(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 3 135 354 A1

(12) EUROPEAN PATENT APPLICATION
published in accordance with Art. 153(4) EPC

(43) Date of publication:
01.03.2017 Bulletin 2017/09

(21) Application number: **15782927.6**

(22) Date of filing: **09.03.2015**

(51) Int Cl.:
A63F 9/10 *(2006.01)*

(86) International application number:
PCT/KR2015/002226

(87) International publication number:
WO 2015/163575 (29.10.2015 Gazette 2015/43)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA

(30) Priority: **24.04.2014 KR 20140049335**

(71) Applicant: **MTEK C&K CO., LTD**
Nam-gu
Inch'on gwangyoksi 402-711 (KR)

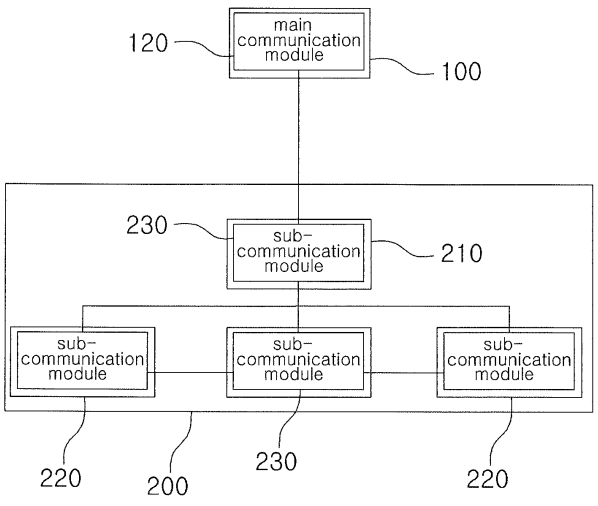
(72) Inventor: **KIM, Jong-Yong**
Suwon
Gyeonggi-do 440-330 (KR)

(74) Representative: **Petraz, Gilberto Luigi et al**
GLP S.r.l.
Viale Europa Unita, 171
33100 Udine (IT)

(54) PUZZLE SYSTEM CAPABLE OF COOPERATING WITH EXTERNAL DEVICE

(57) The present invention relates to a puzzle system capable of cooperating with an external device. More specifically, it relates to a puzzle system capable of cooperating with an external device, whereby a user's continuous interest can be stimulated by automatically detecting a type of puzzle that includes a plurality of puzzle pieces, and expressing various implementation operations corresponding to the puzzle when the puzzle is completed. To this end, the present invention includes: a puzzle device for transmitting a detection signal by detecting the completion of placement of a plurality of puzzle pieces forming a puzzle; and an implementation device operating in response to the signal transmitted from the puzzle device, wherein the puzzle device includes: a frame having a placement face on which the plurality of puzzle pieces is placed; a detection module for detecting the completion of placement of the puzzle pieces; and a main communication module for transmitting a signal detected at the detection module.

[Fig. 4]



EP 3 135 354 A1

Description

Technical Field

[0001] The present invention relates generally to a puzzle system capable of cooperating with an external device. More particularly, it relates to a puzzle system capable of cooperating with an external device, whereby a user's continuous interest can be stimulated by automatically detecting a type of puzzle that includes a plurality of puzzle pieces, and expressing various implementation operations corresponding to the puzzle when the puzzle is completed.

Background Art

[0002] In general, a puzzle with a picture or text is configured such that a user coherently places a plurality of puzzle pieces on a main body, such as a board, so as to complete a picture or text using the puzzle pieces having partial pictures or text thereon

[0003] The pictures used for the puzzle are designed and printed based on pictures or photographs of animation characters, and the puzzle is used as a game tool for children to play with or as a learning tool by dividing text into many pieces.

[0004] However, the conventional puzzle is problematic in that users soon tire of the puzzle after playing a few times and do not play again for a long time.

[0005] For this reason, various technologies have been developed in order to induce continuous interest of users. An example of such a technology is disclosed in Korean Patent No. 10-1005344, as shown in FIGS. 1 to 3, wherein the document relates to a puzzle toy including: a set of pieces 20 including a plurality of component pieces 22; and a main body 30 that accommodates the set of pieces 20 therein, wherein each of the component pieces 22 has a back surface on which a plurality of lattices 26 is formed. The main body 30 includes: light-emitting elements 32 arranged to correspond to the respective lattices 26 and emit light toward the lattices 26; light-receiving elements 34 for sensing the light reflected by the lattices 26; a signal analyzing unit 36 that determines colors of the lattices 26 by the signals sensed by the light-receiving elements 34 and outputs signals for the lattices 26; a feedback call unit 37 which analyzes output signals for each of the lattices 26, received from the signal analyzing unit 36, recognizes the lattice arrangement of the set of pieces 20, and determines whether the assembly for the set of pieces 20 is completed and the type of the set of pieces 20 upon completion of the placement of the set of pieces 20; and a feedback processing unit 38 that outputs information on the set of pieces 20 completed by the signal received from the feedback call unit 37.

[0006] A technology disclosed in Korean Patent No. 10-1005344 is advantageous in that a location of each of the component pieces 22 is detected by the light-emitting elements 32 and the light-receiving elements 34, and it is possible to determine whether each of the component pieces 22 is located at a correct place, and thus it is possible to easily check whether the puzzle is completed, and also a sound or an image is output upon completion of placement of the puzzle. However, in order to check that each piece is located at the correct place, it is required that the main body 30 should be provided with a plurality of light-emitting elements 32 and the light-receiving elements 34, and thereby the configuration may be complex and manufacturing cost may be increased.

[0007] The conventional puzzle toy is further problematic in that a sound or an image is output only from the puzzle main body, so users soon tire of the puzzle after playing a few times and do not play again for a long time.

Disclosure

Technical Problem

[0008] Accordingly, the present invention has been made keeping in mind the above problems occurring in the related art, and the present invention is intended to propose a puzzle system capable of cooperating with an external device, the puzzle system including: a puzzle device and a implementation device, wherein the puzzle device includes: a frame having a placement face, on which a plurality of puzzle pieces is placed; and a main communication module puzzle transmitting a completion signal by determining the completion of placement of the puzzle when the pieces are placed at correct places, and the implementation device performs a predetermined function corresponding to the puzzle by receiving the completion signal transmitted from the puzzle device, whereby it is possible to induce a continuous interest of users by allowing the users to realize contents of the puzzle in a variety of ways in response to the puzzle.

[0009] The present invention is further intended to propose a puzzle system capable of cooperating with an external device configured such that the implementation device includes a plurality of devices, but may include only one device, wherein each device is controlled by a main device; and the main device is provided with implementation modes combining functions that each device and the main device are capable of performing so as to correspond to the puzzle, whereby when the completion signal of the puzzle is received, each device is controlled according to the implementation modes corresponding to the puzzle, and thus users are more interested in the puzzle, thereby using the puzzle continuously.

