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(54) **Lock with assembly for preventing misregistration of the driven gear that actuates the closing and opening mechanism upon insertion of the cylinder with the key in a lock**

(57) An assembly for preventing misregistration of the driven gear (5) that actuates the closing and opening mechanism upon insertion of the cylinder with the key in a lock, an oscillating lever (9) being mounted in the lock and having a coupling end (10) that is forced by

elastic means into a recess of the driven gear in the absence of the cylinder; when the cylinder is inserted, it interferes, with a portion of its contour, with a protrusion of the lever and, by overcoming the action of the elastic means, disengages the coupling end.

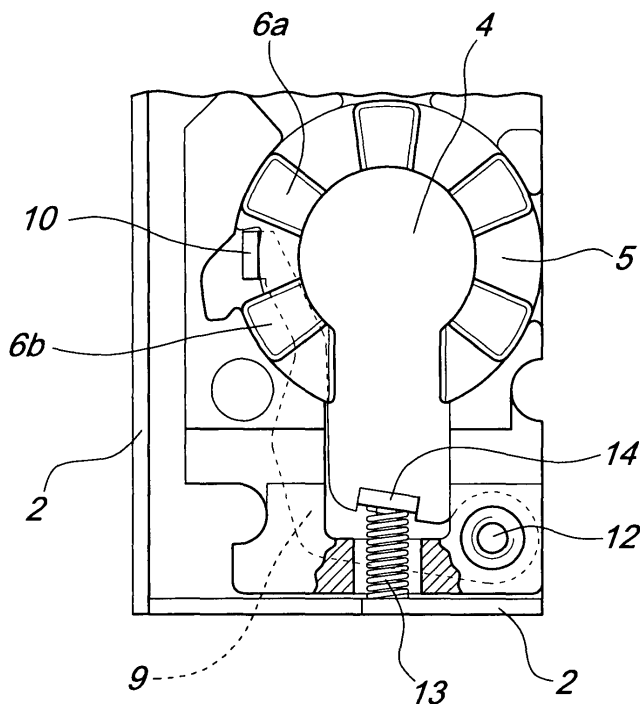


Fig. 4

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Description

[0001] The present invention relates to an assembly for preventing misregistration of the driven gear that actuates the closing and opening mechanism upon insertion of the cylinder with the key in a lock, particularly for locks in which the cylinder is to be inserted after fitting said lock to the door panel for which it is intended.

[0002] A lock is usually fitted to a door panel in two successive steps: the lock body is inserted in the recess provided on the side of the door panel that lies opposite with respect to the side that is pivoted to the supporting structure; then the cylinder is inserted in a transverse opening of the door panel that faces the appropriately provided seat formed in the body of the lock.

[0003] During installation, the lock is usually operated several times to check its good operation and placement on the supporting structure. During this step, when the cylinder is not present, it is important to ensure that the internal gears of the lock do not move, in order to prevent their incorrect movement from causing a loss of register of the system and therefore a meshing condition that is different from the one intended for correct operation.

[0004] If this happens, the lock is unusable and has to be reset by the manufacturer.

[0005] The aim of the present invention is to obviate the cited drawbacks and to meet the mentioned requirements, by providing an assembly for preventing misregistration of the driven gear that actuates the closing and opening mechanism upon insertion of the cylinder with the key in a lock, which forces the mating of the driven gear with the cylinder in the initial configuration assigned to the driven gear by the manufacturer.

[0006] Within this aim, an object of the present invention is to provide an assembly that is simple, relatively easy to provide in practice, safe in use, effective in operation, and has a relatively low cost.

[0007] This aim and this object are achieved by the present assembly for preventing misregistration of the driven gear that actuates the closing and opening mechanism upon insertion of the cylinder with the key in a lock, characterized in that an oscillating lever is mounted in the lock and has a coupling end that is forced by elastic means into a recess of said driven gear in the absence of said cylinder, and in that said cylinder, once inserted, interferes, with a portion of its contour, with a protrusion of said lever and, by overcoming the action of said elastic means, disengages said coupling end.

