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Enshaee et al.

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(54) **BUTTON PRESSING DEVICE WITH MOVING PLATE AND STICKY BALL**

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(51) **Int. Cl.**

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H01H 9/02	(2006.01)
G07C 9/00	(2006.01)

(52) **U.S. Cl.**

CPC ***G05G 1/02*** (2013.01); ***G07C 9/00944*** (2013.01); ***H01H 9/0235*** (2013.01)

(58) **Field of Classification Search**

CPC G05G 1/02; H01H 9/0235; G07C 9/00944

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2002/0123381 A1* 9/2002 Akeripa A63F 13/02 463/26

* cited by examiner

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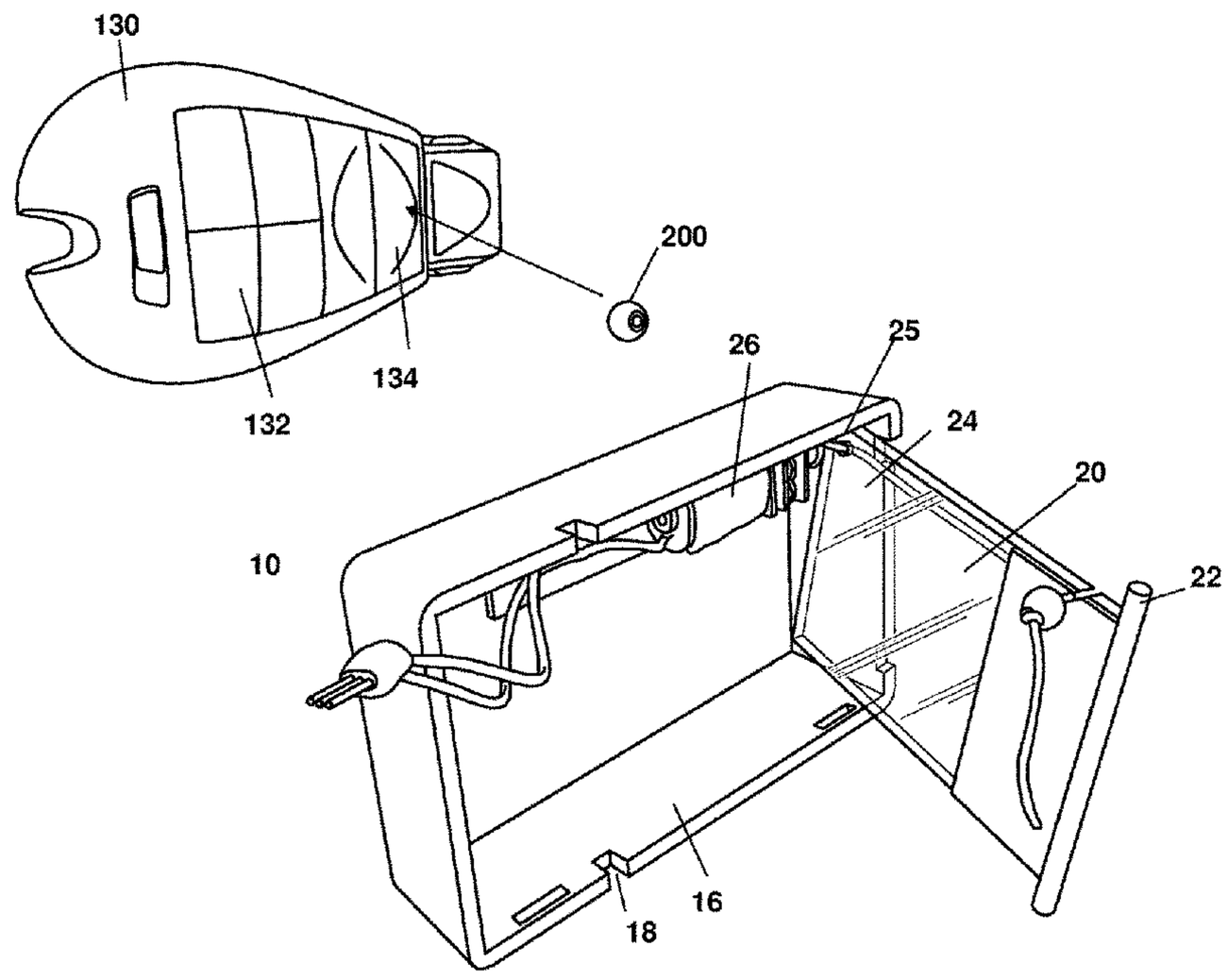
(57) **ABSTRACT**

A resilient ball is placed on a button to be pressed. The ball rises above the rest of the surface of a device with a button, so that a plate which pushes down on the device presses first against the ball, and presses the button there-beneath. A user can place the ball on a button of his/her choice and insert it in a housing, so that, when the plate is pushed downward, it will, in turn, cause the chosen button to be pressed. The plate is held with a dowel on one end, extending past the plate thereof at another end and into portals which are part of, or fixed to, the housing. The compressible ball is thus positioned between the plate and the button to be pressed, the device abutting the housing and/or a fixed plate on its other side.

