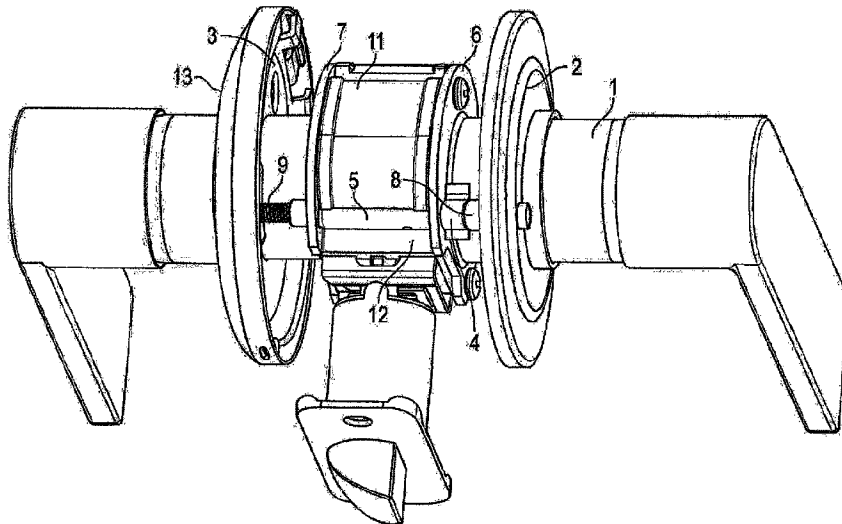




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(54) Titre : DISPOSITIF D'INSTALLATION DE SERRURE DE PASSAGE POUSSER-TIRER ADAPTE AUX PORTES DE DIFFERENTES TAILLES
(54) Title: PUSH-PULL PASSAGE LOCK MOUNTING DEVICE ADAPTED TO DOORS IN VARIOUS SIZES



(57) Abrégé/Abstract:

A push-pull passage lock mounting device is provided for use with doors of various thicknesses. The device, which comprises a first mounting plate, a second mounting plate, adjusting inserts, a central actuator block, a first threaded stud connected with the first mounting plate, a second threaded stud connected with the second mounting plate. The adjusting inserts are sleeved on the first threaded stud or the second threaded stud. The distance between the first mounting plate and the second mounting plate can be adjusted via the inserts so as to adapt to doors with various thicknesses.

ABSTRACT

A push-pull passage lock mounting device is provided for use with doors of various thicknesses. The device, which comprises a first mounting plate, a second mounting plate, adjusting inserts, a central actuator block, a first threaded stud connected with the first
5 mounting plate, a second threaded stud connected with the second mounting plate. The adjusting inserts are sleeved on the first threaded stud or the second threaded stud. The distance between the first mounting plate and the second mounting plate can be adjusted via the inserts so as to adapt to doors with various thicknesses.

PUSH-PULL PASSAGE LOCK MOUNTING DEVICE ADAPTED TO DOORS IN VARIOUS SIZES

CROSS-REFERENCE TO RELATED APPLICATIONS

5 This application claims priority to Chinese Patent Application No.
201720717203.1 filed June 19, 2017, and to United States Patent Application No.
15/796102 filed October 27, 2017 which are herein incorporated by reference in its
entirety.

10 FIELD OF THE INVENTION

 This invention relates to a push-pull passage lock mounting device adapted to be
installed on doors having different thicknesses.

BACKGROUND OF THE INVENTION

15 In the prior art, there are many kinds of door locks, including a push-pull passage
lock. The push-pull passage lock generally comprises a latch plunger or bolt, a sliding
frame connected to the latch bolt and a cam configured inside the sliding frame, wherein
the cam rotates and drives the sliding frame to rotate, whereby the latch bolt connected to
the sliding frame is driven to retract. A reset spring resets the sliding frame to its normal, at
20 rest position. The sliding frame, the cam and the reset spring are all configured inside the
housing, and the push-pull passage lock is mounted to a door through two cover plates on
the housing. Existing push-pull passage locks have the followings drawbacks:

- 25 (1) A push-pull passage lock has a constant or fixed distance between the two cover
plates and cannot be adapted to doors with various thicknesses, which brings
inconvenience for users to select a lock cylinder.
- (2) Lock cylinders in various sizes are needed to adapt to doors with various
thicknesses due to the fixed distance between the cover plates, and thus various
manufacturing molds are needed, which is a waste of resources and labors.