[0010] The present invention is further intended to propose a puzzle system capable of cooperating with an external device configured such that the puzzle pieces are each provided with wiring lines, so when all the puzzle pieces are connected correctly, electric current flows through each of the wiring lines, whereby it is possible to easily check the completion of placement of the puzzle pieces at a low cost, and further the puzzle system is configured such that the placement face, on which the

puzzle pieces are placed, is provided with a plurality of input terminals and output terminals at a side thereof so as to supply power to the puzzle pieces, whereby it is possible to determine the contents of the puzzle pieces placed on the placement face by the combination of the input terminals and the output terminals, and thus it is possible to play various puzzles using one puzzle device.

Technical Solution

[0011] In order to achieve the above object, according to one aspect of the present invention, there is provided a puzzle system capable of cooperating with an external device, the puzzle system including: a puzzle device transmitting a detection signal by detecting completion of placement of a plurality of puzzle pieces that are used to complete a puzzle; and an implementation device operating in response to the signal transmitted from the puzzle device.

[0012] Herein, the puzzle device may include: a frame having a placement face, on which the plurality of puzzle pieces are placed; a detection module detecting the completion of placement of the puzzle pieces; and a main communication module transmitting a signal detected by the detection module.

[0013] Further, the detection module may include: an input terminal provided outside the placement face and supplying an electric current to the puzzle pieces; and an output terminal provided outside the placement face and detecting an electric current output from the puzzle pieces.

[0014] Here, the detection module may be provided with the input terminal and the output terminal in plural, wherein the detection module further includes a determination part matching contents of the puzzle through combination of the input terminals and the output terminals.

[0015] Herein, each of the puzzle pieces may be provided with a wiring line connected to an adjacent puzzle piece.

[0016] Meanwhile, the detection module may include: a detection sensor provided at a first side of the placement face; and an operation bar provided at a second side of the placement face and pushing the placed puzzle pieces toward the detection sensor.

[0017] Herein, of the plurality of puzzle pieces, one or more puzzle pieces adjacent to the detection sensor may be provided with detection protrusions; and the detection sensor may be provided with a plurality of insertion switches that correspond to the detection protrusions.

[0018] Further, the detection module may further include a determination part determining contents of the puzzle according to locations of the detection protrusions sensed by the detection sensor.

[0019] Further, the implementation device may include at least one electronic device, wherein the electronic device constituting the implementation device is provided with a sub-communication module receiving the detection signal transmitted from the main communication module.

[0020] Here, when the implementation device is constituted by a plurality of electronic devices, the implementation device may include: a main device receiving the detection signal transmitted from the puzzle device; and a sub-device receiving a control signal from the main device.

[0021] Further, the main device may store implementation modes allowing functions that the main device and the sub-device are capable of performing to be performed sequentially or simultaneously by combining the functions, so as to correspond to the puzzle.

[0022] Herein, the main device may transmit the control signal to the sub-device or the main device sequentially or simultaneously according to the implementation modes such that the functions of the sub-device or the main device are performed.

[0023] Meanwhile, the detection module may include a determination part determining which type of puzzle piece is placed on the placement face and whether the puzzle is completed or not, wherein the determination part is provided with implementation modes for controlling the implementation device.

[0024] Here, the implementation modes may combine functions of the electronic devices constituting the implementation device such that the functions are performed sequentially or simultaneously.

[0025] Further, the implementation modes may further include a control signal controlling a speaker or an LED provided in the puzzle device.

[0026] Further, the puzzle device may transmit the control signal for controlling each of the functions forming the implementation modes, to one of the electronic devices constituting the implementation device, and the electronic device having received the control signal may directly transmit the control signal to an electronic device that is designated to perform a next function.

[0027] Meanwhile, the puzzle device may transmit the control signal for controlling each of the functions forming the implementation modes, to each of the electronic devices constituting the implementation device.

Advantageous Effects

[0028] According to the present invention having the above-described characteristics, it is possible to induce continuous interest of users by allowing the users to realize contents of the puzzle in a variety of ways in response to the puzzle since the present invention includes: a puzzle device and a implementation device, wherein the puzzle device includes: a frame having a placement face, on which a plurality of puzzle pieces is placed; and a main communication module puzzle transmitting a completion signal by determining the completion of placement of the puzzle when the pieces are placed at correct places, and the implementation device performs a predetermined function corresponding to the puzzle by receiving the completion signal transmitted

from the puzzle device.

[0029] Further, since the present invention is configured such that the implementation device may include only one device or a plurality of devices, , wherein each device is controlled by a main device; and the main device is provided with implementation modes combining functions that each device and the main device are capable of performing so as to correspond to the puzzle, whereby when the completion signal of the puzzle is received, each device is controlled according to the implementation modes corresponding to the puzzle, and thus user interest in the puzzle is stimulated, and thus they may use the puzzle continuously.

[0030] Further, the present invention is configured such that each of the puzzle pieces is provided with a wiring line, so when all the puzzle pieces are connected correctly, electric current flows through each of the wiring lines, whereby it is possible to easily check the completion of placement of the puzzle pieces at a low cost, and further the puzzle system is configured such that the placement face, on which the puzzle pieces are placed, is provided with a plurality of input terminals and output terminals at a side thereof so as to supply power to the puzzle pieces, whereby it is possible to determine the contents of the puzzle pieces placed on the placement face by the combination of the input terminals and the output terminals, and thus it is possible to play various puzzles using one puzzle device.

Description of Drawings

[0031]

FIG. 1 is a perspective view illustrating a conventional puzzle;

FIG. 2 is a block diagram illustrating the conventional puzzle;

FIG. 3 is a back view illustrating back surfaces of a set of pieces of the conventional puzzle;

FIG. 4 is a conceptual view illustrating a puzzle system capable of cooperating with an external device according to an embodiment of the present invention;

FIG. 5 is a conceptual view illustrating a puzzle device of the puzzle system capable of cooperating with an external device according to the embodiment of the present invention;

FIG. 6 is a conceptual view illustrating a puzzle device of the puzzle system capable of cooperating with an external device according to a modification of the embodiment of the present invention;

FIG. 7 is a block diagram illustrating the puzzle system capable of cooperating with an external device according to the embodiment of the present invention;

FIG. 8 is a conceptual view illustrating a puzzle of the puzzle device of the puzzle system capable of cooperating with an external device according to another embodiment of the present invention;

FIG. 9 is a block diagram illustrating the puzzle according to the embodiment of FIG. 8; and

FIG. 10 is a conceptual view illustrating a puzzle system capable of cooperating with an external device according to a further another embodiment of the present invention.

Best Mode

[0032] Reference will now be made in greater detail to an exemplary embodiment of the present invention, an example of which is illustrated in the accompanying drawings. Wherever possible, the same reference numerals will be used throughout the drawings and the description to refer to the same or like parts. Further, it should be understood that the embodiment of the present invention may be changed to a variety of embodiments and the scope and spirit of the present invention are not limited to the embodiment described hereinbelow.

