(12) STANDARD PATENT APPLICATION (11) Application No. **AU 2006236021 A1**
(19) AUSTRALIAN PATENT OFFICE

(54) Title
A camper van

(51) International Patent Classification(s)
B60P 3/355 (2006.01)

(21) Application No: **2006236021** (22) Date of Filing: **2006.11.15**

(30) Priority Data

(31) Number	(32) Date	(33) Country
2005907090	**2005.12.16**	**AU**

(43) Publication Date: **2007.07.05**
(43) Publication Journal Date: **2007.07.05**

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ABSTRACT

A camper van 10 comprises a box section 16 having a floor and a peripheral wall surrounding the floor, and a roof assembly 26 movable between a stowed position where the roof assembly 26 is substantially level with a top of the box section, and an elevated position. The roof assembly 26 has a front roof panel 28, a rear roof panel 30, and a central roof panel 32. The front panel 28 is attached by a hinge assembly 34 to a front wall 18 of the box section 16, while the rear roof panel 30 is attached by hinge assembly 34 to a rear wall 22 of the box section 16. Guide blocks 48 are attached to each of corners 46 of the rear roof panel 30 while elongated tracks 58 extend along the side edges of the central roof panel 32. The guide block 48 ride in the tracks 58.

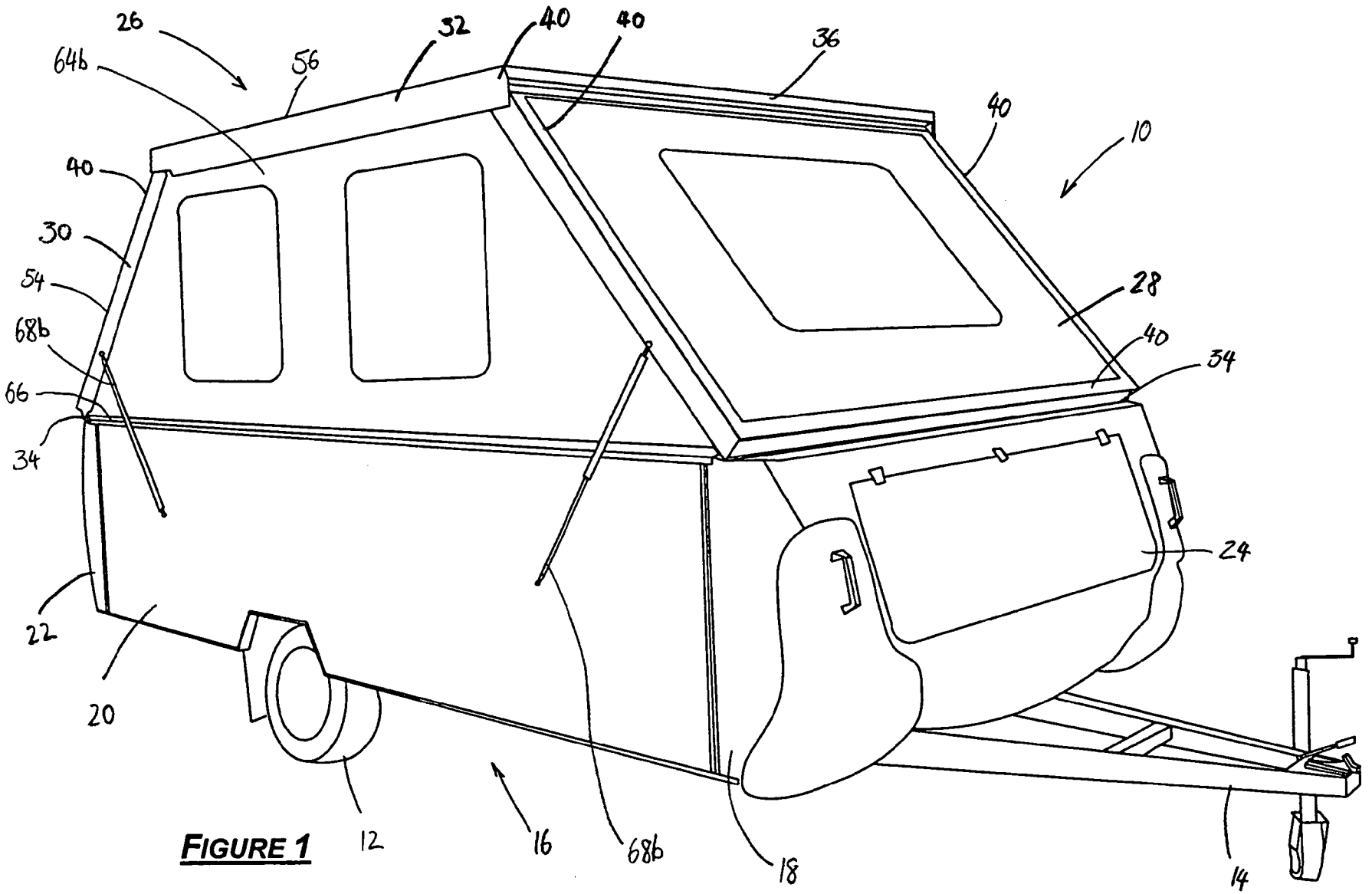
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FIGURE 1

