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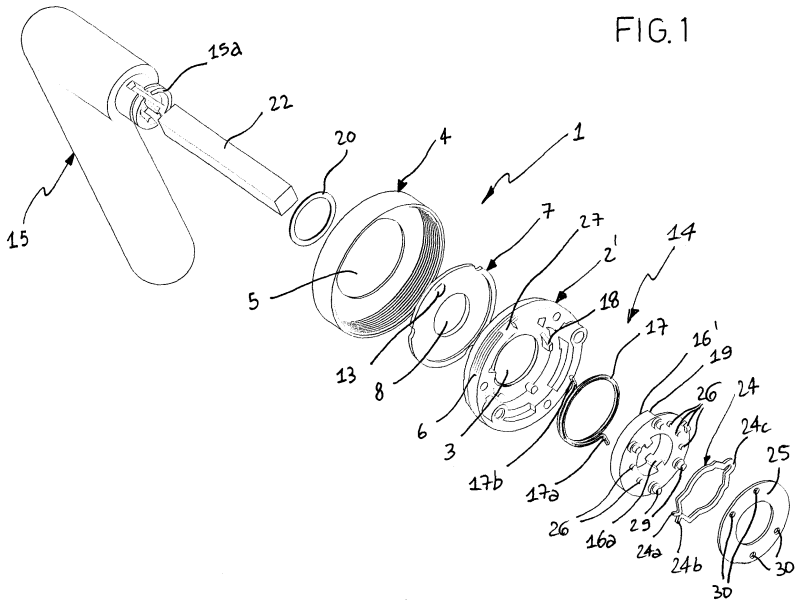
(54) Sealing ring and mechanism for door shackles comprising such a sealing ring

(57) Mechanism for door shackles (15), comprising a support body (2) to be fastened to a door and having a hole (3), a rotary element (16) associated to said support body (2) and having an engagement portion (16a) to be associated to a shackle (15), and an elastic element (17) placed between the support body (2) and the rotary element (16) and having a first end (17a) associated to an operating portion (18) of the support body (2) and a second end (17b) associated to an operating portion (19) of the rotary element (16), said support body (2), rotary element (16) and elastic element (17) defining an elastic return mechanism (14) for a shackle (15). The mechanism for door shackles (15) further comprises an elastic sealing ring (24) placed beside said rotary element (16) and to be movably associated to an operating end (15a) of a shackle (15) so as to fasten said operating end (15a) to said rotary element (16).

FIG. 1



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Description

[0001] The present invention relates to a mechanism for door shackles.

[0002] As is known, mechanisms for door shackles enabling the rotation and return to position of said shackles are housed within a body provided with an outer covering element to aesthetical purposes, generally made of brass or other precious material.

[0003] It is further known that, still to aesthetical purposes, the outer cover of the mechanism often consists of two concentric portions having a different color or surface finishing (chroming, butter finish or other treatments).

[0004] In such cases the covering element covers only partially said body, which is also made of brass or other precious material and becomes the central portion of the cover arranged around the shackle.

[0005] The shackle mechanism is then applied onto the body during assembly. An example of an easy-to-use mechanism for door shackles is described in Italian patent no. IT1.282.808 of 21.4.1994 issued to the Applicant, whose content is to be regarded as a substantial part of the present description to reference purposes, in particular as far as the elements constituting the mechanism for door shackles are concerned.

[0006] It is also known that cylinders of door locks for houses or other premises are usually protected on the door side pointing outside, in order to increase lock safety, by means of a cylinder-covering element having a cap-like shape matching one of the two ends of the cylinder so as to house the latter within. Said cylinder cover, also known in the field as "defender" or "security", typically consists of a sub-plate made of a burglar-resistant material, generally hardened steel, covered to aesthetical purposes by a plate made of brass or other material. The cylinder cover is then housed in its turn in the central hole of a support body and is provided on its inner edge with a peripheral projection preventing - once said cover is housed in operating position - its extraction through the central hole of the support body. The support body can be, depending on the circumstances, a circular or oval washer surrounding the lock, or an oblong plate extending from the lock to the door shackle, and is anyhow covered in its turn to aesthetical purposes with a covering element made of brass or other precious material. An outer cover consisting of two concentric portions having a different color or surface finishing can be provided also for the support body, the cover element thus covering only partially the support body made of precious material and constituting the central portion of the cover arranged around the cylinder cover.

[0007] The known technique disclosed above has some drawbacks.

[0008] Indeed, the solutions described are quite expensive, since both the body of the shackle mechanism and the cylinder support body are significantly massive, and therefore their production with precious materials increases the price of the finished product.

[0009] It should further be pointed out that the assembly of the shackle mechanism onto the body is quite a complex operation, which should generally be carried out at the factory with obvious disadvantages involving delivery and storage costs.

