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(71) Applicant
Daimler-Benz Aktiengesellschaft
Stuttgart-Untertürkheim
Federal Republic of Germany

(72) Inventors
Johann Tomforde
Peter Pfeiffer
Josef Gallitzendörfer
(74) Agents
Jensen & Son
8 Fulwood Place
High Holborn
London WC1V 6HG
England

(54) A motor vehicle body

(57) A motor vehicle body having a bonnet, windscreen, roof, a rear window and a boot has water guide channels (1 to 5) extending from the front to the back of the vehicle on either side of the central longitudinal plane.

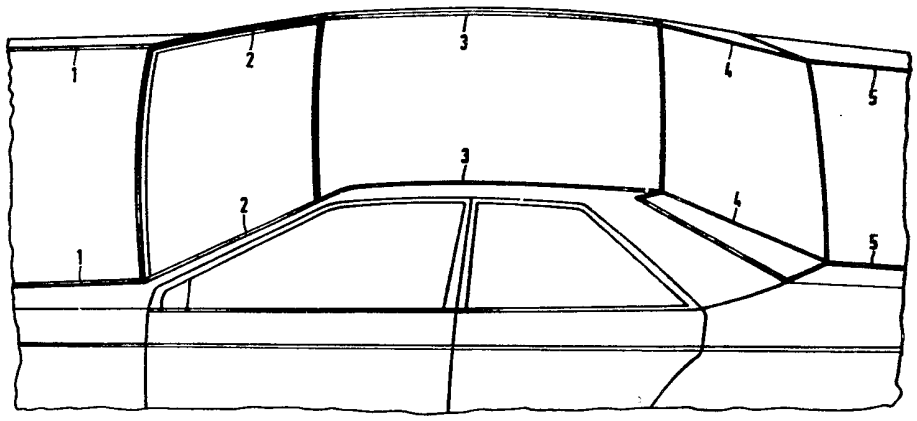


FIG.1

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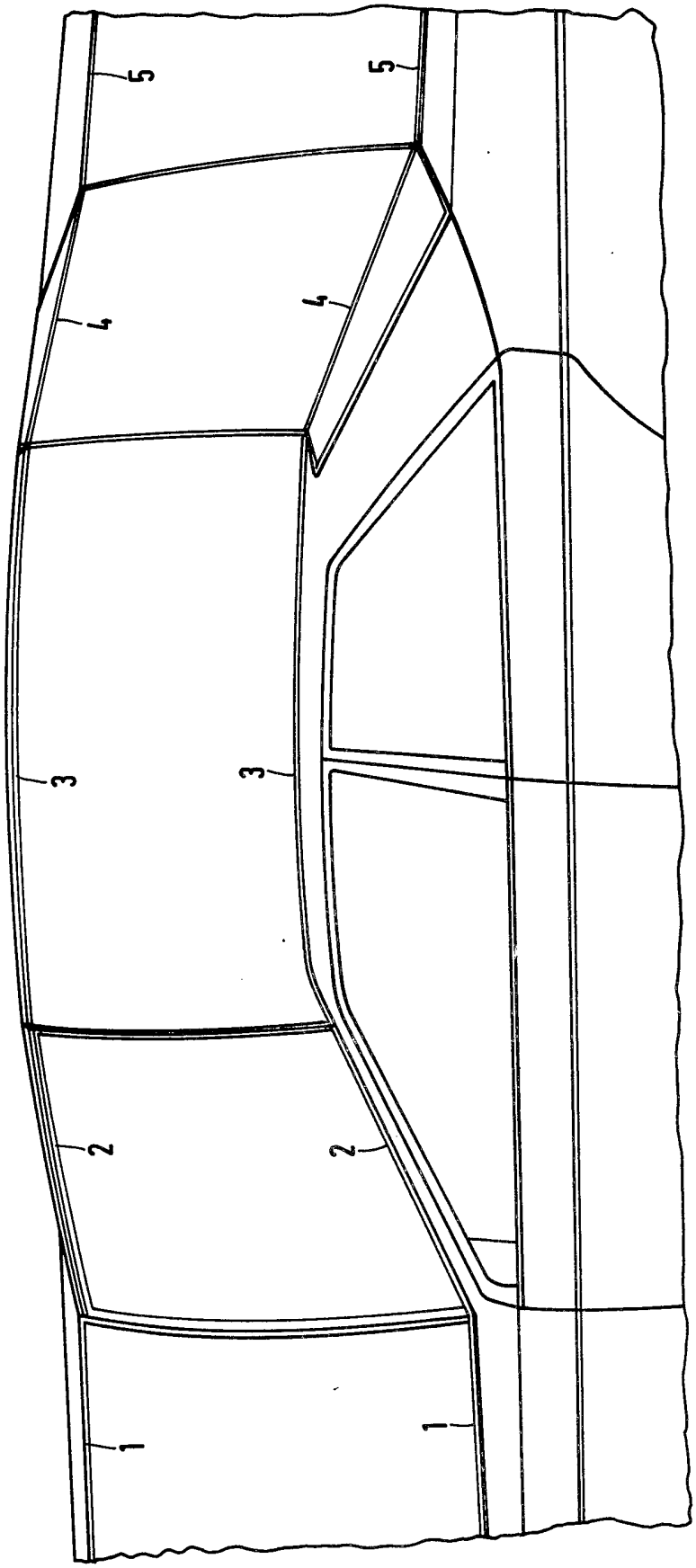