AUSTRALIA

Patents Act 1990

COMPLETE SPECIFICATION

STANDARD PATENT

Applicant(s):

COROMAL CARAVANS PTY LTD

Invention Title:

A CAMPER VAN

The following statement is a full description of this invention, including the best method of performing it known to me/us:

A CAMPER VAN

FIELD OF THE INVENTION

The present invention relates to a camper van.

BACKGROUND OF THE INVENTION

Caravans and camper vans are popular amongst travellers, such as holiday makers. Both caravans and camper vans offer travellers the freedom to stay where ever they choose. Furthermore, the traveller has their own equipment already at least partially set up on arrival at the destination. Caravans and camper vans can provide travellers with increased comfort and protection when compared with, for example, camping in a tent.

A camper van has a roof arrangement and upper side walls that are stowed in a low position, but deployed in an elevated position when the camper van is to accommodate occupants. In contrast to a caravan, a camper van has a lower profile when in the stowed position, which leads to reduced drag and increased fuel economy for the towing vehicle.

Traditional camper vans have a lower box section that contains most of the internal features such as the beds, kitchen, cupboards, etc. of the camper van. A flat roof panel is movable from a stowed position, (in which the roof panel rests upon the top of the box), to an elevated position. Sections of canvas or the like are provided between the box section and the roof panel for privacy and weather protection. The upper wall sections are

susceptible to weathering, for example by exposure to UV light. Furthermore, the security of the traditional camper van can be compromised by tearing or cutting of the upper wall sections.

SUMMARY OF THE INVENTION

The present invention provides a camper van comprising a box section having a floor and a peripheral wall surrounding the floor and a roof assembly movable between a stowed position that is substantially level with a top of the box section and an elevated position, the roof assembly having:

a first roof panel pivotally connected at one edge to the peripheral wall of the box section;

a second roof panel pivotally connected at one edge to the peripheral wall of the box section opposite the first roof panel;

a third roof panel;

guide means provided on one of the second and third roof panels; and,

track means provided on the other of the second and third roof panels, such that the guide is slidably received within the track,

wherein pivoting of the first and second roof panel moves the roof assembly between the stowed position and the elevated position.

BRIEF DESCRIPTION OF THE DRAWINGS

In order that the invention may be more easily understood, an embodiment will now be described, by way of example

only, with reference to the accompanying drawings, in which:

Figure 1 is a first perspective view of a camper van according to an embodiment of the present invention, showing the roof in an elevated position;

Figure 2 is a second perspective view of the camper van of Figure 1, showing the roof in an elevated position;

Figure 3 is a perspective view of the camper van of Figure 1, showing the roof in a stowed position;

Figure 4 is a perspective view of the camper van of Figure 1, showing the roof in a partially elevated position;

Figure 5 is a perspective view of the camper van of Figure 1, showing the roof in an elevated position, with an upper side wall in a partially raised position;

