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(54) A switching device

Schaltvorrichtung

Dispositif de commutation

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EP 2 306 480 B1

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Description

Field of the Invention

[0001] The present invention relates generally to a switching device. More particularly, the invention encompasses a switching device with an improved locking means.

Background of the Invention

[0002] Electrical systems such as power units, circuit breakers, electrical drivers or the like are usually encased within a chassis to house and protect the systems against elements. A removable cover on the chassis is provided for access to adjust and control the electrical systems, which may be inconvenient and at times difficult particularly within a space constraint operating environment.

[0003] A common solution is to install one or more switches outside the chassis to operate the electrical systems. In order to prevent accidental or unauthorized operation of the switch, some form of locking means is usually provided within the switch.

[0004] However, most switches with locking means are constructed with bulky locking mechanisms that inevitably increase the thickness and height of the switches. Such switches when installed on the chassis would result in high protruding parts projecting from the surface of the chassis which are space consuming and may cause obstructions and even dangers to passers-by knocking inadvertently on the switches resulting in injuries.

[0005] JP 2004-355 923 concerns a switching device having a housing. The switching device comprises a lock piece. A cam is pushing the lock piece from a locking position to an unlocking position.

[0006] EP 1 729 313 A1 concerns switching device having a locking unit being mobile in translation along an axis between a locking position of a rotation of a handle and an unlocking position. A sliding unit is mounted on the handle and includes an opening for receiving padlocks in the locking position. A driving mechanism formed of an articulated rod and a toothed wheel cooperates with the locking unit and the sliding unit for converting a translation movement of the locking unit in one direction into a translation movement of the sliding unit in the opposite direction.

[0007] DE 196 03 238 C1 concerns a lockable actuating device for a rotary switch. A turning handle, secured in a rotationally rigid manner on an actuating shaft, is provided with at least one lock opening in which padlocks can be placed. In the turning handle a locking slide, which can be actuated from the exterior and locks and unlocks the lock opening, is mounted so as to be displaceable perpendicular to the actuating shaft axis and a lock bolt, which can be actuated by the locking slide against spring force, is mounted so as to be displaceable parallel to the actuating shaft axis.

[0008] There is therefore a need for a switching device with an improved locking means to address the problems mentioned above.

Summary of Invention

[0009] In one aspect of the present invention, there is provided a switching device operable between different set-points according to claim 1.

[0010] The knob further includes a handle adapted for displacement between a resting position and an elevated position for controlling the latch triggering mechanism.

[0011] In a preferred embodiment, the latch is triggered by the latch triggering mechanism to directly engage the recess at right angle.

[0012] In another preferred embodiment, the latch is triggered by the latch triggering mechanism to directly engage the recess at substantially right angle.

[0013] In yet another preferred embodiment, the latch triggering mechanism comprises the cam coupled to the handle, said cam is moveable between a first direction and a second direction in concert with the handle during the handle displacement between the resting position and the elevated position.

[0014] In another aspect of the present invention, there is provided a method according to claim 6.

[0015] In another aspect of the present invention, there is provided a method according to claim 7.

Brief Description of the Drawings

[0016]

Fig. 1 shows a plan view of a switch in accordance to a preferred embodiment of the invention;
Fig. 2 shows a plan view of an alternative embodiment with an added padlock;
Fig. 3 shows a cross sectional view of the preferred embodiment;
Fig. 4 shows an expanded view of a locking means of the preferred embodiment;
Figs. 5a-5d show cross sectional views of the preferred embodiment with a handle of the switch being pulled-up for locking.

Preferred Embodiments of the Invention

[0017] The present invention provides a switch 100 comprising a housing 104 and a knob 116 disposed within the housing 104 as shown in Fig. 1. The switch 100 may be mounted on an external surface of a chassis of an electrical system and thereby providing a means for selectively activating and deactivating one or more states of the electrical system.

[0018] The switch 100 may be operated by turning the knob 116. The knob 116 may be turned between 2 or more set-points that correspond to 2 or more states of the electrical system. In a preferred embodiment of the invention, the knob 116 is turned between 2 set-points

that correspond to an "ON" state and an "OFF" state of the electrical system.

[0019] In another embodiment of the invention, a locking means is provided to prevent accidental triggering or unauthorized turning of the knob 116 once the knob is disposed at any one set-point. The locking means allows the switch 100 to be locked once disposed at a set-point and turning of the knob 116 is therefore disabled.

[0020] The locking means comprises a latch 108 formed within the knob 116, a recess 110 formed on an inner perimeter surface of the housing 104 and a latch triggering mechanism provided within the knob 116. The latch 108 is releasable from the knob 116 by the latch triggering mechanism to selectively engage or disengage the latch 108 into or from the recess 110.

[0021] Engaging or disengaging the latch 108 vis-à-vis the recess 110 will respectively lock or unlock the knob 116 at any particular set-point. In a preferred embodiment, the latch 108 is triggered by the latch triggering mechanism to selectively engage or disengage into or from the recess 110 at right angle.

[0022] Locking of a subsequent set-point may be provided by forming an additional recess at the desired set-point location. For example, a first recess 110 may be provided for locking the switch 100 at the "ON" set-point position while a second recess 112 may be provided 90 degree apart for locking the switch 100 at the "OFF" set-point position.

