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## Description

The invention relates to a luggage-rack module for constructing a luggage rack in a rail vehicle, the luggage-rack module having a bearing panel, which can be fixed in relation to  
5 a bodyshell of the rail vehicle by means of at least one holder, having a rear supporting profile and having a front supporting member.

Such a luggage-rack module is known, for example, from DE 10 2007 052 493 A1. In the luggage-rack module set-out therein, there are provided between two adjacent bearing  
10 modules retention modules which can be connected to both bearing modules. The retention modules are fixed to a bodyshell of a rail vehicle and carry the bearing modules.

In such a luggage-rack module for rail vehicles, it is considered to be disadvantageous for a luggage-rack not to be able to be constructed continuously in terms of the bearing face  
15 thereof. This is precluded by the fact that the required retention modules are arranged in each case between two adjacent bearing modules and consequently necessarily interrupt the bearing face. This also particularly has effects in that, when a luggage-rack is viewed from below, an aesthetically non-uniform image is produced.

20 Based on this, an object of the invention is to provide a luggage-rack module which enables a visually continuous bearing face for luggage and which, based on this, promotes an aesthetic impression of the luggage-rack from the inner space of the vehicle.

This object is achieved with the luggage-rack module of the type mentioned in the  
25 introduction in that the luggage-rack module has, at each of its two ends, a holder, which is constructed in the form of a bracket which is open in the downward direction, wherein the rear supporting profile is constructed for attachment to the vehicle bodyshell, and the bearing panel extends over the entire length of the luggage-rack module and is retained in accommodating grooves of the holders, of the rear supporting profile and of the front  
30 supporting member.

As a result of the construction of the holders as downwardly open brackets provided at both sides of the luggage-rack module, it is made possible for the bearing face for luggage to be configured in a visually uniform and continuous manner along a plurality of luggage-rack  
35 modules which form a luggage-rack. The bearing face is, for example, provided by a bearing plate which may also be a glass plate which is fixed by means of the holders, the rear supporting profile and the front supporting member. With the provision of a continuous

bearing face, the possibility is further afforded of configuring the luggage-rack module in a uniform manner from the lower side thereof.

5 The front supporting member may have along its front side an elongate, groove-like recess for accommodating an installation module. This installation module may be a seat-reservation display, a lighting device, a dummy panel or a handle rail. Since the groove-like recess of the front supporting member extends over the entire length thereof, in this manner, when viewed from the side of the luggage-rack, a uniform appearance of the luggage-rack composed of a plurality of luggage-rack modules is provided.

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The elongate groove-like recess at the front side of the front supporting member may additionally be considered to be a multi-purpose interface so that, when additional components of the luggage-rack module are retained, such as lateral holders or a rear supporting profile, only the appearance of the front side of the front supporting member can be changed.

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The front supporting member may bear a functional element on its rear side which is assigned to the shelf panel. Such a functional element may, for example, be a strip lighting, an arrangement of reading lights and/or a passenger information device. It is also conceivable for a passenger information device which is secured to the front supporting member to be fitted with the opposing side thereof to the rear supporting profile. In this manner, a reliable retention of the passenger information device is obtained.

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The rear supporting profile may, in its upper region, be hooked into adapter profiles and, in its lower region, be fixed on the adapter profiles, wherein the adapter profiles are fastened on the vehicle bodyshell. From a force path point of view, forces applied by items of luggage are consequently introduced via the lateral holders of the luggage-rack module into the rear supporting profile. The forces acting on the supporting profile are then introduced into the vehicle bodyshell via the adapter profiles, of which, for example, two may be provided along a luggage-rack module. It should be emphasised that the rear supporting profile may have over the entire length thereof a hook-like portion so that a displaceability of the supporting profile is enabled in the longitudinal direction of the rail vehicle. In one embodiment, the adapter profiles are connected in the lower region thereof to C-shaped rails of the vehicle bodyshell which may extend over substantially the entire length of the vehicle bodyshell.

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The holders of the luggage-rack module may have on the front sides thereof accommodating grooves, which are arranged in such a manner that laterally projecting lugs

of the front supporting member can be inserted into this accommodating groove. In this manner, a suitable securing of the front supporting members on associated holders of a luggage-rack module is enabled. The supporting members could inter alia be screwed at both sides via the respective "lug" from the front. The screwing is then later covered by functional elements in front. A single-sided insertion and single-sided screwing to the opposing side would also be conceivable.

The rear supporting profile may bear a functional element on its front side, which is assigned to the shelf panel. This functional element may be constructed as a strip lighting, as an arrangement of reading lights and/or as a passenger-information device. With regard to the connection of a passenger information device in the luggage-rack module, it is in turn possible to bring about a cooperation of the front supporting member and the rear supporting profile in order to secure the passenger information device. In addition, it is possible for the front supporting member or the rear supporting profile to be used to accommodate a power supply for light sources and/or the passenger information device.

The luggage-rack module or the luggage-rack which is composed of a plurality of identical luggage-rack modules is intended to be integrated in the side wall region of a rail vehicle, wherein in particular the rear supporting profile and the adapter profiles may be concealed or at least terminate in a flush-mounted manner with the side wall region. To this end, there may be provision for the rear supporting profile to have pockets or grooves which are accessible from below or above for inserting lateral cornice-like elements.

In order to modify the visual appearance of the lower side of the luggage-rack module with little complexity, there may be provision for a covering panel which is secured to the front supporting member and/or the rear supporting profile to be positioned against the underside of the bearing panel. This may be a releasable securing, for example, using magnetically acting holders or also clip-fit connections which may be secured by means of split pins. The variation possibility involves the covering panel being constructed in different manners, wherein in turn the remaining construction of the luggage-rack module remains unchanged.

For simple disassembly of the luggage-rack module, there may be provision for the holders, the front supporting member and the rear supporting profile to be releasably connected to each other.

The connection principle is similar at the front and back. In this instance, there are also bolts which protrude laterally on the rear supporting profile 33 and which are inserted in the

recesses of the extrusion profile of the holder 4 in the rear portion and which are screwed from the rear (and which are consequently not visible to the passenger).

(For example, above the groove 35, the profile pocket which abuts the adapter profile 28.)

