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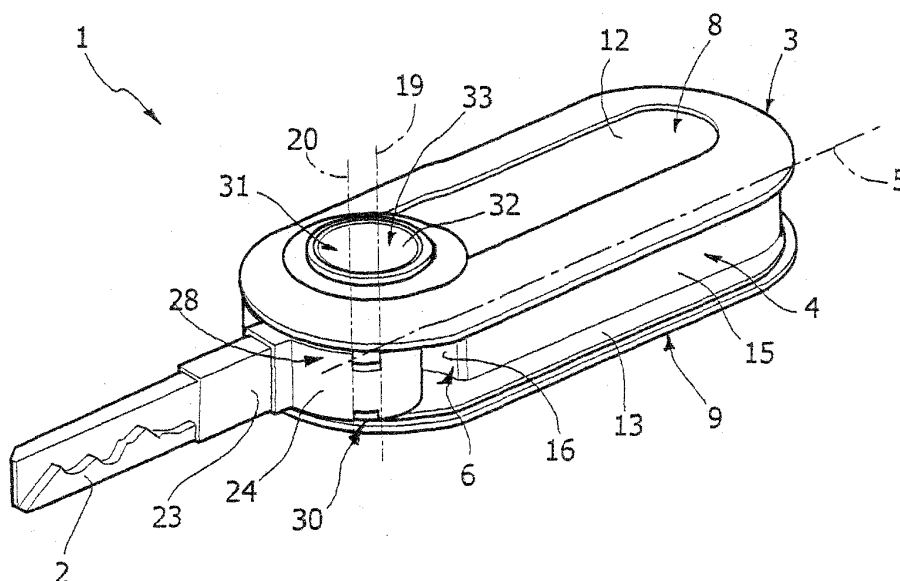
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(54) **Key-holder with a retractable key, in particular for a vehicle lock**

(57) A key-holder (1) with a retractable key (2), in particular for a vehicle lock; the key (2) is fitted to a supporting body (3) to rotate about a hinge axis (19) between an extracted position for insertion inside a lock, and a withdrawn position alongside the supporting body (3); an

angular retaining device retains the key (2) in the withdrawn position; a button (31) is movable along a release axis (20) from a raised position to a lowered position to release the angular retaining device and permit rotation of the key (2); and the hinge and release axes (19, 20) are parallel and spaced apart.

FIG. 1



Description

[0001] The present invention relates to a key-holder with a retractable key, in particular for a vehicle lock.

[0002] Key-holders are known which comprise a supporting body; and a flat key hinged to the supporting body to rotate between an extracted position for insertion inside the lock, and a withdrawn position housed inside a lateral recess in the supporting body.

[0003] The key is retained in the withdrawn position by a retaining device, which is released by manually pressing a release button located on a wall of the supporting body, coaxially with the hinge axis of the key, and adjacent to an edge of the lateral recess housing the key in the withdrawn position.

[0004] The key is pushed automatically by an elastic device into the extracted position when the key release button is pressed; and the key is returned to the withdrawn position by simply rotating it manually, in opposition to the elastic device, until it engages the retaining device.

[0005] The supporting body normally also houses in fluidtight manner a remote control operated by a further button to activate/deactivate an antitheft device on the vehicle.

[0006] Despite the compact design of the supporting body, known solutions of the type described above have aesthetic drawbacks. More specifically, the release button can only accommodate a relatively small trademark or logo, and, being located close to an edge of the supporting body, conditions the design of the key-holder as a whole.

[0007] What is more, a trademark or logo on the release button rotates together with the key about the hinge axis when the key rotates from the withdrawn position to the extracted position or vice versa.

[0008] It is an object of the present invention to provide a key-holder with a retractable key, in particular for a vehicle lock, designed to provide a straightforward, low-cost solution to the above problems, and which, in particular, is straightforward and compact.

[0009] According to the present invention, there is provided a key-holder comprising:

- a supporting body;
- a key hinged to said supporting body to rotate about a hinge axis between an extracted position for insertion inside a lock, in particular a vehicle lock, and a withdrawn position alongside said supporting body;
- angular retaining means for retaining said key in at least one of said withdrawn and extracted positions; and
- a release button movable along a release axis from a raised rest position to a lowered release position to release said angular retaining means and permit rotation of said key;

characterized in that said hinge axis and said release

axis are parallel and spaced apart.

