(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 249 140 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
29.11.2017 Bulletin 2017/48

(51) Int Cl.:
E05B 15/00 *(2006.01)* ***E05B 63/00*** *(2006.01)*
E05B 3/04 *(2006.01)*

(21) Application number: **17172887.6**

(22) Date of filing: **24.05.2017**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD

(30) Priority: **27.05.2016 IT UA20163856**

(71) Applicant: **S.A.B. Serrature S.r.l.**
25071 Agnosine, Brescia (IT)

(72) Inventor: **GABURRI, Enrico**
25087 Salò, Brescia (IT)

(74) Representative: **Eterno, Enrico**
Jacobacci & Partners S.p.A.
Piazza della Vittoria, 11
25122 Brescia (IT)

(54) **LOCK AND ASSEMBLY**

(57) Lock (1, 1', 1") for securing a leaf (20) of a door or window to a jamb comprising a locking device (2, 2') comprising a movable bolt (4) between a release configuration and a locking configuration of the leaf (20) to the jamb; a square pin (18), passing through the lock device (2, 2') so as to protrude from both sides of the latter; actuation elements (14, 16), each engaged with one end of the square pin (18) and manually rotatable around a rotation axis (R) to move the bolt between said configurations.

The square pin (18) is telescopic and comprises a female portion (22) with one or more walls (24) that circumscribe a pin compartment (26) slidably receiving a male portion (28) of said pin (18), where the wall (24) delimits at least one longitudinal slit (32) wherein the male portion (28) is partly housed for coupling of the latter with the lock device (2, 2').

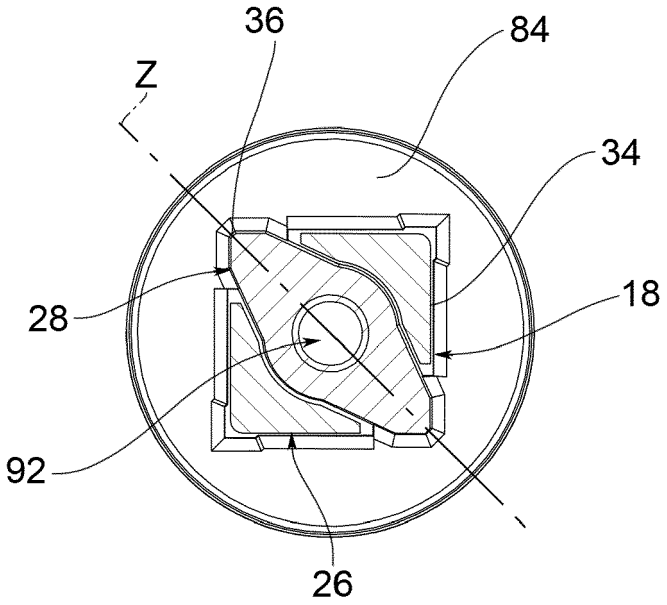

FIG.4

EP 3 249 140 A1

Description

[0001] The present invention relates to a lock, a square pin and an assembly comprising the aforementioned lock or the aforementioned pin associated with a leaf of a door, a window, or the like.

[0002] When mounting a lock on a door, the difficulty encountered in selecting the components to be used, due the range of different door thicknesses commercially available, is well known.

[0003] For example, in the document no. IT1406639 by the same applicant, a system is known that allows the disadvantages associated with this thickness variability to be partially reduced.

[0004] The present invention is set forth in the foregoing context, aiming to provide a more adaptable lock for a plurality of different door thicknesses, and to ensure this adaptability by means of a special square pin which, with the same mechanical strength, may be adjusted in length.

[0005] This object is achieved by means of a lock according to claim 1, by means of a square pin according to claim 16, and by means of an assembly according to claim 17. The claims dependent on these show preferred embodiments.

[0006] The object of the present invention will now be described in detail, with the aid of the accompanying figures, wherein:

- figures 1, 2, 3 show respectively two perspective views from opposite sides and a side view of a lock object of the present invention, according to a possible embodiment;
- figure 4 illustrates an enlarged sectional view through the plane IV-IV shown in figure 3;
- figures 5, 6 and 7, 8 are a pair of perspective views and a pair of front views respectively of a female portion and a male portion associated with a respective actuation element;
- figures 9A, 9B, 9C show schematically the geometric shape in cross-section of the male portion, of the female portion and of both such telescopically mounted portions;
- figures 10, 11, 12 show three perspective views of an assembly according to the present invention according to different embodiments;
- figures 13, 14 are perspective views respectively of a male portion and of a female portion associated with a respective actuation element;
- figures 15, 16, 17 show respectively two perspective views from opposite sides and a side sectional view of a lock object of the present invention, according to a further possible embodiment.

[0007] In the aforementioned tables, the reference numerals 1, 1', 1" distinguish, in its entirety, a lock to secure a door or window leaf 20 to a jamb.

[0008] Preferably, such door or window leaf is of a sliding type.

[0009] Such lock 1, 1', 1" comprises a lock device 2, 2', a square pin 18 and actuation elements 14, 16.

[0010] According to different embodiments, the side of the square pin 18 could measure 6 millimeters, 7 millimeters or 8 millimeters.

[0011] The lock device 2, 2' is insertable in a first leaf seat 10 and comprises a bolt 4, movable between a retracted or release configuration and an extracted or locking configuration of the leaf 20 to the jamb. In the variants shown, the first leaf seat is delimited in the thickness 82 of the leaf 20.

[0012] It should be noted that in the present description, the terms "retracted" and "extracted" refer to a bolt respectively received within or protruding with respect to a device body 78, 78' of the lock device 2, 2'.

[0013] More specifically, in the locking configuration, the bolt 4 protrudes from the device body 78, 78' (specifically: from a front wall 80, 80' of said body 78, 78') to engage an edge of a counter-plate (not illustrated) associated with the jamb.

[0014] According to various embodiments, the bolt 4 may be rotatable (figure 10) or roto-translatable (figure 11) with respect to the device body 78, 78'.

[0015] The square pin 18 passes through the lock device 2, 2' so as to protrude from both sides of the latter.

[0016] In this regard, in the variant shown e.g. in figure 10, the lock device 2, 2' delimits a through seat 60, optionally square, wherein the square pin 18 is received.

[0017] The actuation elements 14, 16, are each engaged with one end of the square pin 18 and are manually rotatable around a rotation axis R for moving the bolt between said configurations discussed previously.

[0018] For example, the actuation elements may comprise at least one knob, at least one pommel, at least one handle 14, at least one emergency actuation element 16 (i.e. a molded/shaped element for coupling in form with a tool or the edge a coin), and their combinations.

[0019] Optionally, the lock 1, 1', 1" may comprise one pair of handle casings 6, 6', 6", which are at least partially embedded in second leaf seats 30, each of which delimits a leaf-abutment surface 8 and a housing compartment 12.

[0020] The second leaf seats 30 advantageously communicate with the first leaf seat 10.

[0021] In the variants shown, the second leaf seats 30 extend from opposite side surfaces 90 of the leaf 20 toward the inside (i.e. through the thickness) of the latter.

[0022] For example, the leaf-abutment surface 8 is of a substantially annular shape and may advantageously be delimited by an outer metal ring 88 of the casing 6, 6', 6" .

[0023] According to one variant, at least one casing 6, 6', 6" comprises a bottom wall 84 which delimits a pin hole 86, in which the square pin 18 passes through.