17 Claims, 6 Drawing Sheets



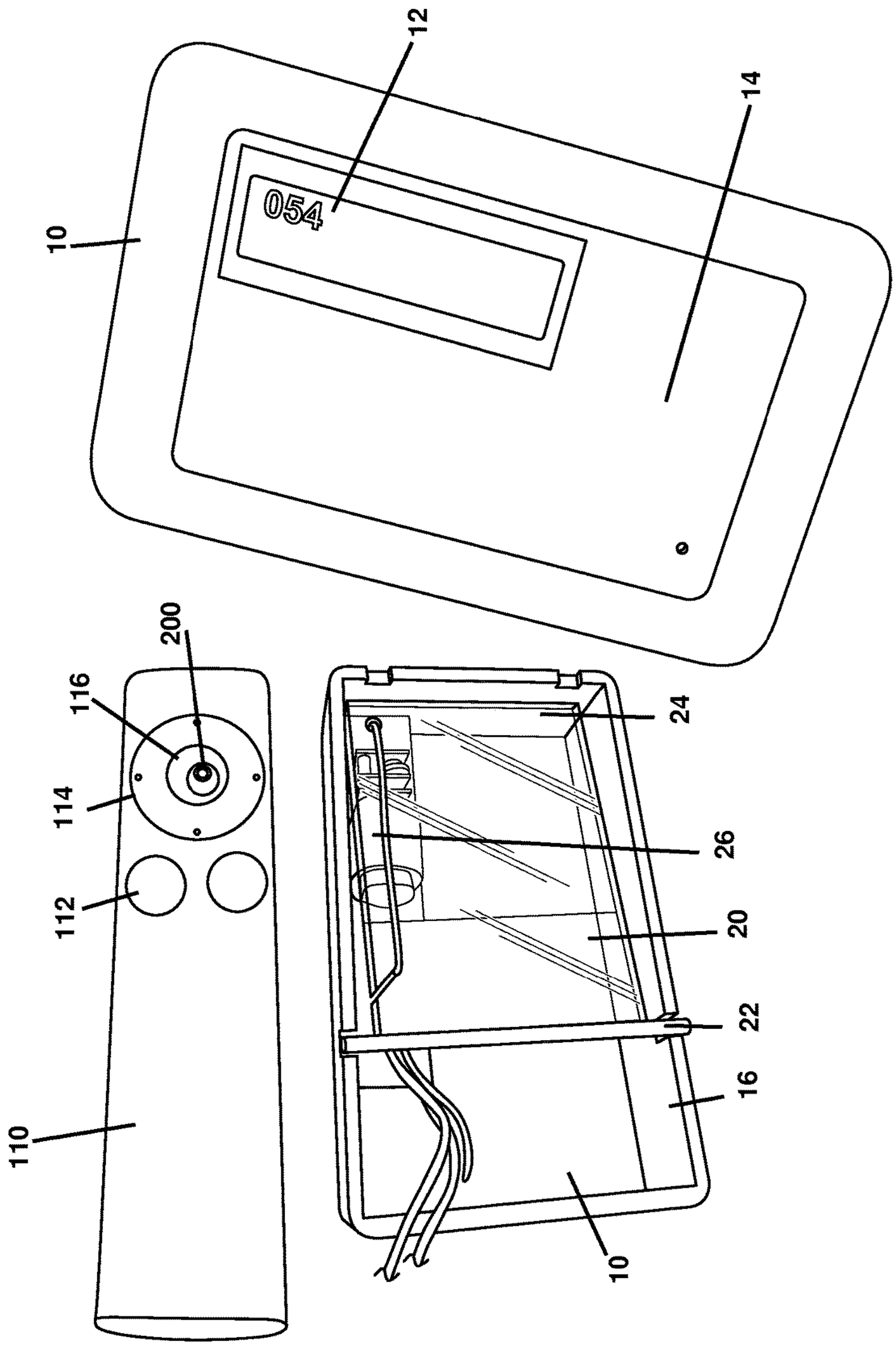


FIGURE 1

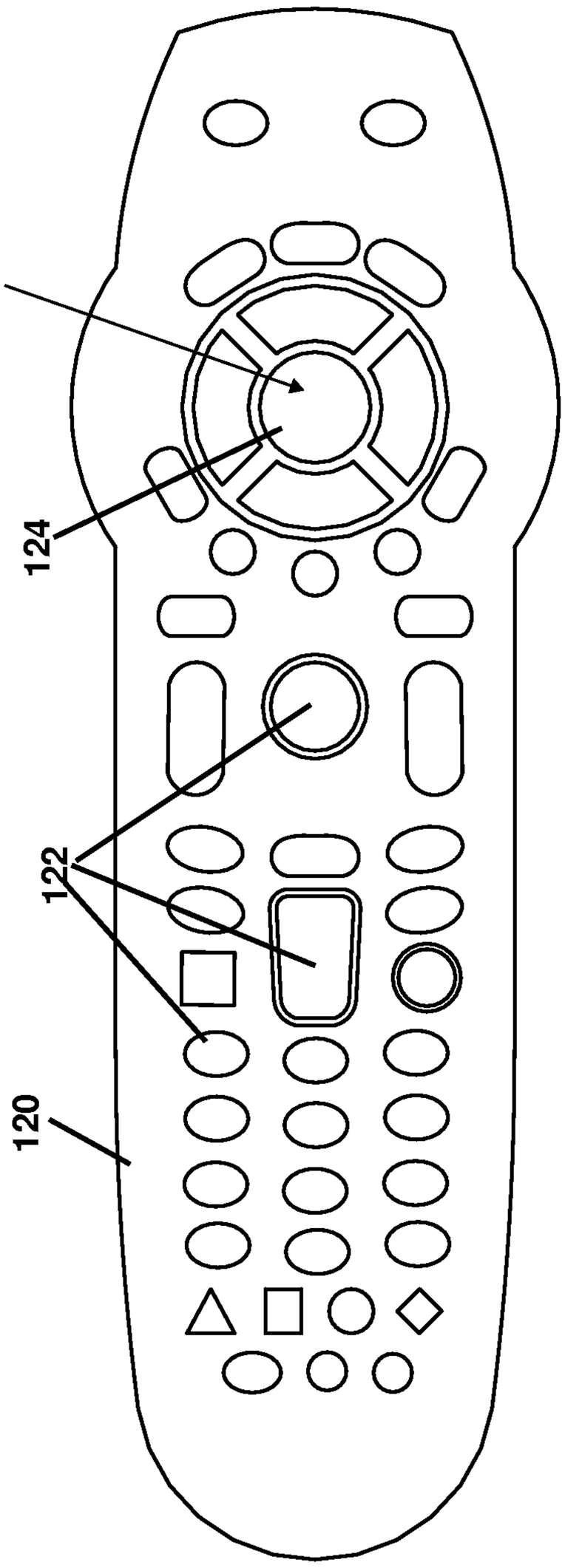


FIGURE 2

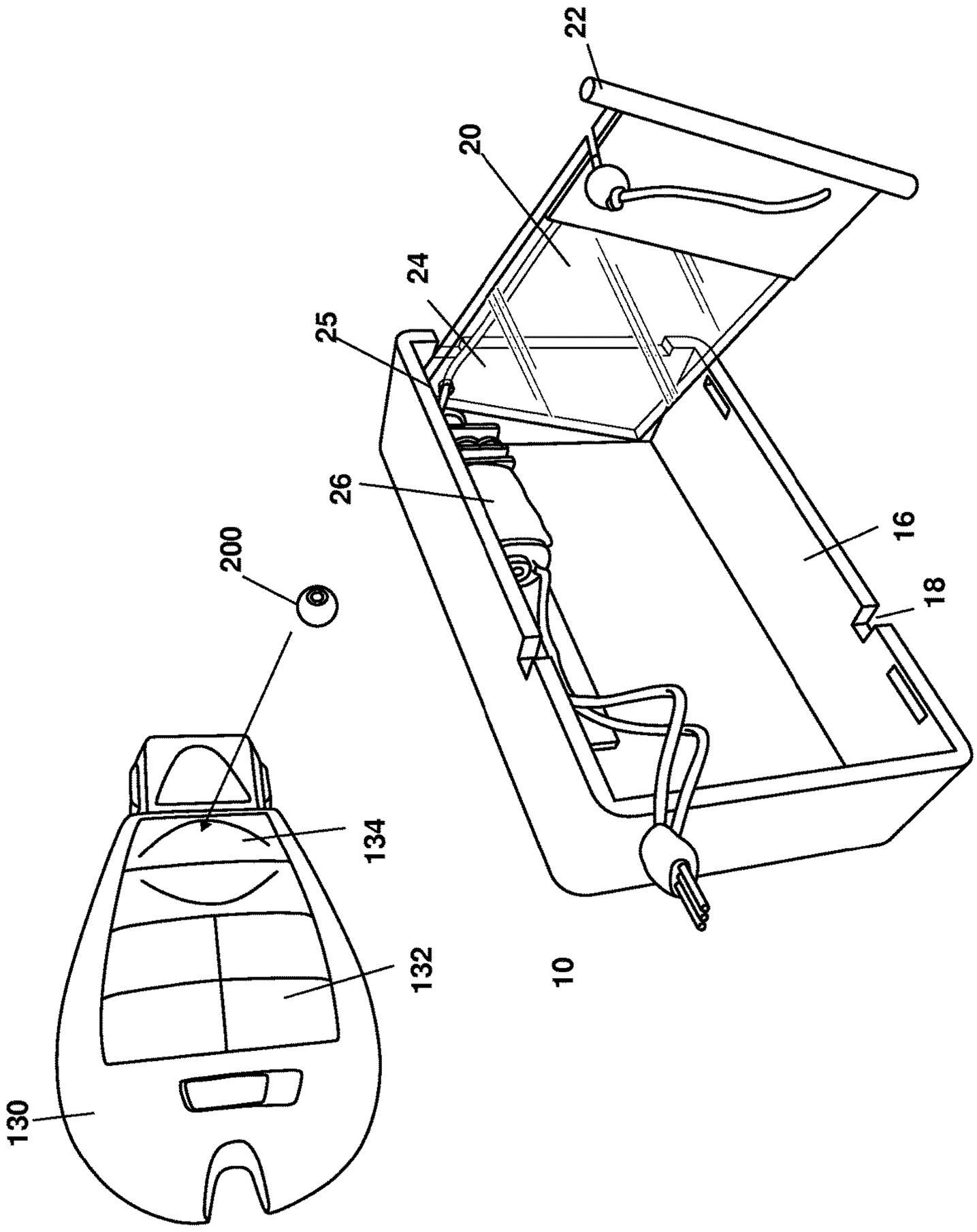


FIGURE 3

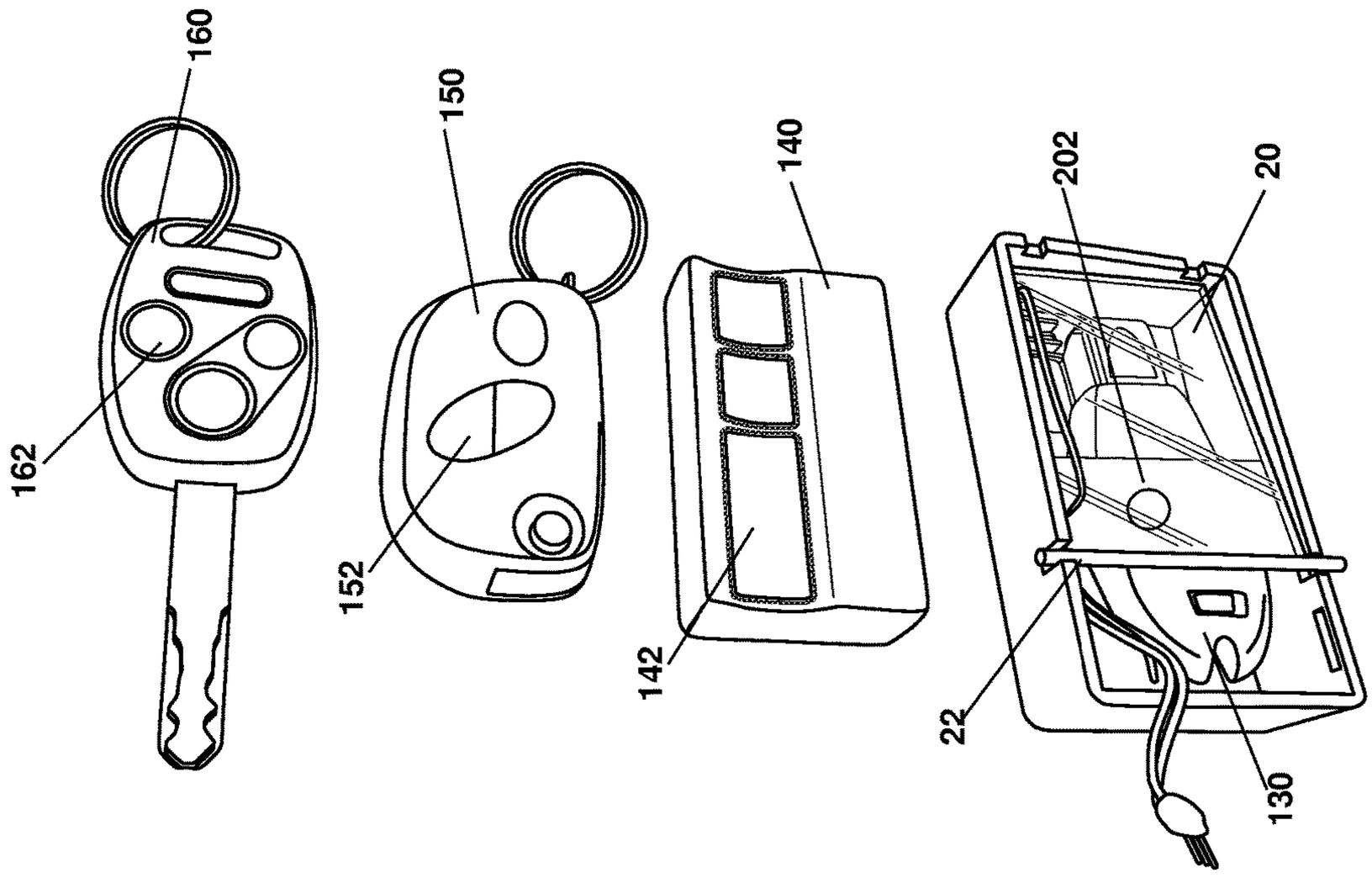


FIGURE 4

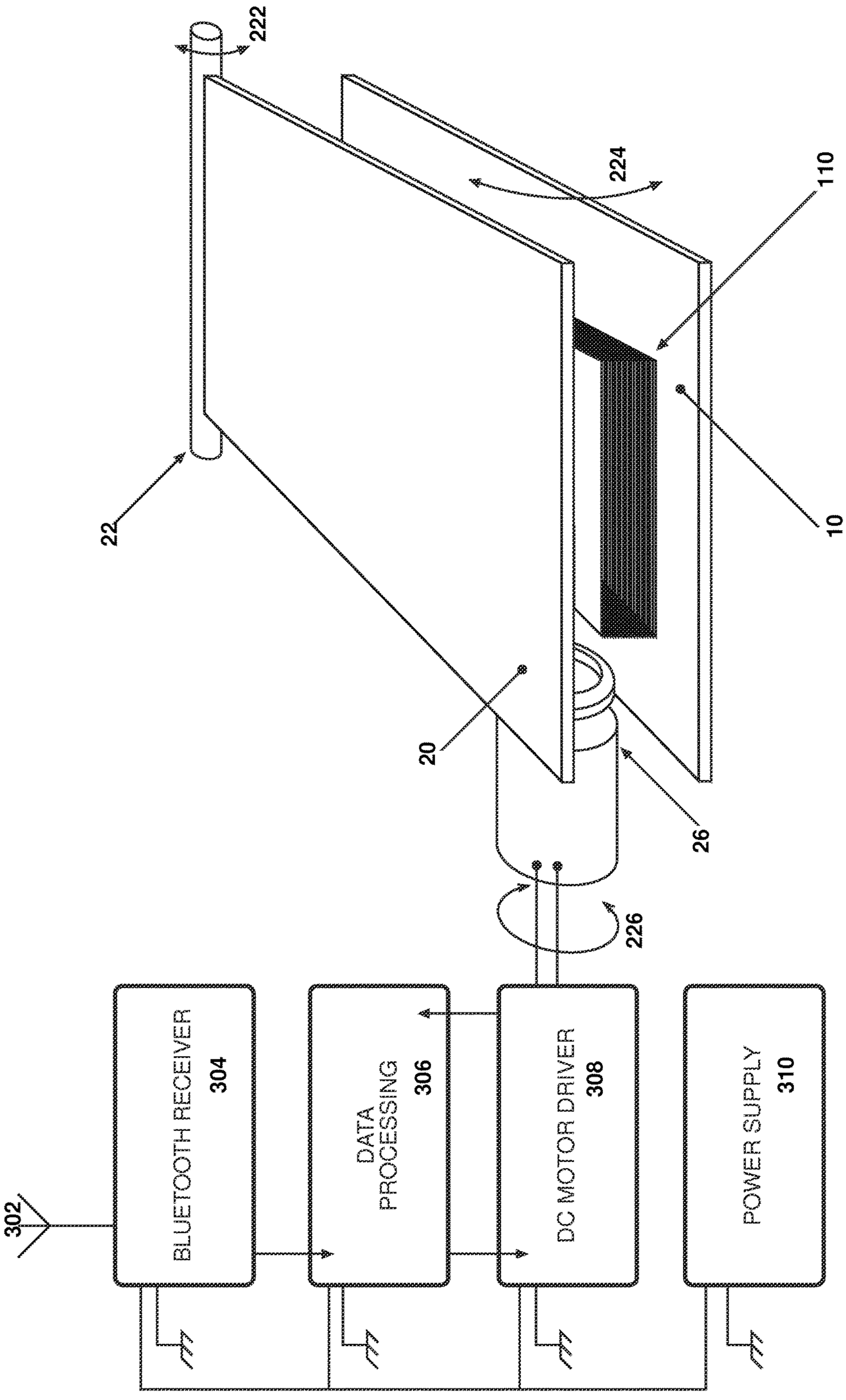

222
224
110
22
10
20
26
226
302
BLUETOOTH RECEIVER
304
DATA
PROCESSING
306
DC MOTOR DRIVER
308
POWER SUPPLY
