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Chen et al.

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(54) **ADJUSTABLE DOOR CHIME WITH INTERCHANGEABLE PARTS**

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(21) Appl. No.: **11/747,720**

(22) Filed: **May 11, 2007**

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Related U.S. Application Data

(60) Continuation-in-part of application No. 11/512,965, filed on Aug. 30, 2006, now Pat. No. 7,471,210, which is a division of application No. 10/798,836, filed on Mar. 11, 2004, now Pat. No. 7,126,490.

(60) Provisional application No. 60/503,626, filed on Sep. 17, 2003, provisional application No. 60/916,499, filed on May 7, 2007.

(51) **Int. Cl.**
G08B 3/00 (2006.01)

(52) **U.S. Cl.** **340/328**; 340/326; 340/692; 340/392.1; 340/392.2; 340/384.1; 116/153

(58) **Field of Classification Search** 340/328, 340/326, 692, 392.1, 393.3, 384.1, 825.31, 340/825.32; 116/9, 10, 153
See application file for complete search history.

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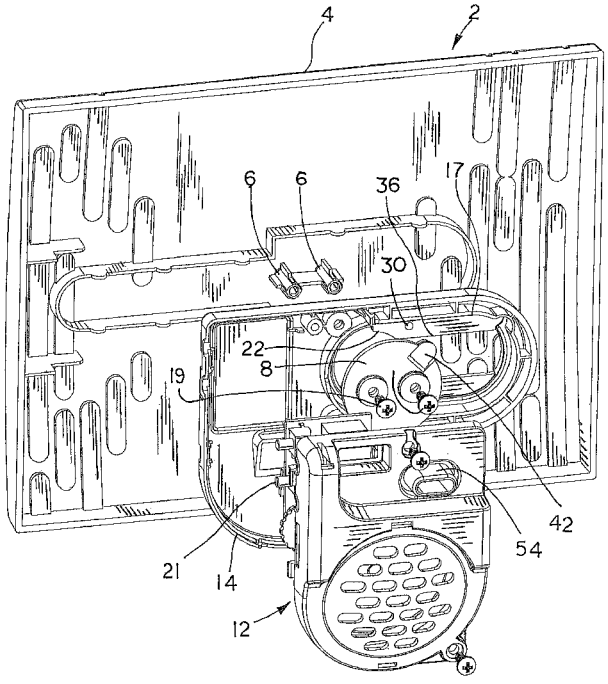
(74) *Attorney, Agent, or Firm*—Botkin & Hall, LLP

(57) **ABSTRACT**

The present invention is a door chime. The door chime has a decorative cover connected to a sound module including sound controls. The decorative cover is shiftable relative to the sound module from a first position in which the decorative chime will be displayed during normal use, to a second position to allow access to the sound controls in the second position. The connection between the sound module and the decorative cover allows for either a sliding connection or a rotating connection depending on the desired configuration. The power module for the door chime is interchangeable between a battery powered and hard wired module.