[0010] A non-limiting embodiment of the invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a view in perspective of a preferred embodiment of the key-holder with a retractable key, in particular for a vehicle lock, according to the present invention;

Figures 2 and 3 show larger-scale views in perspective, with parts removed for clarity, of a number of component parts of the Figure 1 key-holder;

Figures 4 and 5 show larger-scale views in perspective, with parts removed for clarity, of a variation of the Figure 1 key-holder.

[0011] Number 1 in Figure 1 indicates a key-holder comprising a retractable key 2, in particular for a vehicle lock (not shown).

[0012] Key-holder 1 comprises a supporting body 3 elongated in a straight direction 5 and defining a lateral recess 4, which is outwardly open and communicates with an outwardly open front cavity 6 of body 3.

[0013] With reference to Figures 1 to 3, body 3 defines an inner chamber 7 housing a remote control (not shown), and comprises two half-shells 8, 9 fixed to each other in conventional manner not shown, e.g. by click-on fasteners and/or one or more screws screwed into respective threaded seats 11 (Figure 3).

[0014] Half-shells 8, 9 comprise respective walls 12, 13 facing each other and spaced apart in a direction perpendicular to walls 12, 13. And half-shell 9 comprises an annular wall 15, which projects in one piece from wall 13, defines chamber 7 laterally, is fitted in fluidtight manner along one edge to half-shell 8, and comprises a front portion 16 outwardly defining cavity 6.

[0015] Half-shell 9 also comprises two pins 17, 18, which project in one piece from wall 13, inside cavity 6, along respective parallel axes 19, 20 spaced apart and perpendicular to direction 5, and are aligned axially with a pin 21 and an opening 22, respectively, forming part of half-shell 8.

[0016] Pins 17 and 21 define a hinge to allow key 2 to rotate, about axis 19 and by a predetermined angle, in particular of 180°, between an extracted position and a withdrawn position (not shown). Key 2 comprise a flat shaped stem, which lies substantially in a plane parallel to axis 19; and a base or drum 24, integrally connected to an end 23 of the stem. In the extracted position, the stem of key 2 projects in direction 5 with respect to the body 3 for insertion inside a lock; in the withdrawn position, the stem of key 2 is located alongside body 3 and housed inside recess 4.

[0017] Drum 24 at least partly engages cavity 6 and has an axial through hole 25 to fit in rotary and axially fixed manner onto pins 17, 21. Drum 24 is bounded by two substantially flat surfaces 26, 27 resting on walls 12, 13 respectively, and by a curved convex lateral surface

28 facing portion 16. More specifically, an elastic device (not shown) is interposed between drum 24 (or the stem) and body 3, and is preloaded to push key 2 into the extracted position.

[0018] Key-holder 1 also comprises an angular retaining device 30 for retaining key 2 in the withdrawn position in opposition to said elastic device; and a release button 31, which extends along axis 20, and, when pressed manually, is movable axially with respect to body 3 from a raised rest position to a lowered release position to release device 30 and allow key 2 to be rotated automatically into the extracted position by the elastic device.

[0019] More specifically, device 30 is at least partly carried by button 31, and provides for retaining key 2 even when key 2 is in the extracted position. Key 2 is therefore restored to the withdrawn position by pressing button 31 to release key 2; pushing the stem of key 2, in opposition to the reaction of the elastic device, into the withdrawn position, while keeping button 31 pressed; and, finally, releasing button 31 to re-engage device 30.

[0020] Button 31 comprises a disk-shaped head 32 defining a circular outer surface 33; and a rod 34, which extends along axis 20 from head 32, on the opposite side to surface 33, and through opening 22.

[0021] At the opposite end to head 32, rod 34 terminates with an axially hollow portion 35, which is engaged and guided by pin 18, is located alongside drum 24, between surface 28 and portion 16, and houses a spring (not shown) interposed axially between head 32 and pin 18 to push button 31 into the raised position.

[0022] Rod 34 is maintained in a fixed angular position with respect to body 3 by a lock device 37 comprising two flat faces 38, 39 resting on each other: face 38 radially defines one side of rod 34, and face 39 defines an appendix 40 forming part of half-shell 9.