310

FIGURE 5

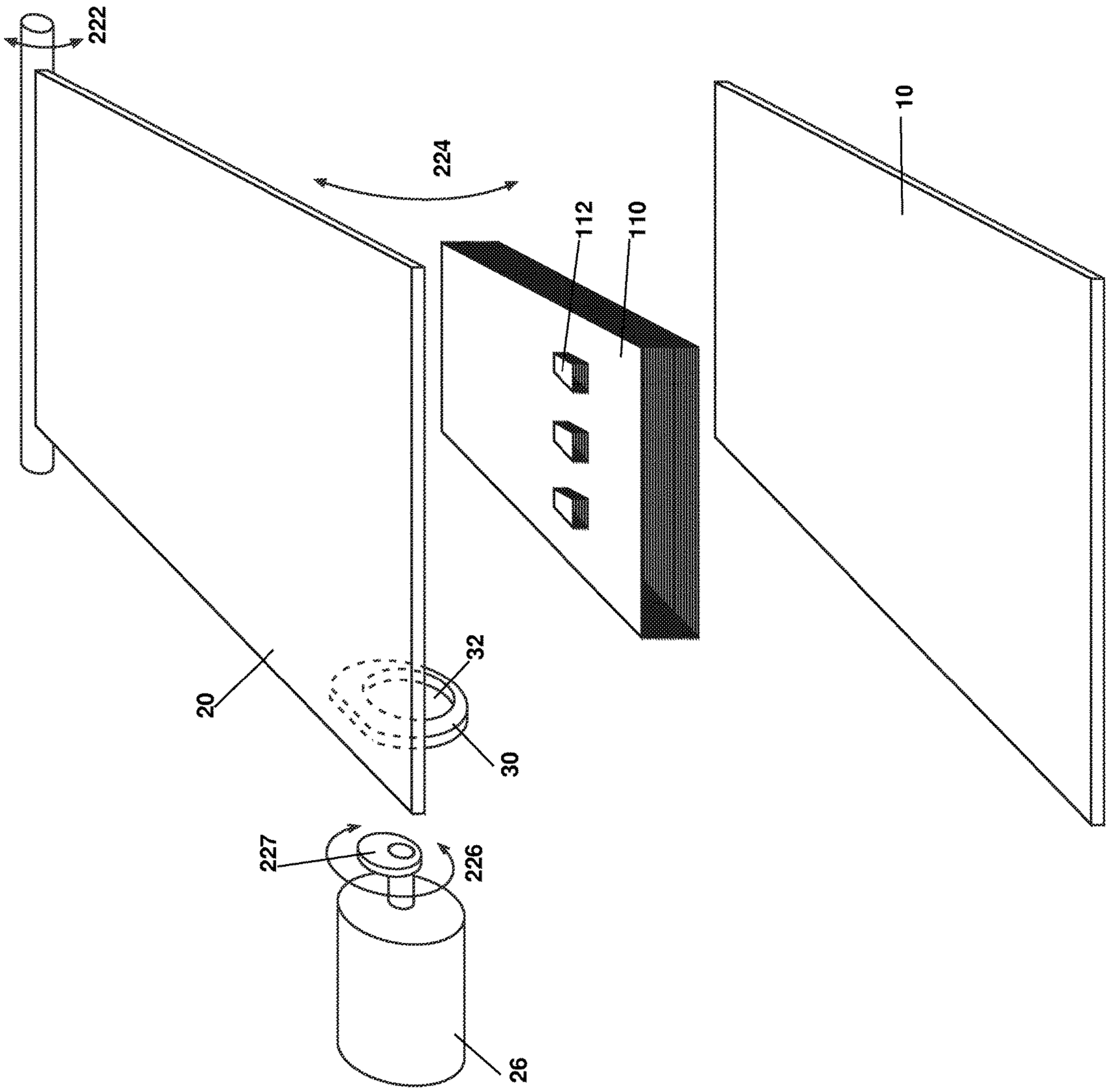


FIGURE 6

BUTTON PRESSING DEVICE WITH MOVING PLATE AND STICKY BALL

This application incorporates by reference U.S. patent application Ser. No. 14/822,084 entitled Double Wireless Receipt and Transmission with Mechanical Movement Causing Second Wireless Transmission having a filing date of Aug. 10, 2015, having the same inventors as the present application.

FIELD OF THE DISCLOSED TECHNOLOGY

The disclosed technology relates generally to button pressing and, more specifically, to pressing buttons by pressing a plate against a ball into a button.

BACKGROUND OF THE DISCLOSED TECHNOLOGY

Remote controls are ubiquitous. Such devices transmit a signal wirelessly using infrared, radio frequency, or otherwise, to a receiver. They are used for various receiving devices, including televisions, garage doors, gates, cars, and even window shades, as well as model craft. They work well, but require specialized devices which transmit particular encoded data. The easiest way to operate a receiving device, for a consumer, is simply to use the remote control provided by the manufacturer or retailer.