Figure 6 is a perspective view of an upper corner of the rear roof panel of the camper van of Figure 1;

Figure 7 is a section view of the upper corner of the rear roof panel, as viewed along the line A-A in Figure 6;

Figure 8 is a section view of the guide and track of the roof panels of the camper van of Figure 1;

Figure 9 is an end view of the track shown in Figure 8;

Figure 10 is a section view of the end hinge assembly of the camper van of Figure 1;

Figure 11 is a section view of a side wall hinge assembly of the camper van of Figure 1; and,

Figure 12 is a section view of a door hinge assembly of the camper van of Figure 1.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS INVENTION

Figures 1 to 5 show a camper van 10 according to an embodiment of the present invention. The camper van 10 has a chassis (not shown) that is supported above the ground by the wheels 12 and running gear (also not shown), such as an axle and suspension. A drawbar 14 extends from the chassis forward of the camper van 10 for attachment to a towing vehicle.

A box section 16, consisting of a floor (not shown) surrounded by peripheral wall formed by a front wall 18, two side walls 20 and a rear wall 22. In the embodiment shown in the figures, the front wall 18 is arranged to provide a lockable boot 24 (also known as a trunk) for storing articles. Within the box section 16, the various fixtures of the camper van 10 are provided. Such fixtures can typically include kitchen facilities, a domestic fridge, a table and chair set, and beds.

The camper van has a roof assembly 26, which has a front roof panel 28, a rear roof panel 30 and a central roof panel 32.

It is to be appreciated that the roof panels 28, 30, 32 should be light weight, whilst also being substantially rigid. As shown in Figures 7 to 9, in this embodiment, each of the roof panels 28, 30, 32 is in the form of an external sheet 38 of fibreglass (although other materials such as aluminium, or composite sheets and the like can be used) with extruded sections 40 of, for example, aluminium provided at the edges of the sheet, and an internal sheet 42 (which can also be fibreglass or alternatively, plywood,

or similar material) extending generally parallel to the external sheet 38. The external and internal sheets 38, 42 are spaced to form a gap 44. The gap 44 may be filled with an insulating material. Alternatively, the gap 44 can be left empty such that an air gap is provided for insulation. In addition, the gap 44 can be used to conceal wiring harnesses for lighting, antenna cables and the like.

It is to be appreciated that alternative constructions of the roof panels 28, 30, 32 can be provided. For example, each panel could be a laminate of sheets of material. Similarly, each panel could be of honeycomb sandwich construction, having two substantially parallel sheets separated by a core of honeycomb cell construction.

As shown in Figure 10, each of the front and rear roof panels 28, 30 is attached by an end hinge assembly 34 to the front and rear walls 18, 22, respectively. The end hinge assembly 34 connects adjacent edges of each of the front wall 18 and front roof panel 28, and the rear wall 22 and rear roof panel 30. The end hinge assemblies 34 allow the associated roof panel 28, 30 to pivot about the upper edge of the associate wall 18, 22. In this embodiment, the end hinge assembly 34 is in the form of a single piano hinge. However, two or more hinges may be provided. In one possible modification the hinge assembly 34 can be filled with a seal (not shown) to minimise the ingress of dust, debris and water into the camper van 10. Alternatively, the roof panels 28, 30 and walls 18, 22 can be arranged with interlocking channels that together form a hinge assembly.

A leading edge 36 of the central roof panel 32 (that is, the edge closest to the drawbar 14) is connected to the adjacent edge of the front roof panel 28 by a hinge assembly (not shown), such as a single piano or continuous hinge. Additionally the hinge may be fitted with a seal, or indeed formed as an integral combined hinge and seal similar to hinge 66 described hereinafter and depicted in Figure 11, thereby minimising ingress of dust, debris and water into the camper van 10.

As shown in Figures 6 and 7, a guide means, in the form of a guide block 48, is attached to each of the two upper corners 46 of the rear roof panel 30 remote from the end hinge assembly 34. The guide block 48 is made of a durable material, such as nylon. In the embodiment shown, the guide block 48 has the general shape of a cylinder. The longitudinal axis of the cylinder is arranged with generally parallel to, and co-incident with, the edge 50 of the rear roof panel 30 that extends between the two upper corners 46. As best shown in Figure 7, an axial end 52 of each guide block 48 has an end portion 49 that protrudes beyond the adjacent side edge 54 of the rear roof panel 30.

