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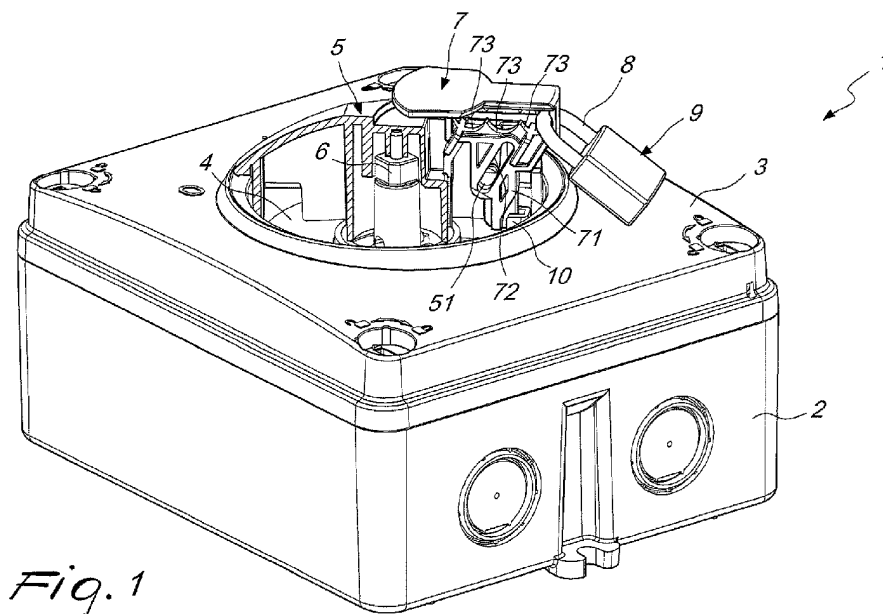
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(54) ROTARY DISCONNECTOR WITH PADLOCKABLE ACTUATION KNOB

(57) A rotary disconnecter 1 with lockable actuation knob 5, including a casing 2 provided with a cover 3 in which a seat for an actuation knob 5 is formed; the knob actuates a bar 6 which actuates the members of the disconnecter and rotates between at least two operating positions: an open position and a closed position; the open position corresponds to an open position of the contacts of the disconnecter, in which there is no flow of current, while the closed position corresponds to a closed position of the contacts of the disconnecter, in which there is flow of current between the contacts; a padlock seat member 7 is coupled to the knob 5 and accommodates

the shackle 8 of one or more padlocks 9; the padlock seat member 7 translates with respect to the knob 5 between two operating positions: a released position, in which the padlock seat member is retracted into the knob and allows the rotation thereof between the open and closed positions, and a locked position, in which the padlock seat member is partially extracted from the knob and locks it in one of the open or closed positions; by inserting a shackle 8 of one or more padlocks 9 in the padlock seat member 7 the padlock seat member 7 is prevented from retracting into the knob 5, which is locked in one of the open or closed positions.

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Description

[0001] The present invention relates to a rotary disconnect with lockable actuation knob.

[0002] Industrial electrical breakers are known which include a rotating switch with a rotatable actuation knob within a base and are provided with closure systems to prevent their unauthorized or accidental operation.

[0003] A simple system for facilitating the locking of the disconnect is to provide openings in a portion of the rotary breaker and in the base, where these openings can be aligned when the breaker is set to a selected position, usually the "OFF" position. In this manner, the shackle of a padlock can be passed through these aligned openings and can be locked with a key so as to prevent the rotation of the rotating switch with respect to the base.

[0004] A problem with the locking method described above is that the openings for the shackle of the padlock can constitute an accumulation point for dust, dirt and moisture which can enter the breaker.

[0005] Enclosed disconnectors are known which are actuated by means of a rotating knob and are provided with systems for applying one or more padlocks, in which the shackle of the padlock does not have to enter holes provided in the base.

[0006] A disconnecter manufactured by the SCAME company is known in which three holes for a corresponding number of padlocks are provided directly in the knob and on the cut-out plate

[0007] Another type of disconnecter, manufactured by the SOCOMEC company, is provided with a knob in which a movable member with holes for three padlocks is pivoted. The member can rotate to allow access to the holes for the insertion of one or more padlocks.

