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(54) VEHICLE DOOR HANDLE ASSEMBLY

(57) The present invention refers to a vehicle door handle assembly (1) comprising:
- a bowl (5) configured to be mounted in an opening (7) of a door panel (3),
- a peripheral gasket (9) disposed between the bowl (5) and the door panel (3) and configured to be sandwiched between the bowl (5) and the door panel (3) to provide

waterproofness, wherein the bowl (5) comprises a concavity (13), the said concavity (13) being configured for receiving an edge (15) of the door panel (3) and wherein the peripheral gasket (9) comprises a pad (91) configured to protrude in the concavity (13) of the bowl (5) to prevent friction between the edge (15) of the door panel (3) and the said concavity (13).

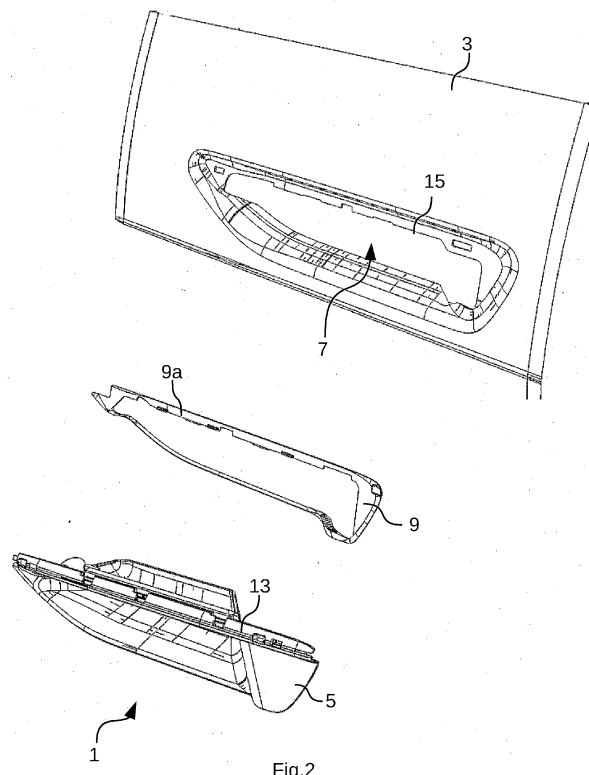


Fig.2

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Description**TECHNICAL FIELD**

[0001] The present invention relates to the field of vehicle door handles to control the opening of vehicle doors and in particular to vehicle door handles comprising a bowl configured to be fastened to the door panel and automatic door latches that are controlled via electric means to lock or release vehicle door panels in an automated fashion. Automated door latches, under normal circumstances, do not require bulging handle levers on the exterior surface of the vehicle. The air drag of the vehicle can consequently be reduced, while the visual aspect of the vehicle can be streamlined.

BACKGROUND OF THE INVENTION

[0002] In the vehicle door handles of the state of the art, a bowl is disposed in an opening of a door panel and the bowl is fastened to the door panel, for example via a bracket and a slider positioned inside the door panel. The bowl provides a recess and the automatic door latch may be disposed within the recess of the bowl. Thus, to actuate the automatic door latch, the user puts his fingers within the recess to reach the latch.

[0003] To ensure the fastening of the bowl onto the door panel, the upper part of the bowl may comprise a slot configured for receiving an edge of the door panel. Furthermore, the door panel is generally a metallic panel, notably a steel panel, which is painted. However, with the pulling force applied by the user on the bowl at each opening of the door, frictions may occur at the interface between the bowl and the door panel which may remove the painting of the door panel and lead to a corrosion of the door panel. Furthermore, if the bowl is also painted, such friction may also remove the painting of the bowl and lead to the emission of an unpleasant noise at each pulling of the user on the door handle.

SUMMARY OF THE INVENTION

[0004] It is therefore a goal of the present invention to provide a solution avoiding the degradation of the door panel over time and preventing the occurrence of noise at each pulling of the user on the door handle.

[0005] Thus, the present invention refers to a vehicle door handle assembly comprising:

- a bowl configured to be mounted in an opening of a door panel,
- a peripheral gasket disposed between the bowl and the door panel and configured to be sandwiched between the bowl and the door panel to provide waterproofness and soft contact, wherein the bowl comprises a concavity, the said concavity being configured for receiving an edge of the door panel and wherein the peripheral gasket comprises a pad con-

figured to protrude in the concavity of the bowl to prevent friction between the edge of the door panel and the said concavity.

5 The absence of friction between the edge of the door panel and the bowl allows avoiding the removal of paint of the door panel which could lead to premature wear and even corrosion. Such friction may also produces unpleasant noise for the user.

10 **[0006]** According to another aspect of the invention, the door panel is vertical and the edge of the door panel configured to be received in the concavity of the bowl is directed in a horizontal direction when the door panel is assembled to the vehicle.

15 **[0007]** According to another aspect of the invention, the peripheral gasket has a flat portion configured for lying against the door panel and the pad extends from the flat portion of the peripheral gasket with an angle comprised between 70° and 110°, especially 90°.

20 **[0008]** According to another aspect of the invention, the peripheral gasket comprises a plurality of pads distributed along the upper portion of the peripheral gasket when the vehicle is assembled.

25 **[0009]** According to another aspect of the invention, the peripheral gasket is made of elastomer material.

[0010] According to another aspect of the invention, the concavity of the bowl is made in an upper part of the bowl when the vehicle is assembled.

30 **[0011]** According to another aspect of the invention, the door panel is made of a metallic layer, especially steel.

[0012] According to another aspect of the invention, the door panel is painted.

35 **[0013]** According to another aspect of the invention, the bowl is made of plastic and is painted.