As shown in Figures 8 and 9, each of the side edges 56 of the central roof portion 32 has an extruded section 40 that defines a track means, in the form of elongate tracks 58, which extend parallel to the side edges 56. The tracks 58 define a channel that opens inwardly with respect to the central roof portion 32. The end portion 49 of the guide block 48 is received within the track 58. By virtue of the guide blocks 48 and tracks 58, the rear roof panel 30 is slidably connected to the central roof panel 32. The

benefit of this arrangement will be explained later in greater detail.

A stop 60 is provided within each track 58, near the trailing edge 62 of the central roof portion 32. Thus, the extent of travel of the guide blocks 48 within the tracks 58 is limited.

Figure 3 shows the camper van 10, with the roof assembly 26 in a stowed position. In this position, the rear roof panel 30 is lowered to lie substantially parallel with the top of the box section 16. The front roof panel 28 similarly is lowered to lie substantially parallel with the top of the box section 16. The central roof panel 32 is also substantially parallel with the top of the box section 16. However, in this position, the guide blocks 48 are positioned part way along the length of the tracks 58. Accordingly, part of the central roof panel 32 overlaps the rear roof panel 30.

Figure 4 shows the camper van 10, with the roof assembly 26 in a partially elevated position. As the front roof panel 28 is moved from the stowed position to the elevated position, the central roof panel 32 is also partially lifted away from the box section 16 and drawn toward the front of the camper van 10 with respect to the rear roof panel 30. During this movement, the rear roof panel 30 is also partially raised by virtue of the guide blocks 48 and tracks 58 and by the central roof panel 32 overlapping the rear roof panel 30.

Once the front roof panel 28 has been moved to its elevated position, the rear roof panel 30 is then moved into its

elevated position. During this movement, the edge 50 of the rear roof panel 30 slides rearwardly with respect to the central roof panel 32. Figure 5 shows the camper van 10, with the roof assembly 26 in the fully elevated position. Thus, the central roof panel 32 is moved from the stowed position to the elevated position by movement of the front roof panel 28 and subsequent movement of the rear roof panel 30.

As shown in Figure 5, each of the front and rear roof panels 28, 30 is inclined at an angle of approximately 45° with respect to the top of the side walls 20 of the box section.

The camper van 10 is provided with:

1. spring means to assist elevation of the roof assembly 26,

2. means for limiting the extent of angular rotation of the front and rear roof panels 28, 30 with respect to the box section 16, and

3. means for locking each of the front and rear roof panels 28, 30 in their respective elevated positions.

In the embodiment shown in the figures, these three features are provided by gas struts 68a, 68b. Each corner is provided with a gas strut 68a, 68b that extends between a point on the side wall 20 of the box section 16 adjacent a corner and a side edge of one of the front and rear roof panels 28, 30. The gas struts 68a, 68b (also known as a gas spring) use compressed gas to provide a spring effect. As each gas strut 68a, 68b has a limit in the extent of travel of the rod out of the cylinder, which in turn limits the extent of pivoting (that is, angular rotation) of each

of the front and rear roof panels 28, 30 with respect to the box section 16.

One side (hereinafter referred to as the "door side") of the camper van 10 is provided with a door 70. The gas struts 68a on the door side of the camper van 10 are provided with a self locking function that locks the gas strut 68a in the fully extended position. The gas strut 68a can be manually unlocked to allow lowering of the respective front or rear roof panel 28, 30. The self locking function of the gas struts 68a ensures that each of the front and rear roof panels 28, 30 do not collapse unintentionally, for example by wind pressure.

The gas struts 68b on the side of the camper van without the door 70 do not have the self locking function. Accordingly, the roof assembly 26 can be raised and lowered by a single person.