5 Embodiments of the invention are described in greater detail below with reference to the drawings, in which:

Figure 1 is a perspective, broken-away view of a luggage-rack portion which is composed of three luggage-rack modules in a first embodiment,

10 Figure 2 is a perspective view of the luggage-rack portion of Figure 1 in the assembled state,

Figure 3 is a perspective view of a luggage-rack portion which is composed of three luggage-rack modules in a second embodiment,

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Figure 4 is a perspective view of a luggage-rack portion which is composed of three luggage-rack modules in a third embodiment,

Figure 5 is a perspective view of a luggage-rack portion which is composed of three luggage-rack modules in a fourth embodiment,

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Figure 6 is a perspective view from the side of a luggage-rack module in a fifth embodiment shown together with an adjacent side wall portion of a rail vehicle,

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Figure 7 is a perspective view of a luggage-rack portion which is composed of three luggage-rack modules in a sixth embodiment,

Figure 8 is a cross-sectional view of a luggage-rack module for constructing the luggage-rack portion according to Figure 4,

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Figure 9 is a perspective view of a luggage-rack module, and

Figure 10 is another perspective view of the luggage-rack module of Figure 9.

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Figures 1 and 2 show a luggage-rack portion which is composed of three luggage-rack modules 1 in a first embodiment and which can be mounted, for example, on a side wall of

a rail vehicle. For reasons of clarity, in the Figures only the front-most luggage-rack module 1 is provided with reference numerals.

5 The luggage-rack module 1 has a centrally arranged bearing panel 2, in this instance of glass. The bearing panel 2 is supported at the short edges thereof in each case in accommodating grooves 3 of a respective holder 4. The holders 4 are in each case constructed as brackets which are open at the bottom, wherein the accommodating grooves 3 are arranged in the lower region of the holders 4 and in the longitudinal direction of the bearing panel 2 so that mutually adjacent bearing panels 2 of a plurality of luggage-rack  
10 modules 1 which are arranged beside each other can on the whole form a continuous bearing face.

The two end-side holders 4 are connected to each other in the front region of the luggage-rack module 1 by means of a front supporting member 5. The front supporting member 5  
15 has at the side thereof facing the bearing plate 2 an accommodating groove 6 which extends over the entire length thereof and in which the associated edge of the bearing plate 2 can be inserted. The front member 5 is additionally provided with end-side protruding lugs 7. These lugs 7 engage in accommodating grooves 14 which are provided in the front side in the lower region of the holders 4 so that the front member 5 connects the front sides of the  
20 holders 4 to each other, by means of screwing from the front - as explained above. The screws are concealed by the installation modules.

The front carrier member 5 has over the entire length thereof at the front side thereof an elongate, groove-like recess 8 in which installation modules of different types can be  
25 inserted. In the embodiment of Figure 1, there is provided for the front side of the front supporting member 7 a seat reservation display which has a rear housing portion 9 which is inserted directly into the recess 8 of the front member 5, the housing portion 9 with the technical equipment is also screwed from the front, either only in the region of the holders and/or only in the region of the supporting members. The cover of the seat reservation  
30 displays is clip-fitted and fixed. From the front, the passenger information device is closed by a strip-like display screen 10.

As can be seen in Figure 2, the display screen 10 terminates directly in front of the adjacent portions of the holders 4.

35 An insert profile 11 is inserted into the front accommodating groove 14 of each holder 4 in order to provide a substantially consistent end face both in the region of the holders 4 and

in the region of the display screen 10.

As can be further seen in Figures 1 and 2, the bearing plate 2 is partially concealed from below. To this end, there are used in the present embodiment two elongate covering elements 12, 13, wherein the front covering element 12 is placed from below against the front supporting member 5 and is, for example, magnetically connected thereto. The rear covering element 13 is placed below the rear edge of the bearing plate and is also magnetically fitted to a lower side of a rear supporting profile 33 which will be explained below. (Could also be clip-fitted or connected to the glass plate in a suitable manner - for example, by means of releasably bonded hook and loop fastenings at the edge of the glass face and on the covering elements 12.)

In addition in Figures 1 and 2, a portion of a side wall inner cover of a rail vehicle is illustrated. In the cornice region relevant in this instance, that is to say, the transition region between the inner cover and side wall, in which luggage-racks are typically arranged, in the present embodiment the cover is formed by an upper covering element 15 and a lower covering element 16 which are fitted to the rear supporting profile 33, for example, in suitably constructed grooves or pockets. In this instance, the covering elements 15, 16 extend along a respective luggage-rack module, between the holders 4.

Figures 3 to 5 show modifications of the luggage-rack module 1 explained with reference to Figures 1 and 2, wherein exclusively modifications which are carried out thereto in each case will be discussed below.

In the embodiment according to Figure 3, the receiving member 8 of the front supporting member 5 has a dummy profile 17. In addition, the bearing face 2 is not provided at the lower side thereof with covering elements so that, when viewing a luggage-rack 18 according to the embodiment in Figure 3, a visually appealing continuous surface is produced.

Figure 4 shows a luggage-rack portion with a luggage-rack module 19 which also does not provide any covering elements at the lower side of the covering plate 2. Again, a modification is provided in the region of the front supporting member 5. The elongate receiving member 8 at the front side of the front supporting member 5 is in this embodiment used to secure a handle rail 20.

The embodiment of a luggage-rack module 21 according to Figure 5 is distinguished in that

there is placed from below against the bearing plate 2 a covering element 22 which is secured both to the rear supporting profile 33 and to the front supporting member 5. The covering element 22 leaves only a generally elliptically formed central region of the bearing plate 2 free. Specific optical effects are achieved by the glass of the bearing plate 2 being illuminated. The illumination is carried out laterally, at the same location at which the front reading lights can also be fitted. The required ambient light is directed via LED strips laterally into the glass plates.

Furthermore, in the embodiment with covering elements which are attached from below, the appearance is also such that no interruption of the covering faces is brought about by the holders 4. This is relevant particularly when divided front and rear covering elements are used (see Figure 1). In this instance, both covering elements including the glass face which is located therebetween extend continuously without interruption.