[0033] FIG. 4 is a conceptual view illustrating a puzzle system capable of cooperating with an external device according to an embodiment of the present invention; FIG. 5 is a conceptual view illustrating a puzzle device of the puzzle system capable of cooperating with an external device according to the embodiment of the present invention; FIG. 6 is a conceptual view illustrating a puzzle device of the puzzle system capable of cooperating with an external device according to a modification of the embodiment of the present invention; FIG. 7 is a block diagram illustrating the puzzle system capable of cooperating with an external device according to the embodiment of the present invention; FIG. 8 is a conceptual view illustrating a puzzle of the puzzle device of the puzzle system capable of cooperating with an external device according to another embodiment of the present invention; FIG. 9 is a block diagram illustrating the puzzle according to the embodiment of FIG. 8; and FIG. 10 is a conceptual view illustrating a puzzle system capable of cooperating with an external device according to a further another embodiment of the present invention.

[0034] The present invention relates to the puzzle system capable of cooperating with an external device, wherein as shown in FIGS. 4 to 7, the puzzle system includes: a puzzle device 100 transmitting a detection signal by detecting that placement of a plurality of puzzle pieces 160 used to complete a puzzle is completed; and an implementation device 200 operating in response to the signal transmitted from the puzzle device 100.

[0035] Herein, the puzzle device 100 includes: a frame 110 having a placement face, on which a plurality of puzzle pieces 160 is placed; a detection module 140 detecting completion of placement of the puzzle pieces 160; and a main communication module 120 transmitting a signal detected by the detection module 140 to the implementation device 200.

[0036] Here, the frame 110 is provided with an operation button 148 at a side thereof, wherein when a user

presses the operation button 148 after assembling the puzzle pieces 160, the detection module 140 determines whether the puzzle pieces 160 are located at correct places and completed, and in the case where the puzzle is completed, the detection signal including a success message is transmitted to the implementation device 200 through the main communication module 120, and then the implementation device 200 implements a motion corresponding to the signal.

[0037] Further, the detection module 140 includes: an input terminal 142 provided outside the placement face 112 formed in the frame 110 and supplying electric current to the puzzle pieces 160; and an output terminal 144 provided outside the placement face 112 and detecting electric current output from the puzzle pieces 160.

[0038] Herein, the puzzle pieces 160 are provided with wiring lines 162 connecting neighboring puzzle pieces 160, wherein the wiring lines 162 may be respectively provided in the puzzle pieces 160, or be provided in some of the puzzle pieces 160.

[0039] Thereby, when a user presses the operation button 148 provided in the frame 110, the electric current is supplied to a puzzle piece 160 being in contact with the input terminal 142 through the input terminal 142, then the electric current circulates along the wiring lines 162 provided in the puzzle pieces 160, and then the electric current is output through a puzzle piece 160 being in contact with the output terminal 144, so when all the puzzle pieces 160 are located at the correct places, the electric current from the input terminals 142 is output to the output terminal 144, whereby it is possible to recognize the completion of placement of the pieces of the puzzle, and on the contrary, when the electric current is not output to the output terminal 144, it is possible to recognize that the puzzle pieces 160 are not located at the correct places.

[0040] Thus, the completion detection signal or the incompletion detection signal is transmitted to the implementation device 200 through the main communication module 120 provided in the frame 110 such that the implementation device 200 implements a motion corresponding to the signal, whereby it is possible to induce a user's interest.

[0041] In other words, in the case of the completion detection signal, the implementation device implements a corresponding motion to the puzzle, and on the contrary, in the case where of the incompletion detection signal, a message, such as "Sorry, but find a missing place, please", is output such that the puzzle is completed, and accordingly users can enjoy the puzzle more.

[0042] Meanwhile, the input terminal 142 and the output terminal 144 provided outside the placement face 112 may be respectively provided on different surfaces of the placement face 112, as shown in FIG. 5, or be respectively provided in different portions of the same surface of the placement face, as shown in FIG. 6.

[0043] Of course, the input terminal 142 and the output terminal 144 may be provided outside on the entire of the placement face 112.

[0044] Further, the input terminal 142 and the output terminal 144 are respectively provided in plural, wherein when the operation button 148 provided in the frame 110 is pressed, one of the input terminals 142 and one of the output terminals 144 are operated.

[0045] Herein, the detection module 140 is further provided with a determination part 146, wherein when the combination of the input terminals 142 and the output terminals 144 operated when the operation button 148 is pressed, the determination part determines which type of puzzle a puzzle currently placed on the placement face 112 is, whereby the detection signal including information on the puzzle is transmitted to the implementation device 200 via the main communication module 120, and accordingly the implementation device 200 implements a motion corresponding to the information included in the detection signal, thereby inducing a user's interest.

[0046] Meanwhile, the implementation device 200 is made into a toy or an electronic device, and provided in singular or in plural, wherein each device is provided with a sub-communication module 230 capable of receiving the detection signal transmitted wirelessly or by wire from the main communication module 120 provided in the puzzle device 100.

[0047] Accordingly, the implementation device 200 is configured such that in the case of the toy, a motion unique to the toy is implemented according to the detection signal, or in the case of the electronic device, an image or a sound corresponding to the detection signal is output, thereby inducing a user's interest.

[0048] Further, in the case where the implementation device 200 is constituted by a plurality of devices rather than a single device, a plurality of implementation devices 200 includes a main device 210 and a sub-device 220, and each of the devices 210 and 220 is provided with the sub-communication module 230.

[0049] Herein, when the puzzle device 100 transmits the detection signal via the main communication module 120, the main device 210 receives the detection signal, and the main device 210 transmits a control signal about a function that the sub-device 220 implements corresponding to the received detection signal, to each sub-device 220 via the sub-communication module 230, and accordingly not only the main device 210 but also each sub-device 220 implements a motion corresponding to the detection signal simultaneously or sequentially, and thus users are more interested in the puzzle.

[0050] Here, a plurality of implementation modes are stored in the main device 210 so as to correspond to a puzzle placed on the placement face 112 of the frame 110, wherein the implementation modes combine functions that the main device and the sub-device can perform so as to form control signals (control command) implemented simultaneously or sequentially.

[0051] Thus, for example, when the main device 210 is a smart pad, the sub-device is various toys, and a puzzle shows a picture of a user's favorite character, the

puzzle device 100 transmits the completion detection signal to the implementation device 200 by detecting the completion of placement of the puzzle pieces 160, and the implementation device 200 outputs a video clip and a sound corresponding to the character of the puzzle, from the main device 210 by detecting the signal and transmits a control signal to the sub-device 220 having a corresponding character such that only the sub-device 220 having the corresponding character implements a motion unique to the toy, whereby the puzzle device 100 cooperates with the main device 210 and the sub-device 220 constituting the implementation device, and thus users are more interested in the puzzle.

[0052] Further, the present invention may be configured such that the puzzle pieces 160 showing a variety of contents are used in one frame 110, so information on the puzzle pieces 160 is automatically detected without creating a setting for each of the puzzle pieces 160, and accordingly it is easy to use the puzzle.