7 Claims, 10 Drawing Sheets



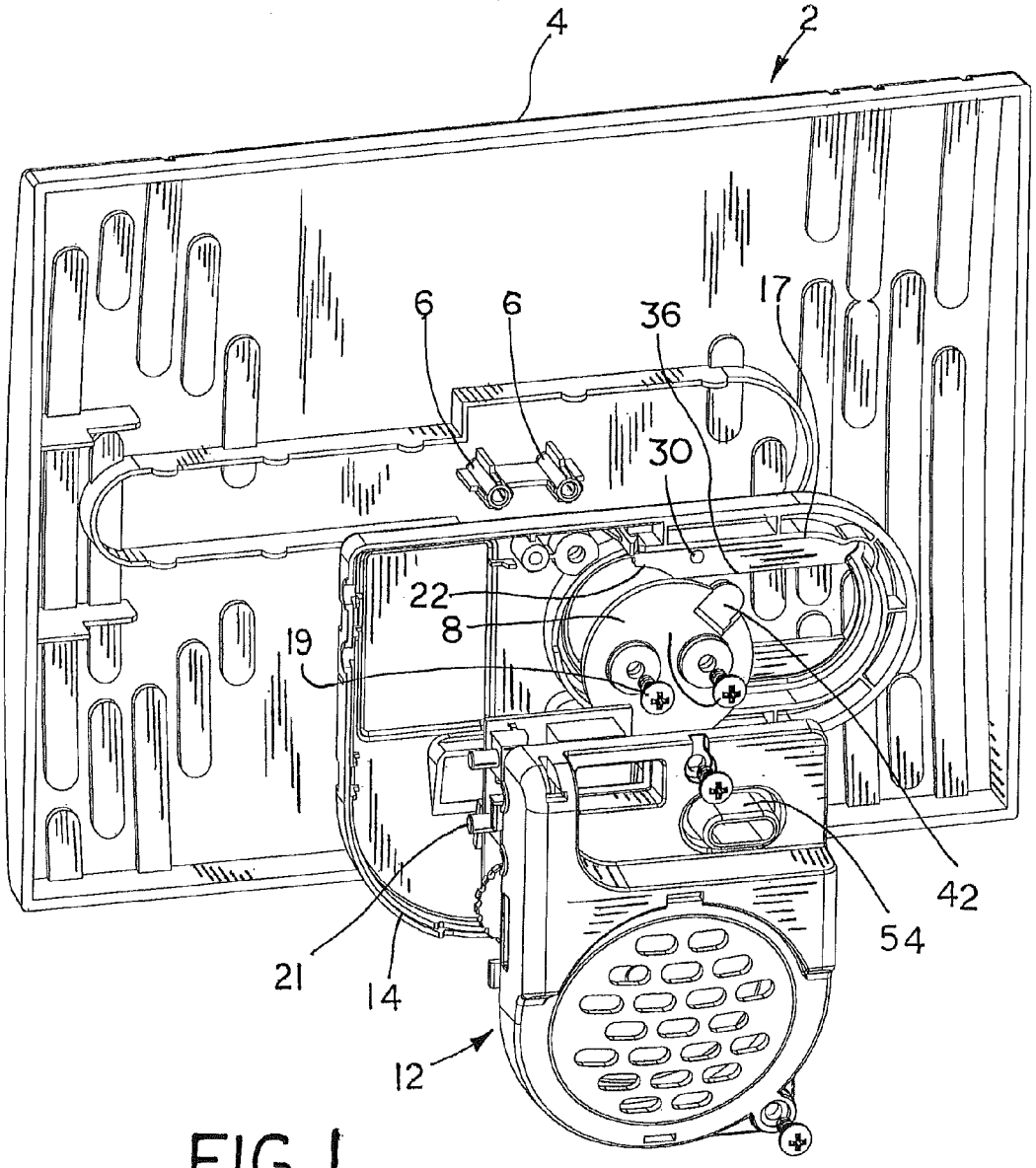


FIG. 1

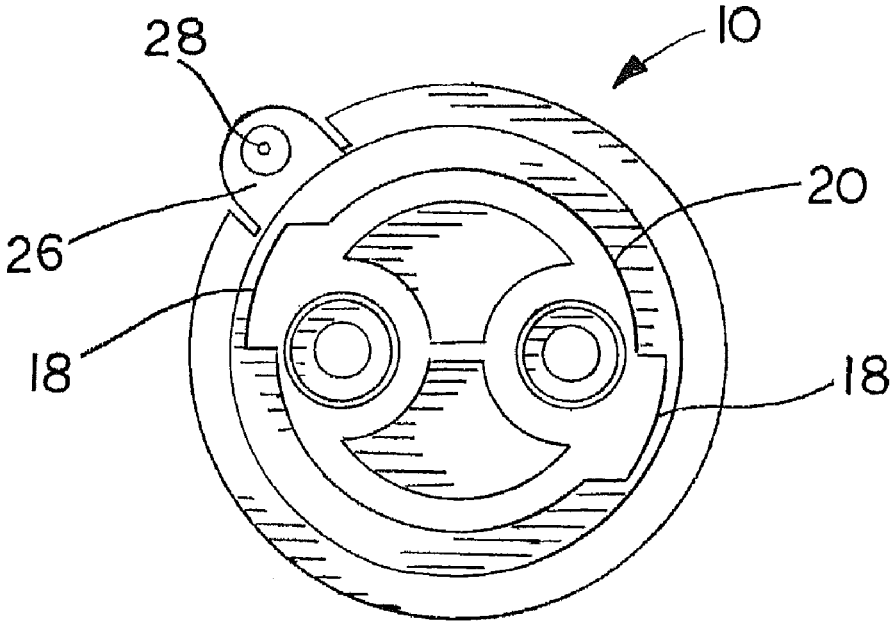


FIG. 2

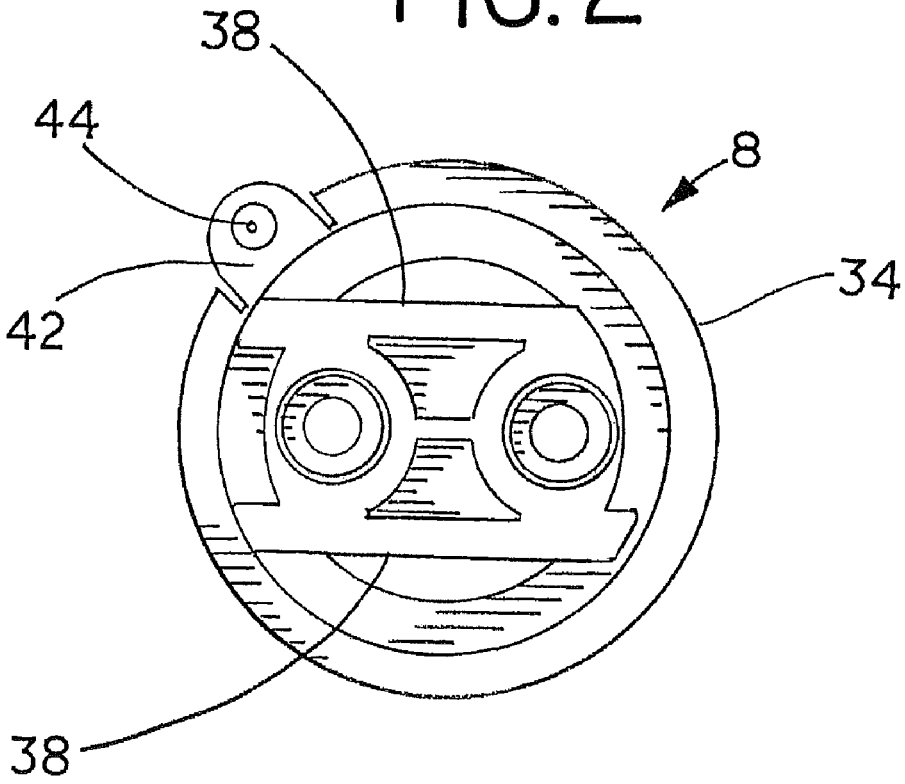


FIG. 3

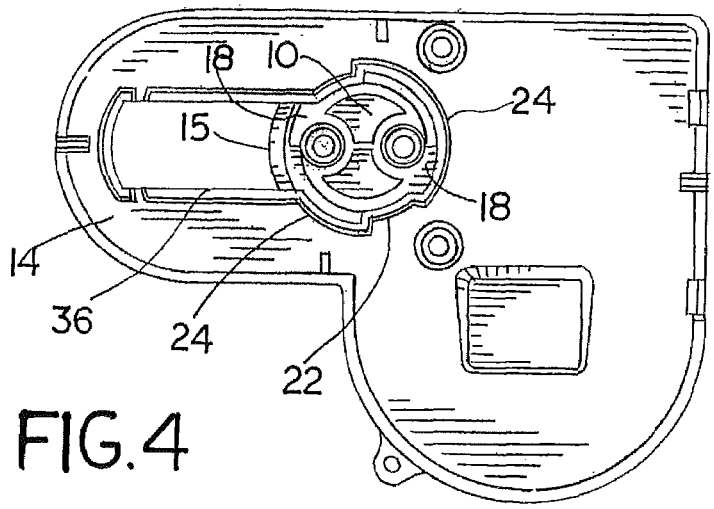


FIG.4

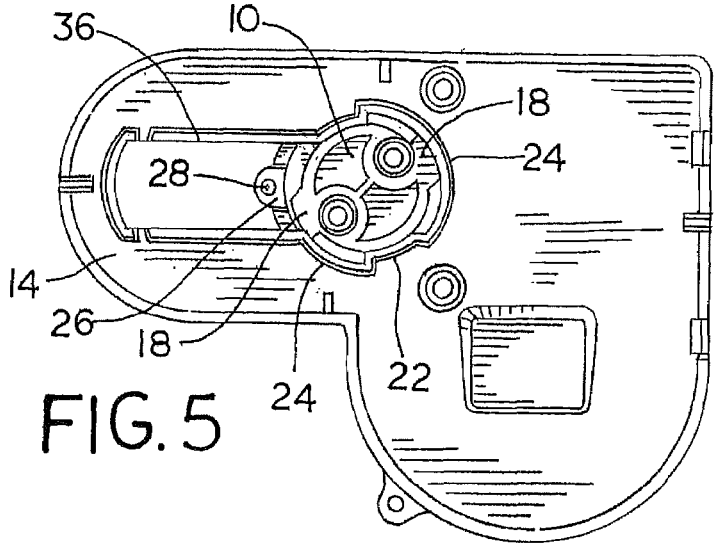


FIG.5

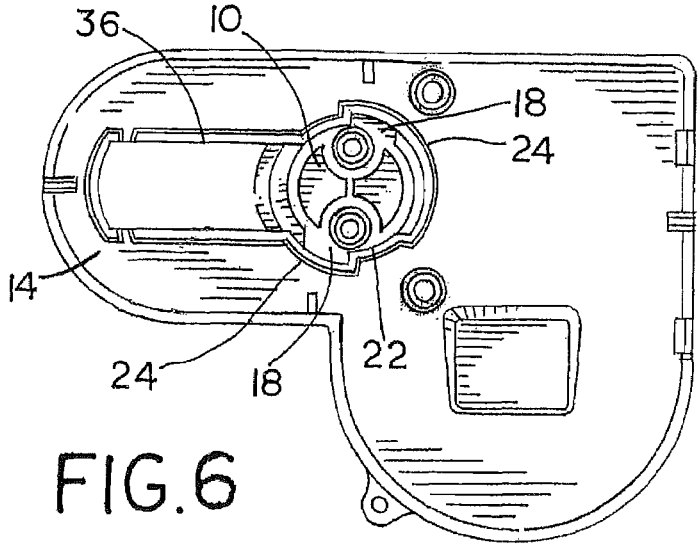


FIG.6

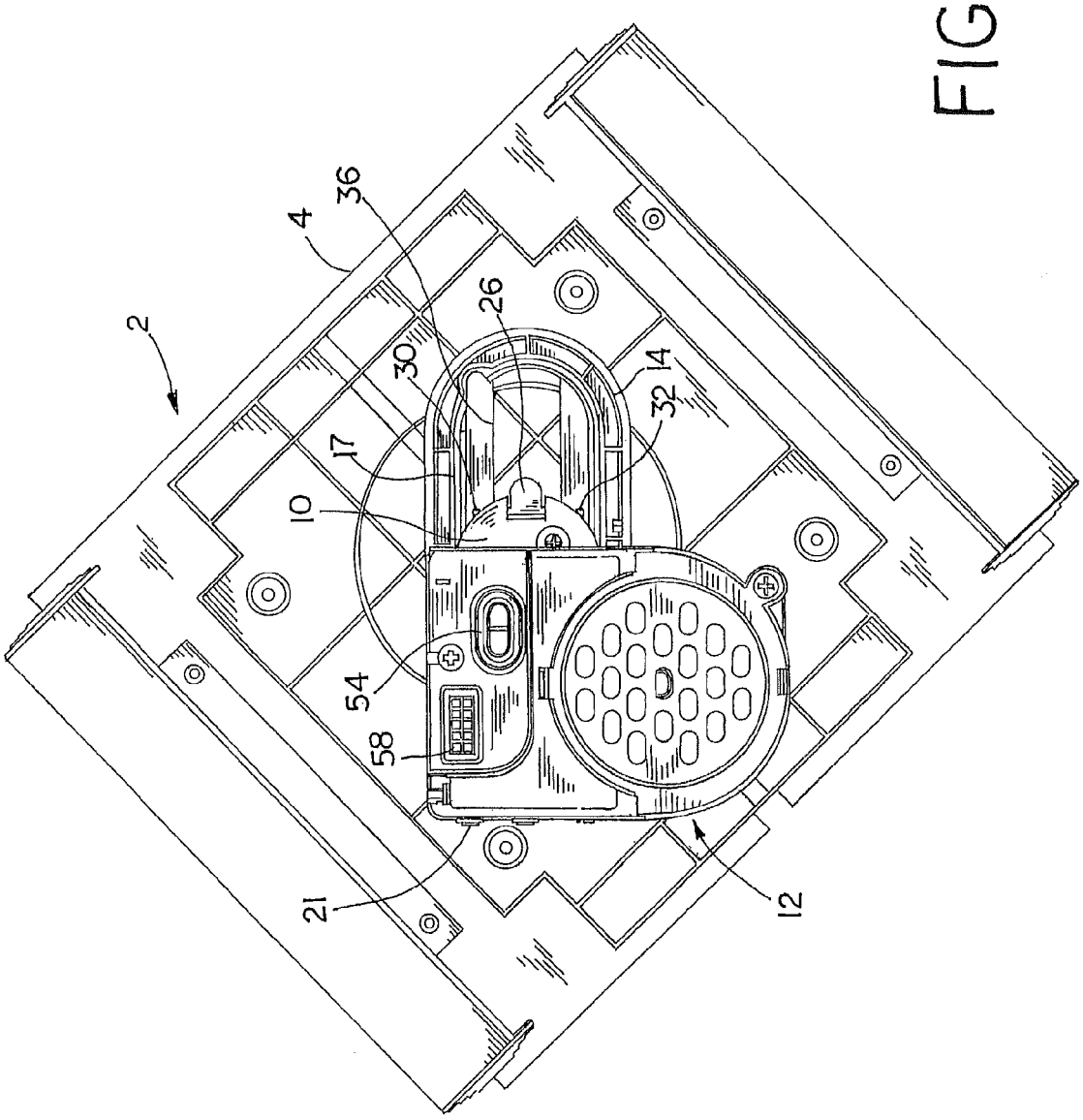


FIG. 7

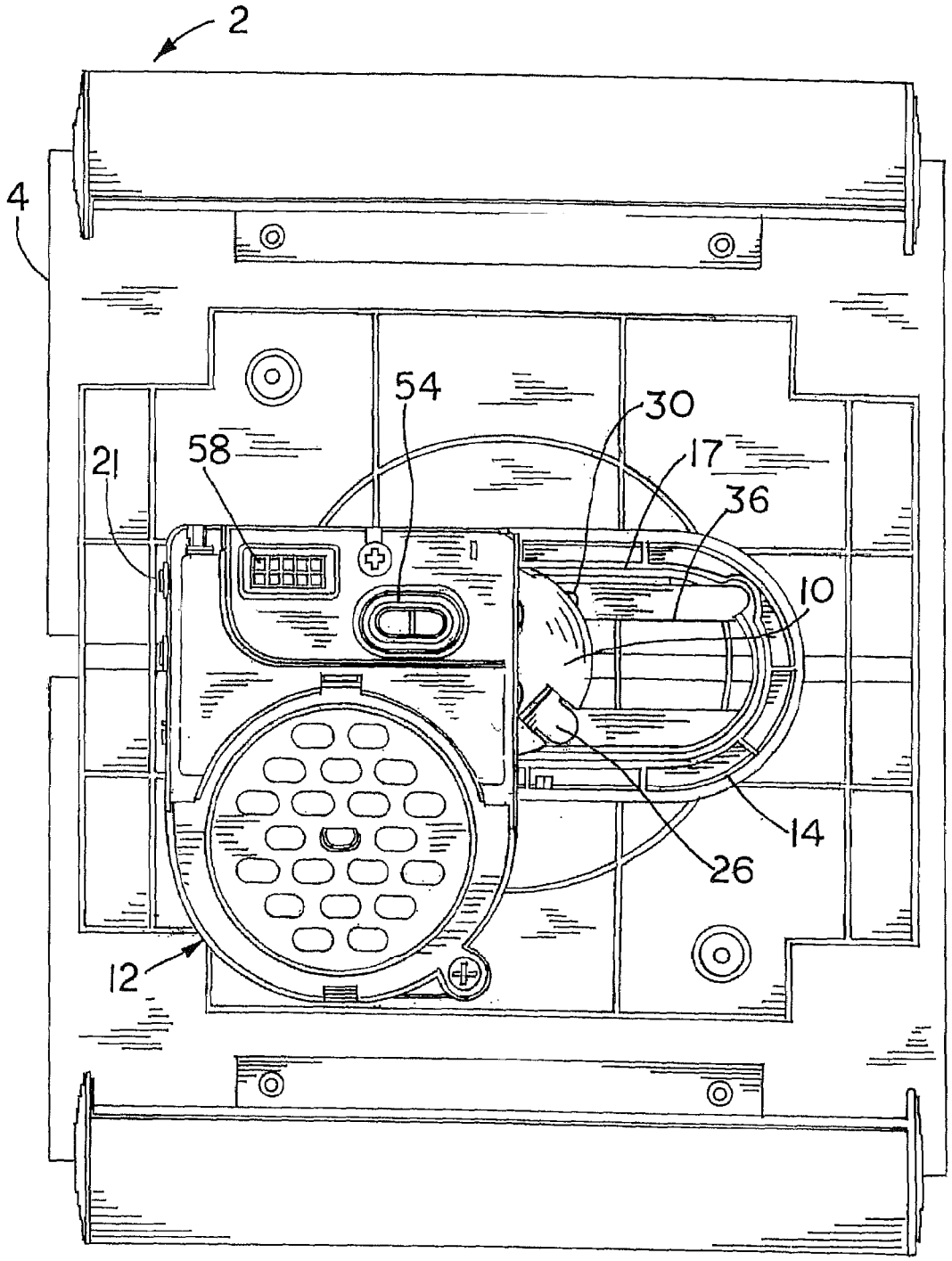


FIG. 8

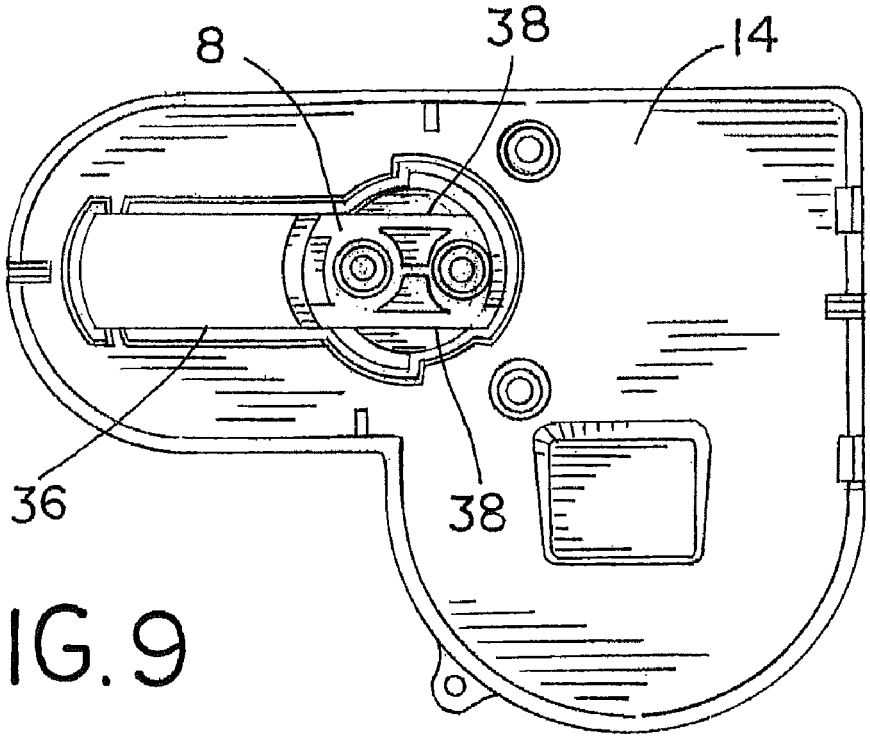


FIG. 9

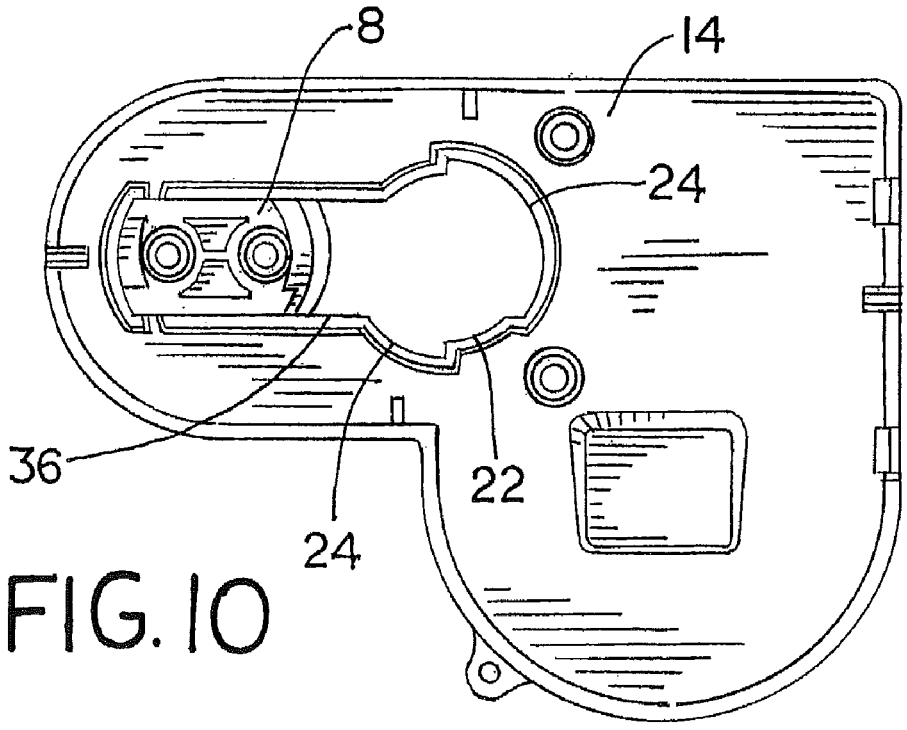


FIG. 10

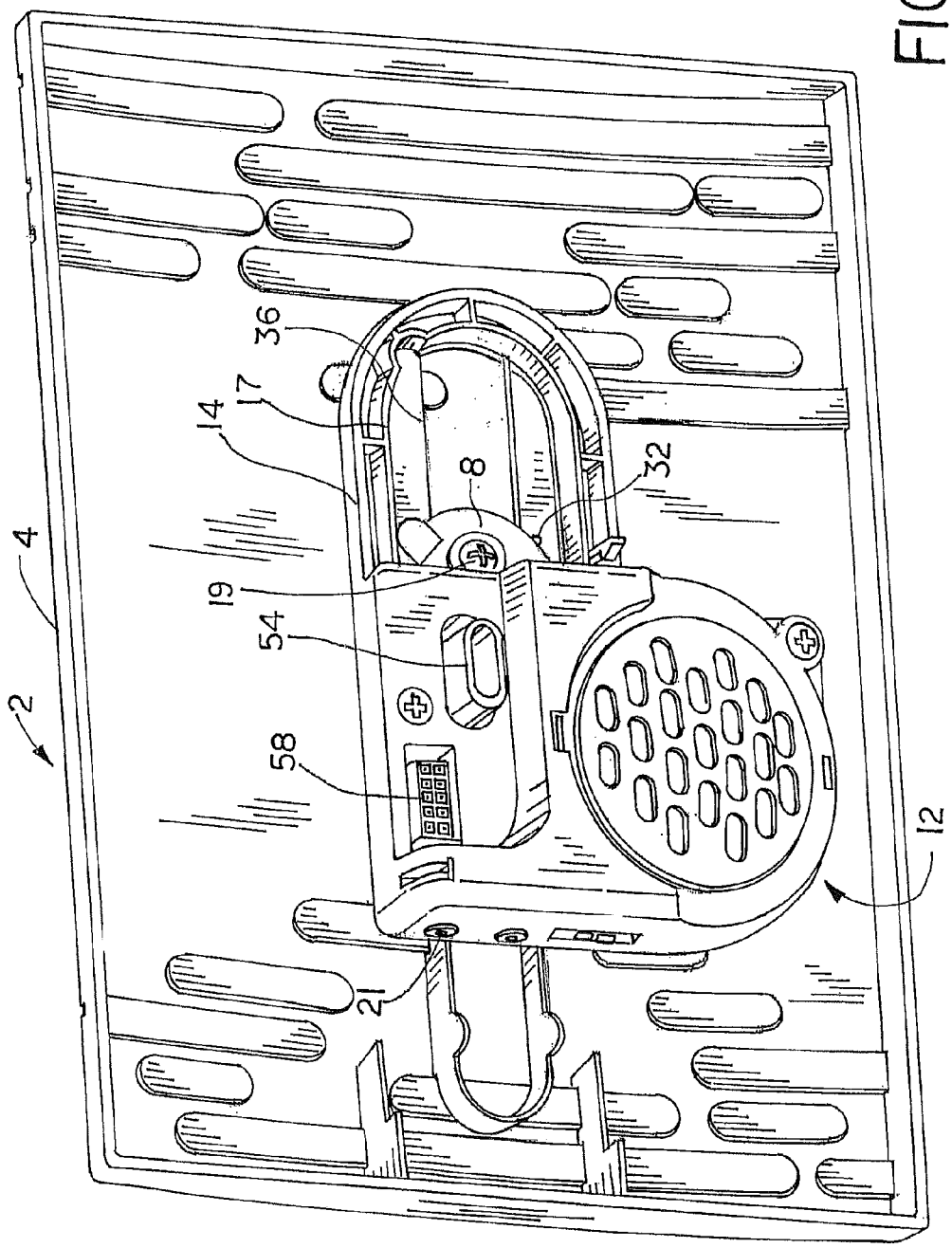


FIG. 11

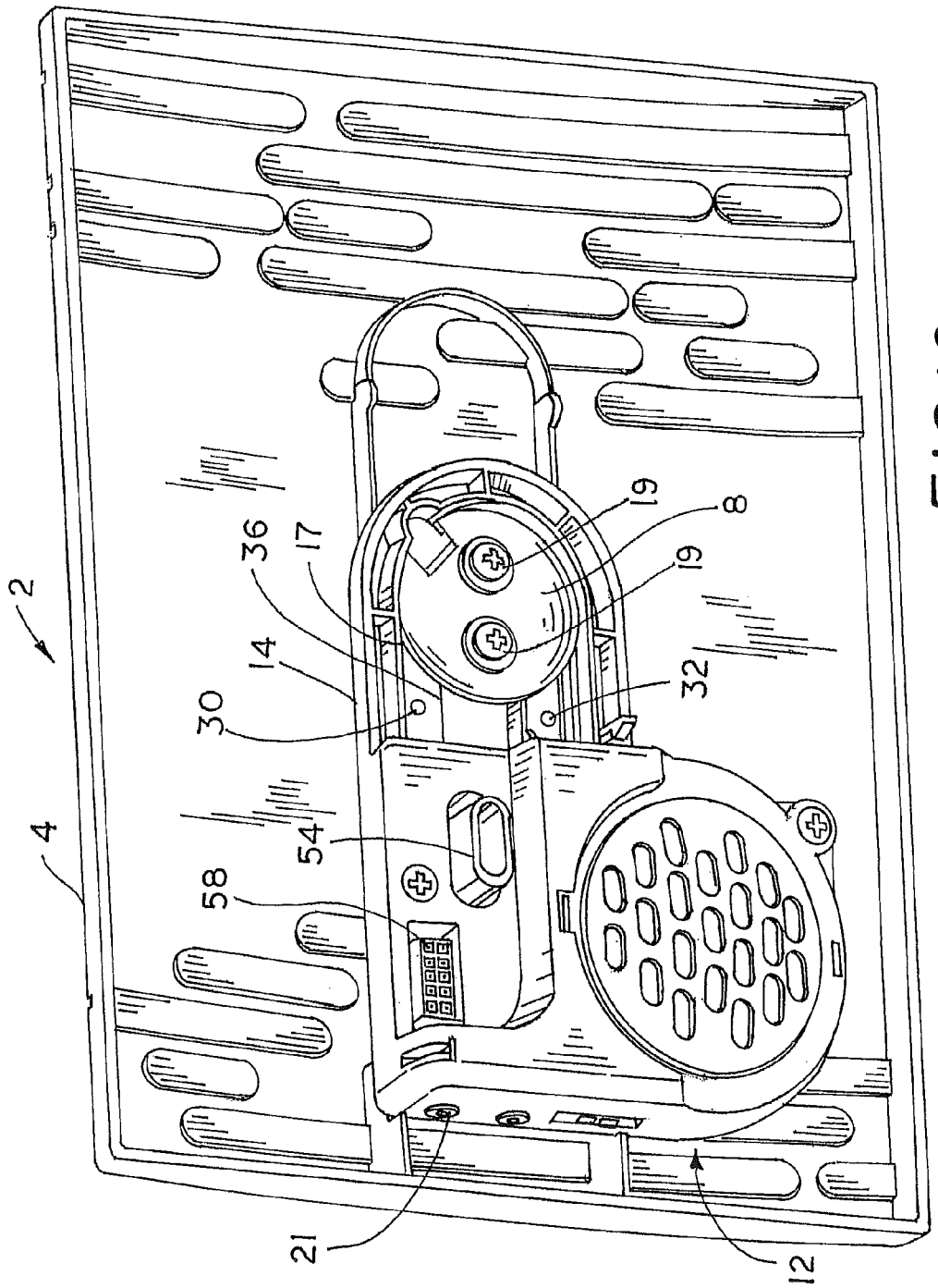


FIG.12

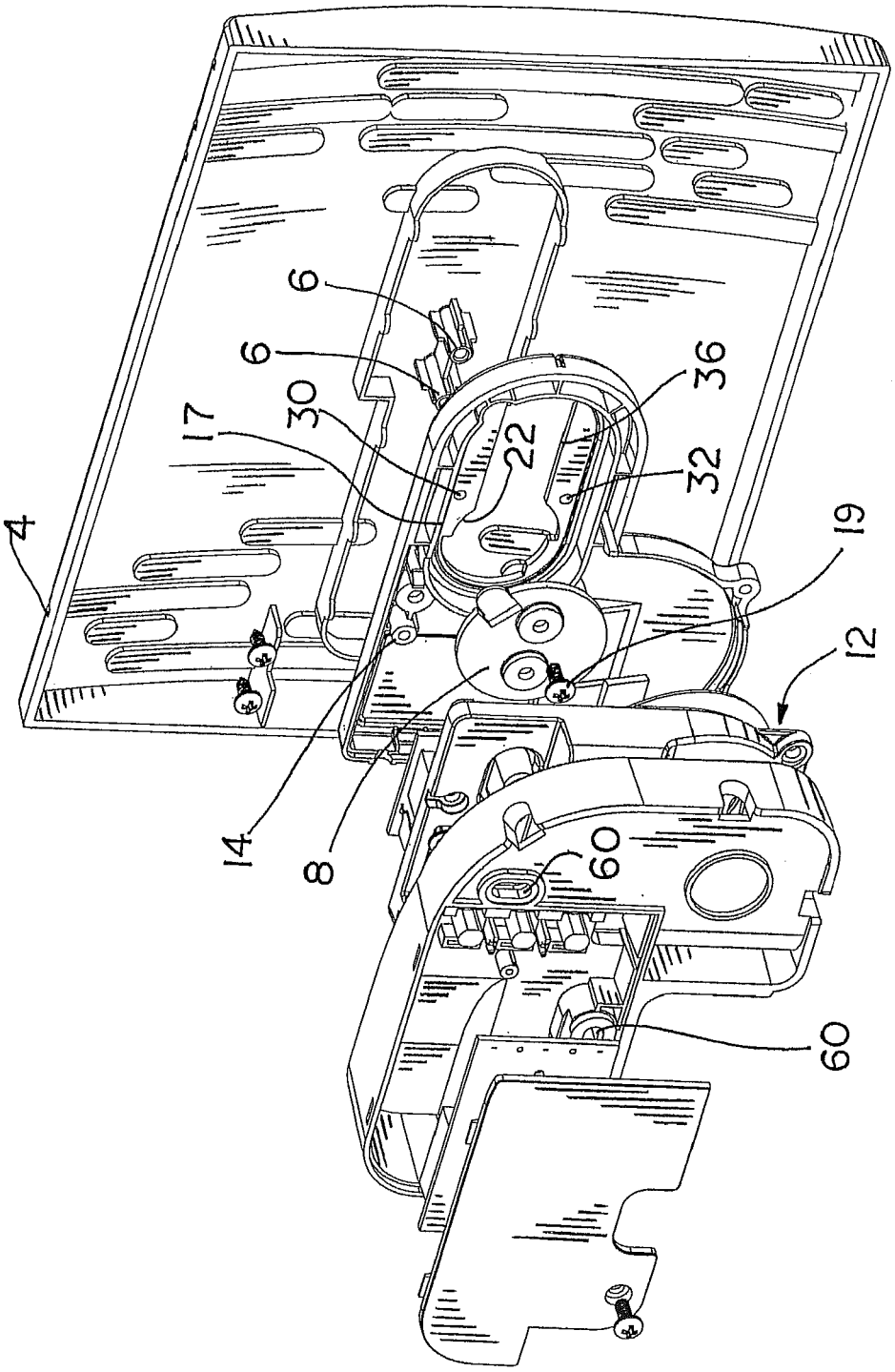


FIG. 13

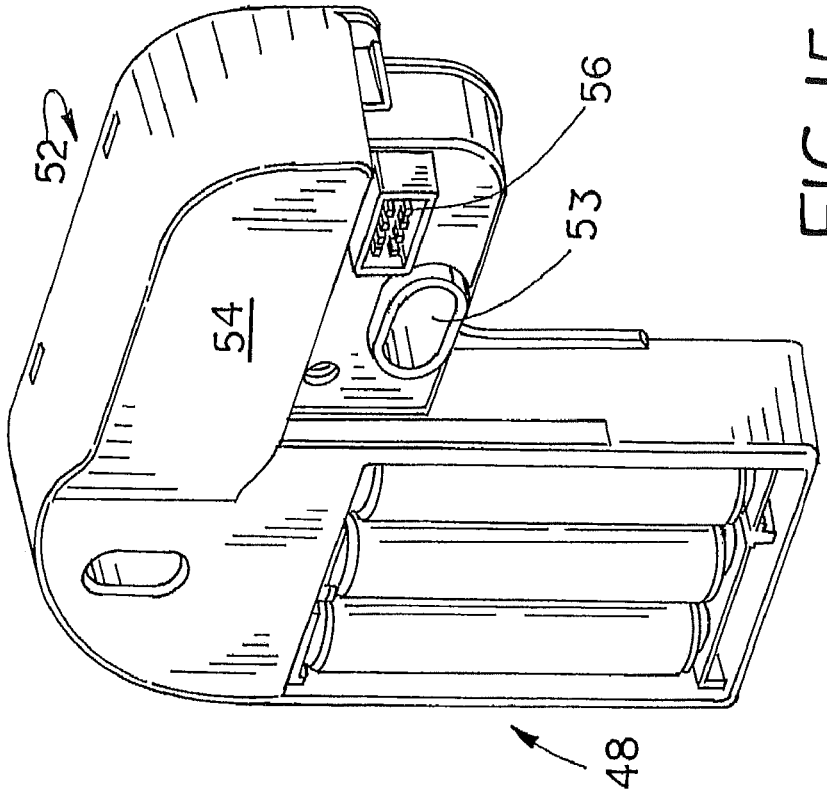


FIG. 15

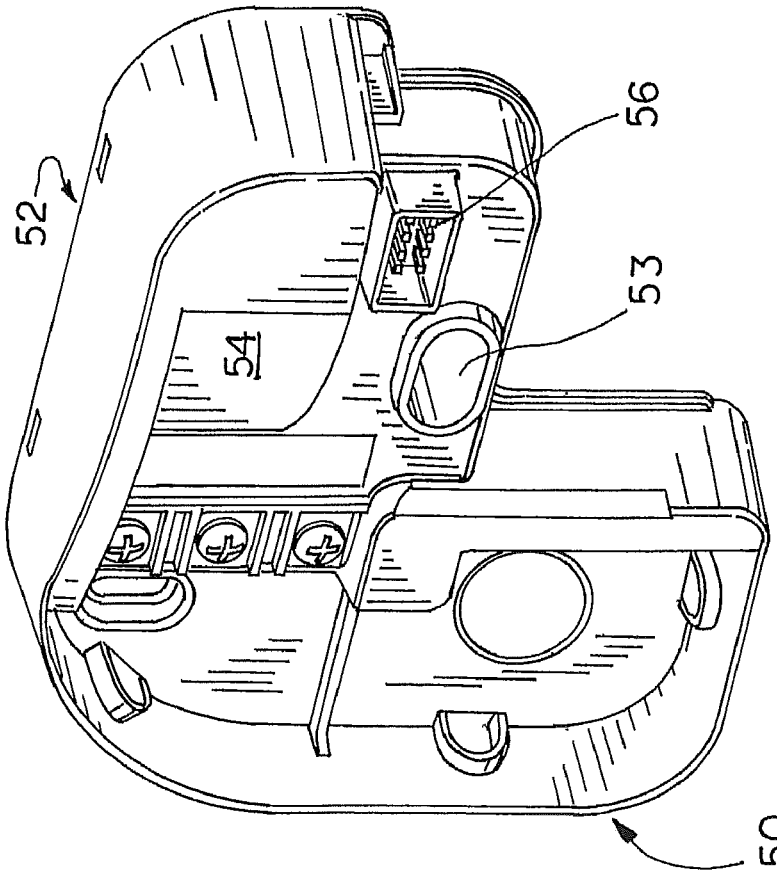


FIG. 14

ADJUSTABLE DOOR CHIME WITH INTERCHANGEABLE PARTS

CROSS REFERENCE TO RELATED APPLICATIONS