[0023] Device 30 comprises two diametrically-opposite slots 43, 44 on drum 24; and a tooth 42 carried by button 31 and located alongside portion 35 in a radial direction 45. When button 31 is raised, tooth 42 selectively engages slots 43, 44 to retain key 2 in the extracted and withdrawn position respectively.

[0024] In the Figure 2 embodiment, tooth 42 extends in one piece directly from portion 35, and slots 43, 44 are formed along an edge 46 joining surfaces 27, 28. In the Figure 4 and 5 variation, tooth 42 extends parallel to axis 20 towards head 32 from a radial arm 48, which in turn extends in one piece from portion 35, projects axially with respect to portion 35, and axially faces edge 46; and slots 43, 44 are formed in surface 27 and radially inwards of edge 46.

[0025] With reference to Figure 3, when button 31 is pressed down, tooth 42 releases slot 43, 44 to permit rotation of key 2, and, together with portion 35, engages a recess 47 formed on wall 13. Once key 2 is rotated 180°, button 31 is pushed back into the raised position by the spring housed in portion 35, and tooth 42 engages the other slot 44, 43. In the Figure 4 and 5 variation, recess 47 comprises a through opening 49 to permit

downward movement of arm 48.

[0026] As shown in Figure 2, opening 22 is defined by a slot, which is bounded by a lateral wall 22a forming part of half-shell 8 and extending in one piece crosswise to wall 12. In a radial direction 50 perpendicular to direction 45, slot 22 is shaped and large enough to permit axial insertion, during assembly, of portion 35, tooth 42, and another diametrically-opposite tooth 52 carried by rod 34. More specifically, in direction 50, slot 22 comprises two portions 51, diametrically opposite with respect to rod 34, to permit insertion of respective teeth 42, 52 during assembly.

[0027] In the Figure 2 condition, tooth 52 rests tangentially against a shoulder 22b defined by wall 22a, and rests axially against a shoulder 22c also defined by wall 22a. Engagement of shoulder 22c by tooth 52 defines the fully raised position of button 31.

[0028] Portions 51 are engaged respectively by the ends of appendix 40 and a diametrically-opposite appendix 53. Appendixes 40, 53 extend in one piece from wall 13, and are positioned alongside rod 34 and aligned with head 32.

[0029] Wall 22a is aligned with teeth 42, 52 in a direction parallel to axis 20 to prevent withdrawal of button 31 during assembly. More specifically, key-holder 1 is assembled by:

- fitting drum 24 onto pin 21 so that it rests on wall 12, with key 2 in the extracted position and the elastic device preloaded;
- inserting portion 35, with teeth 42, 52, axially inside slot 22 so that head 32 rests on wall 12;
- rotating button 31, by sliding tooth 42 over edge 46 on surface 27, so that tooth 52 rests tangentially against shoulder 22b;
- axially inserting tooth 42 inside slot 43 (if head 32 is kept facing downwards, insertion is automatic by force of gravity) so that tooth 52 rests axially on shoulder 22c;
- inserting the spring inside the axial cavity of portion 35;
- fitting half-shell 9 to half-shell 8 by inserting pin 17 inside hole 25, compressing the spring by means of pin 18, and inserting the ends of appendixes 40, 53 inside portions 51.

[0030] Alternatively, button 31 may be inserted first inside opening 22, and drum 24 then inserted between tooth 42 and wall 12.

[0031] As shown in Figure 1, button 31 is far enough away from the edges of body 3 to form a relatively large surface 33 on which to apply or stamp a trademark or logo. By virtue of the location of axis 20, key-holder 1 is therefore much more aesthetically pleasing than known solutions in which the release button is coaxial with the hinge axis of the key.

[0032] The attractiveness of the key-holder is also enhanced by button 31 being angularly fixed with respect

to body 3, so that the trademark or logo on surface 33 is always oriented the same way. Moreover, in the Figure 4 and 5 variation, slots 43, 44 are concealed at all times by wall 13.

[0033] Not being coaxial with drum 24, button 31 can be located as required, and may be customized, by being angularly fixed and independent of the shape of drum 24. In particular, button 31 need not necessarily be circular in shape to permit rotation.