[0010] Moreover, the assembly of the shackle onto the mechanism should always be carried out before assembling the mechanism onto the door with a difficult operation, and it is always necessary to disassemble the whole door mechanism if only the shackle has to be replaced due to wrong assembly or other. It should eventually be pointed out that known mechanisms have quite a complex assembly, which makes it necessary to preassemble the mechanism at the factory and deliver the assembled mechanism to the distributor or installer. This results in high costs for storing and delivering said mechanisms, since the assembled mechanism is bulkier than its single components.

[0011] Under these circumstances the technical task underlying the present invention is to provide a mechanism for door shackles that can basically obviate the drawbacks referred to above. Within said technical task an aim of the present invention is to provide a mechanism for door shackles that enables a significant reduction of manufacturing, assembly, storage and delivery costs. Another aim of the present invention is to provide a mechanism that can be easily carried out.

[0012] A further aim is to considerably speed up and simplify assembly operations for door locks and shackles, thus enabling the assembly during installation and reducing stock of the various elements. A further aim of the present invention is to provide a mechanism with a high flexibility, a high interchangeability for the various components and rapid combinations of different elements. A final aim of the present invention is to provide a mechanism that enables an easy assembly and disassembly of the shackle from the mechanism also when the latter is mounted on the door.

[0013] These and other aims, which shall become more evident thanks to the following description, are basically achieved by a mechanism for door shackles according to the appended claims. Further characteristics and advantages will become more evident from the detailed description of a preferred but not exclusive embodiment of a mechanism for door shackles according to the present invention. Said description will now be disclosed with reference to the accompanying drawings, provided to a merely indicative and therefore nonlimiting purpose, in which:

- Figure 1 is a perspective exploded view of a mechanism for door shackles according to the present invention;
- Figures 2 and 3 are perspective views of a support body of the device of Figure 1;
- Figure 4 and 5 are perspective views of a variant of the support body with a different fastening system

to a door;

- Figures 6 and 7 are perspective views of a rotary element of the device of Figure 1;
- Figures 8, 9 and 10 show the disassembly of a shackle from a portion of the mechanism of Figure 1 in three operating stages;
- Figure 11 shows an execution variant of an elastic sealing ring according to the present invention.

[0014] With reference to the accompanying figures, a mechanism 24 for door shackles 15 comprises a support body 2 to be fastened to a door and having a hole 3, a rotary element 16 associated to said support body 2 and having an engagement portion 16a to be associated to a shackle 15, and an elastic element 17 placed between the support body 2 and the rotary element 16 and having a first end 17a associated to an operating portion 18 of the support body 2 and a second end 17b associated to an operating portion 19 of the rotary element 16. The support body 2, the rotary element 16 and the elastic element 17 define an elastic return mechanism 14 for a shackle 15. The mechanism 24 for door shackles 15 further comprises an elastic sealing ring 24 placed beside the rotary element 16 and to be movably associated to an operating end 15a of a shackle 15 so as to fasten said operating end 15a to said rotary element 16.

[0015] The mechanism 24 for door shackles 15 comprises also a covering device 1. The covering device 1 comprises a support body 2 to be fastened to a door and having a central hole 3, and a first covering element 4 having an opening 5 and to be associated to the support body 2 so as to cover a first portion 2a of said body. The first covering element 4 can be screwed onto a peripheral portion 6 of the support body 2 through corresponding threadings. The covering device 1 further comprises a second covering element 7 having a central hole 8 corresponding to the central hole 3 of the support body 2. The second covering element 7 is concentric with respect to the first covering element 4 and can be placed beside the latter in the central opening 5, and can be associated to the support body 2 so as to cover a second portion 2b of said body 2. Preferably, the second covering element 7 is basically disc-shaped and its mass is as small as possible. The second covering element 7 and the first covering element 4 cover the whole front surface 9 of the support body 2. The second covering element 7 has a peripheral portion 10 placed between the support body 2 and the first covering element 4, and is therefore kept in position since it is clamped between said elements.

[0016] The support body 2 is provided with a housing 11 for the second covering element 7 and with an engagement portion 12, for instance a pin, to be associated to a corresponding engagement portion 13, for instance a hollow seat, of the second covering element 7 so as to prevent the reciprocal rotation in operating position. In a preferred embodiment, as shown in Figures 1 to 7, the central hole 3 of the support body 2 is therefore designed to enable the passage of an operating end 15a of the shackle 15. In said embodiment the device 1 further comprises a rotary element 16 associated to the support body 2 and having an engagement portion 16a that can be associated to the operating end 15a of the shackle 15, and an elastic element 17, for instance a coil spring, placed between the support body 2 and the rotary element 16. The elastic element 17 has a first end 17a associated to an operating portion 18 of the support body 2, and a second end 17b associated to an operating portion 19 of the rotary element 16. Advantageously, the support body 2, the rotary element 16 and the elastic element 17 therefore define an elastic return mechanism 14 for a shackle 15, which is thus integrated and should not be applied later during assembly of the mechanism 14. Said embodiment of the elastic return mechanism 14 using only said three elements, i.e. the support body 2, the rotary element 16 and the elastic element 17, is enabled by a free choice of the material which the support body 2 and the rotary element 16 are made of. As a matter of fact, the embodiment of the elastic return mechanism 14 using only three elements requires the presence on the support body 2 and on the rotary element 16 of a series of operating portions with undercuts, which would not be easily obtained from a technical point of view by molding with traditional materials such as brass. The possibility of using suitable metal alloys, for instance "Zamak" (zinc alloy), or plastic for the support body 2, thus enables to achieve the result referred to above.