This application is a Continuation-in-Part of U.S. patent application Ser. No. 11/512,965, filed Aug. 30, 2006, now U.S. Pat. No. 7,471,210 which is a Divisional of Ser No. 10/798,836 filed Mar. 11, 2004 now U.S. Pat. No. 7,126,490, issued Oct. 24, 2006, which claims priority to U.S. Provisional Application for Patent 60/503,626, filed Sep. 17, 2003, the disclosures of which are hereby incorporated by reference. This application also claims priority to and incorporates by reference U.S. Provisional Application for Patent No. 60/916,499, filed May 7, 2007.

SUMMARY OF THE INVENTION

Door chimes commonly sold are often sold as a complete assembly without the ability to change the configuration of a particular door chime assembly to suit a customer's style preferences. This means a retailer must stock an entire assembly for each style of door chime the retailer would like to sell. For instance, one decorative style of door chime may come in a battery powered model, as well as a hard wired model, which is attached to existing wiring in a home. Although the same in appearance, if a retailer wishes to sell a battery powered model and a hard wired model, this would require stocking two different door chimes. The number of door chimes needed in stock increases when considering the possibility of multiple decorative styles, combined with the fact that a customer may want to purchase different particular styles in either a hard wired or battery powered configuration.

There remains a need for a door chime with interchangeable parts to allow for reduced inventory.

The present invention is a door chime. The door chime has a decorative cover connected to a sound module including sound controls. The decorative cover is shiftable relative to the sound module from a first position to a second position. In the first position, the decorative cover is located where it is during normal use with respect to the sound module. The second position allows access to the sound controls on the sound module. The connection between the sound module and the decorative cover allows for either a sliding