30 Therefore, a primary objective of the present invention is the provision of a push-
pull door lock which accommodates doors having various thicknesses.

Another objective of the present invention is the provision of a push-pull door lock which is easy to adjust to mount on doors having different thicknesses.

A further objective of the present invention is the provision of an adjustable push-pull door lock which is economical to manufacture, and durable in use.

5 These and other objectives will become apparent from the following description of the invention.

SUMMARY OF THE INVENTION

10 The present invention is directed to a door handle assembly, and particularly a push-pull passage lock mounting device adapted for use on doors, wherein the distance between a first mounting plate and a second mounting plate is adjustable so as to adapt to doors having various thicknesses.

The present invention provides a technical solution as follows:

15 A push-pull passage lock mounting device adapted to doors in various sizes comprises a handle assembly with a first mounting plate, a second mounting plate, an adjusting ring or insert, and a central actuator block. A first threaded stud or fastener threads into the first mounting plate and is configured on the actuator block along the longitudinal axis of the handle assembly. Preferably, there are a pair of first studs oriented 180° from one another, and a pair of second studs also spaced 180° apart, as well as a pair of inserts. The adjusting
20 inserts are mounted or sleeved on the first threaded studs or the second threaded studs. The adjusting insert is Ω -shaped so as to fit over the first or second stud.

25 A first actuator housing and a second actuator housing are joined together by a mounting column or fastener and fastened on opposite two sides of the actuator block. The mounting fastener column comprises a body and a threaded end, wherein the body resides
between the first actuator housing and the second actuator housing, and the threaded end protrudes from the first actuator housing to form the first threaded stud.

30 A mounting post or boss is further configured, wherein one end of the ? is threadably connected to the first threaded stud, while the other end is provided with a protruding column which extends through the first mounting plate and is swaged or otherwise attached.

The mounting post further comprises a head which extends through the second mounting component and is in threaded-connection with a screw. The screw passes

through the second mounting plate and is threaded into the head. The threaded section of the screw forms the second threaded stud.

The first mounting component and second actuator housings are fastened together by bolts or screws on opposite sides of the actuator block.

5 The screw, the mounting post, and a boss are further configured, wherein the mounting post is threaded into the boss. The mounting post comprises a head and tail, and the tail forms a first threaded stud. One end of the boss is in threaded-connection with the first threaded stud, while the other end is provided with a protruding column to which the first mounting plate is fastened. The screw passes through the second mounting plate and
10 threads into the head. The threaded section of the screw forms the second threaded stud.

A first cover plate and a second cover plate are provided, wherein the first cover plate is in snap-fit or twist fit connection with the first mounting plate and the second cover plate is in snap-fit or twist fit connection with the second mounting plate.

15 An elastic or resilient piece or tab is arranged at the edge of the first mounting plate, a projection or detent is provided at the inner wall of the sidewall of the first cover plate, and elastic tab of the first mounting plate is in snap-fit or twist fit connection with the projection of the first cover plate. An elastic or resilient tab is arranged at the edge of the second mounting plate, a projection or detent is provided at the inner wall of the
20 sidewall of the second cover plate, and the elastic tab of the second mounting plate is in snap-fit or twist fit connection with the projection of the second cover plate. Preferably there are at least two detents and tabs on each cover plate and mounting plate.

