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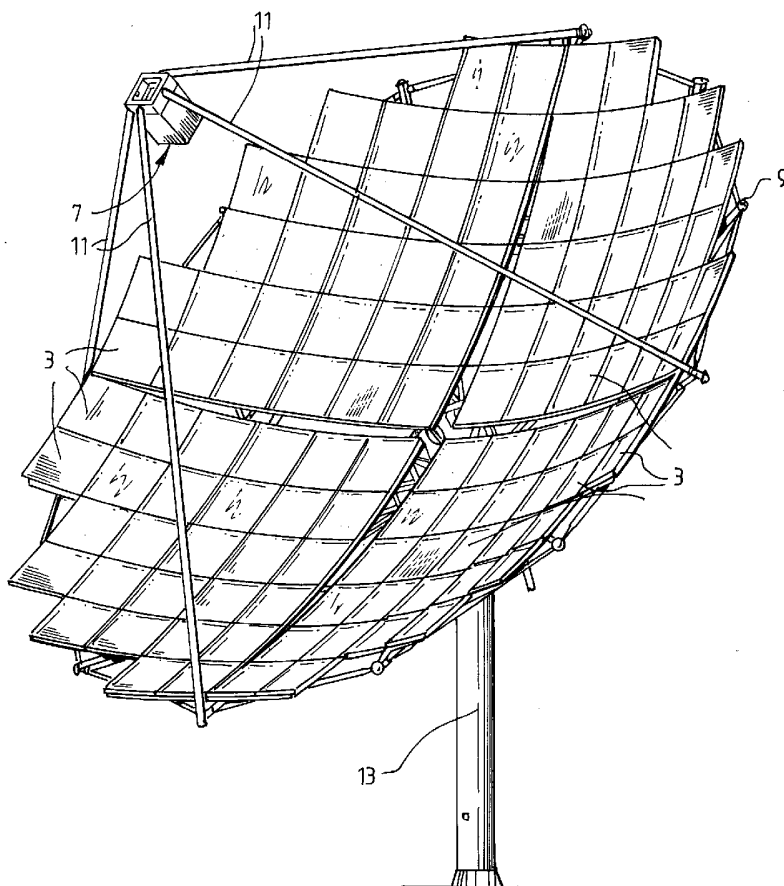
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[Continued on next page]

(54) Title: A WATERCRAFT CARRIER



(57) Abstract: A watercraft carrier (10) to be attached to a vehicle roof rack bar (11). The carrier (10) includes a support pad (12) that is resiliently deformable to adapt to the contours of the watercraft being carried. The pad (12) is supported by two pivotally mounted members (9), pivotally attached to a base (15) for pivoting movement about a common axis (21).

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**Published:**

— *with international search report*

## A WATERCRAFT CARRIER

### Technical Field

The present invention relates to watercraft carriers that are mounted on a bar of a roof rack assembly to support a watercraft such as a canoe, kayak or surf ski.

### Background of the Invention

Watercraft come in a large range of sizes and shapes. However previously known watercraft carriers do not cater for the abovementioned range in size and shape, in a structure that is easy and rapid to operate including mounting and removal.

### Object of the Invention

It is the object of the present invention to overcome or substantially ameliorate at least one of the above disadvantage.

### Summary of the Invention

There is disclosed herein a support assembly to support an object on a bar to extend across a vehicle roof, said assembly including:

a base;

means to secure the base to the bar;

a first support member pivotally mounted on the base for angular movement about an axis to extend generally normal to the bar;

a second support member pivotally mounted on the base for angular movement about an axis also to extend generally normal to the bar; and

a flexible support attached to the support members so as to extend therebetween and to engage the object to at least partly support the object, with relative angular disposition of the members at least aiding in determining the configuration of said flexible support to accommodate the object.

Preferably, said flexible support is a support pad.

Preferably, the pivot axis of said first member is also the pivot axis of said second member so that the members pivot about a common axis.

Preferably, each member extends from the common axis to an extremity, and said flexible support is pivotally attached to the extremities of the support members so as to extend therebetween.

Preferably, the assembly is adapted as a watercraft carrier.

