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(54) VEHICLE DOOR HANDLE ASSEMBLY

(57) The invention concerns a vehicle door handle assembly (2) comprising:

- a housing (6) that sits flush against an outer panel (4) of the vehicle, the housing (6) comprising an upper part (12) and a lower part (14),
- a door handle assembly bracket (8) configured to attach

the housing (6) to the panel (4), and

- a sliding attachment unit (20) comprising attachment means (22) to the housing (6) and to the bracket (8), the sliding attachment unit being arranged to compress the housing in a direction substantially perpendicular to an extension direction of the lower part of the housing.

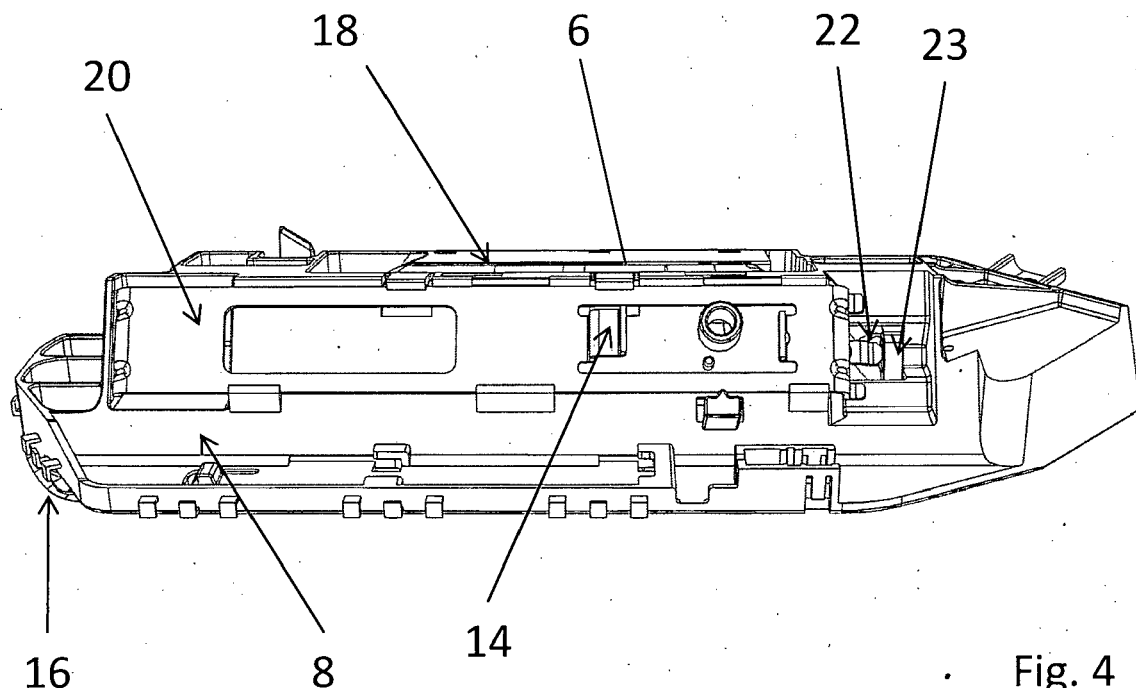


Fig. 4

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Description

[0001] The invention relates to a vehicle door handle assembly to control the opening of a door.

[0002] A door panel is equipped with a handle in order to allow to open and close a door. This handle can be formed by a housing that sits flush against an outer panel of the vehicle. A user can introduce his hand into a housing of the handle in order to open the door.

[0003] The door can be opened thanks to an automated door latches selectively lock or release vehicle door panels in an automated fashion. By automated door latches are herein designated door latches where the user does not provide the energy to actuate the latch through grasping and moving a handle lever, knob or other.

[0004] Once the vehicle panel is released, the user or an electric panel actuator swings or slides the panel to grant physical access the vehicle. 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.