By applying the above-mentioned technical solution, the invention has achieved the following benefits:

- 25 (1) For a push-pull passage lock mounting device adapted to doors in various sizes of this invention, an adjusting ring can be sleeved on the first threaded stud or the second threaded stud to adjust the distance between the first mounting plate and the second mounting plate, so as to adapt to the thickness of a door. For example, when a door has a small thickness, the adjusting rings or inserts can be taken off or the heights of the adjusting ring can be changed so as to adapt to
30 the thickness of the door;
- (2) The cross section of the adjusting ring or insert is Ω -shaped, for quick snap fit onto the studs, which brings convenience to disassembly and assembly;

(3) The first cover plate is in snap-fit or twist fit connection with the first mounting plate, and the second cover plate is in snap-fit or twist connection with the second mounting plate, such that the assembly process is convenient; and furthermore, the installing parts can be covered, thus bringing improved appearance to the lock.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is perspective view of a push-pull passage lock mounting device adapted to doors in various sizes, according to the invention.

Figure 2 is a partially exploded view of the push-pull passage lock mounting device adapted to doors in various sizes, according to the invention.

Figure 3 is another further exploded view of the push-pull passage lock mounting device, according to the invention.

Figure 4 is a perspective view of the second cover plate of the push-pull passage lock mounting device adapted to doors in various sizes according to the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

As shown in the drawings, this invention provides a handle assembly 1 for a door and specifically, a push-pull passage lock mounting device adapted to doors in various sizes. The assembly 1 comprises a first mounting plate 2, a second mounting plate 3, and a pair of adjusting rings or inserts 4. The assembly 1 protrudes radially outwardly in its middle to form an actuator block 11. A pair of first mounting columns comprising threaded studs 5 are connected with the first mounting plate 2, and configured on one side of the actuation block 11, extending along the length direction of the assembly 1. A pair of second threaded studs 9 connected with the second mounting plate 3, is configured on the opposite side of the actuator block 11, extending along the length direction of the assembly 1. The adjusting inserts 4 are sleeved on the first threaded studs 5 or the second threaded studs 9, and the distance between the first mounting plate 2 and the second mounting plate 3 can be adjusted by use of the inserts 4. When a door has a big thickness, and inserts 4 can be installed or sleeved on the first threaded studs 5 or the second threaded studs 9 to adjust the distance between the first mounting plate 2 and the second mounting plate 3 so as to adapt

to the thickness of a door. When a door has a small thickness, the inserts 4 can be taken off or inserts with a smaller height can be used so as to adapt to the thickness of the door.

As shown in Figure 1 and Figure 2, the actuation block 11 resides in the middle of the housing 1. At least one opening or recess 12 is arranged to extend axially through or
5 along the actuation block 11, and the mounting column 5 resides in the opening. A first actuator housing 6 and a second actuator housing 7, arranged at the two ends of the opening 12, are sleeved on the actuator and are located at the two sides of the actuator block 11 respectively. The first actuator housing 6 and the second housing 7 each include a
10 cylindrical body 6A, 7A and a radial flange 6B, 7B. The housings 6, 7 are fastened together by bolts.

The mounting column 5 comprises a head 51, a body 52 and a threaded tail 53, wherein the body 52 is clamped and fastened between the first actuator housing 6 and the second actuator housing 7, and the threaded end 53 protrudes through the first flange 6B to
15 form the first threaded stud 5. One end of the mounting boss 8 is in threaded connection with the first threaded stud 5, while the other end is provided with a protruding column on which the first mounting plate 2 is sleeved and is fastened in any convenient manner, such as by swaging or by a nut. The head 51 is configured outside the second mounting component 7 and is in threaded connection with the screw 9. The screw 9 passes through
20 the second mounting plate 3 and is in threaded connection with the head 51. The threaded section of the screw 9 forms the second threaded stud. The first threaded stud 5 or the second threaded stud 9 is provided with the adjusting ring or insert 4 which has a Ω -shaped cross section and is elastic, for convenience in disassembly and assembly.

