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(54) **Arrangement for locking and unlocking the luggage compartment of a motor-vehicle**

(57) The present invention refers to an arrangement for locking and unlocking the luggage compartment of a motor-vehicle, in particular a motor-car, comprising a frame (1) provided with a box-like accommodating recess (2) that is in turn provided, at a side end portion thereof, with a hole (6); a box-shaped element (7) accommodated in said recess (2) and accommodating itself the handle (14) for opening said luggage compartment; a lock unit (15) adapted to be positioned in said frame adjacent to said box-like recess, said lock unit be-

ing provided with a cantilever arm (20) protruding towards said box-like recess and provided, at the free end portion thereof, with a through-hole (21) capable of being arranged coaxially with said hole (6). There are also provided fastening means (22) for interconnecting said lock unit to said frame.

The box-shaped element (7) is provided with a hole (13) capable of being arranged coaxially with the holes (6, 21); said fastening means (22) are passing through the holes (6, 21) and engage corresponding retaining means provided in the hole (13).

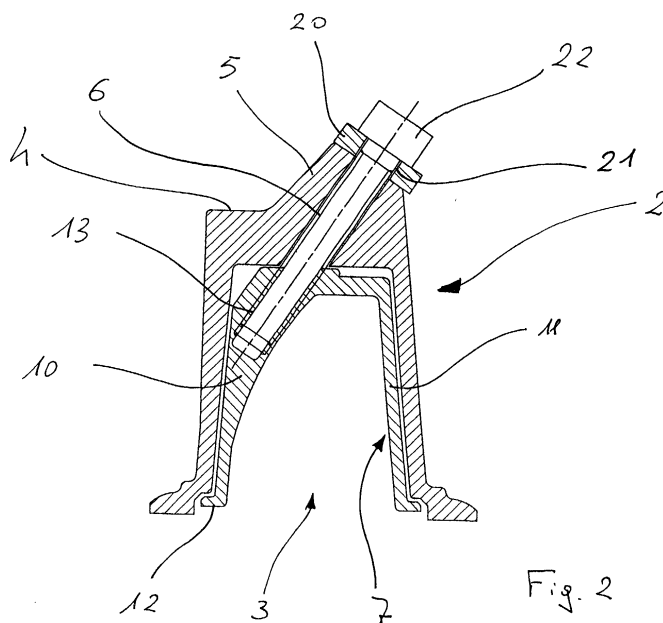


Fig. 2

Description

[0001] The present invention refers to an arrangement for locking and unlocking, i.e. opening and closing the luggage compartment of a motor-vehicle, in particular a motor-car.

[0002] The luggage compartment, i.e. the boot of motor-cars is generally known to be adapted to be closed and opened through the use of an actuating handle located on the lid or door closing the same luggage compartment; the possibility is furthermore given, especially in the case that the vehicle is to be left parked for a longer period of time, for the luggage compartment to be locked by means of a proper key, or in some other suitable way, thanks to the provision of a lock unit located near the handle.

[0003] Such a lock unit is generally mounted on the frame used as a support for the lid opening handle; this support frame is suitably shaped so as to feature a recess of a substantially box-like shape, that is adapted to accommodate the various parts making up the handle assembly, and is attached to the compartment closing lid or door (or, anyway, to the bodywork of the vehicle) by means of screws or similar fastening means. In correspondence of said box-shaped recess, which extends inwardly in the luggage compartment, there is accommodated an element, which is also shaped in a box-like configuration, and is attached on its rear side by means of screws, inside which there is hinged, by means of one or more transversal hinging pins, an actuating handle that is normally held in its resting position by at least a return spring.

[0004] The lock unit, which is constituted by an essentially cylindrically shaped block, is generally inserted at a side of the recess accommodating the box-shaped element, in correspondence of an aperture provided in the support frame and possibly featuring ring-shaped containment walls that extend inwardly in the luggage compartment. In a prior-art solution, the connection between the block of the lock unit and the support wall occurs by means of a cantilever arm projecting in an approximately perpendicular manner with respect to the same block and featuring, at the end portion thereof, a through-hole provided coaxially, once that said block is fitted, with a corresponding threaded hole provided in a protrusion of the box-shaped recess; a screw that passes through said hole in the arm, and engages the threading in the hole provided in the protrusion, fastens the block on to the frame.

