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(54) **DOOR HANDLE FOR A MOTOR VEHICLE**

(57) The invention concerns a door handle (1) intended to be mounted on a door (2) of a motor vehicle and a method for mounting and dismounting a cap. The door handle (1) comprises a gripping sleeve (5) including an end portion (7) and is arranged to be movable in rotation between a rest position in which it is positioned substantially parallel to the door (2), the end portion (7) being adjacent to the door (2), and an open position of the door (2) in which it is inclined relative to the door (2), the end portion (7) being distant from the door (2).

According to the invention, the gripping sleeve (5)

includes a fixed portion (43) and a cap (9) removable relative to the fixed portion (43) forming the end portion (7) of the door handle (1). The cap (9) is intended to cover at least partially a lock (8) mounted on the door (2) of the vehicle. The gripping sleeve (5) includes fastening means allowing to fasten the cap (9) to the fixed portion (43) of the gripping sleeve (5) and to remove the cap (9) from the fixed portion (43) by a translational movement of the cap (9), only when the door handle (1) is in the open position of the door (2).

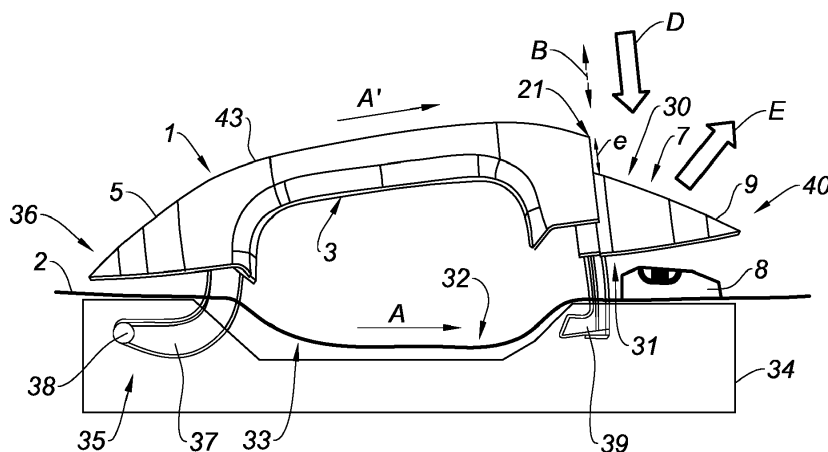


Fig. 3

Description

[0001] The invention concerns a door handle intended to be mounted on a door of a motor vehicle and a method for mounting and dismounting a cap on the door handle.

[0002] This type of door handle has a first end which is rotatably linked to the door and an opposite second end.

[0003] The door handle is mounted movable in rotation on the door between a rest position in which it is positioned substantially parallel to the door, the second end being adjacent to the door, and an open position of the door in which it is inclined relative to the door, the second end being in this case distant from the door.

[0004] Although motor vehicles are equipped with a centralized opening and closure device, a lock cylinder (or lock) is fastened on the door to enable the opening of the door in case of failure of the centralized opening and closure device or in case of emergency.

[0005] For aesthetical reasons, the lock is positioned on the door handle or behind the latter. It is then masked by a lid or a cover.

[0006] There are solutions such as the one of the document EP3118400 describing a door handle movable in rotation comprising an ornamental element forming a removable lid mounted on a door handle body allowing to completely mask the lock. The ornamental element extends over the entire length of the handle body thereby allowing to ensure an aesthetical continuity of the handle. The lock is accessible by removing the ornamental element.

[0007] However, the drawback of this solution is that the ornamental element must be completely removed in order to access to the lock and that it may be lost when the vehicle runs.

[0008] There is another solution such as the one of the document EP 2853665 describing a handle movable in rotation mounted on a door. The handle comprises an opening disposed opposite a lock fastened on the door. The opening is closed by a small lid clipped onto the handle. The lid can be easily removed by pushing it with a thumb.

[0009] The drawback of this solution is that the lid may be lost when detached from the handle when the vehicle is in displacement due to vibrations or when washing the vehicle.

[0010] The invention aims at overcoming these drawbacks by providing a door handle for a motor vehicle comprising a removable cap intended to mask a lock mounted on the door which cannot be disconnected from the handle when the vehicle is moving.

[0011] The invention concerns a door handle intended to be mounted on a door of a motor vehicle.

[0012] The door handle comprises a gripping sleeve including an end portion and is arranged to be movable in rotation between a rest position in which it is positioned substantially parallel to said door, the end portion being adjacent to the door, and an open position of the door in

which it is inclined relative to the door, the end portion being distant from the door.

[0013] According to the invention, the gripping sleeve includes a fixed portion and a cap removable from the fixed portion. The cap forms the end portion of the door handle.

[0014] The cap is intended to cover at least partially a lock mounted on the door of the vehicle.

[0015] The gripping sleeve includes fastening means allowing to fasten the cap to the fixed portion of the gripping sleeve and to remove the cap from the fixed portion by a translational movement of the cap, only when the door handle is in the open position of the door.

[0016] Alternatively, when the door handle is in the rest position, the cap has a first end blocked by the fastening means and a second end intended to be blocked by the door.

[0017] And when the door handle is in the open position of the door, the cap is movable in translation along an axis of translation B between a blocking position in which its first end is blocked by the fastening means and a release position in which it is disconnected from the fastening means.

[0018] Alternatively, the depth of the cap is substantially identical to that of the gripping sleeve to block the latter between the fastening means and the door which is capable of forming a stop when the door handle is in the rest position.

[0019] The fastening means have a thickness e smaller than the distance d between the second end of the cap and the door when the door handle is in the open position so as to enable the translation of the cap toward the door in order to disconnect the cap from the fixed portion of the gripping sleeve.

[0020] Alternatively, the fastening means comprise a flexible clip housed in a cavity of the cap.

[0021] The flexible clip includes two opposite flexible fastening ends clipping respectively into two opposite lugs of the fixed portion of the gripping sleeve positioned in a cavity of the gripping sleeve to block the cap against the gripping sleeve.

[0022] Alternatively, each of the two fastening ends of the flexible clip comprises a notch receiving one of the lugs of the gripping sleeve to hold the flexible clip in compression when the cap is fastened on the fixed portion of the gripping sleeve. The notches are blocked by the lugs.

[0023] Alternatively, the flexible clip is positioned at a lateral end of the cap, the two fastening ends of the flexible clip being positioned in the vicinity of the longitudinal flanges of the cap and positioned at the second end of the cap.

[0024] The lugs are positioned in the vicinity of a lateral end of the fixed portion of the gripping sleeve and in the vicinity of the longitudinal flanges of the fixed portion of the gripping sleeve.

[0025] The lateral ends are adjacent when the cap is fastened to the fixed portion of the gripping sleeve.

[0026] Alternatively, the flexible clip has a curved shape adjusted to the shape of an inner surface of the fixed portion of the gripping sleeve.

[0027] The flexible clip has a lateral wall extending perpendicularly to the inner surface of the fixed portion of the gripping sleeve when the cap is fastened to the fixed portion of the gripping sleeve.

[0028] Alternatively, the fastening means comprise centering means allowing to guide the cap during its fastening on the fixed portion of the gripping sleeve and to hold the cap firmly against this fixed portion when the cap is fastened to the fixed portion of the gripping sleeve to avoid the displacement of the cap relative to the latter.

[0029] Alternatively, the centering means comprise a centering element extending over the inner surface of the fixed portion of the gripping sleeve substantially parallel to the lateral end of the fixed portion of the gripping sleeve by protruding on the inner surface of the fixed portion.

[0030] The centering means also comprise a groove formed in the cap.

[0031] The groove is delimited by the lateral wall of the flexible clip, a holding wall substantially parallel to the lateral wall and a lower wall linking the walls.

[0032] The centering element of the gripping sleeve is inserted into the groove of the cap when the cap is fastened to the fixed portion of the gripping sleeve.

[0033] Alternatively, the lower wall of the groove of the cap comprises two opposite recesses housing a portion of the fastening ends of the flexible clip.

[0034] Alternatively, the fastening means comprise guide means to guide the cap relative to the fixed portion of the gripping sleeve during the translation of the cap relative to the fixed portion of the gripping sleeve along the axis of translation B.

[0035] Alternatively, the guide means comprise at least one projection formed on the inner surface of the fixed portion of the gripping sleeve cooperating with a guide orifice formed in the lower wall of the centering groove of the cap.

[0036] The projection of the fixed portion is inserted into the guide orifice of the cap to guide the cap along the axis of translation B during an operation of fastening the cap on the fixed portion of the gripping sleeve and of removing the cap.

[0037] The invention also concerns a method for mounting and dismounting a cap on a fixed portion of a gripping sleeve, as previously defined.

[0038] According to the invention, the door handle being initially in a rest position in which it is positioned substantially parallel to the door, the end portion being adjacent to the door, the method comprises a step of opening the door handle in which it is inclined relative to the door. The end portion is then distant from the door.

[0039] Afterwards, the method comprises a step of connecting or disconnecting the cap on the fixed portion of the gripping sleeve via fastening means.

[0040] The method also comprises a step of translating

the cap relative to the fixed portion of the gripping sleeve, either toward a direction opposite to the door to fasten the cap to the fixed portion of the gripping sleeve by the fastening means so as to cover at least partially a lock mounted on the door of the vehicle when the door handle returns to the rest position or toward the door after the disconnection of the cap from the fixed portion of the gripping sleeve to make the lock accessible.

[0041] Thus, the invention provides a door handle for a motor vehicle comprising a cap intended to mask a lock mounted on the door which cannot be lost.

[0042] Indeed, the cap can be removed from the handle only when the latter is actuated toward an open position of the door. When the handle is in the rest position (not actuated), the cap is blocked by the door and the fastening means.

[0043] Thus, the cap cannot be disconnected on its own from the handle when the vehicle runs or during the washing of the vehicle. It cannot be lost accidentally.

[0044] In addition, the invention provides a handle having an improved aesthetical appearance. This solution looks like an integral handle. It is difficult to notice that it comprises a removable cap because the latter extends an end portion of the handle. In addition, the cap is movable in rotation with the rest of the handle when the latter is actuated.