While programmable devices exist, these too are standalone devices which require manual button presses to operate. Still further, it is not always possible to copy the transmitted signal, as manufacturers may encrypt or distort the transmission in a way that changes each time or requires a particular piece of hardware. Third party remote control is discouraged, difficult, or simply not worth the expense.

The problem is that current remotes are each proprietary in size, shape, and codes transmitted. In order to create a truly universal remote, one would need to be able to transmit infrared, radio frequency (RF), and have buttons Which are equally easy to use as remote control, while coding for many different remote controls being used in one interface. There exists a need in the art to be able to operate such remotes from a common interface while retaining functionality, ease of producing the desired transmission, and minimum expense.

SUMMARY OF THE DISCLOSED TECHNOLOGY

Embodiments of the disclosed technology include a button-pressing kit. The kit has a fixed plate which abuts a transmitter device. A "plate" is defined as a rigid length of material having an elongated length extending further than any other dimension of the material. The transmitter device has a depressible button on an exterior surface thereof. The transmitter can be a remote control and may have more than one depressible button. The "button," for purposes of this disclosure, is a mechanical button which activates an electrical switch being depressed. "Depressed," for purposes of this specification, is movement of a button, such that an electrical gate is opened or closed (e.g., switched on or off), activating transmission of a radio, light, or other signal. A resilient ball abuts the button and extends above a plane defined by outermost extents of the exterior surface of the transmitter device. "Resilient" is defined as "above to be deformed by pressure and substantially and repeatedly return to its original shape." An axially rotating plate abuts the resilient ball.

Axial rotation (rotating around an axis) in a first direction depresses the button, based on pressure applied by the resilient ball against the button. A motor can cause this axial rotation. However, upon the pressure being too great (e.g., resistance on the motor determined), the button can be considered "depressed," and the motor can rotate in the other direction, sending the movable plate back to a starting point.

In order to depress the button, a specific input may be required, such as on a tactile sensor. This input may be a code entered based on placement and quantity of taps on a housing or a larger structure (such as a car) in which the devices are kept.

The resilient ball can stick to the button (have adhesive connection) and lacks sticking ability with respect to the axially rotating plate (lacks adhesive connection).

More specifically, an embodiment of the disclosed technology can have a compressible ball (defined as "able to be compressed to less than 80% of its non-compressed size while still returning to it's original size), a plate with dowel extending past the plate at a first end, and a housing with portals holding the dowel on either end of the dowel. The compressible ball is positioned between the plate and a device with a button, the device with a button abutting the housing (on the inside or outside of the housing). The compressible ball and the button can be removably and/or adhesively connected. A motor can be mechanically engaged with the plate at a second end, the second end being at an opposite side from the first end. One "side" is differentiated from another by way of a midpoint halfway between the extreme ends. An "end" is defined as between an edge and 20% of the distance from end to end. An "extreme end" is defined as no more than 3% of the distance from the edge of the respective side to the other edge on the opposite side.

A spin of the motor in a first direction causes the dowel to rotate and compress the compressible ball against the button, whereas a spin in a second opposite direction causes the dowel to rotate away from the button, pulling the plate away from the button as well. This spin/rotating can be activated based on a sequence of pressure placed on the housing directly, or through another object, such as the exterior of a car or windshield.

The same concept is also described with respect to its method of use. A button-pressing method is carried out by way of adhering a compressible or resilient ball on a button of a remote control (a type of transmitter designed to act on another object from a distance via wireless transmission of data), placing the remote control between a housing and a rotatable plate, and rotating the rotatable plate towards the remote control at least until the button is pressed. The ball extends above a plane defined by outermost extents of an exterior surface of the remote control. Receipt of a specific tactile input pattern or a remote transmission (different from the transmission of the remote control/transmitter) can cause the rotating. When a tactile input pattern is used, this can be on an exterior of a car causing the button to be pressed and the car to be unlocked.

"Substantially" and "substantially shown," for purposes of this specification, are defined as "at least 90%," or as otherwise indicated. Any device may "comprise" or "consist of" the devices mentioned there-in, as limited by the claims.

It should be understood that the use of "and/or" is defined inclusively such that the term "a and/or b" should be read to include the sets: "a and b," "a or b," "a," "b."

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** shows, at a high level, devices which are used to carry out embodiments of the disclosed technology.

FIG. **2** shows buttons on a transmitter device with placement of a resilient ball, used in embodiments of the disclosed technology.

FIG. **3** shows a different transmitter device with resilient ball and plate spaced apart from one another, in an embodiment of the disclosed technology.

FIG. **4** shows further examples of transmitting devices used in embodiments of the disclosed technology, as well as the transmitter device of FIG. **4** placed within a housing with rotating plate.

FIG. **5** shows plates and accompanying control units used by depressing a button of a transmitter, in an embodiment of the disclosed technology.

FIG. **6** shows a spaced-apart version of the devices shown in FIG. **5**.

DETAILED DESCRIPTION OF EMBODIMENTS OF THE DISCLOSED TECHNOLOGY

Embodiments of the disclosed technology have a compressible or resilient ball (which can be of any shape, such as spherical, conical, prism, cylindrical, etc.). This ball is placed on a button to be pressed, such as on a remote control or transmitter. The ball rises above the rest of the surface of the remote control or transmitter, and, as such, an item pressing down along the surface will contact and press the ball and, therefore, the button beneath it, before any other item on the surface of the remote control or transmitter. As such, a plate is used for this pushing, allowing a user to place the ball on a button of his/her choice and insert it in a housing, so that, when the plate is pushed downwards, it will, in turn, cause the chosen button to be pressed. The plate is held with a dowel on a first end, extending past the plate (meaning, the flat elongated side) thereof at a second end, and into portals which are part of, or fixed to, the housing. The compressible ball is thus positioned between the plate and the button to be pressed, the device abutting the housing and/or a fixed plate on its other side. A motor is activated to push the plate down at an angle (or transverse to the button, bottom of the housing, or top of the housing) to activate the button.