In the embodiment of a luggage-rack module 23 according to Figure 6, there are accommodated on a rear side 24 of the supporting member 5 loudspeakers 25, of which for reasons of clarity only one is illustrated in Figure 6. The loudspeakers 24 are fixed in a suitable manner. Alternatively, a strip lighting could also be provided instead.

Figure 6 also shows the rear fitting of the luggage-rack module 23. The holder 4 of the luggage-rack module 23 has at the rear upper side thereof a hook-like portion 26 which protrudes obliquely downwards. A front, upper web-like portion 27 of an adapter profile 28 engages in the recess which is thereby produced.

In the embodiment of a luggage-rack module 29 illustrated with reference to Figure 7, in a region below the bearing plate 2 a passenger information display device 30 is provided and extends in the transverse direction of the luggage-rack module 29, in the present embodiment below the holder 4, and at least over the entire width of the bearing plate 2 with fixing in the recesses on the rear and on the front supporting member or at the same position in the recesses in the holders 4. A lower edge of the display device 30 terminates with a lower edge of the covering element 16.

Figure 8 shows the connection of all the different embodiments of luggage-rack modules described above in greater detail. As the cross-sectional view of Figure 8 shows, the holder 4 is, as explained with reference to Figure 6, connected not only in the rear upper region via the hook-like portion 26 of the holder 4 and the web-like portion 27 of the adapter profile 28, but in addition in the rear lower region of the holder 4. The adapter profile has in this region a C-shaped profile region 29 which is directed in the direction towards the rear side

of the lower region of the holder 4 and which can be used to connect the holder 4.

5 The rear side of the adapter profile 28 is in turn secured to a side wall portion 31 which belongs to the vehicle bodyshell. This is carried out via two C-shaped rails 32 which extend in the longitudinal direction of the vehicle bodyshell and whose end sides in each case abut a rear side of the adapter profile 28 in such a manner that a suitable screw connection is enabled using sliding blocks.

10 Figure 9 shows that the luggage-rack module 23 which in this instance with regard to the fitting to the side wall portion 31 represents all the above-explained embodiments of luggage-rack modules can be fitted to the side wall portion 31 by means of two adapter profiles 28. Furthermore, Figure 9 shows that the rear supporting profile 33 extends between the holders 4 and in addition in the lower region thereof has an accommodating groove 34 which extends over the entire length of the rear supporting profile 33 and which is used for rear retention of the bearing plate 2. In addition, it can be seen that the holders 4 in the rear, lower region thereof also have accommodating grooves 35 which are in alignment with the accommodating groove 33. It should be emphasised that, in Figure 9 and also in other Figures, the holders which externally adjoin the holders 4 provided with reference numerals belong to adjacent luggage-rack modules in each case. These holders laterally abut the holders 4 so that there is no force-transmitting connection between adjacent luggage-rack modules.

25 Figure 10 is a view of the luggage-rack module 23 from the rear. When viewed together with Figures 8 and 9, it can be seen that the cross-section of the rear supporting profile 33 corresponds to the corresponding cross-section of the holders 4. In particular, the hook-like portion 26 extends in the upper rear region over the entire length of the luggage-rack module 23, from the outer end of one holder 4 via the rear supporting profile 33 as far as the outer end of the opposing other holder 4. Since the luggage-rack module 23 can consequently be freely displaced with respect to the two adapter profiles 28 in the current embodiment, luggage-rack modules which are adjacent to each other in the longitudinal direction of the rail vehicle can be orientated with respect to each other in a simple manner.

## Patentkrav

- 5           **1.** Bagagehyldemodul til opbygning af en bagagehylde i et skinnekøretøj, hvor bagagehyldemodulet (1, 18, 14, 21, 23, 24) omfatter en hyldeplade (2), der ved hjælp af mindst en holder (4) kan fikseres i forhold til en køretøjsråkonstruktion (31) af skinnekøretøjet, en bageste bæreprofil (33) og en forreste bærebjælke (5), **kendetegnet ved, at**
- 10           bagagehyldemodulet (1, 18, 14, 21, 23, 24) i begge ender i hvert tilfælde har en holder (4), der er udformet som en bøjle, der er åben nedadtil, hvor den bageste bæreprofil (33) er udformet til at blive forbundet med køretøjsråkonstruktionen, og hyldepladen (2) strækker sig over hele længden af bagagehyldemodulet (1, 18, 14, 21, 23, 24) og holdes i optagelsesnoter (14, 35, 6, 34) af holderne (4), den bageste bæreprofil (33) og den forreste bærebjælke (5).
- 15           **2.** Bagagehyldemodul ifølge krav 1, **kendetegnet ved, at**
- den forreste bærebjælke (5) langs forsiden har en langstrakt, notformet udsparring (6) til optagelse af et indbygningsmodul.
- 20           **3.** Bagagehyldemodul ifølge krav 2, **kendetegnet ved, at**
- indbygningsmodulet er udformet som siddepladsreservationsvisning (9, 10), som belysningsindretning, som gribebjælke (20) eller som blindfelt (17).
- 25           **4.** Bagagehyldemodul ifølge et af kravene 1 til 3, **kendetegnet ved, at**
- den forreste bærebjælke (5) på den bageste side, der er tilordnet hyldepladen (2), holder et funktionselement.
- 30           **5.** Bagagehyldemodul ifølge krav 4, **kendetegnet ved, at**
- funktionselementet er udformet som lysbånd, som en anordning af højttalere (25) og/eller som passagerinformations-visningsindretning (30).

6. Bagagehylde modul ifølge et af kravene 1 til 5,

**kendetegnet ved, at**

5 det bageste bæreprofil (33) i det øvre område er indsat i adapterprofiler (28) og i det nedre område er fastgjort til adapterprofilerne (28), hvor adapterprofilerne (28) er fastgjort på køretøjsråkonstruktionen (31).

7. Bagagehylde modul ifølge et af kravene 1 til 6,

**kendetegnet ved, at**

10 holderne (4) på deres forside omfatter optagelsesnoter (14), der er anbragt på en sådan måde, at lasker (7), der rager frem i siden, af den forreste bærebjælke (5) kan indsættes i disse optagelsesnoter (14).