[0005] Such a prior-art solution, although proving quite advantageous from the point of view of its compact construction and low space demand, has some drawbacks, in particular in those cases in which attempts are made by burglars or vandals to force or pick the lock. In such an unfortunate event, the picklock usually deals a blow to the surface of the lock unit that protrudes outwardly from the vehicle body. Such a blow causes the cylindrical block to suffer an axial stress that, via said

cantilever arm, discharges itself onto the protrusion of the box-shaped recess and the fastening screw.

[0006] Based on both cases from the practice and experimental results, it has been found that the zone that in these cases is most likely to undergo damage and breakage is the base of the protrusion of the box-shaped recess; it has also been found that the strength opposed by such a zone to an even modest force applied against it is rather low. Now, all this greatly contributes to a reduced ability of the vehicle to resist burglary and breaking attempts, thereby determining a reduced security level of the vehicle in general.

[0007] It therefore is a main purpose of the present invention to provide an arrangement for closing and opening, i.e. locking and unlocking the luggage compartment of a motor-vehicle which is provided with an improved ability to withstand burglary or theft attempts.

[0008] Within the scope of the above-cited main purpose, it is a further purpose of the present invention to provide an arrangement for closing and opening, i.e. locking and unlocking the luggage compartment of a motor-vehicle, which is capable of holding out for a longer period of time against the stresses brought about by impacts or blows dealt thereon by persons or objects, in particular during burglary attempts or attempts made to steal the vehicle.

[0009] Another equally important purpose of the present invention is to provide an arrangement which is low in costs and capable of being obtained with the use of currently available, largely known machines and techniques.

[0010] According to the present invention, these aims are reached in an arrangement for closing and opening, i.e. locking and unlocking the luggage compartment of a motor-vehicle incorporating the features and characteristics as recited and defined in the appended claims.

[0011] Features and advantages of the present invention will be more readily understood from the description of a particular, although not sole embodiment, which is given below by way of non-limiting example with reference to the accompanying drawings, in which:

- Figure 1 is a perspective exploded view of the arrangement according to the present invention;
- Figure 2 is a cross-sectional view along the plane II-II of Figure 1 of the arrangement according to the present invention;
- Figure 3 is a similar view as the previous one of a second embodiment of the arrangement according to the present invention.

[0012] With reference to the accompanying Figures, the arrangement for closing and opening, i.e. locking and unlocking the luggage compartment of a motor-vehicle comprises a support frame 1, which is preferably made of plastic material and is adapted to be fastened

inside the luggage compartment (or, anyway, on to the bodywork) of a motor-vehicle in a per sé known (and not shown) manner.

[0013] Such a support frame 1 is provided with a box-shaped recess 2 extending inwardly in the luggage compartment and being substantially in the shape of a reverse U in its cross-section, wherein the front (lower, in the described example) wall 3 thereof is open. In correspondence of the opposite wall 4, near a side end portion thereof, said box-like recess 2 is provided with a protrusion 5 with an approximately trapezoidal cross-section in which there is provided a first through-hole 6, which is preferably unthreaded. Within the box-like recess 2 there is accommodated a box-shaped element 7, which is fastened to said same recess 2 by means of screws 8 passing for instance through holes 9 provided in the wall 4.

[0014] The cross-section of said box-shaped element 7 has an outer contour that is substantially in the shape of a reverse U, and an inner contour featuring an approximately trapezoidal shape, in such a manner as to define a side wall 10 (corresponding to one of the shanks of the U) that has a greater thickness as compared to the other side wall 11; similarly to the box-like recess 2, the box-shaped element 7 has its front (lower, in the described example) wall open, as defined by an edge 12.

[0015] In correspondence of the side wall 10 featuring an increased thickness, there is provided a second hole 13 which is provided with retaining means, such as a threading, and is arranged coaxially with said first hole 6 once that the box-shaped element 7 is accommodated in the box-like recess 2.

[0016] Hinged on to said box-shaped element 7, by means of one or more transversal hinging pins, there is an opening handle 14 that is normally held in its resting position by at least a return spring in a per sé known manner; for reasons of greater clarity, the handle 14 is not shown in Figure 2.