FIG.1

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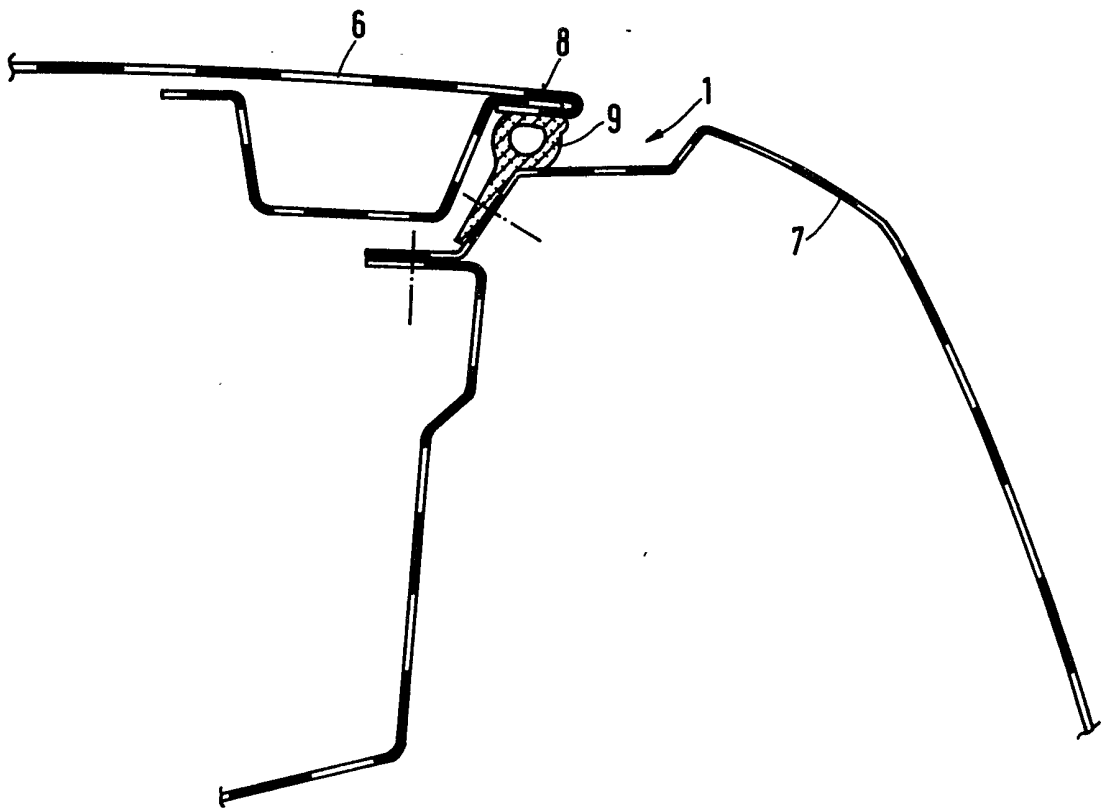


