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(54) Vehicle door latch permitting simultaneous outside and inside door release lever actuation

(57) In one aspect, the invention is directed to a closure latch for a vehicle door, wherein if the closure latch is locked and a person actuates the outside door release lever in an attempt to open the door, the closure latch is configured to permit the inside door release lever to be actuated to open the ratchet, while the outside door release lever is still actuated.

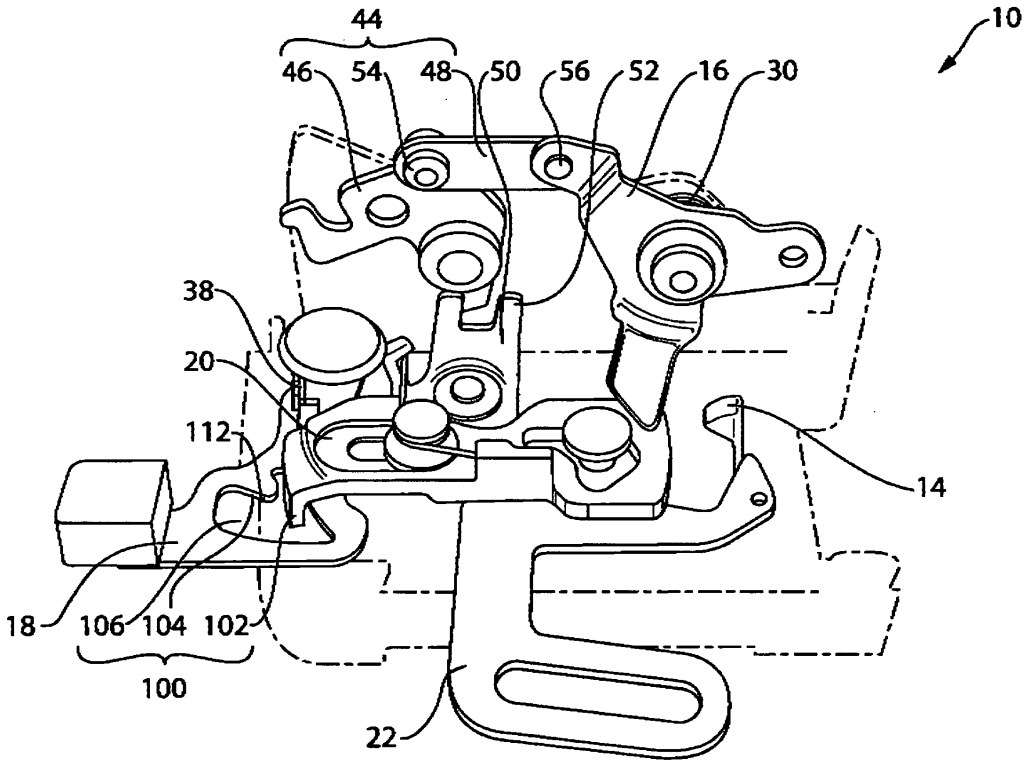

FIG. 1a

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to a closure latch for a vehicle door, and more particularly to a closure latch for a vehicle door in which actuation of the inside door release lever unlocks the door if it is locked and also opens the door.

BACKGROUND OF THE INVENTION

[0002] In some vehicle door closure latches equipped with a lock mechanism, an outside door release lever and an inside door release lever, the inside door release lever can be successfully actuated to open the vehicle door even if the door is locked.

[0003] A situation can occur, however, where a person tries to actuate the outside door release lever to open the door while the door is locked, and a vehicle occupant tries to actuate the inside door release lever to open the door while the outside door release lever is still actuated. If the door is locked, it can occur that the closure latch does not permit the inside door release lever to open the door. Depending on the force used to actuated the inside door release lever it is possible that for some closure latches, the closure latch could become damaged in such a scenario. In a more specific situation, the cloture latch may be configured to unlock the door and also open the door by the actuation of the inside door release lever when the door is locked and when the outside door release lever is actuated.

[0004] It would be beneficial to provide a closure latch that overcame one or more of the aforementioned problems, or one or more other problems relating to closure latches.

SUMMARY OF THE INVENTION

[0005] In one aspect, the invention is directed to a closure latch for a vehicle door, wherein if the closure latch is locked and a person actuates the outside door release lever in an attempt to open the door, the closure latch is configured to permit the inside door release lever to be actuated to open the ratchet, while the outside door release lever is still actuated.

[0006] In a particular embodiment, the invention is directed to a closure latch for a vehicle door. The closure latch includes a ratchet movable between an open position and a closed position and is biased towards the closed position. The closure latch further includes a pawl movable between a ratchet locking position wherein the pawl holds the ratchet in the closed position and a ratchet release position wherein the pawl permits the ratchet to move to the open position. The pawl is biased towards the ratchet locking position. The closure latch further includes an inside door release lever that is movable between a home position wherein the inside door release lever permits movement of the pawl to the ratchet locking position, and a pawl release position wherein the inside door release lever moves the pawl to the ratchet release position. The inside door release lever is biased towards the home position. The closure latch further includes a lock link and an outside door release lever that is operatively connectable to the pawl through the lock link. When the lock link is in an actuatable position the outside door release lever is movable between a home position wherein the outside door release lever permits movement of the pawl to the ratchet locking position, and a pawl release position wherein the outside door release lever moves the pawl to the ratchet release position through the lock link. When the lock link is in a non-actuatable position, the outside door release lever is operatively disconnected from the pawl and is movable from the home position to an attempted pawl release position wherein the pawl is permitted to be in a ratchet locking position. The outside door release lever is biased towards the home position. The closure latch further includes a lock lever movable between a locked position wherein the lock lever moves the lock link to the non-actuatable position, and an unlocked position wherein the lock link is permitted to move to the actuatable position. When the lock lever is in the locked position and the outside door release lever is moved to the attempted pawl release position, the inside door release lever is movable to the pawl release position.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] The present invention will now be described by way of example only with reference to the attached drawings, in which:

[0008] Figure 1 a is a perspective view of a closure latch for a vehicle door in accordance with an embodiment of the present invention, showing an inside door release lever in a home position, an outside door release lever in a home position, a lock link in an actuatable position and a lock lever in an unlocked position;

[0009] Figure 1b is a plan view of the vehicle latch shown in Figure 1a;

[0010] Figure 1c is a plan view of a portion of the closure latch shown in Figure 1a, showing a ratchet and pawl with the ratchet in a closed position;

[0011] Figure 1d is another plan view of the portion of the closure latch shown in Figure 1c, showing the ratchet in an open position;

[0012] Figure 2a is a perspective view of the closure latch shown in Figure 1a, showing the inside door release lever in the home position, the outside door release lever in the home position, the lock link in a non-actuatable position and the lock lever in a locked position;

[0013] Figure 2b is a plan view of the closure latch shown in Figure 2a;

[0014] Figure 3 is a perspective view of the closure latch shown in Figure 1a, showing the inside door release lever in a pawl release position, the outside door release

lever in the home position, the lock link in the actuatable position and the lock lever in the unlocked position;

[0015] Figure 4 is a plan view of the closure latch shown in Figure 1a, showing the inside door release lever in the home position, the outside door release lever in a pawl release position, the lock link in a pawl release position and the lock lever in the unlocked position;

[0016] Figure 5 is a plan view of the closure latch shown in Figure 1a, showing the inside door release lever in the home position, the outside door release lever in an attempted pawl release position, the lock link in the non-actuatable position and the lock lever in the locked position;

[0017] Figure 6 is a perspective view of the closure latch shown in Figure 1a, showing the inside door release lever in the pawl release position, the outside door release lever in the attempted pawl release position, the lock link in the non-actuatable position and the lock lever in the unlocked position.

