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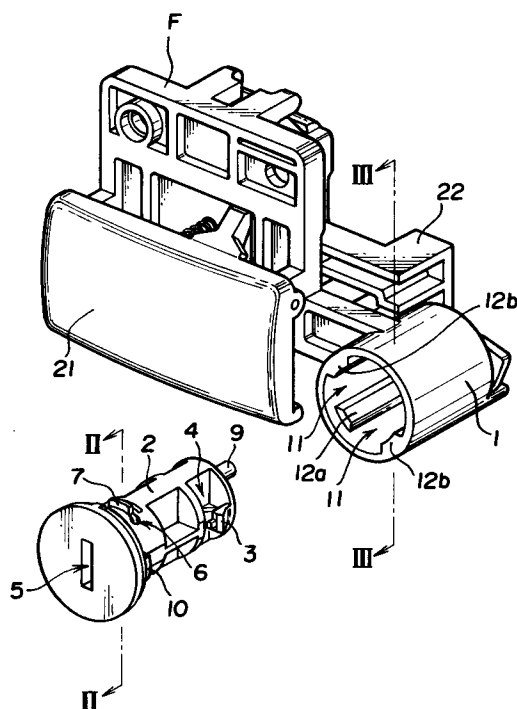
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W-8000 München 80 (DE)(54) **Cylinder lock.**

(57) A cylinder lock includes a cylindrical casing (1) having a stepped part (13) formed on an inner circumferential surface thereof, and a key rotor (2) formed of a synthetic resin material, rotatably inserted and set in place in the casing (1) and having an elastic engaging part (3) integrally formed on an outer circumferential part thereof. The elastic engaging part (3) is engageable with the stepped part (13) of the casing (1) to prevent the key rotor (2) from accidentally slipping off the casing (1).

FIG. 1**EP 0 537 645 A1**

BACKGROUND OF THE INVENTION

1. Field of the Invention:

This invention relates to a cylinder lock in a locking device for an automobile glove compartment, for example.

2. Description of the Prior Art:

Among the conventional cylinder locks of this kind is counted one which is illustrated in Figure 5 to Figure 10 of Japanese Patent Public Disclosure No. 2-112572.

The conventional cylinder lock, though not specifically illustrated herein, generally comprises two parts, i.e. a cylindrical case and a key rotor which are separately formed of a metallic material. In the cylindrical case, two pairs of (a total of four) long grooves are formed in the inner circumferential surface thereof along the axial line and a circularly stepped part is formed over a given range in the rear terminal part thereof. The key rotor is formed in a cylindrical shape so as to be rotatably inserted within the cylindrical case. In this cylindrical key rotor, a key-inserting hole is formed so as to extend from the central part of the front terminal surface thereof to the inner part thereof and, at the same time, a plurality of guide grooves for as many tumblers and one guide groove for a stopper plate are dug in the diametric direction, the tumblers and the stopper plate are disposed in such a manner as to emerge from and submerge in the relevant guide grooves, compression coil springs are provided one each for the tumblers and the stopper plate so as to urge them outwardly with the resilient pressure thereof.

When the key rotor is rotatably inserted and set in place inside the cylindrical case and the key is inserted into the key-inserting hole in preparation for actual use of such a conventional cylinder key lock, the key penetrates the interiors of the hole parts formed in the tumblers and, by virtue of the function of the end face of the key, causes the tumblers to be submerged inside the relevant guide grooves and consequently arrayed in a given line. As a result, the key rotor is relieved of the restrained state maintained thence by the long grooves formed in the inner circumferential surface of the cylindrical case and is consequently allowed to rotate in the locking or unlocking direction.

As respects the rotation of the key rotor of this nature, since the leading terminal of the stopper plate is kept in constant engagement with the circularly stepped part formed in the rear terminal part of the cylindrical case, the key rotor is allowed to produce a rotation but is prevented from slipping off the cylindrical case.

In the conventional cylinder lock, however, since not only the cylindrical case but also the key rotor rotatably inserted and set in place inside the cylindrical case are formed of a metallic material, the plurality of tumblers and the single stopper plate must be separately formed of a metallic material and the stopper plate must be disposed inside the relevant guide groove through a compression coil spring, the disadvantage ensues that the number of the component parts of the cylinder lock is increased and the cost of the cylinder lock is proportionately heightened.