[0005] A door panel (for example made of metal) is placed between the handle housing and a door handle assembly bracket. A gasket is placed between the housing edges and the door panel to ensure a sealing of this area. Furthermore, a sliding attachment unit is placed on the side of the bracket opposite to the one placed against the door panel, the sliding attachment comprising attachment means going through the bracket and the door panel to establish a connection with the handle housing.

[0006] Thus, the door panel is compressed between the handle housing and the bracket (and the gasket is compressed between the handle housing and the door panel).

[0007] In order to attach the sliding attachment unit to the handle housing, it is necessary to slide the sliding attachment unit relative to the handle housing. The attachment means of the sliding attachment unit can thus be attached to other means carried by the handle housing.

[0008] However, and due to the nature of the compression exerted by the sliding attachment unit on the handle housing, an outcrop defect can be observed at the lower edge of the handle housing in contact with the door panel. This can cause a sealing defect due to a lack of compression of the gasket between the handle housing and the door panel. Furthermore, this outcrop defect can lead to an aesthetic defect and to an injury for a user, for example due to the introduction of a nail in the gap between the handle housing and the door panel.

[0009] The purpose of the invention is therefore to provide a vehicle door handle assembly that can avoid the afore mentioned issues.

[0010] To that end, the invention concerns vehicle door handle assembly comprising:

- a housing that sits flush against an outer panel of the vehicle, the housing comprising an upper part and a lower part,
- a door handle assembly bracket configured to attach the housing to the panel, and
- a sliding attachment unit comprising attachment means to the housing and to the bracket, the sliding attachment unit being arranged to compress the housing in a direction substantially perpendicular to an extension direction of the lower part of the housing.

[0011] Thanks to the direction of the compression exerted by the sliding unit on the handle housing, this latter is properly compressed against the door panel (the door panel being compressed between the handle housing and the bracket).

[0012] Consequently, the gasket is compressed between the handle housing and the door panel in a constant way, avoiding any sealing defect.

[0013] Furthermore, the gap between the handle housing lower edge and the door panel is minimized, avoiding any aesthetic defect or injury risk.

[0014] Preferably, the sliding attachment unit is disposed against the lower part of the housing. This allows to obtain a more compact assembly than prior art assembly, for example in the Y direction (or transverse direction) if the handle assembly is mounted on a door panel.

[0015] The sliding attachment unit can comprise at least two hooks placed in at least two holes carried by the lower part of the housing. This is a simple way to attach the housing to the bracket.

[0016] It is possible to attach the sliding attachment unit on a face of the bracket opposite to the face of the bracket located in front of the housing.

[0017] Preferably, an upper edge of the housing comprises indexing pawns of the housing upper edge to the door panel. This allows to properly insert the housing against the panel.

[0018] Preferably, a gasket is placed between the housing edges and the door panel in order to ensure the sealing of the handle assembly.

[0019] The housing can comprise an electrical switch configured to release the door in order to open the door.

[0020] Preferably, the lower part can be inclined relative to a vertical axis of the vehicle on which the vehicle door assembly is configured to be attached to.

[0021] The lower part can be inclined about an angle comprised between 30° and 45°, preferably substantially equal to 35°.

Brief description of the figures

[0022] The invention will be better understood in view of the following description, referring to the annexed Figures in which:

- Figure 1 is a front view of a part of a door handle

- assembly according to the invention;
- Figure 2 is a lateral view of the lower part of the housing according to the invention;
- Figure 3 is a lateral view of the part of a door handle assembly according to the invention;
- Figure 4 is a view of the bottom part of the part of a door handle assembly according to the invention;
- Figure 5 is a view in perspective of the part of a door handle assembly according to the invention;
- Figure 6 is a view of the upper part of the part of a door handle assembly according to the invention; and
- Figure 7 is a cross section of the door handle assembly according to the invention. In the following description the directions X (longitudinal), Y (transverse) and Z (vertical) are the conventional directions of a vehicle.

Detailed description

[0023] A vehicle door handle assembly 2 is shown on figure 1.