[0024] According to a further variant, the actuation elements 14, 16 are at least partially received (for example: in a prevalent or complete manner) in the casings 6, 6', 6".

[0025] According to one embodiment, at least one lock casing 6', 6" comprises a plastic body 56, 58 configured for being inserted into the second leaf seat 30.

[0026] According to such variant, a finishing element 62 could optionally be connected to the plastic body 56, 58 in a releasable manner.

[0027] According to a further embodiment, a portion 64 of the finishing element 62 may be configured to radially force anchoring fins 66 outside of the plastic body 56, 58 to said second seat 30.

[0028] Referring, for example, to the variant of figure 12, such portion 64 could comprise a truncated cone portion of the finishing element 62.

[0029] According to another further embodiment, at least one lock casing 6 comprises a metallic body 68 comprising externally indented portions 70 to engage the second leaf seat 30.

[0030] According to the invention, the square pin 18 is telescopic and comprises a female portion 22 comprising one or more walls 24 which circumscribe a pin compartment 26. This compartment 26 receives a male portion 28 of the pin 18 in a sliding manner.

[0031] Thus, the telescopic movement between such portions, and hence an adjustment of the length of the pin 18 as a function of the thickness 82 of the leaf 20, is permitted.

[0032] The wall 24 (or plurality of walls) of the female portion 22 delimits at least one longitudinal slit 32 wherein the male portion 28 is partly received for a coupling of the latter with the locking device 2, 2'.

[0033] In other words, although telescopically received in the female portion 22, the male portion 28 also mechanically works on the lock device, as one of its parts protrudes outwardly from the pin compartment 26 to engage such device 2, 2' and, more precisely, to be inserted into the through seat 60.

[0034] It follows that, according to one embodiment, the female portion 22 and the male portion 28 each define an abutment surface 34, 36 with the through seat 60 of the lock device 2, 2'.

[0035] In the embodiments illustrated, the male portion 28 has a substantially ovoidal or ellipsoidal cross-section.

[0036] According to one embodiment, the male portion 28 and/or the female portion 22 are made in one piece with the respective actuation element 14, 16, e.g. of a metallic material or of a polymeric material.

[0037] As diagrammed in the variant of figure 11, the casings 6' may be interconnected by means of respective connecting arms 74, 76 in an adjustable manner according to the telescopic length of the square pin 18, and may optionally cooperate with each other in order to surround part of, and optionally retain, the lock device 2'.

[0038] According to one embodiment, the connecting arms 74, 76 are coupled to each other by snap and/or bayonet couplings.

[0039] In the variants of figure 7 or 13, the male portion 28 comprises at least one longitudinal rib 38 protruding in the longitudinal slit 32 so that such rib 38 forms an obstacle to the elastic shrinkage of such slit 32.

[0040] According to another variant, the male portion 28 and optionally the longitudinal rib 38 of such portion is wedged through a tapered space 40 delimited by the female portion 22 which - in a radial direction Z from the inside to the outside of the square pin 18 - precedes the longitudinal slit 32.

[0041] According to a further variant, the female portion 22 and the male portion 28 delimit complementary sliding surfaces 42, 44 of a substantially arched shape, to divert the forces transmitted through said actuation elements 14, 16 in a direction with a tangential component (relative to the axis of rotation R).

[0042] Referring, for example, to the schematic diagrams of figure 9, a square perimeter Q is detectable around the female portion 22, which circumscribes such portion 22. Optionally, in such perimeter Q the part of the male portion 28 protruding in the longitudinal slit 32 is also inscribed, in particular, the longitudinal rib 38 according to one of the embodiments discussed.

[0043] In the variant schematically diagrammed in figures 4 and 9B, the female portion 22 comprises at least a pair of walls 24 shaped, for example, in a generally "L" section, delimiting a pair of longitudinal slits 32 arranged along a diagonal of the square pin 18.

[0044] According to such variant, the male portion is therefore oriented and protrudes through the diagonal identifiable in the square pin 18.

[0045] According to another variant, the female portion 22 and the male portion 28 are retained axially through a locking means 46 (such as a threaded means such as a screw) that develops partially in the pin compartment 26 and which engages one end 28' of the male portion 28.

[0046] For example, this end 28' could delimit an axial hole 92 (optionally threaded internally) to receive, and preferably retain, the locking means 46.

[0047] According to one advantageous variant, one 16 of said actuation elements delimits an axial through-passage 48 (for example threaded), where the female portion 22 is joined to said actuation element 16 with an opening of the pin compartment 26 at least partially aligned with the axial passage 48, so that the locking means 46 is actuatable from the outside to secure the female portion 22 and the male portion 28.

[0048] According to one embodiment, the male portion 28 and/or the female portion 22 associated with the casing 6 are retained axially by means of an elastic ring 72.

[0049] Specifically, an actuation element 16 associated with such portion 28, 22 may include a lock collar 94 which passes through the pin hole 86 and delimits a ring seat 96 wherein the elastic ring 72 is inserted.

[0050] Thus, since the ring 72 operates on an outer surface 98 of the casing 6 and the actuation element 16 is at least partially arranged in the housing compartment 12, the male portion 28 and/or the female portion 22 will remain secured to the casing and - through the latter - to the leaf 20.

[0051] According to a further embodiment, the female

portion 22 and/or the male portion 28 are retained axially through a shape and/or force coupling of the actuation elements 14, 16 in the respective casing 6, 6', 6" .

[0052] By entering more into the specifics and referring, for example, to the variants of figures 12 or 13, at least one actuation element 14, 16 may comprise at least one outer edge 100, for example of a substantially circular or arc shape, axially retained through locking fins 102 (e. g. elastic) of the casing 6', which operate on such edge 100.

[0053] The aforementioned objects are also achieved by means of a telescopic square pin 18, engageable between actuation elements 14, 16 of a lock 1, 1', 1" for transmitting the rotations of one such element to the bolt 4 of a lock device 2, 2'.

[0054] Such square pin 18 comprises a female portion 22 which comprises one or more walls 24 that circumscribe a pin compartment 26 slidably receiving a male portion 28 of the pin 18, where the wall 24 delimits at least one longitudinal slit 32 wherein the male portion 28 is partly housed by a coupling of the latter with the lock device 2, 2'.

[0055] As to the preferred or additional features of this square pin 18, reference is made to the description above.

[0056] The above objectives are finally achieved by means of an assembly 50, 52, 54 comprising:

- a door/window leaf 20, wherein at least one first leaf seat 10 is made; and
- a lock 1, 1', 1" according to any of the preceding embodiments, inserted in the first leaf seat 10 to secure such leaf to a jamb, or a square pin 18 according to the preceding variants passing through the lock device 2, 2'.

[0057] Innovatively, the lock object of the present invention is adaptable to different types of doors, as is the square pin that does not require any mechanical machining to be adapted to the thickness of the leaf.

[0058] Advantageously, the lock object of the present invention may be assembled/disassembled in the absence of specific tools; in fact, such lock has been designed with precise and reliable couplings that make the use of screwdrivers and the like superfluous.

[0059] Advantageously, this lock is coupled to the door with a substantially self-locking system which is releasable with bare hands.

[0060] Advantageously, the lock and pin of the present invention may be implemented on existing doors and windows, especially due to their small size and ease of assembly.