FIG. 2

FIG. 3

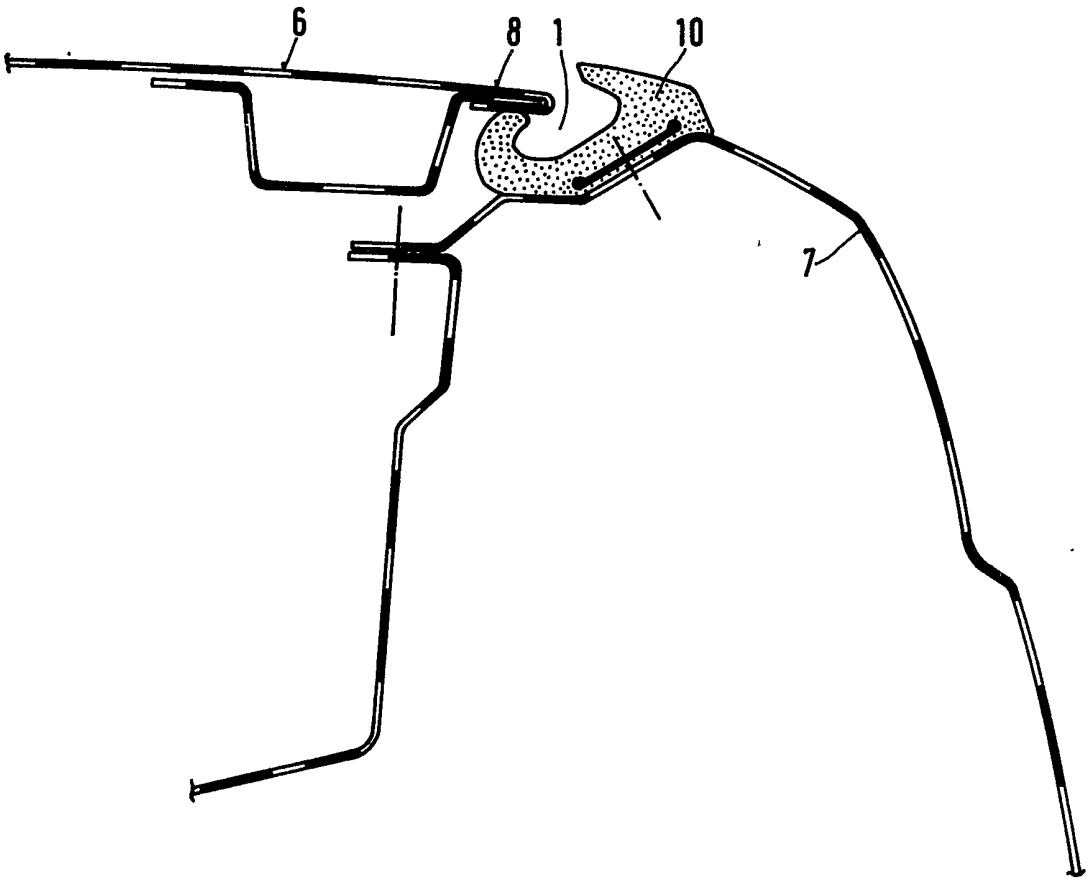


FIG.4

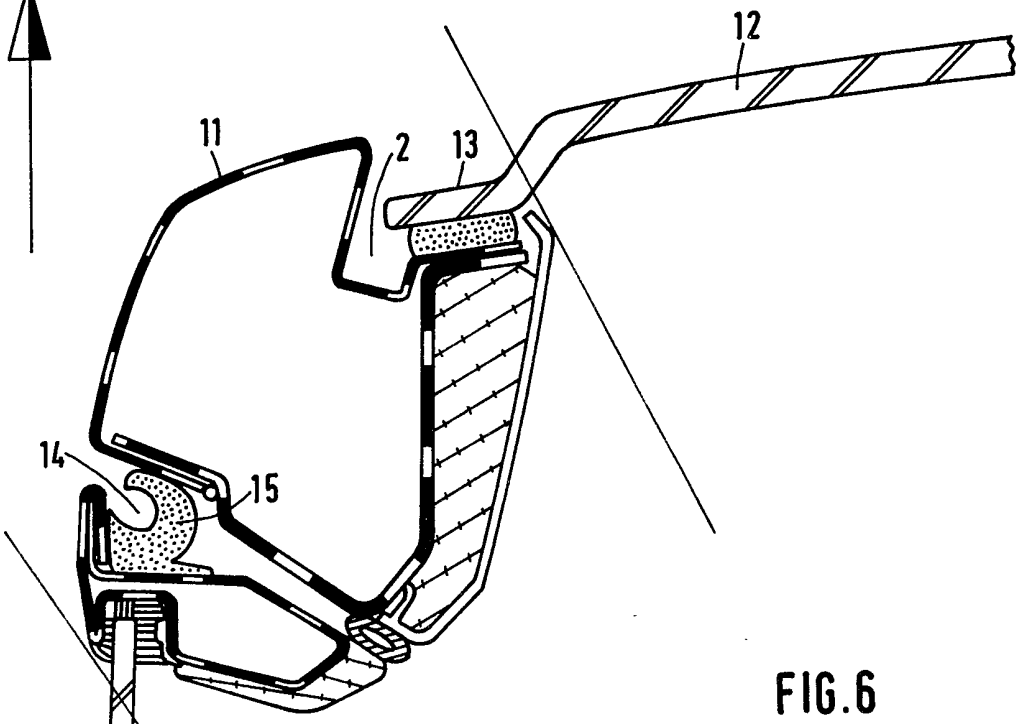


FIG.6