8. Bagagehylde modul ifølge et af kravene 1 til 7,

**kendetegnet ved, at**

15 den bageste bæreprofil (33) på den forreste side, der er tilordnet hyldepladen (2), holder et funktionselement.

9. Bagagehylde modul ifølge krav 8,

**kendetegnet ved, at**

20 funktionselementet er udformet som lysbånd, som en anordning af læselamper og/eller som passagerinformations-visningsindretning (30).

10. Bagagehylde modul ifølge et af kravene 1 til 9,

**kendetegnet ved, at**

25 det bageste bæreprofil (33) omfatter lommer eller noter til indføring af sidehvælvingsbeklædningsselementer (15, 16).

11. Bagagehylde modul ifølge et af kravene 1 til 10,

**kendetegnet ved, at**

30 en beklædningsblænde (22) eller to uafhængige enkelt-beklædningsselementer (12, 13), som er fastgjort på den forreste bærebjælke (5) og/eller den bageste bæreprofil (33), er sat mod undersiden af hyldepladen (2).

**12.** Bagagehyldemodul ifølge et af kravene 1 til 11,

**kendetegnet ved, at**

holderne (4), den forreste bærebjælke (5) og den bageste bæreprofil (33) er forbundet aftageligt med hinanden.

FIG 1

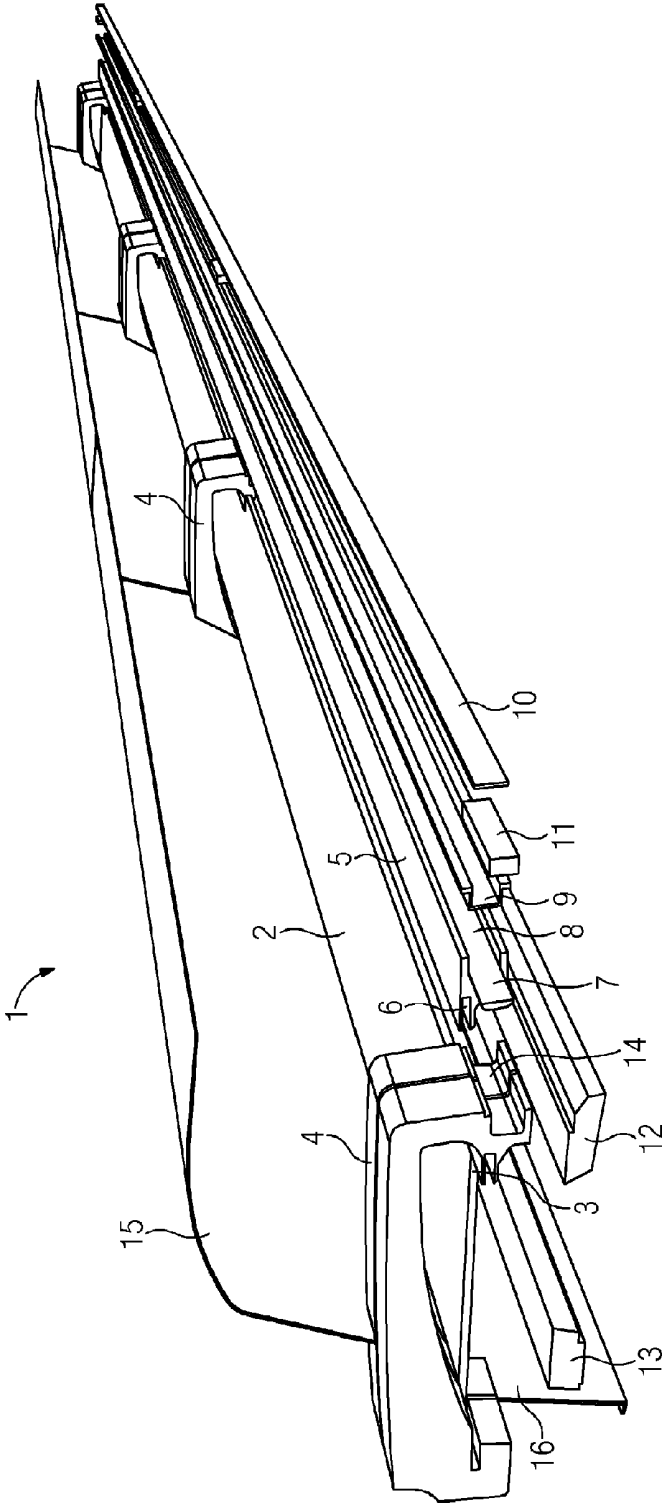


FIG 2

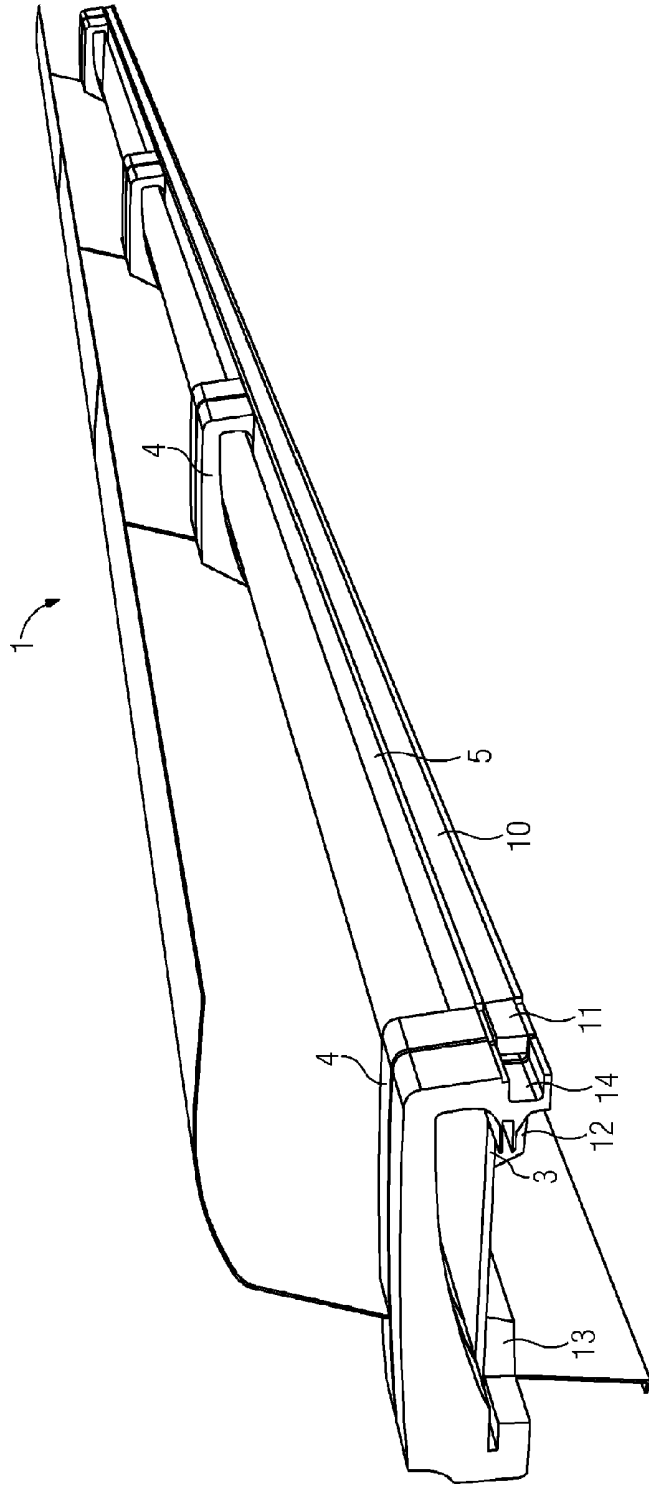


FIG 3

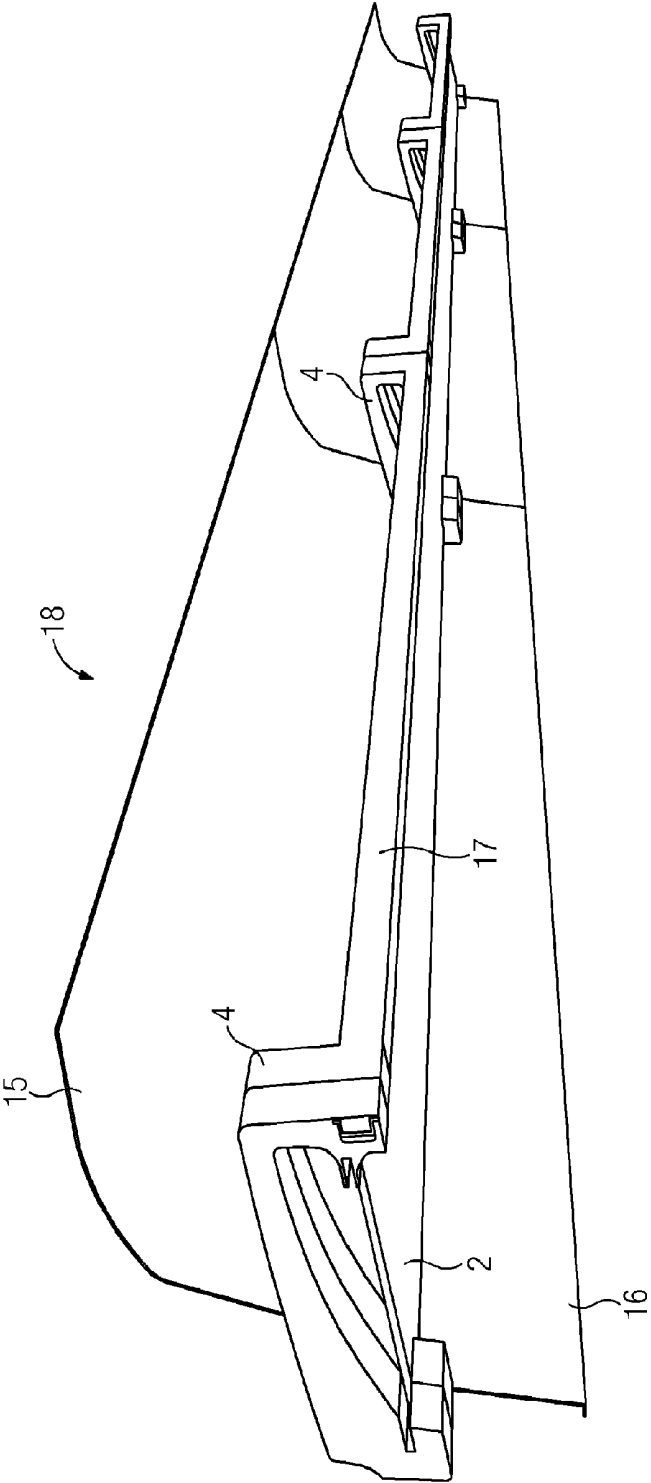