[0053] Further, the frame 110 is provided with an additional power part 130, wherein the power part 130 may use a battery or an outer power source.

[0054] Meanwhile, according to another embodiment of the present invention, as shown in FIGS. 8 and 9, the puzzle device 100 includes: a plurality of puzzle pieces 170; a frame 110 having a placement face 112, on which the plurality of puzzle pieces 170 is placed; and a detection module 150 detecting completion of placement of the puzzle pieces 170.

[0055] Herein, the detection module 150 includes: a detection sensor 152 provided at a first side of the placement face 112; and an operation bar 154 provided at a second side of the placement face 112, wherein the operation bar 154 pushes the puzzle pieces 170 placed on the placement face 112, toward the detection sensor 152.

[0056] Here, of the plurality of puzzle pieces 170, one or more puzzle pieces adjacent to the detection sensor 152 are provided with detection protrusions 172 protruding toward the detection sensor 152 such that when the operation bar 154 pushes the puzzle pieces, the detection protrusion 172 is inserted into the corresponding detection sensor 152.

[0057] Further, the detection sensor 152 is provided with a plurality of insertion switches 153 each corresponding to each of the detection protrusions 172, whereby when the operation bar 154 is operated to move the placed puzzle pieces 170, and the detection protrusions 172 provided in the puzzle pieces 170 are inserted into the corresponding insertion switches 153, the detection sensor 152 senses the insertion switches 153 that the detection protrusions 172 are inserted into.

[0058] Herein, the detection module 150 is provided with a determination part 156, wherein the determination part 156 determines contents of the puzzle placed on the placement face 112 of the frame 110 according to a combination of locations of the detection protrusions 172 sensed by the detection sensor 152.

[0059] Thereby, a detection signal including the contents of the puzzle, which are detected by the detection module 150, is transmitted to the implementation device 200 via the main communication module 120 such that the implementation device 200 implements a motion corresponding to the contents of the puzzle.

[0060] Meanwhile, the other configuration is the same as the above described configuration, so a description thereof will be omitted.

[0061] Further, according to a further another embodiment of the present invention, as shown in FIG. 10, the puzzle system includes: a puzzle device 100 transmitting a detection signal by detecting that a plurality of puzzle pieces 160 forming a puzzle is completed; and an implementation device 200 operating in response to the signal transmitted from the puzzle device 100.

[0062] Herein, not shown in the drawings but as in the embodiment described above, the puzzle device 100 is provided with a determination part 146, 156 determining which type of puzzle is being placed and whether the puzzle is completed or not, wherein the determination part 146, 156 is provided with implementation modes for controlling the implementation device 200.

[0063] Here, the implementation modes combine functions of the electronic devices 210 and 220 constituting the implementation device 200 such that the functions are implemented sequentially or simultaneously.

[0064] Further, the puzzle device 100 is provided with a speaker 182 outputting a unique sound and an LED 184 emitting various lights, wherein the implementation modes may further include a control signal controlling the speaker 182 and the LED 184 provided in the puzzle device 100.

[0065] Accordingly, when the determination part 146 and 156 of the puzzle device 100 senses the completion of placement of the puzzle, and transmits the control signal, which controls the functions of the electronic devices 210 and 220 constituting the implementation device 200 according to the implementation modes, to the sub-communication module 230 provided in the implementation device 200 through the main communication module 120 such that the implementation device 200 operates in response to the puzzle.

[0066] Herein, the puzzle device 100 transmits the control signal for controlling each function forming the implementation modes, to one of the electronic devices 210 and 220 constituting the implementation device 200, and the one of the electronic devices 210 and 220 implements the function and then directly transmits the control signal to one of the electronic devices 210 and 220, which is designated to perform a next function.

[0067] Accordingly, each of the electronic devices 210 and 220 constituting the implementation device 200 implements functions set in the implementation modes sequentially or simultaneously by cooperating with each other.

[0068] Here, the implementation modes may be stored in each of the electronic devices 210 and 220 constituting the implementation device 200, or may transmit the con-

trol signal by storing the information on the entire implementation device in the control signal when transmitting the control signal.

[0069] Of course, when the puzzle device 100 senses the completion of placement of the puzzle without cooperating with the implementation device 200, the contents corresponding to the puzzle may be output through the speaker 182 provided in the puzzle device 100 or through the LED 184.

[0070] Further, the puzzle device 100 may transmit the control signal for controlling the each function forming the implementation modes, directly to each of the electronic devices 210 and 220 and controls the electronic devices.

[0071] Meanwhile, the other configuration is the same as the above described configuration, so a description thereof will be omitted.

[0072] Although a preferred embodiment of the present invention has been described for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims.

Industrial Applicability

[0073] The present invention relates to a puzzle system capable of cooperating with an external device and, more specifically, to a puzzle system capable of cooperating with an external device, whereby a user's continuous interest can be stimulated by automatically detecting a type of puzzle, including a plurality of puzzle pieces, and expressing various implementation operations corresponding to the puzzle when the puzzle is completed.

Claims

1. A puzzle system capable of cooperating with an external device, the puzzle system which is **characterized in that** it comprises:

   a puzzle device (100) transmitting a detection signal by detecting completion of placement of a plurality of puzzle pieces (160, 170) that form a puzzle; and
   an implementation device (200) operating in response to the signal transmitted from the puzzle device (100).

2. The puzzle system of claim 1, wherein the puzzle device (100) includes:

   a frame (110) having a placement face (112), on which the plurality of puzzle pieces (160, 170) are placed;
   a detection module (140, 150) detecting the completion of placement of the puzzle pieces (160, 170); and
   a main communication module (120) transmitting a signal detected by the detection module (140, 150).

3. The puzzle system of claim 2, wherein the detection module (140) includes:

   an input terminal (142) provided outside the placement face (112) and supplying an electric current to the puzzle pieces (160); and
   an output terminal (144) provided outside the placement face (112) and detecting an electric current output from the puzzle pieces (160).

4. The puzzle system of claim 3, wherein
   the detection module (140) is provided with the input terminal (142) and the output terminal (144) in plural; and
   the detection module (140) further includes a determination part (146) matching contents of the puzzle through combination of the input terminals (142) and the output terminals (144).

5. The puzzle system of claim 3, wherein
   each of the puzzle pieces (160) is provided with a wiring line (162) connected to an adjacent puzzle piece (160).

6. The puzzle system of claim 2, wherein the detection module (150) includes:

   a detection sensor (152) provided at a first side of the placement face (112); and
   an operation bar (154) provided at a second side of the placement face (112) and pushing the placed puzzle pieces (170) toward the detection sensor (152).

7. The puzzle system of claim 6, wherein
   of the plurality of puzzle pieces (170), one or more puzzle pieces adjacent to the detection sensor (152) are provided with detection protrusions (172); and
   the detection sensor (152) is provided with a plurality of insertion switches (153) that correspond to the detection protrusions (172).