[0017] It should be pointed out that the return mechanism 14 can therefore be applied also to known covering elements covering the support body 2 wholly with one element, since here again the support body 2 can be made of any suitable material. It is further provided for known elements such as gaskets 20, sealing rings 21 - for instance "seizer" rings - and a control rod 22, which is fitted into the door and connects the operating end 15a of the shackle 15 referred to above to a corresponding operating end of an opposite second shackle.

[0018] The support body 2 is provided with some conventional threaded holes 23, arranged around the central hole 3, for assembling said support body 2 onto a door (not shown in the figure) by means of known assembly elements. The support body 2 can thus be mounted onto the door by means of fastening screws housed in suitable holes made in the door parallel to the lock cylinder or to the rotation axis of the shackle 15, which screws connect two corresponding support bodies 2 mounted on both sides of the door. Obviously, the size of the lock cylinder and of the fastening screws is suitably chosen depending on the thickness of the door onto which they have to be mounted. In the example shown below the support body 2 comprises a basically circular washer, which could however also be an elliptical washer or an oblong plate extending from the lock to the shackle 15, as is known per se and therefore not shown in the accompanying figures.

[0019] Advantageously, the first covering element 4 and the second covering element 7 have a different sur-

face appearance, for instance a different color or a different surface treatment. At least the first 4 and the second covering element 7 can be made of brass or other precious material, whereas the support body 2 and the rotary element 16 not being visible from outside can be advantageously made of cheaper materials, such as metal alloys, "Zamak" (commercial name of a zinc-aluminum-magnesium-copper alloy), or plastic. A covering device 1 according to the present invention, as described above from a mainly structural point of view, works as follows.

[0020] The elastic return mechanism 14 of the shackle 15 can be assembled straight after manufacturing its components and be therefore supplied ready-to-use to the installer. The remaining elements can be advantageously all stored and delivered to the installer separately, therefore unassembled. In order to install the mechanism 14 and the covering device 1 it is only necessary to associate the support body 2, the spring 17 and the rotary element 16, which are pre-assembled, to the second covering element 7, coupling the corresponding engagement portions 12, 13 so as to avoid reciprocal rotation. The first element 4 is now screwed onto the support body 2, thus blocking the second covering element 7 in position. The shackle 15 is then associated to the rotary element 16 and to the control rod 22, and the return mechanism 14 with the covering device 1 can thus be mounted onto the door. The covering device for a lock works in the same way as shown before, with the subsequent association of the support body 2 to a lock cylinder or a cylinder cover.

[0021] In an execution variant, the mechanism for door shackles 15 as shown above comprises a modified support body 2' and a modified rotary element 16', an elastic sealing ring 24 (instead of the traditional "seizer" sealing ring 21) and a stop element 25.

[0022] The stop element 25 is designed to keep the elastic sealing ring 24 in contact with the rotary element 16 while fitting the operating end 15a of the shackle 15 into the elastic sealing ring 24.

[0023] It is thus possible to automatically mount the shackle into the mechanism, even though the latter is already mounted on the door.

[0024] The stop element 25 can comprise a plate to be fastened to the rotary element 16, for instance by means of four pins 29 placed on the rotary element and four fastening holes 30 on the stop element 25. As an alternative, the stop element 25 could be made integrally with the rotary element 16, and therefore as one piece, finding a suitable arrangement enabling the sealing ring 24 to be fitted into its seat.

[0025] Advantageously, the sealing ring 24 is elastic and is placed beside the rotary element 16 and can be movably associated to an operating end 15a of the shackle 15 so as to fasten said operating end 15a to the rotary element 16. Figure 17 shows a different shape of the ring 24, and further shape variants are obviously possible. The elastic sealing ring 24 is provided with a first 24a and a second end 24b having folded portions, suitably shaped so as to separate the ends 24a, 24b and thus partially open the ring 24 by exerting a thrust coplanar to said ring 24. The sealing ring 24 is further provided with at least a low resistance portion 24c (for instance having a small section or a suitable shape reducing its resistance) designed to increase the elasticity of the ring 24 and thus to make its opening easier. Advantageously, the elastic sealing ring 24 can be obtained by shearing or by means of a threadlike element suitable folded so as to achieve a suitable shape, which can also differ from the one shown in the figures.

