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(54) LATCHING DEVICE FOR A LOCK, PARTICULARLY FOR IN-WALL FRAMES OF RETRACTABLE SLIDING DOORS

(57) Latching device (1) for a lock (2), particularly for in-wall frames of retractable sliding doors, constituted by a box-like body (13) with which an eccentric pin (17) is rotatably associated which can be activated by the user and cooperates with a slider (19), which can move inside the box-like body (13), from which protrudes an adjustable engagement pin (15) which cooperates with the lock (2) in order to obtain the closing/opening thereof.

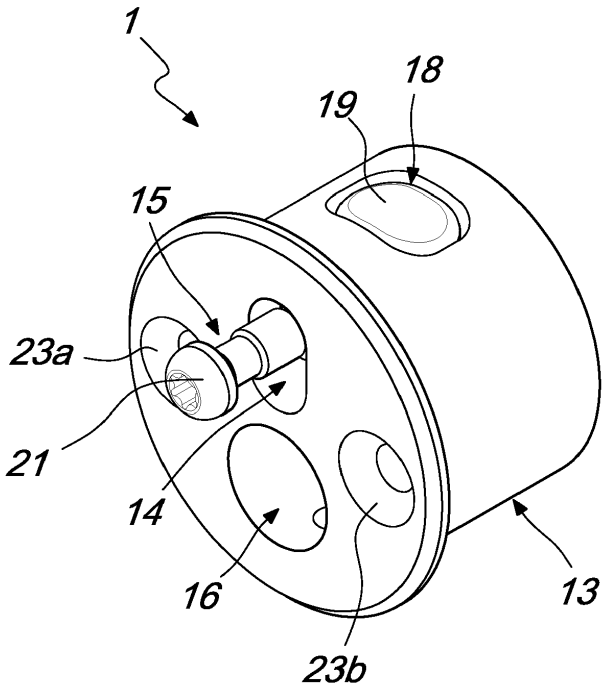

Fig. 2

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Description

[0001] The present invention relates to a latching device for a lock, particularly for in-wall frames of retractable sliding doors.

[0002] Nowadays it is known to provide door frames which involve the use of an in-wall frame, positioned inside a wall, in which a door or a panel is slideably associated and which is also known as a "retractable door".

[0003] Such solution makes it possible to reduce the encumbrances of the door in a room thanks to the possibility of sliding it into the in-wall frame: thus one can use the space adjacent to the door, which would otherwise be occupied by doors of the type that are hinged laterally to a casement.

[0004] In the known art, an embedded in-wall frame is usually constituted by a framework which comprises a plurality of vertical profiled elements, a front post and a rear post, which are connected by horizontal crossmembers which define a containment casing of the panel or of the door.

[0005] Protruding above the case, along an axis that is longitudinal with respect to the case itself and that extends from the side opposite to that of the containment case, is a rail which is hidden by a jamb.

[0006] Trolleys coupled to the upper edge of the door are slideably integrated in the rail in order to enable the sliding of the door into and out of the in-wall frame.

[0007] Usually associated with the end of the rail which is not associated with the vertical posts is an additional post that acts as a terminal for the abutment of the front edge of the door.

[0008] Such conventional door frames thus use metallic profiles that can be mounted together and are sold for example in kit form for assembly.

[0009] The doors are usually associated with a lock of the type constituted by a hook-shaped coupler, which can perform an oscillating movement that is such as to allow its temporary locking at a tooth that is present on the abutment frame for the door.

[0010] EP2889443 discloses a locking system for in-wall frames of sliding doors of the type described above.

[0011] A drawback that is found in the known art consists in that the locator is fixed by screwing it directly onto the jamb or abutment casing of the door, and as a consequence it cannot be adjusted.

[0012] Sliding doors can in fact require height adjustments owing to settling of the system after mounting, or owing to an incorrect measurement at the time of installation, or if the locator has been fixed at a height that is slightly misaligned with respect to the engagement prong of the lock, or if it is desired to raise the level of the floor, after the door has been mounted.

[0013] In order to seek to overcome the problem, it is known to modify the initial fixing position by screwing-in a screw above the existing hole, a few millimeters away.

[0014] A drawback that is found in the known art consists in that the pin tends to shift toward the previous hole, thus compromising the hold of such engagement pin which becomes poor and unstable.

[0015] The aim of the present invention is to eliminate the above mentioned drawbacks, by providing a latching device for a lock, particularly for in-wall frames of retractable sliding doors, which is adjustable easily and rapidly.

[0016] Within this aim, an object of the present invention is to provide a latching device that is adjustable without modifying the initial fixing position.

[0017] Another object is to provide a latching device that is structurally simple and low cost and can be made with the usual conventional plants.

[0018] This aim and these and other objects which will become better apparent hereinafter are achieved by a latching device for a lock, particularly for in-wall frames of retractable sliding doors, characterized in that it is constituted by a box-like body with which an eccentric pin is rotatably associated which can be activated by the user and cooperates with a slider, which can move inside said box-like body, from which protrudes an adjustable engagement pin which cooperates with said lock.