[0023] In a preferred embodiment, a handle 102 is provided on the knob 116 for displacement between a resting position, a position in which the handle 102 is fully inserted on the knob 116, and an elevated position. The latch triggering mechanism is initiated by pulling the handle 102 from its resting position to the elevated position. The pulling of the handle 102 initiates the latch 108 triggering mechanism within the knob 116 to release the latch 108 for engagement into the recess 110. When the handle 102 is fully elevated, the latch 108 is engaged completely within the recess 110 and the turning of the knob 116 is thereby disabled.

[0024] Conversely, restoring the handle 102 to its resting position would result in the latch triggering mechanism to disengage the latch 108 from the recess 110 and to retract back into the knob 116. The turning of the knob 116 is thereby enabled.

[0025] In one embodiment of the present invention, a padlock 600 as shown in Fig. 2 may be used to maintain the elevated position of the handle 102. The use of padlock 600 provides an additional layer of secured locking and preventing any tampering attempt to forcibly turn the knob 116 when the latch 108 is engaged within the recess 110.

[0026] The movement of the handle 102 from its rested position to its elevated position and vice-versa is guided by a pair of handle guides 322 and 324 disposed within 2 guide units 304 and 306 located within the knob 116, as shown in Fig. 3.

[0027] An opening 310 may be provided to accommodate a connecting member such as a shaft to couple the knob 116 to an actuator of the electrical system. The turning of the knob 116 to change between different set-points correspondingly rotate the actuator of the electrical system through the connecting shaft to selectively change between different states of the electrical system.

[0028] The latch triggering mechanism comprises an actuator in the form of a cam 302. The cam 302 may be coupled to the handle 102 through a handle extension 309. A securing device such as a screw 315 may be used to couple the cam 302 to the handle extension 309. As the handle 102 is displaced from the resting position to the elevated position, the cam 302 which is coupled to the handle extension 309 is correspondingly displaced at the same distance and direction. Conversely, as the handle 102 is restored to its resting position, the cam 302 is similarly restored to its original position. The movement of the cam 302 is thereby set in concert with the movement of the handle 102.

[0029] The movement of the handle 102 between the resting position and the elevated position may be converted into sideway movement of the latch 108 through the cam 302, wherein the direction of said sideway movement is preferably at right angle or substantially at right angle to the direction of the handle movement.

[0030] The latch 108 may be displaced by the cam 302 to move between a first origin position and a second locking position. In a preferred embodiment, the movement of the handle 102 from the resting position to the elevated may be converted by the cam 302 into movement of the latch 108 from its first origin position within the knob 116 into the second locking position in the recess 110, thereby locking the switch 100.

[0031] In the same embodiment, the displacement of the handle 102 from the elevated position to the resting position may be converted by the cam 302 into movement of the latch 108 from the second locking position in the recess 110 back to its first origin position within the knob 116, thereby unlocking the switch 100.

[0032] The movement of the cam 302 may be converted into displacement of the latch 108 through the acting of any one of defined profiles 408 and 412 formed on the cam 302 against a relating defined profile 403 or 415 formed on the latch 108 as shown in Fig. 4. When one defined profile on the cam 302 is acting on another relating defined profile on the latch 108, the orientation of the other defined profiles is aligned in a state of non-acting.

[0033] During movement of the cam 302 in a first direction, the defined profile 408 on the cam 302 may be arranged to act and slide against a relating defined profile 403 on the latch 108 so as to displace the latch 108 from the first origin position to the second locking position. The other defined profiles 412 and 415 are configured to be aligned in a state of non-acting.

[0034] During movement of the cam 302 in a second direction, which is in opposite to the first direction, the defined profile 412 on the cam 302 may be arranged to

slide against a relating defined profile 415 on the latch 108 to restore the latch 108 from the second locking position to its first origin position. The other defined profiles 403 and 408 are configured to be aligned in a state of non-acting.

[0035] In a preferred embodiment, the defined profiles 408 and 412 formed on the cam 302 and the corresponding relating defined profiles 403 and 415 formed on the latch 108 may be configured in the shape of a slope. Preferably, all defined profiles are formed of the same gradient.

[0036] An initial setting of a preferred embodiment of the present invention is shown in Fig. 5a. The handle 102 is set at resting position and the cam 302 is at its origin. As the handle 102 is pulled to an elevated position as shown by the direction 506, the cam 302 is moved in concert with the handle 102.

[0037] The movement of the cam 302 causes the defined profile 408 on the cam 302 to act and slide against a relating defined profile 403 on the latch 108 so as to displace the latch 108 from the first origin position to the second locking position as shown by direction 508 in Fig. 5b. The other defined profiles 412 and 415 are configured to be aligned in a state of non-acting.

[0038] When the handle 102 is fully elevated, the latch 108 is engaged within the recess 110 as shown in Fig. 5c and the turning of the handle 102 is thereby disabled. A padlock 600 may be used to maintain the elevated position of the handle 102 as shown in Fig 5d.

[0039] In the preferred embodiment, the handle 102 may be operated as a normally close handle. A biasing, preferably in the form of a spring 512 may be provided around the handle extension 309 as shown in Fig 5d to provide a constant pull on the handle into its resting position.

[0040] While the invention has been particularly shown and described with reference to various embodiments, it will be recognized by those skilled in the art that modifications and changes may be made to the present invention without departing from the scope thereof. The scope of the invention should therefore be determined not with reference to the above description but with reference to the appended claims.