connection or a rotating connection depending on the desired configuration. The power module for the door chime is interchangeable between a battery powered and hard wired module.

An object of the invention is to provide a door chime which allows access to sound controls on the sound module without removing the decorative cover.

Another object of the invention is to provide a door chime which allows different decorative covers to be used with one sound module.

Another object of the invention is to provide a door chime having different power modules to be used with the same sound module.

Still other objects of the invention will become apparent upon a reading of the following description.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an exploded view of the door chime from the rear;

FIG. **2** shows the rotate plate part of the chime;

FIG. **3** shows the slide plate part of the chime;

FIG. **4** shows the interaction of the rotate plate and front cover of the sound module of the chime as viewed from the decorative plate. This view corresponds to zero degrees of rotation and is the position at which the decorative cover would be normally displayed;

FIG. **5** shows the interaction of the rotate plate and front cover of the sound module of the chime as viewed from the decorative plate. This view corresponds to 45 degrees of rotation and is a transition position as the decorative cover is rotated to access the sound controls;

FIG. **6** shows the interaction of the rotate plate and front cover of the sound module of the chime as viewed from the decorative plate. This view corresponds to 90 degrees of rotation and is the position that allows access to the sound controls;

FIG. **7** is a rear view of the decorative cover, rotated 45 degrees corresponding to the position shown in FIG. **5**;

FIG. **8** is a rear view of the decorative cover, rotated 90 degrees corresponding to the position shown in FIG. **6**;

FIG. **9** shows the interaction of the slide plate part and front cover of the sound module of the chime as viewed from the decorative plate. This view corresponds to a centered position and is the position at which the decorative cover would normally be displayed;

FIG. **10** shows the interaction of the slide plate part and front cover of the sound module of the chime as viewed from the decorative plate. This view corresponds to a position where the decorative cover is slid to one side allowing access to the sound controls;

FIG. **11** shows the decorative cover as viewed from the rear, in its centered position corresponding to the position shown in FIG. **9**;

FIG. **12** shows the decorative cover as viewed from the rear, slid to one side to allow access to the sound controls. This corresponds to the position shown in FIG. **10**;

FIG. **13** is an exploded view of the door chime;

FIG. **14** is a perspective view of the hard wired power module; and

FIG. **15** is a perspective view of the battery powered module.