Moreover, the use of the stopper plate entails a troublesome work of making the stopper plate to be set in the relevant guide groove through the compression coil spring. Further, when the key rotor having this metallic stopper plate incorporated therein is to be set in the cylindrical case, the operational efficiency of the work involved herein is inevitably degraded because the slide of the key rotor on the inner surface of the metallic cylindrical case encounters large resistance.

While the stopper plate can protect the key rotor from accidental slip from the cylindrical case, it has absolutely no function of preventing the key rotor from producing a backlash inside the cylindrical case. In other words, it is impossible for the stopper plate to prevent the key rotor from producing a backlash.

In the light of the problems encountered by the conventional cylinder lock as described above, the main object of this invention resides in providing a cylinder lock which promotes enhancement of the operational efficiency of the work of assembly and reduction in the number of component parts and, at the same time, allows effective prevention of the key rotor from producing a backlash.

SUMMARY OF THE INVENTION

To accomplish the object described above, according to this invention there is provided a cylinder lock comprising a cylindrical casing having a stepped part formed on an inner circumferential surface thereof, and a key rotor formed of a synthetic resin material, rotatably inserted and set in place in the casing and having elastic engaging means integrally formed on an outer circumferential part thereof, the elastic engaging means being engageable with the stepped part of the casing to prevent the key rotor from accidentally slipping off the casing.

The above and other objects and features of this invention will become apparent from the detailed description of the invention to be given hereinbelow with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a partially exploded perspective view illustrating one embodiment of the cylinder lock according to this invention.

Figure 2 is a cross section taken along line II-II in Figure 1.

Figure 3 is a cross section taken along line III-III in Figure 1.

Figure 4 is a cross section illustrating a key rotor in a state inserted and set in place inside a casing.

Figure 5 is a side view illustrating another example of the key rotor.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Now, this invention will be described more specifically below with reference to the embodiment illustrated in the drawings.

The cylinder lock of this embodiment is developed as a lock for use in a locking device for an automobile glove compartment. As shown in Figure 1, this lock comprises a cylindrical casing 1 integrally extending from a frame F of resin in a locking device fixed to the lid of the glove compartment and a key rotor 2 rotatably inserted and set in place inside the casing 1. Reference numeral 21 stands for an opening-shutting knob which plays the part of opening or shutting the lid and numeral 22 for an operating lever which fulfills the part of retaining the locking device in a locked or unlocked state.

Unlike the conventional cylinder lock, the cylinder lock of this embodiment is characterized by the fact that the key rotor 2 is formed of a synthetic resin material and has integrally formed on the outer circumferential part in the rear terminal side thereof an elastic engaging means 3 enabled to bend inwardly into an empty space 4 and given a shape capable of engaging with a stepped part of the casing as specifically described hereinafter.

As illustrated in Figure 2, the construction of the cylinder lock other than the characteristic construction mentioned above, similarly to the conventional cylinder lock, comprises a key-inserting hole 5 formed so as to extend from the central part of the front terminal surface of the key rotor 2 to the interior thereof, a plurality of guide grooves 6 dug in the diametric direction for as many tumblers 7 disposed in such a manner as to emerge from and submerge in the guide grooves 6, and compression coil springs 8 serving to urge the tumblers 7 outwardly with the resilient pressure thereof. In this embodiment, since it is intended for use in the locking device for the glove compartment as described above, the key rotor 2 has integrally

formed on the rear terminal surface side thereof an eccentric shaft 9 adapted to move the operating lever 22 which plays the part of retaining the locking device in a locked or unlocked state.

As illustrated in Figure 3, the casing 1 is so constructed that two pairs of (a total of four) long grooves 11 are formed in the inner circumferential surface of the casing through partition walls 12a and 12b and, as illustrated in Figure 4, an annular stepped parts 13 (possibly depressed surface or protuberated surface) is formed in the rear terminal part of the casing.

In the present embodiment, therefore, by setting the key rotor 2 of synthetic resin in place within the casing 1 integrally extending from the frame F without requiring use of a separate part of the stopper plate of a metallic material and the compression coil spring for the stopper plate as in the conventional cylinder lock, the elastic engaging means 3 is bent inwardly through the empty space 4 and allowed to move smoothly inside the casing 1 and, after it has passed the stepped part 13 formed in the rear terminal part of the casing 1, the leading terminal edge of the elastic engaging means 3 is brought into resilient engagement with the annular stepped part 13 as illustrated in Figure 4. As a result, the possibility of the key rotor 2 slipping off the casing 1 is completely eliminated and, at the same time, the possibility of the key rotor 2 producing a backlash within the casing 1 is effectively precluded.

