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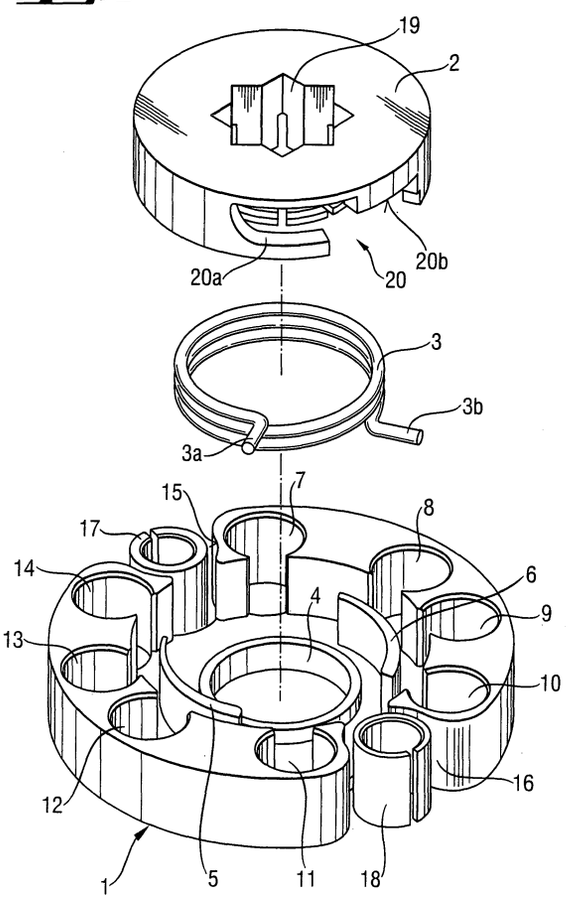
(54) Return spring arrangement for handle

(57) A return spring arrangement for a handle in a door lock or a door latch comprises a body part (1) provided with restricting members (5, 6) for a spring (3), and a spring casing (2) to be rotatably connected to the body part, which spring casing, when installed, encloses both the restricting members (5,6) and the return spring (3) of the handle, the ends (3a, 3b) of which are arranged to cooperate with said restricting members (5, 6). The spring casing (2) is adapted, at least substantially, to be embedded in the body part (1) so that it forms a compact unit, which is arranged to be installed entirely into a countersink made in a door or the like, between the handle plate and the door lock or the door latch, and to be fastened by utilizing the fastening screws of the handle plate.

Fig. 1



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Description

[0001] The invention relates to a return spring arrangement for a handle in a door lock or door latch in accordance with the preamble of claim 1.

[0002] This kind of return spring arrangement is often needed for the reason that the spring in the lock casing of a door lock or door latch is too weak in view of the size and weight of the door handle, so that the handle does not easily stay in horizontal position. One solution is disclosed in the Finnish patent 104007. In this case the handle spring arrangement is an integrated part of the handle plate itself, and the handle plate also needs to be replaced, if the spring force should be found too weak and is to be compensated by a return spring arrangement of the aforementioned kind.

[0003] An object of the invention is to provide such a novel return spring arrangement that may be applied with advantage also to retrofits, independently of the handle plate itself. A further aim is that the installation should be simple to carry out and should not require further machining of the door. The return spring arrangement should also be installable independently of whether the door is a right-hand or a left-hand door, and of the side of the lock casing, on which it will be installed.

[0004] The object of the present invention is achieved by return spring arrangement as set out in claim 1. Preferred or optional features of the invention are defined in the other claims. According to the invention, a spring casing is adapted, at least substantially, to be embedded in a body part so that it forms a compact unit, which is arranged to be installed entirely into a countersink made in a door or the like, between a handle plate and a door lock or door latch, and to be fastened by utilizing the fastening screws of the handle plate.

[0005] The basic idea of the invention relies on the fact that for installing a handle, the door is in any case provided with an opening of a particular size, typically having a diameter of 40 mm. When the return spring arrangement is dimensioned so that its diameter is suitable and its structure is in accordance with the invention, it may be installed into such an opening, whereby the space it requires is as small as possible in the direction of the spindle of the handle. Thus, it is simple to install the return spring arrangement even afterwards as a separate accessory.

