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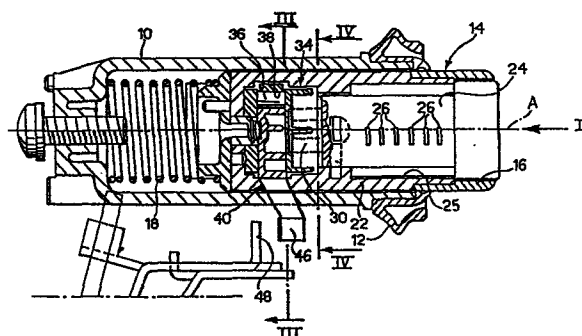
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⑤④ **Device for closing and opening the boot lid or rear hatch of a motor vehicle.**

⑤⑦ A device for closing and opening the boot lid or rear hatch of a motor vehicle with a locking mechanism, in which a slidable push button (14) carries a cylinder lock (22) for effecting, through cam means (36, 38), the translational movement of a release member (40) of the locking mechanism which is slidable between an operative position and an inoperative position. When the cylinder lock (22) is disposed in a pre-established position, the translational movement of the release member (40) from the inoperative position to the operative position, and vice versa, can also be achieved automatically by means of a servo-mechanism operated by an electrical central locking system for the motor vehicle doors.



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Device for closing and opening the boot lid or rear hatch of a motor vehicle .

The present invention relates to devices for closing and opening the boot lid or rear hatch of a motor vehicle having a locking mechanism.

5 More particularly, the invention is concerned with a closing and opening device of the type comprising a hollow support body in which a push button carrying a cylinder lock is slidable, and a release member for the locking mechanism which is slidable with the push button and movable relative thereto, as a result of the rotation of the cylinder lock, between an inoperative position corresponding to the locked position of the lock cylinder in which the sliding of the push button does not cause the release of the locking mechanism, and an operative position corresponding to the open position of the lock cylinder in which the sliding of the push button causes the release of the locking mechanism and then, in use, the opening of the boot lid or hatch of the vehicle.

20 In closing and opening devices of this type, it is also known to effect the rotation of the release member from its operative position to its inoperative position, and vice versa, automatically by means of a servo-mechanism connected to the release member and operated by an electrical central locking system for the motor vehicle doors. Such an electrical system is normally controlled by the push button or operating lever for locking and unlocking the vehicle door at the driver's position.

30 A device of this type is described, for example, in European Patent Application No. 84830273.3 in the name

of the same Applicants. In this device, the lock cylinder can take up a second open position to locate the release member in its operative position independently of the condition assumed by the
5 servo-mechanism, which is of the reversible type.

The object of the present invention is to provide a device of this type which is particularly simple, strong and cheap to manufacture.

According to the invention, this object is achieved by
10 the fact that the release member is formed by a body slidable transverse the direction of sliding of the push button and having an operating appendage for cooperating frontally with a control part for unlocking the locking mechanism, and a connecting part for
15 connecting it to the servo-mechanism, the body and the lock cylinder having respective cooperating cam means shaped so as to allow the sliding of the release member from the operative position to the inoperative position, and vice versa, by means of the
20 servo-mechanism only when the lock cylinder is in its open position and so as to keep the release member in the inoperative position when the lock cylinder is moved from the second open position to the locked position and from this to the first open position.

25 According to the invention, the connecting part of the body of the release member has an aperture which is elongate in the direction of sliding of the release member and the cam means include an eccentric pin controlled by the lock cylinder and engaged in an
30 aperture in the body of the release member. This aperture has a first elongate arm disposed like the aforesaid aperture and in which the pin is inserted in

the first open position of the lock cylinder, and a second elongate arm inclined obliquely to the first arm and in which the pin is inserted in the locked position and in the second open position of the lock cylinder.

- 5 To advantage, the body of the release member is formed by a single piece of moulded plastics material.