[0045] The invention provides a cap which can be easily disconnected from the handle, without having to use a tool which is likely to damage the handle. The cap is removed from the handle in a direction opposite to the direction of holding the handle in the open position.

[0046] The centering means allow avoiding an inclination of the cap relative to the fixed portion of the gripping sleeve.

[0047] Thus, the centering means allow obtaining a perfect alignment between the outer surface of the cap and the outer surface of the fixed portion of the gripping sleeve, thereby guaranteeing a perfect aesthetical appearance.

[0048] Other characteristics and advantages of the invention will become apparent upon reading the following description, given only as an example, with reference to the appended figures, which illustrate:

- Figure 1 is a schematic view of a door handle, according to an embodiment of the invention, mounted on a door in the rest position;
- Figure 2 is a schematic view of this door handle in an open position of the door;
- Figure 3 is a schematic view of this door handle in the open position of the door and when the cap is disconnected from the handle;
- Figure 4 is a schematic view of this door handle in the open position of the door and when the cap is completely removed;
- Figure 5 is a detail schematic view of the cap fastened to the fixed portion of the gripping sleeve of the handle;

- Figure 6 is a schematic view of the front of the gripping sleeve;
- Figure 7 is a schematic view of the rear of the gripping sleeve;
- Figure 8 is a detailed schematic view of the rear of the cap fastened to the fixed portion of the gripping sleeve;
- Figure 9 is another detailed schematic view of the rear of the cap fastened to the fixed portion of the gripping sleeve;
- Figure 10 is a transverse view of the fixed portion of the gripping sleeve and of the flexible clip of the cap;
- Figure 11 is a transverse view of the fixed portion of the gripping sleeve alone;
- Figure 12 is a schematic view of the cap during an operation of disconnecting the latter from the fixed portion of the gripping sleeve according to a possible embodiment;
- Figure 13 is a schematic view of the rear of the cap after its disconnection from the fixed portion of the gripping sleeve;
- Figure 14 is another schematic view of the rear of the cap after its disconnection from the fixed portion of the gripping sleeve;
- Figure 15 is a side view of the cap after its disconnection from the fixed portion of the gripping sleeve;
- Figure 16 is another view of the rear of the cap before its connection to the fixed portion of the gripping sleeve.

[0049] Figures 1 to 4 illustrate an outer door handle 1 which is mounted movable in rotation on an outer surface 32 of a door 2 of a motor vehicle.

[0050] The door handle 1 is linked to a base 34 which is fastened to an inner surface 33 of the door 2.

[0051] The door handle 1 extends according to a longitudinal direction A'.

[0052] When the door handle 1 is in the rest position, as illustrated in Figure 1, the longitudinal direction A' of the door handle 1 is substantially parallel to a longitudinal direction A of the door 2.

[0053] The door handle 1 comprises a handle body 3 linked to the base 34 via a hinge 35 positioned at a first end 36 of the door handle 1. The hinge 35 comprises a pivot arm 37 rotatable about an axis of rotation 38. The pivot arm 37 has a first end linked to the base 34 via the axis of rotation 38 and a second end linked to the handle body 3.

[0054] A maneuvering lever 39 links a second end 40 of the door handle 1 to the base 34. More specifically, the maneuvering lever 39 links the base 34 to the handle body 3.

[0055] The door handle 1 is arranged to be movable in rotation between a rest position in which it is positioned substantially parallel to the door 2, the end portion 7 being adjacent to the door 2 (Fig. 1), and an open position of the door 2 in which it is inclined relative to the door 2, the end portion 7 being distant from the door 2 (Fig. 2).

[0056] When the door handle 1 is in the open position of the door, as illustrated in Figures 2 to 4, the longitudinal direction A' of the door handle 1 is inclined relative to a longitudinal direction A of the door 2.

5 **[0057]** The door handle 1 performs a rotation according to the direction C to reach the open position of the door.

[0058] The maneuvering lever 39 slides in the base 34 between the rest position and the open position.

10 **[0059]** The door handle 1 comprises a gripping sleeve 5 or lid including an end portion 7. More specifically, the gripping sleeve 5 covers the handle body 3 and improves the aesthetic appearance of the handle. It generally forms a trim element.

15 **[0060]** The door 2 comprises a lock 8 positioned below the end portion 7 of the gripping sleeve 5.

[0061] According to the invention, the gripping sleeve 5 includes a removable cap 9 forming the end portion 7 of the door handle 1, as illustrated in Figures 6 and 7.

20 **[0062]** The cap 9 is fastened to a fixed portion 43 of the gripping sleeve 5 and is removable from said fixed portion 43.

[0063] The cap 9 is intended to cover at least partially a lock 8 mounted on the door 2 of the vehicle.

25 **[0064]** The fixed portion 43 of the gripping sleeve 5 comprises a lateral opening 6 adjacent to the lock 8 and delimited by a lateral end or flange 21.

[0065] The cap 9 is intended to close this lateral opening 6. In this example, the lateral opening 6 extends along a plane (X, Y).

30 **[0066]** In the example of Figures 1 to 4 and in a preferred manner, the cap 9 entirely covers and protects the lock 8.

35 **[0067]** The gripping sleeve 5 includes fastening means 10 allowing to fasten the cap 9 to the fixed portion 43 of the gripping sleeve 5 and remove the cap 9 from the fixed portion 43 of the gripping sleeve 5 by a translational movement of the cap 9 in the plane (X, Y), only when the door handle 1 is in the open position of the door 2.

40 **[0068]** By « open position », is meant a sufficient opening, as defined hereinafter, enabling the movement of the cap 9. The door handle 1 may be completely open or not.

45 **[0069]** Figure 3 shows an embodiment in which the cap 9 is movable in translation along an axis of translation B which is perpendicular to the longitudinal direction A' of the door handle 1. The axis of translation B is parallel to the plane (X, Y) which is perpendicular to the plane of Figure 3.

[0070] Alternatively, the axis of translation B or the plane (X, Y) may be inclined relative to the longitudinal direction A'.

[0071] During the removal of the cap 9, its movement is directed transversely toward the door 2, in the direction D.

55 **[0072]** Alternatively and as illustrated in Figure 12, the operator can apply a slight rotational movement (5° to 15° for example) to the cap 9 along the direction F in order to disconnect it from the fixed portion 43 of the

gripping sleeve 5.

[0073] Afterwards, the cap 9 is removed from the fixed portion 43 of the gripping sleeve 5 by a translational movement of the cap 9 according to the axis of translation B and in the direction D.

[0074] Afterwards, the cap 9 is displaced in the direction E, opposite to the door 2, to release it completely from the rest of the gripping sleeve 5, as illustrated in Figure 3.

[0075] As illustrated in Figure 4, the operator can freely access to the lock 8 to open it using a key 41.

[0076] When the door handle 1 is in the rest position (Fig. 1), the cap 9 has a first end 30 blocked by the fastening means 10 and an opposite second end 31 blocked by the door 2 and more specifically by the outer surface 32 of the door 2.

[0077] Thus, in this position, the cap 9 cannot be disconnected alone from the handle.

[0078] When the door handle 1 is in the open position of the door 2, as illustrated in Figure 2, the cap 9 can be movable along the plane (X, Y) and more particularly along an axis of translation B between a blocking position in which its first end 30 is blocked by the fastening means 10 and a release position in which this first end 30 is disconnected from the fastening means 10.

[0079] When the door handle 1 is in the rest position (Fig. 1), the translation of the cap 9 according to the axis of translation B or the plane (X, Y) is not possible.

[0080] The depth (or the height) of the cap 9 is substantially identical to that of the gripping sleeve 5 to block the latter between the fastening means 10 and the door 2 which then forms a stop when the door handle 1 is in the rest position.

[0081] When the door handle 1 is open, the second end 31 of the cap 9 is separated from the outer surface 32 of the door 2 by a distance d.

[0082] The fastening means 10 have a thickness e smaller than the distance d so as to enable the translation of the cap 9 toward the door 2 in order to disconnect the cap 9 from the fixed portion 43 of the gripping sleeve 5.

[0083] The door handle 1 must perform a minimum of rotation along the direction C for the distance d to be sufficient to enable the translation of the cap 9 and its release. The door handle 1 may be only partially open.

[0084] The distance d must be larger than the thickness e of the cap 9 for the latter to be no longer blocked by the outer surface 32 of the door 2.

[0085] For example, the thickness e of the fastening means 10 may be comprised between 3 mm and 6 mm.

[0086] Figures 5 to 16 describe the fastening means 10 in a more accurate manner.

[0087] The fastening means 10 comprise a flexible clip 11 housed in a cavity 12 of the cap 9.

[0088] Figure 10 shows only the flexible clip 11 of the cap 9 fastened to the fixed portion 43 of the gripping sleeve 5.

[0089] The flexible clip 11 includes two opposite fastening ends 13 respectively clipping into two opposite

lugs 14 of the fixed portion 43 of the gripping sleeve 5. They are positioned in a cavity 4 of the fixed portion 43 of the gripping sleeve 5 to block the cap 9 against the gripping sleeve 5, as illustrated in Figures 5 and 7 to 10.

[0090] The flexible clip 11 and the cap 9 form an integral part, obtained by molding, for example. They are made of a plastic material.

[0091] Similarly, the lugs 14 and the gripping sleeve 5 form an integral part, obtained by molding, for example. They are made of a plastic material.

[0092] Other variants are possible. The flexible clip 11 and the cap 9 may be distinct parts, just as the lugs 14 and the gripping sleeve 5.

[0093] Each of the two fastening ends 13 of the flexible clip 11 comprises a notch 15 receiving one of the lugs 14 of the gripping sleeve 5 to hold the flexible clip 11 in compression when the cap 9 is fastened on the fixed portion 43 of the gripping sleeve 5. The lugs 14 block the notches 15.

[0094] The notch 15 is in the form of a curve 47 surrounded by two projections 48.

[0095] In order to disconnect the cap 9 from the fixed portion 43 of the gripping sleeve 5, at least one of the notches 15 of the flexible clip 11 must be removed from the associated lug 14 of the gripping sleeve 5. The flexible clip 11 then recovers its non-compressed initial shape.

[0096] The flexible clip 11 is positioned at a lateral end 42 of the cap 9.