[0061] Advantageously, the lock and pin object of the present invention allow it to be used in an extremely wide range of thicknesses, for example from 35 millimeters to approximately 52-54 millimeters.

[0062] In fact, by virtue of coupling both the male portion and the female portion with the locking device, such portions are designed to work even when the male portion lies outside of the compartment of the female portion, but in any case inside the through seat of such device.

[0063] Advantageously, the male portion object of the present invention prevents the female portion from deteriorating.

[0064] Advantageously, the male portion object of the present invention allows a reliable telescopic sliding to be obtained. In addition, the female portion allows the male portion to remain locked in the transverse direction.

[0065] Advantageously, the lock and pin object of the present invention allow one to obtain high mechanical strength in both directions of rotation of the actuation elements.

[0066] Advantageously, the longitudinal extension of the pin object of the present invention may be stopped in different ways depending on the contingencies, and with the dimensions of the means for this object being extremely reduced.

[0067] Advantageously, the modular nature of this lock allows the costs of assembly and storage to be reduced for a variety of different products.

[0068] In the embodiments of the aforementioned lock, square pin and assembly, a person skilled in the art, in order to meet specific needs, might introduce variants or substitutions of elements with others that are functionally equivalent.

[0069] These variants are also contained within the scope of protection as defined by the following claims.

[0070] Furthermore, each variant described as belonging to a possible embodiment may be achieved independently of the other variants described.

Claims

1. Lock (1, 1', 1") to secure a leaf (20) of a door or window to a jamb, comprising:

- a lock device (2, 2'), insertable in a first leaf seat (10) and comprising a bolt (4), movable between a release configuration and a locking configuration of the leaf (20) to the jamb;
- a square pin (18), passing through the lock device (2, 2') so as to protrude from both sides of the latter;
- actuation elements (14, 16), for example knobs, each engaged with one end of the square pin (18) and manually rotatable about a rotation axis (R) for moving the bolt between said configurations;

wherein said pin (18) is telescopic and comprises a female portion (22) that comprises one or more walls (24) that circumscribe a pin compartment (26) slidably receiving a male portion (28) of said pin (18), said wall (24) delimiting at least one longitudinal slit (32) in which the male portion (28) is partly housed

for coupling of the latter with the lock device (2, 2').

2. Lock according to the preceding claim, wherein the female portion (22) and the male portion (28) each delimit an abutment surface (34, 36) with a through seat (60), optionally squared, of the lock device (2, 2').

3. Lock according to any of the preceding claims, wherein the male portion (28) comprises at least one longitudinal rib (38), projecting in the longitudinal slit (32) so that said rib (38) makes an obstacle to the elastic shrinkage of said slit (32).

4. Lock according to any of the preceding claims, optionally when dependent on the preceding claim, wherein the male portion (28), and optionally the longitudinal rib (38) of said portion, is wedged through a tapered space (40) delimited by the female portion (22), which precedes the longitudinal slit (32) in a radial direction (Z) from the inside to the outside of said pin (18).

5. Lock according to any of the preceding claims, wherein the female portion (22) and the male portion (28) delimit complementary sliding surfaces (42, 44) of substantially arched shape, to divert the forces transmitted through said actuation elements (14, 16) in a direction with a tangential component.

6. Lock according to any of the preceding claims, wherein around the female portion (22) is identifiable a square perimeter (Q) that circumscribes it, in said perimeter (Q) being also inscribed the part of the male portion (28) projecting in the longitudinal slit (32).

7. Lock according to any of the preceding claims, comprising at least a pair of walls (24), shaped for example in generically "L" section, which delimit a pair of longitudinal slits (32) disposed along a diagonal of the square pin (18).

8. Lock according to any of the preceding claims, wherein the female portion (22) and the male portion (28) are axially retained through a locking means (46) that develops partly in the pin compartment (26) and that engages an end (28') of the male portion (28).

9. Lock according to the preceding claim, wherein one (16) of said actuation elements delimits an axial through-passage (48), for example threaded, and wherein the female portion (22) is joined to said actuation element (16) with an opening of the pin compartment (26) at least partially aligned with the axial passage (48), so that the locking means (46) is actuatable from the outside to constrain the female portion (22) and the male portion (28).

10. Lock according to any of the preceding claims, comprising a pair of casings (6, 6', 6") for handle, at least partly recessed in second leaf seats (30), each of which delimits a leaf-abutment surface (8) and a housing compartment (12), the actuation elements (14, 16) being at least partly received in the casings (6, 6', 6").

11. Lock according to the preceding claim, wherein the female portion (22) and/or the male portion (28) are retained axially through a shape and/or force coupling of the actuation elements (14, 16) in the respective casing (6, 6', 6").

12. Lock according to any of claims 10 to 11, wherein at least one of the lock casing (6', 6") comprises a plastic body (56, 58) insertable into the second leaf seat (30), and a finishing element (62) connected to said body (56, 58) in a releasable manner, a portion (64) of said finishing element (62) being configured to force radially outwardly anchoring fins (66) of the plastic body (56, 58) to said second seat (30).

13. Lock according to any of claims 10 to 11, wherein at least one of the lock casings (6) comprises a metal body (68), externally comprising indented portions (70) to engage the second leaf seat (30), and wherein the male portion (28) and/or the female portion (22) associated with it is retained axially by an elastic ring (72).

14. Lock according to any one of claims 10 to 13, wherein the casings (6') are mutually connected through respective connecting arms (74, 76) in a manner adjustable as a function of the telescopic length of the square pin (18), and cooperate with each other to encircle, and optionally retain, the lock device (2').

15. Lock according to any of the preceding claims, wherein the male portion (28) and/or the female portion (22) are made in one piece, for example of a metallic material, with the respective actuation element (14, 16).

16. Square pin (18), telescopic, engageable between actuation elements (14, 16) of a lock (1, 1', 1") to transmit the rotations of one of said elements to the bolt (4) of a lock device (2, 2'), said pin (18) comprising a female portion (22) that comprises one or more walls (24) that circumscribe a pin compartment (26) slidably receiving a male portion (28) of said pin (18), the wall (24) delimiting at least one longitudinal slit (32) in which the male portion (28) is partly housed for a coupling of the latter with the lock device (2, 2').

17. Assembly (50, 52, 54) comprising:

- a leaf (20) of door/window, wherein at least a first leaf seat (10) is made; and
- a lock (1, 1', 1") according to any of claims 1 to 15, inserted in the first leaf seat (10) to secure such leaf to a jamb, or a square pin (18) according to claim 16 passing through the lock device (2, 2').