[0024] The vehicle door assembly 2 comprises a panel 4 placed and compressed between a housing 6 (on its outer face) and a bracket 8 (on its inner face) visible on figures 2 to 4. The panel 4 can include an opening to place the housing 6 which goes through the panel 4 to be in contact with the bracket 8. As explained below, the bracket 8 allows, thanks to a sliding attachment unit, to attach the housing 6 to the panel 4. The edges of this opening can be thinner than the rest of the panel 4 and can comprises opening to make the housing 6 placement easier. A gasket 10 is compressed between the edges of the housing 6 and the panel 4 in order to allow a sealing between those two elements. This construction leads to the placement of the handle assembly 2 on each sides of the panel 4 (one side with the housing 6 and the other side with the bracket 8).

[0025] A trim element 7 can be placed at the junction of the panel 4 and the housing 6.

[0026] The housing 6 can sit flush against the panel 4 (the outer face of this panel 4) and comprises an upper part 12 and a lower part 14 delimiting a cavity giving access to the inside of the housing 6 (these two parts can be two separated elements or two portions of a one-part housing 6). Here, the lower part 14 is delimited by a frame having a rectilinear section. The housing 6 comprises a front wall 16 which is substantially planar and flush against the panel 4 and a back wall 18 which defines the back of the cavity (see for example figure 7 illustrating the interaction between the lower part 14 and the panel 4). The lower part 14 can be inclined relative to a vertical axis of the vehicle on which the vehicle door assembly is configured to be attached to. In other words, and when the housing is mounted on the panel 4 (panel 4 mounted on a vehicle), the lower part 14 extends in a transverse direction (or Y direction according to the conventional directions of a vehicle).

[0027] A user can introduce his hand into the cavity in order to interact with an actuation switch (not shown on the figures) generating an electrical signal to be sent to a vehicle opening element controller to release the vehicle opening element. This actuation switch can be electrical or mechanical. The electrical switch has the advantage, compared to a mechanical switch, of saving space in the door assembly as it there is no need to provide room required by the stroke of a mechanical part to be displaced (this space is needed with a mechanical switch wherein a flap is displaced to generate the electrical signal).

[0028] The electrical signal generated is able to displace the opening element latch. The actuation switch can also be equipped with NFC and/or RFID readers. Furthermore, the actuation switch can be attached on the bracket 8 (preferably in front of the back wall 18 to allow a user to put his fingers on it) and can be equipped with at least one reinforcement bar to protect the actuation switch against an excessive actuation effort.

[0029] The door handle assembly 2 also comprises a sliding attachment unit 20 comprising attachment means 22 to the housing and to the bracket, the sliding attachment 20 unit being arranged to compress the housing 6 in a direction substantially perpendicular to an extension direction of the lower part 14 of the housing 6. Thus, the compression direction depends on the extension direction of the housing 6.

[0030] The sliding attachment unit 20 is placed on the face of the bracket 8 opposite to the face placed against the panel 4 and crosses the bracket 8 and the panel 4 (which is placed between the bracket 8 and the housing 6) to interact with the housing 6 via hooks (i.e. the attachment means 22) introduced into holes 23 carried by the lower part 14 of the housing 6, and allows a compression of the assembly bracket 8/panel 4/gasket 10/housing 6. More precisely, and when the sliding attachment unit 20 has crossed the bracket 8 and the panel 4, this assembly can slide relative to the housing 6 in order to allow an entrance of the hooks into the holes 23. The holes 23 are preferably placed on both sides of the housing 6 following a longitudinal axis of the housing 6.

[0031] Thanks to the direction of the compression exerted by the sliding attachment unit 20 on the handle housing 6, this latter is properly compressed against the door panel (the door panel being compressed between the handle housing and the bracket). Indeed; and compared to the existing attachment unit in which the compression is only horizontal, the compression in the invention is dependent of the direction of extension of the housing 6. Thus, a compression perpendicular to the direction of extension of the housing 6 ensures a complete and uniform housing 6 compression against the panel 4. The sliding attachment unit 20 can extend in a direction parallel to the lower part 14 extension direction (and perpendicular to the compression direction exerting by the sliding attachment unit 20) or not.