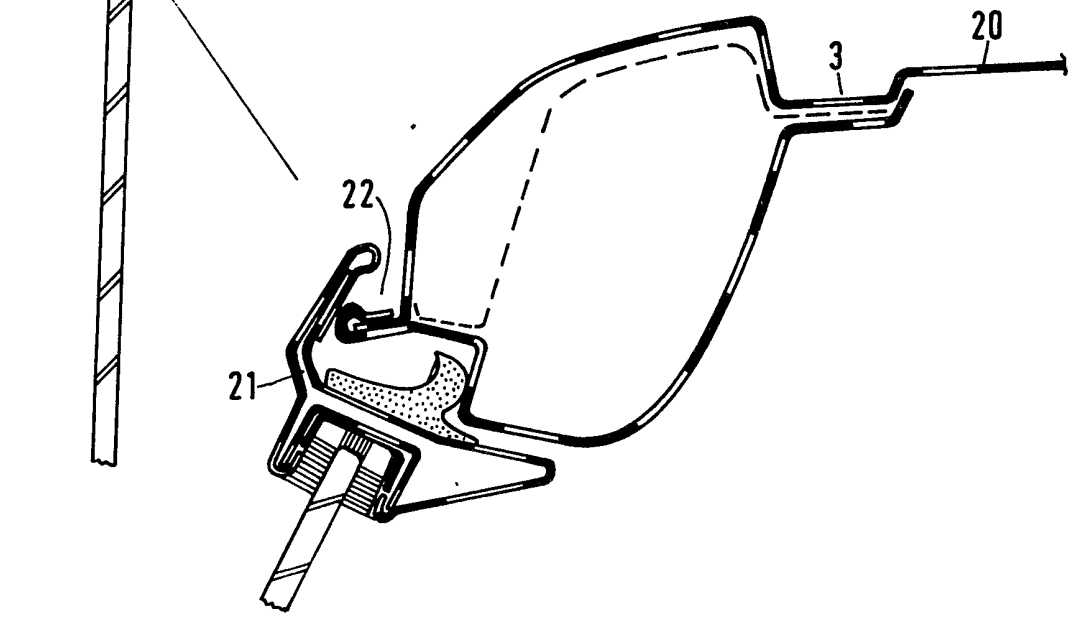


FIG.5

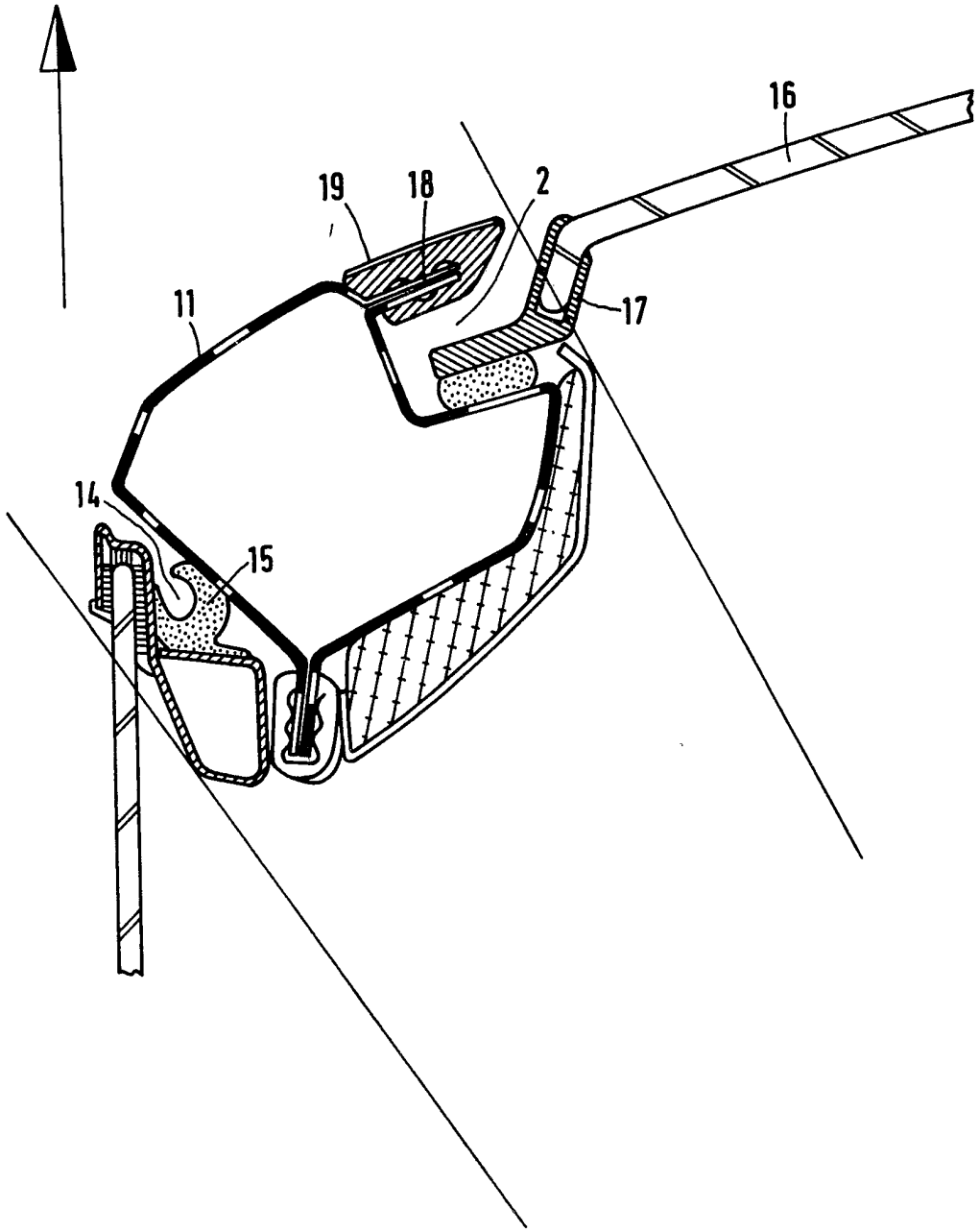
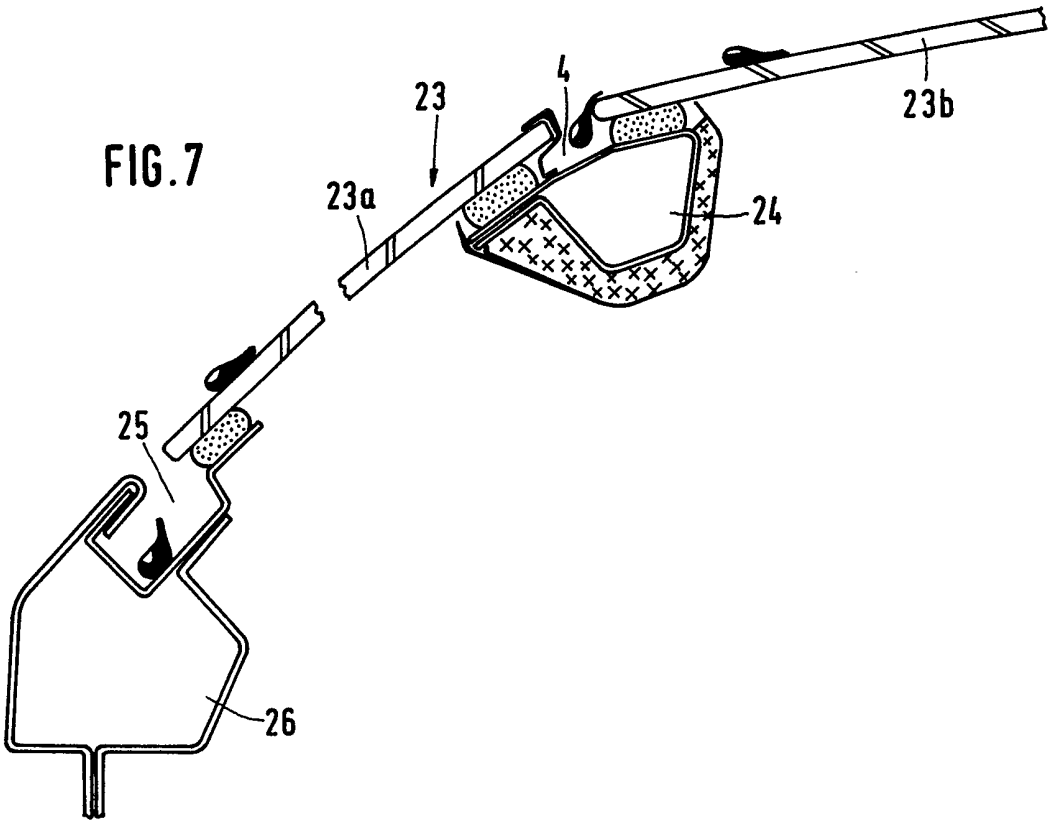