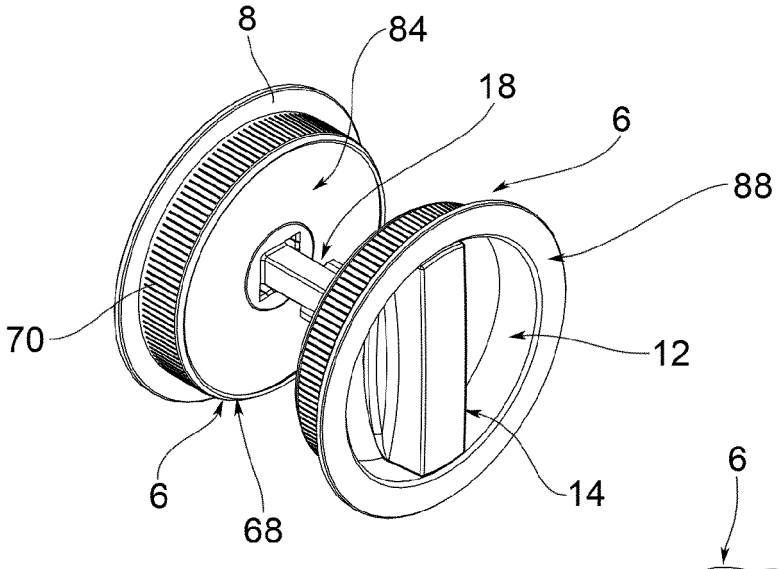

FIG.1

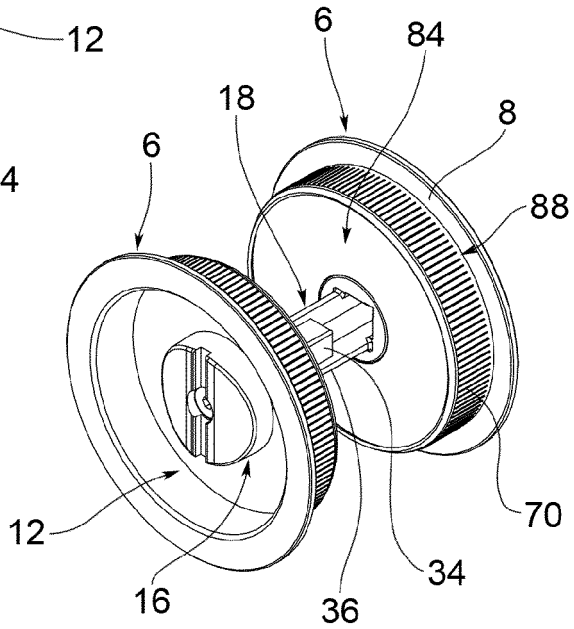

FIG.2

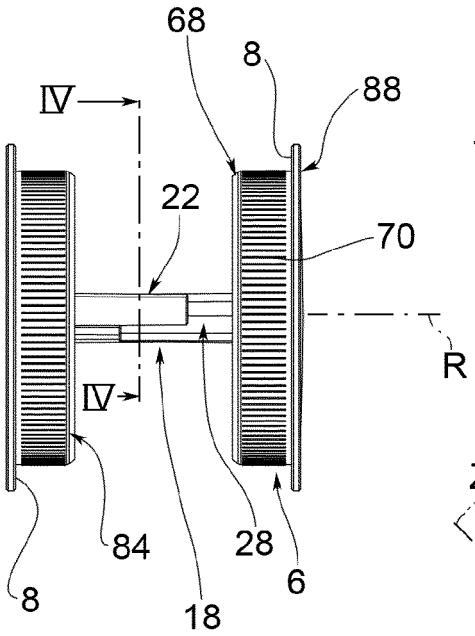

FIG.3

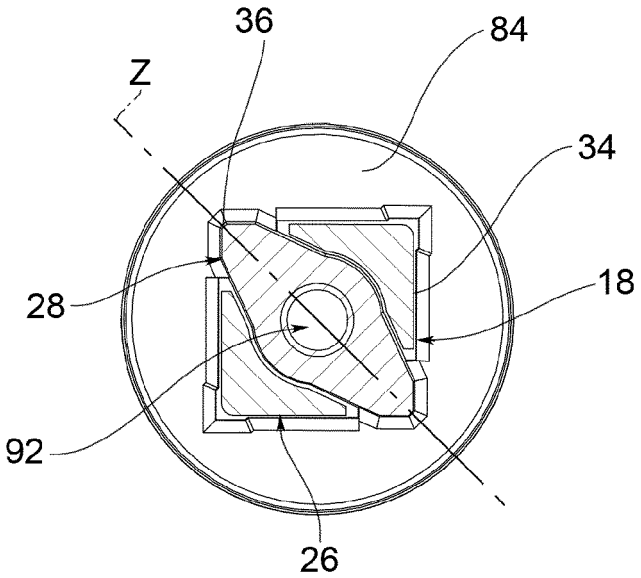

FIG.4

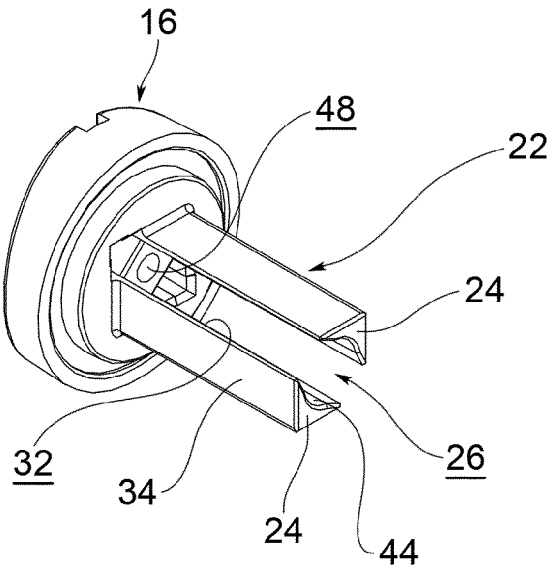

FIG.5

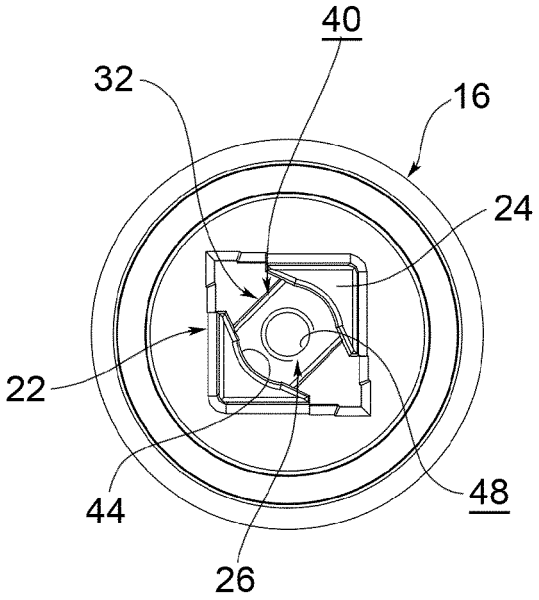