[0006] In practice, the diameter of the return spring arrangement is preferably slightly shorter than that of the handle plate, whereby there is enough space for it under the handle plate and at the same time it can be ensured that the handle plate covers the installation opening. In addition, the return spring arrangement is provided with a number of openings for the lead-through of the fastening screws of the handle plate. In this way the installation into various kinds of operating environments can be secured.

[0007] The spring casing has, in a manner known per se, an opening provided with guide surfaces for the spindle of the handle. The spring is preferably a helical spring, which is installed around the said opening.

[0008] The periphery of the body part is preferably provided with at least one, preferably with two recesses, in which separate sleeve members have been arranged before the installation. During the installation a suitable sleeve member is released and mounted into position for the fastening screws of the handle plate, i.e. into one opening of a given pair of opposite openings, whereby one of the fastening screws passes through the sleeve member. Thus, the positioning of the return spring arrangement is provided by the sleeve member and the fastening screw therethrough, together with the spindle of the handle installed through the opening in the spring casing. The length of the inner diameters of the sleeve members may preferably vary so that they can be used conveniently in conjunction with screws of various diameters.

[0009] For guiding the ends of the spring, the shell surface of the spring casing preferably comprises an installation opening, which has separate branches for each end so that the branches have slightly different positions with respect to each other in the direction of the rotation axis of the spring casing. This, among other things, makes it possible to dimension the return spring arrangement so that it is as space saving as possible in the direction of the rotation axis of the spring casing, i. e. in the direction of the spindle of the handle.

[0010] In the following the invention is described in more detail, by way of example only, with reference to the attached drawings, in which

- Figure 1 is an exploded view of a return spring arrangement according to an embodiment of the invention; and

- Figure 2 shows the arrangement according to Figure 1 fully assembled.

[0011] In Fig. 1 the reference number 1 indicates the body part of the return spring arrangement, into which a spring casing 2 is installed so that a spring 3 is located between these parts. The body part 1 is provided with an opening 4 for the spindle of the handle, restricting members 5 and 6 for spring ends 3a and 3b, and holes 7 - 14 for the lead-through of fastening screws and for sleeve screws to be used in conjunction with them. The body part is also provided with recesses 15 and 16, into which releasable sleeve members 17 and 18 with different inner diameters may be installed. The spring casing 2 has a hole 19 provided with guiding surfaces for the spindle. In addition, the spring casing 2 has an installation opening 20, which comprises two branches 20a and 20b, onto which the spring ends 3a and 3b are supported.

[0012] The spring casing 2 may be turned with respect to the body part 1 (cf. the rotation axis A in Fig. 2) by means of the spindle of the handle (not shown) installed

in hole 19, whereby the turning is effected against the force of the spring 3. The freedom of motion of the ends 3a and 3b of the spring 3 is determined and their return to the initial position effected by the restricting members 5 and 6, which guide the spring ends.

[0013] Since the return spring arrangement according to the invention is not as such a part of the handle plate, it may be sold and installed as a separate accessory. The installation into the opening in the door, under the handle plate, is carried out by utilizing the fastening screws (not shown) of the handle plate, which screws are mounted, depending on the situation, in one of the opposite pairs of openings 7 - 14. A suitable sleeve member 17 or 18 is installed into one of the openings of such an opening pair, through which sleeve member one of the fastening screws is inserted. In this manner, by means of the spindle of the handle installed into hole 19 and the screw inserted through the sleeve member 17 or 18 the installation clearances may be eliminated and a precise positioning of the return spring arrangement in the installation opening of the door accomplished.

[0014] As shown in Fig. 2, the thickness, i.e. the extent, of the return spring arrangement in the direction of the rotation axis A of the spring casing 2, i.e. in the direction of the spindle of the handle, corresponds to the thickness of the body part 1 and is typically about 7.5 mm, whereby it may be installed in various kinds of applications. The optional openings 7 - 14 make the arrangement installable in conjunction with several kinds of lock casings and latches. The variety of installation angles is further increased by the fact that the arrangement is symmetric and it enables the elimination of clearances.

[0015] The invention is not limited to the above-described application, but several other modifications are conceivable within the scope of the appended claims.

Claims

1. A return spring arrangement for a handle in a door lock or a door latch, the arrangement comprising a body part (1) provided with restricting members (5, 6) for a spring (3), and a spring casing (2) to be rotatably connected to the body part, which spring casing, when installed, encloses both said restricting members (5, 6) and the return spring (3) of the handle, the ends (3a, 3b) of which spring are arranged to cooperate with said restricting members (5, 6), **characterised in that** the spring casing (2) is adapted, at least substantially, to be embedded in the body part (1) so that it forms a compact unit, which is arranged to be installed entirely into a countersink made in a door or the like, between the handle plate and the door lock or the door latch and to be fastened by utilizing the fastening screws of the handle plate.