FIG.7



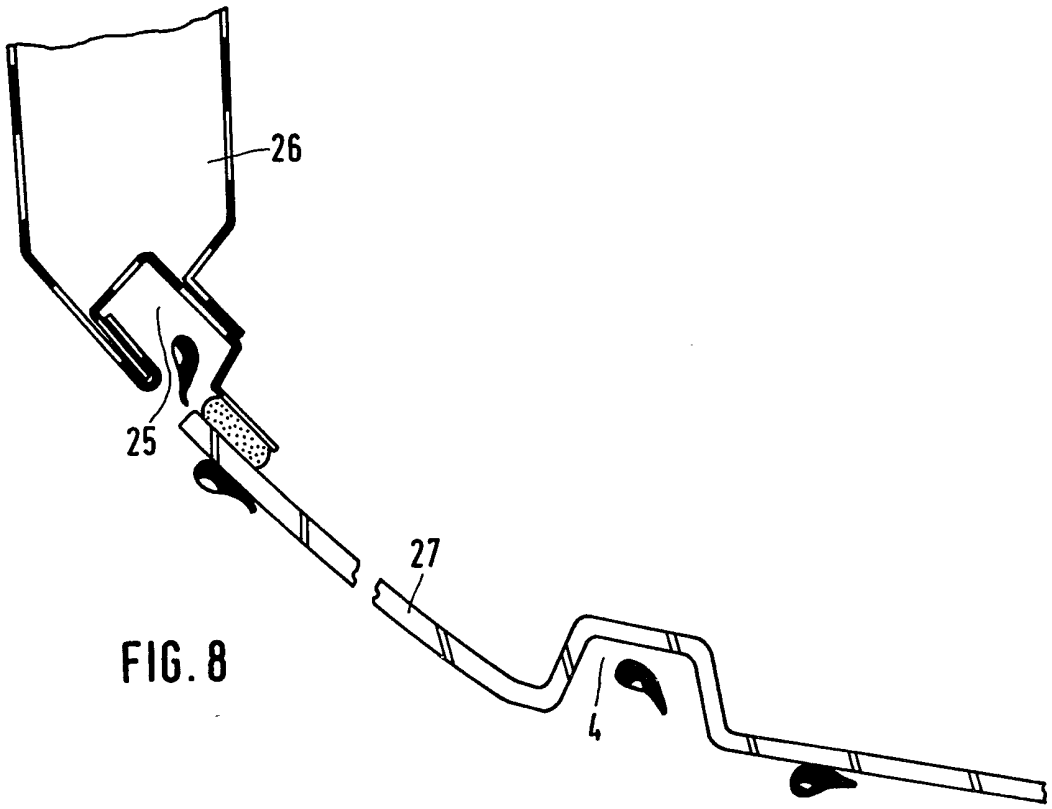


FIG.8

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FIG.9

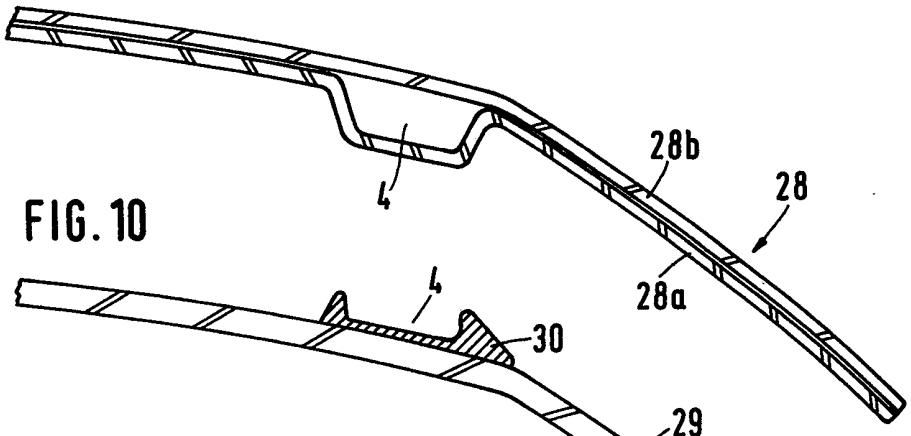


FIG.10

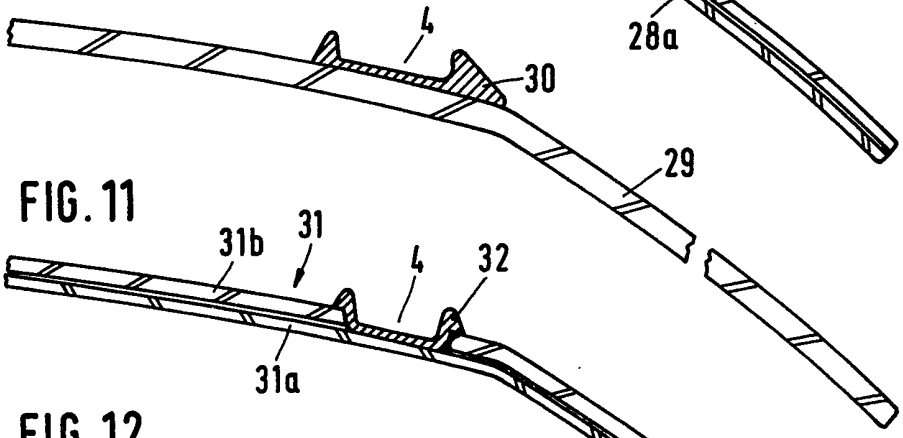
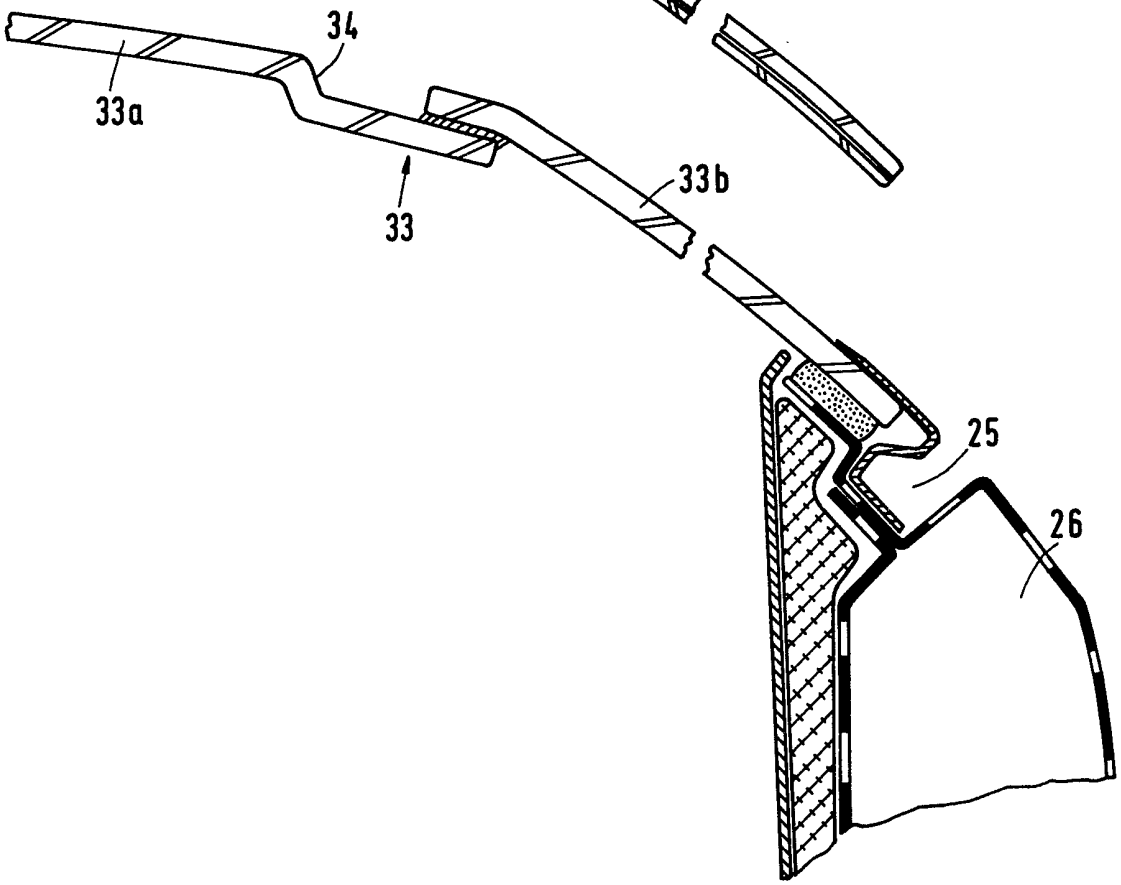


FIG.11

FIG.12



SPECIFICATION

A motor vehicle body

The invention relates to a motor vehicle body, particularly, but not exclusively, for a passenger car, having a front bonnet, a windscreen, a roof and a rear area adjacent thereto, and having means of diverting or draining dirty water or rain water.

On most passenger cars, drip mouldings are provided only in the roof side edge region as means of collecting and draining off dirty water and rain water, and these mouldings are at most supplemented by separate water drip mouldings which are fitted in the region of the windscreen columns. However, this means that controlled consistent water guidance is completely absent from large areas of the vehicle body so that a high degree of dirt accumulation can be observed on the vehicle, including its window areas which must be kept clean for driving safety.

The object underlying the present invention is to avoid these disadvantages and to design a vehicle body in such a way that the dirt accumulated and remaining thereon is reduced to a minimum even in unfavourable weather conditions.

According to the present invention there is provided a motor vehicle body, having a front bonnet, a windscreen, a roof and a rear area adjacent thereto, and having means of diverting or draining dirty water or rain water, comprising water guide channels extending from the front area to the rear area of the vehicle on either side of the central longitudinal plane of the vehicle.

Furthermore, the object underlying the present invention is to give these water guide channels the best possible design in the individual areas of the vehicle body.

This is effected in accordance with a preferred embodiment of the invention, in the joint area between a front engine bonnet and wings laterally adjacent thereto, by providing between each wing and the bonnet a seal which can be elastically deformed by the closing engine bonnet and which forms at least part of a water guide channel. Not only is favourable water guidance achieved as a result of this type of design, but the joint area between the bonnet and wing, which on account of its hardness is particularly dangerous in the event of a collision with cyclists or pedestrians, is also rendered less dangerous.