[0097] The cap 9 comprises longitudinal flanges 26, 27 joining at the second end 40 of the door handle 1.

[0098] The two fastening ends 13 of the flexible clip 11 are positioned in the vicinity of the longitudinal flanges 26, 27 of the cap 9 and positioned at the second end 31 of the cap 9.

[0099] The lugs 14 are positioned in the vicinity of a lateral end 21 of the fixed portion 43 of the gripping sleeve 5 and in the vicinity of the longitudinal flanges 28, 29 of the fixed portion 43.

[0100] The lateral ends 42, 21 are adjacent when the cap 9 is fastened on the fixed portion 43 of the gripping sleeve 5. More specifically, the lateral end 42 of the cap 9 and the lateral end 21 of the fixed portion 43 of the gripping sleeve 5 overlap.

[0101] The flexible clip 11 has a curved shape adjusted to the shape of an inner surface 17 of the fixed portion 43 of the gripping sleeve 5.

[0102] The flexible clip 11 has a lateral wall 16 extending perpendicularly to the inner surface 17 of the fixed portion 43 of the gripping sleeve 5 when the cap 9 is fastened to the fixed portion 43 of the gripping sleeve 5.

[0103] In other words, the flexible clip 11 protrudes on the inner surface 17 of the fixed portion 43 of the gripping sleeve 5.

[0104] The flexible clip 11 comprises a central portion 44 extended by the two flexible fastening ends 13 which are thinner than the central portion 44 and elastically deformable.

[0105] When the flexible clip 11 is fastened to the lugs

14 (Fig. 10), the two fastening ends 13 are deformed and inclined. They are not in contact with the inner wall of the fixed portion 43 of the gripping sleeve 5 so as to provide it with mobility during the disconnection.

[0106] The fastening means 10 comprise centering means 18, 19 allowing to guide the cap 9 during its fastening on the fixed portion 43 of the gripping sleeve 5 and to hold the cap 9 firmly against the fixed portion 43 when the cap 9 is fastened to the latter to avoid the displacement of the cap 9 relative to the fixed portion 43 of the gripping sleeve 5.

[0107] The centering means 18, 19 comprise a centering element 18 extending over the inner surface 17 of the fixed portion 43 of the gripping sleeve substantially parallel to the lateral end 21 of the fixed portion 43 of the gripping sleeve by protruding on the inner surface 17 of the fixed portion 43.

[0108] In the example of Figures 1 to 13, the centering element 18 comprises two walls 45 parallel to each other and separated by a space in order to increase the thickness of the centering element 18.

[0109] The centering means 18, 19 comprise a groove 19 formed in the cap 9.

[0110] The groove 19 is delimited by the lateral wall 16 of the flexible clip 11, a holding wall 20 substantially parallel to the lateral wall 16 and a lower wall 24 linking these walls 16, 20.

[0111] The centering element 18 of the gripping sleeve is inserted into the groove 19 of the cap 9 when the cap 9 is fastened to the fixed portion 43 of the gripping sleeve 5.

[0112] The centering means 18, 19 have a non-zero depth e , corresponding to the thickness e of the fastening means 10, enabling the centering element 18 of the cap 9 to slide along the walls 16, 20 of the groove 19 according to the axis of translation B during the fastening of the cap 9 or its removal.

[0113] The centering means 18, 19 allow to avoid the inclination of the cap 9 relative to the fixed portion 43 of the gripping sleeve 5 after the connection.

[0114] The lateral wall 16 of the flexible clip 11 and the holding wall 20 are substantially parallel to the plane (X, Y) and perpendicular to the direction A'. Similarly, the two walls 45 of the centering element 18 are substantially parallel to the plane (X, Y).

[0115] During the translation of the cap 9 relative to the fixed portion 43 of the gripping sleeve 5, the two walls 45 of the centering element 18 slide respectively on and along the lateral wall 16 of the flexible clip 11 and of the holding wall 20 of the groove 19.

[0116] The holding wall 20 of the cap 9 comprises an upper bearing surface 51 abutting against a bearing surface 52 of the fixed portion 43 of the gripping sleeve 5 housing the centering element 18, and the lateral end 21 of the fixed portion 43 of the gripping sleeve 5.

[0117] The lower wall 24 of the groove 19 of the cap 9 comprises two opposite recesses 25 housing a portion of the fastening ends 13 of the flexible clip 11.

[0118] These recesses 25 allow the fastening ends 13 to be flexible.

[0119] The fastening means 10 comprise guide means 22, 23 to guide the cap 9 relative to the fixed portion 43 of the gripping sleeve 5 during the translation of the cap 9 relative to the fixed portion 43 of the gripping sleeve 5 along the axis of translation B.

[0120] The guide means 22, 23 comprise at least one projection 22 formed on the inner surface 17 of the fixed portion 43 of the gripping sleeve 5, as represented in Figure 11, cooperating with a guide orifice 23 formed in the lower wall 24 of the centering groove 19 of the cap 9.

[0121] The projection 22 of the fixed portion 43 of the gripping sleeve 5 is inserted into the guide orifice 23 of the cap 9 to guide the cap 9 along the axis of translation B during an operation of fastening the cap 9 on the fixed portion 43 of the gripping sleeve 5 or of removing the cap 9.

[0122] In this example, the projection 22 is formed by two parallel walls 46.

[0123] The cap 9 comprises a shoulder 49 linking an inner surface 50 of the cap 9 to the fastening means 10.

[0124] The lateral wall 16 of the flexible clip 11 and the holding wall 20 are substantially perpendicular to the inner surface 50 of the cap 9 which is curved (concave).

[0125] The invention also concerns a method for mounting and dismounting a cap 9 on a fixed portion 43 of a gripping sleeve 5 of a door handle 1 rotatably mounted on a door 2 of a motor vehicle.

[0126] The door handle 1 being initially in a rest position in which it is positioned substantially parallel to the door 2, as represented in Figure 1, the method comprises a step of opening the door handle 1 in which it is inclined relative to the door 2. The end portion 7 of the handle or the cap 9 are then distant from the door 2.

[0127] Afterwards, the method comprises a step of connecting or disconnecting the cap 9 on the fixed portion 43 of the gripping sleeve 5 via fastening means 10, as represented in Figures 3, 12 to 14.

[0128] Figure 12 illustrates a disconnection step, as previously described, in which a rotation is applied on the cap 9 to make it turn in the plane (X, Y) and in the direction F in order to disconnect it from the fixed portion 43 of the gripping sleeve 5.

[0129] Figures 3, 13 and 14 show another disconnection mode in which the cap 9 is disconnected from the fixed portion 43 of the gripping sleeve 5 by a translational movement in the plane (X, Y), along the axis of translation B and toward the door 2.

[0130] More specifically, it is the flexible clip 11 of the cap 9 which is unclipped from the lugs 14 of the fixed portion 43 of the gripping sleeve 5 by a translational or rotational movement of the cap 9 exerted with the hand of a user.

[0131] Afterwards, the method comprises a step of translating the cap 9 relative to the fixed portion 43 of the gripping sleeve 5 in the plane (X, Y) and along the axis of translation B toward the door 2, in order to disconnect

the cap 9 from the fixed portion 43 of the gripping sleeve 5 and make the lock 8 accessible, as illustrated in Figure 15.

[0132] This translation step is achieved via the centering means 18, 19 allowing to guide the cap 9.

[0133] Afterwards, the cap 9 is removed in the direction E, as illustrated in Figure 3.

[0134] By analogy, the cap 9 can be translated relative to the fixed portion 43 of the gripping sleeve 5 in the plane (X, Y) and along the axis of translation B toward a direction opposite to the door 2 in order to fasten the cap 9 to the fixed portion 43 of the gripping sleeve 5 by the fastening means 10, as illustrated in Figure 16.

[0135] This enables the cap 9 to cover at least partially the lock 8 mounted on the door 2 of the vehicle when the door handle 1 returns to its rest position.

[0136] The invention is described in the foregoing as an example. It is understood that those skilled in the art are capable of carrying out different variants of the invention without departing from the scope of the invention.

Claims

1. A door handle (1) intended to be mounted on a door (2) of a motor vehicle, said door handle (1) comprising a gripping sleeve (5) including an end portion (7) and being arranged to be movable in rotation between a rest position in which it is positioned substantially parallel to said door (2), said end portion (7) being adjacent to the door (2), and an open position of the door (2) in which it is inclined relative to the door (2), said end portion (7) being distant from the door (2),

characterized in that:

- said gripping sleeve (5) includes a fixed portion (43) and a cap (9) removable from the fixed portion (43) forming the end portion (7) of the door handle (1), said cap (9) being intended to cover at least partially a lock (8) mounted on the door (2) of the vehicle, said gripping sleeve (5) including fastening means (10) allowing to fasten the cap (9) to the fixed portion (43) of the gripping sleeve (5) and to remove the cap (9) from said fixed portion (43) by a translational movement of the cap (9), only when the door handle (1) is in the open position of the door (2).

2. The door handle (1) according to claim 1, **characterized in that**, when the door handle (1) is in the rest position, the cap (9) has a first end (30) blocked by the fastening means (10) and a second end (31) intended to be blocked by the door (2), and when the door handle (1) is in the open position of the door (2), the cap (9) is movable in translation along an axis of translation (B) between a blocking position in which its first end (30) is blocked by the fastening

means (10) and a release position in which it is disconnected from the fastening means (10).