Moreover, in the present embodiment, since not only the key rotor 2 but also the frame F of the locking device is formed of a synthetic resin material integrally with the casing 1, the present embodiment has the advantage that the work of setting the key rotor 2 in place inside the casing 1 is rendered notably easy.

In the cylinder lock thus constructed, therefore, the locking device can be locked or unlocked by the manipulation of the key when the key rotor 2 is inserted and set in place inside the casing 1 and the frame F of the locking device is fixed on the lid of the glove compartment.

To be specific, when the key (not shown) is inserted into the inserting hole 5 of the key rotor 2, this key penetrates the interiors of hole parts 7a (Figure 2) formed in the tumblers 7 and causes the tumblers 7, by virtue of the function of the end face of the key, to be submerged inside the relevant guide grooves 6 and consequently arranged in a given line. As a result, the restrained state retained thence by the long grooves 11 formed in the inner circumferential surface of the casing 1 is released and the key rotor 2 is allowed to rotate in the locking or unlocking direction. Further, since the elastic engaging means 3 remains in engagement with the stepped part 13 on the casing 1 side

during the rotation of the key rotor 2, the possibility of the key rotor 2 accidentally slipping off the casing 1 is completely eliminated. Moreover, owing to the resilient engaging force generated by the elastic engaging means 3, the possibility of the key rotor 2 producing a backlash can be precluded.

In the embodiment described thus far, the cylinder lock is so constructed as to bring the key rotor 2 infallibly to a stop at the locked or unlocked position by forming a pair of projecting parts 10 opposite the rear surface side of the enlarged front terminal part of the key rotor 2 and meantime making the opposed partition walls 12a short of the end face of the casing 1, thereby enabling the projecting parts 10 to collide against the lateral surfaces of the other partition walls 12b. This invention is not required to be limited to this particular construction but may be otherwise constructed so that the stop of the key rotor 2 at the locked or unlocked position will be secured by dint of the correlation of the elastic engaging means 3 and the stepped part 13.

In the embodiment described above, the elastic engaging means 3 formed relative to the key rotor 2 made of synthetic resin comprises a single elastic engaging part. Again in this respect, this invention is not required to be limited to this particular quantitative relation. It is permissible to form two or more elastic engaging parts 3 as illustrated in Figure 5 so as to suit the strength of slip to be required.

Further, in the present embodiment, the cylinder lock is depicted as being intended for use in the locking device of the glove compartment. The use found for the cylinder lock is not required to be limited to this particular application. This cylinder lock may be applied to some other independent use. In this case, the casing 1 is formed as a sole part and the key rotor 2 is provided on the rear terminal surface side thereof with an ordinary locking claw means instead of the eccentric shaft 9.

As described above, this invention in adopting the construction described above ensures effective preclusion of the possible slip of the key rotor from the casing simply by bringing the elastic engaging part formed on the key rotor of synthetic resin into engagement with the stepped part formed on the inner circumferential side of the casing. Thus, this invention has absolutely no use for either the stopper plate which has been indispensably formed separately of the key rotor or the compression coil spring required in the conventional cylinder lock and can be expected to allow generous enhancement of the operational efficiency of the work of assembly and ample reduction in the number of component parts of the cylinder lock.

Further, the resilient engagement established between the elastic engaging part of the key rotor

and the stepped part of the case allows effective preclusion of the possibility that the key rotor will produce a backlash within the casing.

Claims

1. A cylinder lock, comprising:
a cylindrical casing (1) having a stepped part (13) formed on an inner circumferential surface thereof; and a key rotor (2) formed of a synthetic resin material, rotatably inserted and set in place in said casing (1) and having elastic engaging means (3) integrally formed on an outer circumferential part thereof; said elastic engaging means (3) being engageable with said stepped part of said casing to prevent said key rotor (2) from accidentally slipping off said casing.
2. A cylinder lock according to claim 1, wherein said elastic engaging means comprises at least two elastic engaging parts (Fig. 5).
3. A cylinder lock according to claim 1, wherein said key rotor has an empty space (4) formed therein around said elastic engaging means (3; Fig. 5) so that said elastic engaging means is capable of bending inwardly into said empty space (4).
4. A cylinder lock according to claim 3, wherein said elastic engaging means comprises at least two elastic engaging parts and further including empty spaces (4; 4) for said at least two elastic engaging parts (Fig. 5).