Claims

1. A switching device (100) operable between different set-points for changing the state of operations of an electrical system comprising:

a housing (104) with a recess (110, 112) formed on an inner perimeter surface of said housing at any set-point; and
a knob (116) disposed within the housing and is turned to switch between different set-points, said knob includes a latch (108) and a latch triggering mechanism (302),
said latch is selectively releasable from the knob by the latch triggering mechanism to engage into or from the recess (110,112) for locking and unlocking the switching device, said knob includes a handle (102) adapted for displacement between a resting position and elevated position for controlling the latch triggering mechanism;
wherein said latch triggering mechanism includes a cam (302) moveable between a first direction and a second direction, which is in opposite to the first direction;
wherein during movement of the cam (302) in the first direction, said cam displaces the latch (108) from a first origin position within the knob to a locking position within the recess, thereby locking the switching device;
wherein during movement of the cam in a second direction, said cam displaces the latch from the second locking position back to the origin position, thereby unlocking the switching device,
wherein said cam includes one or more defined profiles (408, 412) acting against one or more relating defined profiles (403, 415) on the latch resulting in displacement of the latch, wherein
during movement of the cam (302) in the first direction, a first defined profile (408) on the cam (302) is arranged to act and slide against a relating first defined profile (403) on the latch (108) so as to displace the latch (108) from the first origin position to the second locking position, **characterized in that**
during movement of the cam (302) in the second direction, a second defined profile (412) on the cam (302) is arranged to slide against a relating second defined profile (415) on the latch (108) to restore the latch (108) from the second locking position to its first origin position.

2. The switching device as claimed in Claim 1, wherein the direction of movement of said cam is substantially at right angle to the direction of movement of said latch.

3. The switching device as claimed in Claim 1 or 2, wherein said latch is triggered by the latch triggering mechanism to directly engage the recess at right angle.

4. The switching device as claimed in Claim 1, wherein the knob further includes a handle (102) adapted for displacement between a resting position and an elevated position for controlling the latch triggering mechanism.

5. The switching device as claimed in any preceding claims, wherein said handle is configured as a normally close handle by biasing a handle extension with a spring to provide a constant pull on the handle

into its resting position.

6. A method for assembling a switching device operable between different set-points for changing the state of operations of an electrical system, said method includes the steps of:

providing a housing (104 with a recess (110, 112) formed on an inner perimeter surface of said housing at any set-point;
providing a knob with a built-in latch (108) and a latch triggering mechanism (302),
said latch is selectively releasable from the knob by the latch triggering mechanism to engage into or from the recess for locking or unlocking the switching device;
disposing said knob within the housing, said knob includes a handle (102) adapted for displacement between a resting position and elevated position for controlling the latch triggering mechanism, wherein
said latch triggering mechanism includes a cam (302) moveable between a first direction and a second direction, which is in opposite to the first direction;
wherein during movement of the cam (302) in the first direction, said cam displaces the latch (108) from a first origin position within the knob to a locking position within the recess, thereby locking the switching device;
wherein during movement of the cam in a second direction, said cam displaces the latch from the second locking position back to the origin position, thereby unlocking the switching device,
wherein said cam includes one or more defined profiles (408, 412) acting against one or more relating defined profiles (403, 415) on the latch resulting in displacement of the latch, wherein
during movement of the cam (302) in the first direction, a first defined profile (408) on the cam (302) is arranged to act and slide against a relating first defined profile (403) on the latch (108) so as to displace the latch (108) from the first origin position to the second locking position,
characterized in that
during movement of the cam (302) in the second direction, a second defined profile (412) on the cam (302) is arranged to slide against a relating second defined profile (415) on the latch (108) to restore the latch (108) from the second locking position to its first origin position.

Patentansprüche

1. Schaltvorrichtung (100), die zwischen unterschiedlichen Einstellpunkten zum Ändern der Betriebszustände eines elektrischen Systems betätigbar ist, umfassend:

ein Gehäuse (104) mit einer an einer inneren Umfangswand des Gehäuses an jedem Einstellpunkt ausgebildeten Vertiefung (110, 112); und
einen Knopf (160), der in dem Gehäuse angeordnet ist und zum Schalten zwischen unterschiedlichen Einstellpunkten gedreht wird, wobei dieser Knopf einen Riegel (108) und einen Riegelauslösemechanismus (302) einschließt, der Riegel selektiv durch den Riegelauslösemechanismus von dem Knopf freigesetzt werden kann, um in die Vertiefung (110, 112) zum Verriegeln und Entriegeln der Schaltvorrichtung einzugreifen oder aus dieser Vertiefung auszurücken, wobei der Knopf einen Griff (102) einschließt, der für eine Bewegung zwischen einer Ruheposition und einer erhöhten Position zum Steuern des Riegelauslösemechanismus ausgebildet ist;
wobei der Riegelauslösemechanismus einen Nocken (302) einschließt,
der zwischen einer ersten Richtung und einer zweiten, zur ersten Richtung entgegengesetzten Richtung bewegbar ist;
wobei während der Bewegung des Nockens (302) in die erste Richtung dieser Nocken den Riegel (108) von einer ersten Ursprungsposition in dem Knopf zu einer Verriegelungsposition in der Vertiefung verschiebt,
wodurch die Schaltvorrichtung verriegelt wird;
wobei während der Bewegung des Nockens in eine zweiten Richtung der Nocken den Riegel von der zweiten Verriegelungsposition zurück in die Ursprungsposition bewegt, wodurch die Schaltvorrichtung entriegelt wird, wobei der Nocken eines oder mehrere definierte Profile (408, 412) umfasst, die gegen ein oder mehrere bezogene definierte Profile (403, 415) an dem Riegel wirken, was zu einer Verschiebung des Riegels führt, wobei
während der Bewegung des Nockens (202) in die erste Richtung ein erstes definiertes Profil (408) an dem Nocken (302) angeordnet ist, gegen ein bezogenes erstes definiertes Profil (408) an dem Riegel (108) zu wirken und zu gleiten, um so den Riegel (108) von der ersten Ursprungsposition in die zweite Verriegelungsposition zu verschieben,
dadurch gekennzeichnet, dass
während der Bewegung des Nockens (302) in die zweite Richtung ein zweites definiertes Profils (412) an dem Nocken (302) angeordnet ist, gegen ein bezogenes zweites definiertes Profil (415) an dem Riegel (108) zu gleiten, um den Riegel (108) von der zweiten Verriegelungsposition zu seiner ersten Ursprungsposition zurückzubringen.