2. A return spring arrangement according to claim 1, **characterised in that** its diameter is slightly shorter than that of the handle plate, and that it is provided with a number of openings (7 - 14) for the lead-through of the fastening screws of the handle plate.

3. A return spring arrangement according to claim 1 or 2, **characterised in that** the spring casing (2) has, in a manner known per se, an opening (19) provided with guide surfaces for the spindle of the handle, and that the spring (3) is a helical spring, which is installed around said opening (19).

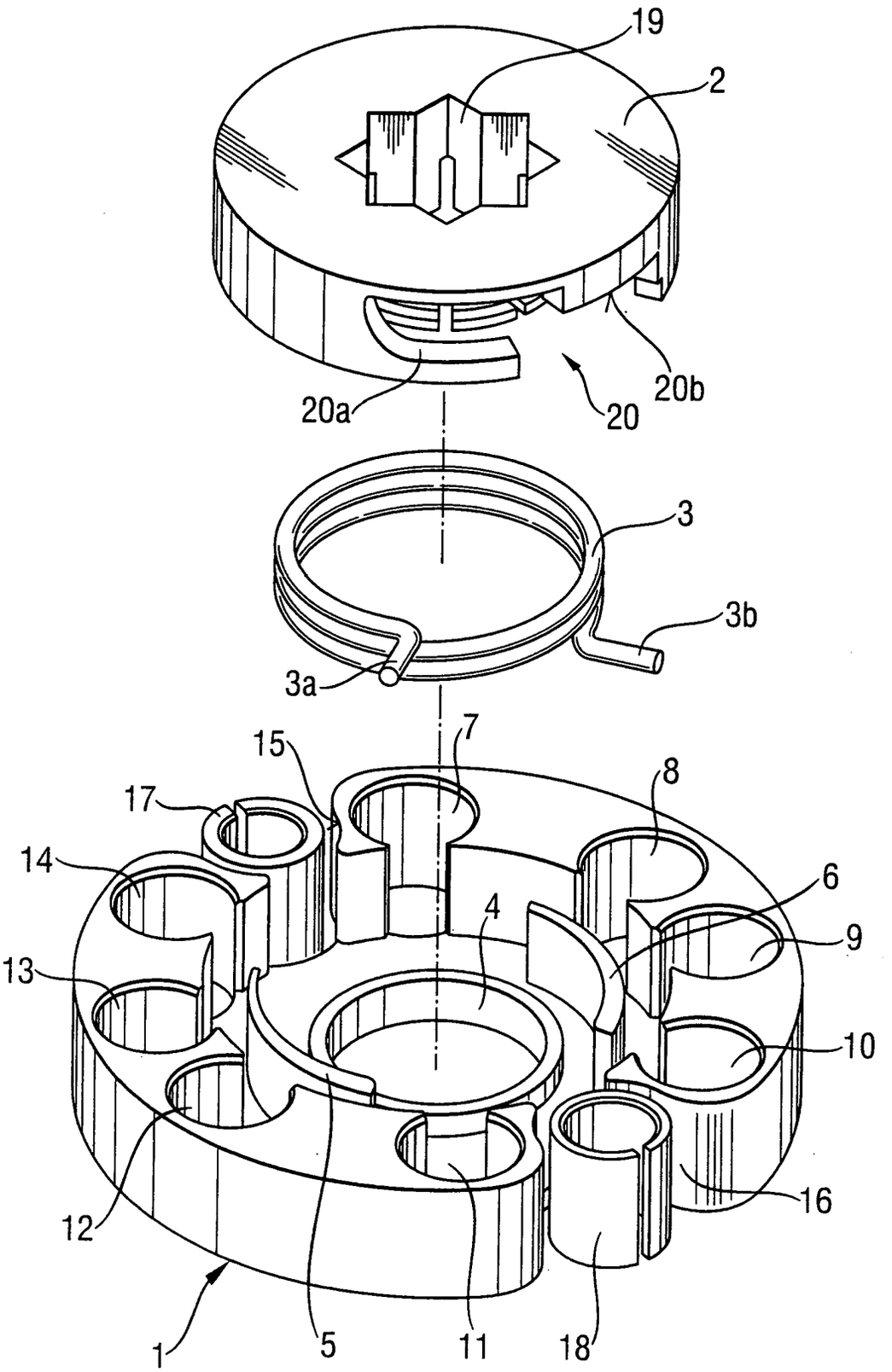
4. A return spring arrangement according to claim 3, **characterised in that** it comprises a sleeve member (17, 18), which is arranged to be installed for the fastening screws of the handle plate into one opening (7 - 14) of a given pair of opposite openings (7 - 14), whereby said sleeve member (17, 18) together with the fastening screw and the spindle of the handle installed through the opening (19) in the spring casing effects the positioning of the return arrangement.