[0026] The rotary element 16 is advantageously equipped with a plurality of positioning elements 26 to be movably associated to the elastic sealing ring 24, which is suitably shaped so as to be associated to the positioning elements 26. Said positioning elements 26 thus enable to fasten the elastic sealing ring 24 rotably together with the rotary element 16, thus preventing reciprocal rotations and enabling in the meanwhile a partial opening of the elastic sealing ring 24.

[0027] Moreover, the support body 2 is advantageously provided with a side opening 27 designed to enable the introduction, when the mechanism is mounted on a door, of a spacing element 28 parallel to the elastic sealing ring 24, so as to enable a partial opening of the elastic sealing ring 24 and the release of the operating end 15a of the shackle 15.

[0028] Obviously, said side opening 27 should be arranged so as to be, when the mechanism is in its rest position, on the two ends 24a, 24b of the elastic sealing ring 24.

[0029] Furthermore, said mechanism can comprise a spacing element 28 having an end 28a suitably matching the folded portions of the ends 24a, 24b of the ring 24 and designed to fit into the side opening 27 of the support body 2 so as to allow the shackle to be disassembled.

[0030] Obviously, said execution variant can also be carried out separately from the covering device disclosed above.

[0031] The mechanism described above works as briefly disclosed in the following.

[0032] The shackle 15 can be very easily mounted, since it is only necessary to assemble the mechanism 14, to mount it onto a door and then to fit the shackle 15 into the mechanism 14 so that the end 15a pushes against the elastic sealing ring 14, slightly opening the latter and thus blocking it around said end 15a, which has a known peripheral groove.

[0033] In order to disassemble the shackle, it is only necessary to fit the end 28a of the spacing element 28 into the side opening 27 of the body 2, pushing against the folded portions of the ends 24a, 24b of the ring 24, so as to allow the shackle to be disassembled, as shown in detail in Figures 14 to 16 (in which for reasons of clarity only the shackle 15, the rotary element 16, the sealing ring 24 and the spacing element 28 are shown, without the body 2 and the stop element 25).

[0034] The present invention achieves important advantages. First of all, a mechanism for door shackles according to the present invention enables to achieve a considerable reduction of product manufacturing, assembly, storage and delivery costs. As a matter of fact, thanks to an extremely simple assembly, it is now possible to store and deliver to distributors and installers single components instead of the mechanisms with already assembled shackles, which obviously results in advantages concerning room and reduction of variants to be stored. Furthermore, thanks to the second covering element, the support body can be made of less precious materials, which allows to save a lot of money. Moreover, since the return mechanism can be placed directly on the support body, the number and complexity of the elements of the mechanism are further reduced. It should further be pointed out that a mechanism according to the present invention enables to significantly simplify and speed up assembly operations for door locks and shackles, thus reducing operators' interventions and enabling assembly during installation. It is further possible to easily assemble the shackle automatically when the mechanism is already mounted on the door, as well as to easily disassemble only the shackle in case of assembly mistakes or shackle replacement. The invention further grants a high flexibility of its various components, which can be easily associated one to the other and replaced by elements having different materials and appearance, thus allowing different combinations of elements to be rapidly obtained. Therefore, the invention also enables to reduce stock of the various elements. Moreover, the mechanism can be easily manufactured with low costs. The invention thus conceived is subject to several changes and variants, all of which fall within the inventive idea characterizing it. Furthermore, all details can be replaced by technically equivalent element and any size, depending on needs, can be used.

Claims

1. Sealing ring (24) having a first (24a) and a second end (24b), **characterized in that** said first and second end (24a, 24b) have folded portions suitably shaped so as to separate said ends (24a, 24b) and thus to partially open the ring (24) by exerting a thrust coplanar to said ring (24).

2. Sealing ring (24) according to claim 1, **characterized in that** it is provided with at least a low resistance portion (24c) designed to increase the elasticity of the ring (24) and thus to make its opening easier.

3. Sealing ring (24) according to claim 1 or 2, **characterized in that** it is obtained from a suitably folded threadlike element.

4. Mechanism for door shackles (15), comprising:
   a support body (2) to be fastened to a door and having a hole (3),
   a rotary element (16) associated to said support body (2) and having an engagement portion (16a) to be associated to a shackle (15), and
   an elastic element (17) placed between the support body (2) and the rotary element (16) and having a first end (17a) associated to an operating portion (18) of the support body (2) and a second end (17b) associated to an operating portion (19) of the rotary element (16), said support body (2), rotary element (16) and elastic element (17) defining an elastic return mechanism (14) for a shackle (15),
   characterized in that it further comprises an elastic sealing ring (24) according to any of the claims from 1 to 3, placed beside said rotary element (16) and to be movably associated to an operating end (15a) of a shackle (15) so as to fasten said operating end (15a) to said rotary element (16).