### **Brief Description of the Drawings**

A preferred form of the present invention will now be described by way of example with reference to the accompanying drawings wherein:

Figure 1 is a schematic isometric view of portion of the bar of a roof rack assembly, and a watercraft carrier;

Figure 2 is a schematic parts exploded isometric view of the carrier of Figure 1;

Figures 3 and 4 are schematic end elevations of a means of attaching the carrier of Figures 1 and 2 to the bar;

Figures 5 and 6 are schematic isometric views of the arrangements illustrated in Figures 3 and 4;

Figure 7 is a schematic end elevation of the bar and attachment of Figure 3; and

Figure 8 is a schematic end elevation of the bar and attachment of Figure 5.

### **Detailed Description of the Preferred Embodiments**

In the accompanying drawings there is schematically depicted a watercraft carrier 10 attached to the bar 11 of a vehicle roof rack assembly. The carrier 10 is adapted to support a watercraft such as a kayak, canoe or water ski. The carrier 10 includes a flexible support in the form of a flexible support pad 12 including a base strip 13 to which there is attached relatively soft resiliently material 14 to engage the watercraft. The pad 12 is deformable and preferably is resiliently deformable to a configuration best suited to engage the contours of the watercraft being supported.

The carrier 10 includes a base 15 including a mounting portion 16 from which there extends transversely spaced generally parallel co-extensive flanges 17. Each flange 17 is provided with a passage 18 through which a pivot pin 19 passes.

Mounted on the pin 19 are support members 20 so that the support members 20 are pivotally mounted on the base 15 for relatively free pivoting movement about a common axis 21. However, in this respect it should be appreciated that each member 20

could pivot about its own respective pivot axis, with the pivot axes being generally parallel but transversely spaced.

Each member 20 has an extremity 22 provided with aligned eyelets 23 between which a pin 24 passes via a passage 25 formed in the strip 13. Accordingly, the strip 13 is pivotally supported adjacent its ends, on the extremities 22 of the members 20, for angular movement about parallel axes 42. The axes 42 are parallel to the axis 21.

The members 20 include parallel flanges 26 providing the eyelets 23 and further providing eyelets 27 through which the pin 19 passes.

In operation of the above described carrier 10, pivoting displacement of the members 20 changes the configuration of the pad 12 to suit the watercraft being supported, that is the watercraft deforms the pad 12 to thereby cause pivoting of the members 20.

The carrier 10 is secured to the bar 11 by means of a clamp device 28. The clamp device 28 includes a concave sleeve 29 that receives and extends transversely across the bar 11 and is resiliently deformable between a clamping configuration as shown in Figures 4, 5 and 8, and a release configuration as shown in Figures 3, 6 and 7.

The sleeve 29 includes longitudinally extending edge parts 30 that are concave so as to receive longitudinally extending edge portions 31 of the bar 11. The sleeve 29 has a central portion 32 that extends between the parts 30 and is attached to the base 15. More particularly the central portion 32 has a socket 33 that receives the head 34 of a threaded shaft 35 so that the head 34 (and therefore the shaft 35) cannot rotate relative to the sleeve 29. The threaded shaft 35 passes through a passage 42 in the mounting portions 16 and has its upper extremity threadable with a "grub" wheel 36 that is manipulated by the user. The wheel 36 is rotated about the vertical axis 37. The wheel 36 includes an embedded nut to threadably engage the shaft 35. Rotation of the wheel 36 causes movement of the shaft 35 along its axis 37 and therefore resilient deformation of the sleeve 29. More particularly, when the head 34 is moved toward the base 15 the sleeve 29 moves into engagement with the bar 11 so as to securely attach the carrier 10 thereto. When the head 34 moves away from the base 15, the sleeve 29 moves to release the bar 11. More particularly, the sleeve 29 is resiliently urged to its release position.

When the wheel 36 is rotated to deform the sleeve 29 to release the bar 11, the wheel 36 is inhibited from moving away from the mounting portion 16 by one or both of the members 20.

The socket 33 has adjacent to it raised portions 38 which bear against the undersurfaces of the mounting portion 16 to co-operate with movement of the shaft 35 to deform the sleeve 29.

The head 34 is captively located in the socket 33 so that the sleeve 29 remains attached to the base 15.

As an alternative arrangement, the carrier 10 may be attached to the bar 11 without the use of the sleeve 29. In the alternative construction the head 34 is located directly in the slot 39 (with portion of strip 40 removed) so that longitudinally extending flanges 41 retain the head 34 attached to the bar 11. Rotation of the wheel 36 will then tension the shaft 35 to bring the base 15 into secure mounting on the bar 11. To remove the carrier 10 the head 34 is moved longitudinally of the slot 39 to its extremity at which extremity the head 13 is extracted from within the slot 39.