2. Schaltvorrichtung nach Anspruch 1, bei der die Bewegungsrichtung des Nockens im Wesentlichen im rechten Winkel zu der Bewegungsrichtung des Riegels liegt.

3. Schaltvorrichtung nach Anspruch 1 oder 2, bei der der Riegel durch den Riegelauslösemechanismus ausgelöst wird, um direkt in die Vertiefung in einem rechten Winkel einzugreifen.

4. Schaltvorrichtung nach Anspruch 1, bei der der Knopf außerdem einen Griff (102) umfasst, der für eine Verschiebung zwischen einer Ruheposition und einer erhöhten Position zur Steuerung des Riegelauslösemechanismus ausgebildet ist.

5. Schaltvorrichtung nach einem der vorhergehenden Ansprüche, bei der der Griff als normalweise geschlossener Griff durch Vorspannen einer Griffauslage mit einer Feder ausgebildet ist, um einen konstanten Zug auf den Griff in seiner Ruheposition zu bringen.

6. Verfahren zum Zusammenbau einer Schaltvorrichtung, die zwischen unterschiedlichen Einstellpunkten zum Ändern der Betriebszustände eines elektrischen Systems betreibbar ist, wobei das Verfahren die Schritte umfasst, die darin bestehen:

Bereitstellen eines Gehäuses (104) mit einer Vertiefung (110, 112), die an einer inneren Umfangsfläche des Gehäuses an jedem Einstellpunkt geformt ist,
Bereitstellen eines Knopfes mit einem eingebauten Riegel (108) und einem Riegelauslösemechanismus (302), wobei der Riegel selektiv von dem Knopf durch den Riegelauslösemechanismus zu lösen ist, um in die Vertiefung einzugreifen und aus ihr auszurücken zum Verriegeln oder Entriegeln der Schaltvorrichtung;
Anordnen des Knopfes in dem Gehäuse, wobei der Knopf einen Griff (102) einschließt, der für eine Verschiebung zwischen einer Ruheposition und einer erhöhten Position zum Steuern des Riegelauslösemechanismus geeignet ist, wobei
der Riegelauslösemechanismus einen Nocken (302) einschließt, der zwischen einer ersten Richtung und einer zweiten, zur ersten Richtung entgegengesetzten Richtung bewegbar ist;
wobei während der Bewegung des Nockens (302) in die erste Richtung dieser Nocken den Riegel (108) von einer ersten Ursprungsposition in dem Knopf zu einer Verriegelungsposition in der Vertiefung verschiebt, wodurch die Schaltvorrichtung verriegelt wird;
wobei während der Bewegung des Nockens in eine zweiten Richtung der Nocken den Riegel von der zweiten Verriegelungsposition zurück in die Ursprungsposition verschiebt, wodurch die Schaltvorrichtung entriegelt wird, wobei der Nocken eines oder mehrere definierte Profile (408, 412) umfasst, die gegen ein oder mehrere bezogene definierte Profile (403, 415) an dem Riegel wirken, was zu einer Verschiebung des Riegels führt, wobei
während der Bewegung des Nockens (202) in die erste Richtung ein erstes definiertes Profil (408) an dem Nocken (302) angeordnet ist, gegen ein bezogenes erstes definiertes Profil (408) an dem Riegel (108) zu wirken und zu gleiten, um so den Riegel (108) von der ersten Ursprungsposition in die zweite Verriegelungsposition zu verschieben,
dadurch gekennzeichnet, dass
während der Bewegung des Nockens (302) in die zweite Richtung ein zweites definiertes Profils (412) an dem Nocken (302) angeordnet ist, gegen ein bezogenes zweites definiertes Profil (415) an dem Riegel (108) zu gleiten, um den Riegel (108) von der zweiten Verriegelungsposition zu seiner ersten Ursprungsposition zurückzubringen.