The seal in this case can advantageously comprise an upwardly open hollow space which forms the water guide channel.

A further increase in the flexibility of the hard joint area in the event of an accident is achieved in a further preferred embodiment in which the seal is, in use, subjected to the pressure of a laterally projecting flange of the bonnet. Preferably, in this case, there is a vertical spacing between the bonnet and the adjacent parts of the wing when the bonnet is closed.

Another area which presents problems for known water guide systems is the windscreen columns of the vehicle because known solutions involving separate attached mouldings are frequently unsatisfactory because of their effect on the drag coefficient of the body which should be as low as possible particularly for low fuel consumption of the vehicle.

In this case it is therefore proposed in accordance with a preferred feature of the invention that the water guide channel be formed by an impression or groove in the windscreen column.

As a result of aerodynamic considerations, it is further preferred for the lateral edge area of the windscreen to be bent or offset in the shape of a step in the direction of the windscreen column, relative to the plane of the remaining windscreen area.

The lateral edge area of the windscreen may be bent at an angle and connected to an angled moulding which forms the lateral fastening area of the windscreen.

All in all, the water guide system according to the invention is to be designed in this area in such a way that neither parts of the windscreen and its fixture nor parts of the windscreen column and water guide channel project from the generating line i.e. the overall profile, of the vehicle.

Conventional drip mouldings in the roof edge area generally disturb the air flow when the vehicle is moving and act as an additional source of danger in the event of accidents.

For the roof are, a preferred embodiment of the invention includes, on each side of the body, a main water channel which is formed preferably by an impression in the roof panel, and a residual water channel running through the area above the door(s) and covered by the said door(s) when closed.