The axes 42 and 21 are generally horizontal and normal to the bar 11, while the axis 37 is generally vertical and also normal to the bar 11 and axes 21 and 42.

Usually two pairs of carriers 10 would be used, each pair being fixed to a respective bar 11. The carriers 10 would engage the longitudinal edge portion of a watercraft.

The above described preferred embodiment has a number of advantages including being able to accommodate watercraft of a variety of sizes and shapes, as well as distributing the load along the pad 12.

**CLAIMS:**

1. A support assembly to support an object on a bar to extend across a vehicle roof, said assembly including:

a base;

5 means to secure the base to the bar;

a first support member pivotally mounted on the base for angular movement about an axis to extend generally normal to the bar;

a second support member pivotally mounted on the base for angular movement about an axis also to extend generally normal to the bar; and

10 a flexible support attached to the support members so as to extend therebetween and to engage the object to at least partly support the object, with relative angular disposition of the members at least aiding in determining the configuration of said flexible support to accommodate the object.

2. The assembly of claim 1, wherein said flexible support is a support pad.

15 3. The assembly of claim 2, wherein said support pad includes a resiliently deformable base strip.

4. The assembly of claim 1, 2 or 3, wherein the pivot axis of said first member is also the pivot axis of said second member so that the members pivot about a common axis.

20 5. The assembly of claim 4, wherein each member extends from the common axis to an extremity, and said flexible support is pivotally attached to the extremities of the support members so as to extend therebetween.

6. The support assembly of any one of claims 2 to 5, wherein said assembly is adapted as a watercraft carrier.

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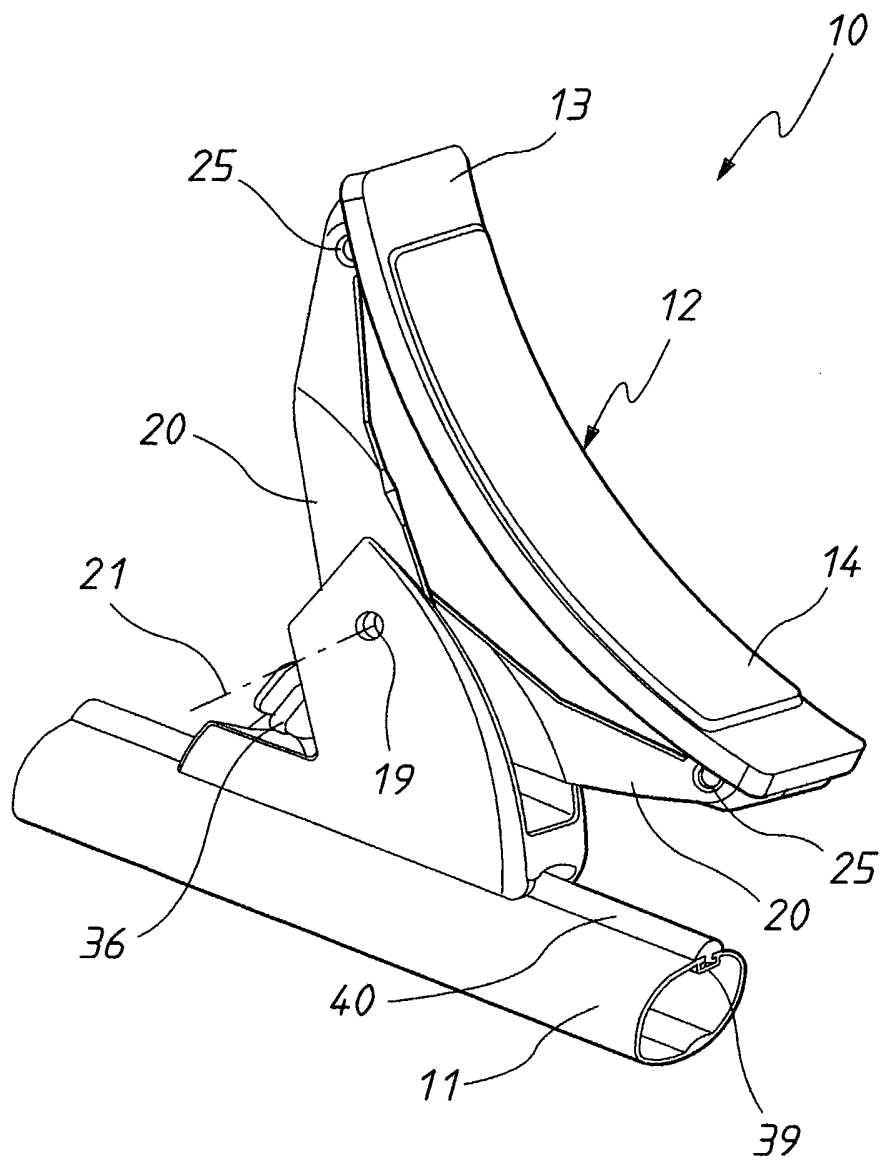