Revendications

1. Dispositif de commutation (100) pouvant fonctionner entre différents points de consigne pour modifier l'état des fonctionnements d'un système électrique, comprenant :

un boîtier (104) avec un évidement (110, 112) formé sur une surface périmétrale interne dudit boîtier à l'un quelconque des points de consigne ; et
un bouton (116) disposé à l'intérieur du boîtier et est pivoté pour commuter entre différents points de consigne, ledit bouton comprend un verrou (108) et un mécanisme de déclenchement de verrou (302), ledit verrou est sélectivement amovible du bouton par le mécanisme de déclenchement de verrou pour se mettre en prise dans ou de l'évidement (110, 112) pour verrouiller et déverrouiller le dispositif de commutation, ledit bouton comprend une poignée (102) adaptée pour le déplacement entre une position de repos et une position élevée afin de commander le mécanisme de déclenchement de verrou ; dans lequel ledit mécanisme de déclenchement de verrou comprend une came (302) mobile entre une première direction et une seconde direction, qui est opposée à la première direction ;
dans lequel pendant le mouvement de la came (302) dans la première direction, ladite came fait passer le verrou (108) d'une première position

d'origine à l'intérieur du bouton à une position de verrouillage à l'intérieur de l'évidement, verrouillant ainsi le dispositif de commutation ;
dans lequel pendant le mouvement de la came dans la seconde direction, ladite came fait passer le verrou de la seconde position de verrouillage dans la position d'origine, déverrouillant ainsi le dispositif de commutation, dans lequel ladite came comprend un ou plusieurs profils définis (408, 412) agissant contre un ou plusieurs profils définis relatifs (403, 415) sur le verrou résultant du déplacement du verrou, dans lequel :

pendant le mouvement de la came (302) dans la première direction, un premier profil défini (408) sur la came (302) est agencé pour agir et coulisser contre un premier profil défini (403) relatif sur le verrou (108) afin de faire passer le verrou (108) de la première position d'origine à la seconde position de verrouillage, **caractérisé en ce que** :

pendant le mouvement de la came (302) dans la seconde direction, un second profil défini (412) sur la came (302) est agencé pour coulisser contre un second profil défini (415) relatif sur le verrou (108) pour ramener le verrou (108) de la seconde position de verrouillage à sa première position d'origine.

2. Dispositif de commutation selon la revendication 1, dans lequel la direction de mouvement de ladite came est sensiblement en angle droit par rapport à la direction de mouvement dudit verrou.

3. Dispositif de commutation selon la revendication 1 ou 2, dans lequel ledit verrou est déclenché par le mécanisme de déclenchement de verrou pour mettre en prise directement l'évidement en angle droit.

4. Dispositif de commutation selon la revendication 1, dans lequel le bouton comprend en outre une poignée (102) adaptée pour se déplacer entre une position de repos et une position élevée afin de contrôler le mécanisme de déclenchement de verrou.

5. Dispositif de commutation selon l'une quelconque des revendications précédentes, dans lequel ladite poignée est configurée comme une poignée normalement fermée par la sollicitation d'une extension de poignée avec un ressort afin de fournir une traction constante sur la poignée dans sa position de repos.

6. Procédé pour assembler un dispositif de commutation pouvant fonctionner entre différents points de consigne pour modifier l'état des fonctionnements d'un système électrique, ledit procédé comprend les étapes consistant à :

prévoir un boîtier (104) avec un évidement (110, 112) formé sur une surface périmétrale interne dudit boîtier à l'un quelconque des points de consigne ;
prévoir un bouton avec un verrou intégré (108) et un mécanisme de déclenchement de verrou (302), ledit verrou est sélectivement amovible du bouton par le mécanisme de déclenchement de verrou afin de se mettre en prise dans ou de l'évidement pour verrouiller ou déverrouiller le dispositif de commutation ;
disposer ledit bouton dans le boîtier, ledit bouton comprend une poignée (102) adaptée pour se déplacer entre une position de repos et une position élevée pour contrôler le mécanisme de déclenchement de verrou, dans lequel :

ledit mécanisme de déclenchement de verrou comprend une came (302) mobile entre une première direction et une seconde direction, qui est à l'opposé de la première direction ;
dans lequel pendant le déplacement de la came (302) dans la première direction, ladite came fait passer le verrou (108) d'une première position d'origine à l'intérieur du bouton à une position de verrouillage à l'intérieur de l'évidement, verrouillant ainsi le dispositif de commutation ;
dans lequel pendant le mouvement de la came dans la seconde direction, la came fait passer le verrou de la seconde position de verrouillage à la position d'origine, déverrouillant ainsi le dispositif de commutation, dans lequel ladite came comprend un ou plusieurs profils définis (408, 412) agissant contre un ou plusieurs profils définis relatifs (403, 415) sur le verrou se traduisant par le déplacement du verrou, dans lequel :

pendant le mouvement de la came (302) dans la première direction, un premier profil défini (408) sur la came (302) est agencé pour agir et coulisser contre un premier profil défini (403) relatif sur le verrou (108) afin de faire passer le verrou (108) de la première position d'origine à la seconde position de verrouillage, **caractérisé en ce que** :

pendant le mouvement de la came (302) dans la seconde direction, un second profil défini (412) sur la came (302) est agencé pour coulisser

contre un second profil défini (415) relatif sur le verrou (108) afin de ramener le verrou (108) de la seconde position de verrouillage à sa première position d'origine.