The invention will now be described in detail with reference to the appended drawings, provided purely by way of non-limiting example, in which:

- 10 Figure 1 is a partially-sectioned schematic longitudinal view of a closing and opening device for the boot lid or rear hatch of a motor vehicle, in accordance with the invention,

- 15 Figure 2 is a side elevational view taken on the arrow II of Figure 1,

Figure 3 is a cross-sectional view taken on the line III-III of Figure 1,

Figure 4 is a cross-sectional view taken on the line IV-IV of Figure 1, and

- 20 Figures 5, 6 and 7 are three views similar to Figure 3 illustrating the device in three different operating conditions.

- 25 In the drawings, a hollow cylindrical support body is indicated 10 and is intended to be fitted into an aperture formed in the boot lid or rear hatch, not illustrated, of a motor vehicle, with the interposition of a grommet 12.

A push button 14 having a hollow initial part 16 is axially slidable in the body 10 against the action of a helical compression spring 18. The initial part 16 constitutes the fixed member of a cylinder lock 22 the
5 rotatable cylinder of which is indicated 24.

The rotatable cylinder 24 is of conventional type and, in known manner, has check plates 26 for cooperating in known manner with axial recesses 25 in the initial part 16.

10 As illustrated in greater detail in Figure 4, the rotatable cylinder 24 has two diametrically-opposed shaped axial appendages 30 at its front end, which are engaged in corresponding recesses 32 in a rotor 34.

The rotor 34 carries an axial pin 36 disposed
15 eccentrically relative to the axis A of the lock 22 and inserted in a recess 38 in a release member, generally indicated 40.

The release member 40 is constituted by a one-piece body of moulded plastics material slidable within the
20 push button 14 in a direction B perpendicular to the axis A of the lock 22, coincident with the axis of movement of the push button 14.

The body 40 forms on one side an attachment part 42 with a slot 44 elongate parallel to the direction of
25 movement B, and on its opposite side a radial operating arm 46 disposed beneath the body 10 for cooperating frontally, in the manner explained below, with an operating member 48 whose movement causes the release of the locking mechanism of the boot lid or hatch and

then its opening.

The recess 38, the upper part of which is defined by a top plate 50, is generally L-shaped with a first elongate arm 38a parallel to the direction of movement
5 B of the member 40 and a second elongate arm 38b inclined slightly to the arm 38a.

The slot 44 in the member 40 is intended to house slidably a rod 52 forming part of a reversible servo-mechanism, for example of the nut-and-bolt type,
10 operated by a conventional electrical central locking system for the vehicle doors. This servo-mechanism is controlled in known manner through the push button or control lever for locking and unlocking the vehicle door at the driver's position.

15 The rotatable cylinder 24 of the cylinder lock 2 has, in known manner, a keyhole 54 for receiving a suitable key by which the rotatable cylinder can be rotated.

The operation of the device of the invention will now be described.

20 The rotatable cylinder 24 of the lock 22 is arranged to take up three different angular positions which will be termed "first open position", "locked position" and "second open position" below. In these positions, the keyhole 54 is in the positions illustrated in full
25 outline, broken outline and chain lines, respectively, in Figure 2.

The movement from the first open position to the locked position is effected by rotation of the cylinder 24 through 90° in a clockwise sense, and the movement from

the locked position to the second open position is effected by further rotation of the cylinder 24 through about 75° in the clockwise sense.

The first open position corresponds to the condition of engagement of the servo-mechanism with the key being removable. The release member 40 and its control member 46 can assume the configuration illustrated in Figure 3 or that illustrated in Figure 5 according to the command received from the servo-mechanism. In the first case (Figure 3) the release member 40 is in the inoperative position with the control part 46 spaced from the operating member 48, while in the second case (Figure 5) the release member 40 is in the operative position with the control part 46 frontally facing the operating member 48. The movement of the release member 40 between the operative and inoperative positions is achieved automatically by means of the rod 52 of the servo-mechanism which, as stated previously, is controlled by the electrical central locking system for the vehicle doors: the condition of Figure 5 corresponds to the unlocked position of the push button or locking lever and unlocks the driver's door, while the condition of Figure 3 corresponds to the locked position of this lever or push button. Consequently, the opening of the boot lid or hatch of the vehicle is prevented when the central locking system is in the locked condition, while the boot lid or hatch can be opened when the system is in the unlocked condition. In fact, in the first case, the release member 40 and hence its control part 46 are kept in the inoperative position of Figure 3 by the servo-mechanism, whereby any sliding of the push button 14 against the action of the spring 18 and the simultaneous axial advance of the member 40 do not allow the operating member 48 to act.