[0019] Further characteristics and advantages of the invention will become better apparent from the detailed description of a particular, but not exclusive, embodiment of the latching device according to the invention, which is illustrated by way of non-limiting example in the accompanying drawings wherein:

Figure 1 is a perspective view of the device according to the invention adjacent to a lock;
Figures 2, 3, 4, 5 and 6 are perspective views of the components of the device according to the invention;
Figure 7 is a side view of the device according to the invention;
Figure 8 is a front elevation view of the device according to the invention;
Figure 9 is a cross-sectional view taken along the line IX-IX of Fig. 7;
Figure 10 is a cross-sectional view taken along the line X-X of Fig. 8;
Figure 11 shows a detail of Figure 9;
Figures 12, 14, 16, 18 and 20 are front elevation views of the device showing a clockwise rotation of 180° of the eccentric pin and showing the positioning assumed by the slider;
Figures 13, 15, 17, 19 and 21 are cross-sectional views of the device in the conditions in Figures 12, 14, 16, 18 and 20.

[0020] In the embodiments illustrated, individual characteristics shown in relation to specific examples may in reality be interchanged with other, different characteristics, existing in other embodiments.

[0021] Moreover, it should be noted that anything found to be already known during the patenting process is understood not to be claimed and to be the subject of a disclaimer.

[0022] With reference to the figures, the reference nu-

meral 1 generally designates a latching device for a lock 2, particularly for in-wall frames of retractable sliding doors (not shown).

[0023] The lock 2 is constituted by a box-like structure 3 that is parallelepiped in shape, is open on one side, can be closed by means of a cover (not shown), and is connected frontally by a faceplate 4 which is provided with first holes 5a, 5b for coupling to the door.

[0024] Engagement means are arranged within the box-like structure 3 for an engagement pin 15 and are constituted for example by a cylinder 6 which is open at one end and closed at the other end by a wall 7 and is provided axially with a pivot 8 for pivoting to the backplate 9 of the box-like structure 3.

[0025] The cylinder 6 is thus idle and associated rotatably with the box-like structure 3, and has a lateral surface 10 which skims, during rotation, the internal surface of the faceplate 4 and has at least one first hole 11 which can be facing a corresponding opening 12 provided on the faceplate 4.

[0026] The latching device 1 is constituted by a box-like body 13, which is substantially shaped like a cylinder with a circular base, on which there is a first axial through seat 14, which in plan view is substantially oval with the major axis arranged along an axis that is diametrical to the axis of the box-like body 13, within which the engagement pin 15 acts slideably.

[0027] On the box-like body 13 there is also a second axial through seat 16, which in plan view has a substantially circular shape and a sequentially different diameter and within which the eccentric pin 17 acts rotatably, the second axial seat 16 being provided in a region that is adjacent to the first axial seat 14.

[0028] On the box-like body 13 there is furthermore, along an axis that is perpendicular to the axis of the first and second axial seats 14, 16, a third through seat 18, the axis of which is therefore parallel to the major axis of the first seat 14.

[0029] The third seat 18 in plan view is substantially oval in shape, with the major axis provided along an axis that is perpendicular to the major axis of the first seat 14 and it affects the first and second axial seats 14, 16; furthermore the third seat 18 has, in a cross-section that passes through the major axis, a conical shape.

[0030] The first and second axial seats 14, 16 are mutually parallel, while the third seat 18 is perpendicular to the previous two.

[0031] Inside the third seat 18 there is a slider 19 which is allowed both to perform an axial movement and to perform a partial rotation in the region affected by the eccentric pin 17, the third seat 18 having an appropriate width.

[0032] The engagement pin 15 has a first threaded shank 20 which is fixed rotatably to the slider 19 and has a first head 21 protruding beyond the end of the first axial seat 14 that is directed toward the faceplate 4 of the lock 2.

[0033] The box-like body 13 advantageously has, in the direction of the faceplate 4, a flat base 22 of larger diameter on which a pair of second holes 23a, 23b is provided in order to fix it to a frame or abutment jamb for the door in a region adjacent to the opening 12 provided in the faceplate 4.

[0034] The eccentric pin 17 has a second head 24, associated rotatably with a complementarily shaped first substantially cylindrical portion 25a of the second axial seat 16, which is adjacent to the flat base 22, a notch 26 being provided on the base and being adapted to be affected for example by the blade-like tip of a tool such as a screwdriver.

[0035] On the second head 24 there is advantageously a notch or annular ridge 30 for a spring 31 which protrudes radially from it and interacts with an adapted receptacle 32 provided on the facing lateral surface that is internal to the first portion 25a of the second axial seat 16; the spring increases the friction for the rotation of the eccentric pin 17.

[0036] To insert the spring 31, a hole can be advantageously provided for the placing thereof at the box-like body 13, and the spring can optionally then be locked in place by way of a grub screw.

[0037] A second substantially cylindrical shank 27 is contiguous to the second head 24 and has a smaller diameter and is axially offset with respect to the second head 24.

[0038] The second shank 27 is rotatably associated at a second substantially cylindrical portion 25b of the second axial seat 16 that is axially offset with respect to the first portion 25a.

[0039] A third substantially cylindrical shank 28 is provided contiguous to the second shank 27, has a smaller diameter than the second shank 27, is axially aligned with the second head 24 and acts at a third substantially cylindrical portion 25c of the second axial seat 16 which is axially aligned with the first portion 25a.

[0040] The end 29 of the third shank 28 has a larger diameter and is elastically and radially compressible for snap coupling at an adapted fourth substantially cylindrical portion 25d of the second axial seat 16 which is contiguous to the third portion 25c, axially aligned with the latter but has a larger diameter than the latter so as to define a step-like discontinuity for the temporary anchoring of the end 29.