[0017] The lock unit 15, which is constituted by a block 16 of a substantially cylindrical shape, is inserted adjacent to the box-like recess 2 in correspondence of an aperture 17 provided in the frame 1 and featuring advantageously circular containment walls 18 that extend inwardly in the luggage compartment; the block is of course oriented in such a manner as to enable the key-hole 19 to be accessible from the outside. In correspondence of the upper end portion thereof, the block 16 is provided with a cantilever arm 20 protruding in an approximately perpendicular manner with respect to the same block towards the box-like recess 2; in correspondence of the free end portion thereof, said cantilever arm is provided with a third through-hole 21, which is arranged coaxially with said first through-hole 6 and said second threaded hole 13.

[0018] A peculiar feature of the present invention is constituted by the manner in which the lock unit 15 is connected to the frame 1, wherein such a connection is

obtained by means of fastening means such as for instance a screw 22 passing through the third hole 21, the first hole 6 and engaging the retaining means that are provided in the box-shaped element 7 and are constituted by the threading in said second hole 13.

[0019] The screw 22 engaging the second hole 13, instead of the first hole 6 as it occurs in the prior-art, enables stresses brought about by blows imparted to the block 16 to be transferred from the protrusion 5 of the box-like recess 2 to the box-shaped element 7, while at the same time ensuring an optimum distribution of internal stresses in the arrangement made in this way. In fact, the box-shaped element 7 turns out to have a much greater strength to resist the above cited stresses, since it is fully contained within such a resistant structure as the recess 2; furthermore, the greater extension of the linkage of the block 16 with several strong members such as the protrusion 5 of the recess 2 and the box-shaped element 7, as well as the interconnection of said block with said members, give the whole assembly a greater capability of withstanding the stresses imposed by impacts or blows that may be dealt by burglars or vandals during burglary attempts or attempts at stealing the vehicle. Finally, the box-shaped element 7 acting as a locking bolt to lock the screw 22 further contributes to an increased strength and safety of the connection.

[0020] It has in this way been found that the arrangement according to the present invention is actually capable of reaching all of the pre-set aims, an arrangement having been devised which is provided with a greater capability of withstanding burglary or theft attempts.

[0021] It will of course be appreciated that the above described arrangement may be subject to a number of modifications and variants without departing from the scope of the present invention.

[0022] So, for instance, Figure 3 can be noticed to illustrate a second embodiment of the present invention, in which to an increased tensile strength of the arrangement there are contributing at least a pair of teeth 23, 24 protruding outwardly from the box-shaped element 7 and interacting, by abutting thereagainst, with corresponding sunken receptacles 25, 26 provided inside the box-like recess; preferably, said pair of teeth 23, 24 and the corresponding sunken receptacles 25, 26 are positioned at different heights with respect to the longitudinal axis of the box-shaped element 7 and the box-like recess 2.

[0023] It will be further appreciated that the materials used in the construction of the arrangement according to the present invention, as well as the shapes and the size of the various parts thereof, may be selected so as to most suitably fit any particular application and requirement.

Claims

1. Arrangement for locking and unlocking the luggage

compartment of a motor-vehicle comprising:

- a frame provided with a box-like accommodating recess that is in turn provided, at a side end portion thereof, with a first hole,
- a box-shaped element accommodated in said recess and accommodating itself the handle for opening said luggage compartment,
- a lock unit adapted to be positioned in said frame adjacent to said box-like recess, said lock unit being provided with a cantilever arm protruding towards said box-like recess and provided, at the free end portion thereof, with a third through-hole capable of being arranged coaxially with said first hole,
- fastening means for interconnecting said lock unit to said frame,

characterized in that said box-shaped element (7) is provided with a second hole (13) capable of being arranged coaxially with said first and third holes (6, 21), said fastening means (22) passing through said first and said third hole and engaging corresponding retaining means provided in said second hole (13).

2. Arrangement according to claim 1, **characterized in that** said box-like accommodating recess (2) is provided, on the wall (4) oriented inwardly in said luggage compartment and in the proximity of a side end portion thereof, with a protrusion (5) in which there is provided said first hole (6) and on which said cantilever arm (20) of said lock unit (15) rests.

3. Arrangement according to claim 2, **characterized in that** said first hole (6) is an unthreaded through-hole.

4. Arrangement according to claim 1, **characterized in that** said box-shaped element (7) has a cross-section with an outer contour in the shape of substantially a reverse U and an inner contour of an approximately trapezoidal shape so as to define a side wall (10) having a greater thickness than the opposite side wall (11).