[0034] Key-holder 1 comprises relatively few component parts, and is relatively easy to assemble, mainly on account of tooth 42, for angularly locking drum 24, being carried by button 31, and by virtue of the design of opening 22 and rod 34.

[0035] Though the Figure 1-3 solution is more compact and has fewer restrictions in terms of geometry and design, the Figure 4 and 5 variation provides for concealing slots 43, 44.

[0036] As will be clear from the above description, key-holder 1 is also relatively compact and easy to use.

[0037] Clearly, changes may be made to key-holder 1 as described herein without, however, departing from the scope of the present invention as defined in the accompanying Claims. In particular, device 30 may only lock key 2 angularly in the withdrawn position, and/or may be separate from button 31.

[0038] Also, head 32 and surface 33 need not necessarily be circular, as shown.

Claims

1. A key-holder (1) comprising:

- a supporting body (3);
- a key (2) hinged to said supporting body (3) to rotate about a hinge axis (19) between an extracted position for insertion inside a lock, in particular a vehicle lock, and a withdrawn position alongside said supporting body (3);
- angular retaining means (30) for retaining said key (2) in at least one of said withdrawn and extracted positions; and
- a release button (31) movable along a release axis (20) from a raised rest position to a lowered release position to release said angular retaining means (30) and permit rotation of said key (2);

characterized in that said hinge axis (19) and said release axis (20) are parallel and spaced apart.

2. A key-holder as claimed in Claim 1, **characterized in that** said key (2) comprises:

- a hinge drum (24) hinged to said supporting body (3) about said hinge axis (19);
- a stem integrally connected to said hinge drum

(24);

and **in that** said angular retaining means (30) comprise:

- first angular retaining means (43,44) carried by said hinge drum (24);
- second angular retaining means (42) carried by said release button (31) and cooperating with said first angular retaining means (43,44) for angularly retaining said key (2).

3. A key-holder as claimed in Claim 2, **characterized in that** said first angular retaining means (43,44) are located on a face (27) which defines said hinge drum (24) and is transversal to said hinge axis (19).

4. A key-holder as claimed in Claim 3, **characterized in that** said first angular retaining means (43,44) are located in a position which is inner and radially spaced with respect to an edge (46) that joins said face (27) to lateral external surface (28) of said hinge drum (24).

5. A key-holder as claimed in anyone of Claims from 2 to 4, **characterized by** comprising locking means (37) for preventing rotation of said release button (31) about said release axis (20) with respect to said supporting body (3).

6. A key-holder as claimed in anyone of Claims from 2 to 5, **characterized in that** said second angular retaining means comprise a tooth (42), and **in that** said first angular retaining means (43,44) comprise at least one slot (43) engageable by said tooth (42).

7. A key holder as claimed in Claim 6, **characterized in that** said release button (31) comprises:

- a head (32) which can be manually pushed along said release axis (20), and
- a rod (34) extending from said head (32) along said release axis (20), located alongside said hinge drum (24), and carrying said tooth (42).

8. A key-holder as claimed in Claim 7, **characterized in that** said tooth (42) is located at an end (35) of said rod (34) axially opposite said head (32).

9. A key-holder as claimed in Claim 8, **characterized in that** said tooth (42) extends parallel to said release axis (20) and towards said head (32) from a radial arm (48) integral with said end (35).

10. A key-holder as claimed in Claim 8 or 9, **characterized in that** said supporting body (3) comprises a first and a second wall (12, 13) spaced apart along said hinge and release axes (19, 20); said first wall

(12) defining an opening (22) which is engaged by said release button (31) and is shaped and large enough to permit axial insertion of said end (35) and said tooth (42) during assembly.

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11. A key-holder as claimed in Claim 10, **characterized in that** said first wall (12) comprises a portion (22c), which bounds said opening (22) and is aligned, in a direction parallel to said release axis (20), with a further tooth (52) carried by said rod (34).

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12. A key-holder as claimed in Claim 11, **characterized in that** said second wall (13) carries at least one appendix (40, 53) radially facing said rod (34) and axially facing said head (32), and having one end engaging a portion (51) of said opening (22).

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13. A key-holder as claimed in Claims 5 and 12, **characterized in that** said locking means (37) comprise two flat faces (38, 39) resting on each other and defining said rod (34) and said appendix (40) respectively.