[0032] Consequently, the gasket 10 is compressed be-

tween the handle housing and the door panel in a constant way, avoiding any sealing defect. Furthermore, the gap between the handle housing lower edge and the door panel is minimized (the gasket 10 is partially crushed in this gap), avoiding any aesthetic defect or injury risk. This is due to the direction of compression of the housing 6.

[0033] Preferably, the sliding attachment unit 20 is disposed against the lower part 18 of the housing 6. This lower part 18 being inclined, the sliding attachment unit 20 is then placed under the housing 6. This allows to obtain a more compact assembly than prior art assembly, for example in the Y direction.

[0034] Preferably, wherein the sliding attachment unit 20 comprised at least two hooks placed in at least two holes 23 carried by the lower part of the housing. It can also comprise other hooks placed against the bracket 8. The space between the hooks placed into the holes 23 and the hooks placed against the bracket 8 is scaled to place between them the housing 6 and the bracket 8 compressed together.

[0035] An upper edge 24 of the housing 6 can comprise indexing pawns 26 of the housing 6 upper edge 24 to the door panel 4. This allows to properly insert the housing 6 against the panel 4. Indeed, and when the lower edge of the housing 6 is pressed against the panel 4 and the bracket 8, this latter exerts a reaction force that allows to press the upper edge 24 of the housing 6 under the panel 4. The indexing pawns can then interact with recesses fitted in the panel 4. This interaction ensures that the housing 6 sits flush against the panel 4.

List of references

[0036]

2 : door assembly
 4 : panel
 6 : housing
 7 : trim element
 8 : bracket
 10 : gasket
 12 : upper part
 14 : lower part
 16 : front wall
 118 : back wall
 20 : sliding attachment unit
 22 : attachment means
 23 : holes
 24 : upper edge
 26 : indexing pawns

Claims

1. Vehicle door handle assembly (2) comprising:

- a housing (6), the housing (6) comprising an upper part (12) and a lower part (14),

- a door handle assembly bracket (8) configured to attach the housing (6) to the panel (4), and
 - a sliding attachment unit (20) comprising attachment means (22) to the housing (6) and to the bracket (8), **characterized in that** the sliding attachment unit is arranged to compress the housing in a direction substantially perpendicular to an extension direction of the lower part of the housing.

2. Vehicle door handle assembly (2) according to claim 1, wherein the sliding attachment unit (20) is disposed against the lower part (14) of the housing (6).

3. Vehicle door handle assembly (2) according to any preceding claims, wherein the sliding attachment unit (20) comprised at least two hooks placed in at least two holes (23) carried by the lower part (14) of the housing (6).

4. Vehicle door handle assembly (2) according to any of the preceding claims, wherein the sliding attachment unit (20) is attached on a face of the bracket (8) opposite to the face of the bracket (8) located in front of the housing (6).

5. Vehicle door handle assembly (2) according to any of the preceding claims, wherein an upper edge (24) of the housing (6) comprises indexing pawns (26) of the housing upper edge (26) to the door panel (4).

6. Vehicle door handle assembly (2) according to claim 6, wherein a gasket (10) is placed between the housing edges and the door panel (4).

7. Vehicle door handle assembly (2) according to any of the preceding claims, wherein the housing (6) comprises an electrical switch configured to release the door in order to open the door.

8. Vehicle door handle assembly (2) according to any of the preceding claims, wherein the lower part (14) is inclined relative to a vertical axis of the vehicle on which the vehicle door assembly is configured to be attached to.

9. Vehicle door handle assembly (2) according to any of the preceding claims, wherein the lower part (14) is inclined relative to a vertical axis of the vehicle on which the vehicle door assembly is configured to be attached to about an angle comprised between 30° and 45°, preferably substantially equal to 35°.