Optionally to facilitate movement of the front and rear roof panels 28, 30 a handle 72 may be provided on each of the front and rear roof panels 28, 30. In the embodiment shown in the figures, the handles 72 are located on the side of the front and rear roof panels 28, 30. However it is to be understood that in alternate embodiments no such handles 72 are provided or required.

The camper van 10 further has two upper side walls 64a, 64b which are each connected via a hinge assembly 66 to the top edge of a respective one of the two side walls 20 of the box section 16. As shown in Figures 1 and 2, the two side walls 64a, 64b have a generally trapezoidal shape. Each side wall 64a, 64b is movable from a stowed position, in

which the side wall 64a, 64b lies substantially level with the top of the box section 16, to an elevated position, in which the side wall 64a, 64b is generally vertical. When the roof assembly 26 is in the stowed position, the two upper side walls 64a, 64b lie beneath the roof assembly 26.

Figure 11 is a cross-section view of the hinge assembly 66 as seen looking along the hinge axis. In this embodiment, the hinge assembly 66 is an extruded section of resilient material, such as rubber, which has a constant cross section. Accordingly, the hinge assembly 66 also acts as a seal between each upper side wall 64a, 64b and the box section 16. In an alternate embodiment the hinge assembly 66 may be replaced with a separate piano hinge and seal.

The upper side walls 64a on the door side is further provided with a handle (not shown). Once the roof assembly 26 has been raised, the upper side wall 64a with the door 70 can be raised by simply pulling on the handle. In this embodiment, a gas strut (not shown) is provided internally of the camper van 10, which extends between the side wall 20 (on the door side of the camper van 10) and the upper side wall 64a. The gas strut provides a spring means for assisting raising of the upper side wall 64a.

Figure 12 shows a partial section view of the door 70. In this embodiment of the camper van 10, the door 70 has a lower section 76 and an upper section 78, which are connected by a hinge assembly 80. The rotational axis of the hinge assembly 80 is co-incident with the rotational axis of the hinge assembly 66 between the upper side wall 64a and the box section 16. Accordingly, the door 70 can only be operated when the upper side wall 64a is in the

elevated position. In addition, the hinge assembly 80 forms a seal between the lower and upper sections 76, 78 of the door 70.

Once the upper side wall 64a has been raised, the operator can open the door 70 and step into the camper van 10. Releasable latching means (not shown) are provided internally of the upper side wall 64a to secure the upper side wall 64a to the roof assembly 26. In this embodiment, the latching means are in the form of two sliding bolts.

The upper side wall 64b can then be raised from within the camper van 10, by simply lifting the upper side wall 64b from its stowed position to its elevated position. The upper side wall 64b is similarly provided with releasable latching means (not shown) internally of the upper side wall 64b to secure the upper side wall 64b to the roof assembly 26.

It is to be appreciated that lowering the roof assembly 26 and upper side walls 64a, 64b to the stowed position is simply the reverse of the procedure for elevating the roof assembly 26 and upper side walls 64a, 64b.

As shown in Figures 7 to 9, the extruded sections 40 on the side edges 54 of each of the front and rear roof panels 28, 30 and the side edges 56 of the central roof panel 32 has a strip 82, which depends from the respective side edge 54, 56. The strips 82 overlap with the upper side walls 64a, 64b when the roof assembly 26 and upper side walls 64a, 64b are in the elevated position. Similarly, the strips 82 overlap with the side walls 20 of the box section 16 when the roof assembly 26 is in the stowed position. Each strip

82 is provided with a flexible seal 84 that extends parallel to the side edge 54, 56 of the respective roof panel 28, 30, 32. Each seal 84 is arranged to abut the adjacent upper side wall 64a, 64b, and similarly the adjacent side wall 20, depending on the position of the roof assembly 26. The seal 84 minimizes ingress of dust, debris and water into the interior of the camper van 10. In this embodiment, the seals 84 are made of an elongate rubber extrusion. However, alternative forms of seals 84 may be employed. Further, to improve sealing against ingress of dust, debris and water additional seals, for example extending parallel to the seals 84, may be incorporated.

It is to be understood to persons skilled in the relevant art many modifications may be made without departing from the scope of the invention.