5. Mechanism according to claim 4, **characterized in that** it further comprises a stop element (25) designed to keep said elastic sealing ring (24) in contact with said rotary element (16) while fitting said operating end (15a) of a shackle (15) into said elastic sealing ring (24).

6. Mechanism according to any of the claims 4 or 5, **characterized in that** said stop element (25) comprises a plate to be fastened to said rotary element (16).

7. Mechanism according to any of the claims 4 or 5, **characterized in that** said stop element (25) is made integrally with said rotary element (16).

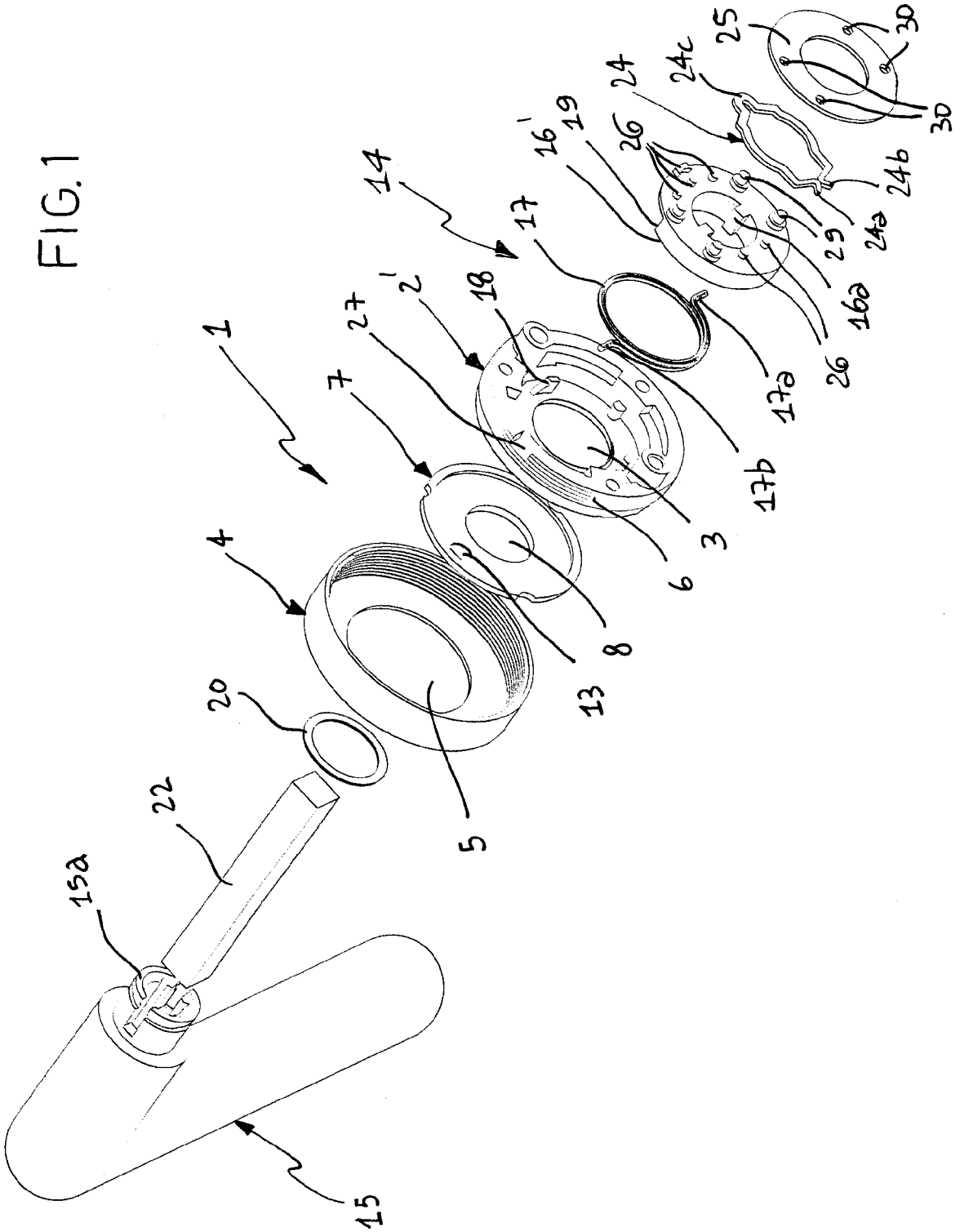
8. Mechanism according to any of the claims 4 to 7, **characterized in that** said rotary element (16) is equipped with a plurality of positioning elements (26) movably associated to said elastic sealing ring (24), which is suitably shaped so as to be associated to said positioning elements (26), so as to rotably fasten said elastic sealing ring (24) together with said rotary element (16), thus enabling a partial opening of said elastic sealing ring (24).

9. Mechanism according to any of the claims from 4 to 8, **characterized in that** said support body (2) is provided with a side opening (27) enabling the introduction, when said mechanism is mounted on a door, of a spacing element (28) parallel to said elastic sealing ring (24), so as to partially open said elastic sealing ring (24) and to release said operating end (15a) of a shackle (15).