[0008] Further characteristics and advantages of the present invention will become better apparent from the following detailed description of a preferred but not exclusive embodiment of an assembly for preventing misregistration of the driven gear that actuates the closing and opening mechanism upon insertion of the cylinder with the key in a lock, according to the invention, illustrated by way of nonlimiting example in the accompanying drawings, wherein:

Figure 1 is a view of a lock that is adapted to be associated with an assembly for preventing misregistration according to the invention;

Figure 2 is a plan view of an oscillating lever of an assembly for preventing misregistration according to the invention;

Figure 3 is a plan view of a driven gear of a lock that is adapted to be associated with an assembly for preventing misregistration according to the invention;

Figure 4 is a partially sectional side view of a detail of the mounting of a first embodiment of the assembly for preventing misregistration according to the invention;

Figure 5 is a partially sectional side view of a detail of the mounting of a second embodiment of an assembly for preventing misregistration according to the invention.

[0009] With reference to the figures, the reference numeral 1 generally designates a lock of the type that is adapted to be inserted in the recess provided on the side of the door panel that lies opposite with respect to the side that is hinged to the supporting structure (fixed or movable wall). The lock 1 is a box-like body 2 that is shaped like a parallelepiped and is provided with a plurality of distributed recesses; its face that lies opposite the one on the back wall of the recess of the door panel is coupled to a faceplate 3 for fixing to said door panel. One of the recesses is arranged in the lower part of the box-like body 2 and is a through recess: it is the seat 4 of the cylinder. The rotation of the key inside the cylinder causes the rotation, about its axis, of a cam that engages in a set of teeth. A driven gear 5 surrounds the cylinder and accommodates the cam in a radial slot: since the gear 5 is functionally connected to the gears of the lock, its rotations produce, in one direction, the closure of a bolt 7 and, in the other direction, the opening of the bolt 7 and then the opening of a latch 8.

[0010] When the cylinder is not inserted in the seat 4, the driven gear 5 is locked due to the presence of a coupling end 10 of an oscillating lever 9 in a recess 11 arranged in the peripheral region of the driven gear 5 at the space that lies between the two successive teeth 6a and 6b. The end 10 is forced into the recess 11, since the lever 9 is pivoted by means of a pivot 12 in the lower end of the box-like body 2 and is pushed by a helical spring 13 that acts with its head on the lower surface of a protrusion 14 and with its tail on the lower end of the box-like body 2.

[0011] The protrusion 14 is provided in such a manner that its upper surface is hump-shaped, with its greatest protrusion at the central section, and its ends, when the lock 1 is fitted without the cylinder inserted therein, are aligned with the lower profile of the seat 4. This shape is necessary to allow the easy insertion of the cylinder in the seat 4 without causing jamming thereof.

[0012] The operation of the invention is as follows: the

box-like body 2 of the lock 1 is inserted in the recess provided on the side of the door panel that lies opposite the side that is hinged to the supporting structure (fixed or movable wall).

[0013] The movement of the driven gear 5 is prevented by the presence of the coupling end 10 of the oscillating lever 9 in the recess 11 arranged on the peripheral region of the driven gear 5 at the space comprised between the two successive teeth 6a and 6b. The insertion of the cylinder within the seat 4 entails that the lower end of the cylinder acts on the protrusion 14, lowering it and accordingly compressing the helical spring 13.

[0014] The lowering of the protrusion 14 leads to a rotation of the oscillating lever 9, with consequent spacing of the coupling end 10 from the driven gear 5 until it exits fully from the recess 11, freeing said gear 5. At this point the lock 1 is operational and therefore, as a consequence of rotations of the key inside the lock, the driven gear 5 can turn, actuating the bolt 7 and the latch 8.

[0015] It has thus been shown that the invention achieves the intended aim and object.

[0016] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0017] For example, the oscillating lever 9 can have a U-shaped coupling end 10a that is adapted to enter the space between the two successive teeth 6a and 6b without having to provide a specifically formed recess 11 as in the preceding description.

[0018] All the details may further be replaced with other technically equivalent ones.

[0019] In the embodiments cited above, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other embodiments.

[0020] In practice, the materials used, as well as the shapes and the dimensions, may be any according to requirements without thereby abandoning the scope of the protection of the appended claims.