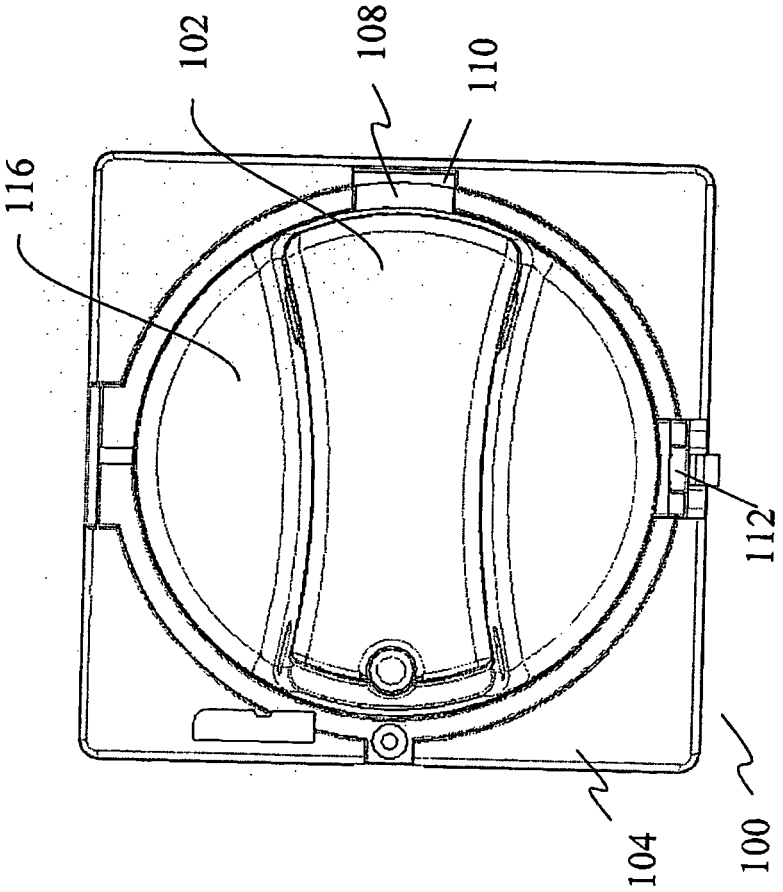


Fig. 1

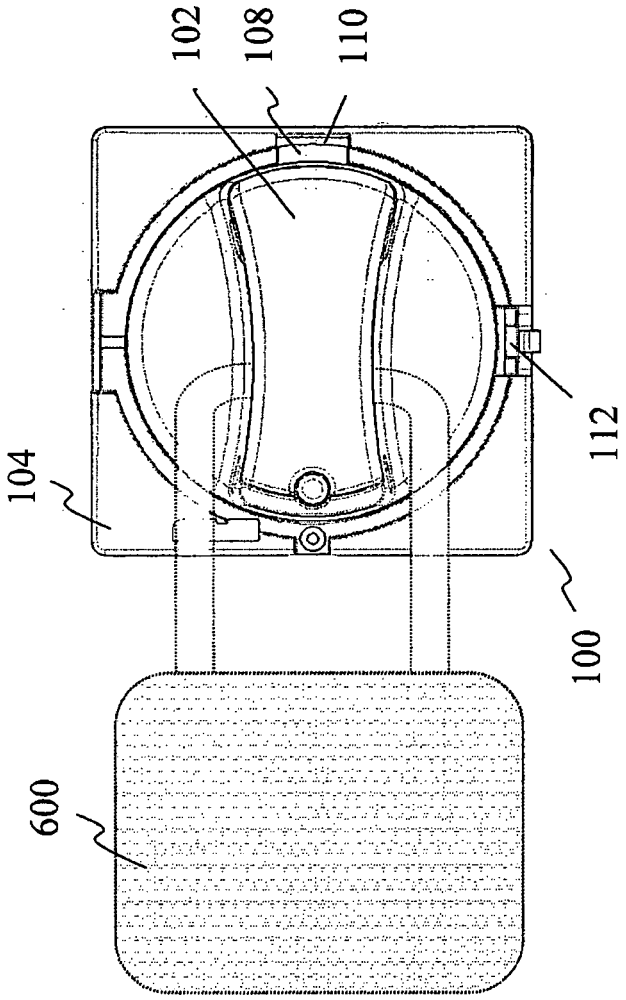


Fig. 2

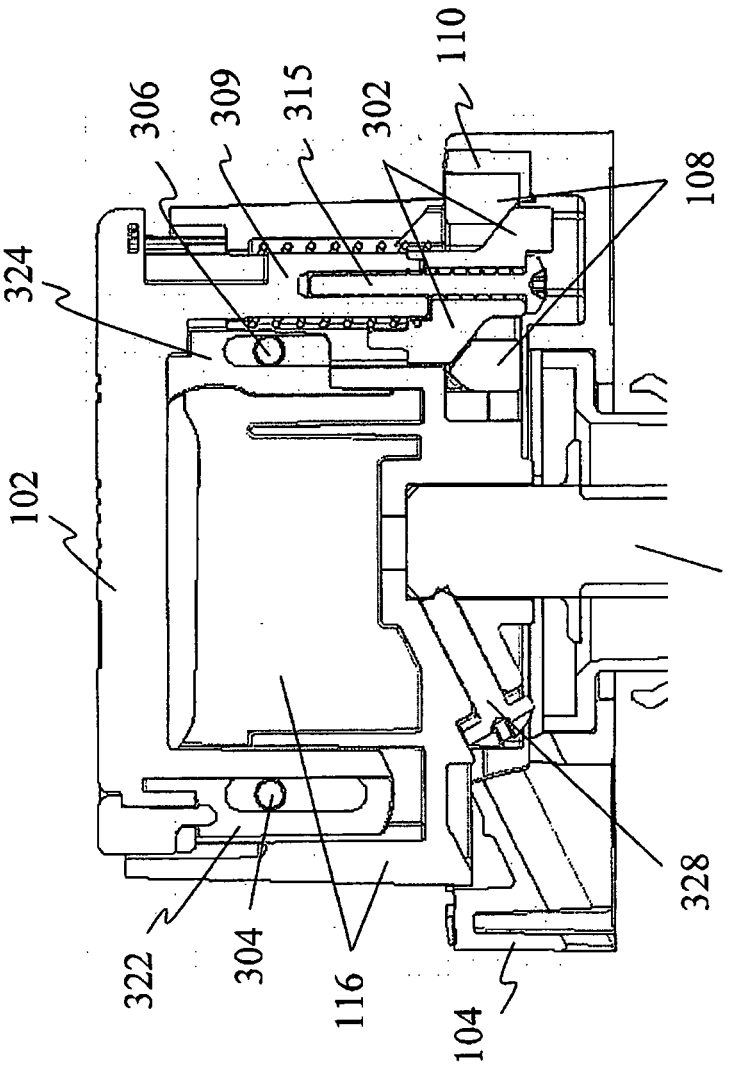


Fig. 3

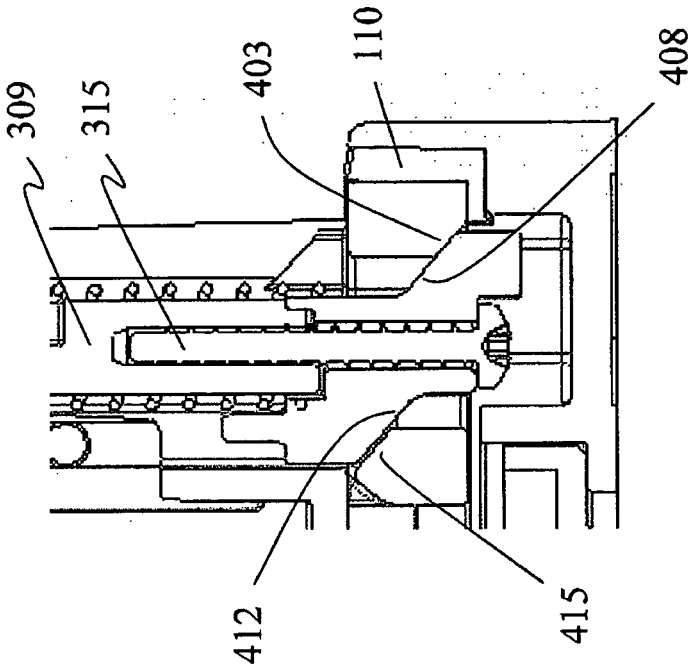