[0008] A disconnecter manufactured by the ABB company has a movable member hinged to a knob, the movable member is provided with holes for three padlocks. The movable can rotate and can cause the holes to be accessible for the insertion of one or more padlocks.

[0009] US2015221459 discloses disconnect operating handles for circuit breakers configured with a rotary handle attached to an inwardly oriented shaft that connects to a gear assembly that translates rotational input to linear input. The disconnect operating handles include pivoting lockout levers that can automatically "pop" out to expose the lockout space for a padlock when a user touches the lever in an appropriate location.

[0010] The aim of the present invention is to provide an improved rotary disconnect with a lockable actuation knob, that constitutes an advantageous alternative with respect to the prior art lockable disconnectors or breakers.

[0011] Within the scope of this aim, an object of the invention is to provide a rotary disconnecter that has an improved aesthetic appearance.

[0012] Another object of the invention is to provide a rotary disconnecter to which it is possible to apply one

or more padlocks simultaneously with a quick and easy operation.

[0013] This aim, these objects and others which will become better apparent hereinafter are achieved by a rotary disconnecter with lockable actuation knob, comprising a casing provided with a cover in which a seat for an actuation knob is formed; said knob actuating a bar which actuates members of the disconnecter; said knob rotating between at least two operating positions: an open position and a closed position; said open position corresponding to an open position of the contacts of the disconnecter, in which there is no flow of current, said closed position corresponding to a closed position of the contacts of the disconnecter, in which there is flow of current between the contacts; a padlock seat member being associated to said knob and accommodating the shackle of one or more padlocks; said padlock seat member translating with respect to said knob between two operating positions: a released position, in which said padlock seat member is retracted into said knob and allows the rotation thereof between the open and closed positions, and a locked position, in which the padlock seat member is partially extracted from said knob and locks said knob in one of the open or closed positions; by inserting a shackle of one or more padlocks in said padlock seat member said padlock seat member is prevented from retracting into said knob, which is locked in one of said open or closed positions; said disconnecter being characterized in that said padlock seat member has a slot which is extended diagonally and radially, with respect to the rotary motion of the knob, and engages at least one fixed member, which is integral with said knob, said padlock seat member moving radially and vertically.

[0014] Further characteristics and advantages will become better apparent from the description of preferred but not exclusive embodiments of the invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a partially sectional perspective view of the rotary disconnecter according to the present invention, shown in the open position (O) with a padlock applied;

Figure 2 is a view, similar to the preceding one, showing the disconnecter in the closed position (I);

Figure 3 is a top view of the disconnecter without the actuation knob;

Figure 4 is a partially sectional perspective view of the rotary disconnecter, shown in the open position (O) without a padlock;

Figure 5 is a perspective view of the rotary disconnecter, shown in the open position (O) without a padlock.

[0015] With reference to the cited figures, the rotary disconnecter according to the invention, generally designated by the reference numeral 1, includes a casing 2 provided with a cover 3; a recess 4 is formed in the cover

3 for an actuation knob 5.

[0016] The knob 5 actuates a bar 6 which actuates the members of the disconnecter, which are not visible in the figures. The knob 5 rotates between at least two operating positions: an open position, visible in Figure 1, and a closed position, visible in Figure 2.

[0017] The open position corresponds to an open position of the contacts of the disconnecter, in which there is no flow of current, and is termed position "O".

[0018] The closed position corresponds to a closed position of the contacts of the disconnecter, in which there is flow of current between the contacts, and is termed position "I".

[0019] According to the present invention, the disconnecter includes a padlock seat member 7 which is coupled to the knob 5 and can accommodate the shackle 8 of one or more padlocks 9.

[0020] The padlock seat member 7 translates with respect to the knob 5 between two operating positions: a released position, in which the padlock seat member 7 is retracted into the knob 5 and allows its rotation between the positions O and I, and a locked position, in which the padlock seat member 7 is partially extracted from the knob and locks it in one of the positions O or I.

[0021] By inserting the shackle 8 of one or more padlocks 9 in the padlock seat member 7, the padlock seat member 7 is prevented from retracting into the knob 5, which is therefore locked in one of the positions O or I.

[0022] The locked position of the padlock seat member 7 is visible in Figures 1 and 2.

[0023] The padlock seat member 7 has a tab 71 which can engage one of two seats 10 and 11 which are formed in the recess 4 of the cover 3 and correspond respectively to the positions O and I of the knob 5.