8. The puzzle system of claim 7, wherein
   the detection module (150) further includes a determination part (156) determining contents of the puzzle according to locations of the detection protrusions (172) sensed by the detection sensor (152).

9. The puzzle system of claim 2, wherein
   the implementation device (200) includes at least one electronic device, wherein the electronic device constituting the implementation device (200) is provided with a sub-communication module (230) re-

ceiving the detection signal transmitted from the main communication module (120).

10. The puzzle system of claim 9, wherein when the implementation device (200) is constituted by a plurality of electronic devices, the implementation device (200) includes:

a main device (210) receiving the detection signal transmitted from the puzzle device (100); and
a sub-device (220) receiving a control signal from the main device (210).

11. The puzzle system of claim 10, wherein
the main device (210) stores implementation modes allowing functions that the main device (210) and the sub-device (220) are capable of performing to be performed sequentially or simultaneously by combining the functions, so as to correspond to the puzzle.

12. The puzzle system of claim 11, wherein
the main device (210) transmits the control signal to the sub-device (220) or the main device (210) sequentially or simultaneously according to the implementation modes such that the functions of the sub-device (220) or the main device (210) are performed.

13. The puzzle system of claim 9, wherein
the detection module (140, 150) includes a determination part (146, 156) determining which type of puzzle piece is placed on the placement face and whether the puzzle is completed or not, wherein
the determination part (146, 156) is provided with implementation modes for controlling the implementation device (200).

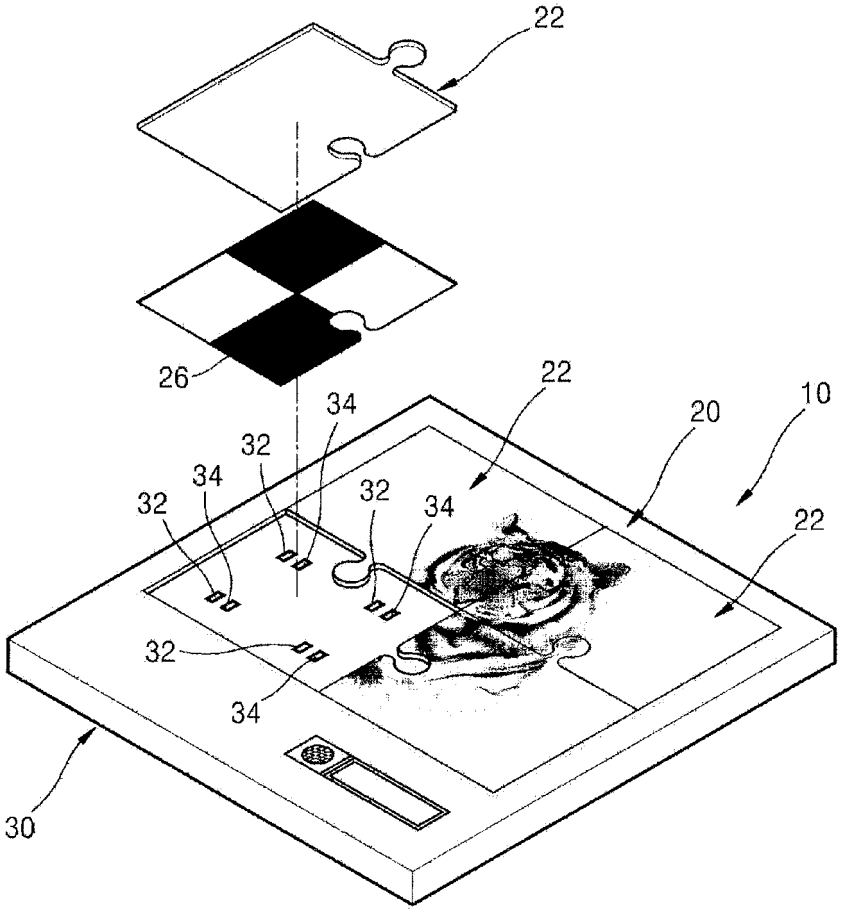
14. The puzzle system of claim 13, wherein
the implementation modes combine functions of the electronic devices constituting the implementation device (200) such that the functions are performed sequentially or simultaneously.

15. The puzzle system of claim 14, wherein
the implementation modes further include a control signal controlling a speaker (182) or an LED (184) provided in the puzzle device (100).

16. The puzzle system of claim 14, wherein
the puzzle device (100) transmits the control signal for controlling each of the functions forming the implementation modes, to one of the electronic devices constituting the implementation device (200), and
the electronic device having received the control signal directly transmits the control signal to an electronic device that is designated to perform a next function.

17. The puzzle system of claim 14, wherein
the puzzle device (100) transmits the control signal for controlling each of the functions forming the implementation modes, to each of the electronic devices constituting the implementation device (200).