In the second case, the release member 40 and its control part 46 are kept in the operative position of Figure 5 by the servo-control, whereby pushing of the push button 14 and the simultaneous advance of the member 40 cause the part 46 to bear against the operating member 48 and consequently move the latter to open the boot lid or hatch.

In other words, when the lock 22 is in the first open position, the servo-mechanism allows the release member 40 to be positioned automatically in the inoperative position in which operation of the member 48 is prevented, even in the operative position in which this operation would be allowed. Clearly, during the sliding of the release member 40 between the operative and inoperative positions, relative movement is achieved between the eccentric pin 36, which remains stationary, and the arm 38a of the aperture 38 of the release member 40.

In the closed position of the lock 22 illustrated in Figure 6, in which the key can be removed, the eccentric pin 36 is rotated through 90° in a clockwise sense relative to the position of Figure 5 and is disposed in the initial zone of the arm 38b of the aperture 38, and the release member 40 is kept in the inoperative position. In effect, the part 46 of the member 40 is spaced from the operating member 48 so that the opening of the boot lid or hatch of the vehicle is always prevented and cannot be enabled even by the servo-mechanism, whatever the position assumed by the push button or lever for locking and unlocking the driver's door.

If the rotatable cylinder 24 is rotated further towards

- the second open position, in which the key cannot be removed, the eccentric pin 36 is disposed in correspondence with the end portion of the arm 38b of the aperture 38, in the manner illustrated in Figure 7.
- 5 The release member 40 is again disposed in the operative position with the part 46 facing the member 48 frontally, so that the boot lid or hatch of the vehicle can be opened by a push on the push button 14 whatever the position assumed by the servo-mechanism.
- 10 It should be noted that, during the return of the eccentric pin 36 to that of Figure 6 or to that of Figure 1 as a result of the rotation of the rotatable cylinder 22 in the anticlockwise sense, the release member 40 is always in the inoperative position, that
- 15 is, unable to operate the member 48.

Naturally, the constructional details and forms of embodiment may be varied with respect to that described and illustrated without thereby departing from the scope of the present invention.

CLAIMS

1. Device for closing and opening the boot lid or rear hatch of a motor vehicle having a locking mechanism, of the type comprising a hollow support body in which a push button carrying a cylinder lock is slidable, and
5 a release member for the locking mechanism which is slidable with the push button and movable relative thereto, as a result of the rotation of the cylinder lock, between an inoperative position corresponding to the locked position of the locking cylinder in which
10 the sliding of the push button does not cause the release of the locking mechanism, and an operative position corresponding to the open position of the lock cylinder in which the sliding of the push button causes the release of the locking mechanism and then, in use,
15 the opening of the boot lid or hatch, and in which the movement of the release member from the operative position to the inoperative position, and vice versa, can also be achieved automatically by means of a servo-mechanism connected to the said release member
20 and operated by an electrical central locking system for the motor vehicle doors, and also in which the locking cylinder can take up a second open position to locate the release member in its operative position independently of the condition assumed by the
25 servo-mechanism,
characterised in that the release member is formed by a body (40) slidable transverse the direction of sliding (A) of the push button (14) and having an operating appendage (46) for cooperating frontally with a control
30 part (48) for unlocking the locking mechanism of the boot or hatch, and a connecting part (42, 44) for connecting it to the servo-mechanism, the body (40) and the lock cylinder (24) having respective cooperating cam means (36, 38) shaped so as to allow

the sliding of the release member from the operative position to the inoperative position, and vice versa, by means of the said servo-mechanism only when the lock cylinder (24) is in its open position and so as to keep
5 the release member (40) in the inoperative position when the lock cylinder (24) is moved from the second open position to the locked position or the first open position.