In order to cover the screws 8 so as to improve the aesthetic appearance, a first cover plate 10 is mounted over the first mounting plate 2, and a second cover plate 13 is
25 mounted over second mounting plate 3. The first cover plate 10 is in snap-fit or twist-fit connection with the first mounting plate 2, while the second cover plate 13 is in snap-fit or twist-fit connection with the second mounting plate 3. For example, as shown in Figure 3, the second cover plate 13 is dome-shaped, and comprises a dome plate and a sidewall configured around the edge of the dome plate. A projection or detent 131 is provided at the
30 inner wall of the sidewall of the second cover plate 13, and an elastic piece or tab 31 is provided adjacent the edge of the second mounting plate 3. During installation, the tab 31 of the second mounting plate 3 is buckled into the projection 131 of the second cover plate

13. The first cover plate 10 has the same structure as the second cover plate 13, and the snap-fit or twist-lock structure between the first cover plate 10 and the first mounting plate 2 is the same as that between the second mounting plate 3 and the second cover plate 13. A projection or detent 131 is also provided at the inner wall of the sidewall of the first cover plate 10, and an elastic tab 31 is also provided at the inner wall of the sidewall of the first cover plate 10, and an elastic tab 31 is arranged at the edge of the first mounting plate 2. During installation, the elastic tab 31 of the first mounting plate 2 is buckled into or overlapped with the projection 131 of the first cover plate 10. Thus, the first cover plate 10 is in snap-fit or twist-locked connection with the first mounting plate 2.

The push-pull door handle lock assembly of the present invention is further described in concurrently filed applications serial number 15/796,352, entitled PUSH-PULL PASSAGE LOCK HOUSING (docket P12348US00) and serial number 15/796,550, entitled PUSH-PULL PASSAGE LOCK (docket P12349US00), which are incorporated by reference herein in their entireties.

It should be appreciated that the embodiment described hereinbefore is merely preferred embodiment of the present invention and not for purposes of any restrictions or limitations on the invention. Therefore, any simple amendments, equivalent variants and modifications to above embodiments according to the technical essence of the present invention, without departing from the technical solution of the present invention, should be incorporated into ambit of claims of the present invention.

What is claimed is:

1. A push/pull passage lock mounting device designed to be installed on a door having an exterior handle and an interior handle, comprising:
 - 5 a first mounting plate;
 - a second mounting plate, wherein the first mounting plate and the second mounting plate are arranged so as to create a spacing between said plates;
 - an adjusting ring;
 - an actuator between the mounting plates, wherein said actuator is connected to the
 - 10 exterior handle and the interior handle;
 - a pair of first studs threaded into the first mounting plate and extending along opposite side walls of the actuator;
 - a pair of second studs extending through the second mounting plate and threaded into the pair of first studs;
 - 15 a pair of adjusting inserts on the first studs or the second studs to adjust the spacing between the first and second mounting plates,
 - whereby the push/pull passage lock mounting device is mountable on doors having different thicknesses;
 - wherein the adjusting inserts consist of a cylindrical body with an opening to
 - 20 receive one of the first or second studs and outwardly extending legs situated on opposing sides of the cylindrical body;
 - wherein the door upon which the device is mounted may be opened or closed by pushing or pulling one of the handles.
- 25 2. The push/pull passage lock mounting device according to Claim 1, further comprising two actuator housings consisting of a first actuator housing and a second actuator housing; and a mounting column, wherein the actuator housings are sleeved on opposite sides of the actuator, the mounting column comprising a body and a threaded end, wherein the body of the mounting column resides between the first and the second actuator
- 30 housings and the threaded end of the mounting column protrudes from the first actuator housing to form the first threaded stud.