[Fig. 1]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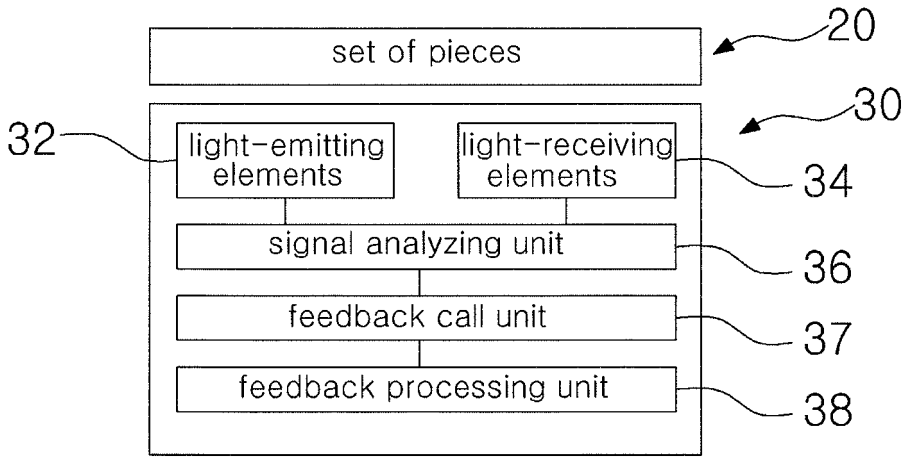
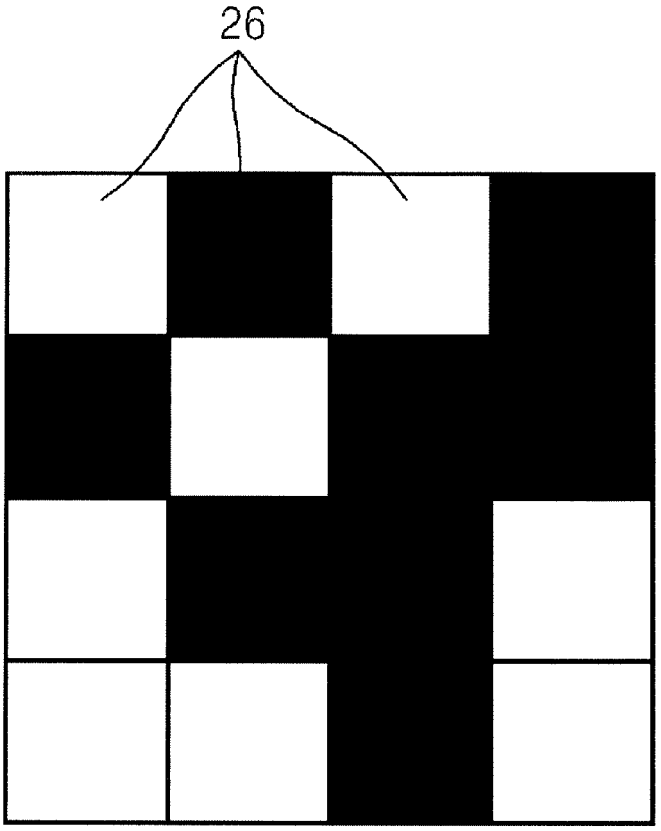
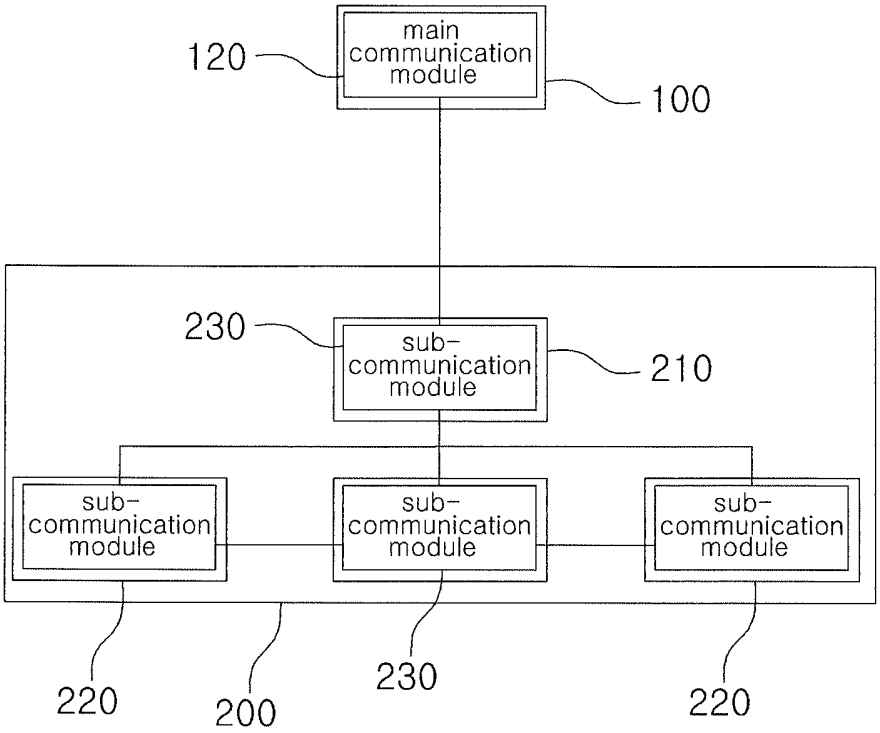
[Fig. 2]


set of pieces
20
30
32
light-emitting elements
light-receiving elements
34
signal analyzing unit
36
feedback call unit
37
feedback processing unit
38

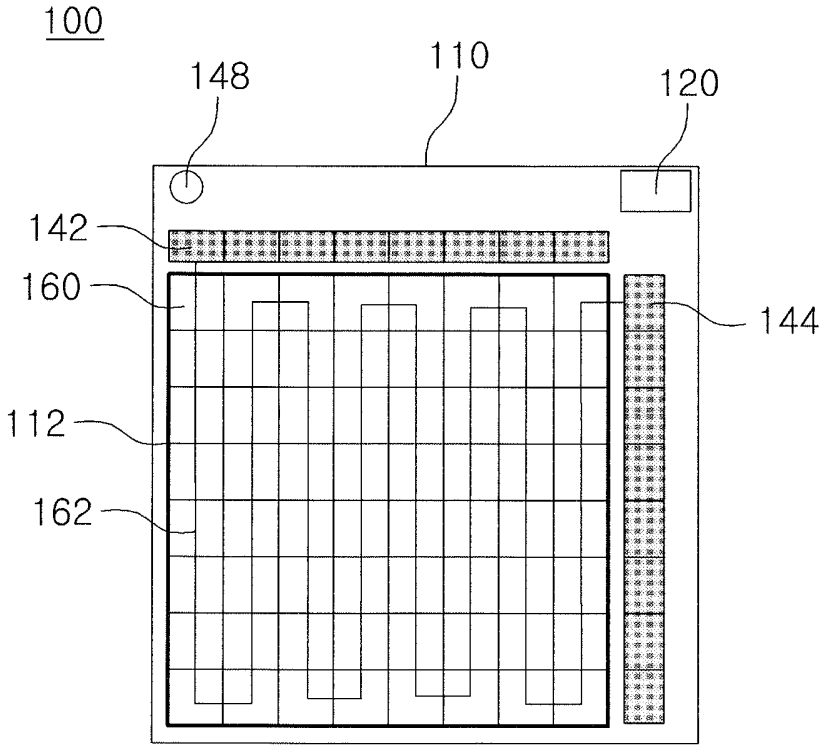
[Fig. 3]



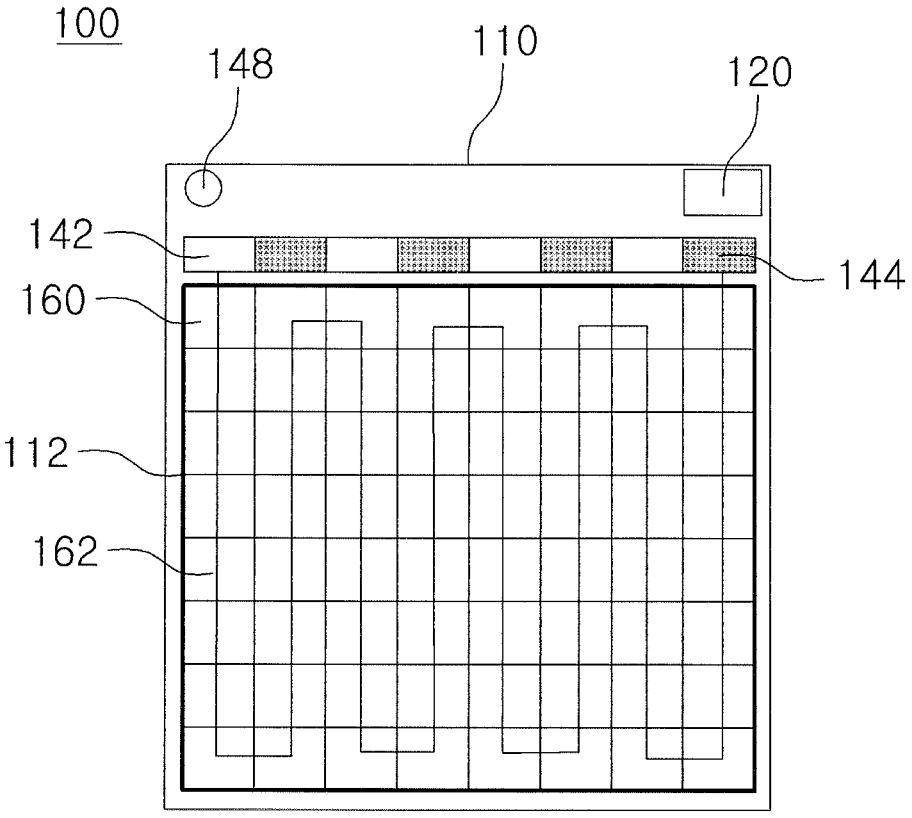
[Fig. 4]


main communication module
120
100
230
sub-communication module
210
sub-communication module
sub-communication module
sub-communication module
220
200
230
220