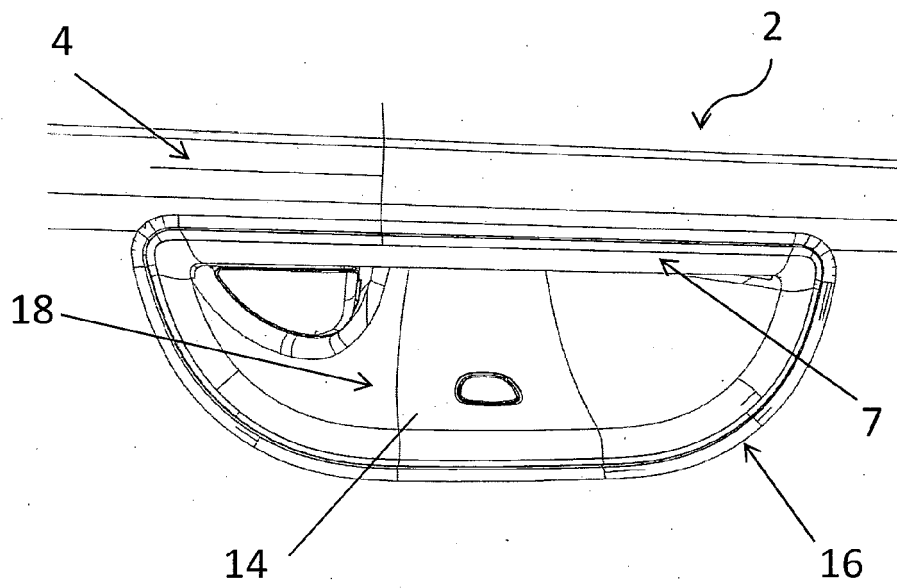


Fig. 1

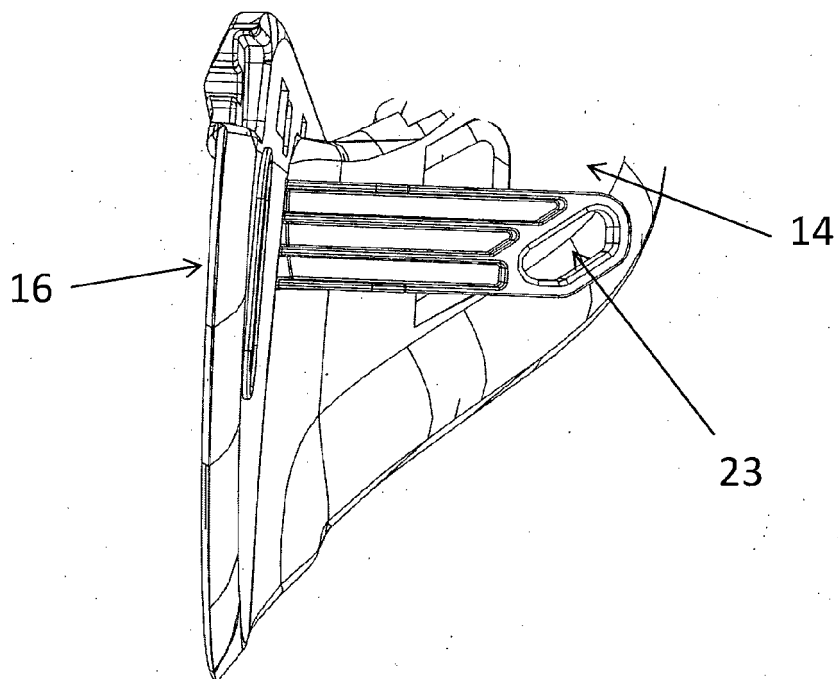


Fig. 2

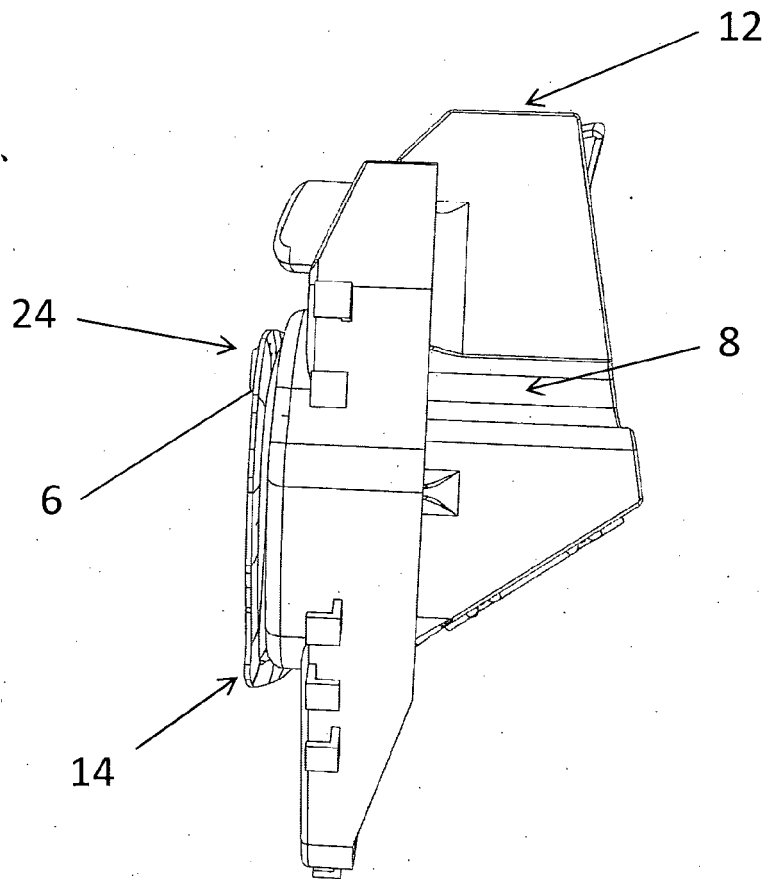


Fig. 3

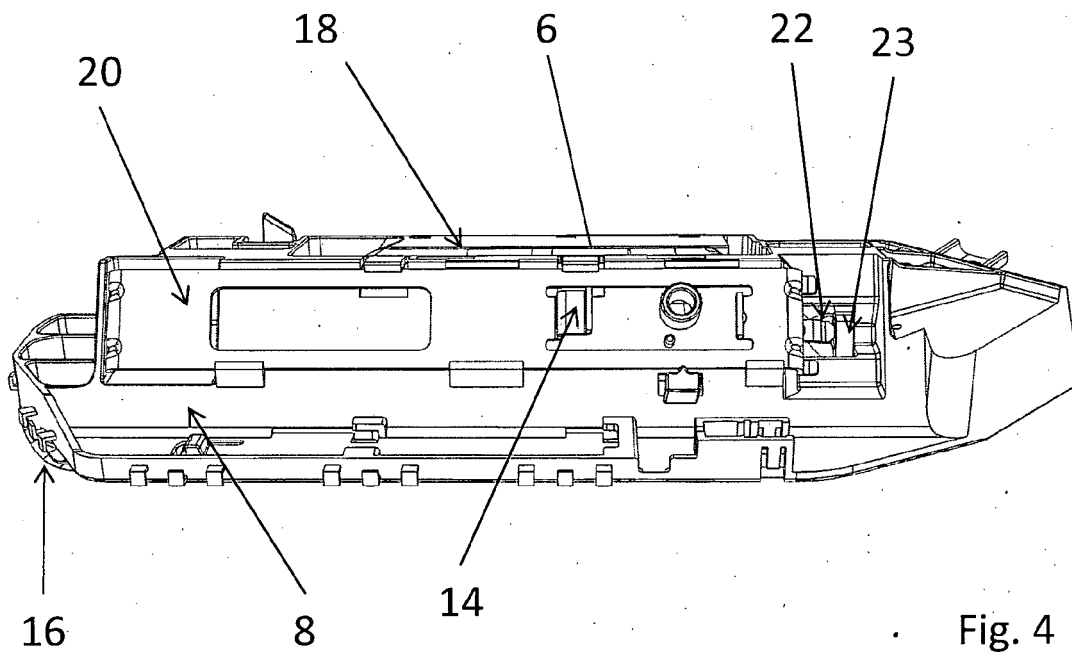