3. The push/pull passage lock mounting device according to Claim 2, further comprising a mounting boss having one end connected to the first threaded stud, and the other end fastened to the first mounting plate.
- 5 4. The push/pull passage lock mounting device according to Claim 2, wherein the mounting column further comprises a head residing outside the second actuator housing and is in threaded connection with a screw; the screw passes through the second actuator housing and is in threaded connection with the body of the mounting column, and the screw forming a second threaded stud.
- 10 5. The push/pull passage lock mounting device according to Claim 2, wherein the first actuator housing and the second actuator housing are fastened together.
6. The push/pull passage lock mounting device according to Claim 2, further comprising a screw, a mounting column and a mounting boss, wherein the mounting boss has a first end and a second end, and the mounting column is fastened to the mounting boss at one of the ends of the mounting boss; the mounting column comprises a body part and a threaded end part which are configured at opposite sides of the first actuator housing; the threaded end part forms the first stud; the first end of the mounting boss is in threaded-connection with the first stud, while the second end of the mounting boss is fastened to the first mounting plate; the screw passes through the second mounting plate and is in threaded-connection with the mounting column; the screw is provided with a threaded section forming the second threaded stud.
- 15 20 25 7. The push/pull passage lock mounting device according to Claim 1, further comprising a first cover plate and a second cover plate, the first cover plate is in twist-fit connection with the first mounting plate and the second cover plate is in twist-fit connection with the second mounting plate.
- 30 8. The push/pull passage lock mounting device according to Claim 7, further comprising an elastic tab at an edge of the first mounting plate, a projection on an inner wall of a sidewall of the first cover plate, and the elastic tab of the first mounting plate is in

connection with the projection of the first cover plate; an elastic tab is arranged at an edge of the second mounting plate, a projection is provided at an inner wall of a sidewall of the second cover plate, and the elastic tab of the second mounting plate is in twist-lock connection with the projection of the second cover plate.

5

9. A push-pull passage lock for a door having interior and exterior handles, comprising:

a pair of housings on opposite sides of the actuator;

10 a pair of mounting plates mounted over said pair of housings, wherein said pair of mounting plates are arranged so as to create a space between said pair of mounting plates;

an actuator consisting of opposing sides situated between the mounting plates and operatively connected to the interior and exterior handles of said door, wherein when said interior handle or exterior handle is either pushed or pulled by a user, the actuator opens said door;

15 a pair of fasteners extending through the mounting plates to secure the plates together; and

a pair of split spacers selectively mounted on the pair of fasteners capable of adjusting the spacing between the mounting plates so that the push-pull passage lock may be installed on doors having different thicknesses;

20 wherein said pair of inserts comprise opposing legs connected by an arch with an opening for receipt of the fasteners.

10. The push-pull passage lock of claim 9 wherein the fasteners include two sets of threaded connectors and the spacers are mountable on either set of connectors.

25

11. The push-pull passage lock of claim 9 wherein the spacers have a side wall with an opening therein.

12. The push-pull passage lock of claim 9 wherein each of the spacers is a partial ring.

30

13. The push-pull passage lock of claim 9 wherein the spacers include first and second sets and the first set is bigger than the second set.