FIG.6

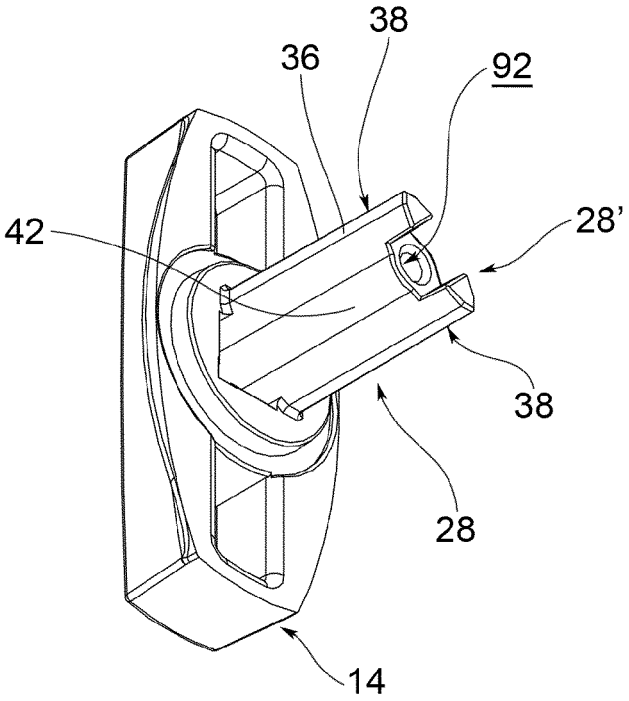

FIG.7

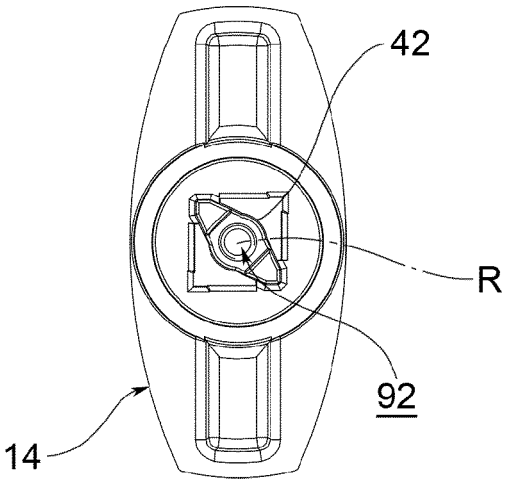

FIG.8

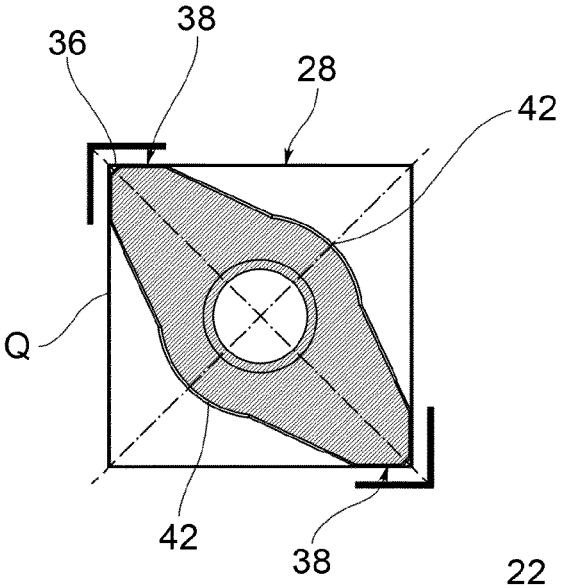

FIG.9a

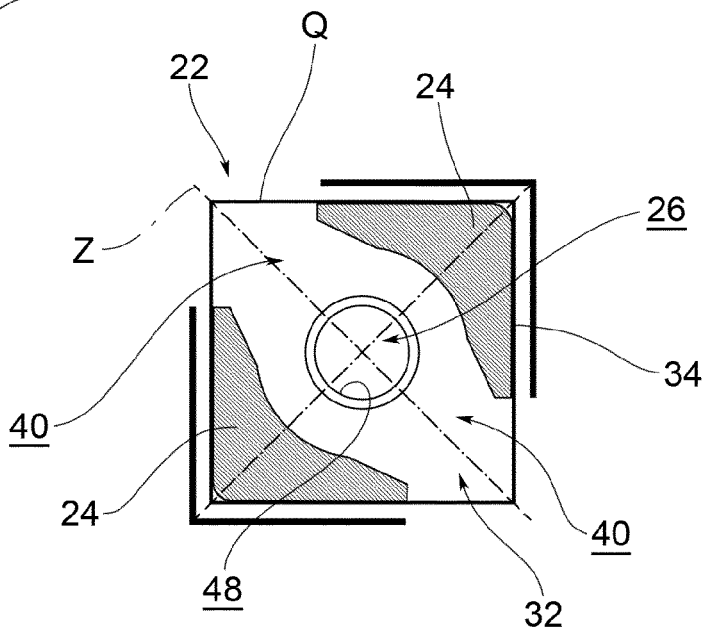

FIG.9b

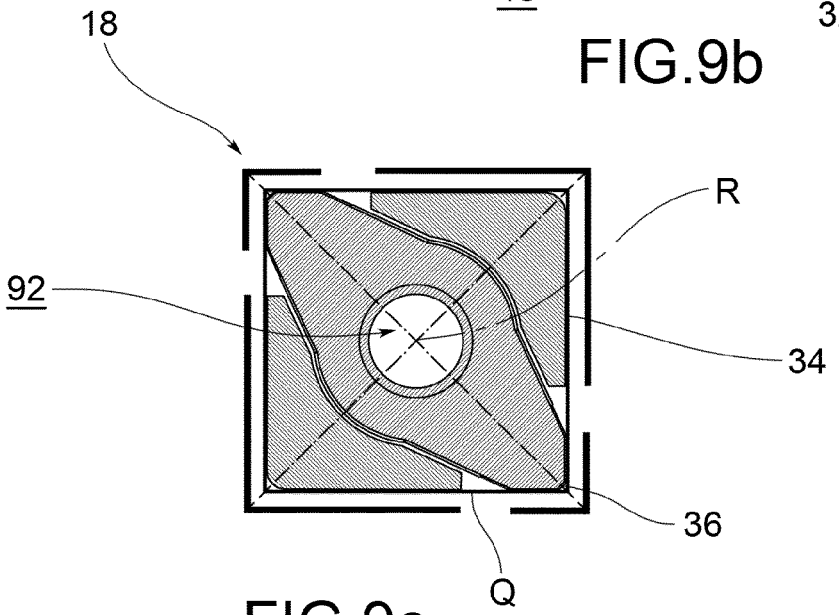

FIG.9c

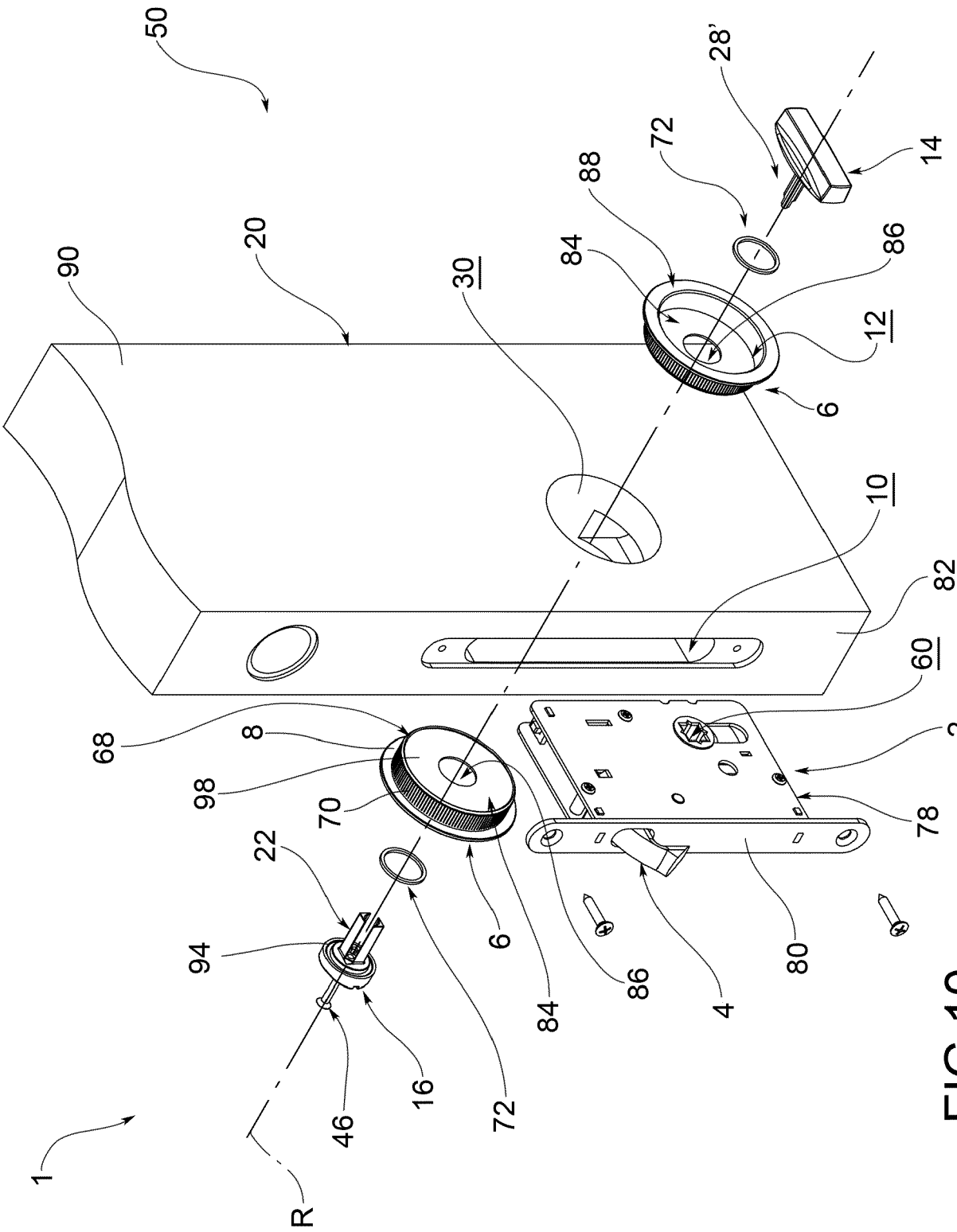