FIG. 1



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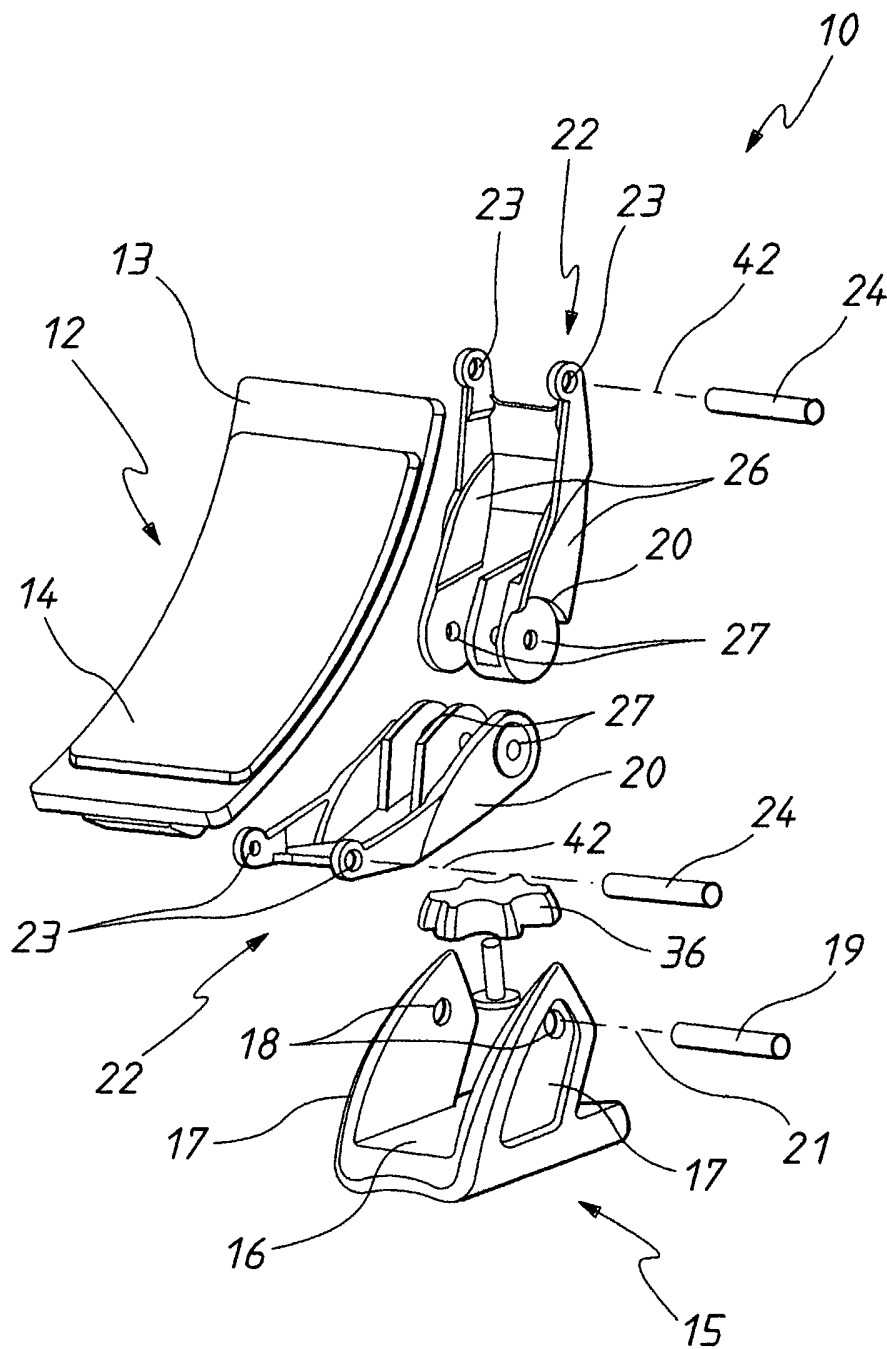


