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(54) **Stopper with removable spacer**

(57) A plastic rebound for a mobile part of the bodywork of motor-vehicles, consisting of a fixed body and of a mobile part (6) inserted into the fixed body inside a

coaxial seat (5) that can be translated along its axis in order to adjust its position in relationship to the fixed body, and that can be blocked on a part (9) of said fixed body into a desired position, by means of rotation.

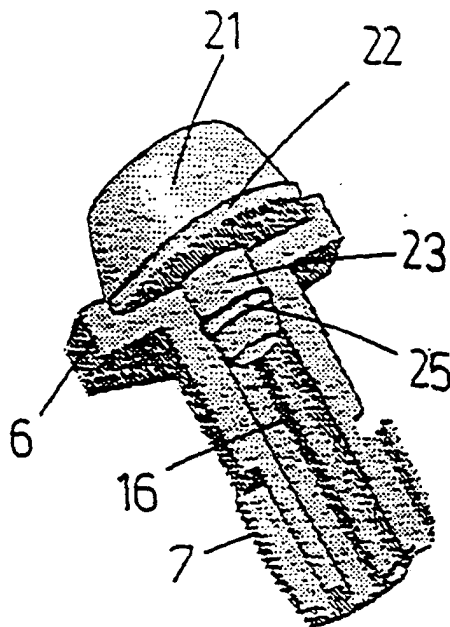


Fig. 6

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Description

[0001] The present invention refers to a rebound for the mobile part of the bodywork of a motor vehicle, provided with a disposable spacer. More in particular, the rebound is intended to be used for adjusting the closing of bonnets and hatchback door of motor vehicles.

[0002] This kind of rebound, which is made of soft plastic material is already known to the art. In order to fix it on the motor-vehicle, a threaded part is screwed into a seat located into a hole made at a suitable point. The stopping surface of the rebound, intended for instance to line up the surface of a bonnet with the remaining part of the bodywork, is adjusted by screwing or unscrewing the rebound into its threaded seat and this operation requires a rather long time. Besides, since the rebound is compressed when the bonnet is closed in order to control its vibrations while the motor-vehicle is moving, the compliance of the rebound itself is to be taken into consideration so that the rebound must protrude from the bodywork and the length of this protrusion, which is a predefined length, is not always achieved with the necessary precision.

[0003] Adjustable rebounds are also known, said rebounds being put in place and adjusted by means of minimal operations. This adjustment allows to always place the rebound in the same predefined position since the moment in which it is designed.

[0004] German patent n° DE 4011186 shows a rebound of this type, basically consisting of a fixed part that can be inserted into a seat in the bodywork and of a mobile part that can be placed on the fixed part and the height of which can be adjusted. When being fixed by means of a screw at its adjusted position achieved when closing the hatchback door or the bonnet, the mobile part moves upwards by a predetermined length, due to the relative rotation between the mobile and the fixed parts, the rotation being caused by the screw that stops against the mobile part on which it is screwed.

[0005] This rebound, while accomplishing its task, that is while making the adjustment of the rebound simpler, precise and even, forces the operator to make use of a screw that is to be screwed by means of a special tool inside one of the component elements of the rebound. This implies the fact that the operator can make a mistake and that the assembling time is rather long.

[0006] A further type of rebound for hatchback doors or bonnets of motor-vehicles is the one which does not need to be adjusted after the bonnet or the hatchback door is closed, the locking of the sliding element of the rebound, that is a sort of piston, at its final position, being enough to grant the wanted result. Said locking takes place by means of the rotation of the piston, the stem of which presents a basically oval cross section and is provided with a toothed section on its wider part, adapted to become engaged with a corresponding toothed section on the cylindrical seat supporting and guiding said piston, on two diametrical opposite parts of the inner

section.

[0007] It is an object of the present invention to provide a rebound for a mobile part of the bodywork such as a hatchback door or bonnet that can be adjusted after the door or the bonnet is closed for the first time, yet can be economical and easily mounted.

[0008] Said object is achieved by means of rebound for a mobile part of a motor-vehicle which presents the characteristics set forth in claim 1.