In the embodiment shown in the figures, the angle of inclination of both the front and rear roof panels 28, 30 (in the elevated position) with respect to the top of side walls 20 of box section 16 is approximately 45°. However, in alternative embodiments the angle of inclination could be in the range of 30° to 90°. In addition, the angle of inclination for each of the front and rear roof panels 28, 30 does not have to be equal. For example, in one embodiment the front roof panel 28 could be inclined to 60° and the rear roof panel 30 inclined to 90°. It is to be appreciated that the shape of the upper side walls 64a, 64b is dependent on the elevated shape of the roof assembly 26.

The camper van 10 shown in the figures has a single central roof panel 32. However, alternative embodiments may be

provided in which there are two or more central roof panels that are supported by the front and rear roof panels.

In the embodiment shown in the figures, the door 70 is provided on the left hand side of the camper van 10, with respect to the forward direction of towing the vehicle. The person skilled in the relevant art will appreciate that this is the desirable side for a camper van 10 that is intended for use in countries where vehicles drive on the left hand side of the road. However, where the camper van is intended for use in countries in which vehicles drive on the right hand side of the road, it is desirable that the door 70 is provided on the right hand side of the camper van 10.

It may be desirable to provide both upper side walls 64a, 64b with one or more gas struts internal of the camper van 10, for assisting moving the respective upper side walls 64a, 64b between the stowed and elevated positions.

Embodiments of the camper van 10 may be provided that have actuators for raising and lowering the roof assembly 26 and upper side walls 64a, 64b. Such embodiments may allow the operation of the roof assembly 26 and upper side walls 64a, 64b to be controlled from a single point, and without requiring the operator to physically lift the panels of the roof and/or side walls. Such actuators may be hydraulic, pneumatic or electric.

Latching mechanisms, such as over-centre latches, can be provided for securing the roof assembly 26 in the stowed position. Such latching mechanisms can minimise damage to the roof assembly 26 while the camper van 10 is in transit.

The embodiment described in the Figures has the inclined roof panels (that is, the front and rear roof panels 28, 30) hingedly attached to the front and rear walls 18, 22 of the box section 16. It is to be appreciated that in an alternative embodiment the inclined roof panels are hingedly connected to the side walls 20 of the box section 16. In this embodiment, the upper side walls are hingedly attached to the front and rear walls of the box section.

One alternative embodiment has the guide arranged on an edge of the central roof panel 32. In this embodiment, track is provided along the side edges of one of the front and rear roof panels 28, 30 within which the guide means is slidably received. In this embodiment, a stop is provided at one end of each of the track means, to limit the extent of travel of the guide means within the track means.

In the claims of this application and in the description of the invention, except where the context requires otherwise due to express language or necessary implication, the words "comprise" or variations such as "comprises" or "comprising" are used in an inclusive sense, i.e. to specify the presence of the stated features but not to preclude the presence or addition of further features in various embodiments of the invention.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A camper van comprising a box section having a floor and a peripheral wall surrounding the floor and a roof assembly movable between a stowed position that is substantially level with a top of the box section and an elevated position, the roof assembly having:

a first roof panel pivotally connected at one edge to the peripheral wall of the box section;

a second roof panel pivotally connected at one edge to the peripheral wall of the box section opposite the first roof panel;

a third roof panel;

guide means provided on one of the second and third roof panels; and,

track means provided on the other of the second and third roof panels, such that the guide means is slidably received within the track means,

wherein pivoting of the first and second roof panel moves the roof assembly between the stowed position and the elevated position.

2. The camper van according to claim 1, wherein the guide means is provided on the second roof panel and the track means is provided on the third roof panel.

3. The camper van according to claim 1, wherein the track means comprises respective channels extending along opposing side edges of the other of the second and third roof panels.

4. The camper van according to claim 3, wherein each channel is formed by an extruded section provided along the side edges.

5. The camper van according to any one of claims 1 or 4, wherein the guide means comprises a pair of guide blocks, each guide block protruding from one of the second or third roof panels in a direction parallel to a pivot axis of the second roof panel with respect to the peripheral wall.

