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(54) **Title**: SPRAY PREVENTION DEVICE

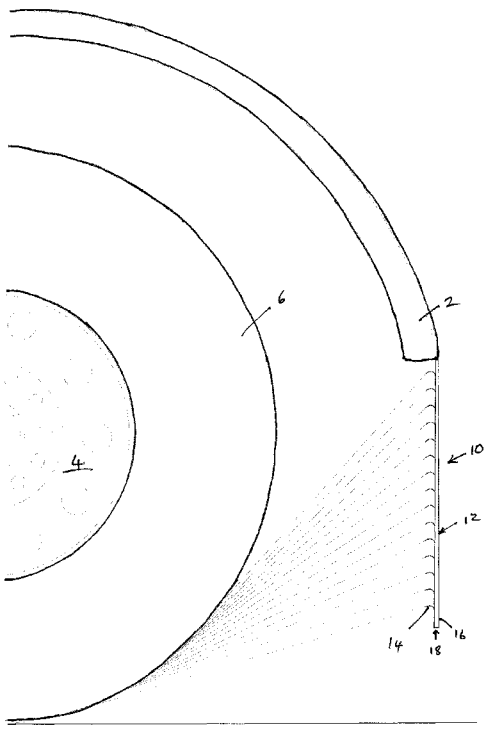

Figure 1

(57) **Abstract**: A device (10) for reducing or preventing spray from a vehicle's tyres (6), said device comprising a first part (12), comprising a plurality of transversely arranged vanes (14) or louvres between which water and air may pass, and a second part (16), comprising a wall member, a channel (18) being defined between the first and second parts through which water may drain, wherein the vanes (14) or louvres are shaped to deflect water and air passing between the vanes or louvres to encourage the water and air to flow downwardly through the drainage channel (18) between the first and second parts.

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Spray Prevention Device

This invention relates to a device for a vehicle for reducing or preventing spray from the vehicle's tyres.

Existing mud flaps commonly used by commercial vehicles use a pile material to try and reduce the amount of spray created when water flung off the vehicles tyres impacts upon the mud flaps mounted behind each tyre. However, such known mud flaps are not particularly effective at preventing spray, particularly in heavy rain.

According to the present invention there is provided a device for reducing or preventing spray from a vehicle's tyres, said device comprising a first part, comprising a plurality of transversely arranged vanes or louvres between which water and air may pass, and a second part, comprising a wall member, a channel being defined between the first and second parts through which water may drain, wherein the vanes or louvres are shaped to deflect water and air passing between the vanes or louvres to encourage the water and air to flow downwardly through the drainage channel between the first and second parts.

Preferably said first part comprises a plurality of vertically spaced louvres or vanes, said second part comprising a substantially vertically arranged wall member.

Preferably said vanes or louvres are shaped to deflect water and air passing therebetween from an upwards and rearwards direction into a substantially downwards direction

The transversely arranged vanes or louvres are shaped to redirect the direction of motion of the water passing therebetween to impart a downward motion to the water to encourage drainage of the water between the first and second parts.

Preferably the width of said channel defined by the distance between said first and second parts increases from an upper end of the device to a lower end of the device.

Preferably each of said vane or louvres comprises a leading edge, a trailing edge and a curved surface extending between said leading and trailing edges.

The leading edges of a least a portion of said plurality of vanes or louvres may be respectively arranged to extend substantially tangentially to an adjacent tyre of the vehicle. Preferably the trailing edges of at least some, preferably all, of said plurality of vanes or louvres extend in a substantially downwards direction to direct water and air passing between the vanes downwardly into said channel between the front and rear members of the device. Said plurality of vanes or louvres may be arranged in two or more vertically spaced groups, the leading edges of each group of vanes or louvres being arranged at a respective common angle.

In one embodiment said plurality of vanes or louvres may be arranged in three vertically spaced groups, a lowermost group, a middle group and an uppermost group. In one embodiment the leading edges of said lowermost group are arranged at an angle of between 5° and 20° to the horizontal, the leading edges of the middle group are arranged at an angle of between 20° and 45° to the horizontal and the leading edges of the uppermost group are arranged at an angle of between 45° and 65° to the horizontal.