FIG.2

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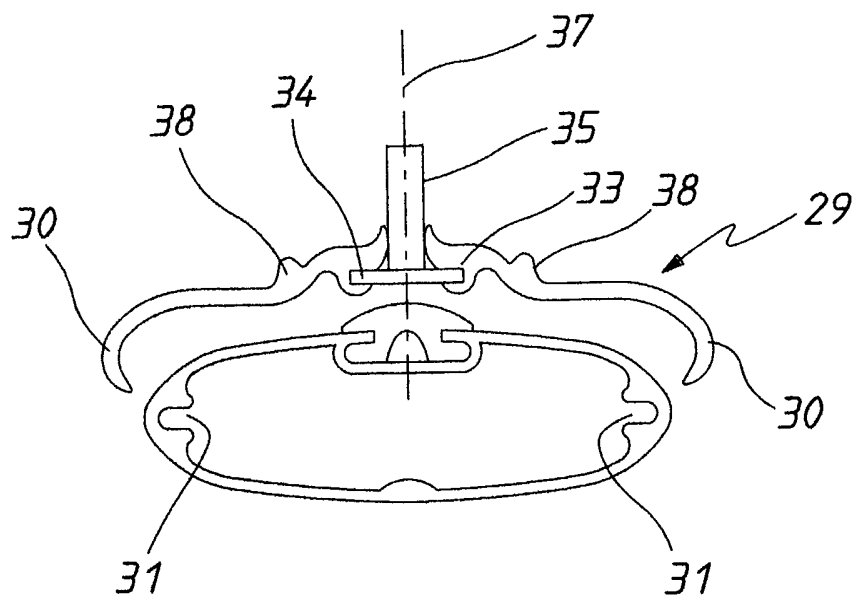


