmitters (4, 5) simultaneously transmits a respectively different signal in the form of a RCS (Remote Control Signal) being generated, typically consisting of a first pulse portion and a second space portion, both portions of which having a predetermined time duration. Depending on the longitudinal alignment of

the remote controller (1) with respect to the IR receiver of the image display device, only one of the remote control signals simultaneously transmitted by said first and second transmitters (4, 5) upon pressing said given function key (6) as received by the IR receiver will be processed by the image display device.

- [0020] The signal transmitted by the second transmitter (4, 5) facing away the image display device can also be received by the IR receiver in a reflected form. To this end, an electronic control unit of the image display device will determine which remote control signal's pulse and space portion patterns correspond to the predetermined pattern as these time durations typically deteriorate in the sense that they deviate from standard values. Besides, the Remote Control Signal protocol supports a toggle bit, which is indicative of a repeated key press. Therefore, the electronic control unit of the present invention can automatically skip the procedure for comparison of the pulse and space portions of dual signals received (if any) in the case of a repeated certain function key (6) press.
- [0021] In a nutshell, the present invention proposes an remote controller (1) comprising a first longitudinal end (2), a second longitudinal end (3) and an operation area (7) with a plurality of function keys (6) effectuating activation of different functions associated with an image display device, said remote controller (1) further comprising more than one transmitter (4, 5).
- [0022] In one embodiment of the present invention, the remote controller (1) has a first transmitter (4) at the first longitudinal end (2) thereof and a second transmitter (5) at the second longitudinal end (3) thereof, both of said first transmitter (4) and second transmitter (5) being simultaneously operable in response to a function key (6) press on said operation area (7).
- [0023] In a further embodiment of the present invention, said operation area (7) is divided into two symmetrical sub-areas such that the two sub-areas have rotational symmetry with respect to a central point of the operation area (7) at which longitudinal and transversal axes of the remote controller (1) intersect in an equidistant manner from the longitudinal and transversal edges thereof.

- [0024] In a further embodiment of the present invention, layout of the operation area (7) remains unchanged after rotation of 180 degrees of the remote controller (1) about said central point.
- [0025] In a further embodiment of the present invention, each sub-area (8) has a group of function keys (6) which are identically configured in both sub-areas (8) in the manner that position of two functions keys (6) in different sub-areas (8) remains unchanged after rotation of 180 degrees of the remote controller (1).
- [0026] In a further embodiment of the present invention, said first and second transmitters (4, 5) simultaneously transmit a respectively different remote control signal upon pressing of any function key (6) in said first or second sub-area (8).
- [0027] In a further embodiment of the present invention, said image display device comprises a receiver and an electronic control unit, the electronic control unit processing only one of the remote control signals simultaneously transmitted by said first and second transmitters (4, 5) upon pressing said given function key (6).
- [0028] In a further embodiment of the present invention, said electronic control unit of the image display device determines which remote control signal's pulse and space portion patterns correspond to the predetermined pattern and performs only one of the two predetermined functions associated with said given function key (6).
- [0029] In a further embodiment of the present invention, said electronic control unit skips the procedure for comparison of the pulse and space portions of dual signals received in the case of a repeated function key (6) press.
- [0030] The present invention therefore provides a system by which a remote controller (1) of an image display device is more effectively operable by visually impaired people or in dark environments.

Claims

1. A remote controller (1) comprising a first longitudinal end (2), a second longitudinal end (3) and an operation area (7) with a plurality of function keys (6) effectuating activation of different functions associated with an image display device, said remote controller (1) further comprising more than one transmitter (4, 5), **characterized in that**;
the remote controller (1) has a first transmitter (4) at the first longitudinal end (2) thereof and a second transmitter (5) at the second longitudinal end (3) thereof, both of said first transmitter (4) and second transmitter (5) being simultaneously operable in response to a function key (6) press on said operation area (7),
said operation area (7) is divided into two symmetrical sub-areas such that the two sub-areas have rotational symmetry with respect to a central point of the operation area (7) at which longitudinal and transversal axes of the remote controller (1) intersect in a equidistant manner from the longitudinal and transversal edges thereof.
2. A remote controller (1) as in Claim 1, **characterized in that** layout of the operation area (7) remains unchanged after rotation of 180 degrees of the remote controller (1) about said central point.
3. A remote controller (1) as in Claim 2, **characterized in that** each sub-area (8) has a group of function keys (6) which are identically configured in both sub-areas (8) in the manner that position of two functions keys (6) in different sub-areas (8) remains unchanged after rotation of 180 degrees of the remote controller (1).
4. A remote controller (1) as in Claim 2 or 3, **characterized in that** said first and second transmitters (4, 5) simultaneously transmit a respectively different remote control signal upon pressing of any function key (6) in said first or second sub-area (8).
5. An image display device communicating with a remote controller (1) as in Claim 4, **characterized in that** said image display device comprises a receiver and an electronic control unit, the electronic control unit processing only one of the remote control signals simultaneously transmitted by said first and second transmitters (4, 5) upon pressing said given function key (6).