3. The door handle (1) according to any one of claims 1 or 2, **characterized in that** the depth of the cap (9) is substantially identical to that of the gripping sleeve (5) to block the latter between the fastening means (10) and the door (2) capable of forming a stop when the door handle (1) is in the rest position, the fastening means (10) having a thickness e smaller than the distance d between the second end (31) of the cap (9) and the door (2) when the door handle (1) is in the open position so as to enable the translation of the cap (9) toward the door (2) in order to disconnect the cap (9) from the fixed portion (43) of the gripping sleeve (5).
4. The door handle (1) according to any one of claims 1 to 3, **characterized in that** the fastening means (10) comprise a flexible clip (11) housed in a cavity (12) of the cap (9), said flexible clip (11) including two opposite flexible fastening ends (13) clipping respectively into two opposite lugs (14) of the fixed portion (43) of the gripping sleeve (5) positioned in a cavity (4) of the gripping sleeve (5) to block the cap (9) against the fixed portion (43) of the gripping sleeve (5).
5. The door handle (1) according to claim 4, **characterized in that** each of the two fastening ends (13) of the flexible clip (11) comprises a notch (15) receiving one of the lugs (14) of the gripping sleeve (5) to hold the flexible clip (11) in compression when the cap (9) is fastened on the fixed portion (43) of the gripping sleeve (5).
6. The door handle (1) according to any one of claims 4 or 5, **characterized in that** the flexible clip (11) is positioned at a lateral end (42) of the cap (9), the two fastening ends (13) of the flexible clip (11) being positioned in the vicinity of the longitudinal flanges (26, 27) of the cap (9) and positioned at the second end (31) of the cap (9), the lugs (14) being positioned in the vicinity of a lateral end (21) of the fixed portion (43) of the gripping sleeve (5) and in the vicinity of the longitudinal flanges (28, 29) of the fixed portion (43) of the gripping sleeve (5), said lateral ends (42, 21) being adjacent when the cap (9) is fastened to the fixed portion (43) of the gripping sleeve (5).
7. The door handle (1) according to any one of claims 4 to 6, **characterized in that** the flexible clip (11) has a curved shape adjusted to the shape of an inner surface (17) of the fixed portion (43) of the gripping sleeve (5), said flexible clip (11) having a lateral wall (16) extending perpendicularly to the inner surface (17) of the fixed portion (43) of the gripping sleeve (5) when the cap (9) is fastened to the fixed portion

(43) of the gripping sleeve (5).

8. The door handle (1) according to any one of claims 1 to 7, **characterized in that** the fastening means (10) comprise centering means (18, 19) allowing to guide the cap (9) during its fastening on the fixed portion (43) of the gripping sleeve (5) and to hold the cap (9) firmly against said fixed portion (43) when the cap (9) is fastened to the fixed portion (43) of the gripping sleeve (5) to avoid the displacement of the cap (9) relative to the fixed portion (43) of the gripping sleeve (5).
9. The door handle (1) according to claim 8, **characterized in that** the centering means (18, 19) comprise a centering element (18) extending over the inner surface (17) of the fixed portion (43) of the gripping sleeve substantially parallel to the lateral end (21) of the fixed portion (43) of the gripping sleeve protruding on said inner surface (17) of the fixed portion (43), and a groove (19) formed in the cap (9), said groove (19) being delimited by the lateral wall (16) of the flexible clip (11), a holding wall (20) substantially parallel to said lateral wall (16) and a lower wall (24) linking said walls (16, 20), the centering element (18) of the gripping sleeve being inserted into the groove (19) of the cap (9) when the cap (9) is fastened to the fixed portion (43) of the gripping sleeve (5).
10. The door handle (1) according to claim 9, **characterized in that** the lower wall (24) of the groove (19) of the cap (9) comprises two opposite recesses (25) housing a portion of the fastening ends (13) of the flexible clip (11).
11. The door handle (1) according to any one of claims 2 to 10, **characterized in that** the fastening means (10) comprise guide means (22, 23) to guide the cap (9) relative to the fixed portion (43) of the gripping sleeve (5) during the translation of the cap (9) relative to the fixed portion (43) of the gripping sleeve (5) along the axis of translation (B).
12. The door handle (1) according to claim 11, **characterized in that** the guide means (22, 23) comprise at least one projection (22) formed on the inner surface (17) of the fixed portion (43) of the gripping sleeve (5) cooperating with a guide orifice (23) formed in the lower wall (24) of the centering groove (19) of the cap (9), the projection (22) of the fixed portion (43) being inserted into the guide orifice (23) of the cap (9) to guide the cap (9) along the axis of translation (B) during an operation of fastening the cap (9) on the fixed portion (43) of the gripping sleeve (5) and of removing the cap (9).
13. A method for mounting and dismounting a cap (9)

on a fixed portion (43) of a gripping sleeve (5) of a door handle (1) intended to be rotatably mounted on a door (2) of a motor vehicle, said cap (9) forming an end portion (7) of the gripping sleeve (5), the door handle (1) being initially in a rest position in which it is positioned substantially parallel to said door (2), said end portion (7) being adjacent to the door (2), **characterized in that** it comprises:

- a step of opening the door handle (1) in which it is inclined relative to the door (2), said end portion (7) being distant from the door (2),
- a step of connecting or disconnecting the cap (9) on the fixed portion (43) of the gripping sleeve (5) via fastening means (10),
- a step of translating the cap (9) relative to the fixed portion (43) of the gripping sleeve (5), either toward a direction opposite to the door (2) to fasten the cap (9) to the fixed portion (43) of the gripping sleeve (5) by the fastening means (10) so as to cover at least partially a lock (8) mounted on the door (2) of the vehicle when the door handle (1) returns to the rest position or toward the door (2) after the disconnection of the cap (9) from the fixed portion (43) of the gripping sleeve (5) to make the lock (8) accessible.

Amended claims in accordance with Rule 137(2) EPC.

1. A door handle (1) intended to be mounted on a door (2) of a motor vehicle, said door handle (1) comprising a gripping sleeve (5) including an end portion (7) and being arranged to be movable in rotation between a rest position in which it is positioned substantially parallel to said door (2), said end portion (7) being adjacent to the door (2), and an open position of the door (2) in which it is inclined relative to the door (2), said end portion (7) being distant from the door (2),

characterized in that:

- said gripping sleeve (5) includes a fixed portion (43) and a cap (9) removable from the fixed portion (43) forming the end portion (7) of the door handle (1), said cap (9) being intended to cover at least partially a lock (8) mounted on the door (2) of the vehicle, said gripping sleeve (5) including fastening means (10) allowing to fasten the cap (9) to the fixed portion (43) of the gripping sleeve (5) and to remove the cap (9) from said fixed portion (43) by a translational movement of the cap (9), only when the door handle (1) is in the open position of the door (2), the depth of the cap (9) is substantially identical to that of the gripping sleeve (5) to block the latter between the fastening means (10) and the door (2) ca-

- pable of forming a stop when the door handle (1) is in the rest position, the fastening means (10) having a thickness e smaller than the distance d between the second end (31) of the cap (9) and the door (2) when the door handle (1) is in the open position so as to enable the translation of the cap (9) toward the door (2) in order to disconnect the cap (9) from the fixed portion (43) of the gripping sleeve (5).
2. The door handle (1) according to claim 1, **characterized in that**, when the door handle (1) is in the rest position, the cap (9) has a first end (30) blocked by the fastening means (10) and a second end (31) intended to be blocked by the door (2), and when the door handle (1) is in the open position of the door (2), the cap (9) is movable in translation along an axis of translation (B) between a blocking position in which its first end (30) is blocked by the fastening means (10) and a release position in which it is disconnected from the fastening means (10).
 3. The door handle (1) according to any one of claims 1 to 2, **characterized in that** the fastening means (10) comprise a flexible clip (11) housed in a cavity (12) of the cap (9), said flexible clip (11) including two opposite flexible fastening ends (13) clipping respectively into two opposite lugs (14) of the fixed portion (43) of the gripping sleeve (5) positioned in a cavity (4) of the gripping sleeve (5) to block the cap (9) against the fixed portion (43) of the gripping sleeve (5).
 4. The door handle (1) according to claim 3, **characterized in that** each of the two fastening ends (13) of the flexible clip (11) comprises a notch (15) receiving one of the lugs (14) of the gripping sleeve (5) to hold the flexible clip (11) in compression when the cap (9) is fastened on the fixed portion (43) of the gripping sleeve (5).
 5. The door handle (1) according to any one of claims 3 or 4, **characterized in that** the flexible clip (11) is positioned at a lateral end (42) of the cap (9), the two fastening ends (13) of the flexible clip (11) being positioned in the vicinity of the longitudinal flanges (26, 27) of the cap (9) and positioned at the second end (31) of the cap (9), the lugs (14) being positioned in the vicinity of a lateral end (21) of the fixed portion (43) of the gripping sleeve (5) and in the vicinity of the longitudinal flanges (28, 29) of the fixed portion (43) of the gripping sleeve (5), said lateral ends (42, 21) being adjacent when the cap (9) is fastened to the fixed portion (43) of the gripping sleeve (5).
 6. The door handle (1) according to any one of claims 3 to 5, **characterized in that** the flexible clip (11) has a curved shape adjusted to the shape of an inner surface (17) of the fixed portion (43) of the gripping sleeve (5), said flexible clip (11) having a lateral wall (16) extending perpendicularly to the inner surface (17) of the fixed portion (43) of the gripping sleeve (5) when the cap (9) is fastened to the fixed portion (43) of the gripping sleeve (5).
 7. The door handle (1) according to any one of claims 1 to 6, **characterized in that** the fastening means (10) comprise centering means (18, 19) allowing to guide the cap (9) during its fastening on the fixed portion (43) of the gripping sleeve (5) and to hold the cap (9) firmly against said fixed portion (43) when the cap (9) is fastened to the fixed portion (43) of the gripping sleeve (5) to avoid the displacement of the cap (9) relative to the fixed portion (43) of the gripping sleeve (5).
 8. The door handle (1) according to claim 7, **characterized in that** the centering means (18, 19) comprise a centering element (18) extending over the inner surface (17) of the fixed portion (43) of the gripping sleeve substantially parallel to the lateral end (21) of the fixed portion (43) of the gripping sleeve protruding on said inner surface (17) of the fixed portion (43), and a groove (19) formed in the cap (9), said groove (19) being delimited by the lateral wall (16) of the flexible clip (11), a holding wall (20) substantially parallel to said lateral wall (16) and a lower wall (24) linking said walls (16, 20), the centering element (18) of the gripping sleeve being inserted into the groove (19) of the cap (9) when the cap (9) is fastened to the fixed portion (43) of the gripping sleeve (5).
 9. The door handle (1) according to claim 8, **characterized in that** the lower wall (24) of the groove (19) of the cap (9) comprises two opposite recesses (25) housing a portion of the fastening ends (13) of the flexible clip (11).
 10. The door handle (1) according to any one of claims 2 to 9, **characterized in that** the fastening means (10) comprise guide means (22, 23) to guide the cap (9) relative to the fixed portion (43) of the gripping sleeve (5) during the translation of the cap (9) relative to the fixed portion (43) of the gripping sleeve (5) along the axis of translation (B).
 11. The door handle (1) according to claim 10, **characterized in that** the guide means (22, 23) comprise at least one projection (22) formed on the inner surface (17) of the fixed portion (43) of the gripping sleeve (5) cooperating with a guide orifice (23) formed in the lower wall (24) of the centering groove (19) of the cap (9), the projection (22) of the fixed portion (43) being inserted into the guide orifice (23) of the cap (9) to guide the cap (9) along the axis of

translation (B) during an operation of fastening the cap (9) on the fixed portion (43) of the gripping sleeve (5) and of removing the cap (9).