[0024] The padlock seat member 7 is also provided with a slot 72 which is extended diagonally and radially, with respect to the direction of motion of the knob 5, and engages at least one fixed member 51, which is integral with the knob 5, so that the padlock seat member 7 can move radially and vertically.

[0025] The padlock seat member 7 has a number of holes 73, in the specific case three, which can accommodate the shackle 8 of one or more padlocks 9.

[0026] The operation of the rotary disconnecter according to the present invention is as follows.

[0027] In position O, by gripping the two side walls of the member 7 and pulling gently, the member 7 translates, by means of the slot 72 engaged by the fixed member 51 of the knob 5, exiting from the knob 5 and allowing access to the three holes 73 in which it is possible to insert up to three padlocks 9.

[0028] The member 7, in this locked position, has the tab 71 engaged in the seat 10, which is U-shaped, of the cover 3, locking the rotation of the knob 5 and therefore of the disconnecter.

[0029] The same situation is repeated with the knob 5 in position I, where the tab 71 engages the seat 11 of the cover 3.

[0030] If the disconnecter is used for an emergency actuation, locking of the knob is possible only in position O and locking of the knob in position I is not provided.

[0031] In practice it has been found that the invention achieves the intended aim and objects, providing a rotary disconnecter having a translatable component with holes for up to three padlocks.

[0032] The translatable member is assembled in the knob itself and allows to lock the rotation of the knob, and therefore of the disconnecter, in the two positions I (ON) or O (OFF).

[0033] An advantage of the present invention is constituted by the improved aesthetic appearance of the product, because the holes of the padlock member remain hidden from view when the locking system is not used.

[0034] A further advantage is constituted by the fact that the holes for the padlocks are all aligned on the same plane.

[0035] The materials used, as well as the dimensions, may of course be any according to the requirements and the state of the art.

Claims

1. A rotary disconnecter with lockable actuation knob, comprising a casing provided with a cover in which a seat for an actuation knob is formed; said knob actuating a bar which actuates members of the disconnecter; said knob rotating between at least two operating positions: an open position and a closed position; said open position corresponding to an open position of the contacts of the disconnecter, in which there is no flow of current, said closed position corresponding to a closed position of the contacts of the disconnecter, in which there is flow of current between the contacts; a padlock seat member being associated to said knob and accommodating the shackle of one or more padlocks; said padlock seat member translating with respect to said knob between two operating positions: a released position, in which said padlock seat member is retracted into said knob and allows the rotation thereof between the open and closed positions, and a locked position, in which the padlock seat member is partially extracted from said knob and locks said knob in one of the open or closed positions; by inserting a shackle of one or more padlocks in said padlock seat member said padlock seat member is prevented from retracting into said knob, which is locked in one of said open or closed positions; said disconnecter being characterized in that said padlock seat member has a slot which is extended diagonally and radially, with respect to the rotary motion of the knob, and engages at least one fixed member, which is integral with said knob, said padlock seat member moving radially and vertically.

2. The disconnecter according to claim 1, **characterized in that** said padlock seat member has a tab that is configured to engage one of two seats formed in said cover which correspond respectively to said open and closed positions of said knob. 5
3. The disconnecter according to claim 1, **characterized in that** said padlock seat member is provided with a number of holes that can accommodate one or more shackles of respective padlocks. 10
4. The disconnecter according to claim 3, **characterized in that** said holes are aligned on a single plane.
5. The disconnecter according to claim 1, **characterized in that** in said released position said padlock seat member is completely retracted inside said knob. 15
6. The disconnecter according to claim 1, **characterized in that** in said released position, in which said padlock seat member is retracted in said knob, said holes are hidden from view. 20