FIG 4

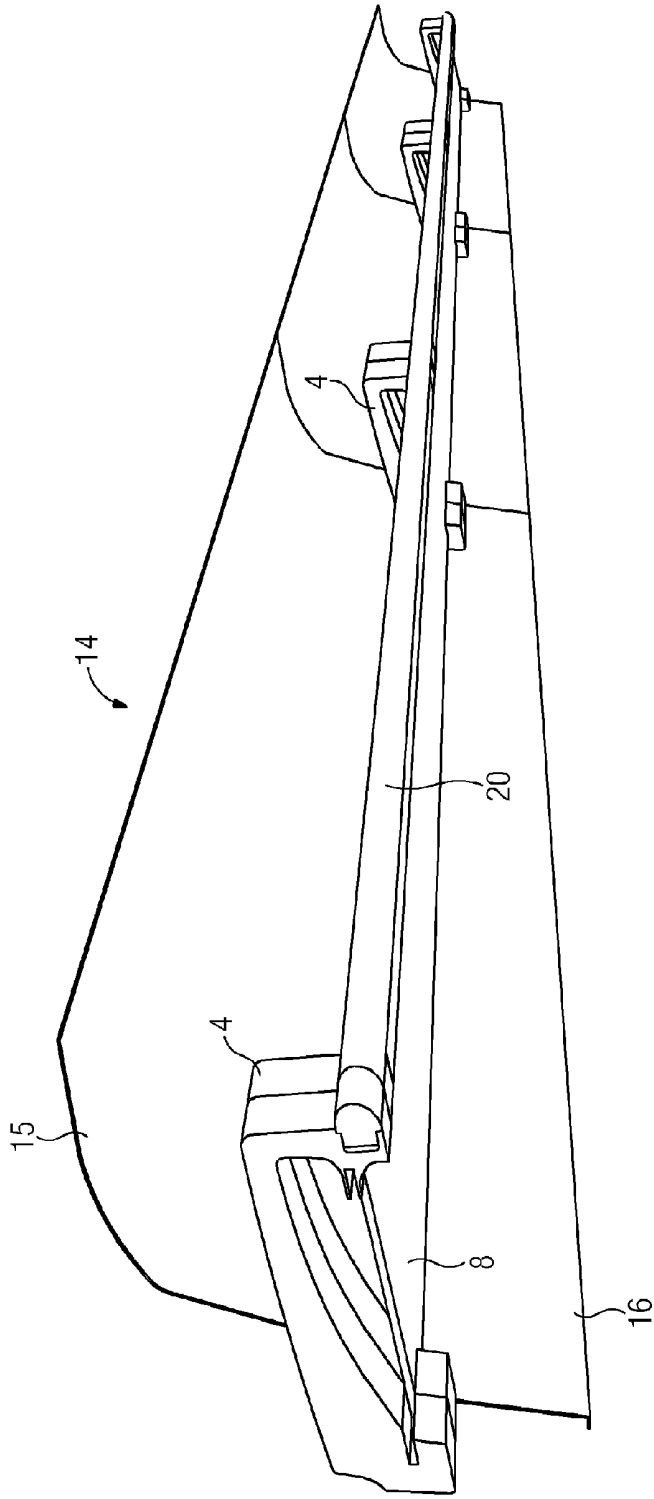


FIG 5

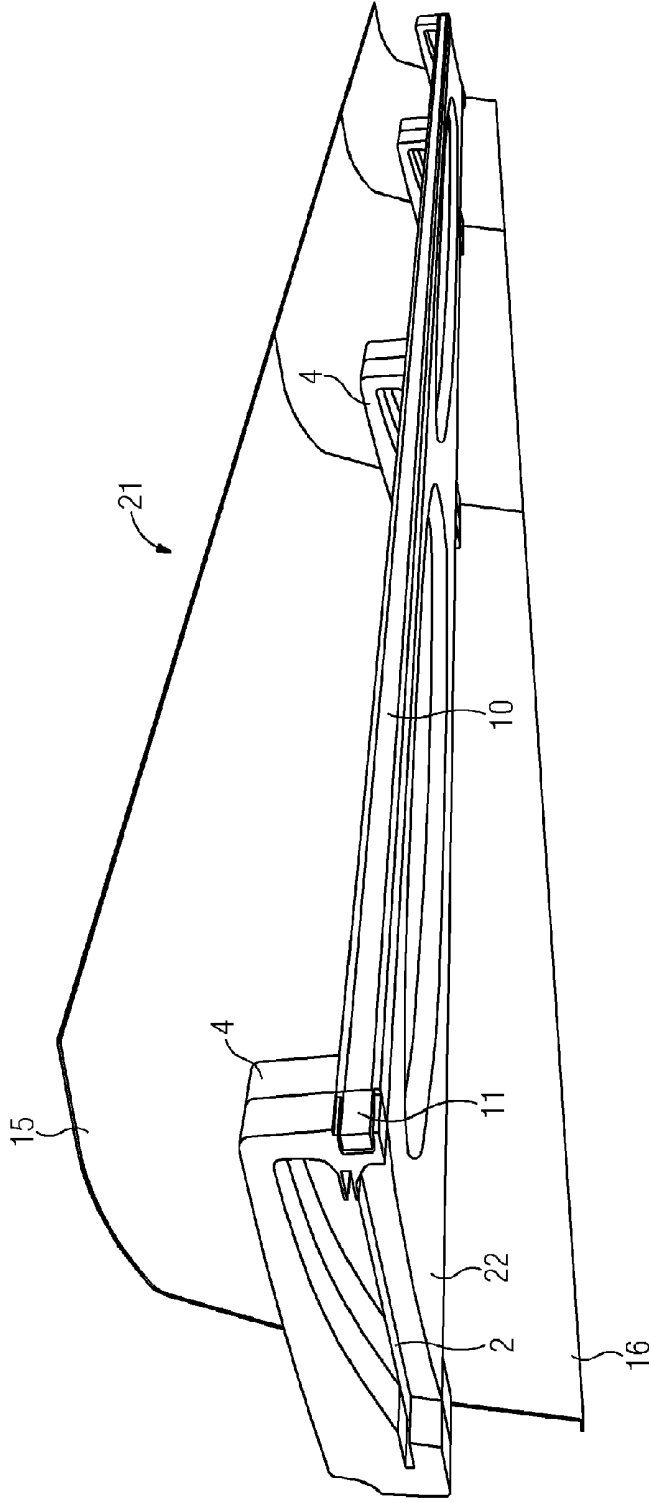


FIG 6

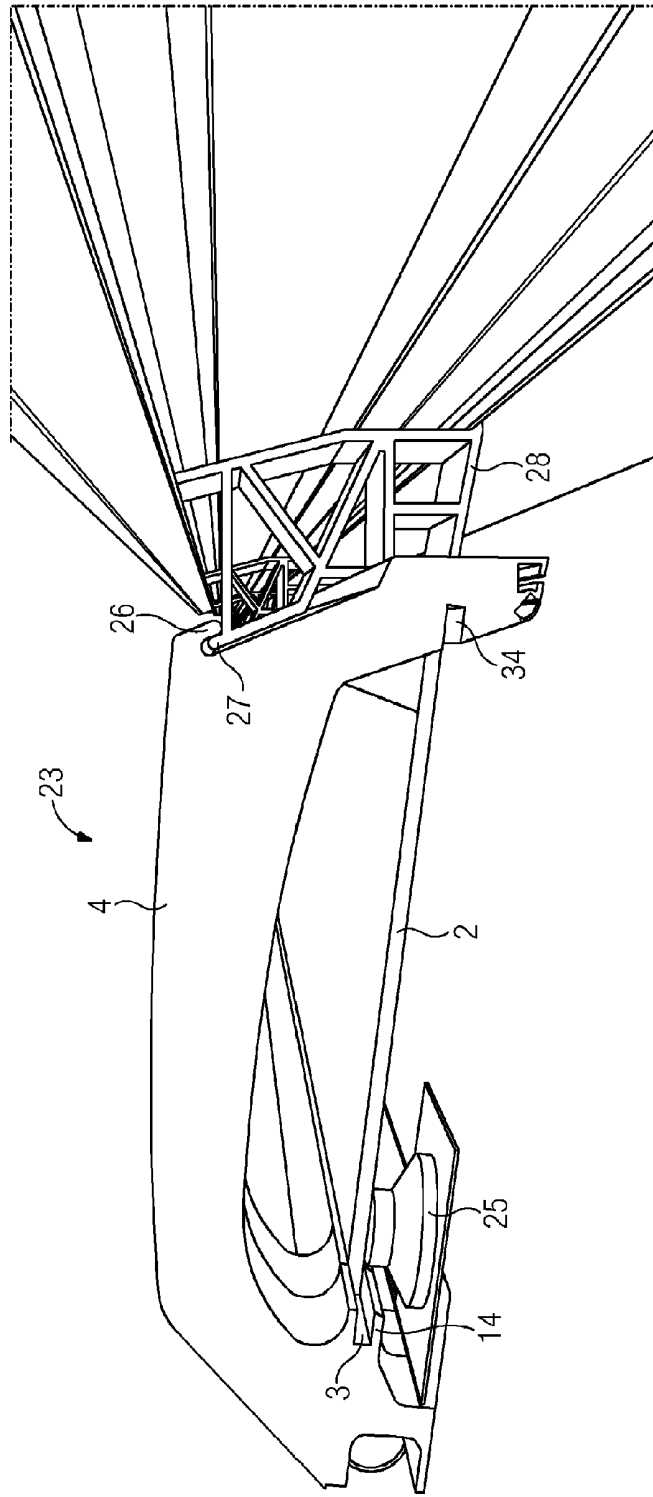


FIG 7

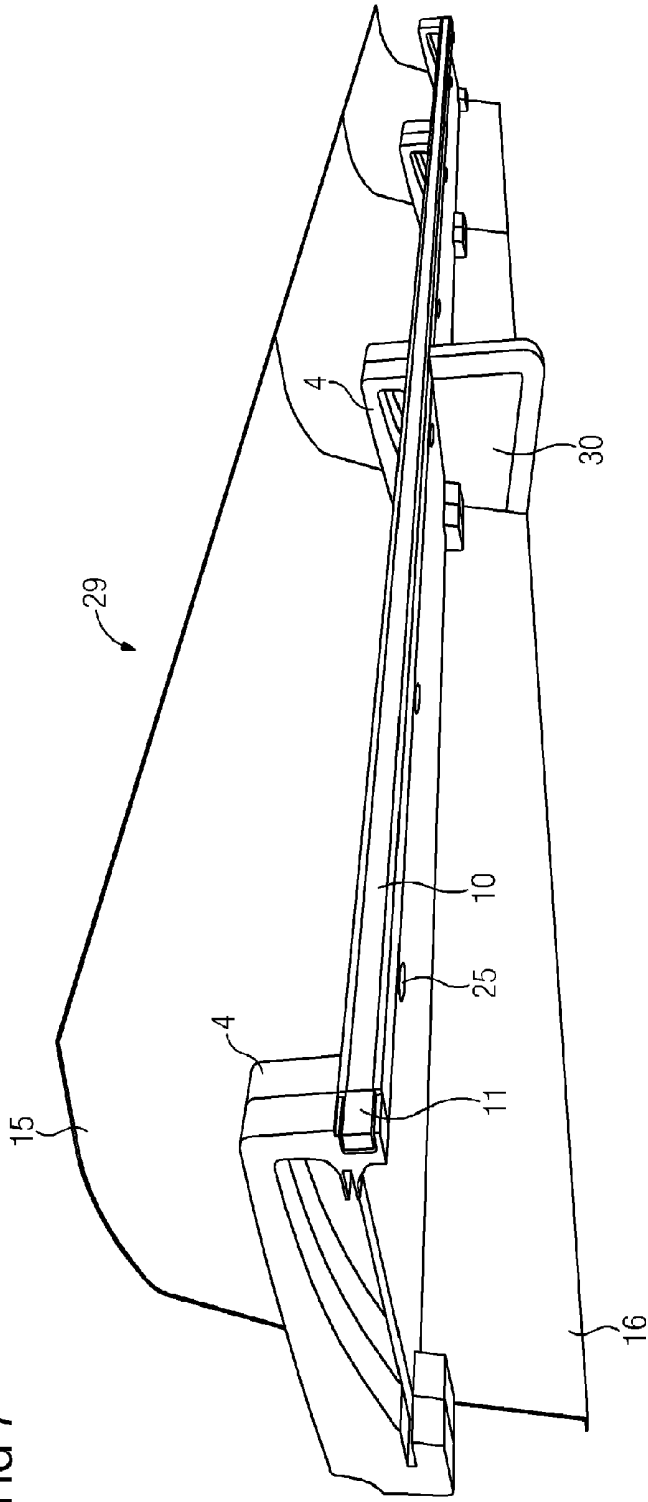


FIG 8

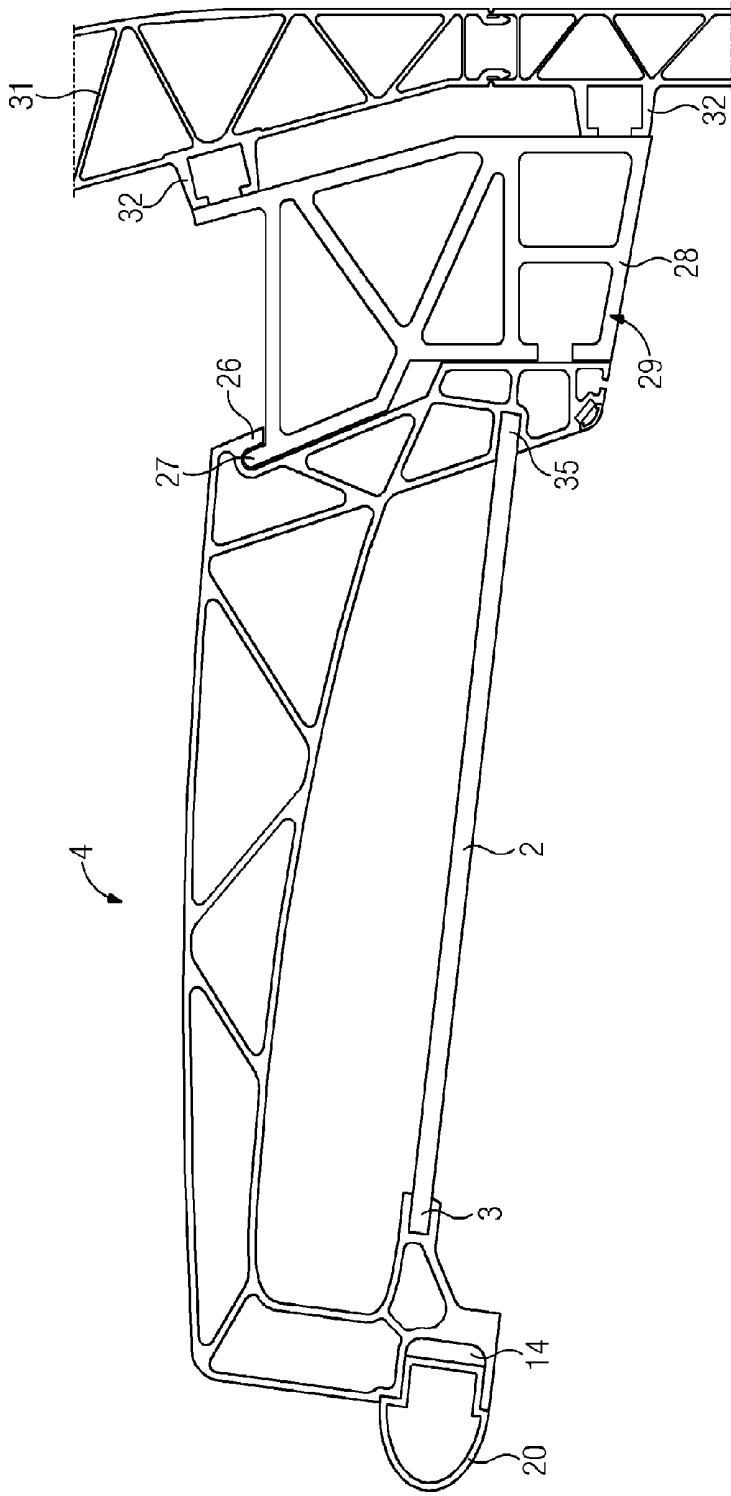


FIG 9

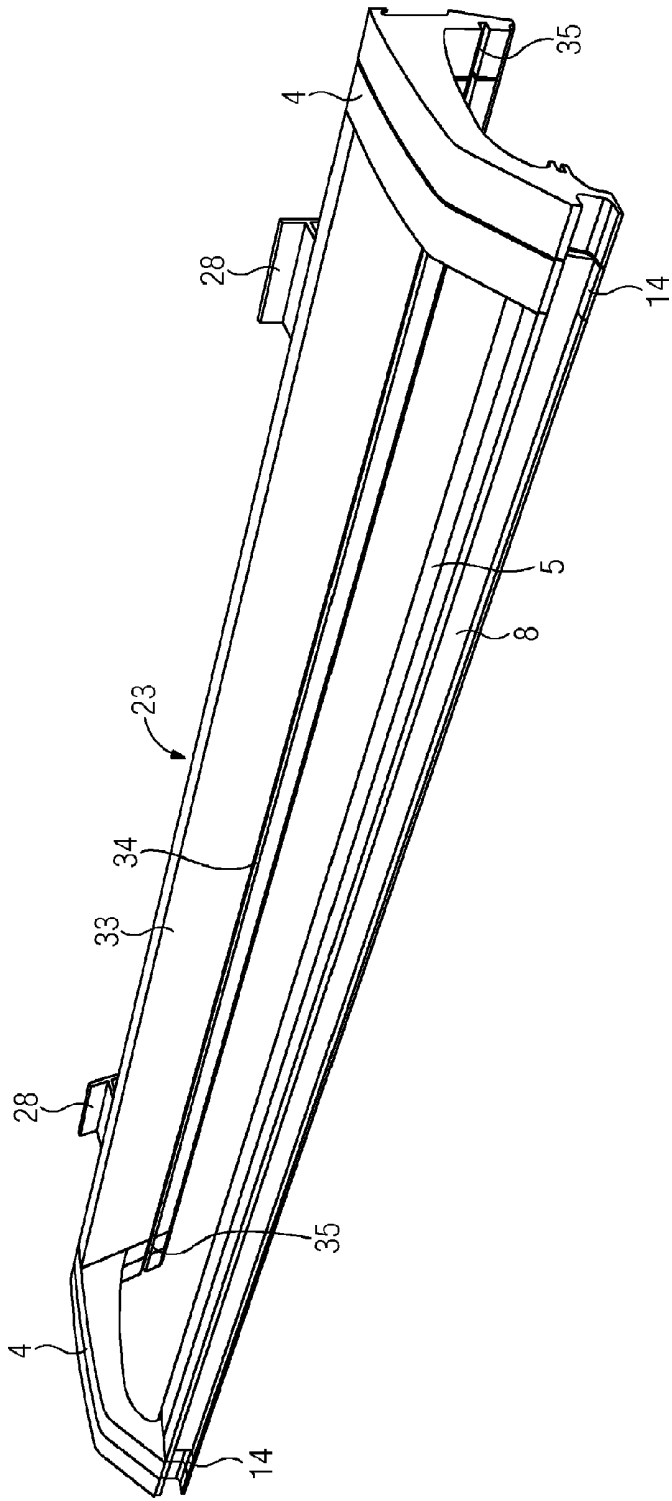


FIG 10