[0021] 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. An assembly for preventing misregistration of the driven gear that actuates the closing and opening mechanism upon insertion of the cylinder with the key in a lock, **characterized in that** an oscillating lever is mounted in the lock and has a coupling end that is forced by elastic means into a recess of said driven gear in the absence of said cylinder, and **in that** said cylinder, once inserted, interferes, with a

portion of its contour, with a protrusion of said lever and, by overcoming the action of said elastic means, disengages said coupling end.

2. The assembly according to claim 1, **characterized in that** said oscillating lever is pivoted at an end portion and is adapted to rotate from a configuration for engaging its coupling end in said recess to a disengagement configuration, in which said coupling end frees said driven gear.

3. The assembly according to one or more of the preceding claims, **characterized in that** said lever is pivoted about an axis that is parallel to the functional rotation axis of said cylinder.

4. The assembly according to one or more of the preceding claims and as an alternative to claim 3, **characterized in that** said lever is pivoted about a horizontal axis that is perpendicular to the functional rotation axis of said cylinder.

5. The assembly according to one or more of the preceding claims, **characterized in that** the protrusion has two surfaces for interference with said portion of said cylinder that are inclined in opposite directions and converge at a central crest, in order to free said driven gear upon insertion of the cylinder in the lock in both opposite possible mounting directions.

6. The assembly according to one or more of the preceding claims, **characterized in that** said recess is provided on the outer surface of said gear in a region that is comprised between two successive meshing teeth and is slightly wider than said coupling end and deep enough to allow the entry of at least one portion of said end.

7. The assembly according to claim 6, **characterized in that** said coupling end of said oscillating lever is extended at right angles to the plane that contains said driven gear.

8. The assembly according to one or more of the preceding claims and as an alternative to claim 6, **characterized in that** said recess of said driven gear is the region comprised between two successive meshing teeth.

9. The assembly according to claim 8, **characterized in that** said coupling end of said lever ends with a portion that is co-planar to said surface, is arranged radially with respect to said driven gear, and is adapted to be arranged between two successive teeth.

10. The assembly according to claim 9, **characterized in that** said elastic means are constituted by at least

one helical spring that is functionally interposed between the lower surface of said protrusion of said oscillating lever and a fixed supporting element on said lock.