FIG. 3

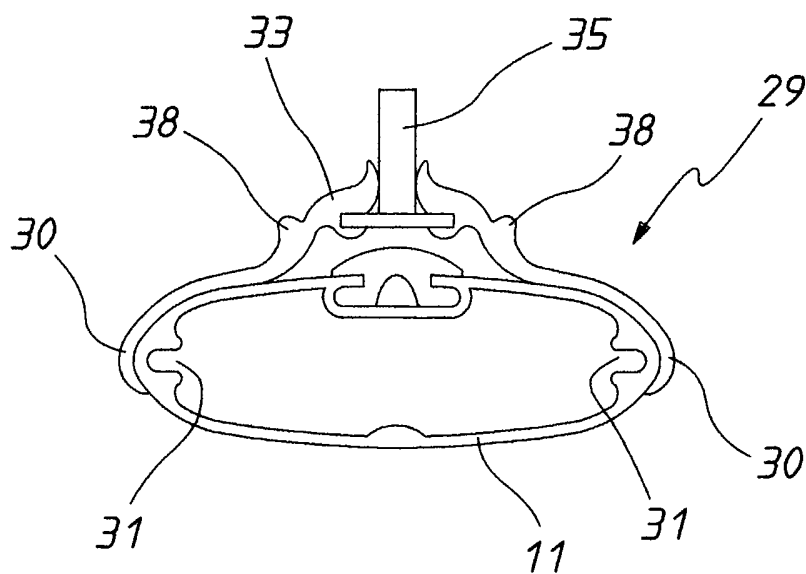


FIG. 4

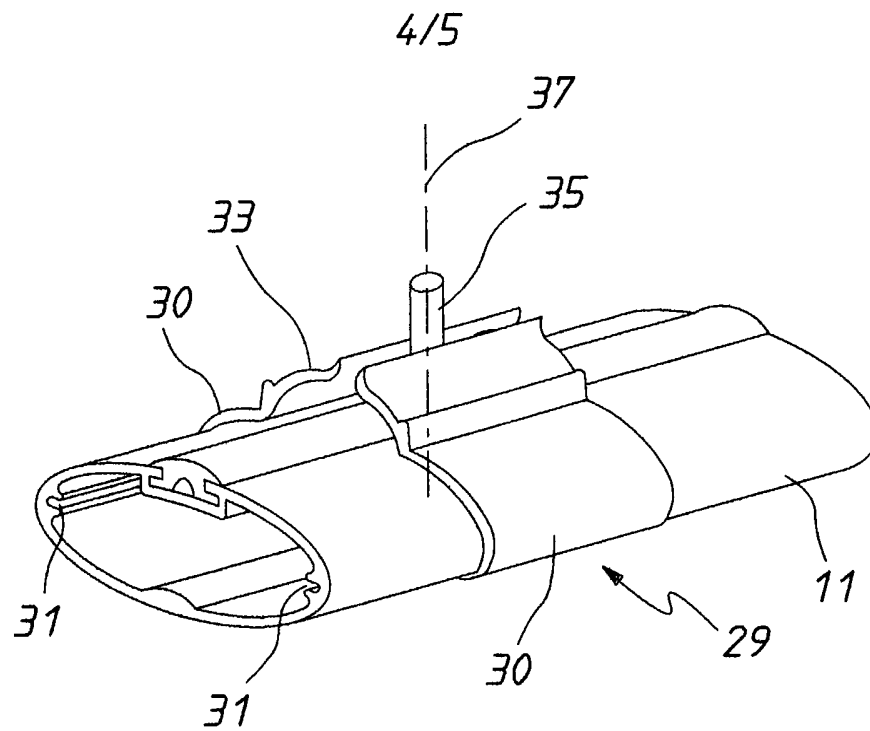


FIG. 5

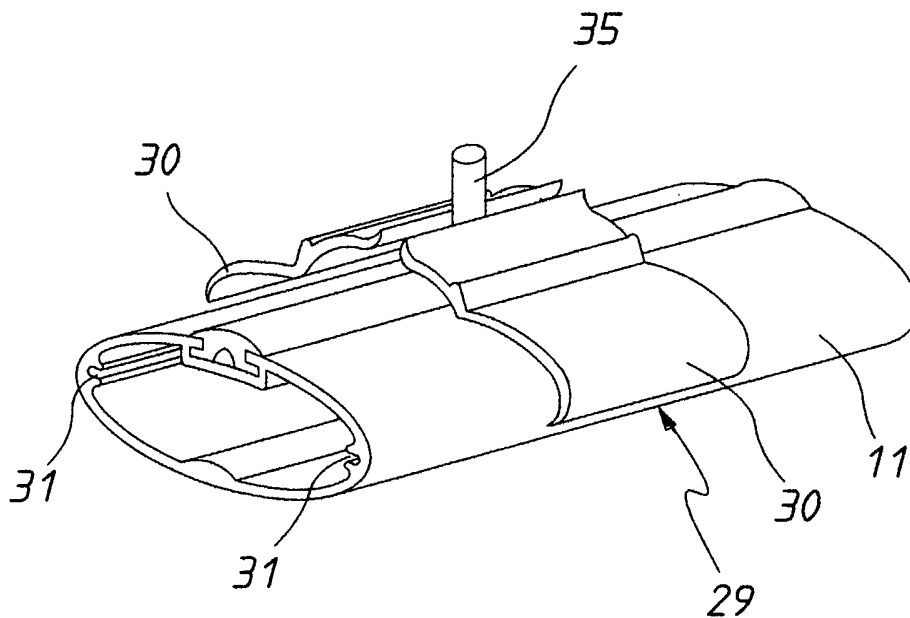


FIG. 6

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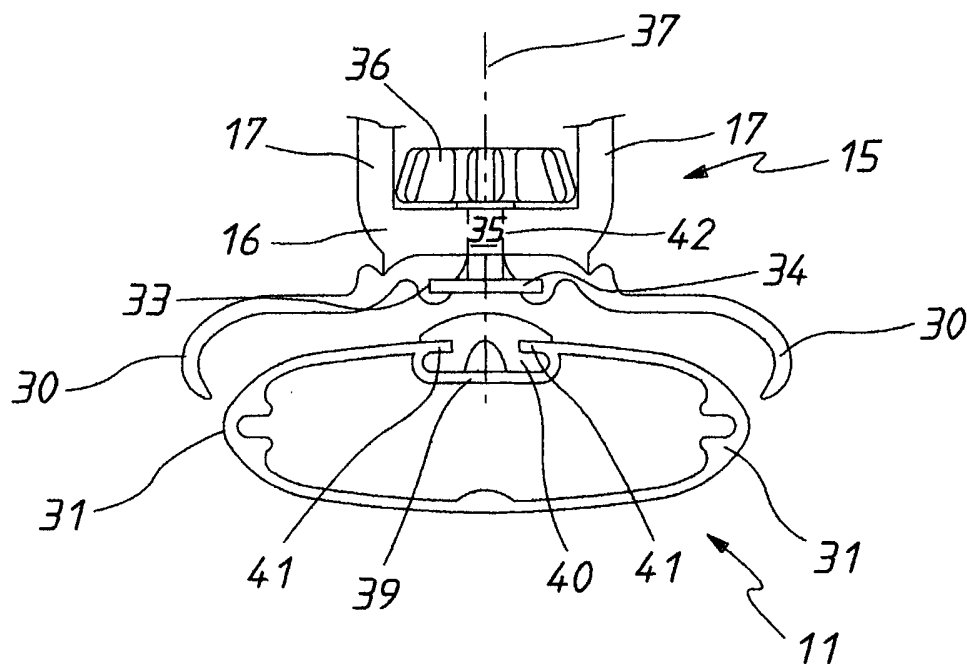


FIG. 7

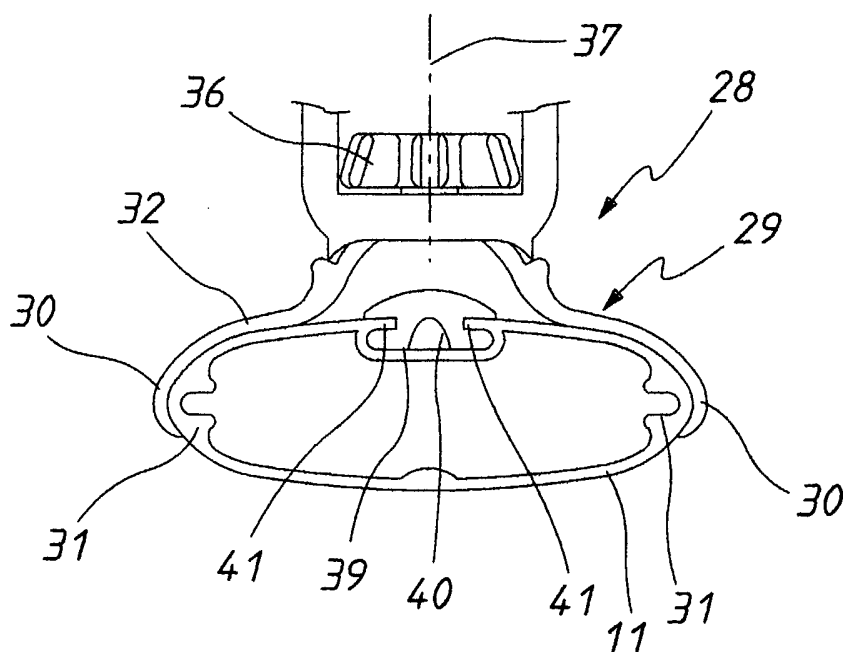


FIG. 8

## INTERNATIONAL SEARCH REPORT

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## A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl. <sup>7</sup>: B60R 9/08, 9/045; B60P 3/10

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)

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)

DWPI: IPC B60R 009/IC, B60P 003/10/IC

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5516017 A (ARVIDSSON) 14 May 1996 Whole document	1-6
X	US 5951231 A (ALLEN) 14 September 1999 Whole document	1-3, 6
X	US 3001679 A (CANNING et al.) 26 September 1961 Whole document	1-3, 6

 Further documents are listed in the continuation of Box C See patent family annex

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"P" document published prior to the international filing date but later than the priority date claimed

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**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International application No.  
**PCT/AU2004/001143**

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report	Patent Family Member
US 5516017	AU 31757/93      EP 0616576      SE 9103753 US 5775557      WO 9311969
US 5951231	
US 3001679	
Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.	
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