5. Arrangement according to claim 4, **characterized in that** said second hole (13) is provided in correspondence of said side wall (10) having such an increased thickness.

6. Arrangement according to claim 1, **characterized in that** said lock unit (15) is constituted by a block (16) of an essentially cylindrical shape adapted to be positioned in correspondence of an aperture (17) provided in said frame (1).

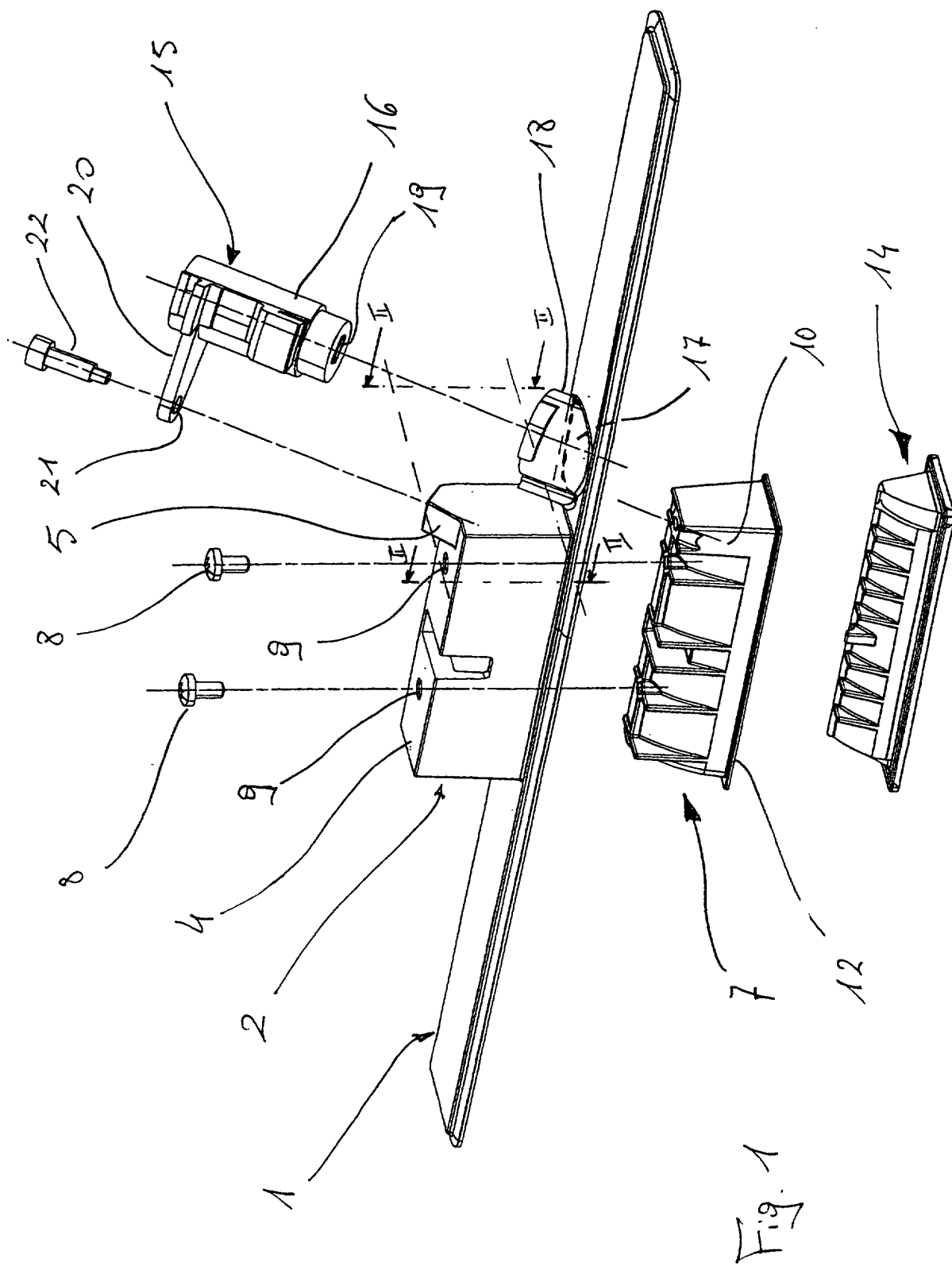
7. Arrangement according to claim 6, **characterized in that** said aperture (17) is provided with circular