12. A method for mounting and dismounting a cap (9) 5
on a fixed portion (43) of a gripping sleeve (5) of a door handle (1) intended to be rotatably mounted on a door (2) of a motor vehicle, said cap (9) forming an end portion (7) of the gripping sleeve (5), the door handle (1) being initially in a rest position in which it is positioned substantially parallel to said door (2), said end portion (7) being adjacent to the door (2), according to claim 1 to 11, **characterized in that** it comprises: 10

- a step of opening the door handle (1) in which it is inclined relative to the door (2), said end portion (7) being distant from the door (2), 15
- a step of connecting or disconnecting the cap (9) on the fixed portion (43) of the gripping sleeve (5) via fastening means (10), 20

a step of translating the cap (9) relative to the fixed portion (43) of the gripping sleeve (5), either toward a direction opposite to the door (2) to fasten the cap (9) to the fixed portion (43) of the gripping sleeve (5) by the fastening means (10) so as to cover at least partially a lock (8) mounted on the door (2) of the vehicle when the door handle (1) returns to the rest position or toward the door (2) after the disconnection of the cap (9) from the fixed portion (43) of the gripping sleeve (5) to make the lock (8) accessible. 25 30

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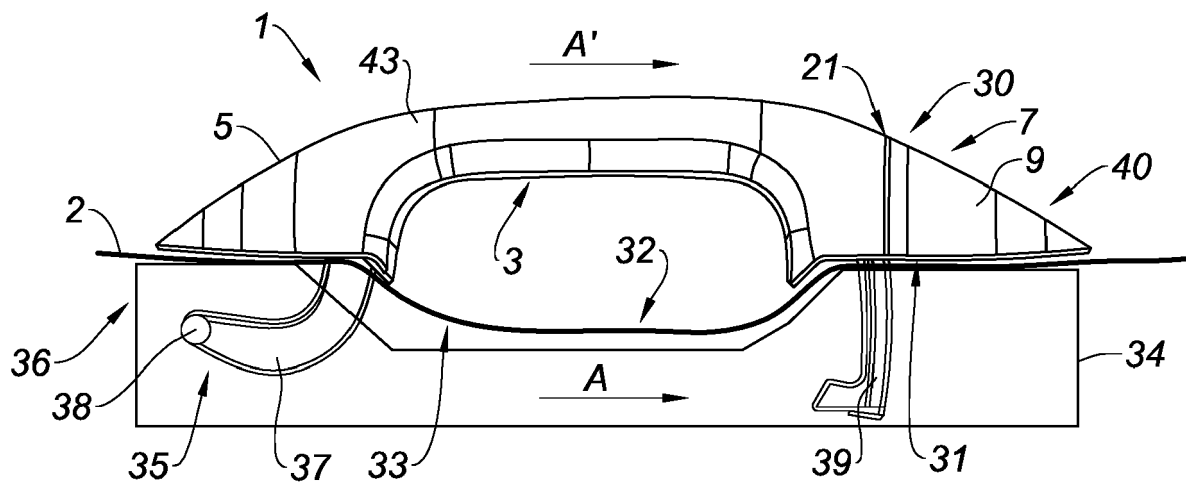