Fig. 4

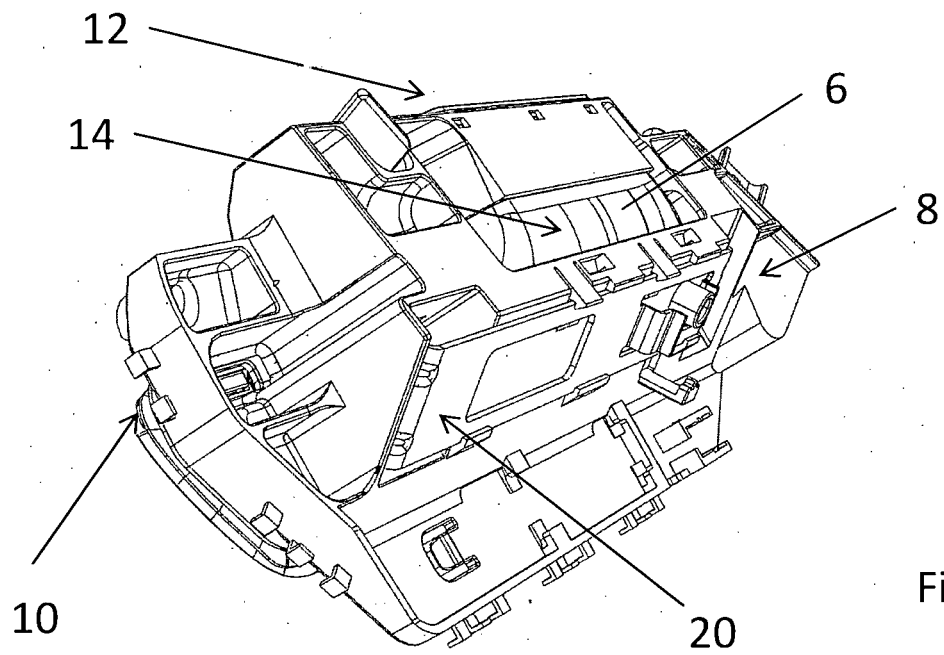


Fig. 5

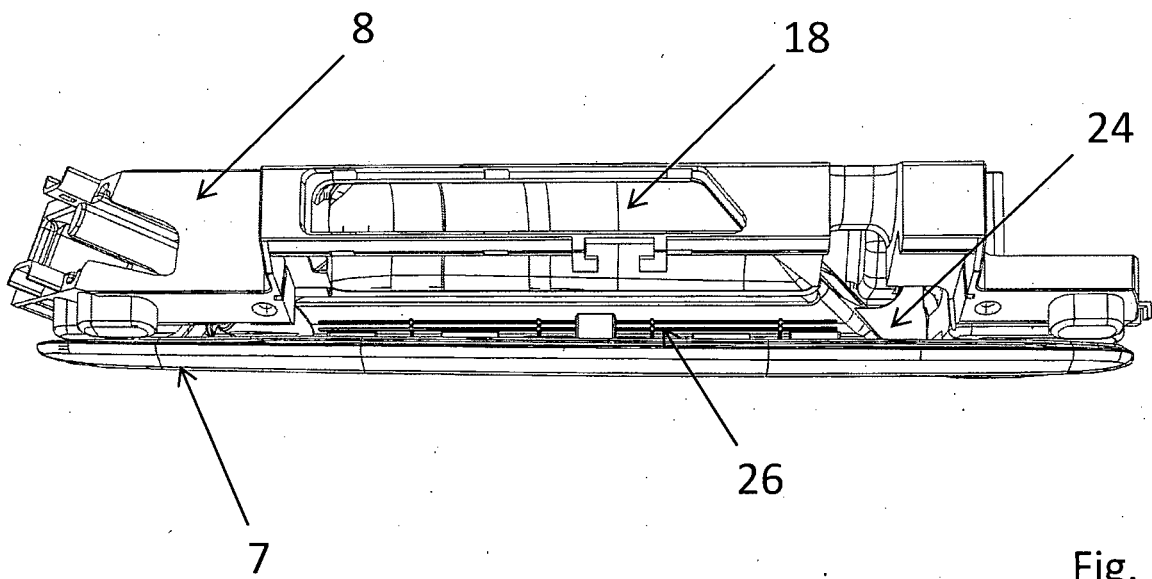


Fig. 6

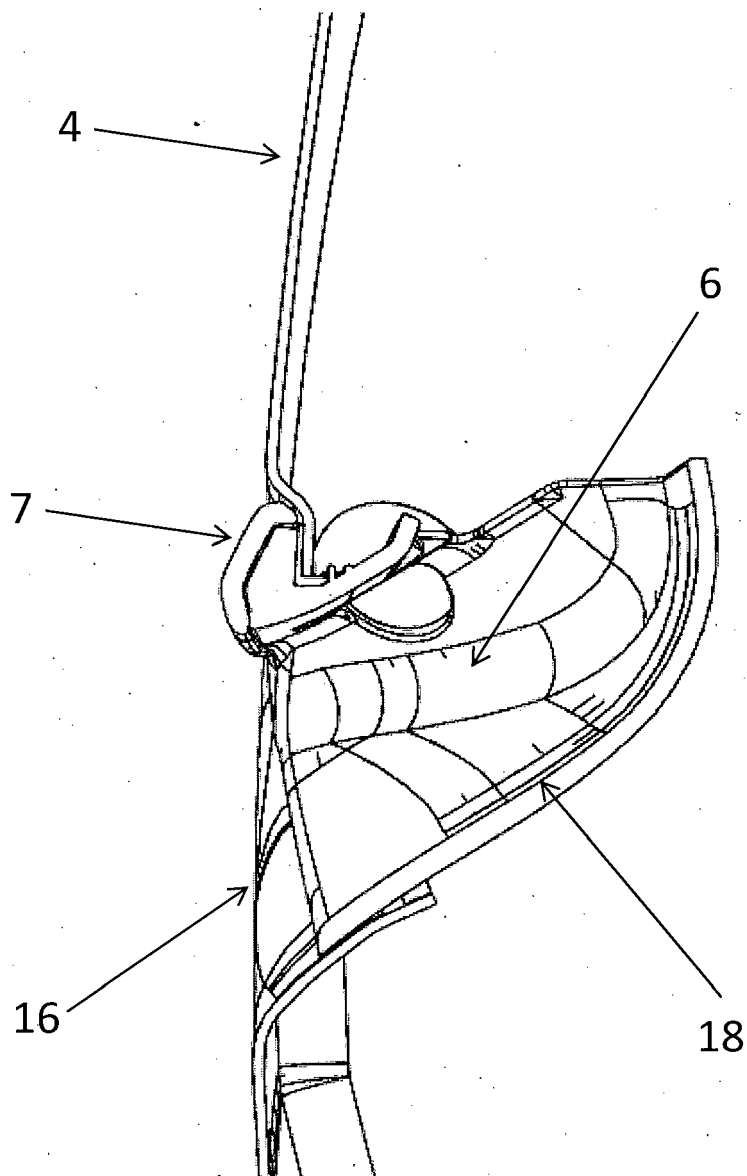


Fig. 7



EUROPEAN SEARCH REPORT

Application Number

EP 21 31 5115

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1 The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 1 December 2021	Examiner Antonov, Ventseslav
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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5 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.

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