2. Device according to Claim 1, characterised in that
10 the part for connecting the release member (40) to the said servo-mechanism (52) has an aperture (44) which is elongate in the direction of sliding(B) of the release member (40), and in that the cooperating cam means include an eccentric pin (36) controlled by the lock
15 cylinder (24) and engaged in an aperture (38) in the body of the release member (40) having a first elongate arm (38a) disposed like the connecting aperture (44) and in which the eccentric pin (36) is inserted in the first open position of the lock cylinder (24), and a
20 second elongate arm (38b) inclined transversely relative to the first arm (38a) and in which the eccentric pin (36) is inserted in the locked position and in the second open position of the lock cylinder (24).

25 3. Device according to Claim 2, characterised in that the body of the release member (40) is formed from a single piece of moulded plastics material.

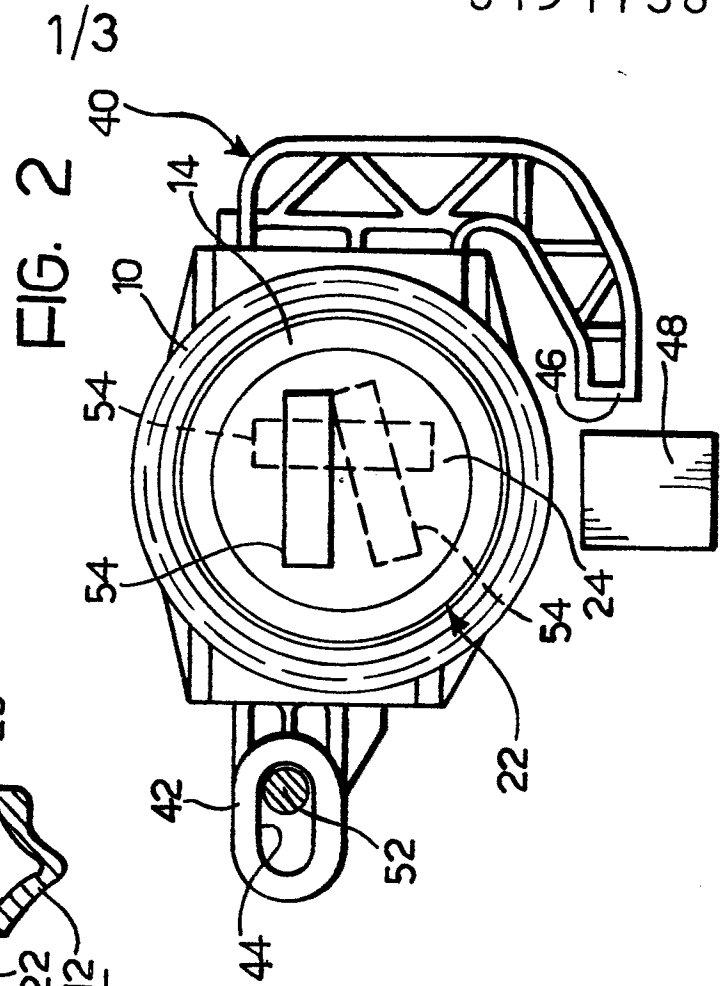
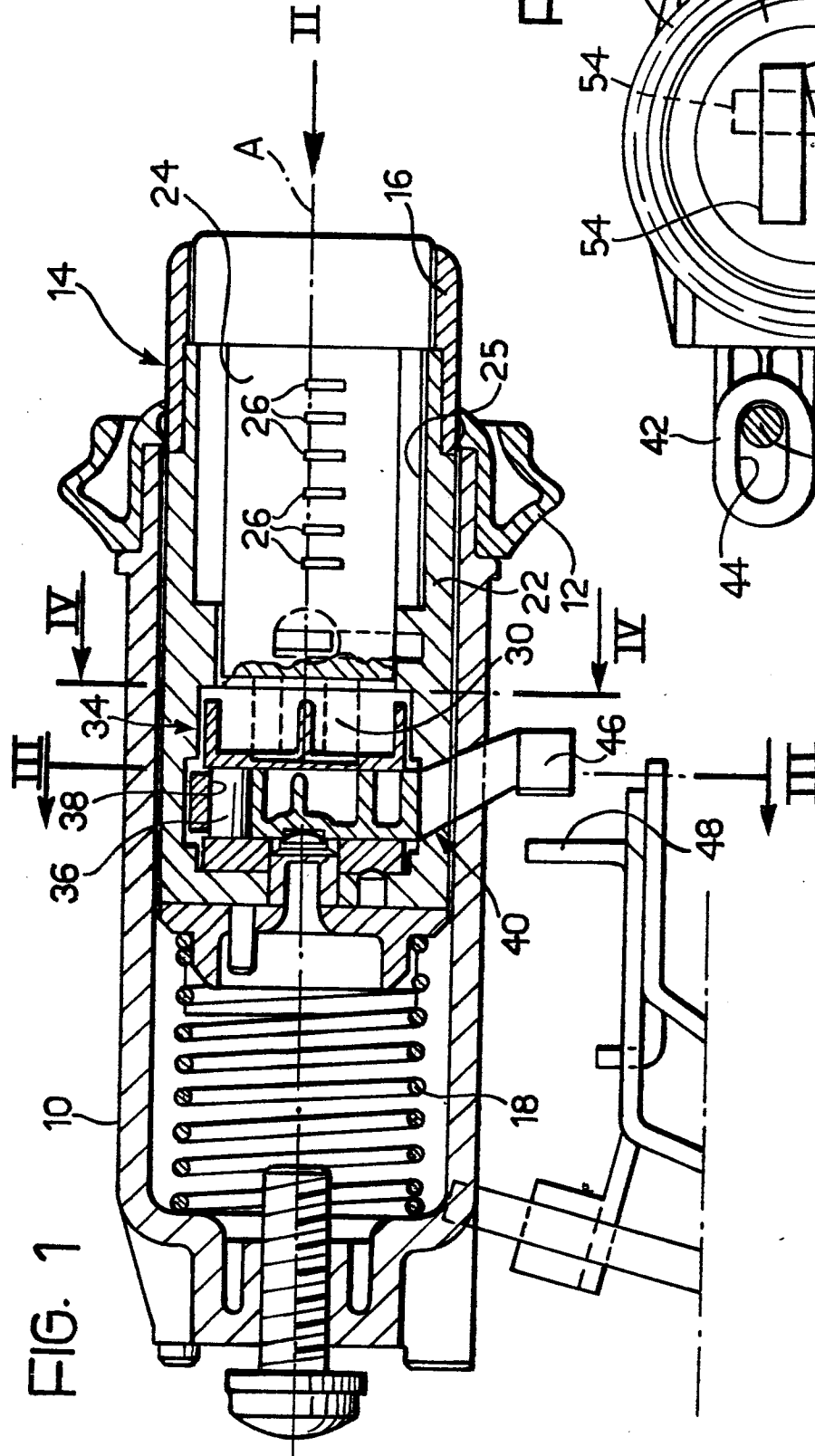