[0041] Use of the device is as follows: once assembled and inserted at a frame or abutment jamb for the door in a region adjacent to the opening 12 provided on the faceplate 4 of the lock, the user can, by acting on the notch 26 of the eccentric pin 17, vary the height of the positioning of the first head 21 until the positioning is aligned with the first hole 11 provided on the lateral surface 10 of the cylinder 6 that constitutes the lock 2.

[0042] In this way the subsequent optimal and rapid closing/opening of the sliding door can be obtained, compensating for any settling of the system after the mounting of the sliding door, or because the door was incorrectly adjusted at the time of installation, or even because it

was decided after mounting the door to cover the floor with an additional pre-finished floor, given that this solution in particular requires raising the door by a few millimeters.

[0043] Thus it has been found that the invention fully achieves the intended aim and objects, a latching device having been obtained for a lock, particularly for in-wall frames of retractable sliding doors, which is height-adjustable easily and rapidly without modifying the initial fixing position or the positioning of the door. The invention is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0044] Naturally the materials used as well as the dimensions of the individual components of the invention may be more relevant according to specific requirements.

[0045] The characteristics indicated above as advantageous, convenient or the like, may also be missing or be substituted by equivalent characteristics.

[0046] The disclosures in Italian Patent Application No. 102015000088822 (UB2015A009803) from which this application claims priority are incorporated herein by reference.

[0047] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A latching device (1) for a lock (2), particularly for in-wall frames of retractable sliding doors, **characterized in that** it is constituted by a box-like body (13) with which an eccentric pin (17) is rotatably associated which can be activated by the user and cooperates with a slider (19), which can move inside said box-like body (13), from which protrudes an adjustable engagement pin (15) which cooperates with said lock (2).

2. The device according to claim 1, for a lock (2) constituted by a box-like structure (3), which is connected frontally by a faceplate (4) provided with first holes (5a, 5b) for coupling to said door, within which there is an engagement means for said engagement pin (15), such as a rotatable cylinder (6) that has a lateral surface (10) that skims, during rotation, the internal surface of said faceplate (4) and has at least one first hole (11) that can face a corresponding opening (12) provided in said faceplate (4), **characterized in that** it is constituted by a box-like body (13), which is substantially shaped like a cylinder with a circular base, on which there is a first axial through seat (14), which in plan view is substantially oval with the major axis arranged along an axis that is diametrical to the axis of said box-like body (13), within which said engagement pin (15) acts slideably, on said box-like body (13) there being also a second axial through seat (16), which in plan view has a substantially circular shape and a sequentially different diameter and within which said eccentric pin (17) acts rotatably, said second axial seat (16) being provided in a region that is adjacent to said first axial seat (14), on said box-like body (13) there being furthermore, along an axis that is perpendicular to the axis of said first and second axial seats (14, 16), a third through seat (18), the axis of which is parallel to the major axis of said first seat (14).

3. The device according to claim 2, **characterized in that** said third seat (18) has, in plan view, a substantially oval shape, with the major axis provided along an axis that is perpendicular to the major axis of said first axial seat (14) and it affects said first and second axial seats (14, 16); said third seat (18) having, in a cross-section that passes through said major axis, a conical shape, said third seat (18) affecting said first and second axial seats (14, 16), said first and second axial seats (14, 16) being mutually parallel, while said third seat (18) is perpendicular to the preceding ones.

4. The device according to one or more of the preceding claims, **characterized in that** inside said third seat (18) there is a slider (19) which is allowed both to perform an axial movement and to perform a partial rotation in the region affected by said eccentric pin (17), said third seat (18) having an appropriate width.

5. The device according to one or more of the preceding claims, **characterized in that** said engagement pin (15) has a first threaded shank (20) which is fixed rotatably to said slider (19) and has a first head (21) protruding beyond the end of said first axial seat (14) that is directed toward the faceplate (4) of the lock (2).

6. The device according to one or more of the preceding claims, **characterized in that** said box-like body (13) has, in the direction of said faceplate (4), a flat base (22) of larger diameter on which a pair of second holes (23a, 23b) is provided in order to fix it to a frame or abutment jamb for said door in a region adjacent to said opening (12) provided in the faceplate (4).

7. The device according to one or more of the preceding claims, **characterized in that** said eccentric pin (17) has a second head (24), associated rotatably with a complementarily shaped first substantially cylindrical portion (25a) of said second axial seat (16), which is adjacent to said flat base (22), a notch (26) being provided on said base and being adapted to be affected by the blade-like tip of a tool such as a screwdriver, a second substantially cylindrical shank (27)

being contiguous to said second head (24) and having a smaller diameter and being axially offset with respect to said first head (21), said second shank (27) being rotatably associated, at a second substantially cylindrical portion (25b) of said second axial seat (16) that is axially offset with respect to said first portion (25a).

8. The device according to one or more of the preceding claims, **characterized in that** a third substantially cylindrical shank (28) is provided contiguous to said second shank (27), has a smaller diameter than said second shank (27), is axially aligned with said second head (24) and acts at a third substantially cylindrical portion (25c) of said second axial seat (16) which is axially aligned with said first portion (25a), the end (29) of said third shank (28) having a larger diameter and being elastically and radially compressible for snap coupling at an adapted fourth substantially cylindrical portion (25d) of said second axial seat (16) which is contiguous to said third portion (25c), axially aligned with the latter but has a larger diameter than the latter so as to define a step-like discontinuity for the temporary anchoring of said end (29).