Preferably said plurality of vanes or louvres comprising said first part are mounted in a peripheral frame. Preferably said frame is detachable from said second part to allow the vents or louvres to be cleaned and/or repaired.

Said device may comprise at least a portion of a mudguard of a vehicle.

In one embodiment said device comprises a mud flap adapted to be mounted behind a wheel of a vehicle, preferably at a lower end of a mudguard of the vehicle.

An embodiment of the present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:-

Figure 1 shows a spray prevention device in accordance with an embodiment of the present invention mounted on a vehicle;

Figure 2 is a perspective view of the spray prevention device of Figure 1;

Figure 3 is a front view of the spray prevention device of Figure 1;

Figure 4 is a rear view of the spray prevention device of Figure 1;

Figure 5 is a plan view of the spray prevention device of Figure 1 from above;

Figure 6 is a detailed perspective view of a vane of the spray prevention device of Figure 1;

Figure 7 is a perspective view of the chassis component of the spray prevention device of Figure 1; and

Figure 8 is a retaining member of the spray prevention device of Figure 1.

A spray prevention device for a vehicle in accordance with an embodiment of the present invention is illustrated in Figures 1 to 8. As shown in Figure 1, the spray prevention device 10 is mounted on a lower end of a mudguard 2 of the vehicle to be arranged vertically behind a wheel 4 of the vehicle to receive water flung off the tyre 6 of the wheel 4 when the tyre 6 passes through water on the road. As illustrated in Figure 1, water tends to be flung tangentially off the tyre 6 in an upwards and rearwards direction from a rear side of the tyre 6.

As best seen from Figures 2 to 8, the spray prevention device 10 comprises a rectangular chassis component 12 supporting a plurality of vertically spaced transversely extending vanes 14, the chassis component 12 having a vertically arranged rear wall 16, a channel 18 being defined between the rear or trailing edges of the vanes 14 and the rear wall 16 of eth chassis component 12, through which water may drain to be returned to the road through a lower end of the channel 18.

Each vane 14 is shaped to deflect the water and air passing between adjacent vanes 14 from an upwards and rearwards direction, extending substantially tangential to the tyre as the water leaves the tyre and enters the mud flap, to a downwards direction, so that the water and air enters the channel 18 in a downwards direction to assist draining of the water from the channel 18 and to prevent the water from directly impacting of the wall of the second part which would otherwise create spray.

Each vane 14 comprises a leading edge, a trailing edge and defines a curved surface extending between said leading and trailing edges.

The vanes 14 are detachably mounted on the chassis component so that the vanes 14 can be removed to permit them to be cleaned and for debris to be removed from the gaps between the vanes 14 and/or the channel 18 and to allow repair and/or replacement of damaged vanes 14.

As shown in Figure 6, each vane 14 incorporates a pair of retaining members 20A,20B adapted to be received in respective vertically extending elongate slots 22 formed in the rear wall of the chassis component 12 to enable the vanes 14 to be attached to the chassis component 12. As can be seen from Figure 7, each of the elongate slots 22 are divided in an upper portion 22A,22B and a lower portion 22C,22D, the lower portion 22C,22D of the slots 22 receiving the lowermost two vanes 14L and the retaining members 20A,20B of the remaining fourteen vanes 14 being received in the upper respective portions 22A,22B of the slots 22. This prevents damage to the lower two vanes 14L or the lower end of the chassis component 12 from dislodging the remaining vanes 14 from the upper regions 22A,22B of the slots 22.

Each vane 14 includes four equally spaced vertically extending ribs 24,26,38,30, the retaining member 20A,20B being provided on a rear end of the central pair of ribs 26,28. The upper and lower sides of the ribs 24,26,28,30 diverge away from one another towards the trailing edge of the vanes 14 by approximately 0.5° so that, when the vanes are stacked 14 on top of one another within the chassis component 12, with the retaining members 20A,20B located in the respective slots 22 in the rear wall 16 of the chassis component 12, the angle of attack of each vane 14 increases by approximately 0.5° increments from the lowermost to the uppermost vanes 14. The lowermost vane rests upon a pair of vertically extending ribs 32,34 provided on a lower wall of the chassis component 12.