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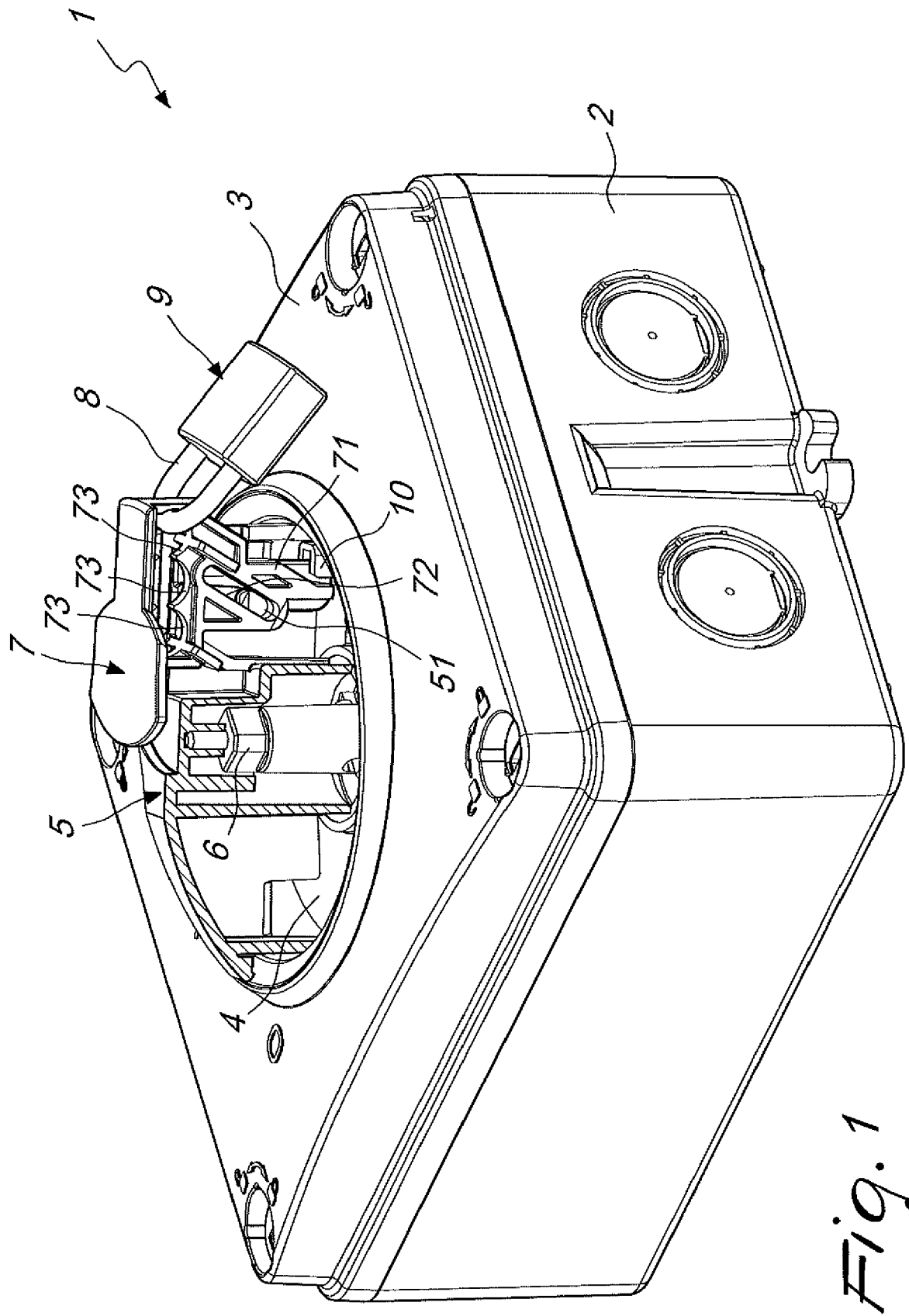