[0014] According to another aspect of the invention, the vehicle door handle assembly also comprises a bracket fastened to the inner side of the door panel and a slider configured for linking the bowl to the bracket in order to ensure the fastening of the bowl on the door panel and the compression of the peripheral gasket.

40 **[0015]** The present invention also refers to a method for assembling a vehicle door handle on a door panel, the door panel comprising an opening configured for receiving the vehicle door handle and the vehicle door handle comprising a bowl comprising a concavity on its upper part, a peripheral gasket comprising a pad on its upper part configured to be disposed in the concavity of the bowl wherein the method comprises the following steps:

- the peripheral gasket is positioned on the bowl so that the pad is positioned in the concavity of the bowl,
- the concavity of the bowl is positioned toward the edge of the door panel formed by the upper part of the opening, the pad being sandwiched between the edge of the door panel and the concavity of the bowl,
- the lower part of the bowl is pivoted toward the lower part of the opening so that a lower part of the periph-

eral gasket is compressed between a lower part of the bowl and a lower part of the opening wherein the lower and upper parts refer to a relative position when the vehicle is assembled.

[0016] According to another aspect of the invention, the vehicle door handle also comprises a bracket and a slider and the method also comprises a preliminary step of fastening the bracket to an inner side of the door panel and an additional step of positioning the slider in a slot of the bowl and in a slot of the bracket to ensure the fastening of the bowl to the bracket and the compression of the peripheral gasket between the bowl and the door panel.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017]

FIG.1 is a perspective view of the diagram of vehicle door handle according to an embodiment of the present invention;

FIG.2 is a exploded view of a bowl and a gasket of a door handle according to an embodiment to the present invention;

FIG.3 is a cut view of the vehicle door handle of Fig. 1 according to a A-A plane;

FIG.4 is a top view of the bowl of a vehicle door handle according to an embodiment of the present invention;

FIG.5 is a perspective view of a gasket according to an embodiment of the present invention;

FIG.6 is a flow chart of the assembling method according to the present invention;

FIG.7 is a perspective view of a bowl and a slider according to an embodiment of the present invention;

FIG.8 is a perspective view of a bowl, a bracket and a slider according to an embodiment of the present invention;

FIG.9 is a diagram of pads of a gasket that are compressed between a door panel and a bowl of a vehicle door handle.

DETAILED DESCRIPTION OF THE INVENTION

[0018] The following achievements are examples. Although, the specification refers to one or several embodiments, it does not imply that each reference refers to the same embodiment or that the features apply only to a single embodiment. Simple features of different embodiments can also be combined to provide other embodiments.

[0019] In the following of the description, the terms up, upper, low, lower, vertical, horizontal refers to relative positions or directions when the door handle is assembled to a vehicle.

[0020] Fig. 1 represents a perspective view of a vehicle

door handle assembly 1 according to an embodiment of the present invention, the vehicle door handle 1 being assembled on a vehicle door panel 3. As represented in fig.2, the vehicle door handle assembly 1 comprises a bowl 5 configured to be mounted in an opening 7 of the door panel 3. The door panel 3 may be made of metal, especially steel and may be painted. The bowl 5 may be made of plastic and may also be painted. The side of the bowl 5 configured to be positioned outside of the door panel 3 may have an elongated shape with a long up side, a long low side and two shorter lateral sides linking the up side and the low side. The central part of the bowl (between the up side and the low side and between both lateral sides) is hollow to enable the hand of the user to protrude within a recess defined by the bowl 5 as shown in the top view of the bowl 5 in Fig.4. The upper part of the bowl 5 comprises a concavity 13 configured to be positioned toward an edge 15 of the door panel 3 formed by the upper part of the opening 7 as represented in the perspective and cut view of Fig.3. The cut of Fig.3 corresponds to the plane A-A represented in Fig.1. When assembled to the vehicle, the door panel 3 is directed in a vertical direction and the edge 15 is directed in a horizontal direction.

[0021] The vehicle door handle assembly 1 may also comprise a strip 11 (visible in Fig.1) configured to be positioned on the upper part of the bowl 5 to hide the upper junction between the bowl 5 and the door panel 3 and to make the vehicle door handle 1 smooth and streamlined. The strip 11 may be clipped and/or glued to the bowl 5.

[0022] Furthermore, a peripheral gasket 9 is disposed between the bowl 5 and the door panel 3 to ensure waterproofness of the assembly and to prevent dust and water from entering through the opening 7 of the door panel 3 when assembled. As shown in Fig.2, the peripheral gasket 9 is configured to be sandwiched and compressed between the bowl 5 and the door panel 3, more particularly between a portion of the bowl 5 configured to be outside of the door panel 3 and an outer side of the door panel 3. In order to ease its positioning and to prevent its displacement over time, the peripheral gasket 9 may comprise flat portions such as the upper part 9a of the peripheral gasket 9 to enhance the contact surface with the bowl 5 and with the door panel 3.