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FIG. 1

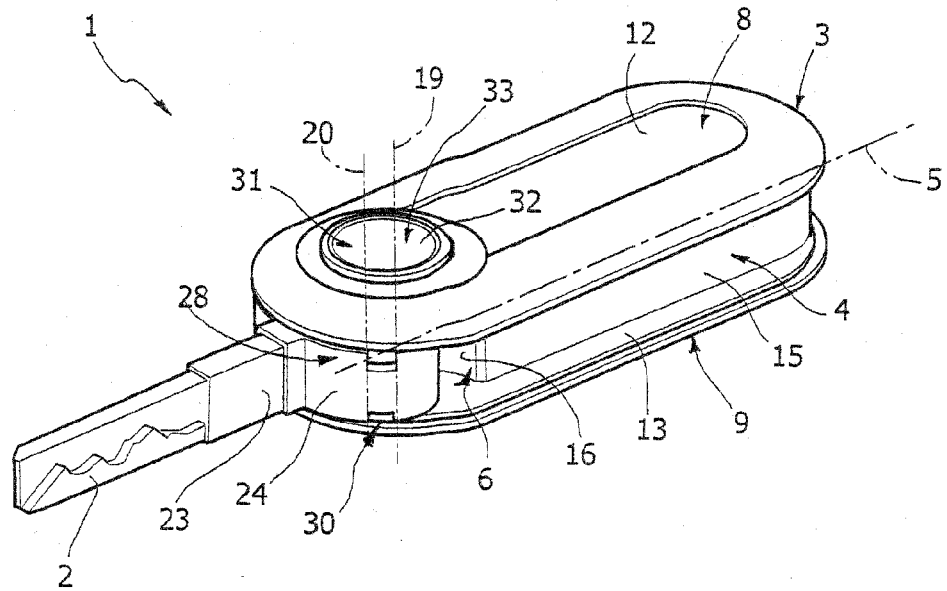


FIG. 3

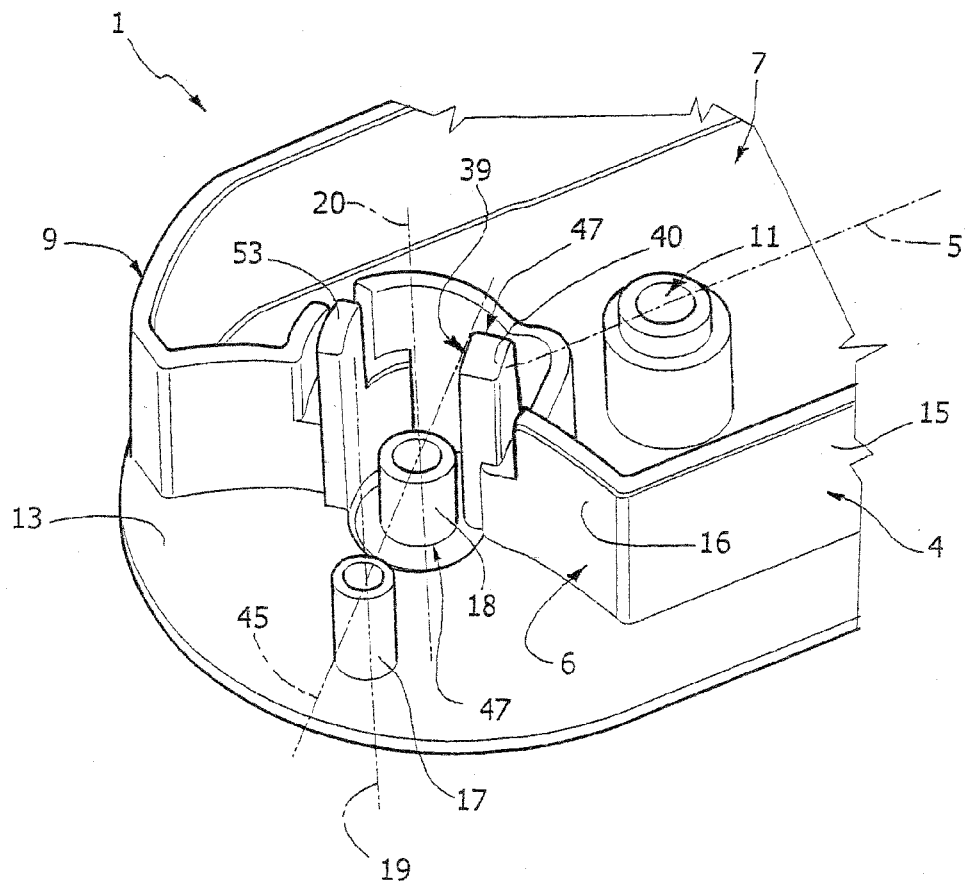


FIG. 2

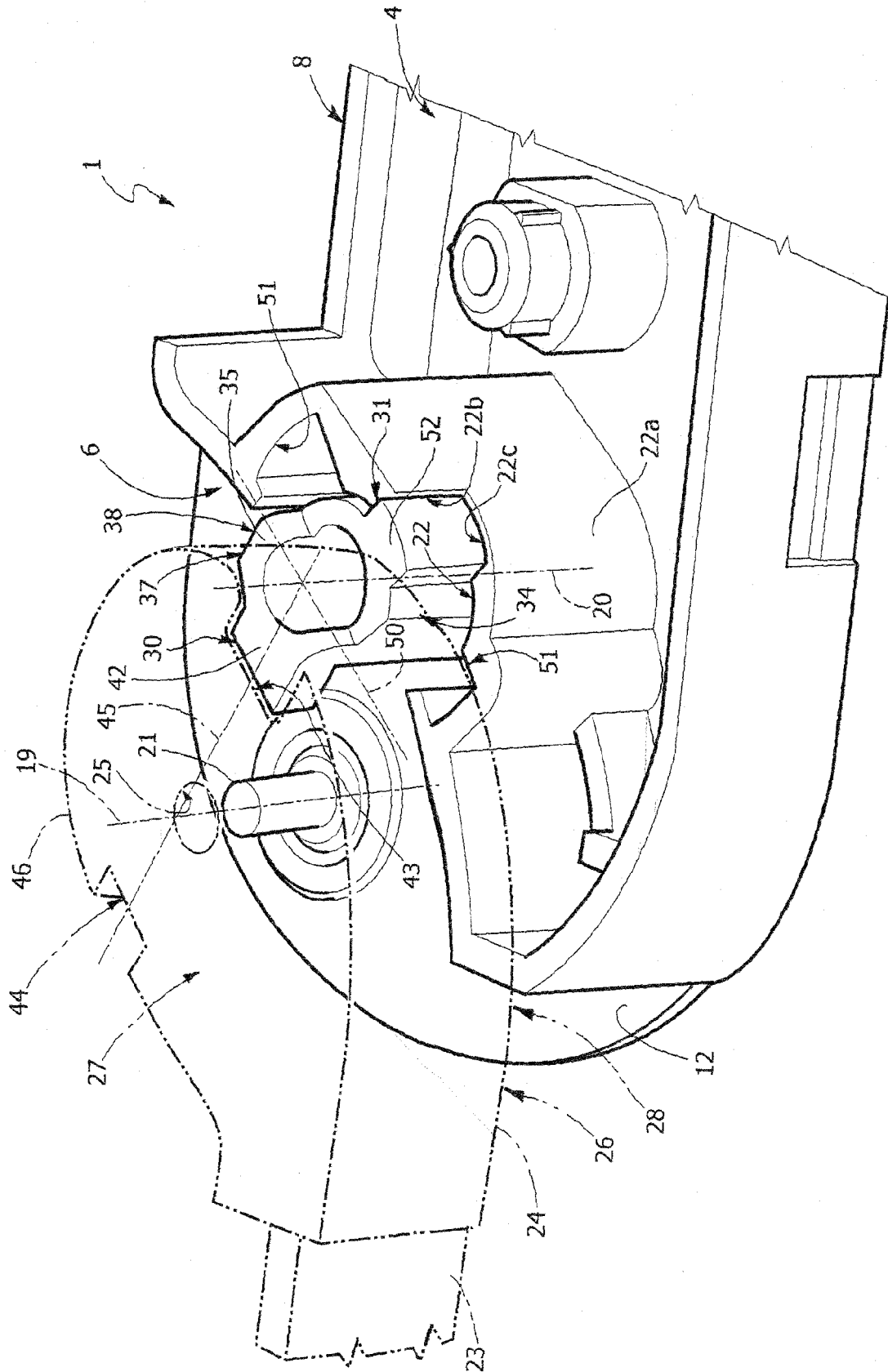


FIG. 4