Fig. 1

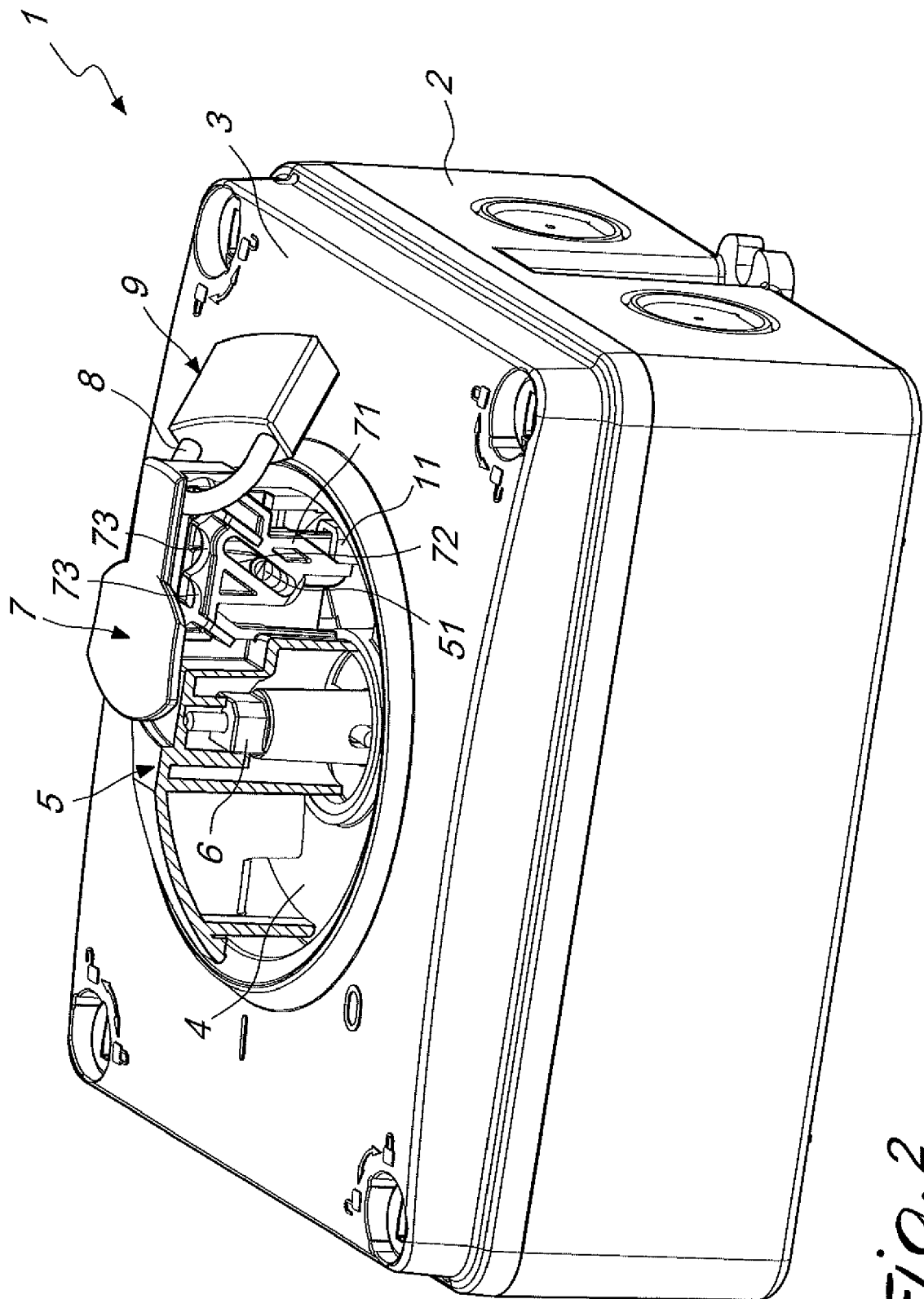


Fig. 2

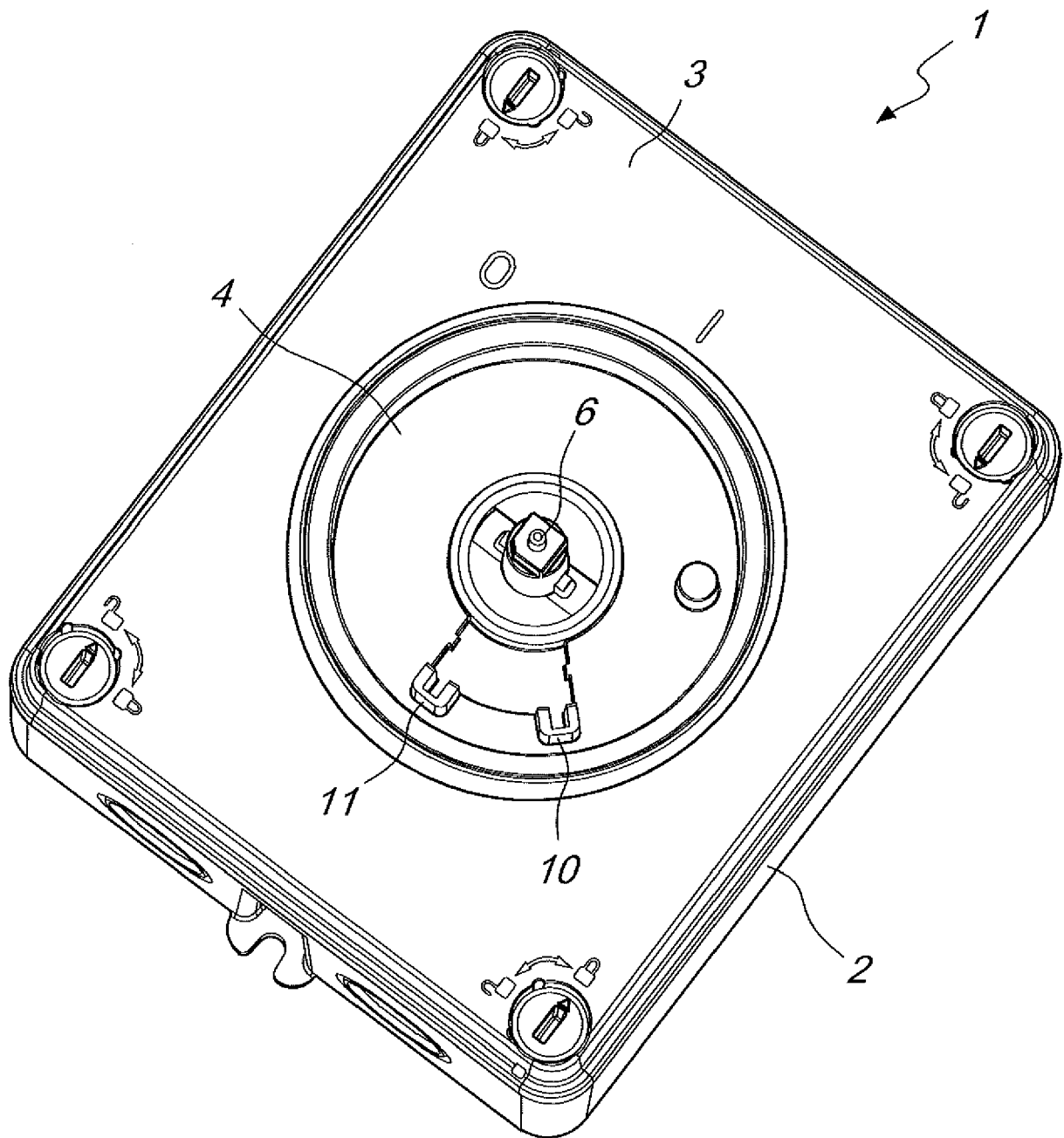


Fig. 3

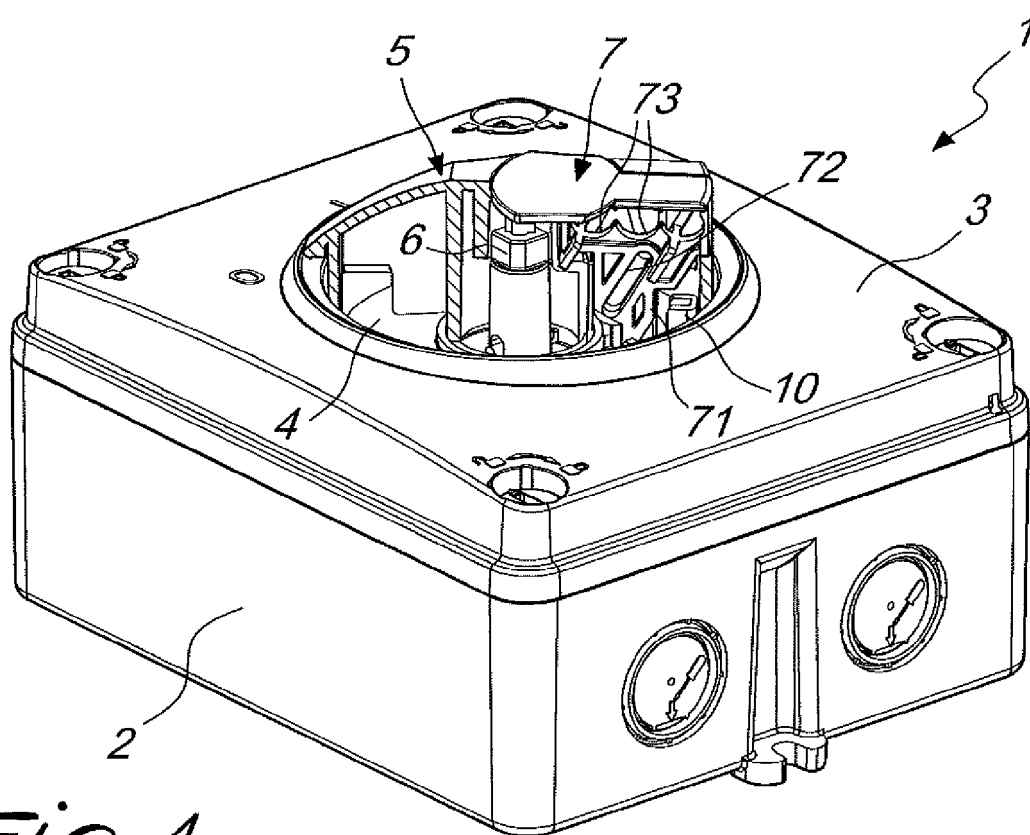