A transverse opening 35 is provided in the lower wall of the chassis component 12 defining a lower end of the channel 18.

The vanes 14 are retaining in the chassis component 12 by means of a retaining member 36 which is adapted to be secured to an upper end of the chassis component 12 by means of

screws 38, the retaining member preventing upward movement of the vanes 14 and thus preventing removal of the retaining members 20A,20B of the vanes 14 from the elongate slots 22 of the chassis component 12. Transverse openings 40 are provided in the retaining member 36 defining an upper end of the channel 18 between the vanes 14 and the rear wall 16 of the chassis component 12.

A rear side of the rear wall 16 of the chassis component 12 has a rubber sheet 40 mounted thereon

In order to ensure effective draining of the channel 18, the vanes 14 may be arranged in the chassis component 12 such that the width of the channel 18 defined therebetween increases towards a lower end of the channel.

The invention is not limited to the embodiment(s) described herein but can be amended or modified without departing from the scope of the present invention.

For example, at least a portion of an inner face of a vehicle mudguard may be provided with transversely extending vanes shaped to deflect the water and air passing between so that the water and air enters the channel defined between the vanes and a rear wall of the mudguard in a downwards and/or rearwards direction to assist draining of the water from the channel and to prevent the water from directly impacting of the rear wall of the mudguard which would otherwise create spray.

In an alternative embodiment the vanes may be mounted on a frame adapted to be detachably mounted on a chassis component, said chassis component defining said rear wall of the device, whereby the frame can be detached from the chassis component to remove the vanes as a single component.

Claims

1. A device for reducing or preventing spray from a vehicle's tyres, said device comprising a first part, comprising a plurality of transversely arranged vanes or louvres between which water and air may pass, and a second part, comprising a wall member, a channel being defined between the first and second parts through which water may drain, wherein the vanes or louvres are shaped to deflect water and air passing between the vanes or louvres to encourage the water and air to flow downwardly through the drainage channel between the first and second parts.

2. A device as claimed in claim 1, wherein said first part comprises a plurality of vertically spaced louvres or vanes, said second part comprising a substantially vertically arranged wall member.

3. A device as claimed in claim 1 or claim 2, wherein said vanes or louvres are shaped to deflect water and air passing therebetween from an upwards and rearwards direction into a substantially downwards direction

4. A device as claimed in claim 3, wherein the transversely arranged vanes or louvres are shaped to redirect the direction of motion of the water passing therebetween to impart a downward motion to the water to encourage drainage of the water between the first and second parts.

5. A device as claimed in any preceding claim, wherein the width of said channel defined by the distance between said first and second parts increases from an upper end of the device to a lower end of the device.

6. A device as claimed in any preceding claim, wherein each of said vane or louvres comprises a leading edge, a trailing edge and a curved surface extending between said leading and trailing edges.

7. A device as claimed in claim 6, wherein the leading edges of a least a portion of said plurality of vanes or louvres are respectively arranged to extend substantially tangentially to an adjacent tyre of the vehicle.

8. A device as claimed in claim 6 or 7, wherein the trailing edges of at least some of said plurality of vanes or louvres extend in a substantially downwards direction to direct water and air passing between the vanes downwardly into said channel between the front and rear members of the device.

9. A device as claimed in any preceding claim, wherein said plurality of vanes or louvres comprising said first part are mounted in a peripheral frame.

10. A device as claimed in claim 9, wherein said frame is detachable from said second part to allow the vents or louvres to be cleaned and/or repaired.

11. A device as claimed in claim 9, wherein said peripheral frame defines said second part of the device, said wall member being defined by a rear wall of said frame.

12. A device as claimed in claim 11, wherein said plurality of vanes or louvres are detachably mounted on said frame.

13. A device as claimed in claim 12, wherein each of said plurality of vanes or louvres is provided with at least one mounting portion receivable in at least one elongate receiving slot or channel formed in a rear wall of said frame for detachably mounting said plurality of vanes or louvres on said frame.