50
28'
72
14
88
20
84
86
90
30
12
6
10
82
60
68
8
2
98
70
78
22
6
94
84
86
4
80
16
72
46
1
R

FIG.10

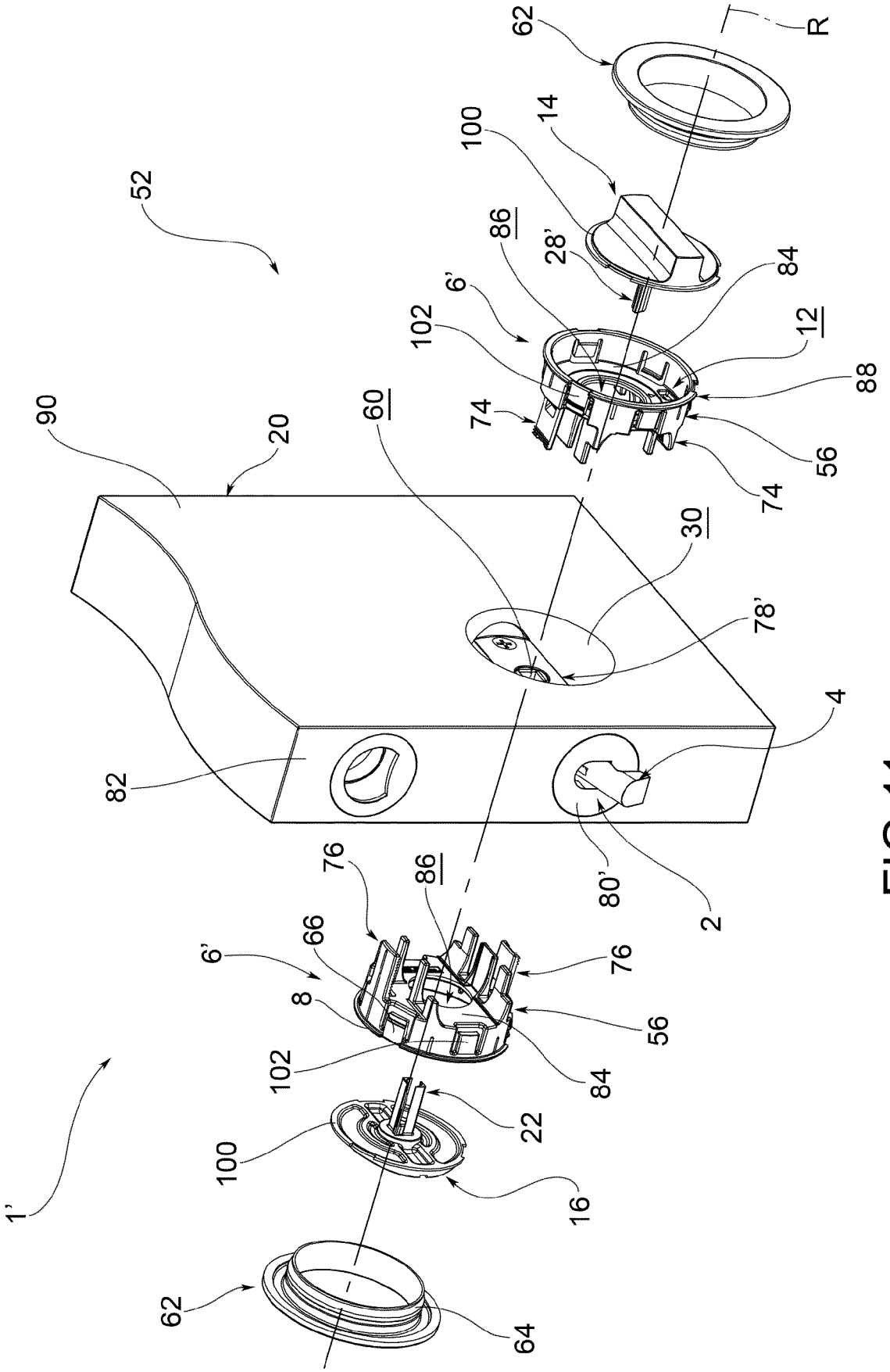
62
R
14
100
52
86
28'
84
6'
102
12
88
74
56
74
60
90
20
30
78'
4
82
80'
2
76
86
66
6'
76
8
56
102
84
22
100
16
1'
62
64