10. Mechanism according to claim 9, **characterized in**

that it comprises a spacing element (28) having an end (28a) suitably matching said folded portions of said ends (24a, 24b) of the ring (24) and designed to fit into said side opening (27) of the support body (2).

FIG. 1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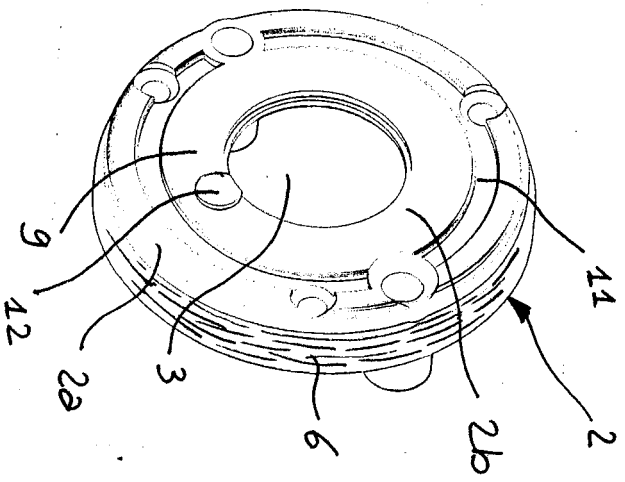