9. The device according to one or more of the preceding claims, **characterized in that** an annular ridge (30) is provided on said second head (24) of said eccentric pin (17) for a spring (31) which protrudes radially from it and interacts with a receptacle (32) provided on the facing lateral surface that is internal to said first portion (25a) of said second axial seat (16), said spring (31) increasing the friction for the rotation of said eccentric pin (17).

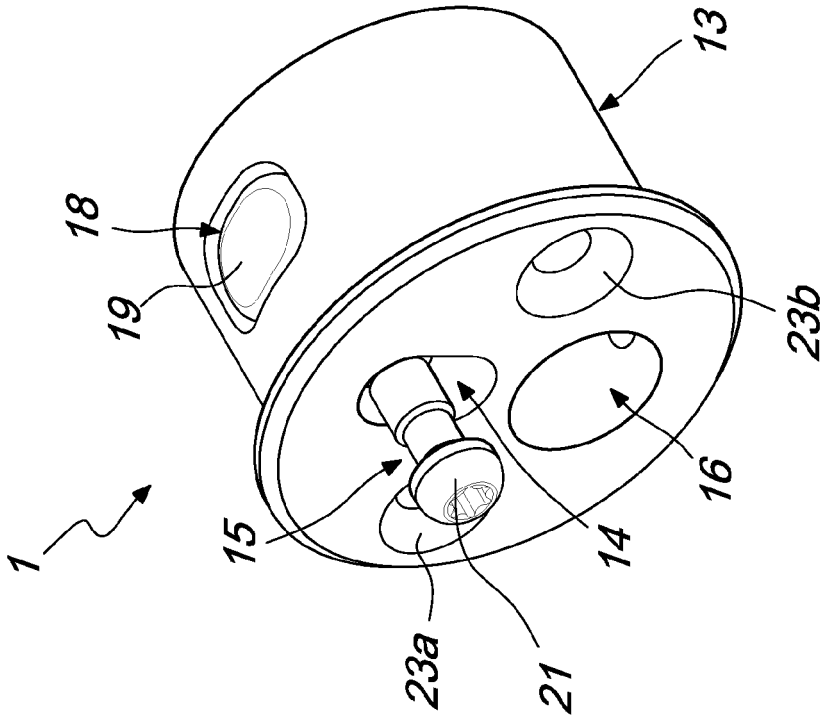

Fig. 2

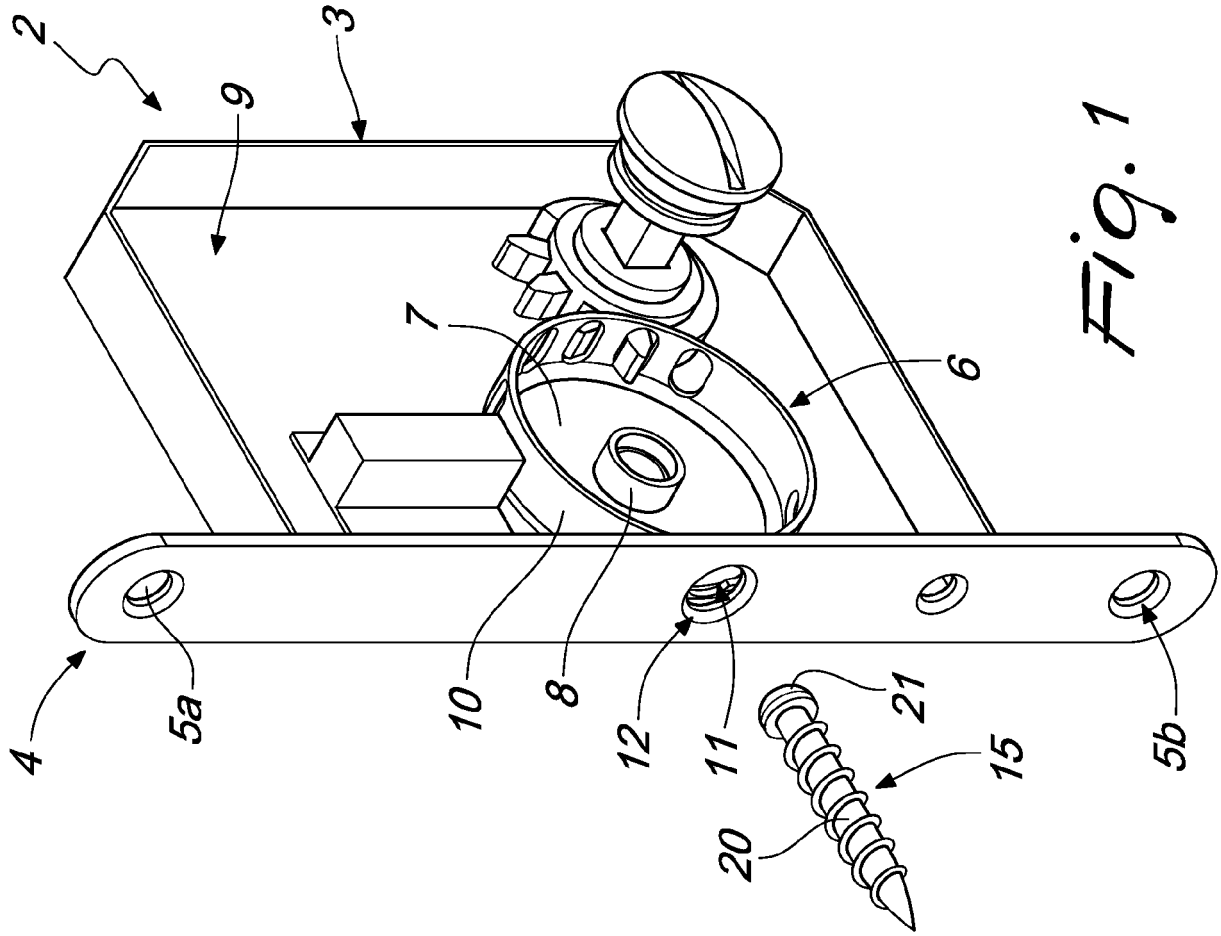

Fig. 1

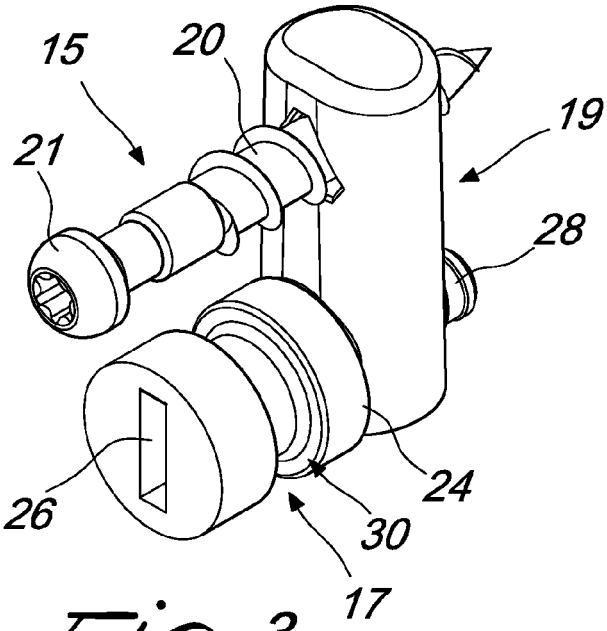

Fig. 3

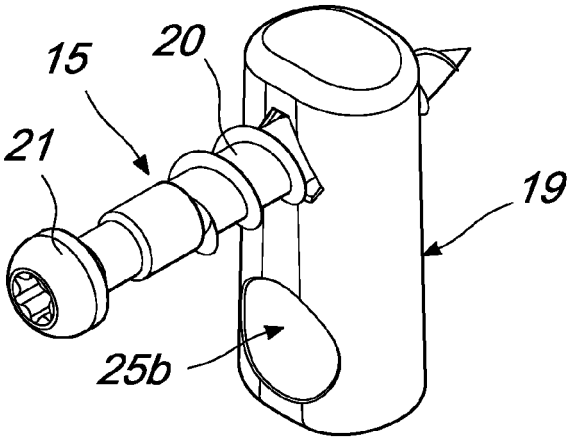

Fig. 4

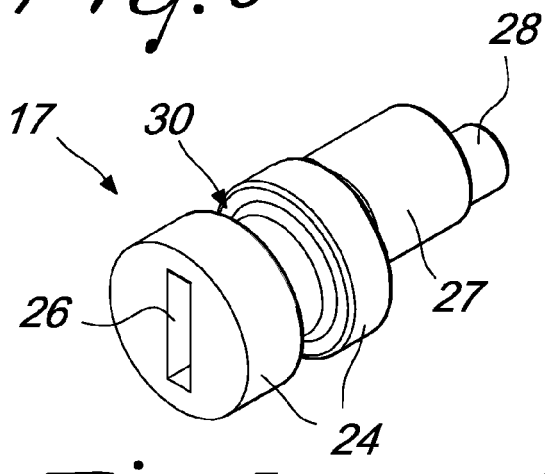

Fig. 5

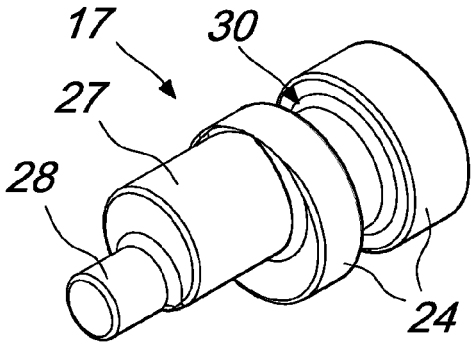

Fig. 6

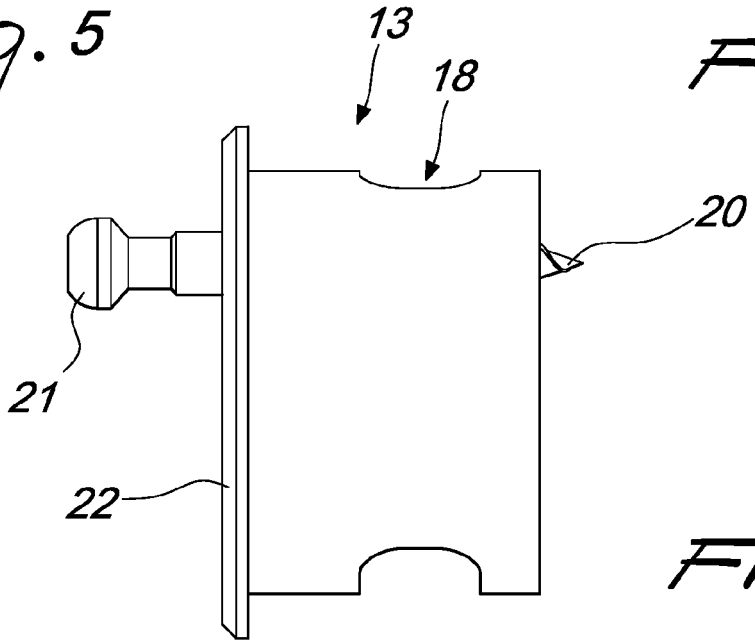

Fig. 7

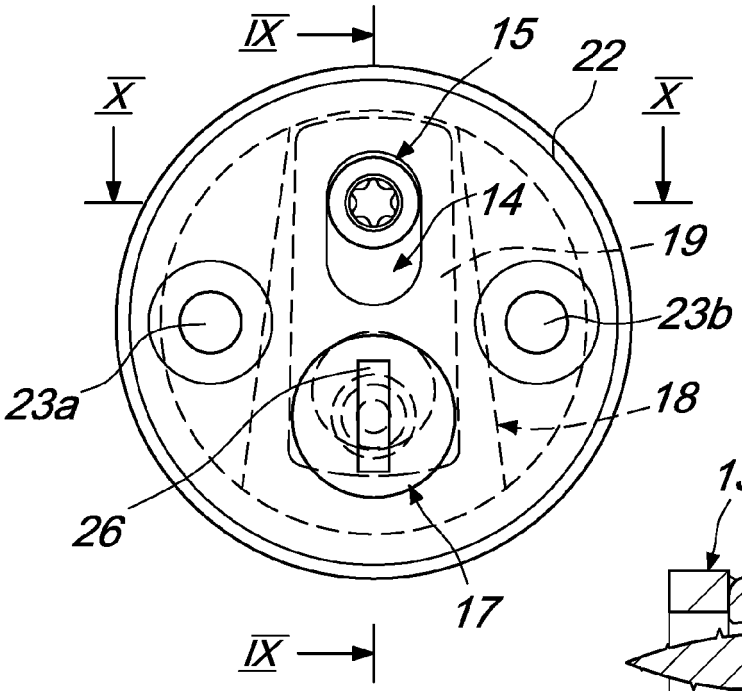

Fig. 8

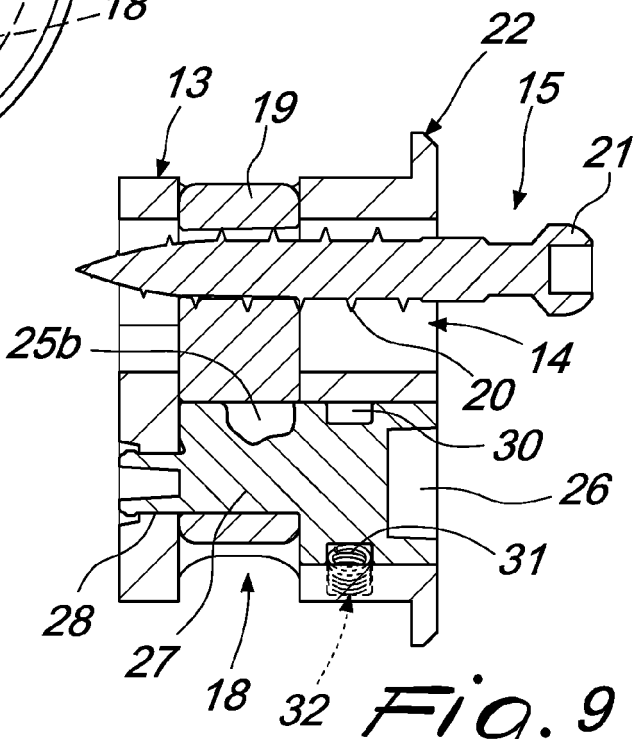

Fig. 9

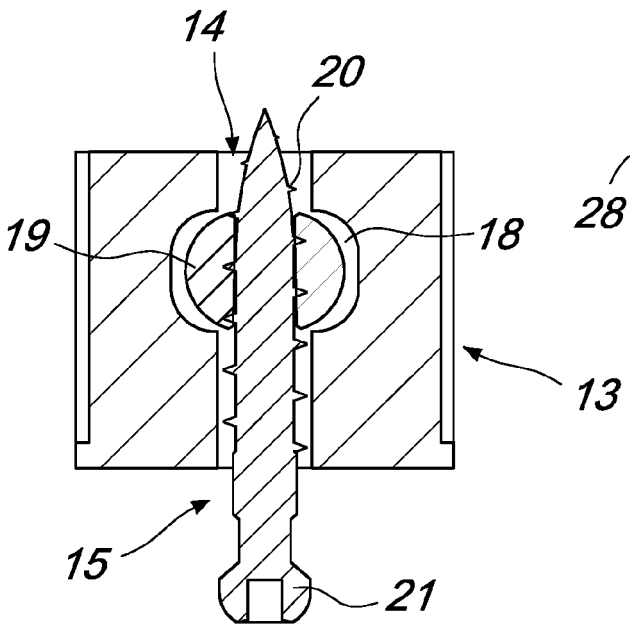