[0009] Additional characteristics and advantages will become more clear from the following description provided as non-restrictive example and referring to the appended drawings in which:

- 15 - figure 1 is a partially sectioned side view of the rebound of the invention a part of it being shown in two operating positions;
- figure 2 is a plant view along the line II-II in figure 1 in a first operating position;
- 20 - figure 3 is a plant view along the line II-II in figure 1 in a second operating position;
- figure 4 is a partially sectioned perspective view of the mobile piston of the rebound in figure 1;
- figure 5 is a perspective view of the spacer mounted on the piston in figure 4;
- 25 - figure 6 is a partially sectioned perspective view of the mobile piston of the rebound in figure 1, provided with a rubber piece instead of the spacer of figure 5, and
- 30 - figure 7 is a perspective view of the rubber piece mounted on the piston of figure 6.

[0010] With reference to the figure, reference number 1 indicates the overall rebound, completely made of plastic material, for a mobile part of a motor-vehicle such as the hatchback door or the bonnet. The rebound consists of a fixed body 3, mounted on a part of the bodywork 4. The fixed body 3 presents a central seat 5 intended to adjust the position of a piston 6 in its axial direction, a couple of toothed protruding surfaces 7 being provided, the toothed surfaces being located at opposite positions on the external surface. The seat 5 of the fixed body also presents two toothed surfaces 9, protruding inside the seat and placed the one opposite to the other. The diameter of the seat measured at the part with no teeth is basically equal to the diameter of the piston 6 measured at the toothed part.

[0011] Inside the seat, at the parts without teeth there is a pair of small teeth 11 adapted to oppose to the translation of the piston by getting engaged with its toothed surfaces, when it is forced into the axial direction. At the point where the small teeth 11 are the wall of the fixed body is provided with two undercuts 12 which provide more elasticity to the small teeth while the toothed surfaces 7 are passing (figure 2 and figure 3). It is clear that when the piston has to slide axially into the seat 5, its surfaces will be kept facing the small teeth 11, while in order to block the piston at the position it has reached

it will be necessary to rotate the piston by 90 degrees, in order to make the toothed part 7 to become engaged with the corresponding toothed parts of the base 9, which of course present a suitable profile.

[0012] As shown in figure 1, piston 6 is mobile under the thrust of the bonnet or hatchback door 13 so that it can move into a final position in which it is partially inserted into the seat 5, position in which the operator locks it by means of rotation, as previously explained.

[0013] The stem 17 of a mushroom-shaped spacer 18 is housed into a seat on piston 6, the spacer, as well as any described parts of the rebound being made of plastic. On the stem 17 there is a groove 19 adapted to house a ring rubber or plastic gasket 20, moulded on the piston 6, which allows to keep the spacer into the axial hole 16. While registering the rebound in its position namely in the position of piston 6, the spacer 18 is removed by means of traction on the protruding part of the mushroom and replaced with a mushroom-shaped rubber piece 21, having a plastic base 22 with a stem 23 presenting a circumferential groove adapted to receive a rubber ring gasket 25. The overall piece is basically the same as the spacer 18 as to shape and dimension, so that replacement can be effected quite easily.

[0014] The thickness of the rubber piece is calculated in order to make the swing-door when closed receive a thrust helping opening it. Said thrust eliminates vibrations that could occur while the motor-vehicle is moving. Its thickness varies according to the type and shape of the swing-door, yet replacement can be done during assembling so that the time needed will be the same as that needed for the basic rebound. The thickness of the spacer will of course be always the same.

spacer into the axial seat (16).

4. A rebound as claimed in claim 1 **characterised in that** the axial seat (16) is adapted to house the stem (24), provided with a rubber piece (22) and a plastic base (23) presenting a mushroom-like shape.
5. A rebound as claimed in claim 1 and 4 **characterised in that** the thickness of the rubber piece (22) can vary as desired.
6. A rebound as claimed in claim 1 and 4, **characterised in that** the stem (23) is provided with a groove adapted to house and retain a ring made of elastic material (25).