Fig. 1

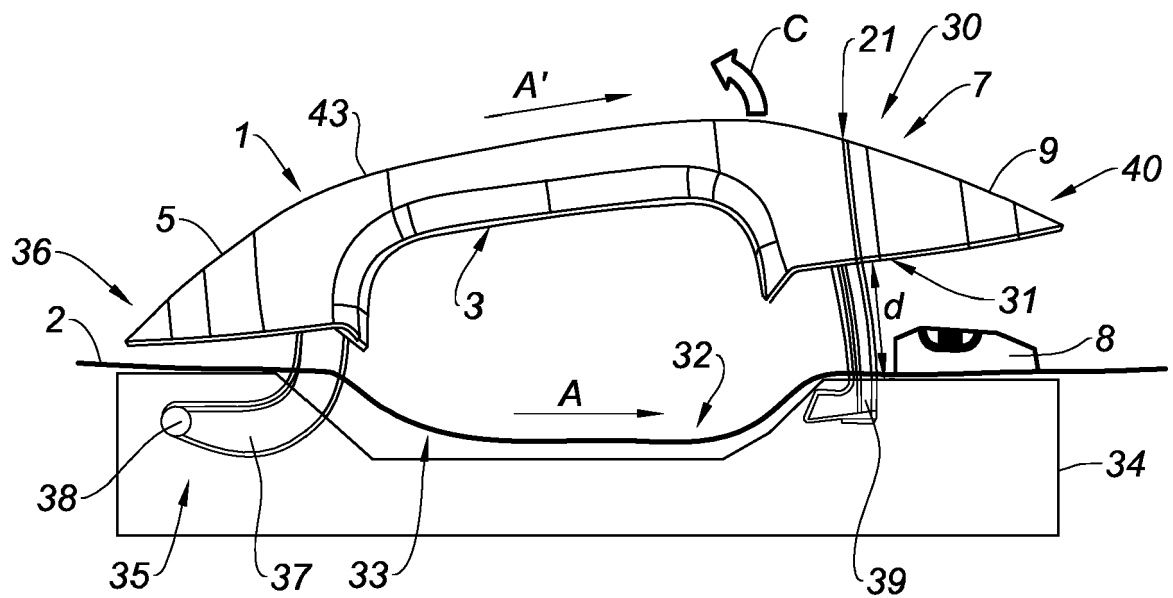


Fig. 2

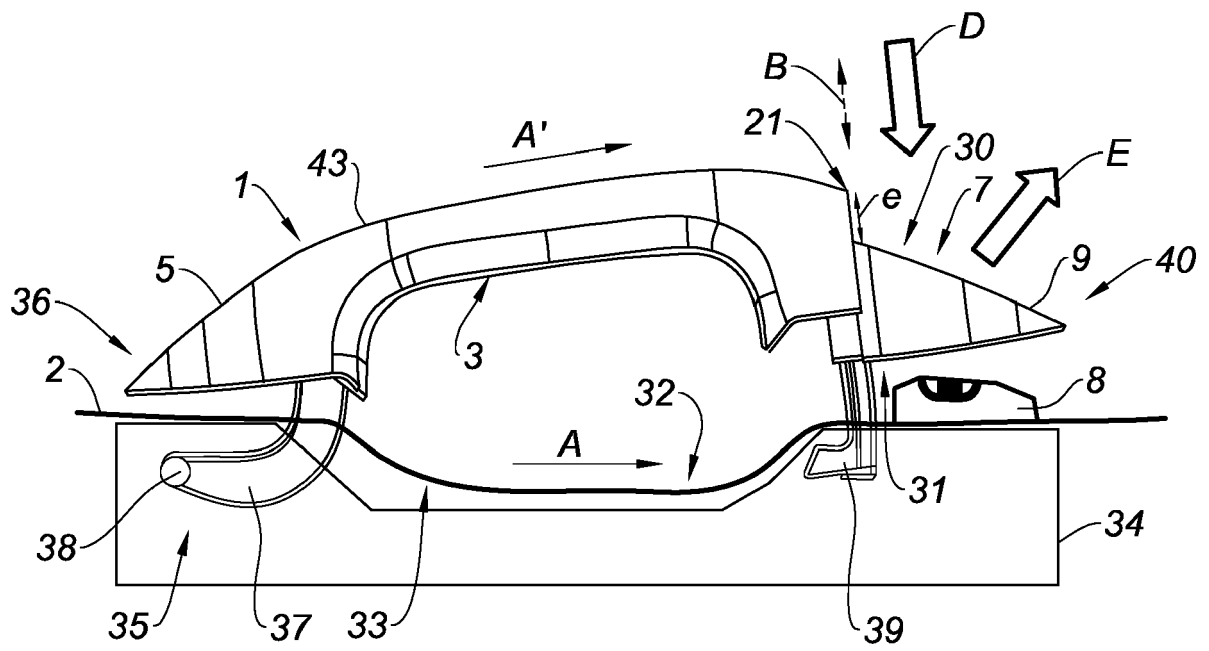


Fig. 3

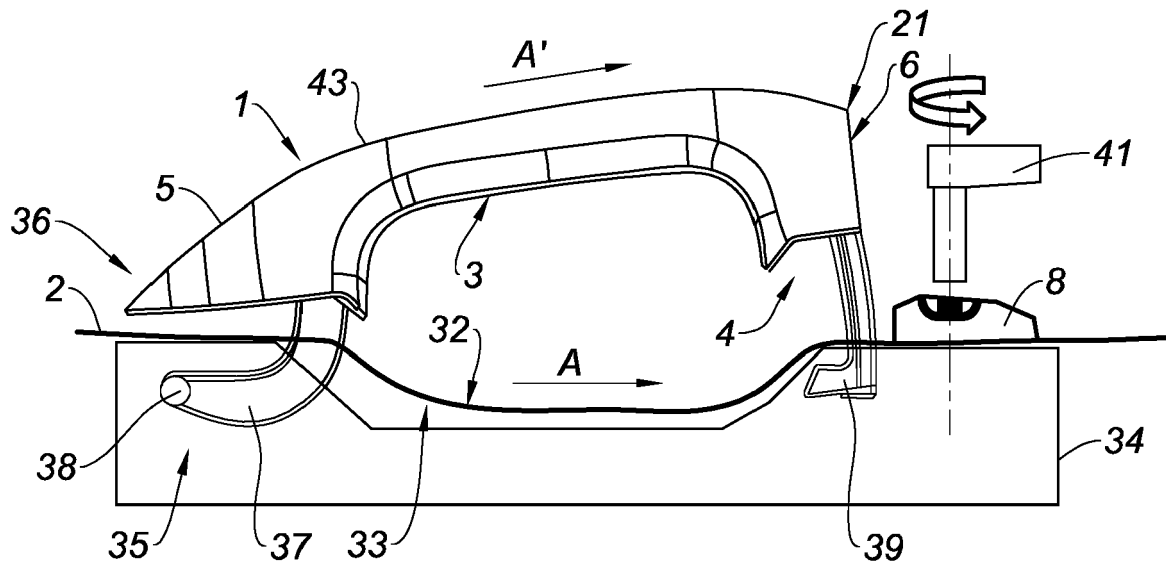


Fig. 4

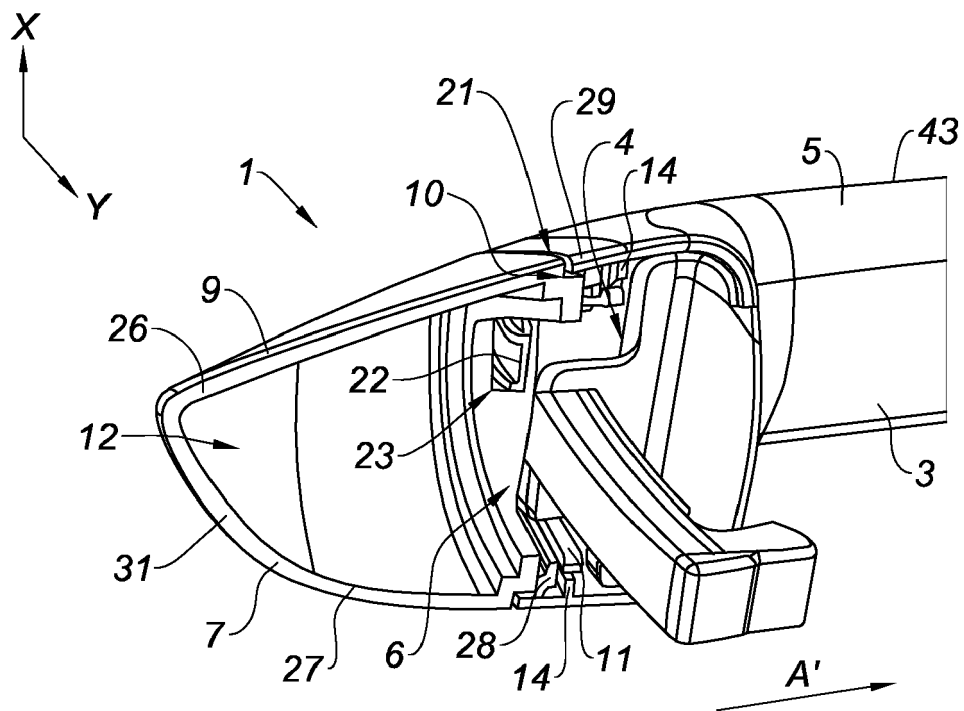


Fig. 5

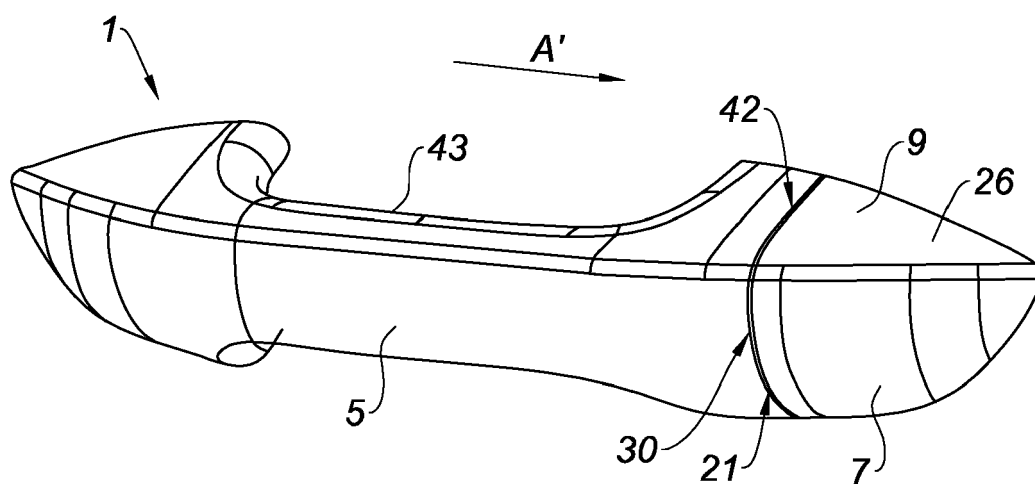


Fig. 6

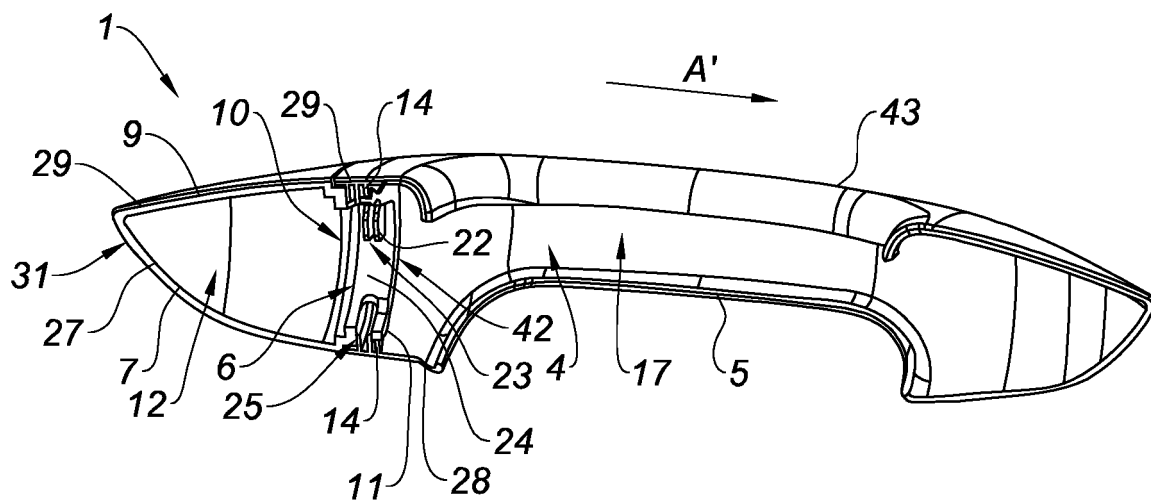


Fig. 7

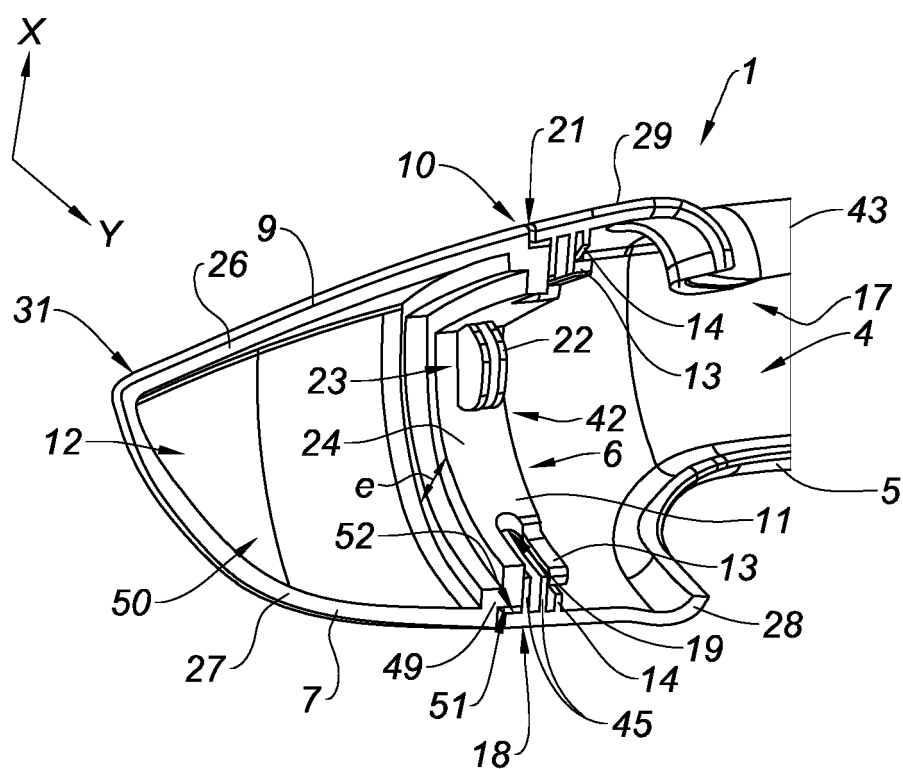


Fig. 8

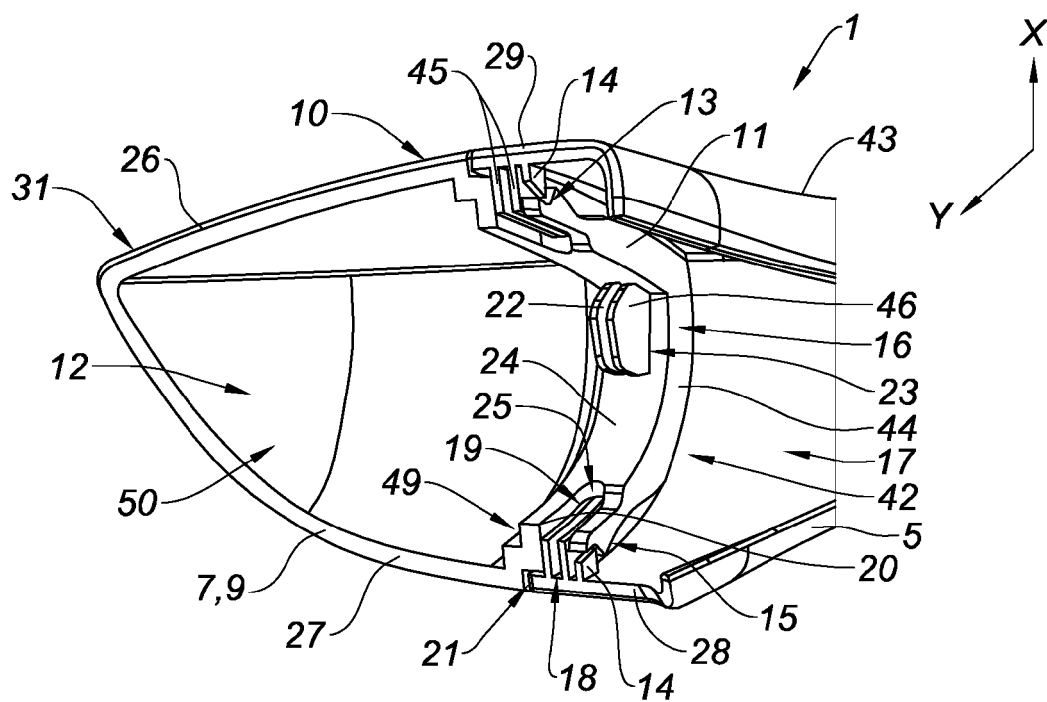


Fig. 9

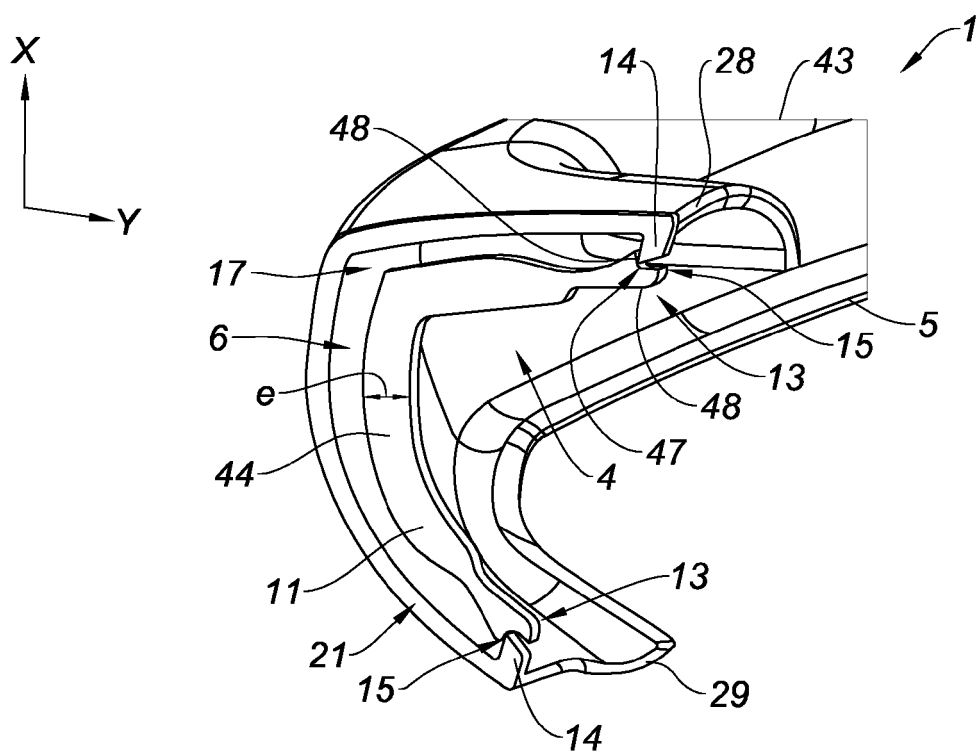


Fig. 10

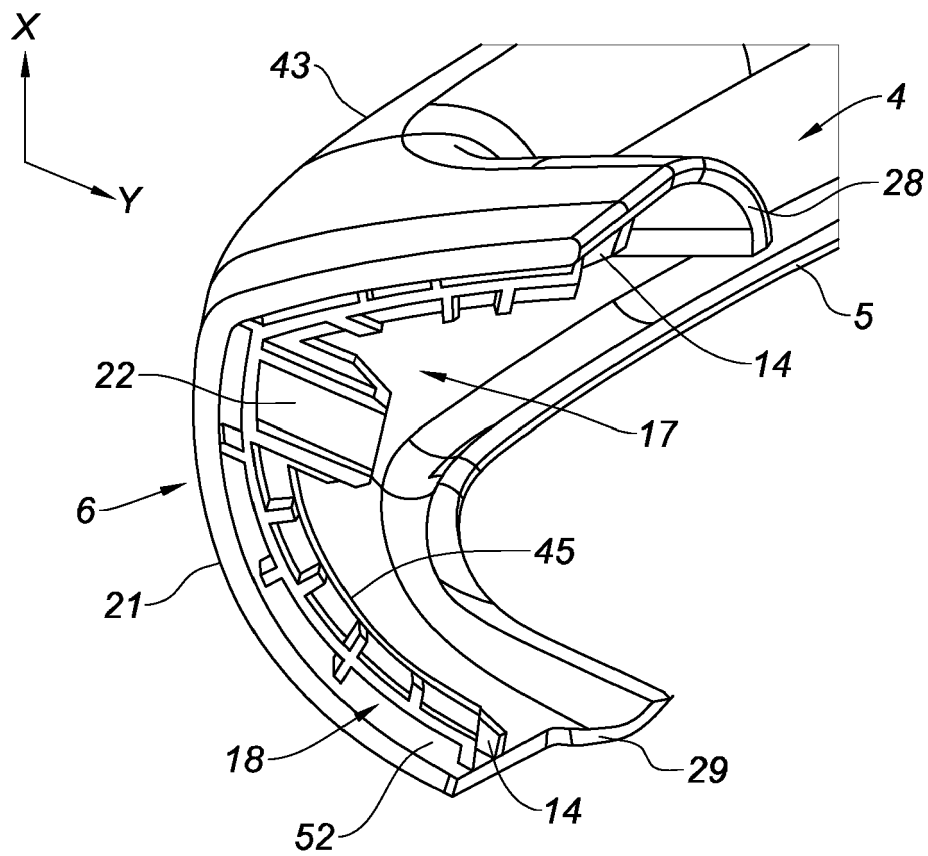


Fig. 11