DESCRIPTION OF THE INVENTION

[0018] Reference is made to Figures 1a and 1c, which show a closure latch 10 for a door (not shown) of a vehicle (not shown), in accordance with an embodiment of the present invention. The closure latch 10 Includes a ratchet 12 (Figure 1c), a pawl 14 (Figure 1c), an inside door release lever 16 (Figure 1a), an outside door release lever 18 (Figure 1a), a lock link 20 (Figure 1 a) and a lock lever 22 (Figure 1a).

[0019] Referring to Figures 1c and 1d, the ratchet 12 is movable between a closed position (Figure 1c) wherein the ratchet 12 retains a striker 24 mounted on the body (not shown) of the vehicle and an open position (Figure 1 d) wherein the ratchet 12 is unengaged with the striker. A ratchet biasing member 26 such as a suitable spring may be provided to bias the ratchet 12 towards the open position.

[0020] The pawl 14 is movable between a ratchet locking position (Figure 1c) wherein the pawl 14 holds the ratchet 12 in the closed position, and a ratchet release position (Figure 1d) wherein the pawl 14 permits the ratchet 12 to move to its open position. A pawl biasing member 28 such as a suitable spring may be provided to bias the pawl 14 towards the ratchet locking position.

[0021] Referring to Figures 1a and 1b, the inside door release lever 16 may be operatively connected to the ratchet 12 for movement from the closed position to the open position. For example, the inside door release lever 16 may be movable between an inside door release lever home position (Figures 1a and 1b) the inside door release lever 16 permits the ratchet 12 (Figure 1c) to be in the closed position, and an inside door release lever pawl release position (Figure 3) wherein it moves the pawl 14 to the ratchet release position so that the ratchet 12 can move from the closed position to the open position.

[0022] An inside door release lever biasing member 30 (Figure 1 a), such as a suitable spring, may be provided to bias the inside door release lever 16 towards its home position.

[0023] The outside door release lever 18 is operatively connectable to the lock link 20 and is operatively connectable to the pawl 14 through the lock link 20. More specifically, when the lock link 20 is in an actuatable position, (Figure 1a), the outside door release lever 18 is movable between an outside door release lever home position (Figure 1a) and an outside door release lever pawl release position (Figure 4). In the outside door release lever home position the outside door release lever 18 permits the ratchet 12 (Figure 1c) to be in the closed position. Movement of the outside door release lever 18 (Figure 4) to the outside door release lever pawl release position, moves the lock link 20 from the actuatable position (Figure 1a) to a lock link pawl release position (Figure 4) wherein the lock link 20 moves the pawl 14 to the ratchet release position.

[0024] When the lock link 20 is in a non-actuatable position, shown in Figure 2b, the outside door release lever 18 is operatively disconnected from the pawl 14 and is movable from its home position to an attempted pawl release position, shown in Figure 5, wherein the outside door release lever 18 permits the pawl 14 to be in the ratchet locking position.

[0025] More specifically, a first operative connection shown at 100, between the lock link 20 and the outside door release lever 18 may be made up of a first arm 102 on the lock link 20 and a first aperture defining wall 104 that defines a first aperture 106 that is on the outside door release lever 18. The first arm 102 may alternatively be on the outside door release lever 18 and the first aperture 106 may be on the lock link 20. When the lock link 20 is in the actuatable position (Figure 1b) a first engagement surface 108 that is a part of the first aperture defining wall 104 is aligned with the first arm 102, so that movement of the outside door release lever 18 to the outside door release lever pawl release position (Figure 4) moves the lock link 20 to the lock link pawl release position. When the lock link 20 is in the non-actuatable position (Figure 2b), the first engagement surface 108 is unaligned with the first arm 102, so that movement of the outside door release lever 18 from its home position to the attempted pawl release position (Figure 5) does not move the lock link 20 and thereby permits the pawl 14 to be in the ratchet locking position, which permits the ratchet 12 to be in the closed position.

[0026] An outside door release lever biasing member 38, such as a suitable spring, may be provided to bias the outside door release lever 18 towards its rest position.

[0027] After the outside door release lever 18 is moved to its pawl release position (Figure 4), it may be returned to the outside door release lever home position (Figure 1b) by the outside door release lever biasing member 38. During this movement back to its home position, a second engagement surface 110 that is part of the first aperture defining wall 104 on the outside door release lever 18 engages the arm 102 and thereby drives the

lock link 20 from the lock link pawl release position to the actuatable position.

[0028] The lock lever 22 is movable between a locked position (Figures 2a and 2b) wherein the lock lever 22 operatively disconnects the outside door release lever 18 from the pawl 14 (and thus from the ratchet 12 (Figure 1c)), and an unlocked position (Figures 1 a and 1b) wherein the lock lever 22 operatively connects the outside door release lever 18 to the pawl 14 (and thus to the ratchet 12 (Figure 1c)). More specifically, the lock lever 22 may be operatively connected to the lock link 20 by a second operative connection 200 (Figure 1 b), which may include a second arm 202 that may be in the form of a pin and that may be on the lock lever 22, and a second aperture wall 204 that defines a second aperture 206 that may be on the lock link 20. Alternatively, the second arm 202 may be on the lock link 20 and the second aperture 206 may be on the lock lever 22.

[0029] When the outside door release lever 18 is in its home position, movement of the lock lever 22 from the unlocked position (Figure 1b) to the locked position (Figure 2b) drives the lock link 20 to move from the actuatable position (Figure 1b) to the non-actuatable position (Figure 2b) by means of the engagement between the second arm 202 and the second aperture 206. When the outside door release lever 18 is in its home position, movement of the lock lever 22 from the locked position (Figure 2b) to the unlocked position (Figure 1b) causes the lock link 20 to move from the non-actuatable position to the actuatable position under the urging of a lock link biasing member 39.

[0030] When a person moves the outside door release lever 18 to the attempted pawl release position while the lock lever 22 is in the locked position and the lock link 20 is in the non-actuatable position, the lock lever 22 may still be movable to the unlocked position (Figure 6), however the movement of the lock link 20 to its actuatable position under the urging of the lock link biasing member 39 may be resisted by engagement between the first arm 102 and a third engagement surface 112 on the first aperture defining wall 104. The aperture 206 has a suitable configuration to permit the movement of the lock lever 22 to its unlocked position even if the movement of the lock link 20 is resisted. A benefit of this configuration is described further below.