The drainage of water from the roof in the area of the rear window had hitherto been largely neglected. For this area it is therefore proposed in a further embodiment of the invention that there be provided water guide channels running from the roof top downwards in the area of the rear window surface.

A large number of particularly advantageous embodiments of the water guide system for this area of the vehicle are described hereinafter.

In one embodiment the channels are moulded in the window, which may, in this case, be formed of polycarbonate or the like plastics material. The channels may be moulded in an inner layer and be closed by an outer layer of the window to form a tube, the upper inlet end of which may be covered by a filter screen or the like.

Alternatively, the channels may be formed in a moulding of groove-shaped section which

may be secured to the outside of the window or set in a groove in the window. In another form, the window is formed in parts and the channels are formed between adjacent edges of the window parts.

Embodiments of the invention will now be described by way of example with reference to the accompanying drawing, in which:–

Figure 1 shows a perspective view of the main areas of the body of a passenger car,

Figures 2 and 3 show respectively two differing vertical sections through the joint area between the engine bonnet and wing,

Figures 4 and 5 show respectively two differing sections through the windscreen column and the adjacent areas of windscreens and driver's door,

Figure 6 shows a section through the roof frame of the vehicle, and

Figures 7 to 12 show horizontal sections through differently designed rear windows.

The general course followed by the water guide channels is shown in Fig. 1 of the drawings. These channels are designated in the area of the front bonnet by reference numeral 1, in the area of the windscreen columns by reference numeral 2, in the roof area by reference numeral 3, along the rear window area by reference numeral 4 and in the area of the rear bonnet of boot joints by reference numeral 5.

Fig. 2 of the drawing shows an embodiment of the water guide channel 1 in the joint area between a front engine bonnet 6 and a wing 7 which is adjacent thereto. In this case there is provided an elastically deformable seal 9 which can be subjected to pressure by the flange 8 of the bonnet 6 and which, together with a wall section of the wing 7 defines the water guide channel 1. The wall section of the wing is formed by an impression or groove in the wing 7. By designing the joint area in this way, the bonnet 6 can be made flexible in this region, which reduces the risk of injury to a pedestrian in the event of a collision with the pedestrian. The vertical spacing which is provided in the structure between the bonnet 6 and the wing 7 also contributes to this flexibility. Other advantages which can also be obtained are a certain containment of the noise from the engine compartment and prevention of dirt accumulation thereon by water penetrating from above.

In Fig. 3 of the drawing, a slightly different design of the water guide channel is shown. In this case there is provided an elastic seal 10 comprising an upwardly open hollow space which alone forms the water guide channel 1. In addition, the advantage of a structure having a low tolerence sensitivity is also achieved by the overlapping of the bonnet 6 and the wing. The precise amount of overlap is not crucial.

On the rear edge of the bonnet 6, each water guide channel 1 can be connected, in a manner not shown, to a water downtake which should continue as far as the front door recess in order that the water on the windscreen, which in plan view is turned considerably inwards for aerodynamic reasons, may be conducted into a drainage hole in the area of the front door recess.

Figs. 4 and 5 of the drawings show in cross-section two versions of the water guide channels 2 in the area of the windscreen pillars 11. The water guide channels 2 in this case are formed substantially by indentations or grooves in the windscreen pillars 11. In the embodiment shown in Fig. 4 of the drawing the edge area of the windscreen 12 is offset either in the form of a step as shown or shaped to an angle. When flowing around, the air forms a cushion in front of this edge area 13 during driving so that, from the aerodynamic aspect, the conditions obtained are equally as good as on smooth-surfaced, greatly rounded parts. Despite this, the water guide system leading the roof functions perfectly on account of the lower position of the water guide channel 2. Adjacent to and to the side of the windscreen pillar 11 away from the windscreen, there is also provided a residual water channel 14 which is defined in part by a correspondingly shaped door seal 15.

In the embodiment of the invention shown in Fig. 5, the windscreen 16 is angled in its edge area and is connected to an also angled moulding 17 which is made, for example, of aluminium and which forms the lateral fastening area of the windscreen 16. In this embodiment the water guide channel 2 is partially covered by a flange 18 of the windscreen pillar 11, on which flange 18 a covering section 19 is mounted. This line which extend from the driver's eye position in Figs. 4 and 5, respectively, indicate that the driver's vision is only slightly impaired by the windscreen pillar 11 which has a relatively small cross-section.

Fig. 6 of the drawings shows a section through a lateral roof area of a passenger car which shows the water guide channel 3 formed by an impression or indentation in the roof panel 20. In addition, there is provided a residual water channel 22 which is located in the area above a door 21, which channel is concealed by a lip on the upper edge of said door 21 when it is closed. The residual water channel 22 does not therefore have an unsightly appearance in the stylistic sense and does not have an unfavourable influence in the drag coefficient of the vehicle.

Figs. 7 to 12 of the drawings show various embodiments of the water guide system in the area of the rear window of a vehicle although it would possibly be conceivable also to have a water guide system in this form in the windscreen area.

In the embodiment according to Fig. 7 of the drawings, the rear window 23 consists of

two parts 23*a*, 23*b*, the division being in the area of the water guide channel 4. Both parts 23*a*, 23*b*, of the window 23 are, while forming an intermediate space which results in the water guide channel 4, bonded to a pillar 24. An additional water guide channel 25 is formed in this embodiment by a recess impressed in a rear window pillar 26.

In the embodiment according to Fig. 8, the water guide channel 4 is moulded into the window 27, in which case polycarbonate with a silicate coating could be used, for example, as the material for the window.

A similar embodiment is shown in Fig. 9, but a window 28 composed of two layers 28*a*, 28*b* is used in this case, the water guide channel 4 being moulded into the inner layer 28*a*, for which a material such as that proposed for the window 27 could be used, whereas the smooth outer layer 28*b* would consist preferably of glass. The upper inlet of the water guide channels 4 may be covered by a screening filter or the like (not shown).