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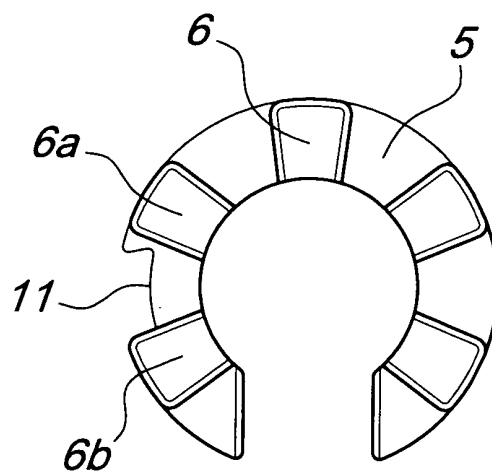
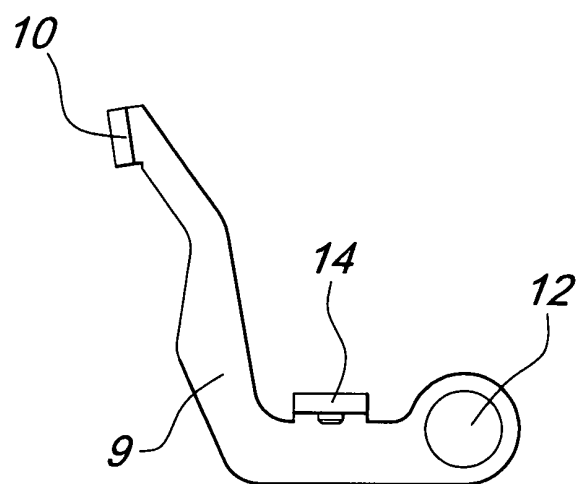
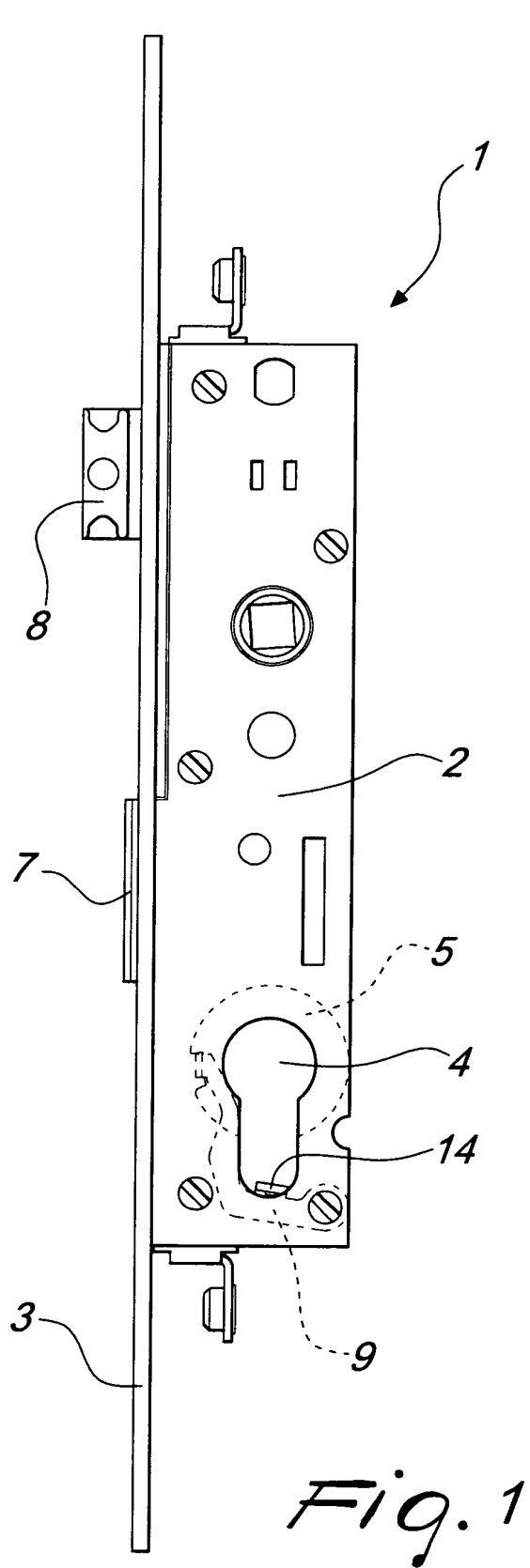
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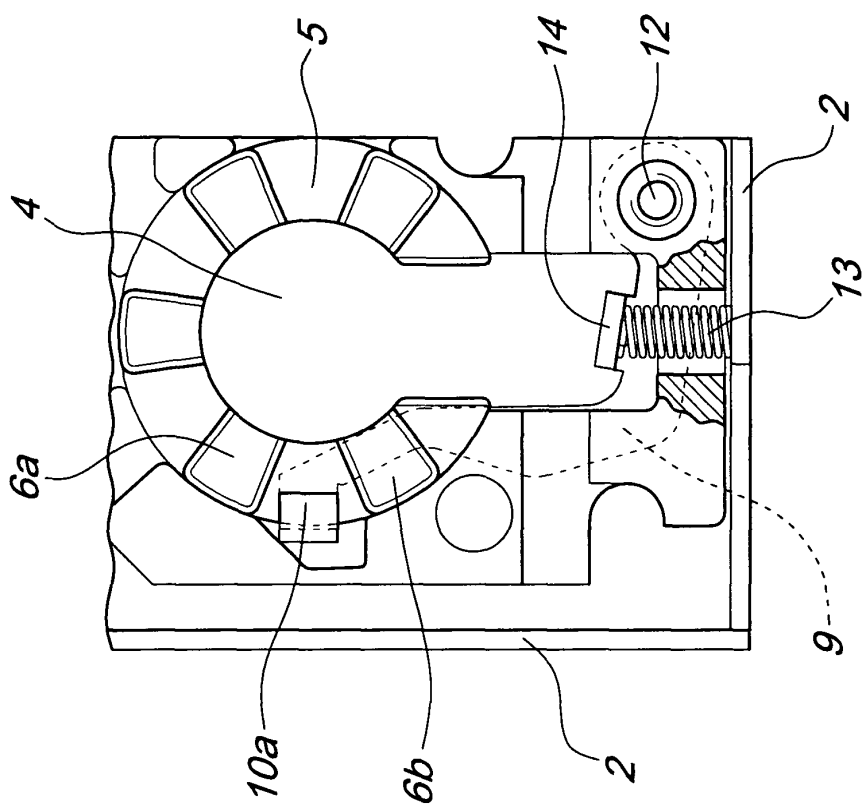