FIG. 2

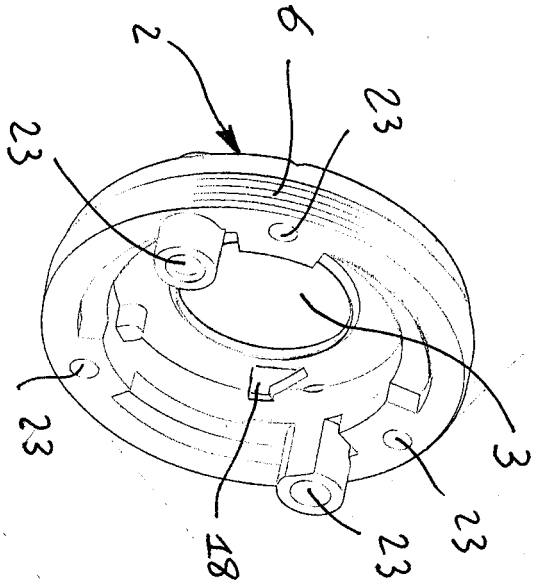

FIG. 3

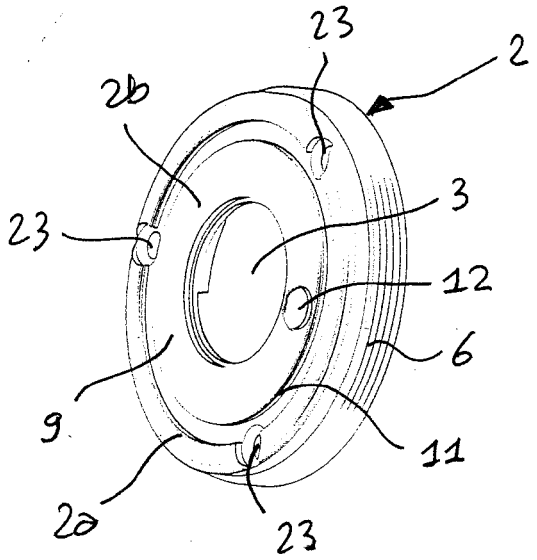

FIG. 4

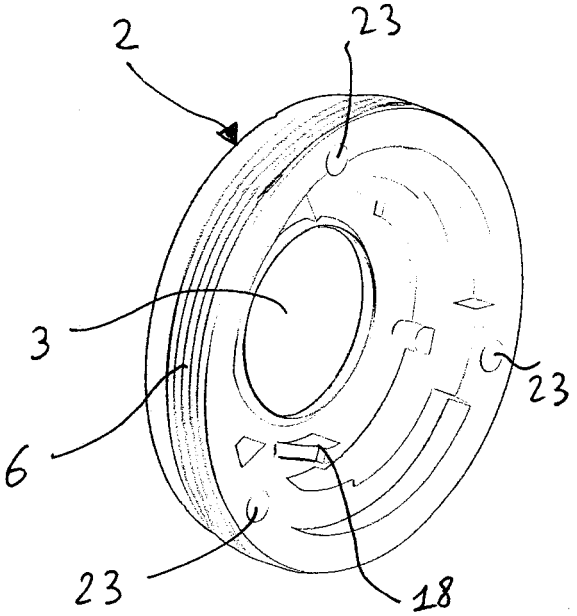

FIG. 5

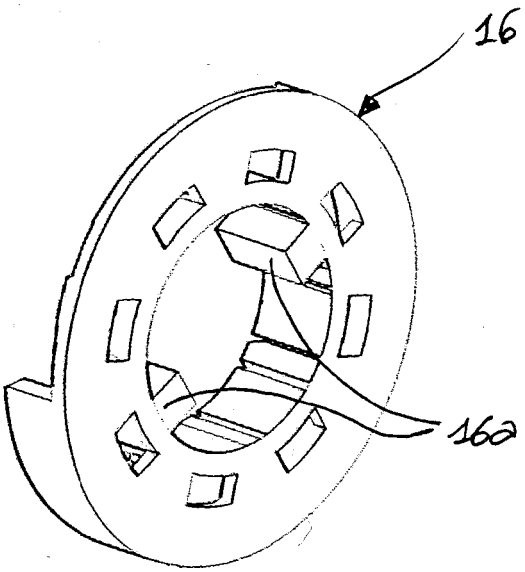

FIG. 6

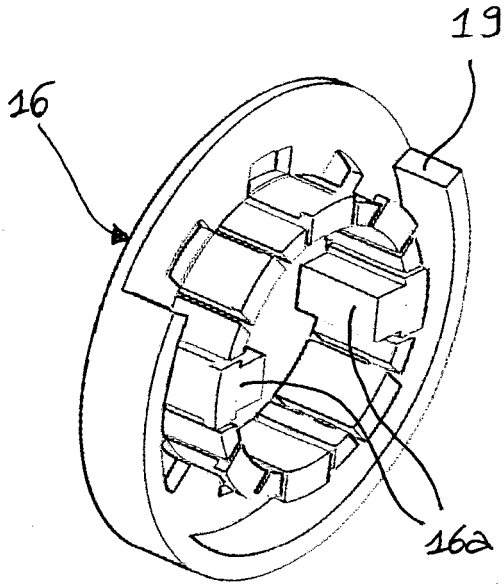

FIG. 7