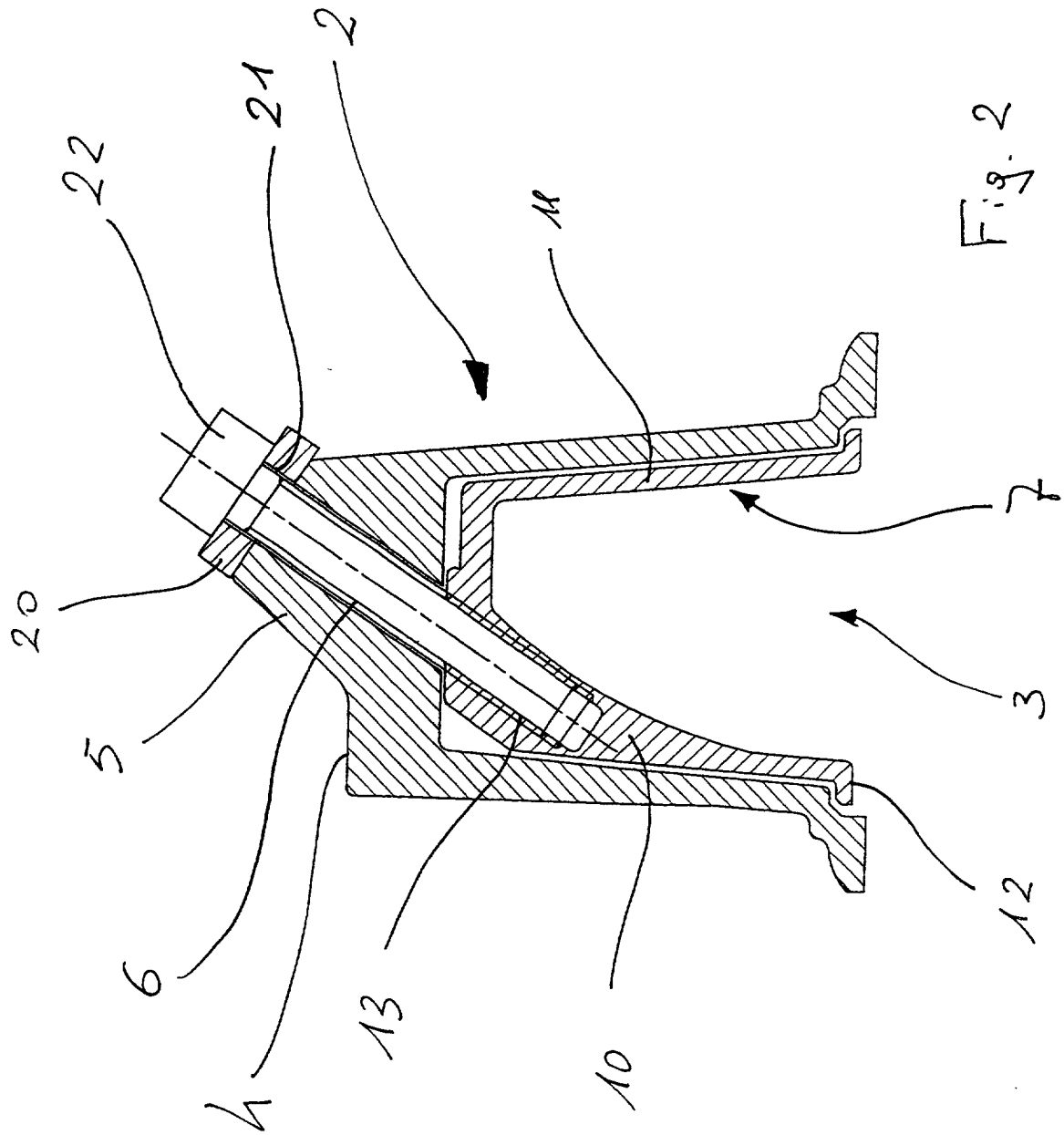
containment walls (18) extending inwardly in the luggage compartment.

8. Arrangement according to claim 1, **characterized in that** said fastening means are constituted by a screw (22).

9. Arrangement according to claim 1, **characterized in that** said retaining means are constituted by a threading provided in said second hole (13).