[0023] Moreover, the peripheral gasket 9 comprises a pad 91 which extends laterally and is configured to protrude in the concavity 13 of the bowl 5. The pad 91 is configured to be placed between the concavity 13 of the bowl 5 and the edge 15 of the door panel 3 in order to avoid contact between the edge 15 of the door panel 3 and the concavity 13 of the upper part of the bowl 5 as represented in Fig.9. In the present example, as represented in Fig.5, the peripheral gasket 9 comprises two pads 91 distributed along the upper part 9a of the gasket 9 which is configured to extends along the length of the concavity 13 of the bowl 5. However, another number of pads 91 may be used such as a single pad 91 or three pads 91. The length and the thickness of the pads 91

may be adapted according to the number of pads 91 to ensure that no contact occurs between the edge 15 of the door panel 3 and the concavity 13 of the bowl 5. The length of the pads 91 is for example comprised between 0,5cm and 10cm and the thickness of the pads 91 is for example comprised between 1mm and 6mm. The pads 91 may extend from the flat portion 9a of the peripheral gasket 9 with an angle comprised between 70° and 110°, especially an angle of 90°. The peripheral gasket 9 may be made of elastomer. By preventing contact and therefore friction between the bowl 5 and the door panel 3, the pads 91 enable avoiding a removal of the paint of the door panel 3 and therefore limit or avoid the occurrence of corrosion on the door panel 3. Furthermore, a friction between the bowl 5 and the edge 15 of the door panel 3 may produce noise which can be unpleasant for the user.

[0024] The present invention also refers to a method for assembling the vehicle door handle 1 on the door panel 3.

[0025] Fig.6 is flowchart of the different steps of the method according to the invention.

[0026] The first step 101 refers to the fastening of a bracket 23 (visible in Fig.8) on the inner side of the door panel 3. The inner side corresponds to the side facing the interior of the vehicle when the vehicle is assembled.

[0027] The second step 102 refers to the positioning of the peripheral gasket 9 on the bowl 5. A footprint may be designed on the bowl 5 to ease the positioning of the peripheral gasket 9 on the bowl 5. The peripheral gasket 9 is positioned so that the pads 91 protrude in the concavity 13 of the bowl 5.

[0028] According to an alternate solution corresponding to step 102', the peripheral gasket 9 may be positioned on the outer side of the door panel 3 around the opening 7. The peripheral gasket 9 may comprise bumps and the door panel 3 may comprise complementary holes configured to receive the bumps to ensure the correct positioning of the peripheral gasket 9.

[0029] The third step 103 refers to the positioning of the concavity 13 of the bowl 5 toward the edge 15 of the door panel 3 formed by the upper part of the opening 7. The upper part of the bowl 5 is first introduced in the opening 7 and moved up so that the concavity 13 of the upper part of the bowl 5 comes around the edge 15. Such positioning leads to the compression of the pads 91 between the edge 15 of the door panel 3 and the concavity 13 of the bowl 5.

[0030] The fourth step 104 refers to the swivelling of the lower part of the bowl 5 toward the lower part of the opening 7 while the pads 91 are maintained compressed between the concavity 13 of the bowl 5 and the edge 15 of the door panel 3. Such swivelling produces the compression of the lower part of the peripheral gasket 9 between a lower part of the bowl 5 and a part of the door panel 3 located below the opening 7.

[0031] The fifth step 105 refers to the positioning of a slider 17 (visible in Fig.7 and 8) in a first slot 19 of the bowl 5 and in a second slot 21 of the bracket 23 to ensure

the fastening of the bowl 5 to the bracket 23 and the compression of the peripheral gasket 9 between the bowl 5 and the door panel 3. Fig. 7 represents an embodiment of the slider 17 positioned on the bowl 5. The slider 17 comprises a first hook 17a and a second hook 17b configured to be introduced respectively in a first slot 5a and a second slot 5b of the bowl 5. Fig.8 represents the bowl 5 of Fig.7 with a bracket 23. The bowl 5 is fastened to the bracket 23 by the slider 17. The bracket 23 comprises hooks 230 forming a slot configured for receiving the slider 17 in order to ensure the fastening of the slider 17 on the bracket 23. Thus, during the assembly, the slider 17 is positioned in both the slots 5a, 5b of the bowl 5 and the hooks 230 of the bracket 23 in order to ensure the fastening of the bowl 5 on the bracket 23. Such fastening of the bowl 5 on the bracket via the slider 17 also ensures the compression of the gasket 9 between the bowl 5 and the door panel 3. Other types of fastening of the bowl 5 to the bracket 23 may also be used.

[0032] Thus, the use of a peripheral gasket 9 comprising at least one pad 91 configured to protrude in the concavity 13 of the bowl 5 in order to be sandwiched between the said concavity 13 and the edge 15 of the door panel 3 allows preventing friction between the bowl 5 and the edge of the door panel 3. Such solution avoids a possible noise created by such friction of painted parts as well as the removal of paint and wear of both parts that may lead to the occurrence of corrosion.

Claims

1. Vehicle door handle assembly (1) comprising:

- a bowl (5) configured to be mounted in an opening (7) of a door panel (3),
- a peripheral gasket (9) disposed between the bowl (5) and the door panel (3) and configured to be sandwiched between the bowl (5) and the door panel (3) to provide waterproofness,

wherein the bowl (5) comprises a concavity (13), the said concavity (13) being configured for receiving an edge (15) of the door panel (3) and wherein the peripheral gasket (9) comprises a pad (91) configured to protrude in the-concavity (13) of the bowl (5) to prevent friction between the edge (15) of the door panel (3) and the said concavity (13).

2. Vehicle door handle assembly (1) in accordance with the previous claim wherein the door panel (3) is vertical and the edge (15) of the door panel (3) configured to be received in the concavity (13) of the bowl (5) is directed in a horizontal direction when the door panel (3) is assembled to the vehicle.

3. Vehicle door handle assembly (1) in accordance with one of the previous claims wherein the peripheral

gasket (9) has a flat portion (9a) configured for lying against the door panel (3) and the pad (91) extends from the flat portion (9a) of the peripheral gasket (9) with an angle comprised between 70° and 110°, especially 90°.