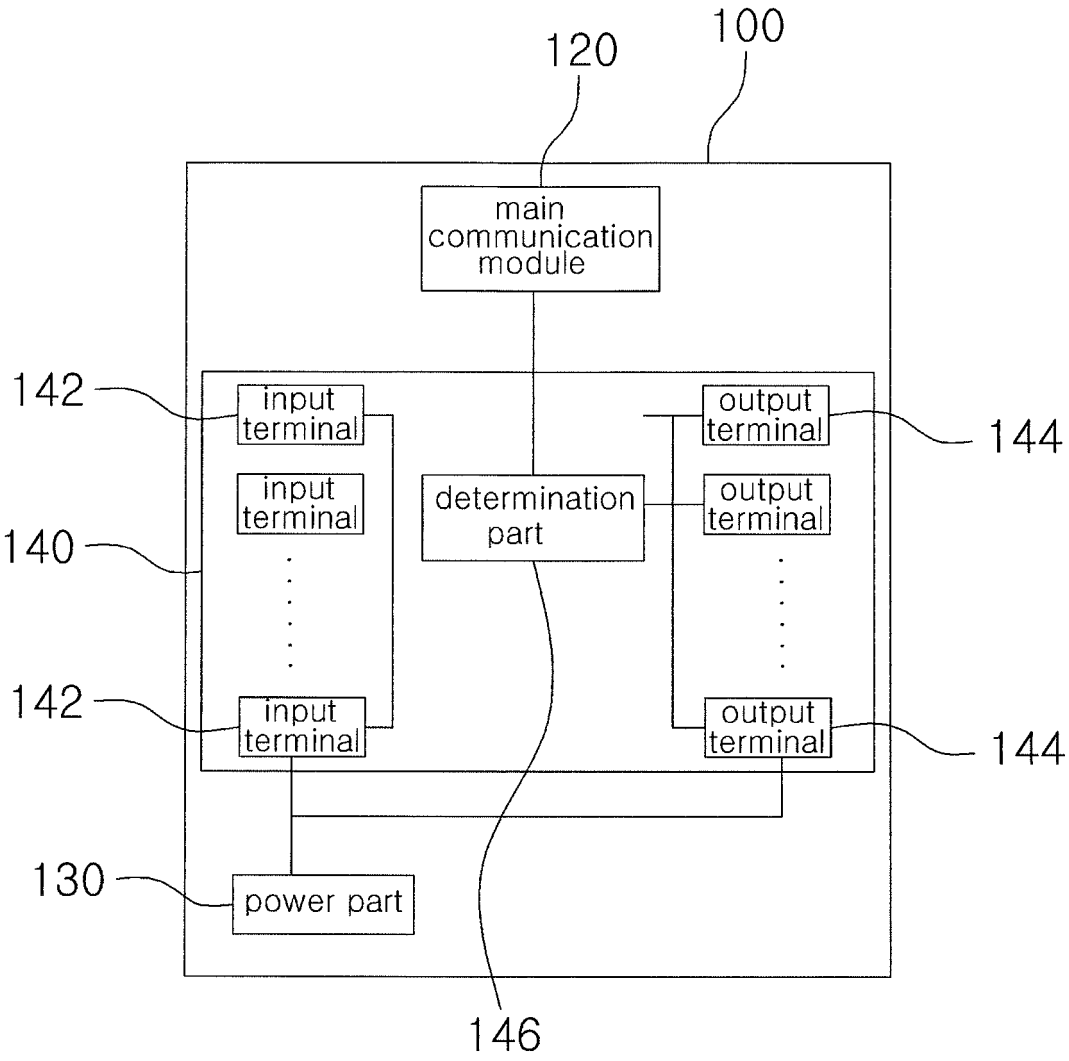
[Fig. 5]


100
148
110
120
142
160
144
112
162

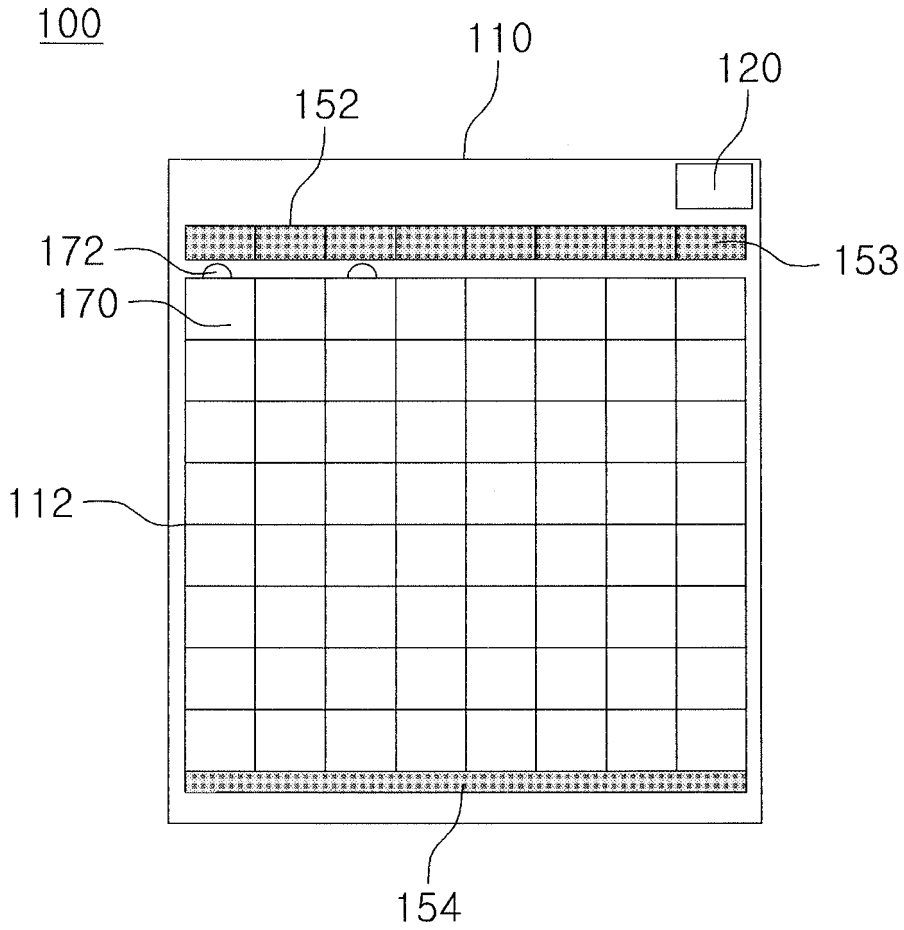
[Fig. 6]