Fig. 10

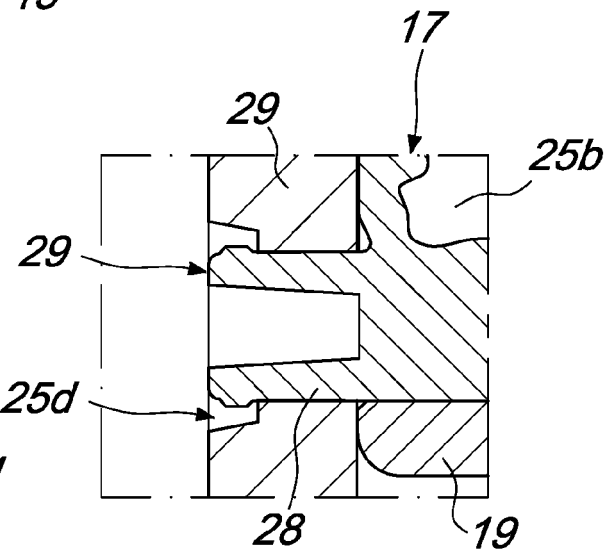

Fig. 11

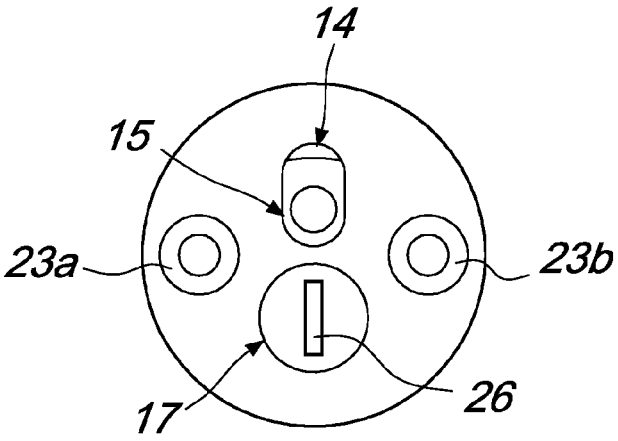

Fig. 12

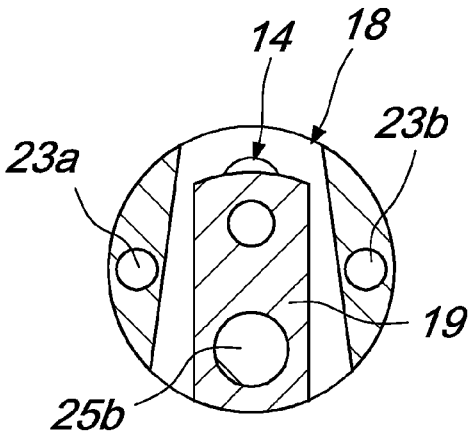

Fig. 13

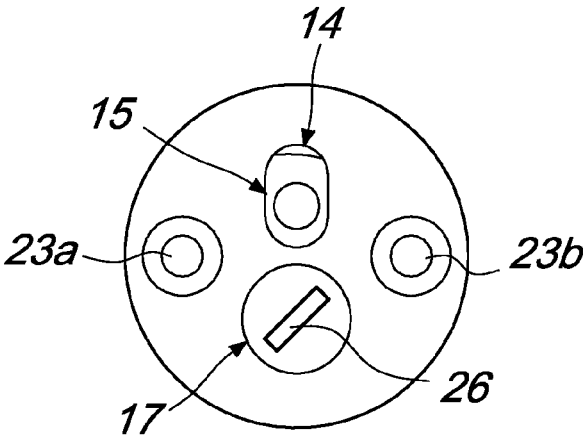

Fig. 14

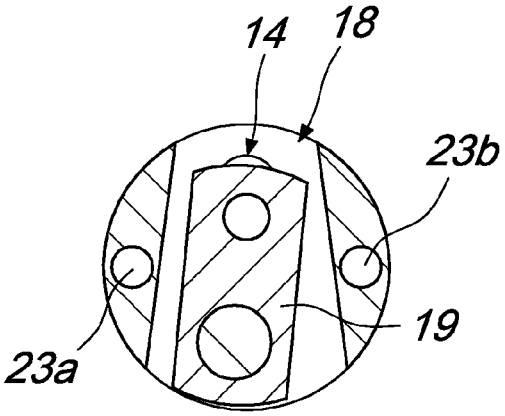

Fig. 15

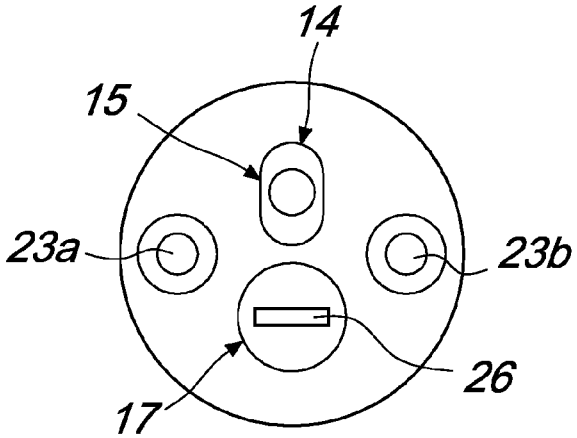

Fig. 16

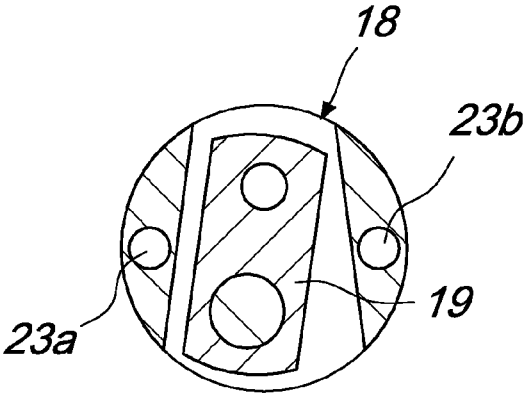

Fig. 17

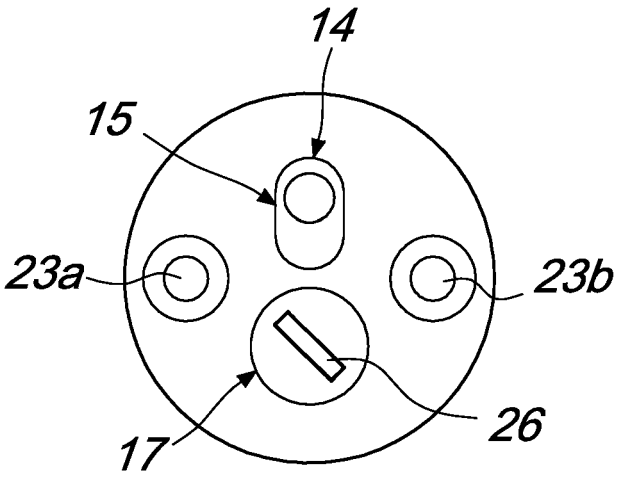

Fig. 18

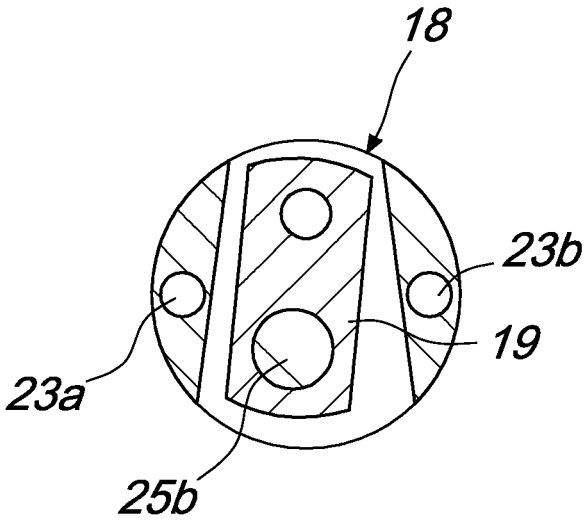

Fig. 19