FIG.11

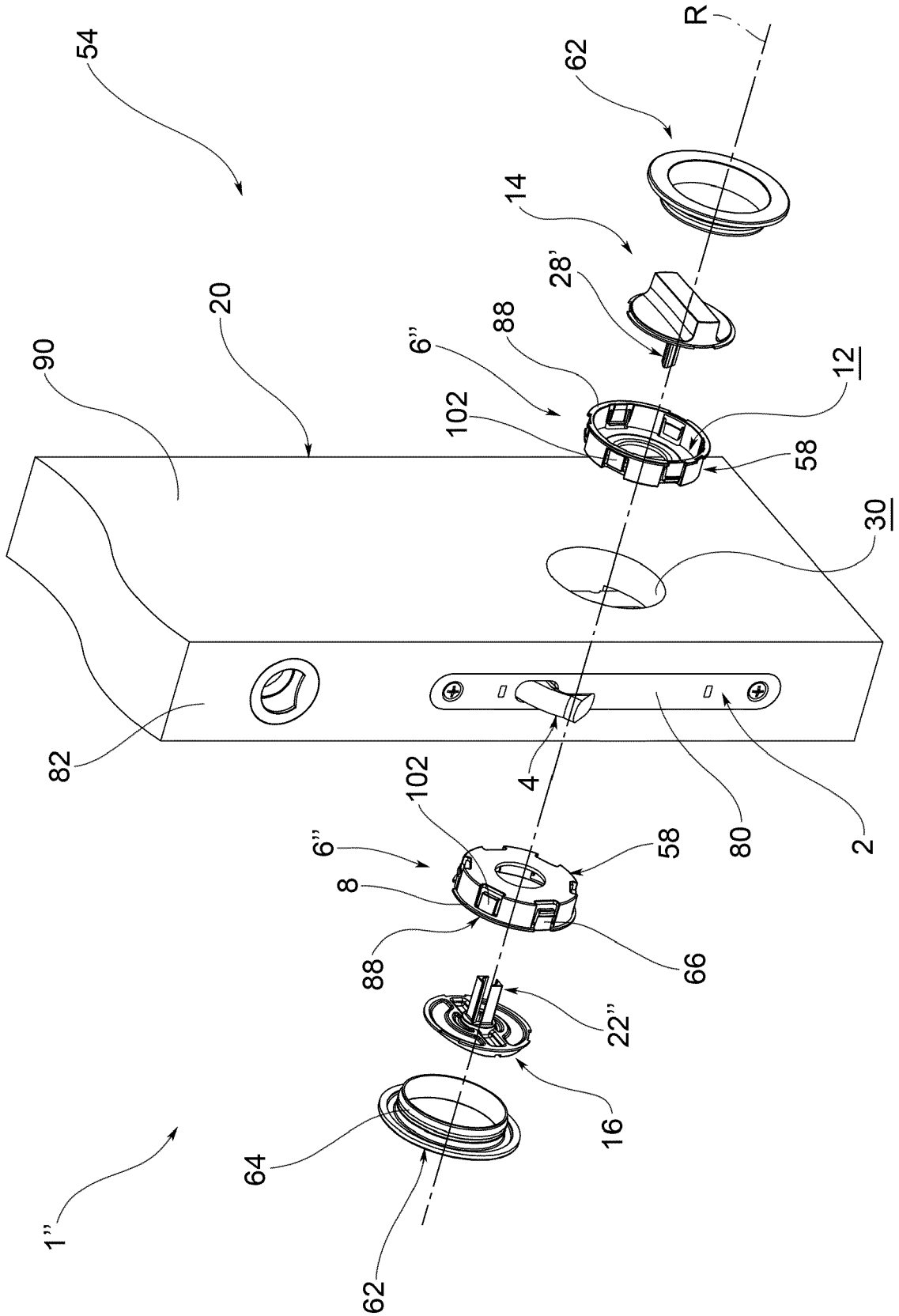
54
R
62
14
28'
88
6''
102
12
58
20
90
30
82
4
80
2
102
6''
58
8
88
66
22''
16
64
62
1''