Claims

1. A plastic rebound for a mobile part of the bodywork of motor-vehicles, consisting of a fixed body (3) that can be fixed into a seat of the bodywork and of a mobile part (6) inserted into the fixed body inside a coaxial seat (5) that can be translated along its axis in order to adjust its position in relationship to the fixed body, and that can be blocked on a part (9) of said fixed body into a desired position, by means of rotation, **characterised in that** the mobile body (6) houses inside an axial seat (16) at its upper part, the stem (17) of a mushroom-shaped spacer (18) made of rigid material.
2. A rebound as claimed in claim 1, **characterised in that** the spacer can be taken out of the mobile body.
3. A rebound as claimed in claim 1 **characterised in that** the stem (17) of the spacer is provided with a groove (19) adapted to house a ring gasket (20) made of elastic material that allows to keep the

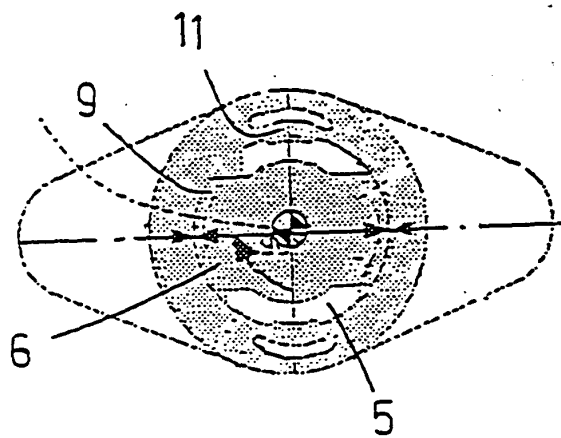
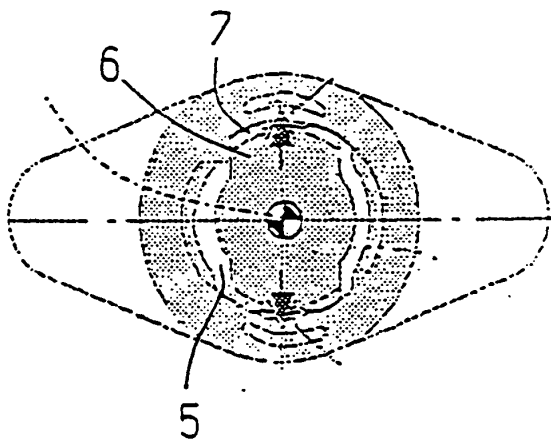
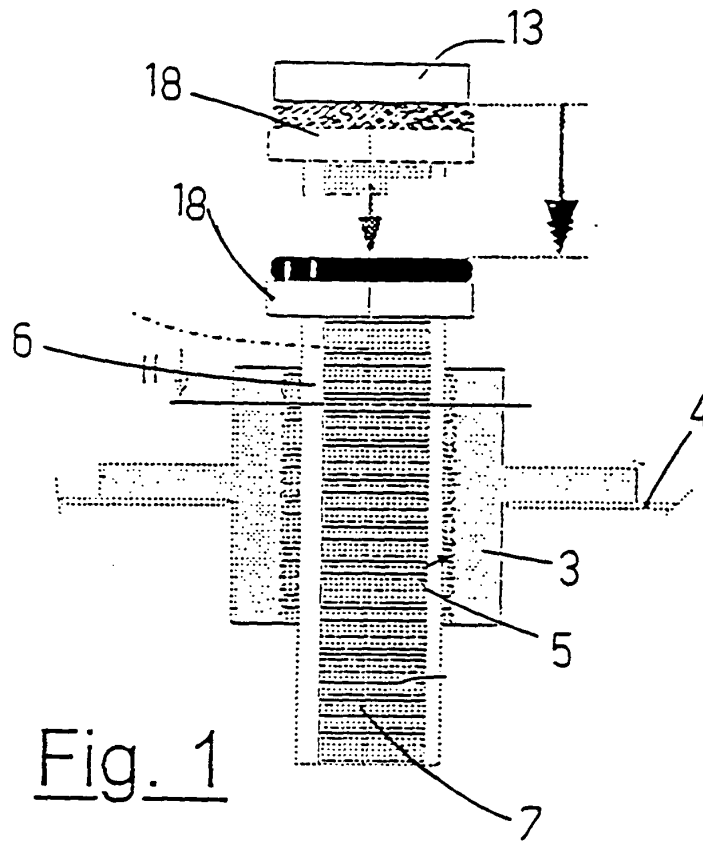