Fig. 4

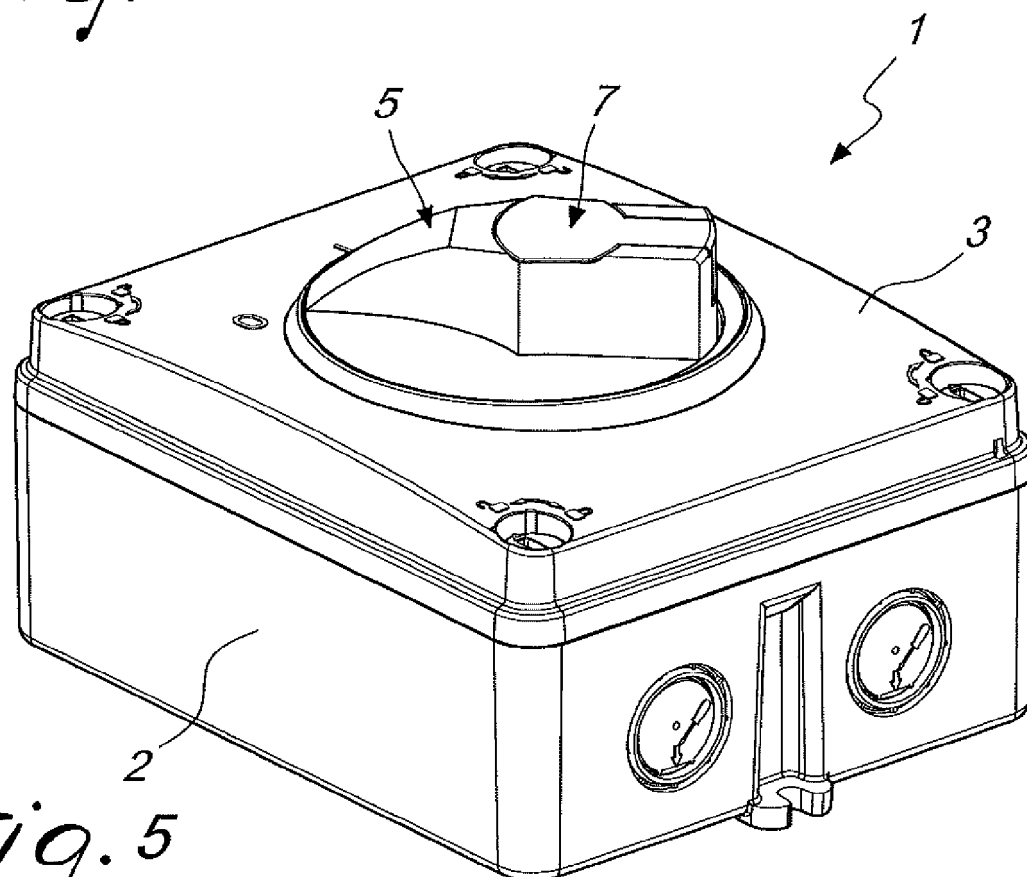


Fig. 5



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Place of search Munich		Date of completion of the search 8 March 2019	Examiner Glamann, C
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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