FIG. 1

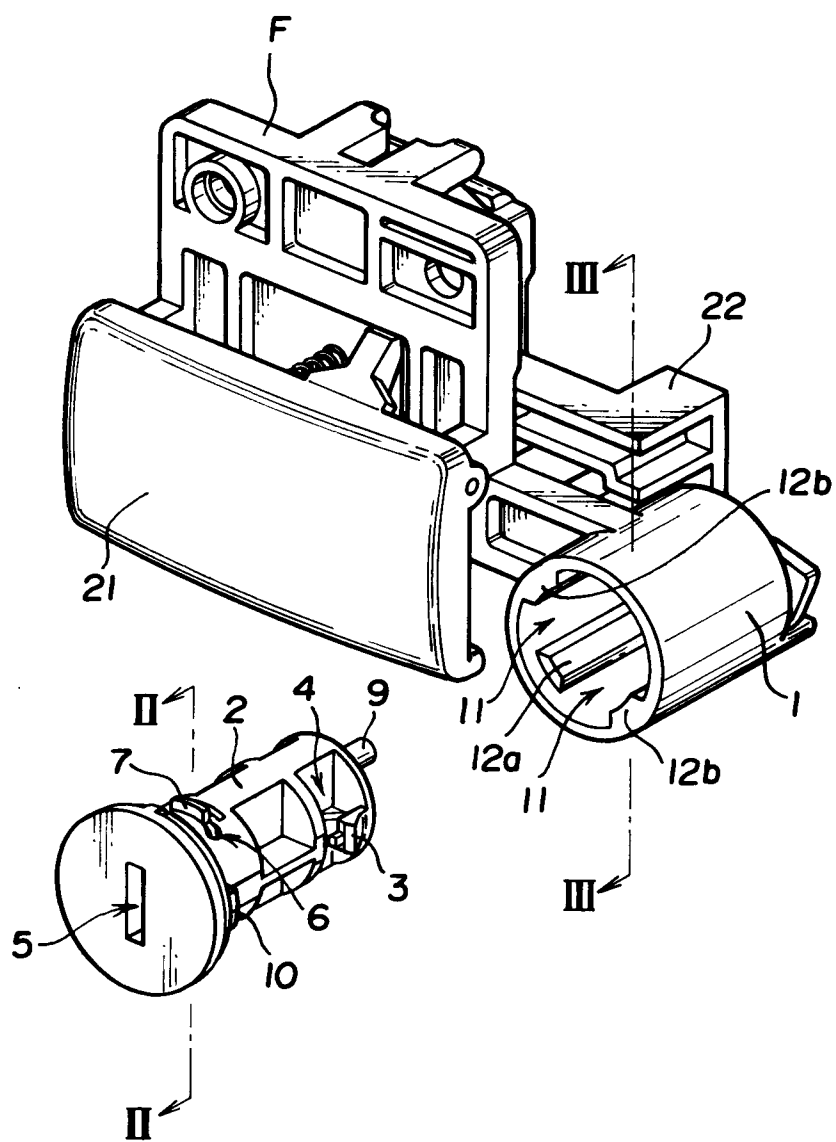


FIG. 2

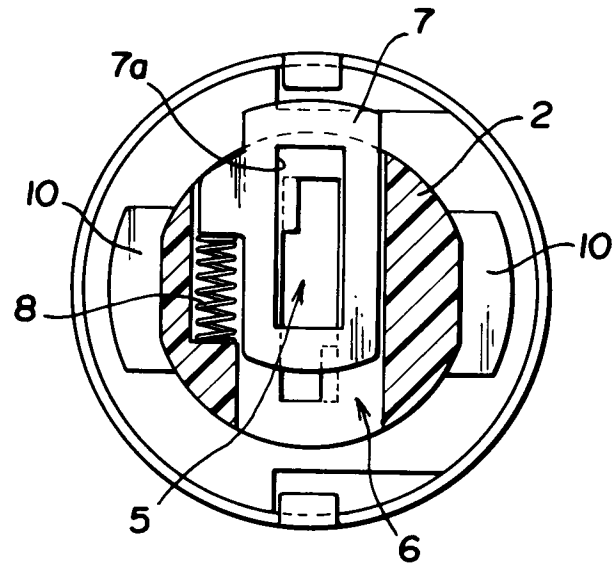


FIG. 3

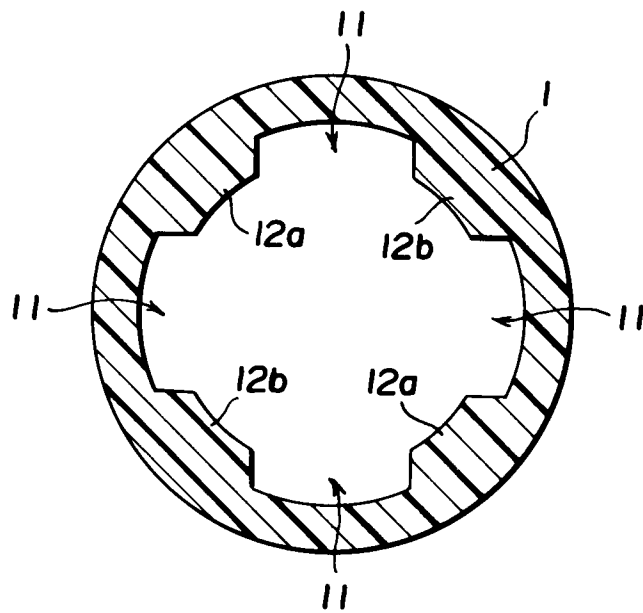


FIG. 4

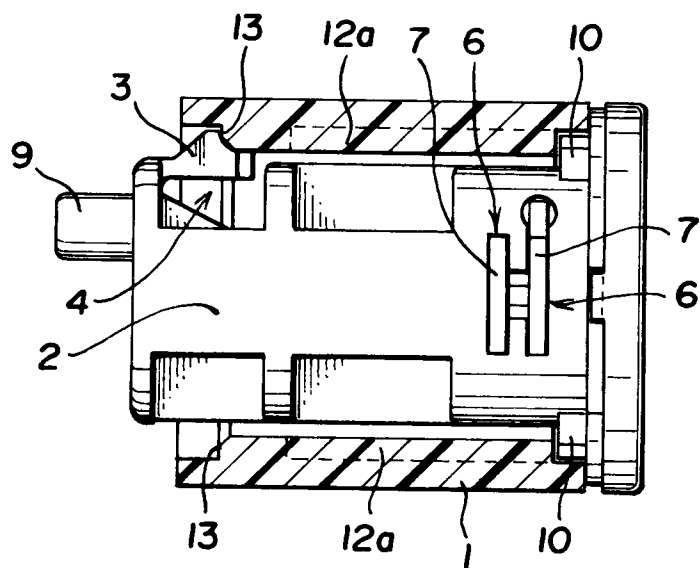
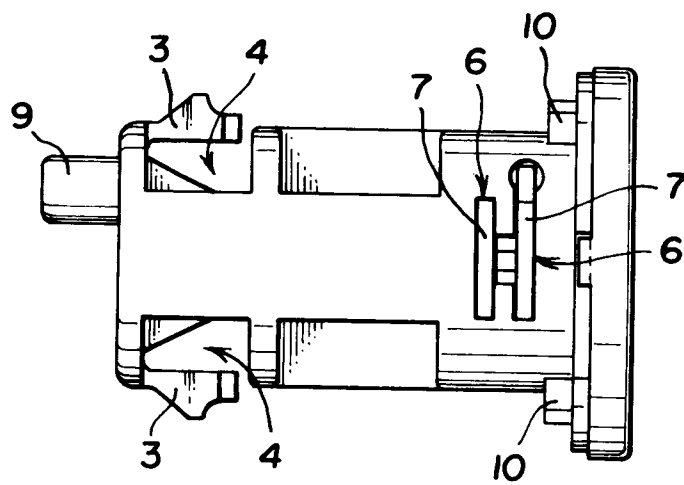


FIG. 5





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EUROPEAN SEARCH REPORT

Application Number

EP 92 11 7332

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	US-A-4 890 467 (KRAUSE ET AL.) * column 2, line 53 - line 64 * * column 5, line 36 - line 61; figures * -----	1-4	E05B9/08
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			E05B E05C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 14 DECEMBER 1992	Examiner GIMENEZ BURGOS R.
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			