Embodiments of the disclosed technology will become clearer in view of the following description of the drawings.

FIG. **1** shows, at a high level, devices which are used to carry out embodiments of the disclosed technology. A remote control or transmitter **110** is shown with buttons **112**, **114**, and **116**. A resilient ball **200** is placed on any one of the buttons. In this manner, a person chooses which button he/she wishes to be pressed by other devices of the disclosed technology, because the button **200** rises above the plane of the exterior of the transmitter. That is, the transmitter has a top plane defined by its top surface (a surface with pressable buttons which are activated by pushing the button inwards, towards an interior of the transmitter device). These buttons are switches which are activated based on pressure. By placing the resilient ball **200** on a button (here, on button **116**) it is now "higher" or further from the surface defined by the other buttons and same side of the transmitter **110**. The exterior plane of the device is defined by taking a theoretically perfectly rigid material of a theoretically infinitely small width and leaning it against one side of the transmitter (or other device) and placing such a device against a side of the transmitter. This plane now forms the exterior plane of the device on the side on which it leans, a side being one of the cardinal sides, in three dimensions, of the product, such as the top side, button side, left side, right side, front side, or rear side. An exterior side is a planar side of the device (at least 50% of the side lying in the same plane).

The transmitter, such as transmitter **110**, is then placed within a housing **10** having a rigid back wall or plate and rotatable/movable plate **20**. By way of a motor **26** or other movement device, the movable plate **20** is rotated about an axis defined by a dowel **22** which fits within slots of the side walls **16** of the housing **10**. A far end **24** of the movable plate **20** then moves downwards, applying pressure on the resilient ball **200**. A cover or front panel **14** of the housing **10** can have a display **12**. The cover **14** can have sensors which sense touch or vibration, in order to determine that a code or pattern has been made there-on to cause the button (e.g., button **116**) to be pressed by the downward rotation of the movable plate **20**. The display **12** can update as the code or pattern is entered, to show the present status of the code entered.

FIG. **2** shows buttons on a transmitter device with placement of a resilient ball, used in embodiments of the disclosed technology. Here, the transmitter is a television remote control with a front surface **120**, an example of an exterior surface, with buttons **122** and **124**, which rise above the exterior surface and form the uppermost extents of an exterior plane. Thus, the exterior plane passes over the tops of the buttons **122** and **124**. The resilient ball **200** then rises above this exterior plane. As such, a movable plate rotating or moving downward towards the front exterior surface **120** of the remote control will be stopped when hitting the resilient ball **200**, pressing the ball into the button **124**, causing it to be pressed. A user can place the resilient ball on any of the buttons of the transmitter which are to be pressed, as the resilient ball **200**, wherever it may be located, will be the highest point with reference to this exterior side of the transmitter. This is true even if the buttons **122** and **124** are recessed into the transmitter surface **120**, as long as the resilient ball rises above the planar front surface **120**.

FIG. **3** shows a different transmitter device with resilient ball and plate spaced apart from one another, in an embodiment of the disclosed technology. Here, a transmitter has a front surface **130** with various buttons **132** and **134**. The resilient ball **200** is placed on a button **134**. The front surface **130** is curvilinear; however, the resilient ball **200** rises above an exterior plane placed against it, due to the downward angle of the surface, such that, when placed in the housing **10** in the orientation shown, the side of the movable plate **200**, which moves downward (most extremely at end **24**), hits into the resilient button **200** before hitting into the buttons or exterior surface **130** of the transmitter.

Referring now to the housing **10** specifically and in more detail, there are two portals **18**, one in each side wall **16**, which are adapted for a dowel **22**. The dowel **22** has a length greater than that of the narrower plane of the rectangular-shaped movable plate **20**, as well as greater than that of the housing **16**. Portals for holding the dowel **22** or end of the movable plate **20** can be interior to the housing as well. The end **24** of the movable plate **20** then moves up or down, based on the rotation of the motor **26**, which is translated by way of gearing known in the order into up/down motion at a contact point near the extreme end **25** of the movable plate **20**. Thus, one end of the plate **30** remains at a constant height, in embodiments of the disclosed technology, while the other end **25** moves downwards onto the resilient ball.

Once the resilient ball is pressed, it may begin to compress or may be incompressible by way of the forces placed against it by the movable plate **20**. Upon (further) pressing, the side of the ball **200** adjacent to the button (e.g., button **134**) is moved downwards, causing the button **134** to move. Once resistance is above a certain level, the downward movement of the movable plate **20** is ceased, and it moves back upwards to a resting position, above the transmitter **130** and resilient ball **200**. In the resting position, the movable plate **20** is spaced apart from the resilient ball **200** and transmitter **130**.

Discussing now the resilient ball **200** specifically, the ball can have adhesive properties, allowing it to be placed on or against a button and adhere-thereto. A separate adhesive may be used (such as tape or even glue), but in embodiments, the surface or surface coating of the ball, or at least a single side of the ball, is "sticky" (defined as, "designed to stick to things on contact"). The side opposite the side with adhesive quality ("sticky") can be non-adhesive ("non-sticky") with reference to its ability to stick to the moving plate **20**, such as a glass or plastic plate, which can be coated with a non-stick coating, or have a surface that does not adhere to the resilient ball **200**. Still further, only one side of the ball **200** has adhesive qualities in embodiments of the disclosed technology, whereas the other side is smooth and/or non-sticky. One can stick the ball to a button only with one side (the sticking/adhesive side,) while the remaining portions of the exterior of the resilient ball **200** do not stick. The ball **200** can have a flat bottom which is sticky, while a remaining, generally spherical, portion and/or top flat side lacks sticky qualities.