10. Arrangement according to any of the preceding claims or combinations thereof, **characterized in that** said box-shaped element (7) is provided with at least a pair of teeth (23, 24) protruding outwardly from said box-shaped element (7) and interacting, by abutting thereagainst, with corresponding sunk-en receptacles (25, 26) provided inside said box-like recess (2).





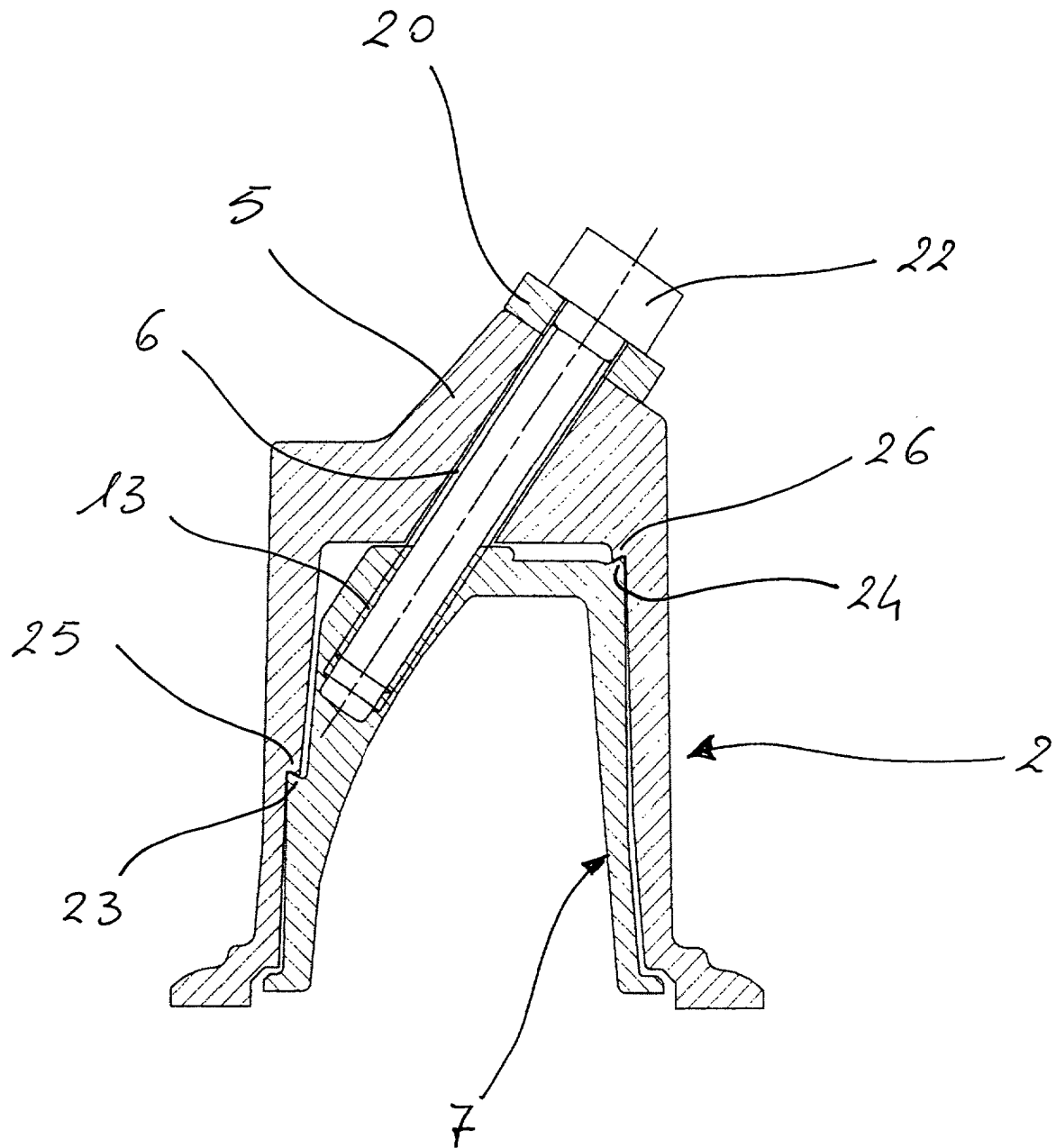


Fig. 3