However, separate components can also be used to form the water guide channels 4, as shown in Figs. 10 and 11. Thus, the embodiment shown in Fig. 10 has a window 29 which is made from toughened or tempered safety glass and on which is mounted a moulding 30 of groove-shaped cross-section which forms the water guide channel 4. Fig. 11 shows a window 31 consisting of two layers 31*a*, 31*b*, the outer layer 31*b* being provided with a gap or opening into which is inserted a moulding 32 of groove-shaped cross-section which forms the water guide channel 4.

As the last embodiment of the invention, Fig. 12 shows a window 33 consisting of two parts 33*a* and 33*b*, one part 33*a* of the window 33 comprising a step-shaped offset edge area and the other part 33*b* being mounted on the offset section some distance from the step 34, thereby forming the water guide channel 4.

The water guide channels 5 in the rear area can be designed identically to the water guide channels 1 in the front area of the vehicle. To prevent the drainage dirty water from being subjected to turbulence or a swirling motion at the rear of the moving vehicle or being deposited again on the vehicle body, exit holes having an outlet below the rear bumper can be advantageously provided at the end of the water guide channels 5.

For all channels, a substantial reducation in wind noise and improvement in the c_D value are obtained by moving the channels or mouldings in towards the centre of the vehicle, away from the critical edge zones. Only this makes it possible for the outer sides of the channels to remain on a level with the inner surfaces of the vehicle body, or up to approximately 4 mm higher, because these zones still lie within the lamina boundary layer of the air flowing round. Additional mouldings or trims on the roof structure are superfluous, which results in a saving in weight and cost.

CLAIMS

1. A motor vehicle body, having a front bonnet, a windscreen, a roof and a rear area adjacent thereto, and having means of diverting or draining dirty water or rain water, comprising water guide channels extending from the front area to the rear area of the vehicle on either side of the central longitudinal plane of the vehicle.

2. A motor vehicle body according to claim 1 wherein the water guide channels in the joint regions between a front engine bonnet and wings laterally adjacent thereto include a seal adapted to be elastically deformed by the closing engine bonnet and which forms at least part of the water guide channel and is disposed between the wing and the bonnet.

3. A motor vehicle body according to Claim 2, wherein the seal comprises an upwardly open hollow space which forms the water guide channel.

4. A motor vehicle body according to Claim 2, wherein the seal is, in use, subjected to the pressure of a laterally projecting flange of the engine bonnet.

5. A motor vehicle body according to Claim 2, wherein there is a vertical spacing between the engine bonnet and the adjacent parts of the wing when the bonnet is closed.

6. A motor vehicle body according to any one of Claims 1 to 5, wherein the water guide channels in the region of the windscreen columns are formed by an impression or groove in the windscreen column.

7. A motor vehicle body according to Claim 6, wherein the lateral edge areas of the windscreen are bent or offset in the form of a step in the direction of the associated windscreen column relative to the plane of the remaining windscreen area.

8. A motor vehicle body according to Claim 6 or 7, wherein the lateral edge areas of the windscreen are each bent at an angle and connected to an angled moulding which forms the lateral fastening area of the windscreen.

9. A motor vehicle body according to Claim 6, wherein each water guide channel is partially covered by a flange of the windscreen column, and a covering section is mounted on the flange.

10. A motor vehicle body according to any one of Claims 6 to 9, wherein the windscreen, its fixing parts, the windscreen columns and water guide channels lie within the generating line of the body.

11. A motor vehicle body according to any one of claims 1 to 10, wherein the water guide channels in the roof area include, on each side of the body, a main roof water

channel and a residual roof water channel running through the area above the door(s) which is covered by said door(s) when closed.

12. A motor vehicle body according to Claim 11 wherein the main roof water channel is formed by an impression in the vehicle body roof.

13. A motor vehicle body according to any one of Claims 1 to 12, wherein the water guide channels in the area of a window, extend from the top downwards in the area of the window surface.

14. A motor vehicle body according to Claim 13 wherein said window is a rear window.

15. A motor vehicle body according to Claim 13 or 14, wherein said water guide channels in the window area are moulded into the window.

16. A motor vehicle body according to Claim 13, 14 or 15 wherein said window is composed of a plurality of layers, the water guide channels in the window being moulded into one or a plurality of internal layers of the window and are covered by an external layer.

17. A motor vehicle body according to Claim 16, wherein the upper inlet of each of the water guide channels in the window area is covered by a filtering screen or the like.

18. A motor vehicle body according to Claim 13 or 14, wherein the water guide channels in the window area are formed by mouldings of groove-shaped cross-section which are mounted on the window.

19. A motor vehicle body according to Claim 13 or 14 having a window composed of a plurality of layers, wherein in the area of the water guide channels in the window area, at least one external layer of the window is provided with a gap or opening, and a moulding of groove-shaped cross-section is inserted into this gap.

20. A motor vehicle body according to Claim 13 or 14, wherein the window is in separate sections, the edges of which are in the area of the water guide channels, a part of the window comprises a step-shaped offset edge area, and the other part of the window is mounted on the offset part some distance from the step to thereby form the channels.

21. A motor vehicle body according to Claim 13 or 14, wherein the window is divided into two sections, the edges of which are in the area of the water guide channels and both parts while forming an intermediate space therebetween are fastened to a column of the body.

22. A motor vehicle body according to Claim 21 wherein the parts of the window are bonded to said column.

23. A motor vehicle body according to any one of Claims 13 to 22, wherein an additional water guide channel formed by a column on the vehicle body is provided in the area of each of the lateral edges of the window.

24. A motor vehicle body having water guide channels substantially as described herein with reference to and as illustrated in Fig. 1 and any one or more of Figs. 2 to 12 of the accompanying drawings.

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