14. A device as claimed in any preceding claim, wherein said device comprises at least a portion of a mudguard of a vehicle.

15. A device as claimed in any preceding claim, wherein said device comprises a mud flap adapted to be mounted behind a wheel of a vehicle, preferably at a lower end of a mudguard of the vehicle.

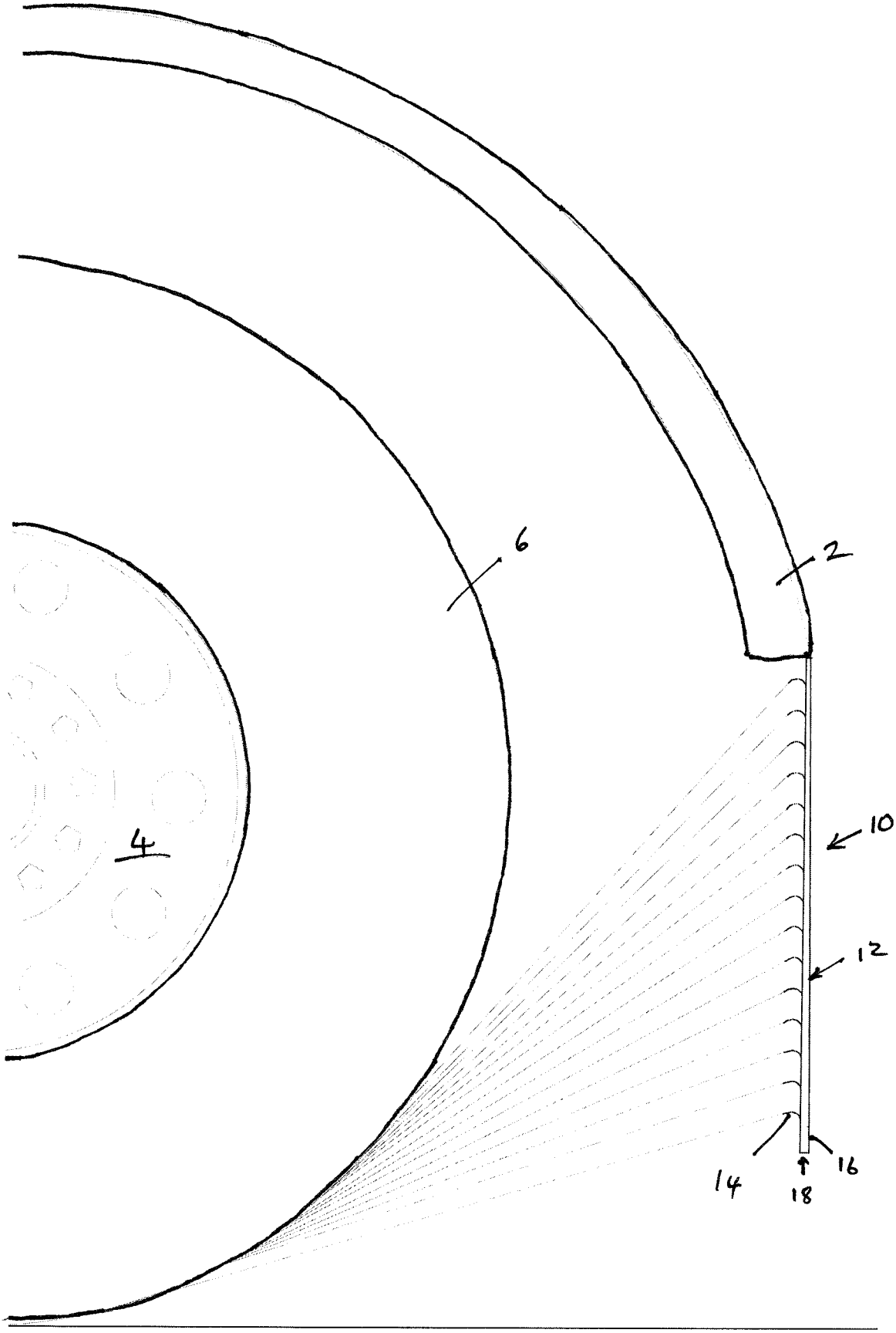

Figure 1

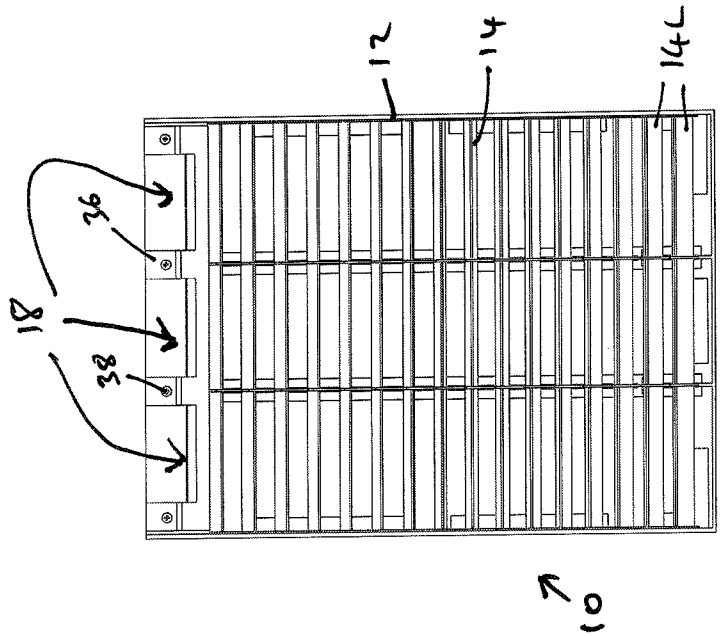

Figure 3