DETAILED DESCRIPTION OF INVENTION

A door chime **2** of this invention has a decorative cover **4** that includes mounting bosses **6**. Attached to the mounting bosses **6** is either a slide plate **8** or a rotate plate **10**. The mounting bosses **6**, shown in FIG. **13**, accept screws **19** driven through the slide plate **8** or the rotate plate **10** depending on which is used.

The door chime **2** has a sound module **12**, which in one embodiment is held to the decorative cover **4** by rotate plate **10**. The sound module has a front cover **14**, and sound controls **21**. The front cover **14** is retained between the rotate plate **10** and the decorative cover. This is accomplished by the rotate plate **10** being received within a circular hole **22** in the front cover **14** of the sound module as shown in FIGS. **4**, **5**, and **6**. The mounting bosses **6** are chosen to be a height that will allow screws **19** to be fully tightened to secure plate **10** to cover **4** and still allow the cover **4** to rotate relative to the sound module **12**. The rotate plate **10** has protrusions **18** extending out from a circular surface **20**. The circular surface **20** of the rotate plate **10** rests upon a shoulder defining the circular hole **22** in the front cover **14**. The circular hole **22** has annular quadrant cutouts **24** which receive the protrusions **18** of the rotate plate **10**. The rotate plate **10** may only rotate 90 degrees relative to the sound module **12** and is stopped from rotating more than 90 degrees due to the protrusions **18** contacting the ends of the annular quadrant cutouts **24** as shown in FIG. **6**.

The rotate plate **10** has a radial flange **26** that carries a protrusion **28**. The protrusion **28** can be seen in FIGS. **2** and **5**. In the preferred embodiment the protrusion **28** is spherical in shape. The front cover **14** has a first detent divot **30** and a second detent divot **32** which can be seen in FIGS. **12** and **13**. The detent divots **30**, **32** are spherical depressions in the preferred embodiment and serve as locators for the decorative cover **4**. When the rotate plate **10** is in the 0 degree normal, or unrotated position, as shown in FIG. **4**, the protrusion **28** on the radial flange **26** engages the first detent divot **30**. When the rotate plate **10** is in the 90 degree rotated position as shown in FIGS. **6** and **8**, the protrusion **28** engages the second detent divot **32**. A small amount of turning force is required to disengage the protrusion **28** from either detent divot **30**, **32**.

In another embodiment, the front cover **14** of the sound module **12** is attached by screws **19** to the decorative cover **4** at bosses **6** by slide plate **8**. The slide plate **8** fits into front cover **14**. Since the diameter **34** on the slide plate is larger than the diameter of the circular hole **22** in the front cover **14**, the front cover is retained, as shown in FIGS. **9** and **10**. A slot **36** extends from hole **22** in the front cover **14**. The slide plate has parallel flat sides **38** that engage the slot **36**. The flat sides **38** are long enough so that when the slide plate **8** is at the end of slot **36** the flat sides **38** extend beyond the annular quadrant cutouts **24**, thereby preventing rotation. The slide plate **8** has a radial flange **42** that carries a protrusion **44**. FIGS. **9** and **10** show how the slide plate **8** interfaces with the front cover **14**. When the slide plate **8** is centered, or as displayed in the position as shown in FIG. **9**, the protrusion **44** on the radial flange **42** engages the first detent divot **30**. When the slide plate is slid to one side to access the sound controls **21**, as shown in FIG. **10**, the protrusion rests on the front cover **14**. A small amount of lateral force is required to disengage the protrusion from detent divot **30**.

A power module **48** or **50** is attached to the back of the sound module **12** by the pin header and a friction fit of an oblong boss **54** into an oblong boss receptacle **53** on a power module **48**, **50**. The power module is either a battery powered module **48** or a hard wired module **50**. The pin header **56** on the power module **48** or **50**, as shown in FIGS. **14** and **15**, mates with female pin header socket **58** on the sound module. Either a battery powered module **48** or a hard wired module **50** connectable to a household electrical circuit may be used since they are interchangeable. Both modules **48**, **50** have mounting holes **60** through which screws are inserted to attach the power module **52** to a wall.

When a customer selects a door chime **2** of this invention, first a decorative style is chosen. The decorative style is defined by the type of decorative cover **4**. Each decorative cover **4** may be affixed to the sound module **12** using either a slide plate **8** or a rotate plate **10**. Certain decorative covers **4** will have shapes that will make reaching the sound controls **21** on the sound module **12** easiest when the decorative cover **4** is rotated. When this is the case, a rotate plate **10** should be used. The rotate plate **10** allows the decorative cover **4** to rotate 90 degrees. FIGS. **7** and **8** show how the rotate plate allows access to the sound controls when the cover **4** is rotated. Other decorative covers **4** will have shapes that will make reaching the sound controls **21** easiest when the decorative cover **4** is slid to one side. When this is the case, a slide plate **8** should be used. FIG. **12** shows the decorative cover **4** slid to the side to allow access to the sound controls **21**.

What is claimed is:

1. A door chime comprising:
a decorative cover;
a sound module connected to said decorative cover;
said module including adjustment controls;
said decorative cover having a first position and a second position, said cover being shiftable relative to said sound module between said first and second positions, wherein said sound controls are accessible in said second position,
a rotate plate attached to said decorative cover, said sound module having a front cover, said front cover of said sound module rotatably held between said decorative cover and said rotate plate to accommodate movement of said decorative cover between said first and second positions.

2. A door chime as claimed in claim **1**, wherein said front cover of said sound module has a circular hole having at least one cutout, said rotate plate having at least one protrusion on a circular surface engaging said circular hole in said front cover of said sound module, each protrusion extending into and engaging ends of a said cutout such that said decorative cover is limited in rotation with respect to said sound module between said first and second position.

3. A door chime as claimed in claim **1**, wherein said rotate plate has a protrusion on a radial flange which releasably engages a detent divot in said front cover, when in said first position.

4. A door chime as claimed in claim **1**, wherein said sound module includes a power supply, said power supply being interchangeable between battery powered and household circuit powered.

5. A door chime comprising:
a decorative cover;
a sound module connected to said decorative cover;
said module including adjustment controls;
said decorative cover having a first position and a second position, said cover being shiftable relative to said sound module between said first and second positions, wherein said sound controls are accessible in said second position; a slide plate attached to said decorative cover, said sound module having a front cover, said front cover of said sound module slidingly held between said decorative cover and said slide plate to accommodate movement of said decorative cover between said first and second positions.

6. A door chime as claimed in claim **5**, wherein said slide plate has flat sides engaging a slot in said front cover, for preventing rotation of said decorative cover as the decorative cover slides between said first and second position.

7. A door chime as claimed in claim **6**, wherein said slide plate has a protrusion on a flange which releasably engages a detent divot in said front cover when in said first position.

* * * * *