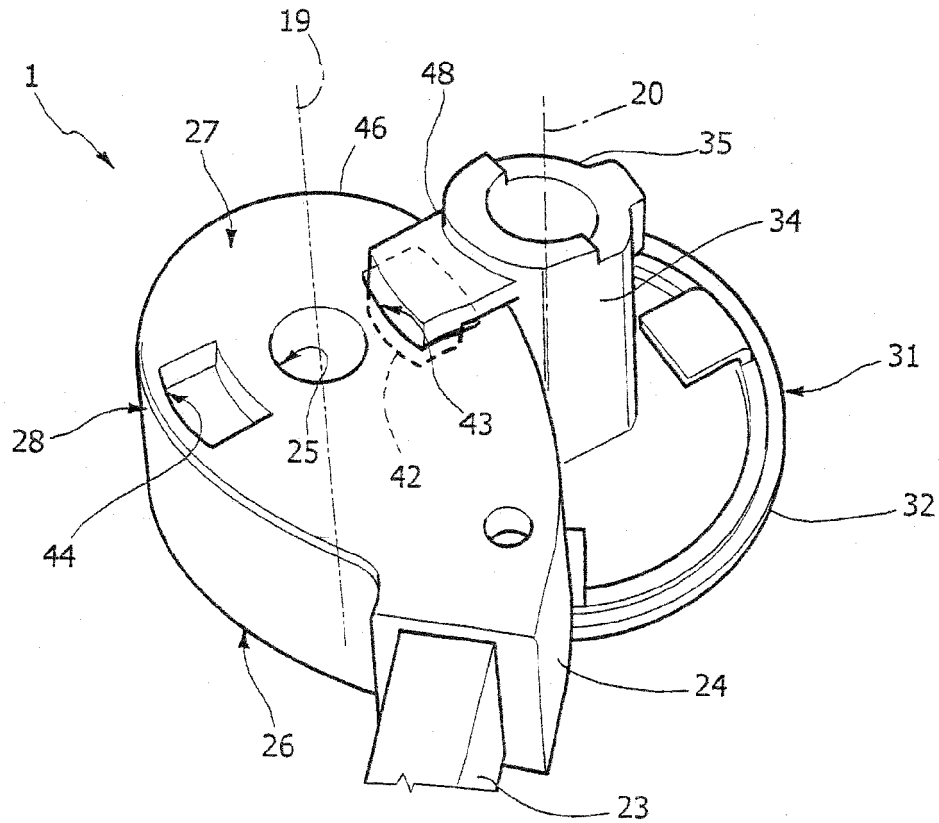
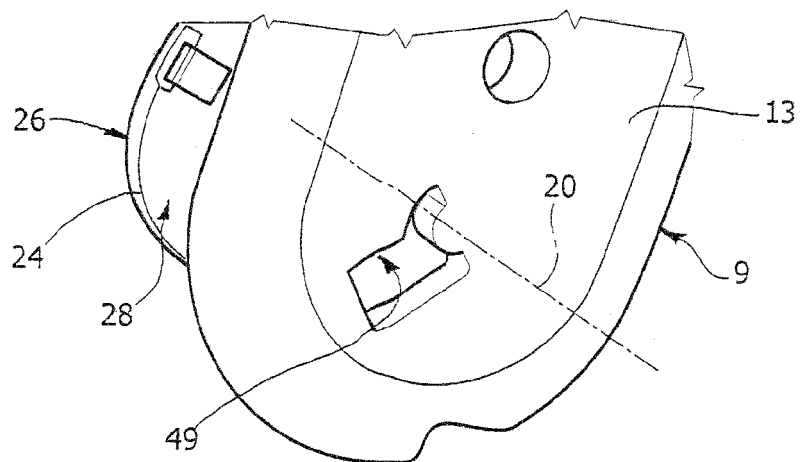


FIG. 5





DOCUMENTS CONSIDERED TO BE RELEVANT			
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CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document	

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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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
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