Fig. 4

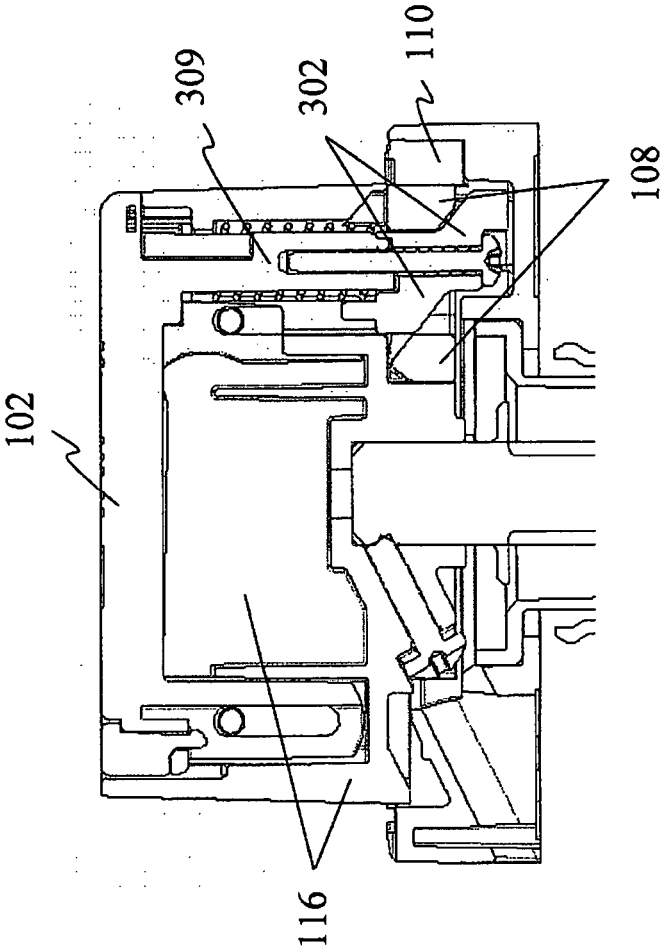


Fig. 5a

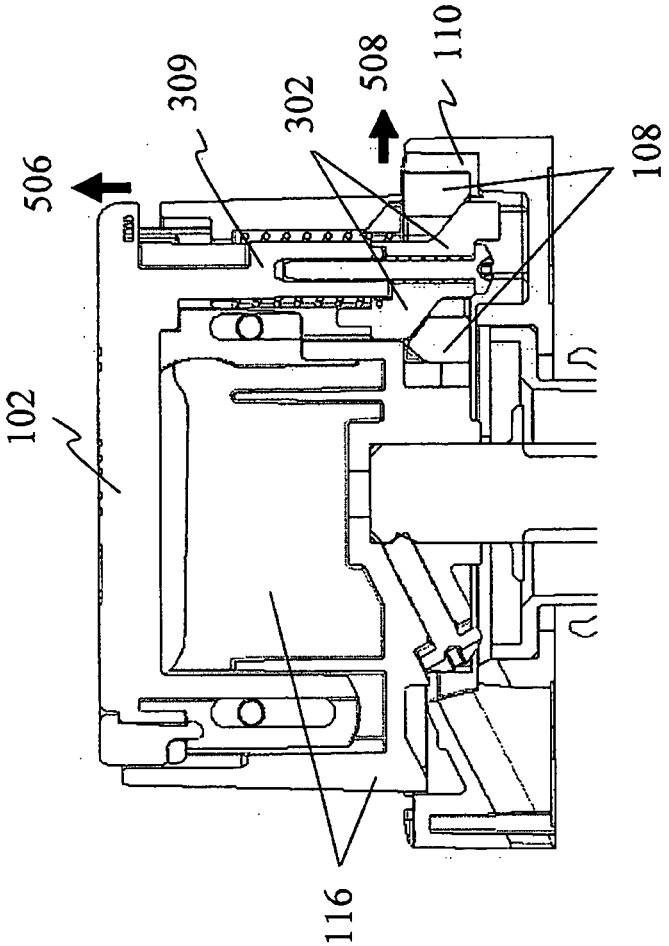


Fig. 5b

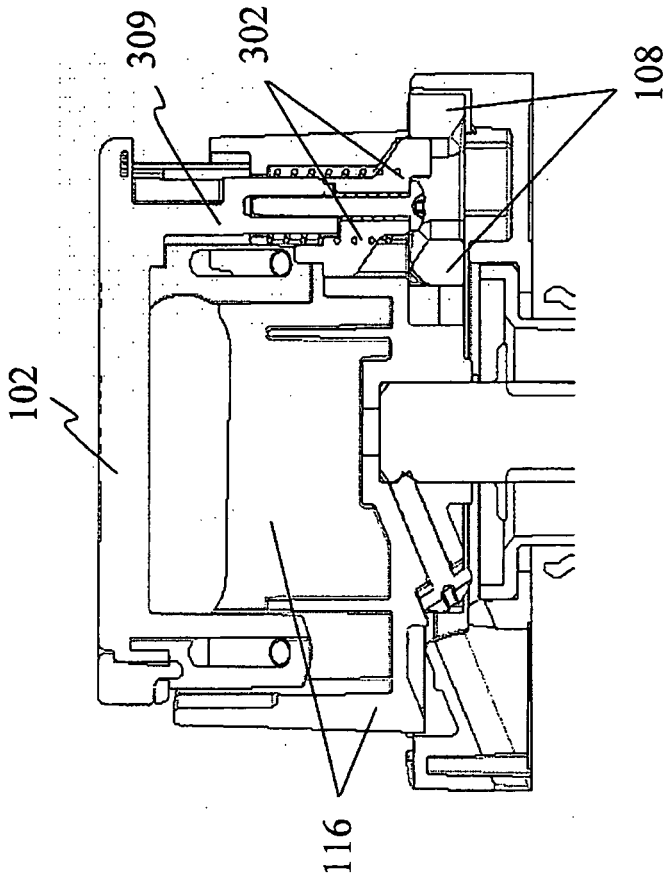


Fig. 5c