[0031] Referring to Figure 1a, a lock lever override mechanism 44 to unlock the lock lever 22 if it is locked when a vehicle occupant actuates the inside door release lever 16. In other words, if the lock lever 22 is in the locked position, the lock lever override mechanism 44 operatively connects the inside door release lever 16 to the lock lever 22 such that movement of the inside door release lever 16 to its pawl release position drives the lock lever 22 from the locked position to the unlocked position. Preferably, the driving of the lock lever 22 to the unlocked position takes place before the inside door release lever 16 reaches the pawl release position (i.e. before the inside door release lever 16 causes the pawl 14 to release the ratchet 12). As a result, when the inside door release lever 16 is actuated by a vehicle occupant, the vehicle door is unlocked before the vehicle door is opened, thereby avoiding the situation where the occupant moves the inside door release lever 16 enough to open the vehicle door but not enough to unlock the lock lever 22.

[0032] The lock lever override mechanism 44 may have any suitable structure. For example, the lock lever override mechanism 44 may include an override lever 46 and an override link 48. The override lever 46 has a lock lever engagement member 50 that is captured in a fork 52 on the lock lever 22. The engagement of the lock lever engagement member 50 and the fork 52 causes the override lever 46 to move in tandem with the lock lever 22. Thus movement of the lock lever 22 to the locked position (Figure 2a) moves the override lever 46 to a locked position, and movement of the lock lever 22 to the unlocked position moves the override lever 46 to an unlocked position. Conversely, however, movement of the override lever 46 to its unlocked position moves the lock lever 22 to its unlocked position, and movement of the override lever 46 to its locked position moves the lock lever 22 to its locked position.

[0033] The override link 48 operatively connects the inside door release lever 16 to the override lever 46 in such a way that, when the lock lever 22 and the override lever 46 are in their respective locked positions, the movement of the inside door release lever 16 to the pawl release position causes the override link 48 to rotate the override lever 46 to its unlocked position, which in turn causes the lock lever 22 to rotate to its unlocked position.

[0034] As shown in Figure 1a, the override link 48 may have a pivotal connection 54 with the override lever 46, e.g. by means of a pin joint, and a pivotal and sliding connection 56 with the inside door release lever 16, by means of a pin 58 on the inside door release lever 16 that engages a slot 60 on the override link 48. Because the override link 48 connects the inside door release lever 16 to the override lever 46, movement of the override lever 46 from the locked position (Figure 2a) to its unlocked position (Figure 1 a) causes the inside door release lever 16 to move to an unlocked home position (Figure 1a), and movement of the override lever 46 from the unlocked position (Figure 1a) to its locked position (Figure 2a) causes the inside door release lever 16 to move to a locked home position (Figure 2a). Movement of the inside door release lever 16 from the locked home position (Figure 2a) to the pawl release position (Figure 3) causes the override lever 46 and therefore the lock lever 22 to move from their respective locked positions to their respective unlocked positions. When the inside door release lever 16 is in the unlocked home position (Figure 1a), its movement to the pawl release position (Figure 3) does not cause movement of the override lever 46 and the lock lever 22 from their respective unlocked positions, as a result of the sliding aspect of the pivotal and sliding connection 56 between the override link 48 and the inside door release lever 16.

[0035] Referring to Figure 5, during use while the vehicle door is locked (ie. while the lock lever 22 is in the locked position), it is possible for a situation to arise where the outside door release lever 18 is actuated (ie. moved to its attempted pawl release position (Figure 5) by an outside person (ie. a person outside the vehicle), and for a vehicle occupant inside the vehicle to actuate the inside door release lever 16 while the outside door release lever 18 is still actuated (ie. in the attempted pawl release position (Figure 5)). Because the lock lever 22 is still movable to its unlocked position (Figure 6) when the outside door release lever 18 is in the attempted pawl release position, the inside door release lever 16 is not prevented from moving to its pawl release position, and as a result the closure latch 10 permits the vehicle occupant to successfully release the ratchet 12 (Figure 1d) and open the vehicle door. Additionally, when the outside person releases the outside door handle so that the outside door release lever 18 returns to its home position (Figure 1b), the lock link 20 moves to its actuatable position under the urging of its lock link blasing member 39, because the movement of the lock link 20 is no longer resisted by the third engagement surface 112.

[0036] While the above description constitutes a plurality of embodiments of the present invention, it will be appreciated that the present invention is susceptible to further modification and change without departing from the fair meaning of the accompanying claims.

Claims

1. A closure latch for a vehicle door, comprising:

a ratchet movable between an open position and a closed position and biased towards the open position;
a pawl movable between a ratchet locking position wherein the pawl holds the ratchet in the closed position and a ratchet release position wherein the pawl permits the ratchet to move to the open position, and wherein the pawl is biased towards the ratchet locking position;
an inside door release lever movable between a home position wherein the Inside door release lever permits movement of the pawl to the ratchet locking position, and a pawl release position wherein the inside door release lever moves the pawl to the ratchet release position, wherein the inside door release lever is biased towards the home position;
a lock link and an outside door release lever that is operatively connectable to the pawl through the lock link, wherein when the lock link is in an actuatable position the outside door release lever is movable between a home position wherein the outside door release lever permits movement of the pawl to the ratchet locking position, and a pawl release position wherein the outside door release lever moves the pawl to the ratchet release position through the lock link, and wherein when the lock link is in a non-actuatable position, the outside door release lever is operatively disconnected from the pawl and is movable from the home position to an attempted pawl release position wherein the pawl is permitted to be in a ratchet locking position, wherein the outside door release lever is biased towards the home position; and
a lock lever movable between a locked position wherein the lock lever moves the lock link to the non-actuatable position, and an unlocked position wherein the lock link is permitted to move to the actuatable position,
wherein, when the lock lever is in the locked position and the outside door release lever is moved to the attempted pawl release position, the inside door release lever is movable to the pawl release position.

2. A closure latch as claimed in claim 1, wherein, when the lock lever is in the locked position, movement of the inside door release lever towards the pawl release position moves the lock lever to the unlocked position,

3. A closure latch as claimed in claim 2, wherein the outside door release lever is connected to the lock link by a first operative connection and wherein the lock lever is connected to the lock link by a second operative connection and wherein the first and second operative connections together have sufficient play to permit the lock lever to move from the locked position to the unlocked position when the outside door release lever is moved to the attempted pawl release position.

4. A closure latch as claimed in claim 3, wherein the first operative connection includes a first arm on one of the lock link and the outside door release lever, and a first aperture defining wall that defines a first aperture into which the first arm extends on the other of the lock link and the outside door release lever.

5. A closure latch as claimed in claim 4, wherein the second operative connection includes a second arm on one of the lock link and the lock lever, and a second aperture defining wall that defines a second aperture into which the second arm extends on the other of the lock link and the lock lever.

6. A closure latch as claimed in claim 5, wherein the first arm is on the lock link and the second arm is on the lock lever.

7. A closure latch as claimed in claim 6, wherein, when

the lock link is in the actuatable position, the first aperture defining wall includes a first engagement surface, wherein the first engagement surface is aligned for engagement with the first arm when the outside door lever is moved from the rest position to the pawl release position, and is unaligned with the first arm when the lock link is in the non-actuatable position.