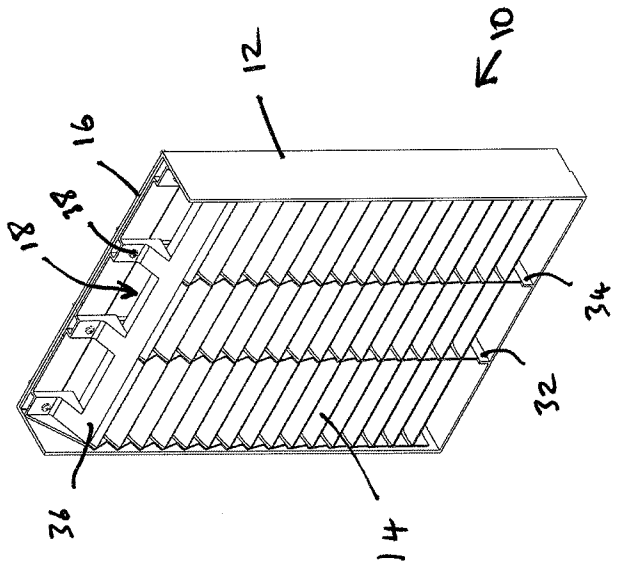

Figure 2

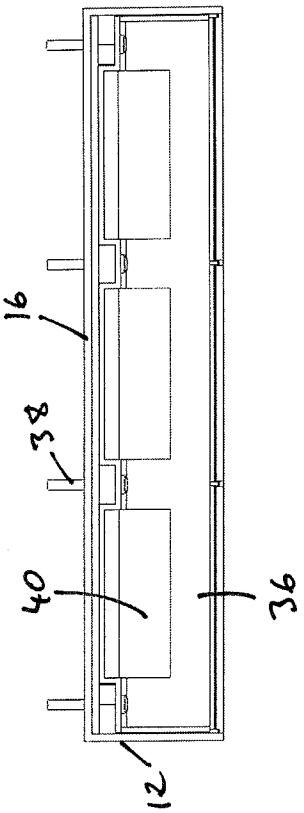

Figure 5

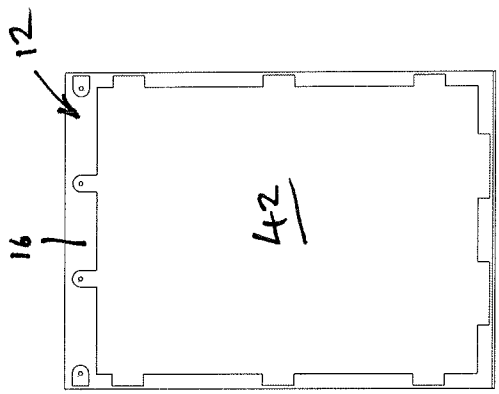

Figure 4

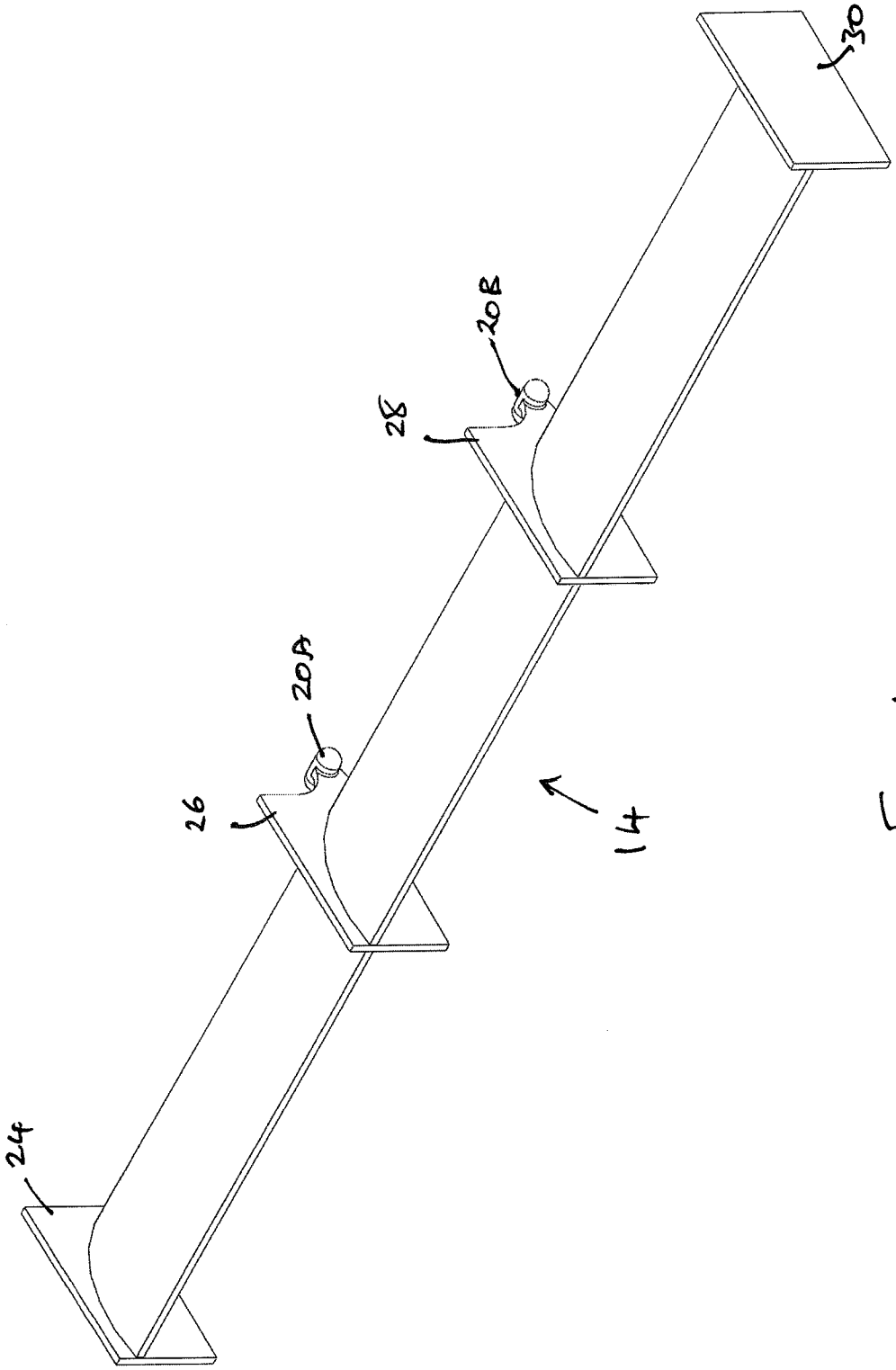

Figure 6

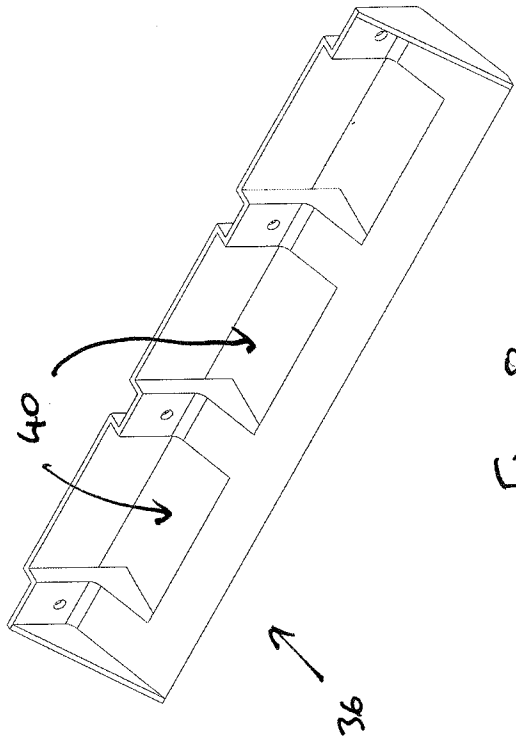

Figure 8

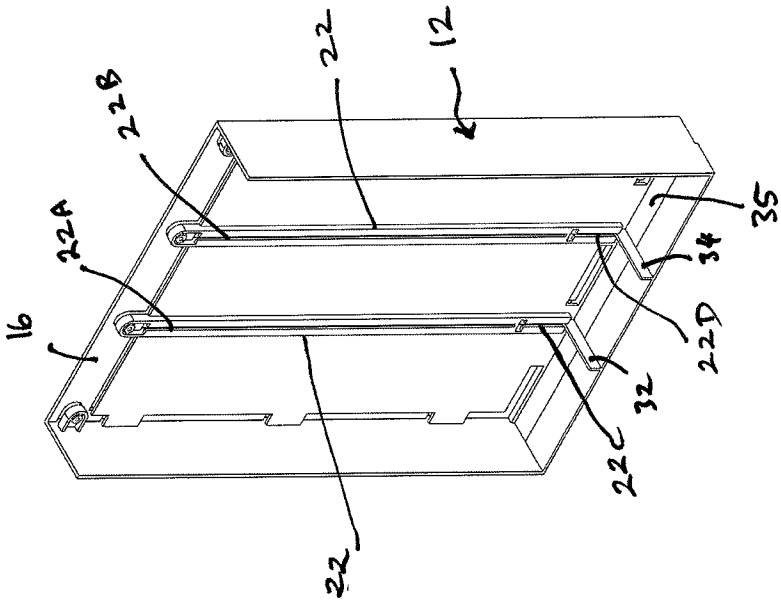

Figure 7

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2012/055859

A. CLASSIFICATION OF SUBJECT MATTER
INV. B62D25/16 B62D25/18
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B62D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 300 396 A (CRAIG RAYMOND RUSSEL [GB]) 6 November 1996 (1996-11-06) page 2, line 6 - page 2, line 33; figures 1-6	1-15
X	US 4 660 846 A (MORIN ALBERT Z [CA]) 28 April 1987 (1987-04-28) column 3, line 5 - column 4, line 34; figures 1-3	1-15
X	US 5 564 750 A (BAJOREK JAY E [US] ET AL) 15 October 1996 (1996-10-15) column 3, line 16 - column 4, line 64; figures 1-3	1-15

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
13 June 2012	29/06/2012

Name and mailing address of the ISA/	Authorized officer
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2012/055859

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2300396 A	06-11-1996	NONE	
US 4660846 A	28-04-1987	CA 1217521 A1	03-02-1987
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US 5564750 A	15-10-1996	NONE	