4. Vehicle door handle assembly (1) in accordance with one of the previous claims wherein the peripheral gasket (9) comprises a plurality of pads (91) distributed along the upper portion of the peripheral gasket (9) when the vehicle is assembled. 5
5. Vehicle door handle assembly (1) in accordance with one of the previous claims wherein the peripheral gasket (9) is made of elastomer material. 10
6. Vehicle door handle assembly (1) in accordance with one of the previous claims wherein the concavity (13) of the bowl (5) is made in an upper part of the bowl (5) when the vehicle is assembled. 15
7. Vehicle door handle assembly (1) in accordance with one of the previous claims wherein the door panel (3) is made of a metallic layer, especially steel. 20
8. Vehicle door handle assembly (1) in accordance with one of the previous claims wherein the door panel (3) is painted. 25
9. Vehicle door handle assembly (1) in accordance with one of the previous claim wherein the bowl (5) is made of plastic and is painted. 30
10. Vehicle door handle assembly (1) in accordance with one of the previous claims also comprising a bracket (23) fastened to the inner side of the door panel (3) and a slider (17) configured for linking the bracket (23) and the bowl (5) in order to ensure the fastening of the bowl (5) to the door panel (3) and the compression of the peripheral gasket (9). 35
11. Method for assembling a vehicle door handle (1) on a door panel (3), the door panel (3) comprising an opening (7) configured for receiving the vehicle door handle (1), the vehicle door handle (1) comprising a bowl (5) which comprises a concavity (13) on its upper part, a peripheral gasket (9) comprising a pad (91) on its upper part configured to be disposed in the concavity (13) of the bowl (5) wherein the method comprises the following steps: 40
 - the peripheral gasket (9) is positioned on the bowl (5) so that the pad (91) is positioned in the concavity of the bowl (5), (102) 45
 - the concavity (13) of the bowl (5) is positioned toward the edge (15) of the door panel (3) formed by the upper part of the opening (7), the pad (91) being sandwiched between the edge (15) of the 50

door panel (3) and the concavity (13) of the bowl (5), (103)

- the lower part of the bowl (5) is pivoted toward the lower part of the opening (7) so that a lower part of the peripheral gasket (9) is compressed between a lower part of the bowl (5) and a lower part of the opening (7) wherein the lower and upper parts refer to a relative position when the vehicle is assembled (104).

12. Method for assembling a vehicle door handle (1) on a door panel (3) in accordance with the previous claim wherein the vehicle door handle (1) also comprises a bracket (23) and a slider (17) and wherein the method also comprises a preliminary step (101) of fastening the bracket (23) to an inner side of the door panel (3) and an additional step (105) of positioning the slider (17) in a slot (5a, 5b) of the bowl (5) and in a slot (230) of the bracket (23) to ensure the fastening of the bowl (5) to the bracket (23) and the compression of the peripheral gasket (9) between the bowl (5) and the door panel (3).