8. A closure latch for a vehicle door, comprising:

a ratchet movable between an open position and a closed position and biased towards the open position;
a pawl movable between a ratchet locking position wherein the pawl holds the ratchet in the closed position and a ratchet release position wherein the pawl permits the ratchet to move to the open position, and wherein the pawl is biased towards the ratchet locking position;
an inside door release lever movable between a home position wherein the inside door release lever permits movement of the pawl to the ratchet locking position, and a pawl release position wherein the inside door release lever moves the pawl to the ratchet release position, wherein the inside door release lever is biased towards the home position;
a lock link and an outside door release lever that is operatively connectable to the pawl through the lock link, wherein when the lock link is in an actuatable position the outside door release lever is movable between a home position wherein the outside door release lever permits movement of the pawl to the ratchet locking position, and a pawl release position wherein the outside door release lever moves the pawl to the ratchet release position through the lock link, and wherein when the lock link is in a non-actuatable position, the outside door release lever is operatively disconnected from the pawl and is movable from the home position to an attempted pawl release position wherein the pawl is permitted to be in a ratchet locking position, wherein the outside door release lever is biased towards the home position; and
a lock lever movable between a locked position wherein the lock lever moves the lock link to the non-actuatable position, and an unlocked position wherein the lock link is permitted to move to the actuatable position,
wherein, when the outside door release lever is moved to the attempted pawl release position, the lock lever is movable from the locked position to the unlocked position.

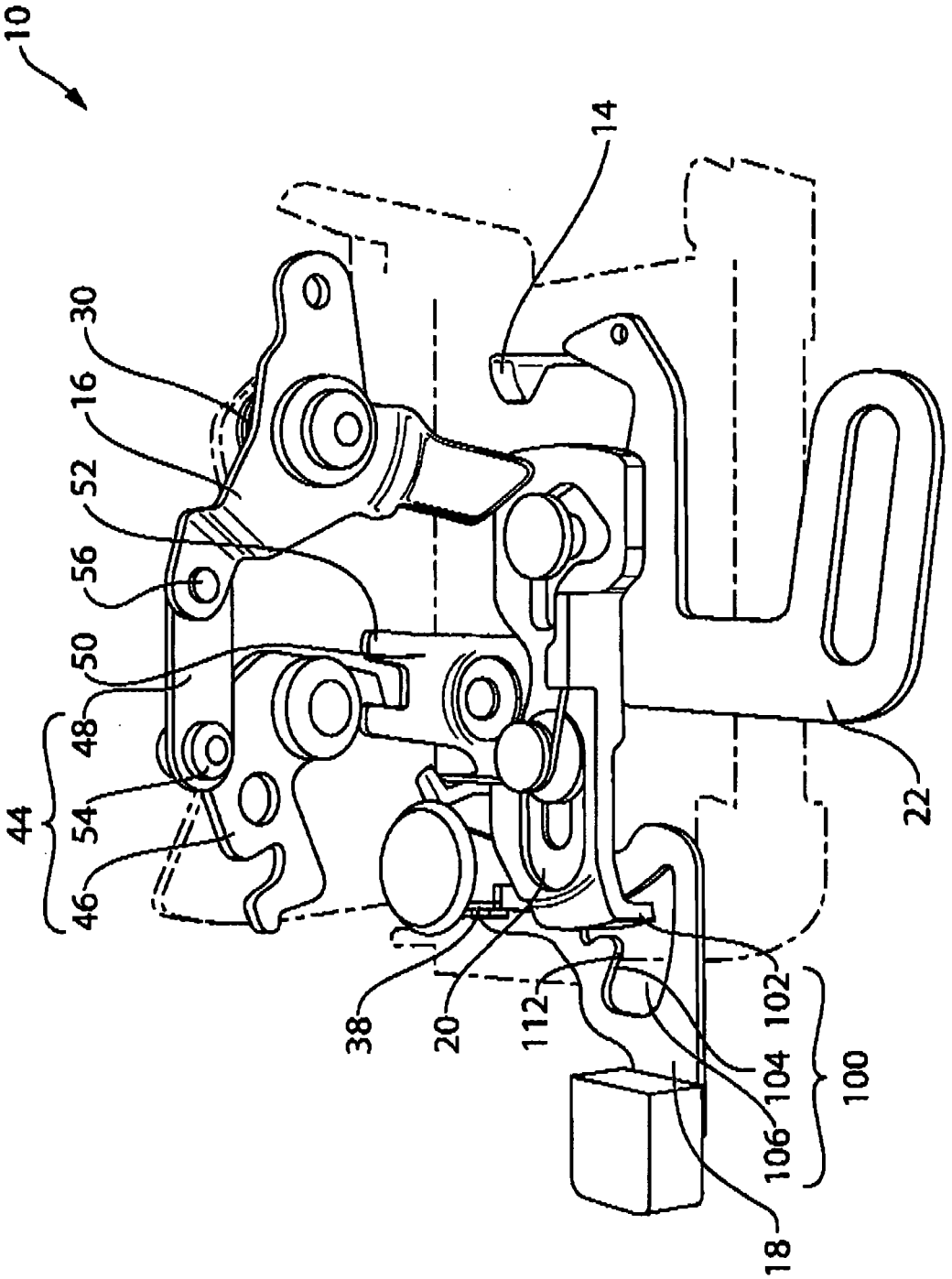

FIG. 1a

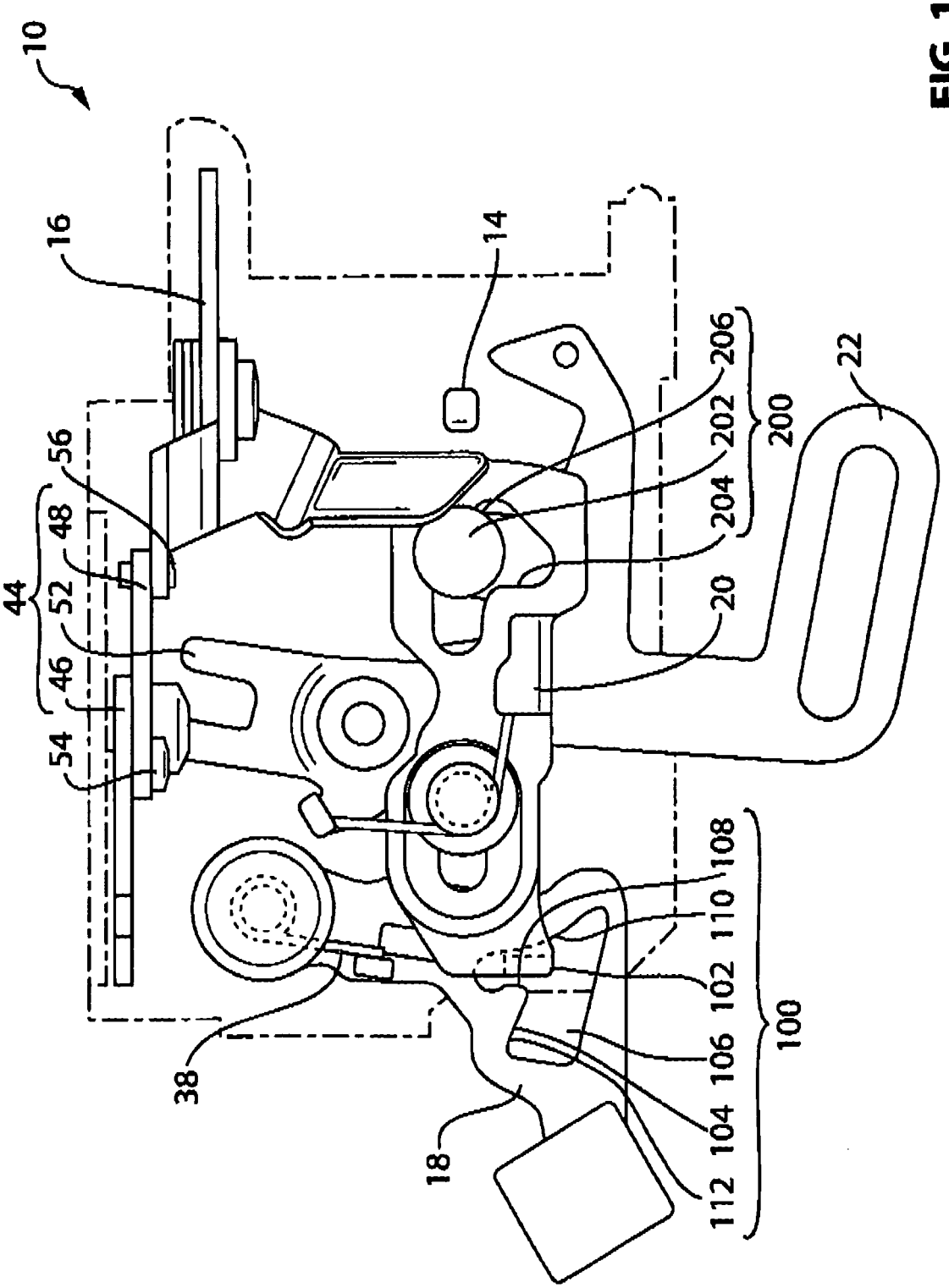
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FIG. 1b