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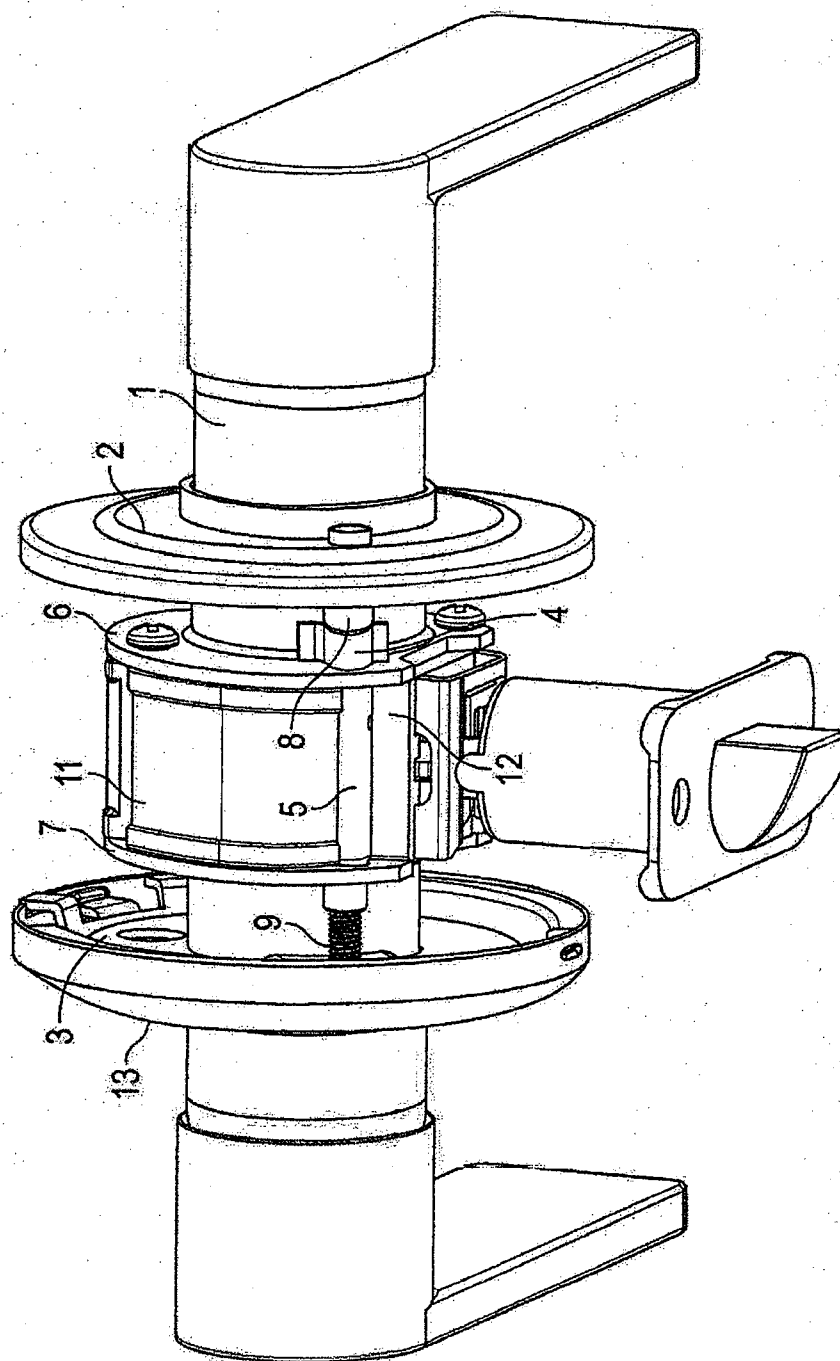