5. A return spring arrangement according to claim 4, **characterised in. that** the periphery of the body part (1) is provided with at least one, preferably with two recesses (15, 16) for keeping the separate sleeve members (17, 18) before the installation.

6. A return spring arrangement according to claim 5, **characterised in that** sleeve members (17, 18) with inner diameters of various lengths for screws of various sizes are included in the arrangement.

7. A return spring arrangement according to any of the preceding claims, **characterised in that** for guiding the ends (3a, 3b) of the spring the shell surface of the spring casing (2) comprises an installation opening (20), which has separate branches (20a, 20b) for each end (3a, 3b) so that the branches (20a, 20b) have slightly different positions with respect to each other in the direction of the rotation axis (A) of the spring casing (2).

Fig. 1



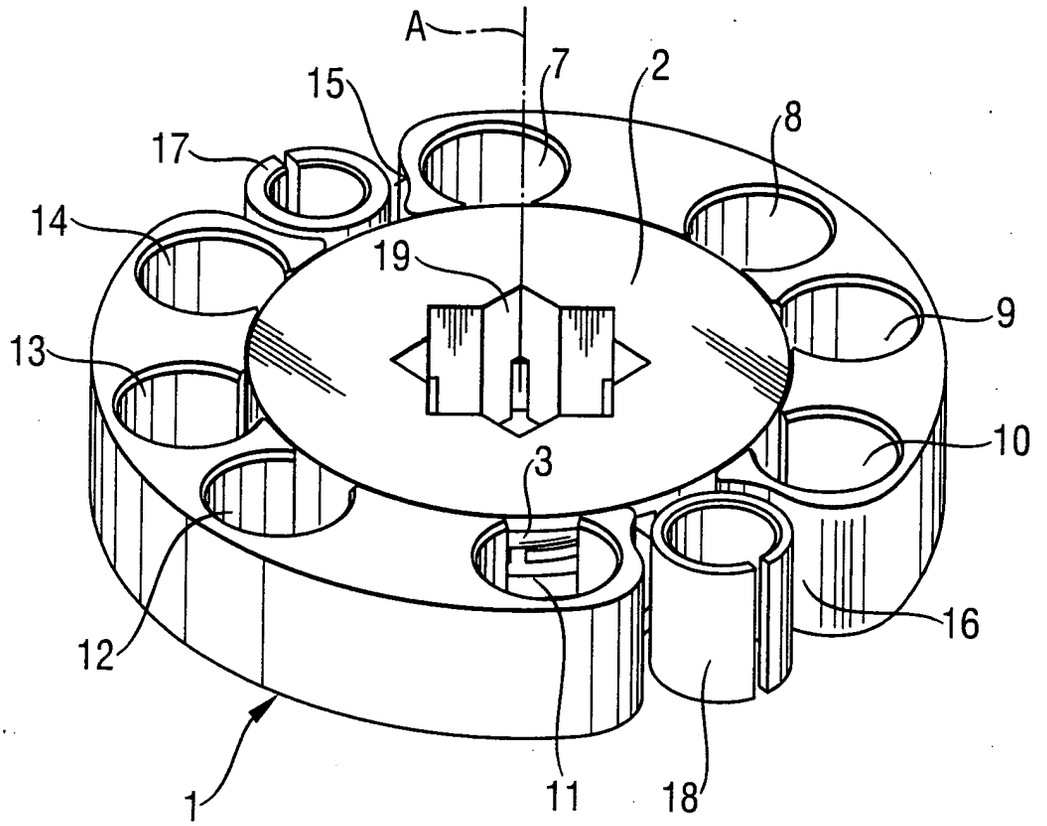


Fig. 2