FIG.12

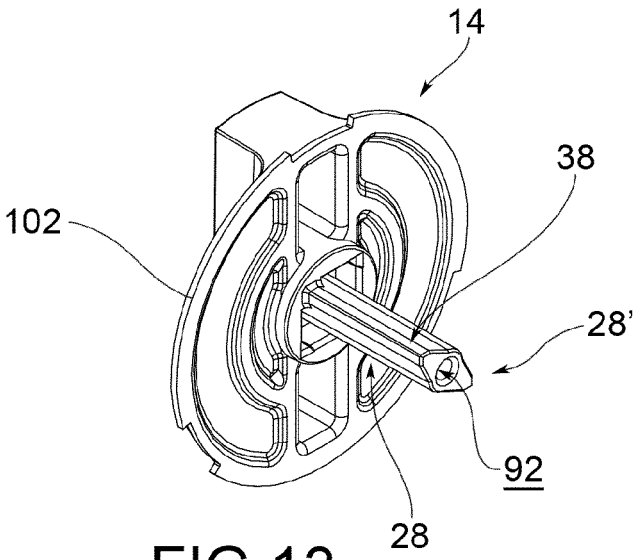

FIG.13

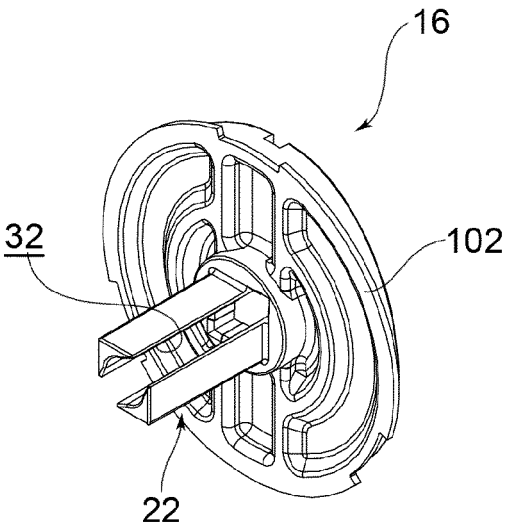

FIG.14

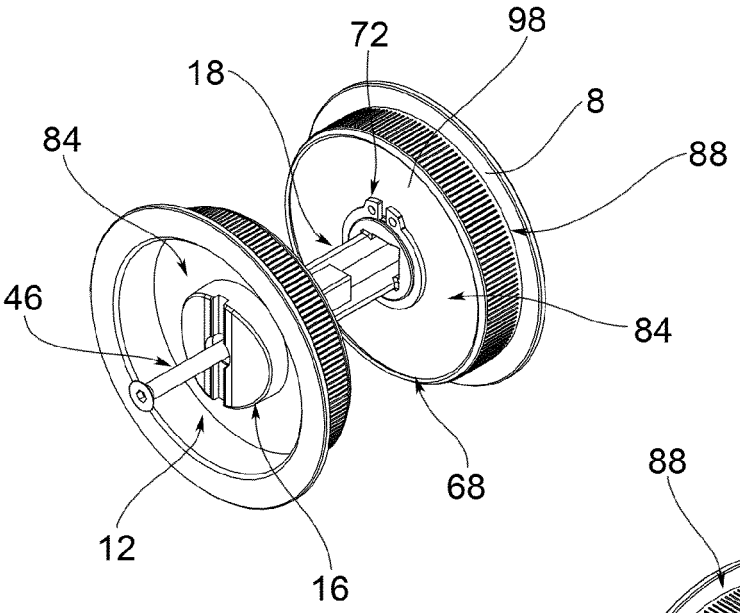

FIG.15

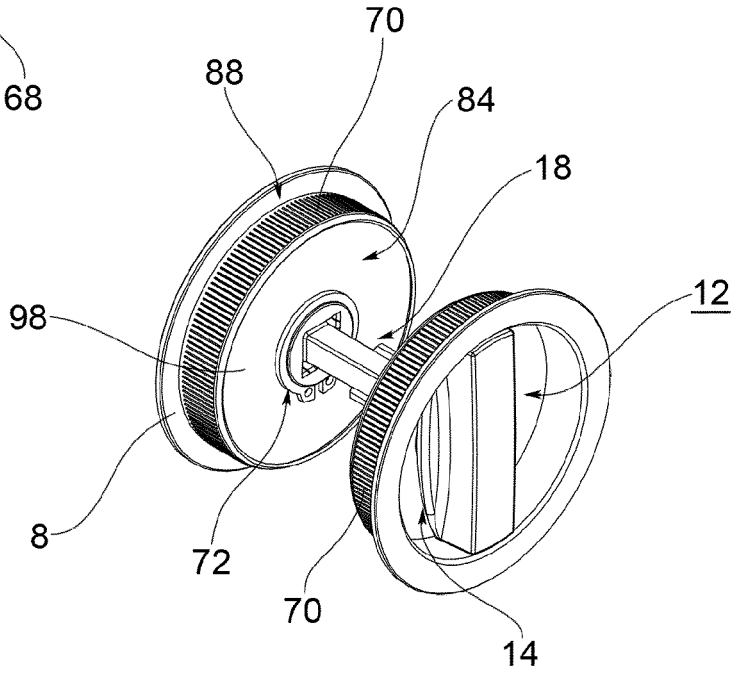

FIG.16

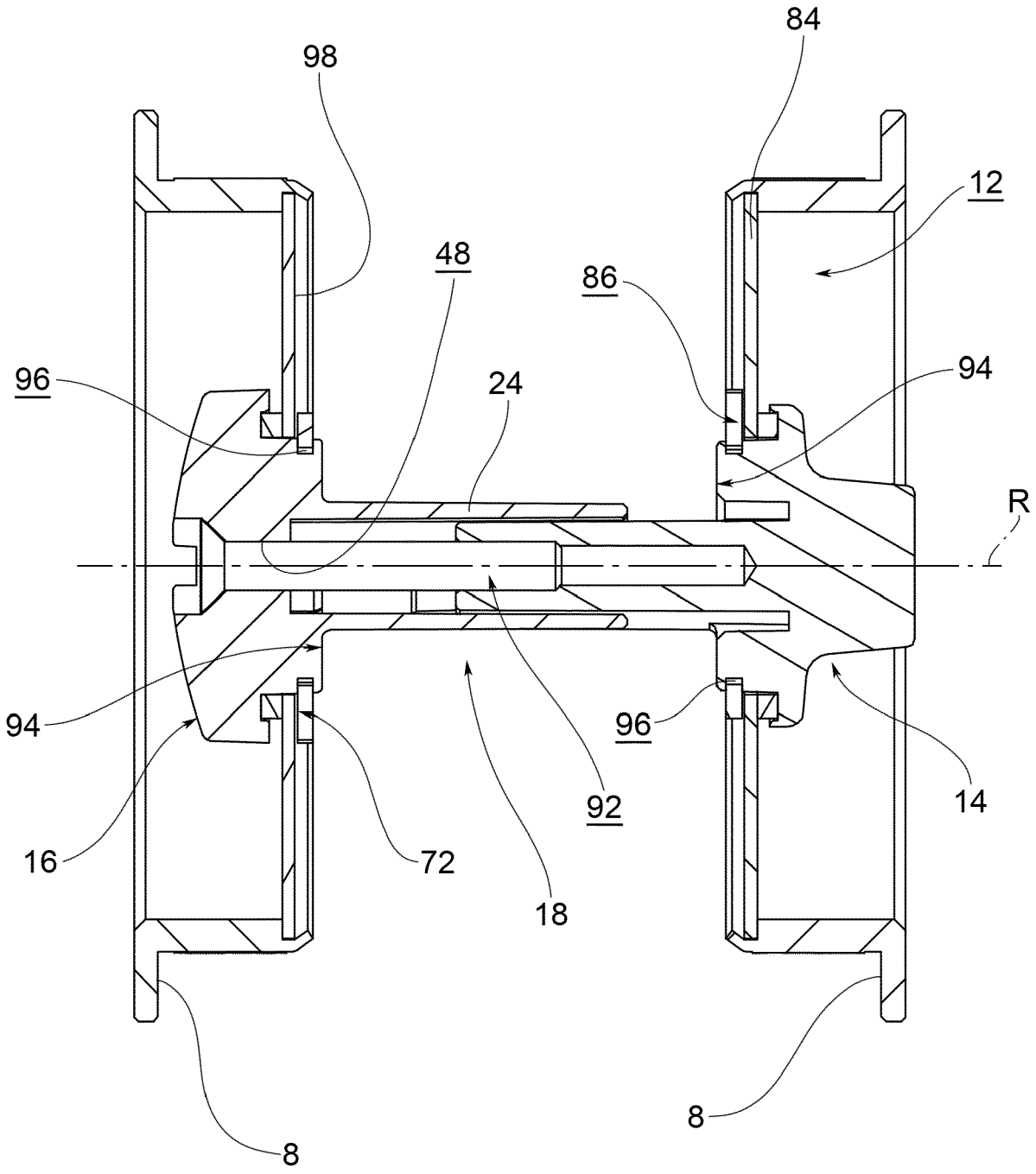

FIG.17

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 17 17 2887

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 Y	US 2011/302971 A1 (BUI JEANETTE VY [US]) 15 December 2011 (2011-12-15) * the whole document *	1-8, 15-17 9-14	INV. E05B15/00 E05B63/00 E05B3/04
X	US 2 111 254 A (TONG JOHN W) 15 March 1938 (1938-03-15) * the whole document *	1-3,16	
X	GB 2 391 286 A (CODELOCKS LTD [GB]) 4 February 2004 (2004-02-04) * the whole document *	1-4,16	
Y A	WO 2005/111347 A1 (ABLOY OY [FI]; SEPPAENEN SAULI [FI]) 24 November 2005 (2005-11-24) * the whole document *	9 8	
Y A	EP 0 471 976 A2 (BRUMME ELKE [DE]) 26 February 1992 (1992-02-26) * figures 34,35 *	9 8	
Y	EP 1 398 435 A1 (HOPPE AG [IT]) 17 March 2004 (2004-03-17) * the whole document *	10-14	TECHNICAL FIELDS SEARCHED (IPC) E05B
A	GB 2 522 610 A (ASSA ABLOY LTD [GB]) 5 August 2015 (2015-08-05) * the whole document *	1	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	18 October 2017	Geerts, Arnold

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

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 17 17 2887

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

18-10-2017

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2011302971 A1	15-12-2011	CA 2740720 A1	09-12-2011
		CN 202359882 U	01-08-2012
		TW 201202535 A	16-01-2012
		US 2011302971 A1	15-12-2011
US 2111254 A	15-03-1938	NONE	
GB 2391286 A	04-02-2004	NONE	
WO 2005111347 A1	24-11-2005	AT 386183 T	15-03-2008
		DE 602005004778 T2	12-06-2008
		DK 1747335 T3	09-06-2008
		EP 1747335 A1	31-01-2007
		FI 20045183 A	20-11-2005
		NO 332872 B1	28-01-2013
		RU 2354797 C2	10-05-2009
		WO 2005111347 A1	24-11-2005
EP 0471976 A2	26-02-1992	AT 95878 T	15-10-1993
		DE 4026080 A1	20-02-1992
		DK 0471976 T3	29-11-1993
		EP 0471976 A2	26-02-1992
EP 1398435 A1	17-03-2004	AT 323812 T	15-05-2006
		EP 1398435 A1	17-03-2004
		ES 2262922 T3	01-12-2006
		IT MI20020421 U1	12-03-2004
GB 2522610 A	05-08-2015	CN 204876818 U	16-12-2015
		GB 2522610 A	05-08-2015

EPO FORM P0459

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

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- IT 1406639 **[0003]**