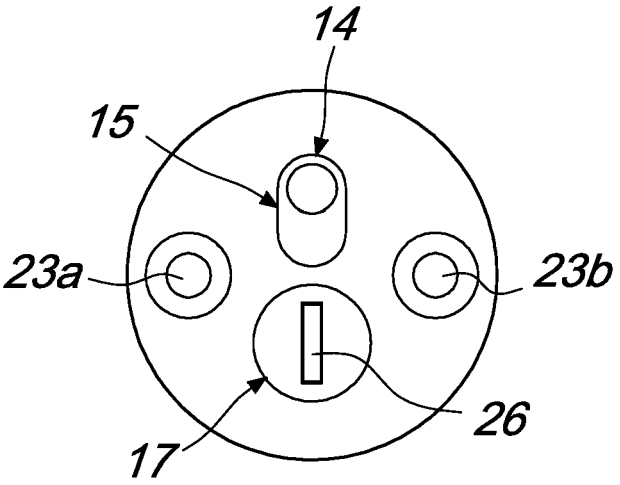

Fig. 20

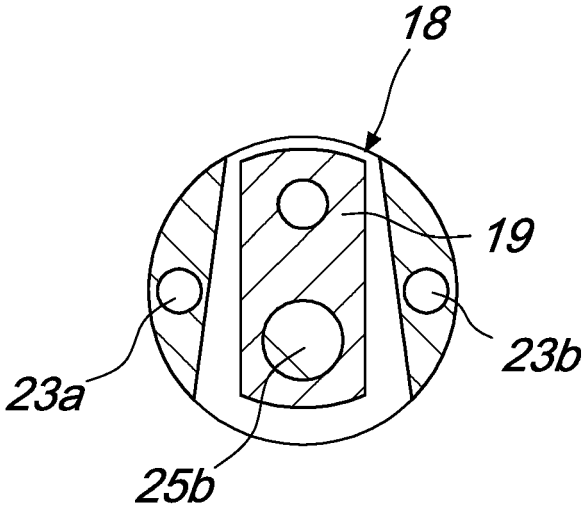

Fig. 21

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 16 20 7405

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2010/123038 A1 (NIFCO INC [JP]; TOMIOKA KAZUYUKI [JP]) 28 October 2010 (2010-10-28)	1	INV. E05B15/02
A	* abstract; figures 1-7b *	2-9	
X	JP 2008 163655 A (ZHANGZHOU UNITA INDUSTRY CO LT) 17 July 2008 (2008-07-17)	1	
A	* abstract; figures 1-3, 9, 10 *	2-9	
A,D	EP 2 889 443 A1 (ECLISSE SRL [IT]) 1 July 2015 (2015-07-01) * paragraph [0019] - paragraph [0053]; figures 1-17 *	2	
A	DE 78 09 937 U1 (WILH. FRANK GMBH) 20 July 1978 (1978-07-20) * page 10, line 1 - line 15; figures 1, 2 *	1	
			TECHNICAL FIELDS SEARCHED (IPC) E05B A47B E05C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	4 April 2017	Goddar, Claudia

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
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