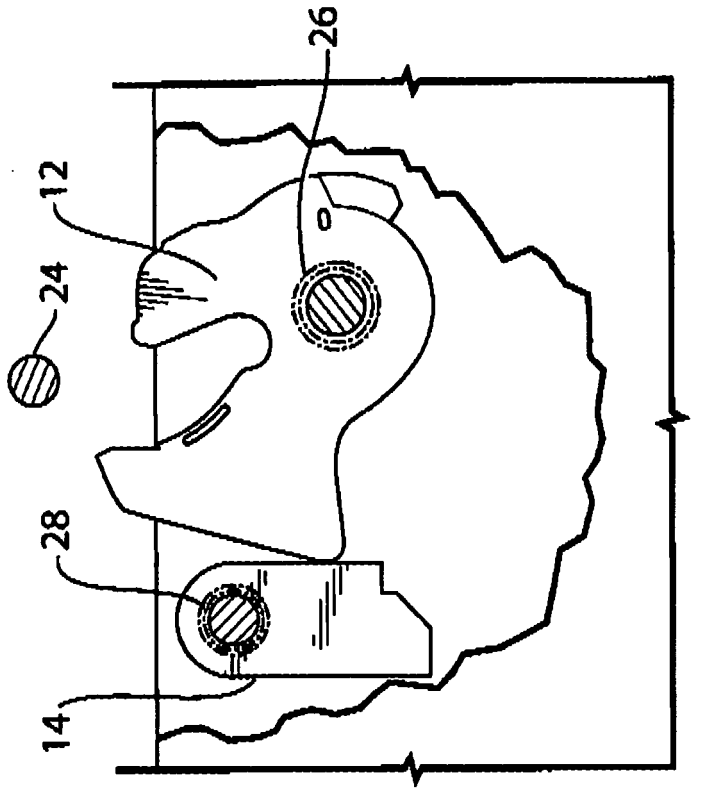

FIG. 1d

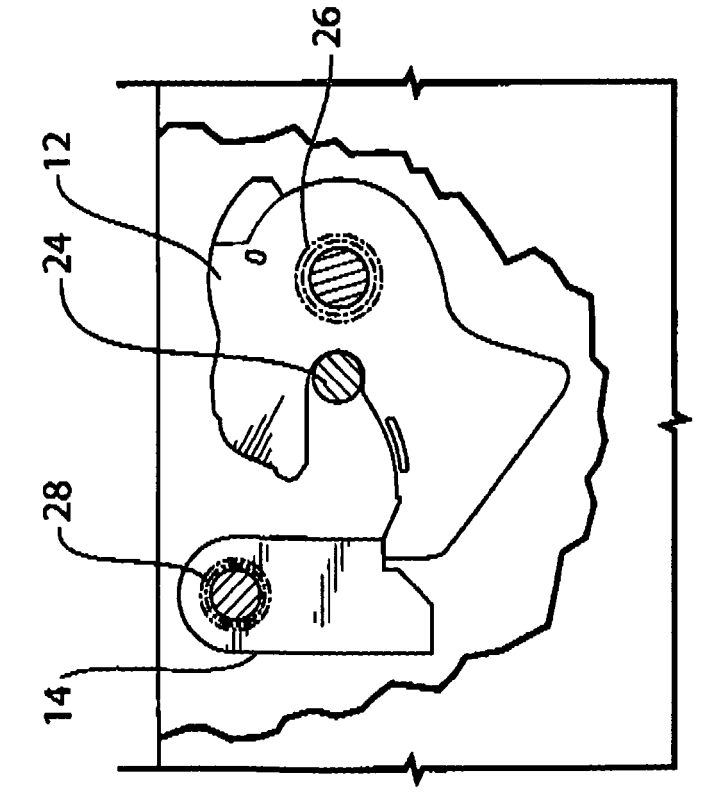

FIG. 1c

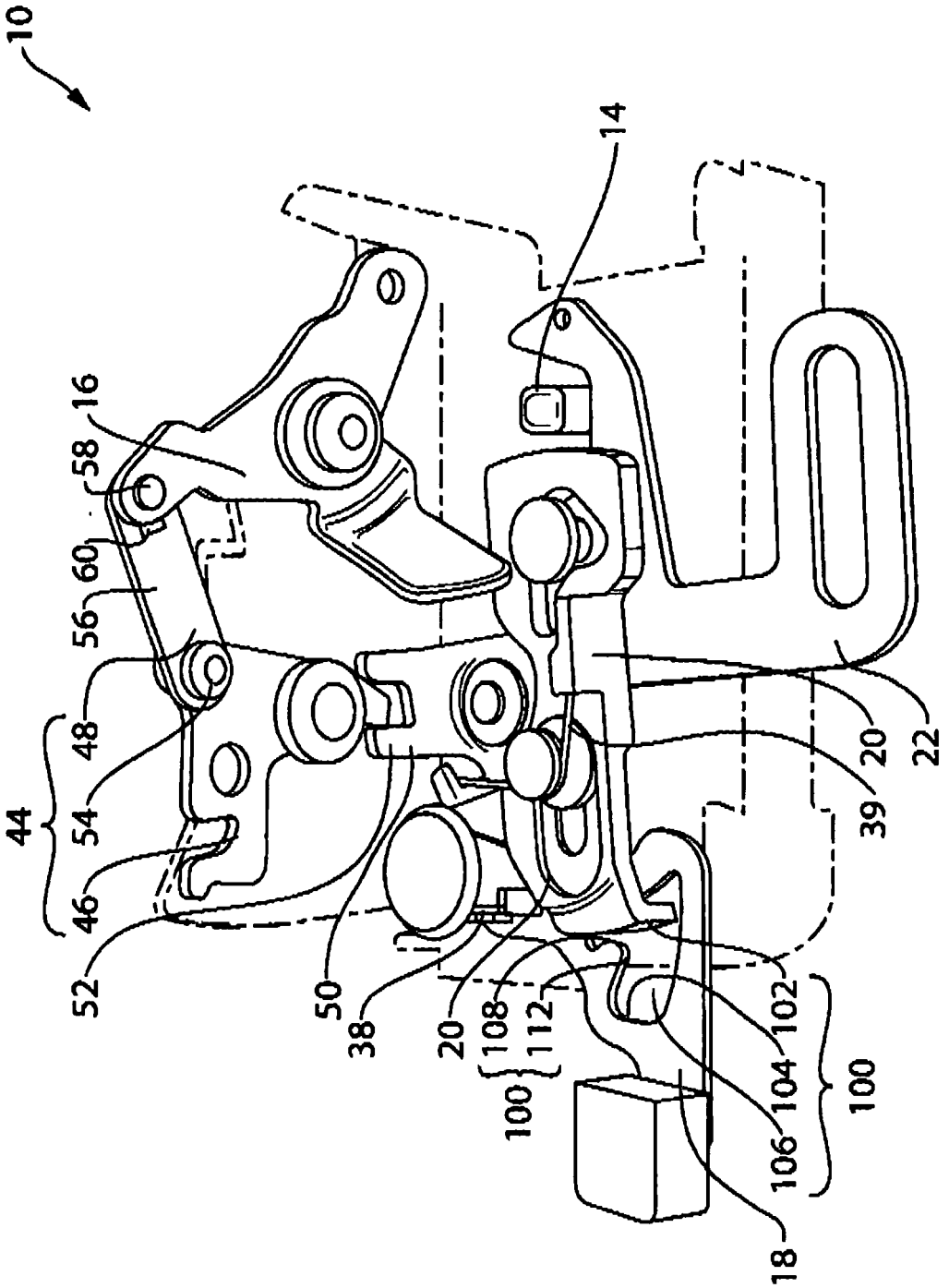