FIG. 3

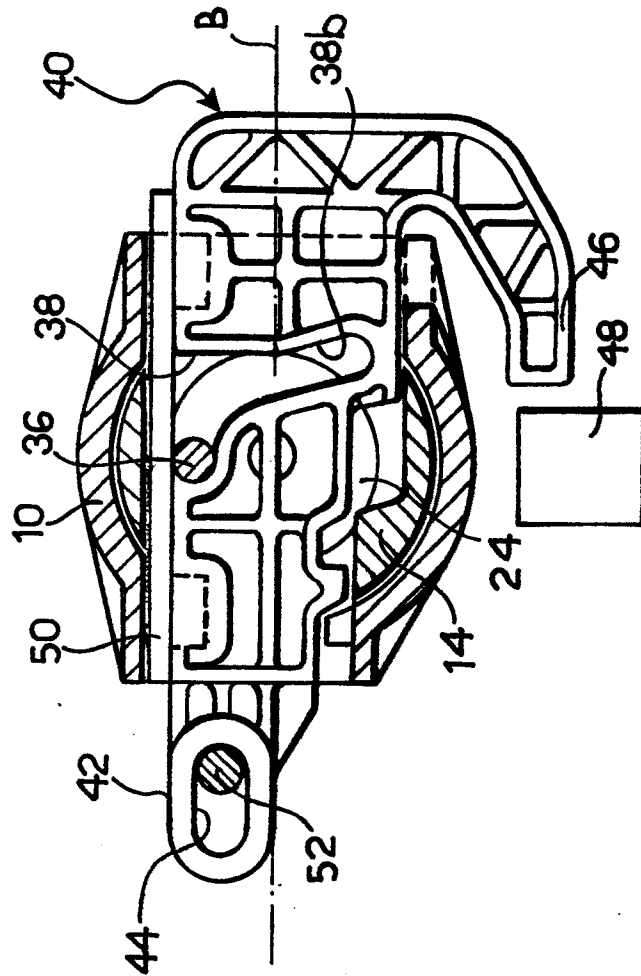
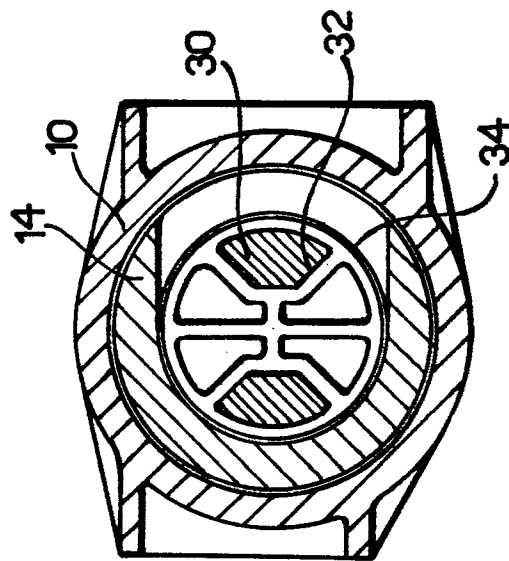


FIG. 4



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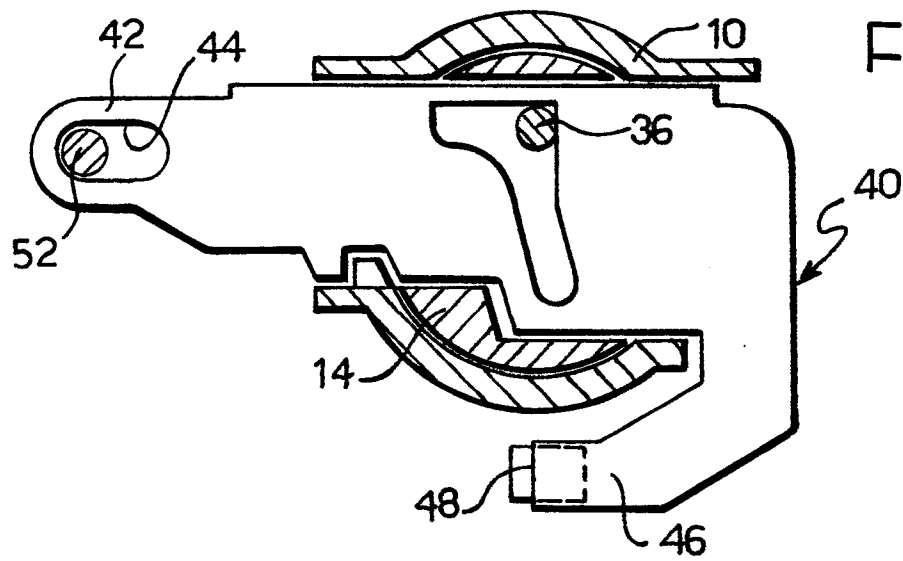