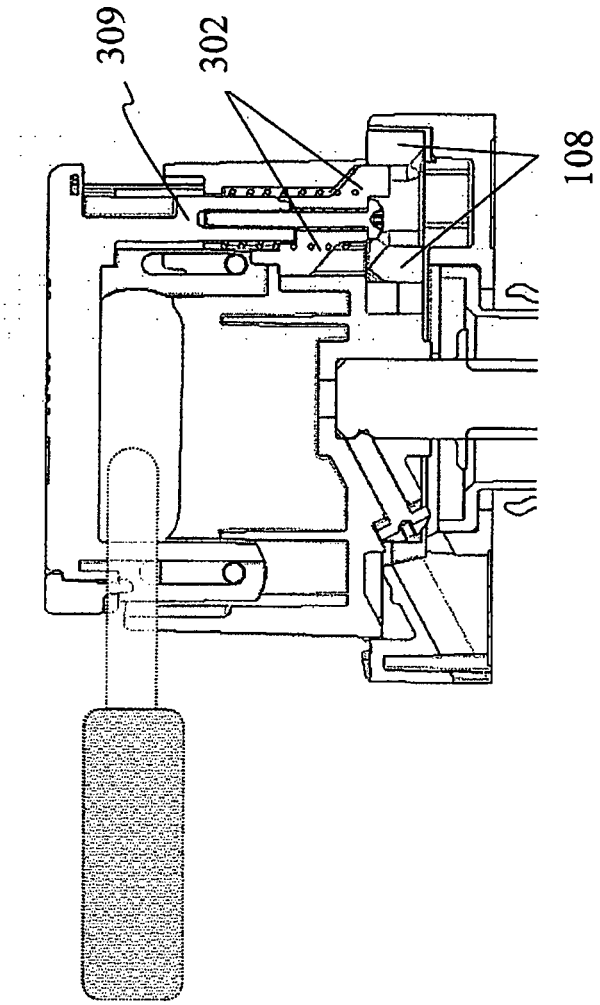


Fig. 5d

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 2004355923 A **[0005]**
- EP 1729313 A1 **[0006]**
- DE 19603238 C1 **[0007]**