FIG. 1

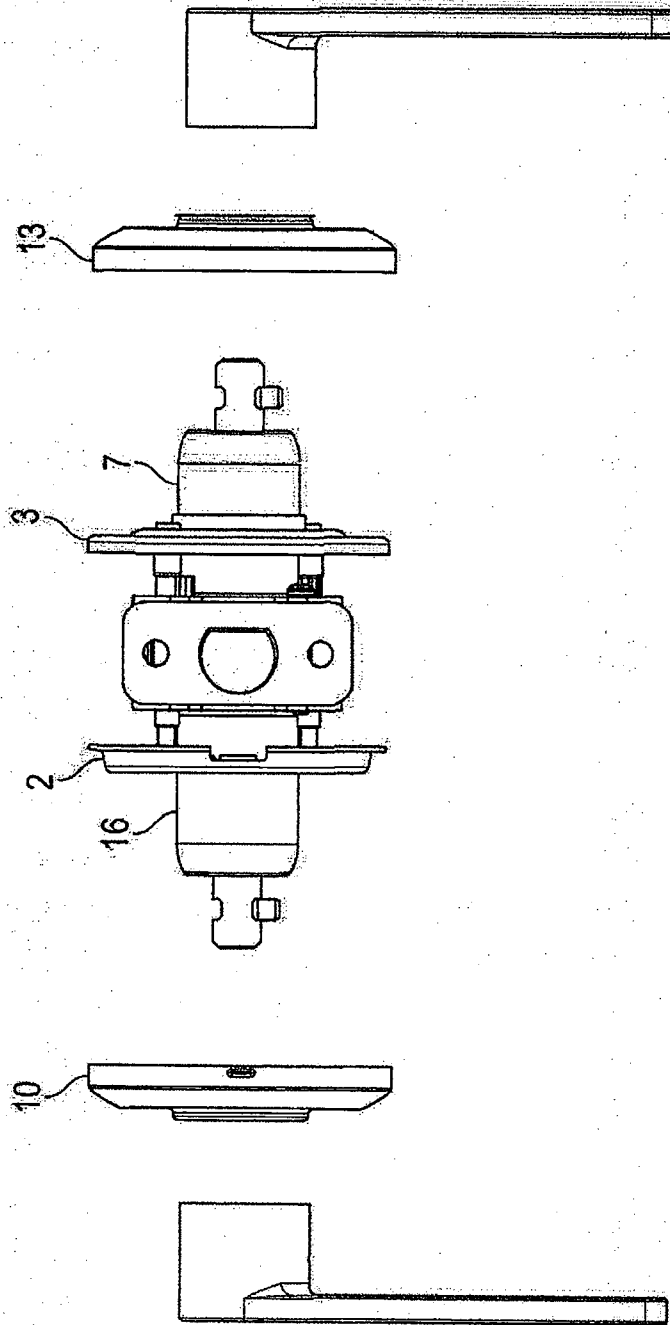


FIG. 2

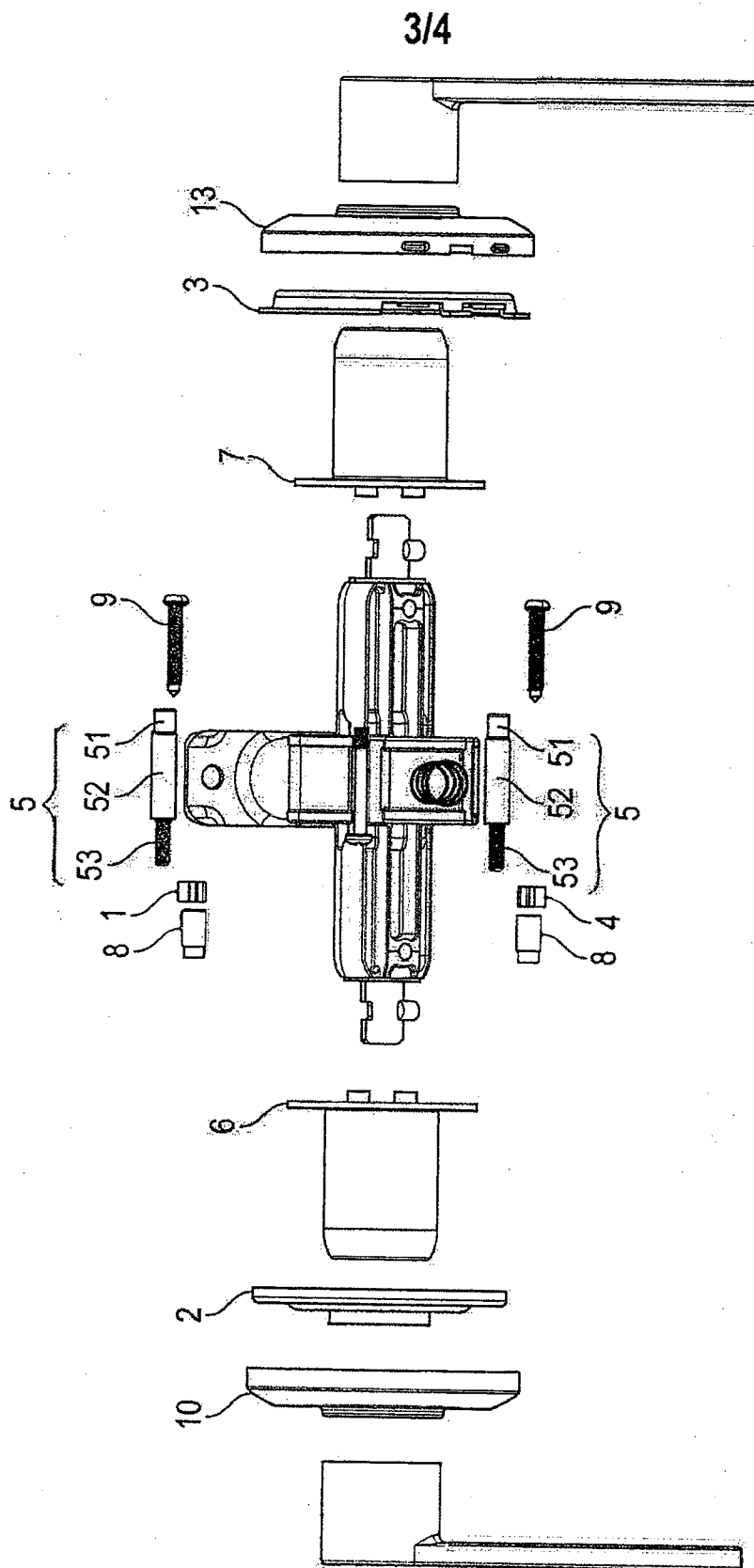