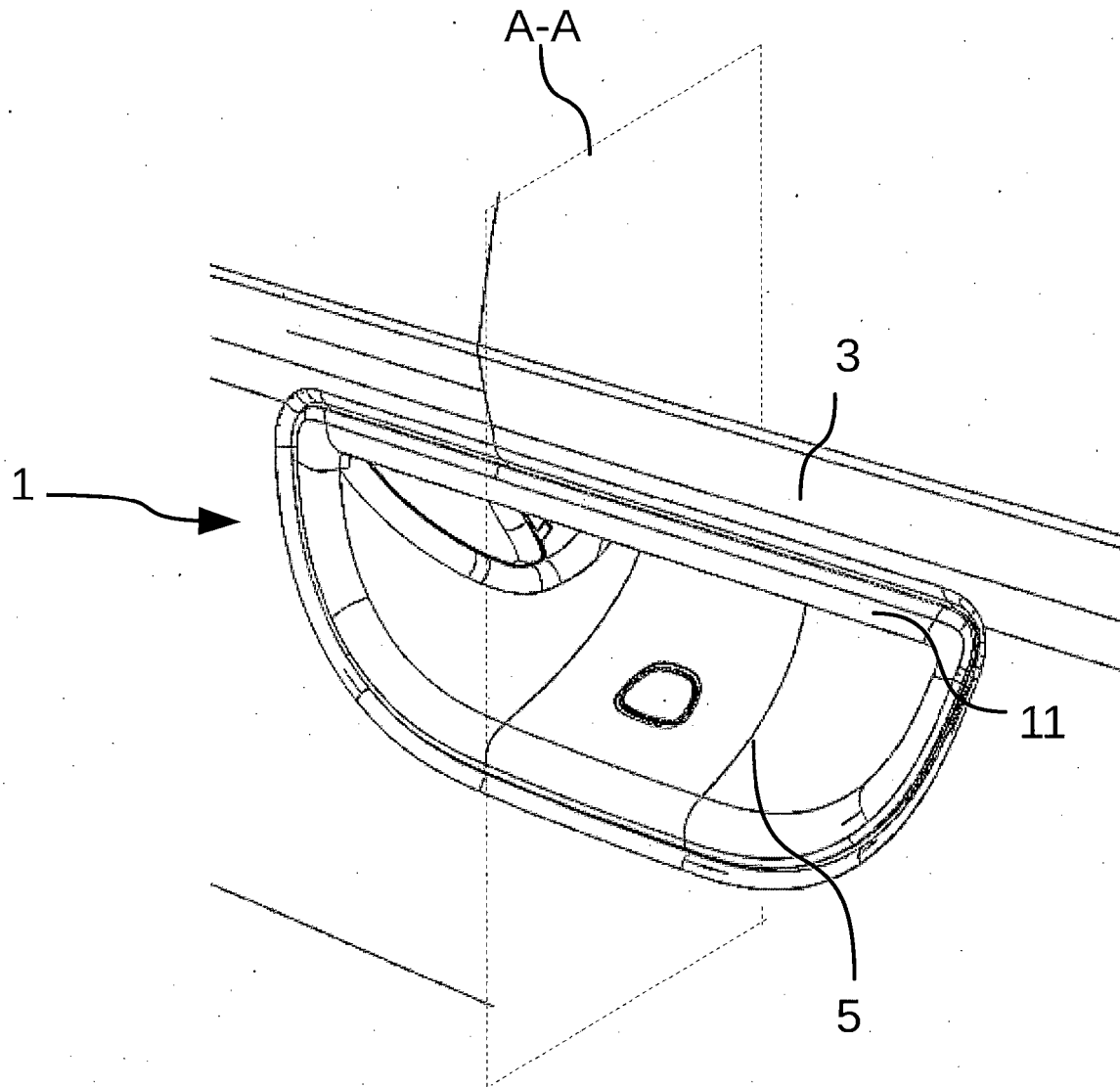


Fig.1

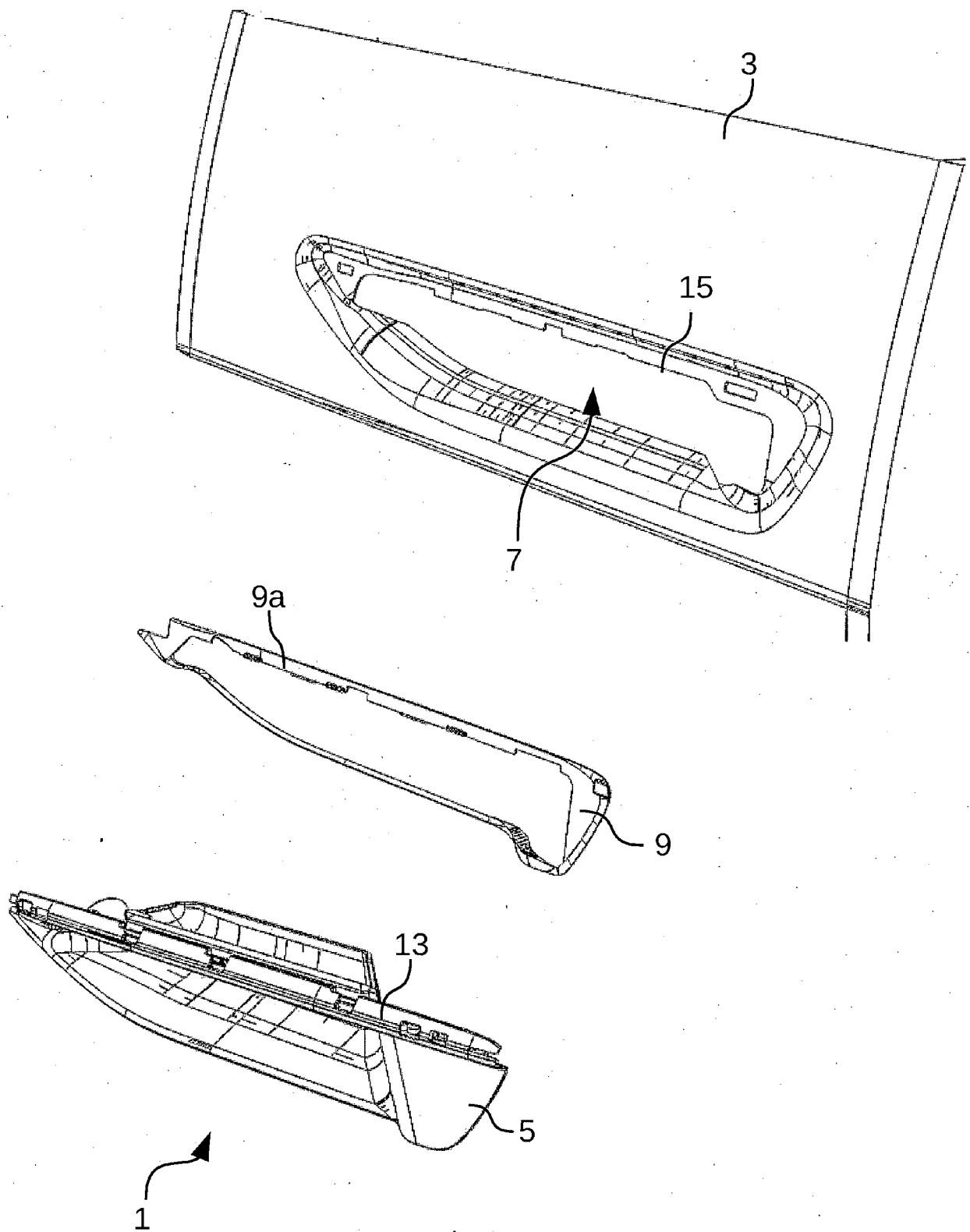