6. The camper van according to claim 5, wherein each guide block has a cylindrical portion protruding from the one of the second and third roof panels.

7. The camper van according to any one of claims 1 to 6, wherein the third roof panel is pivotally connected to one edge of the first roof panel.

8. The camper van according to any one of claims 1 to 7, wherein the first roof panel is connected to a peripheral wall at the front of the box section with respect to the forward direction of travel of the camper van.

9. The camper van according to any one of the preceding claims, further comprising a pair of upper side walls, each being pivotally connected to the peripheral wall, wherein the upper side walls are each movable between a stowed position and an elevated position.

10. The camper van according to claim 9, wherein at least one of the upper side walls is provided with a spring means to assist in moving the respective upper side wall to the elevated position.

11. The camper van according to claim 10, wherein the spring means comprises a gas strut connected at one end to an internal surface of the peripheral wall and at the other end to an internal surface of the respective upper side wall.

12. The camper van according to any one of claims 1 to 11, further comprising roof spring means to assist in moving the roof assembly from the stored position to the elevated position.

13. The camper van according to any one of claims 1 to 12, further comprising means for limiting the extent of pivotal rotation of each of the first and second roof panels.

14. The camper van according to any one of claims 1 to 13, further comprising means for locking each of the front and rear roof panels in their respective elevated positions.

15. The camper van according to claim 12 or 13 wherein the roof spring means comprise the means for limiting.

16. The camper van according to any one of claims 1 to 14, wherein the third roof panel is supported by both the first and second roof panels.

17. The camper van according to claim 1 further comprising spring means coupled between the box section and the roof assembly, the spring means biased to urge the roof assembly toward the elevated position.

18. The camper van according to claim 17 wherein the spring means comprises a plurality of gas struts wherein a first gas strut is coupled between the first roof panel and a first side wall of the box section, a second gas strut is coupled between the second roof panel and the first side wall, a third gas strut is coupled between the first roof panel and a second side wall of a box section, and a fourth strut is coupled between the second roof panel and the second side wall.

19. The camper van according to claim 18 wherein the first and second gas struts are arranged to self lock in an extended position when the roof assembly is in the elevated position.

20. The camper van according to claim 18 or 19 further comprising first and second upper walls pivotally coupled to the first and second side walls respectively, the first and second upper walls movable between a stowed position where the upper walls lie substantially level with the box section and beneath and parallel with the roof assembly when the roof assembly is in the stowed position; and an elevated position in which the upper walls are disposed substantially vertically.

21 The camper van according to claim 20 comprising respective hinge assemblies pivotally coupling the upper walls to the side walls, each hinge assembly extending for a length coterminous with the side walls and forming a seal between respective adjacent edges of the upper walls and the side walls.

22. The camper van according to claim 20 or 21 further comprising a door, the door having a lower section pivotally coupled to the first side wall, an upper section pivotally coupled to the first upper wall and wherein the lower section is pivotally coupled to the upper section.

23. The camper van according to claim 22 further comprising a door hinge assembly pivotally coupling the lower section to the upper section, the door hinge assembly forming a seal between respective adjacent edges of the upper section and the lower section.

24. The camper van according to any one of claims 17 - 23 wherein the first and second roof panels are provided with depending side edges that extend in planes parallel to the guide and track, the side edges dimensioned to overlap the box section when the roof assembly is in the stowed position.

25. The camper van according to claim 24 wherein each side edge is provided on a side beneath its respective groove panel with a flexible seal that forms a seal against the box section when the roof assembly is in the stowed position.

26. The camper van according to claim 23 or 24 wherein the third roof panel is provided with depending side edges that extend in planes parallel to the guide and track, the side edges of the third roof panel dimensioned to overlap the side edges of the second roof panel when the roof assembly is in the stowed position.

27. The camper van according to claim 26 wherein the side edges of the third roof panel are provided with flexible seals that form seals against the side edges of the second roof panel when the roof assembly is in the stowed position.

28. The camper van according to any one of claims 25 - 27 wherein the flexible seals of the first, second and third roof panels form seals against the upper walls when the roof assembly is in the elevated position.