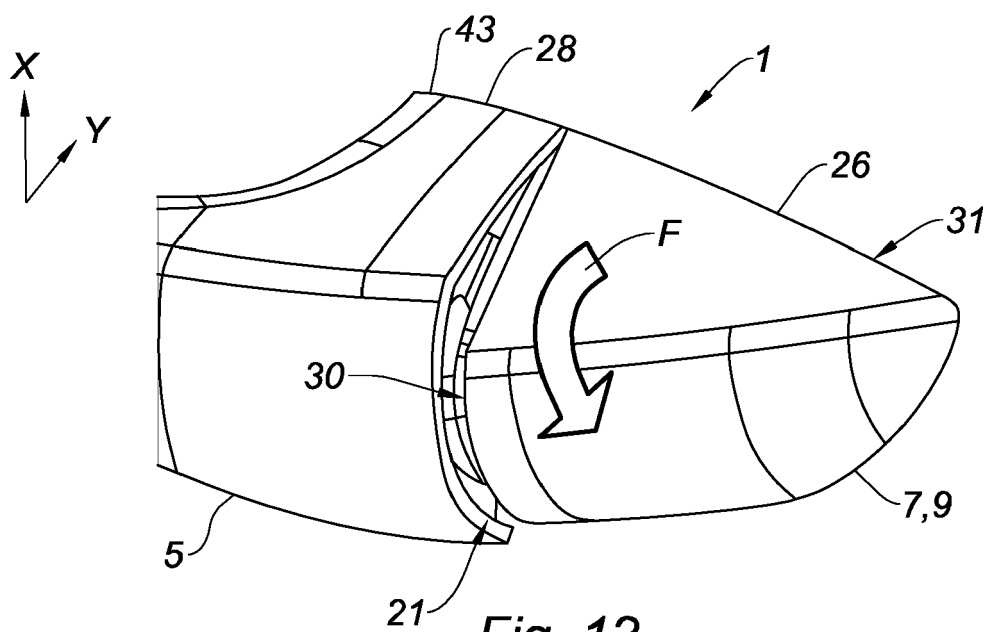


Fig. 12

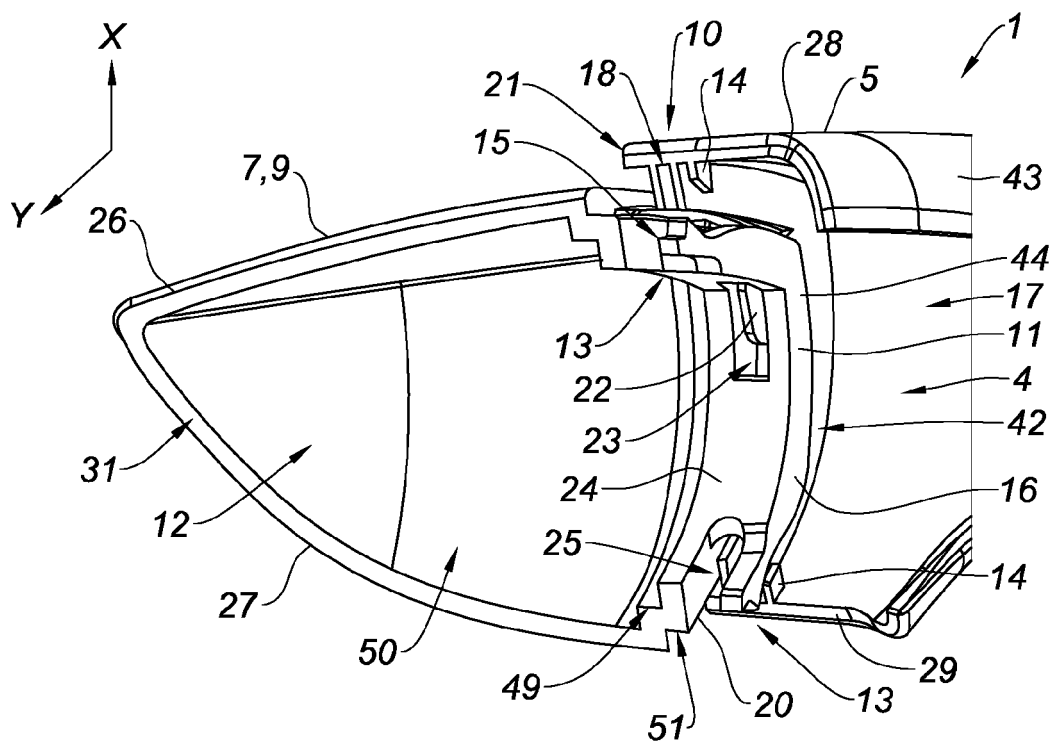


Fig. 13

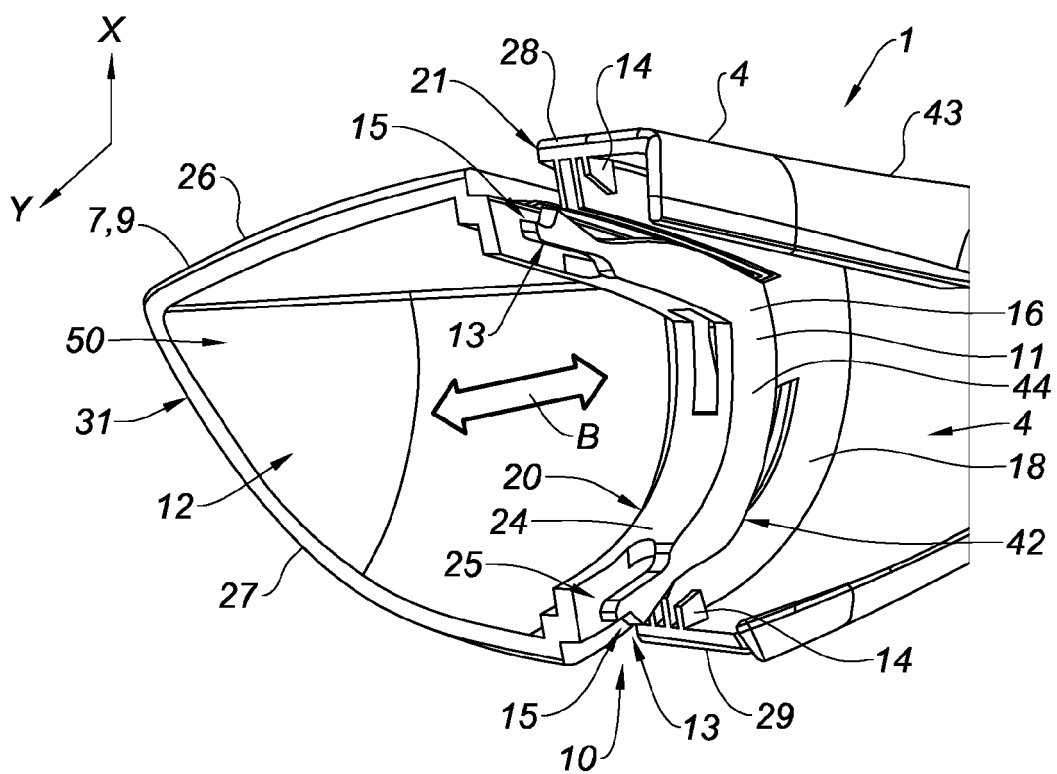


Fig. 14

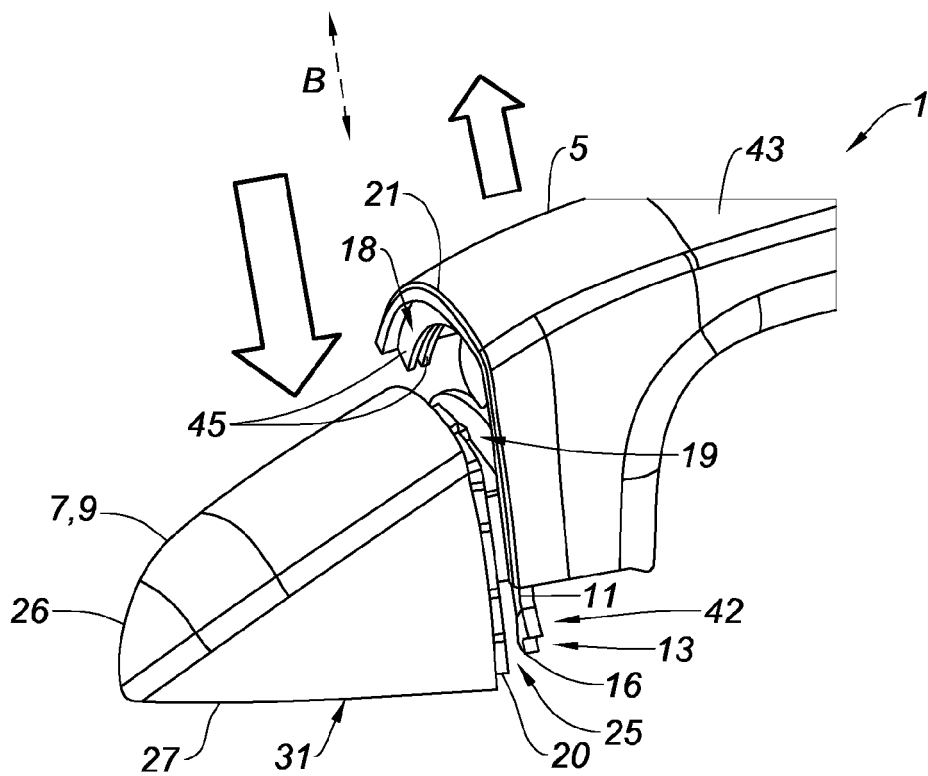


Fig. 15

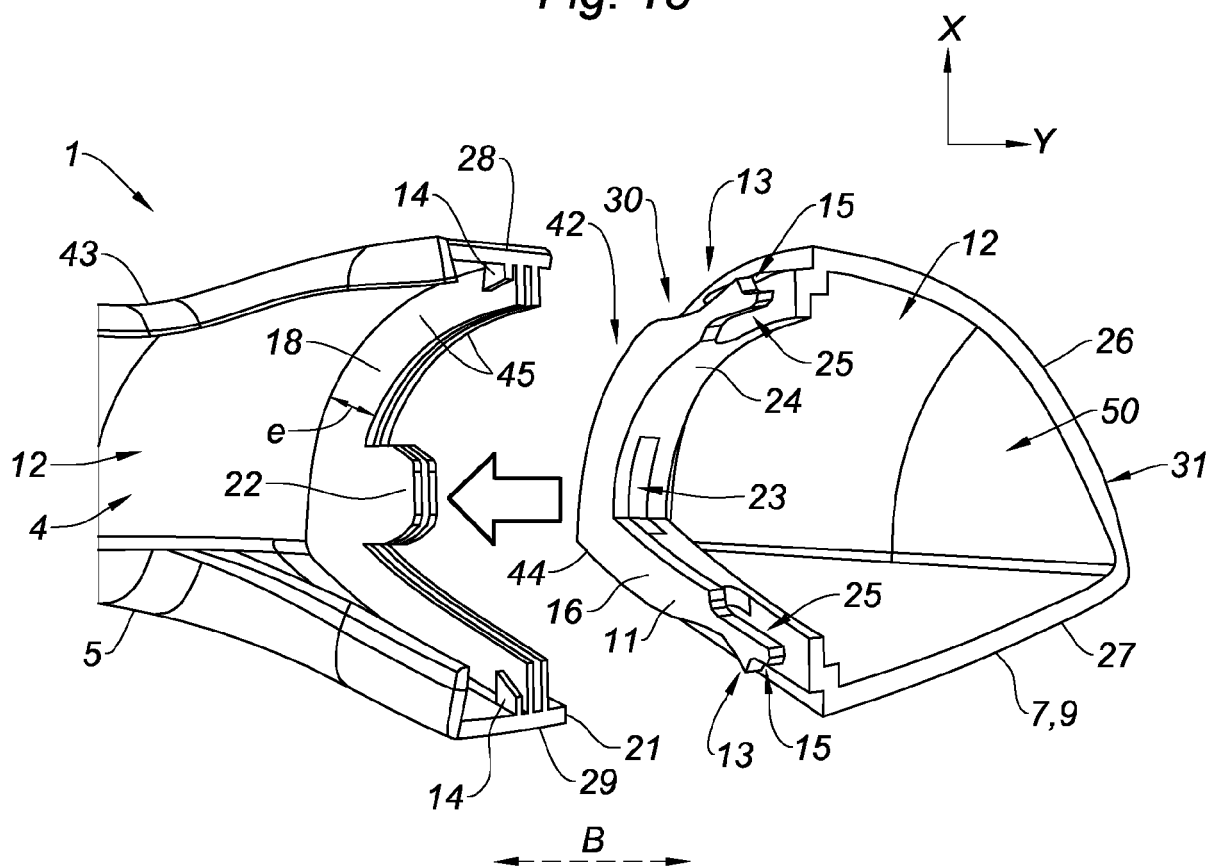


Fig. 16



EUROPEAN SEARCH REPORT

Application Number
EP 17 19 7612

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A	* column 2, line 52 - column 3, line 52; figures 1-3 *	3-7,9-12	E05B85/16
X,D	EP 2 853 665 A2 (HUF HÜLSBECK & FÜRST GMBH & CO KG [DE]) 1 April 2015 (2015-04-01) * paragraph [0028] - paragraph [0030]; figures 1-4 *	1-13	
X	DE 10 2011 001892 A1 (HUF HUELSBECK & FÜRST GMBH [DE]) 11 October 2012 (2012-10-11) * paragraph [0037] - paragraph [0050]; claims 1-4 *	1-13	
			TECHNICAL FIELDS SEARCHED (IPC)
			E05B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 26 March 2018	Examiner Boufidou, Maria
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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The members are as contained in the European Patent Office EDP file on
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