FIG. 5

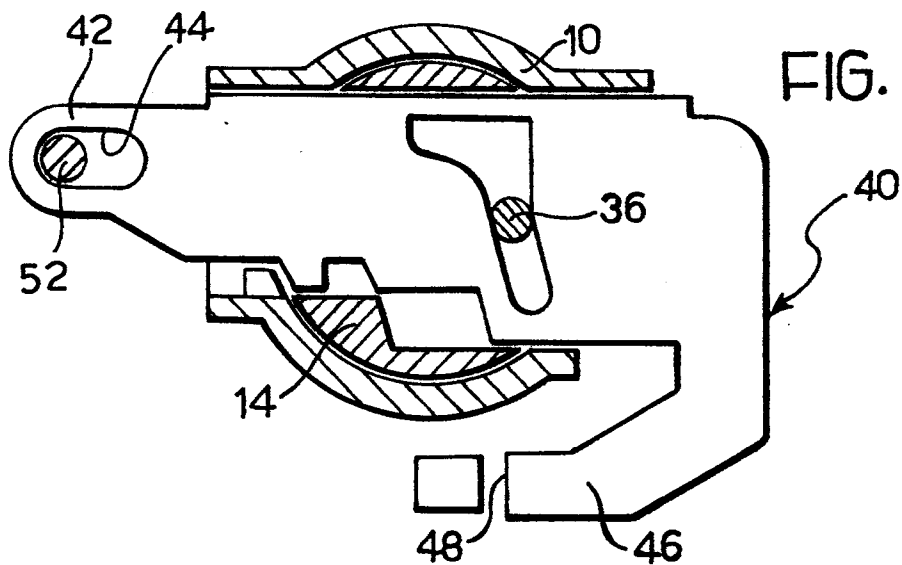


FIG. 6

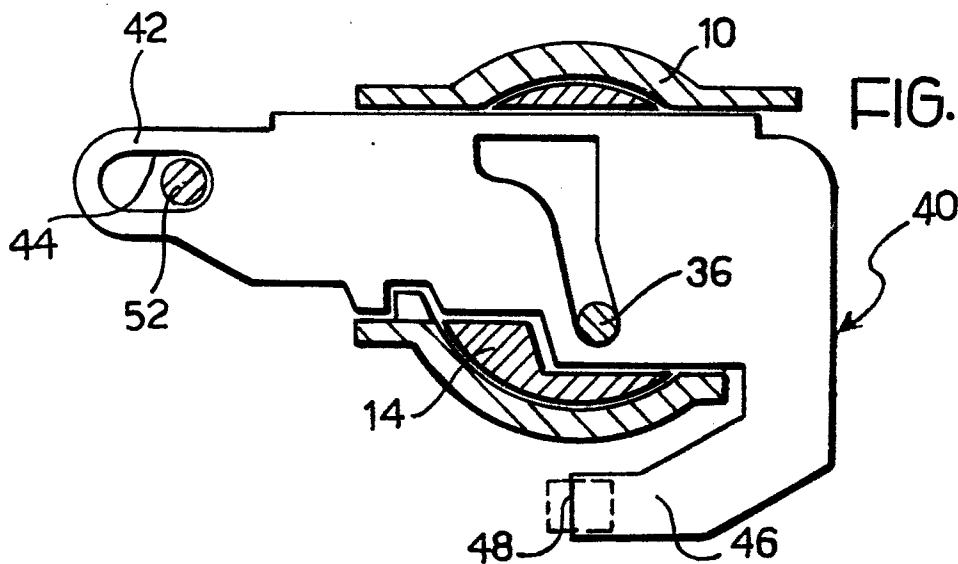


FIG. 7