Fig. 5

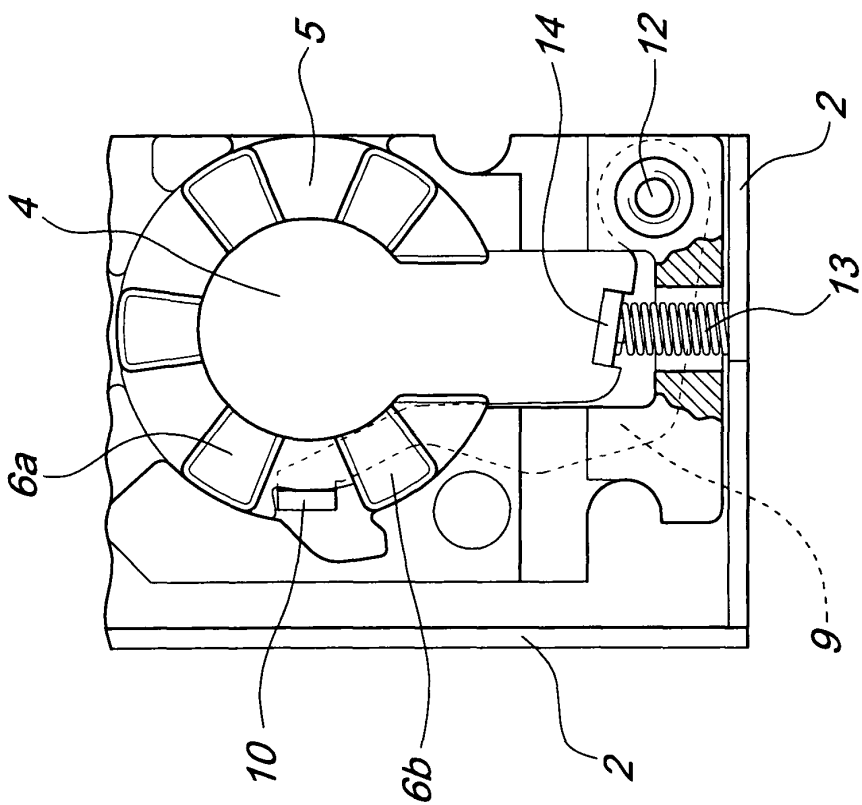


Fig. 4



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EUROPEAN SEARCH REPORT

Application Number
EP 03 02 7435

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	DE 31 14 776 A (BRUMME PRESS & STANZWERK) 28 October 1982 (1982-10-28) * page 15, paragraph 2 - page 17, paragraph 2; figures *	1	E05B17/04 E05B9/00
A	EP 0 096 229 A (GRETSCH UNITAS GMBH) 21 December 1983 (1983-12-21) * the whole document *	1	
A	EP 0 637 666 A (FLIETHER KARL GMBH & CO) 8 February 1995 (1995-02-08) * figure 3 *	1	
A	DE 39 09 584 A (DROSTE DIETER FRHR VON ;DROSTE LOTHAR FRHR VON DIPL PH (DE)) 27 September 1990 (1990-09-27) * figures 3,4 *	1	
A	US 2 228 971 A (PANKRATZ JESS E) 14 January 1941 (1941-01-14) * figures 1,2 *	1	
A	EP 0 942 125 A (SERRURES MUEL) 15 September 1999 (1999-09-15) * figure 2 *	1	E05B E05C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 22 April 2004	Examiner Westin, K
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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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 03 02 7435

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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