FIG. **4** shows further examples of transmitting devices used in embodiments of the disclosed technology, as well as the transmitter device of FIG. **4** placed within a housing with a rotating plate. Any one of a key **160** with button **162** (such as for a car), key-chain garage door opener **150** with button **152**, full size garage door opener **140** with button **142** can be used with embodiments of the disclosed technology, by way of example. The transmitter **130** is shown in the housing **10** with the resilient ball **200** placed below the circle **202** shown on the movable plate **20**. When the movable plate is moved down, the resilient ball **200** extends about the exterior surface defined by its adjacency to the path of the movable plate **20**. As such, the movable plate **20** hits into the resilient ball, pushing down a button there-beneath.

FIG. **5** shows plates and accompanying control units used to depress a button of a transmitter, in an embodiment of the disclosed technology. Here, a BlueTooth receiver **304** or any other wireless receiver can be used to receive a signal via antenna **302**. A processor, input/output, memory storage (volatile or non-volatile) is represented by the data-processing block **306**. A power supply **310** powers the processor, receiver, and/or motor **26**. Data is received from one or more inputs, such as a remote device transmitting a code or a sensor detecting movement or key presses on a surface of the device (see FIG. **1**). The data processing block **306** determines when to operate the DC motor driver **308** to turn the shaft of the motor **26** in the direction indicated by arrow **226**. This circular motion of the motor shaft, in turn, raises and lowers the movable plate **20** in the direction **224**. The plate **10**, which can also be the back of the housing **10** shown in earlier figures, is held in place with respect to the transmitter device **110** shown there-on, as well as the motor **26**. The plate **20** rises, also spinning the dowel **22** in the direction **222**. The plate **20** starts in a resting position above the transmitter **110** and the resilient ball adjacent there-to. The plate **20** is then lowered until it presses into the resilient ball **200** and, in turn, a button on the transmitter **110** is pressed.

FIG. **6** shows a spaced-apart version of the devices shown in FIG. **5**. Here, one can see the gearing **227** on the end of the motor **26**. When the gear **227** turns, it moves gear **30** (fixedly attached to plate **20**) by way of the portal **32** of the gear **30** which gear **227** fits within. This raises and lowers the plate **20** in the **224** direction, while the dowel further moves in direction **222**. When moving down, it presses against a button **112** or a plurality thereof. By placing a resilient ball **200** above a button and adjacent or stuck there-to, the resilient ball is first pressed, causing the button on which it is placed to be activated as the motor **226** moves the plate **20** towards the transmitter.

In an embodiment, the device is placed inside a car with the housing adjacent to, or stuck to, a windshield or window. Tapping on the respective glass of the car is used to enter a code detected by a sensor within the housing, which activates the moving of the movable plate, pressing an unlock button, unlocking the car.

While the disclosed technology has been taught with specific reference to the above embodiments, a person having ordinary skill in the art will recognize that changes can be made in form and detail without departing from the spirit and the scope of the disclosed technology. The described embodiments are to be considered in all respects only as illustrative and not restrictive. All changes that come within the meaning and range of equivalency of the claims are to be embraced within their scope. Combinations of any of the methods and apparatuses described hereinabove are also contemplated and within the scope of the invention.

The invention claimed is:

1. A button-pressing kit comprising:

a fixed plate abutting a transmitter device, said transmitter device having a depressible button on an exterior surface thereof;

a resilient ball abutting said button and extending above a plane defined by outermost extents of said exterior surface of said transmitter device;

an axially rotating plate abutting said resilient ball.

2. The button-pressing kit of claim **1**, wherein axial rotation of said axially rotating plate in a first direction depresses said button based on pressure applied by said resilient ball against said button.

3. The button pressing kit of claim **2**, wherein a motor causes said axial rotation and, upon determination of resistance above a pre-determined threshold, a direction of said axial rotation is reversed.

4. The button-pressing kit of claim **2**, further comprising an input device requiring a specific tactile input pattern to axially rotate said plate and depress said button.

5. The button-pressing kit of claim **1**, wherein said resilient ball sticks to said button and lacks sticking ability with respect to said axially rotating plate.

6. The button-pressing kit of claim **4**, wherein said input device is a tap sensor, and said tactile input pattern is on a surface of housing, said housing holding said movable plate, said fixed plate, and said transmitter.

7. A button-pressing system comprising:

a compressible ball;

a plate with dowel extending past the plate at a first end;

a housing with portals holding said dowel on either end thereof;

wherein said compressible ball is positioned between said plate and a device with a button, said device with a button abutting said housing.

8. The button-pressing system of claim 7, wherein said compressible ball and said button are removably and adhesively connected.

9. The button-pressing system of claim 8, further comprising a motor mechanically engaged with said plate at a second end, said second end being at an opposite side from said first end.

10. The button-pressing system of claim 9, wherein a spin of said motor in a first direction causes said dowel to rotate and compress said compressible ball against said button.

11. The button-pressing system of claim 10, wherein a spin of said motor in a second direction causes said dowel to rotate in an opposite direction from said rotation of claim 10 and move said plate away from said button.

12. The button-pressing system of claim 10, wherein said spin of said motor is activated based on a sequence of pressure placed on said housing.

13. The button-pressing system of claim 12, wherein said housing is located inside a car, said button unlocks said car, and said pressure is applied on an exterior of said car.

14. A button-pressing method carried out by way of:

adhering a compressible or resilient ball on a button of a remote control;

placing said remote control between a housing and a rotatable plate;

rotating said rotatable plate towards said remote control at least until said button is pressed.

15. The button-pressing method of claim 14, wherein said ball extends above a plane defined by outer-most extents of an exterior surface of said remote control.

16. The button-pressing method of claim 15, wherein receipt of a specific tactile input pattern causes said rotating.

17. The button-pressing method of claim 16, wherein said tactile input pattern is on an exterior of a car, causing said button to be pressed and said car to be unlocked.

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