Fig. 4

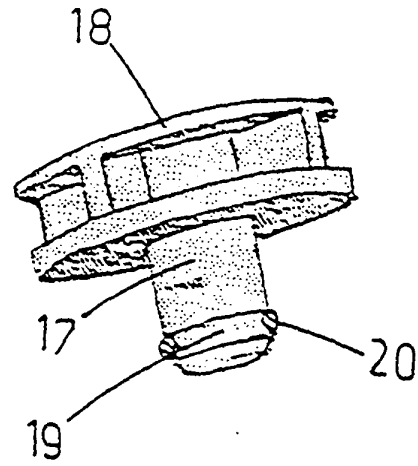
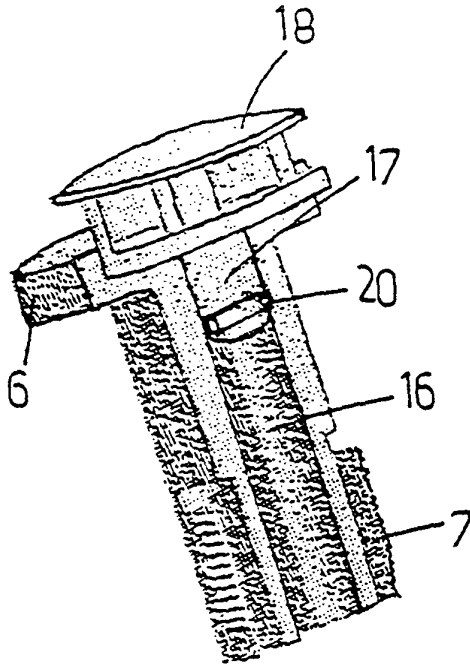


Fig. 5

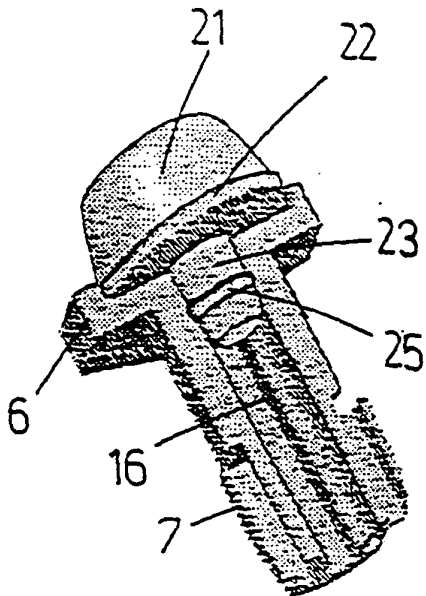


Fig. 6

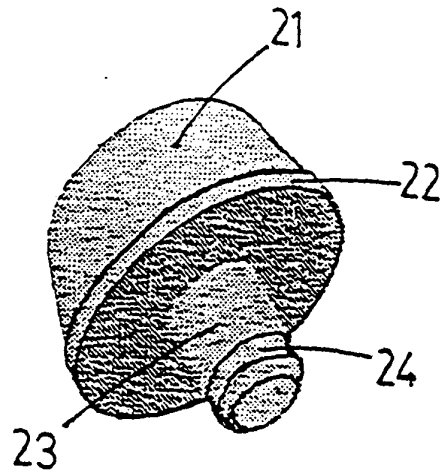


Fig. 7



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.7)
X	WO 02/38900 A (FIAT AUTO SPA ;NOVARINO WALTER (IT)) 16 May 2002 (2002-05-16) Claims unchanged with respect to RS-110247 * page 2, line 24 - page 3, line 3 * * page 3, line 23 - line 27 * * page 5, line 20 - page 6, line 13; claims 1,8; figures 1-3 * -----	1,2,4,5	E05F5/02
X	FR 661 742 A (CONTAL CAMILLE;KRETTLY PIERRE) 29 July 1929 (1929-07-29) * page 1, line 30 - line 54; figures 1-3 * -----	1,2,4,5	
A	EP 0 892 140 A (VOLKSWAGENWERK AG) 20 January 1999 (1999-01-20) * column 4, line 39 - line 49; figure 12 * -----	1,2,4,5	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			E05F B62D
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		8 October 2004	Guillaume, G
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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	

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 04 01 0046

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.

08-10-2004

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 0238900	A	16-05-2002	IT T020001052 A1	09-05-2002
			BR 0105687 A	25-06-2002
			CN 1473234 T	04-02-2004
			WO 0238900 A1	16-05-2002
			EP 1337731 A1	27-08-2003
			JP 2004513024 T	30-04-2004
			US 2004025290 A1	12-02-2004
FR 661742	A	29-07-1929	NONE	
EP 0892140	A	20-01-1999	EP 0892140 A2	20-01-1999