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FIG. 2a

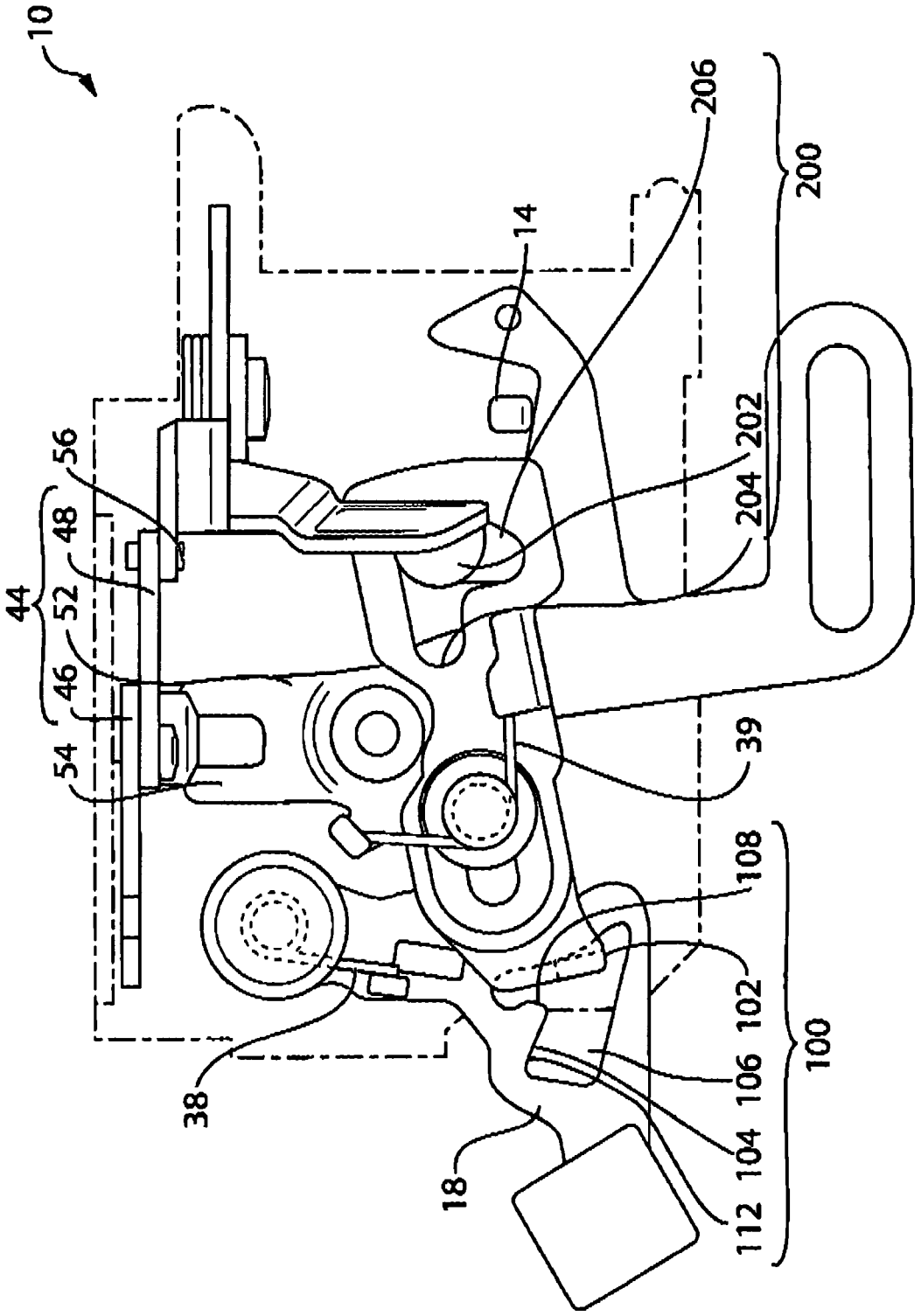
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FIG. 2b