FIG. 3

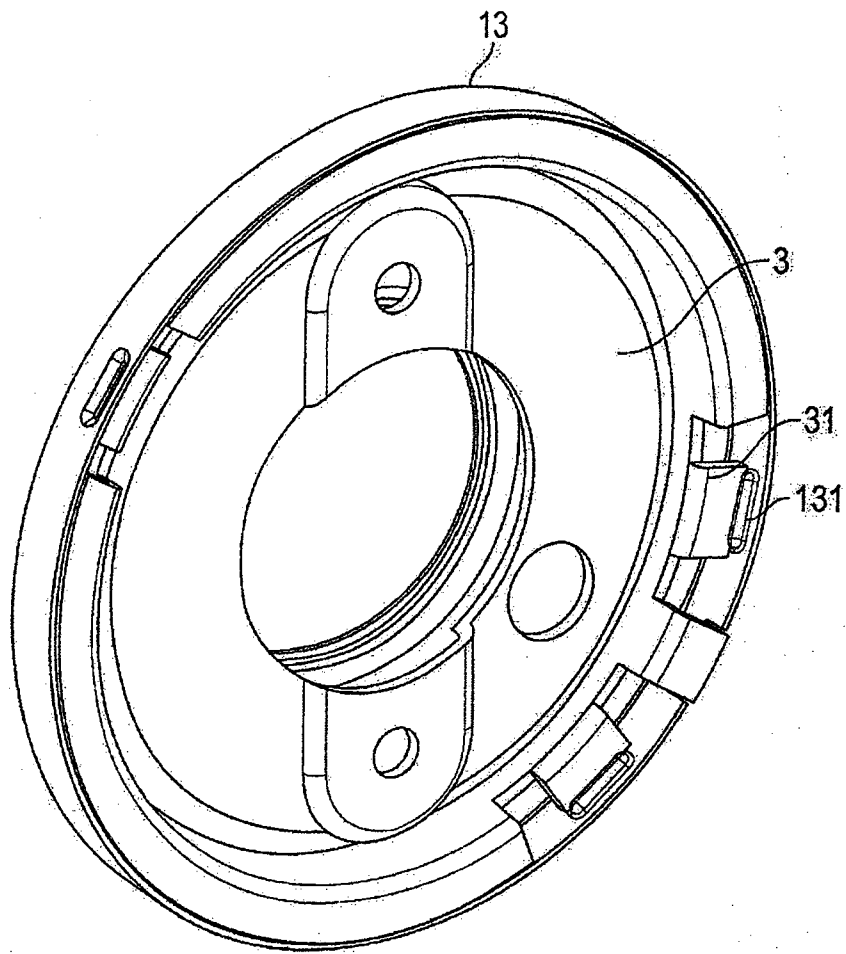


FIG. 4