Fig.2

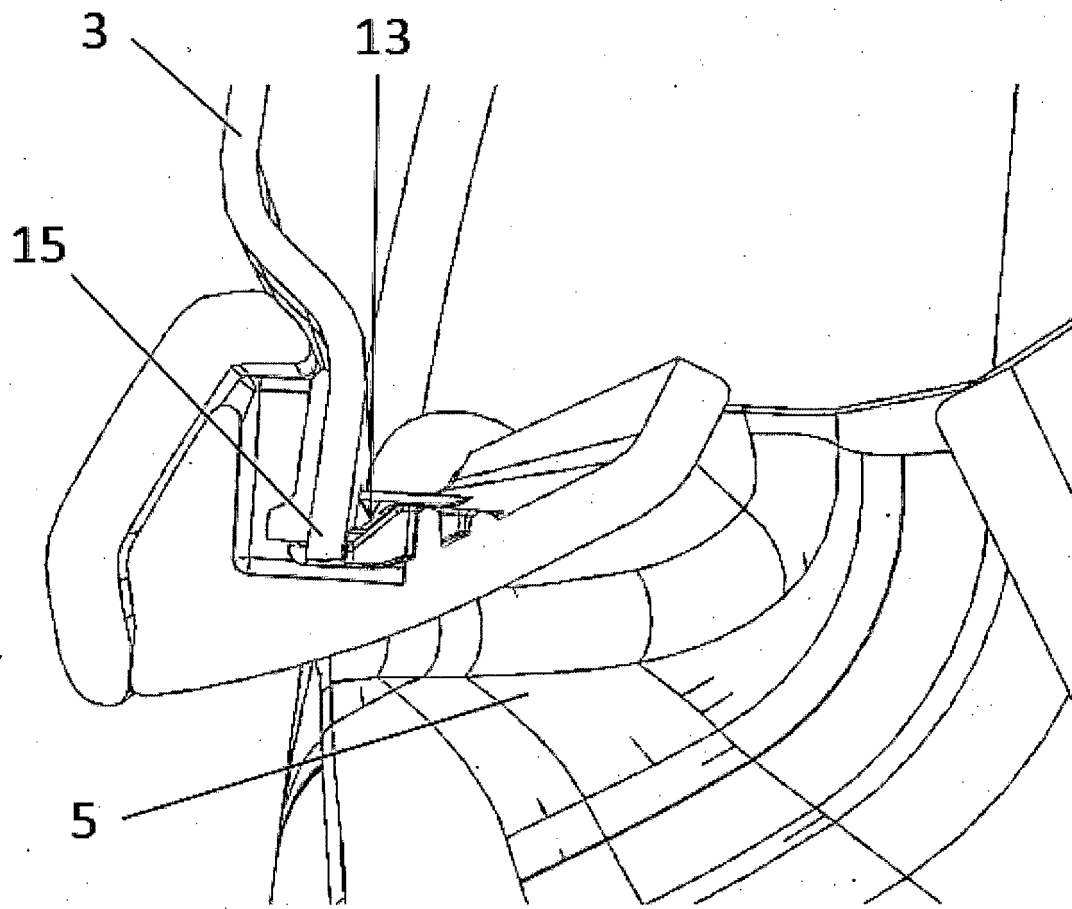
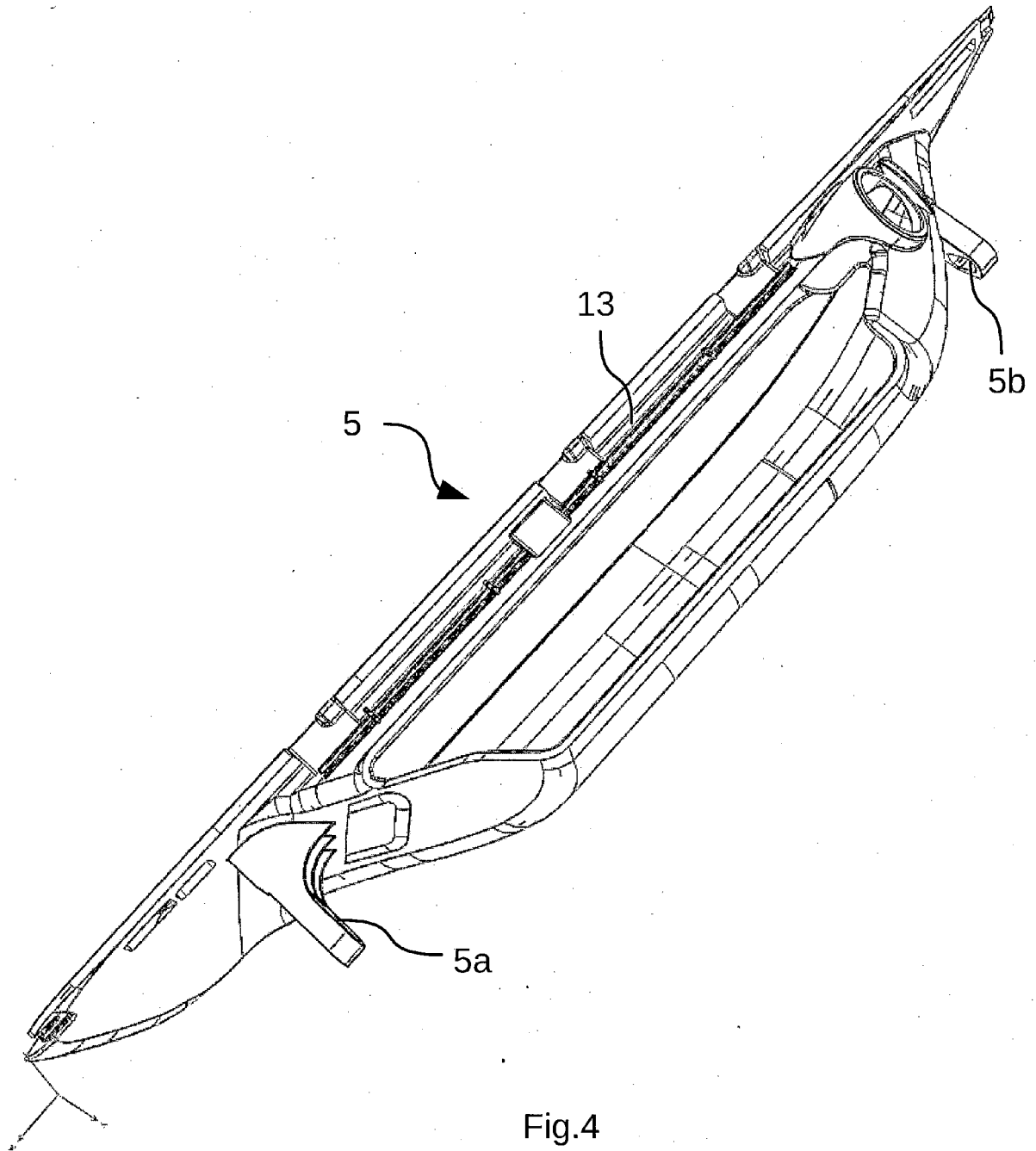