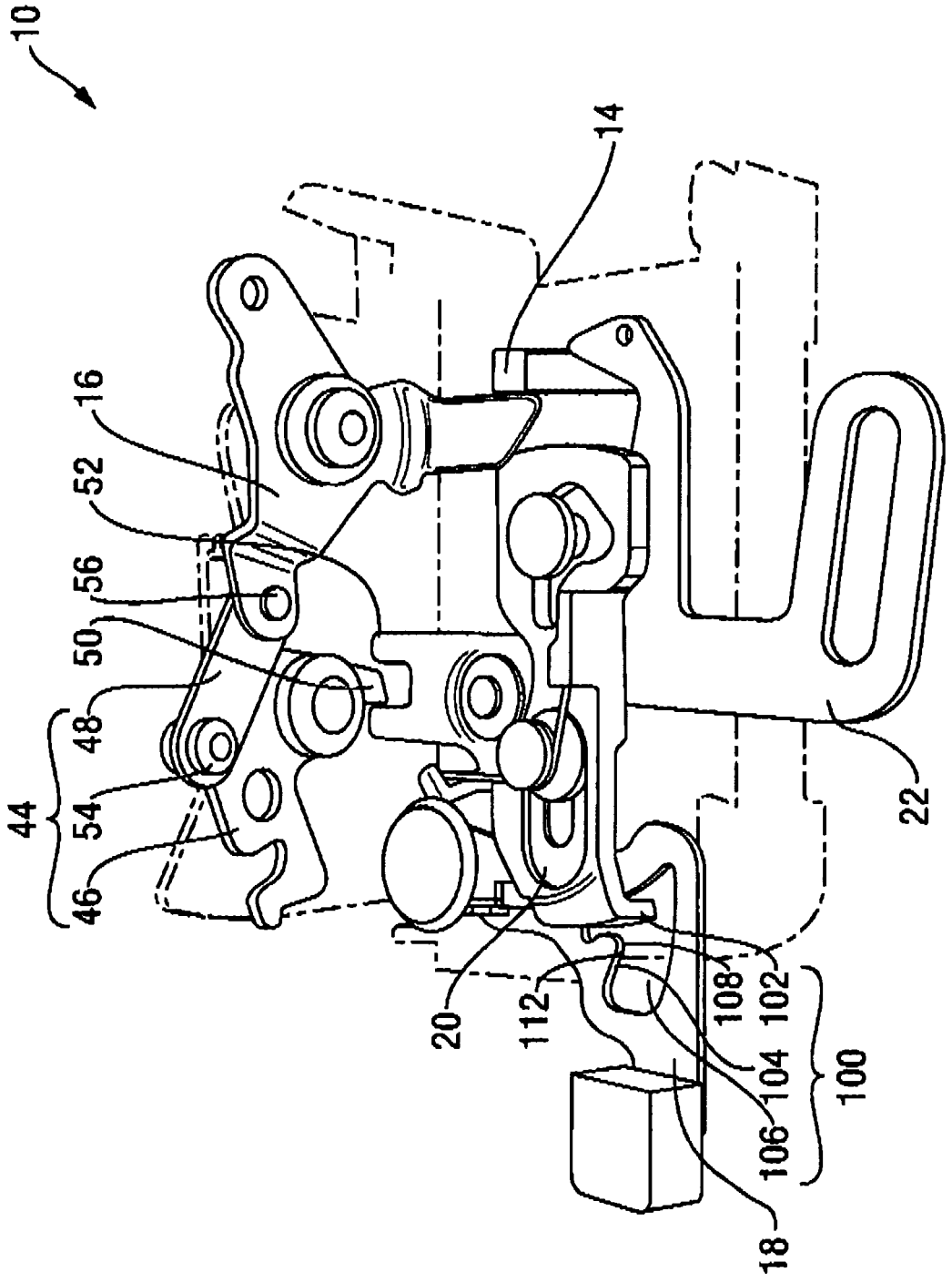

FIG.3

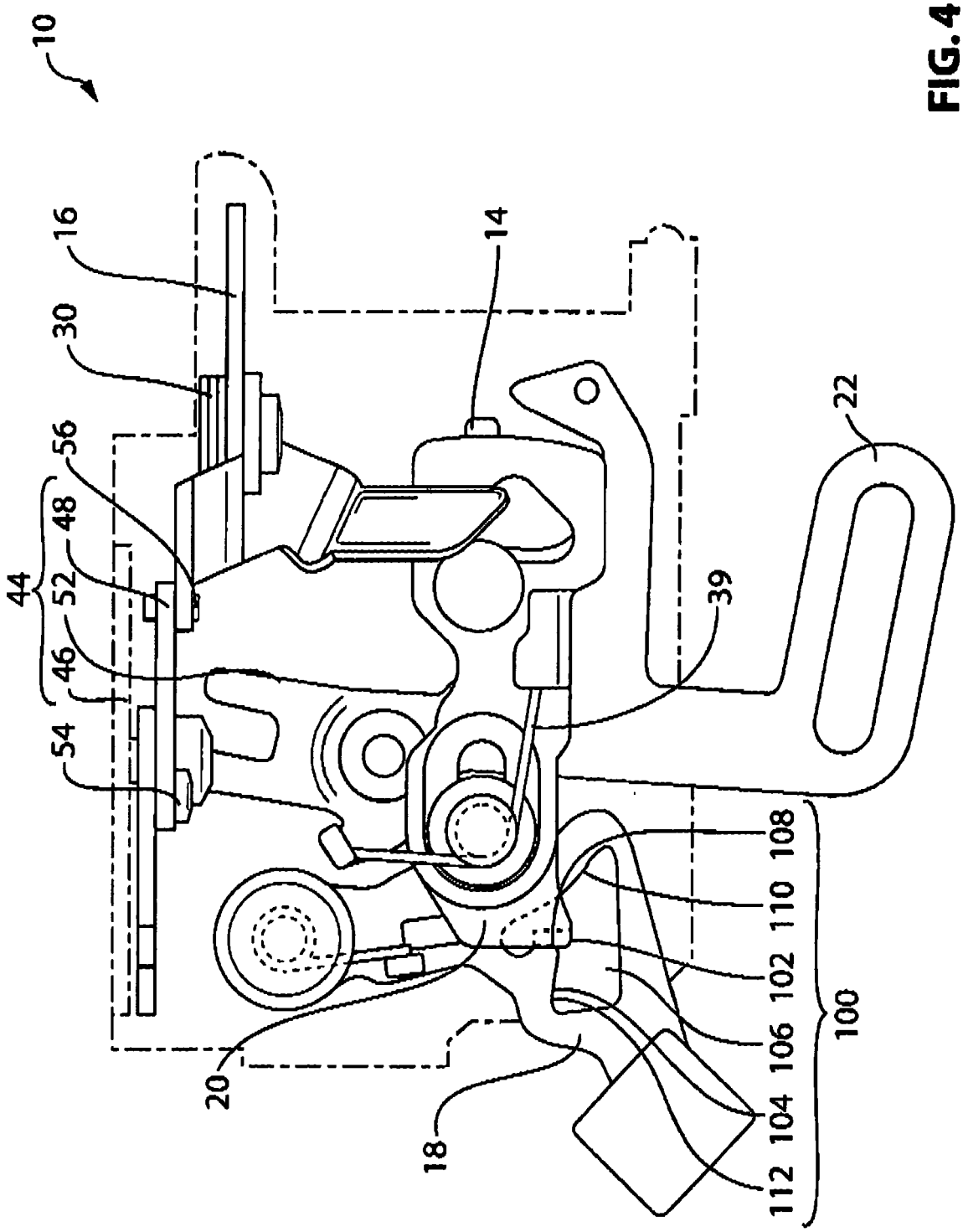

FIG. 4

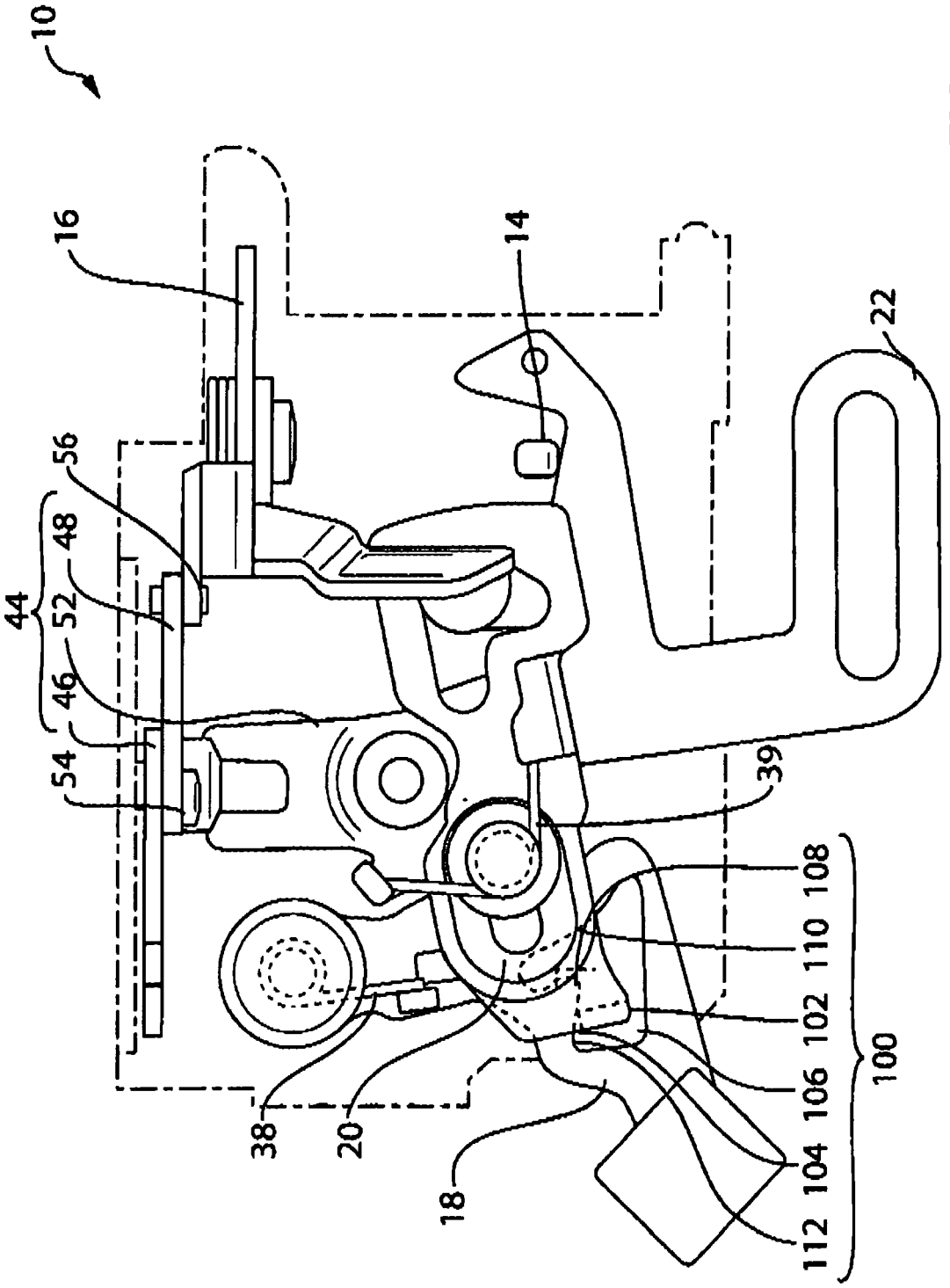