6. An image display device as in Claim 5, **characterized in that** said electronic control unit of the image display device determines which remote control signal's pulse and space portion patterns correspond to the predetermined pattern and performs only one of the two predetermined functions associated with said given function key (6).
7. An image display device as in Claim 6, **characterized in that** said electronic control unit skips the procedure for comparison of the pulse and space portions of dual signals received in the case of a repeated function key (6) press.

Fig. 1

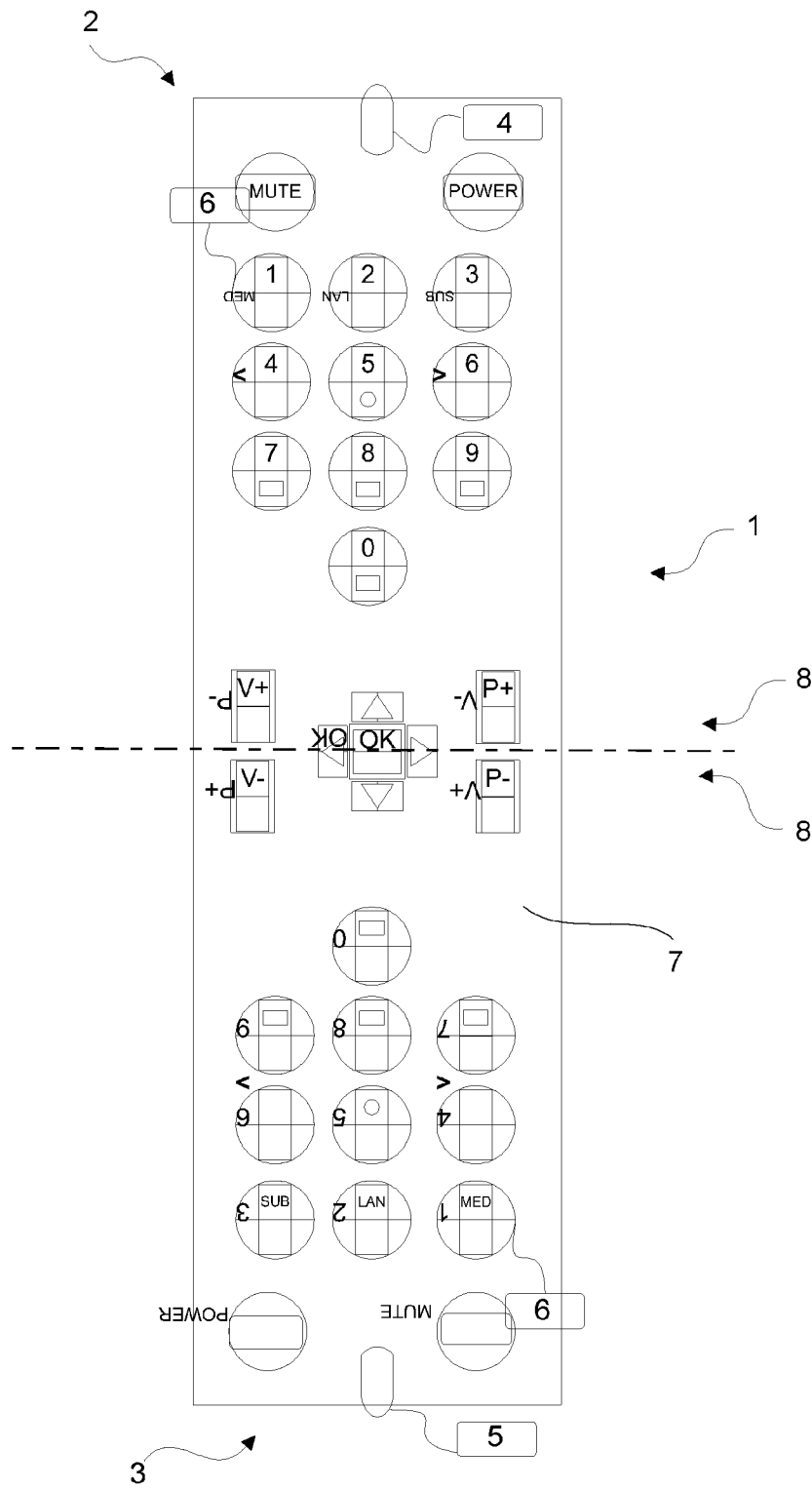
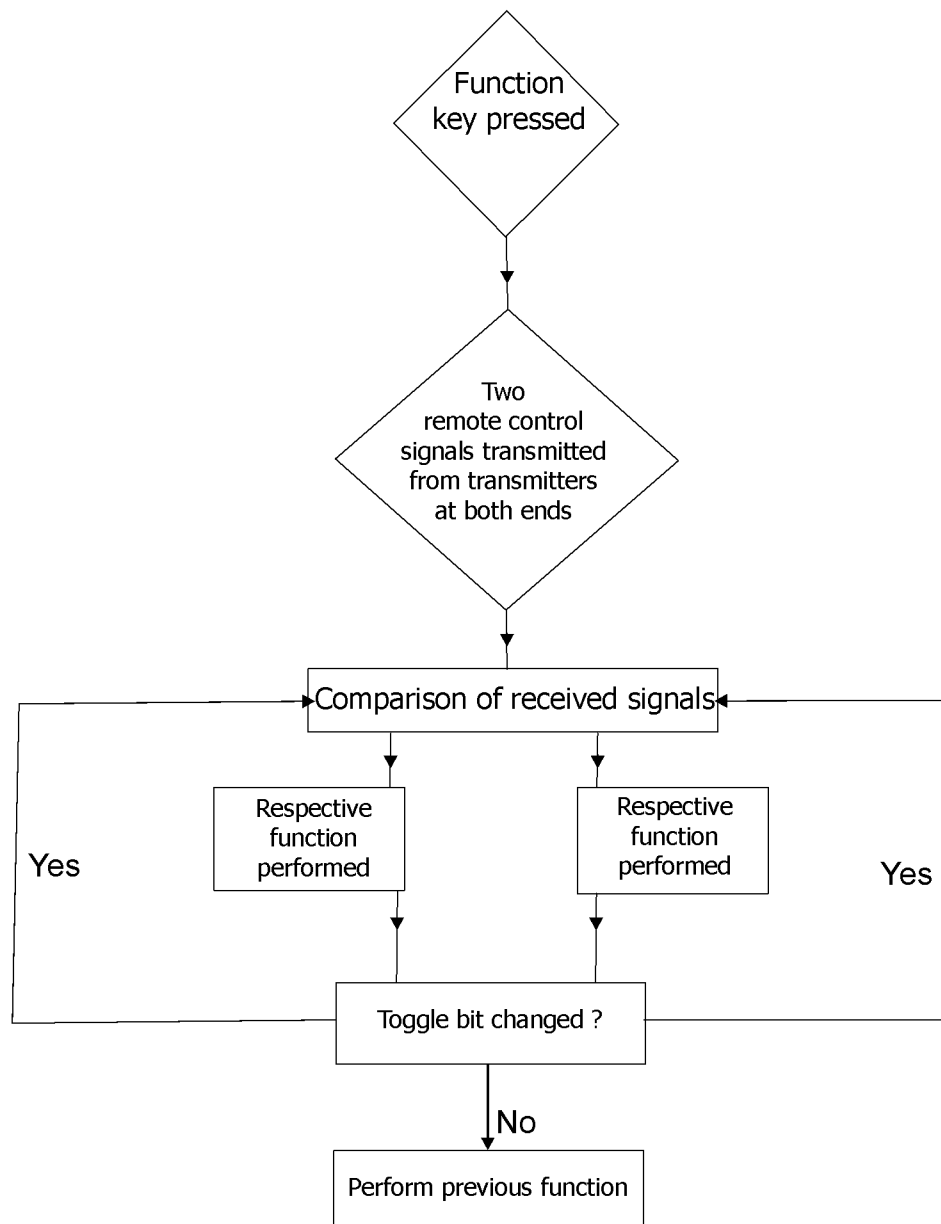


Fig. 2



INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2017/069785

A. CLASSIFICATION OF SUBJECT MATTER INV. H04N5/44 H01H9/02 G08C23/04 H04N21/422 ADD.		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) H04N H01H G08C		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal, WPI Data		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 204 466 078 U (BREMAX TECHNOLOGY COMPANY LTD) 8 July 2015 (2015-07-08) the whole document -----	1-7
☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
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Date of the actual completion of the international search 23 November 2017	Date of mailing of the international search report 08/12/2017	
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Beaudoin, Olivier	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2017/069785

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
CN 204466078	U	08-07-2015	NONE