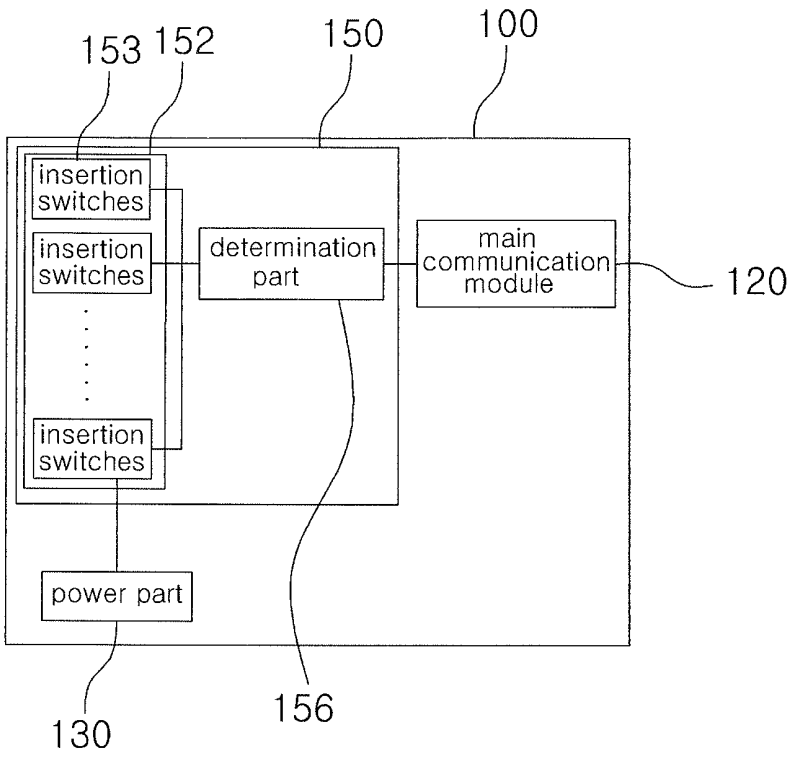
[Fig. 7]


120
100
main communication module
142
input terminal
input terminal
140
142
input terminal
determination part
output terminal
output terminal
144
output terminal
144
130
power part
146

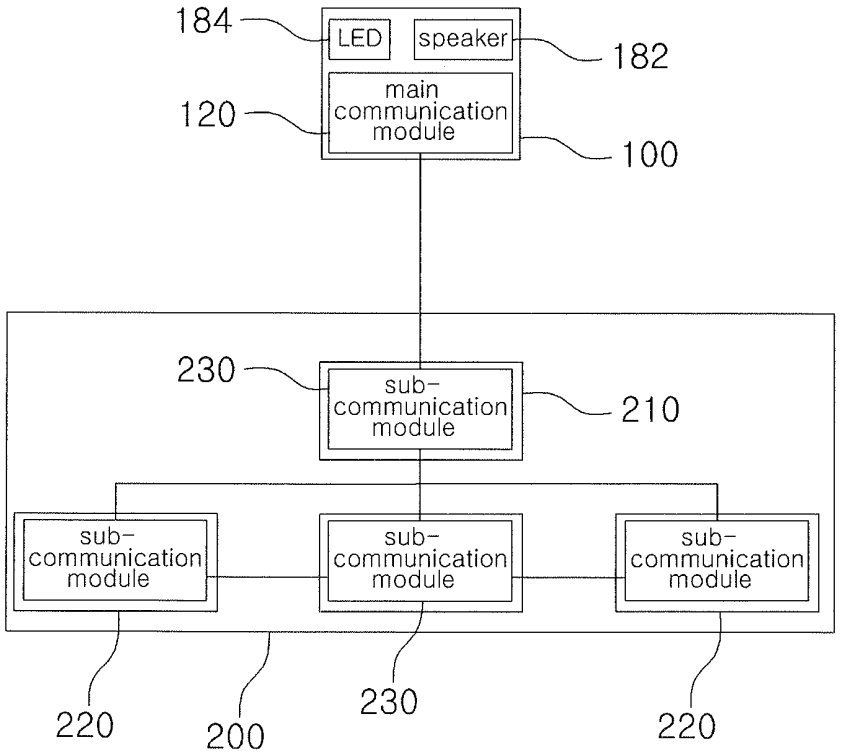
[Fig. 8]



[Fig. 9]


153
152
150
100
insertion switches
insertion switches
insertion switches
determination part
main communication module
120
power part
130
156

[Fig. 10]


184
LED
speaker
182
120
main communication module
100
230
sub-communication module
210
sub-communication module
sub-communication module
sub-communication module
220
200
230
220

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2015/002226

A. CLASSIFICATION OF SUBJECT MATTER

A63F 9/10(2006.01)i

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)

A63F 9/10

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean Utility models and applications for Utility models: IPC as above
Japanese Utility models and applications for Utility models: IPC as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS (KIPO internal) & Keywords: external device, linkage, puzzle, detection, realization, system

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KR 10-2003-0049317 A (LEE, Young Woo) 25 June 2003 See abstract, figures 1-3, pages 3-4, claims 1-2	1-2,9
A		3-8,10-17
Y	KR 10-2006-0079687 A (NHN CORPORATION) 06 July 2006 See abstract, figures 1-3, pages 2-3, claims 1-4	1-2,9
A		3-8,10-17
A	US 2005-0049023 A1 (FOSTER, Bruce) 03 March 2005 See abstract, figures 2-6, paragraphs [0021]-[0027], claims 1-3	1-17
A	KR 10-2012-0084889 A (JEONG, Gu - Min) 31 July 2012 See abstract, figures 3-6, paragraphs [0049]-[0061], claims 1-3	1-17

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Date of the actual completion of the international search	Date of mailing of the international search report
19 MAY 2015 (19.05.2015)	**20 MAY 2015 (20.05.2015)**
Name and mailing address of the ISA/**KR** Korean Intellectual Property Office Government Complex-Daejeon, 189 Seonsa-ro, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer Telephone No.

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/KR2015/002226

Patent document cited in search report	Publication date	Patent family member	Publication date
KR 10-2003-0049317 A	25/06/2003	KR 20-0273771 Y1	27/04/2002
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US 2005-0049023 A1	03/03/2005	US 7585216 B2	08/09/2009
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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- KR 101005344 **[0005] [0006]**