FIG. 5

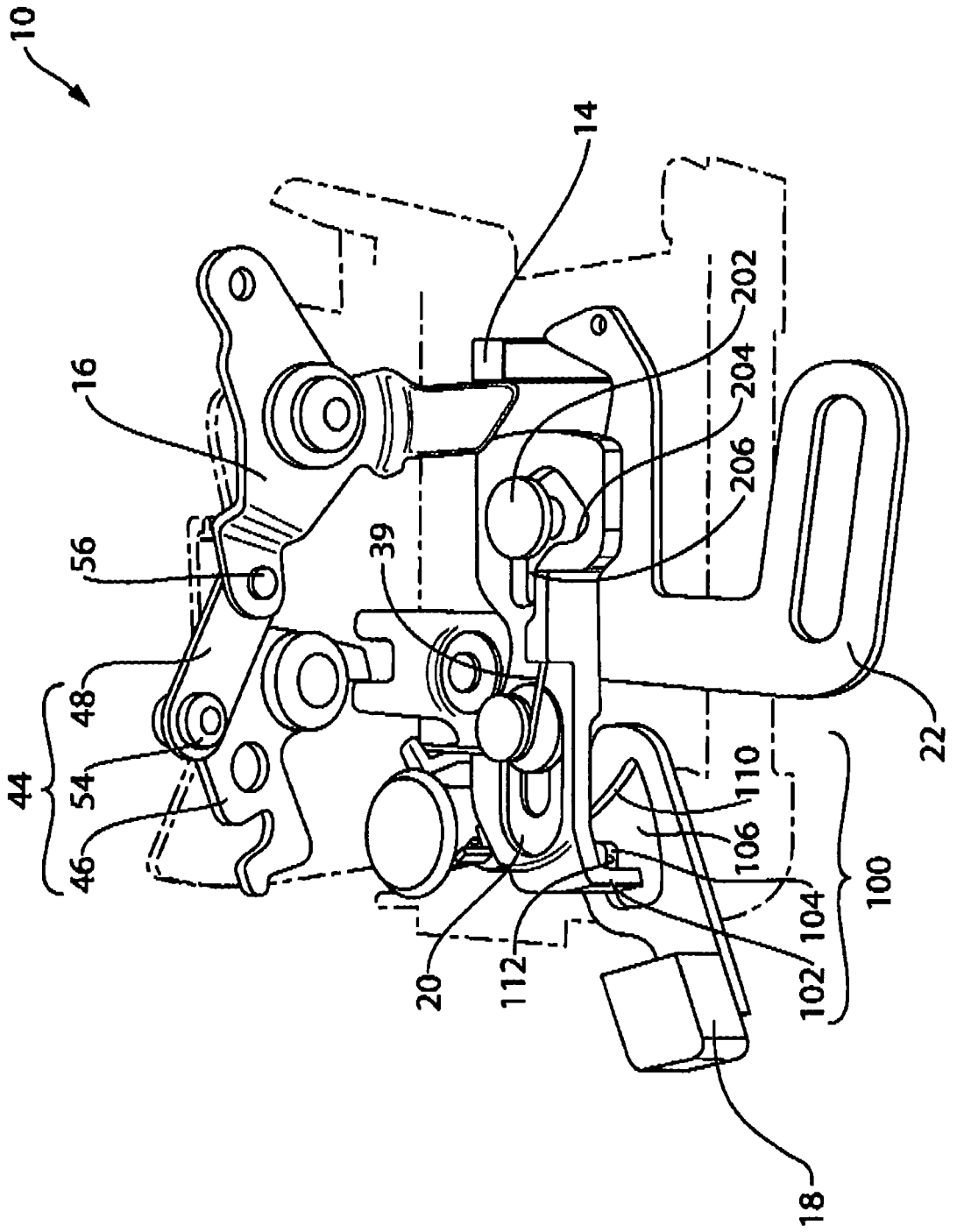
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FIG. 6