Fig.3



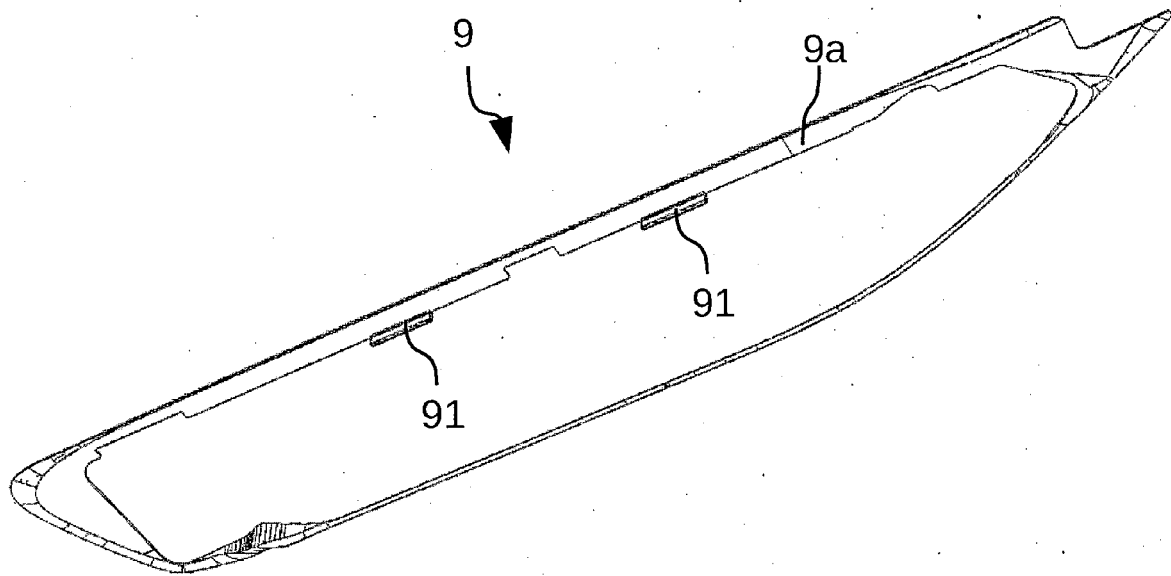


Fig.5

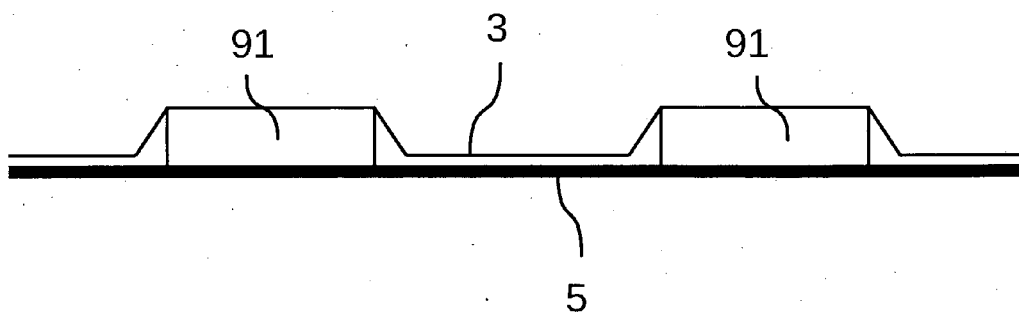


Fig.9

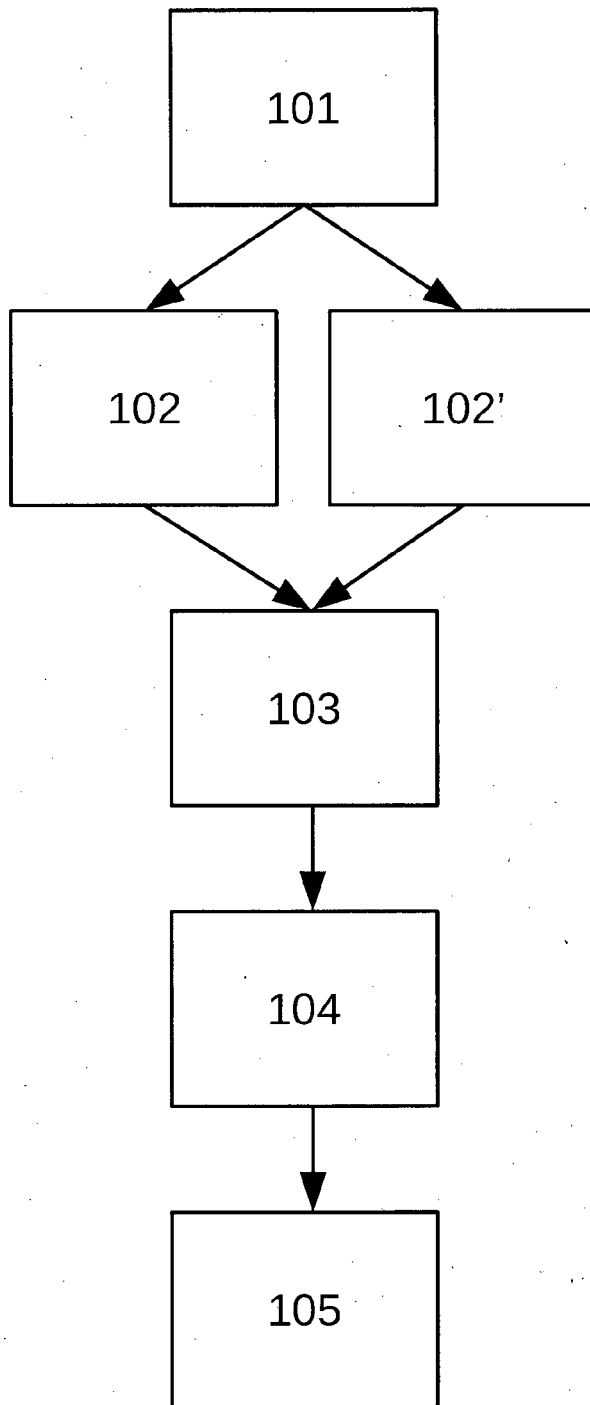


Fig.6

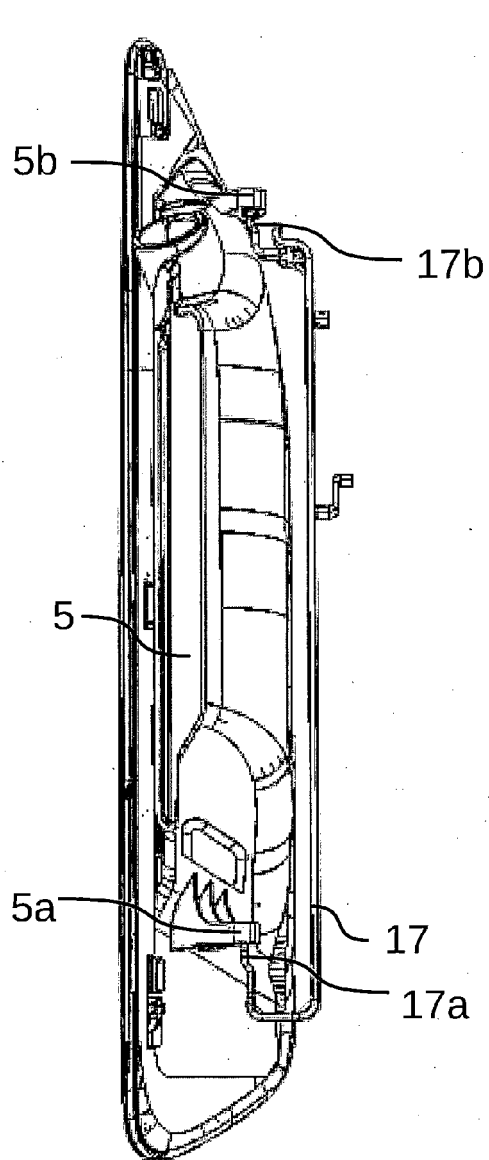


Fig.7

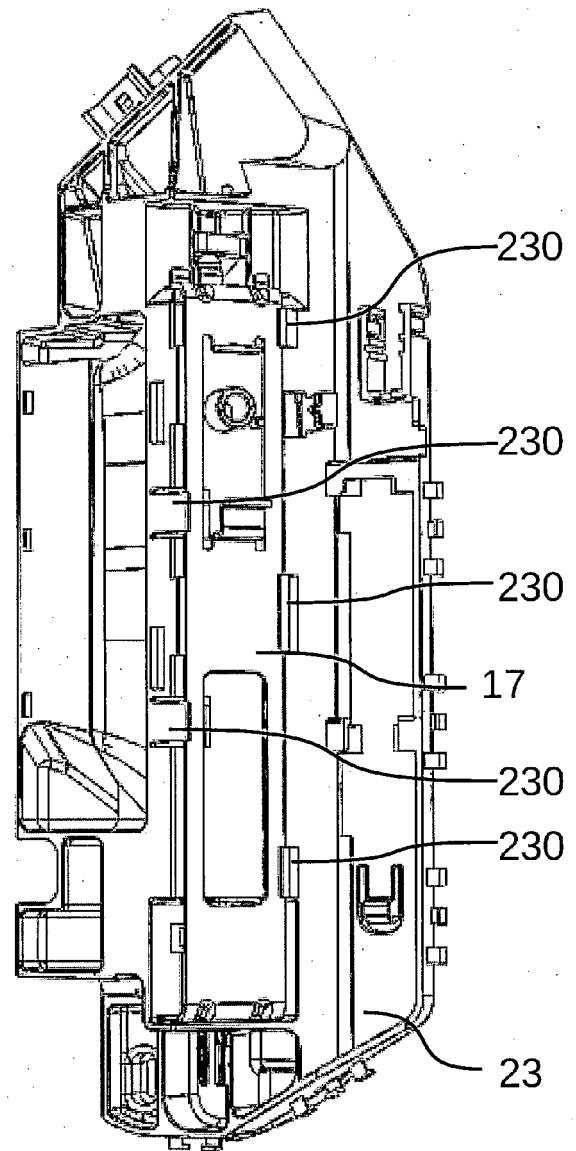


Fig.8



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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		15 November 2021	Cruyplant, Lieve
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			

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

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82