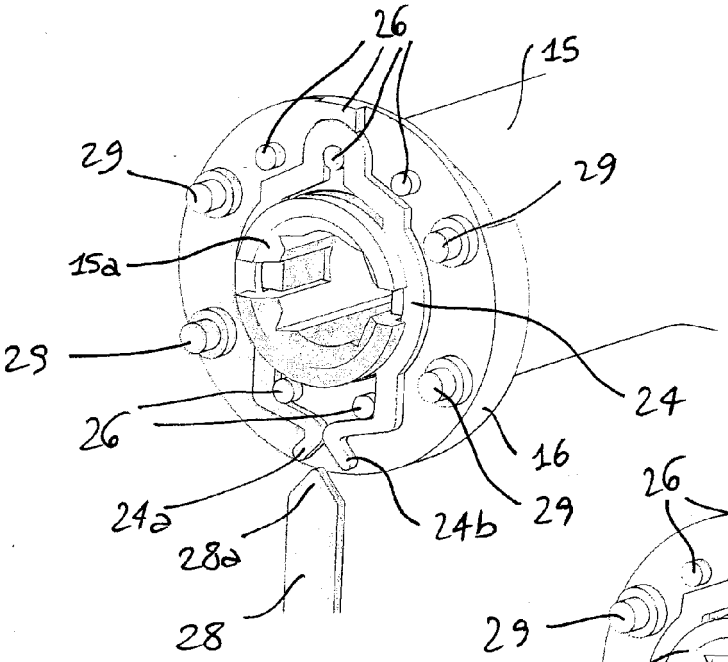

FIG. 8

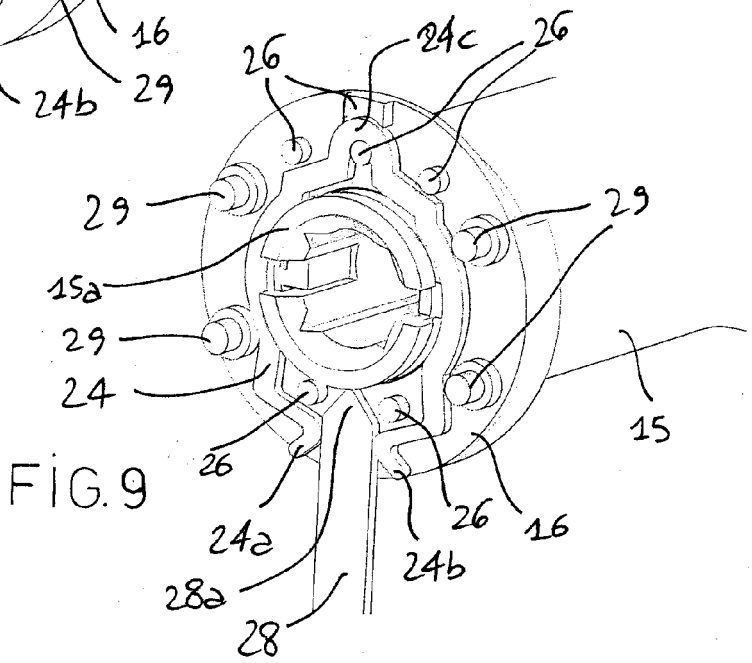

FIG. 9

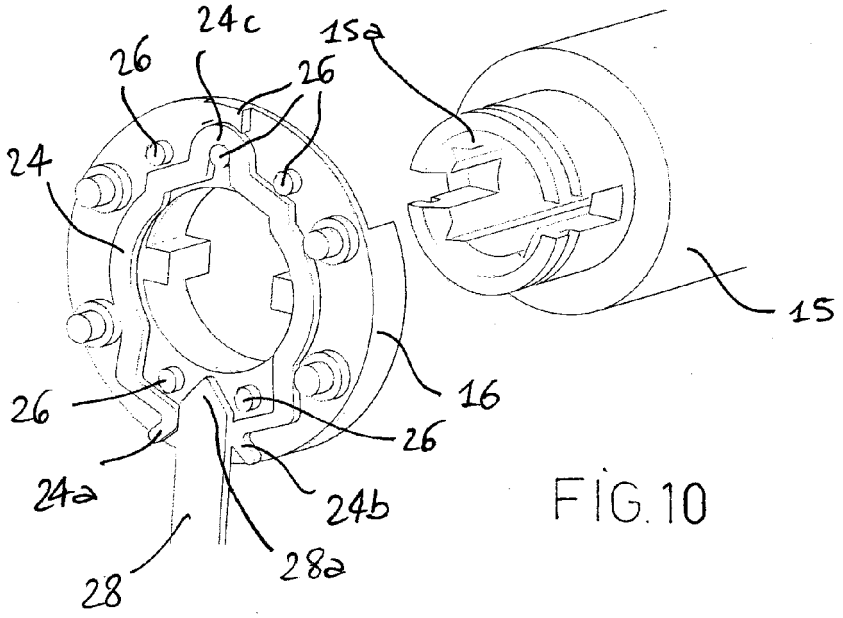

FIG. 10

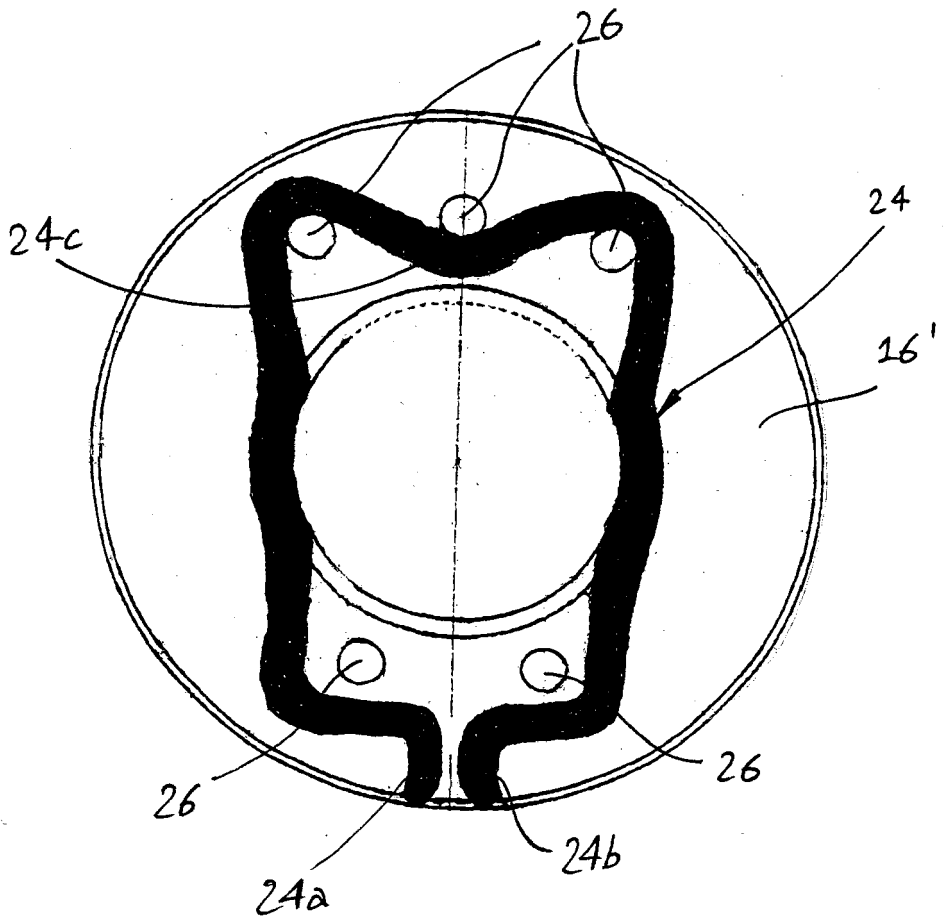

FIG. 11

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- IT 1282808 **[0005]**