29. The camper van substantially as herein before described with reference to and as illustrated in the accompanying drawings.

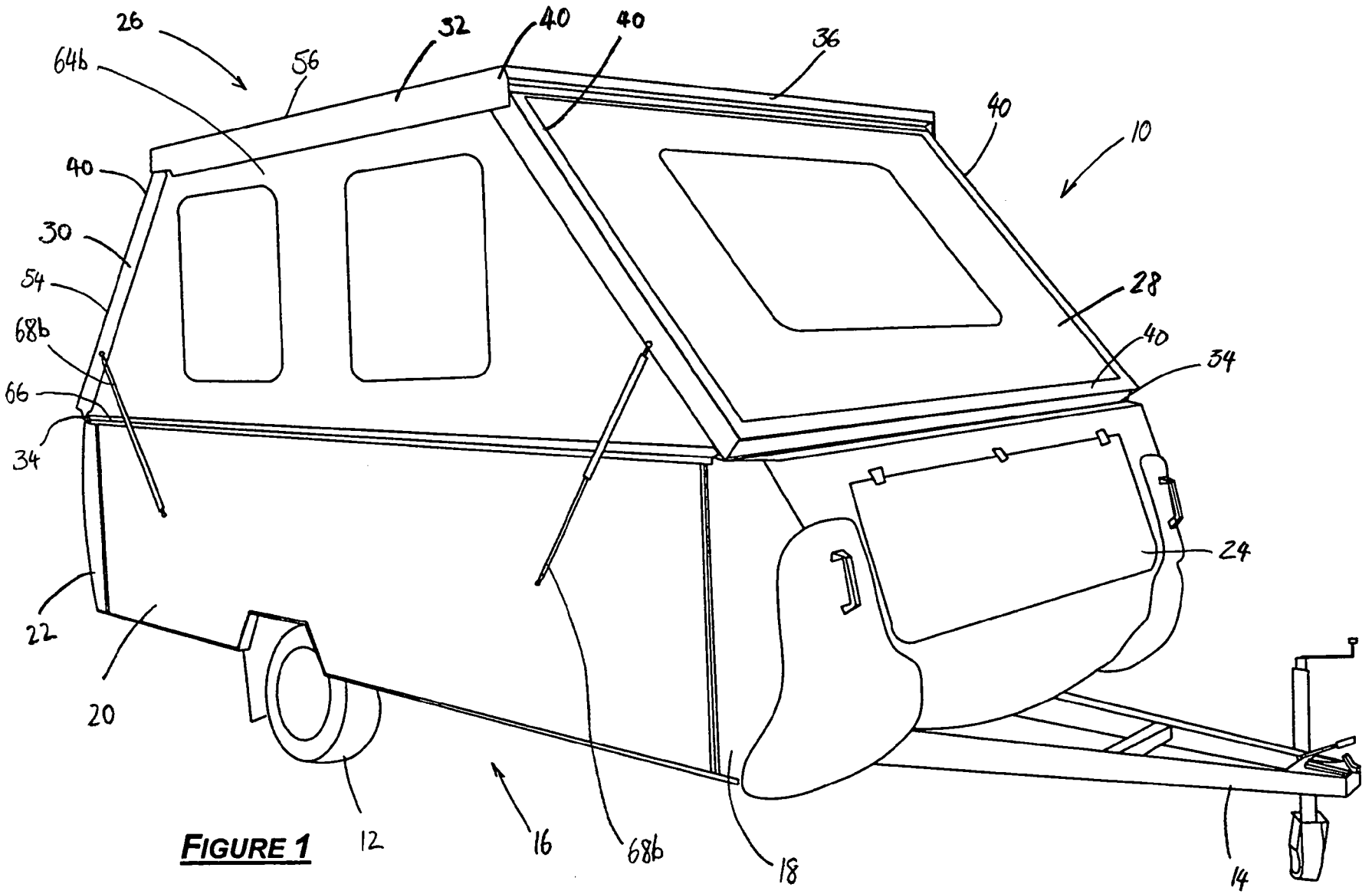
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FIGURE 1

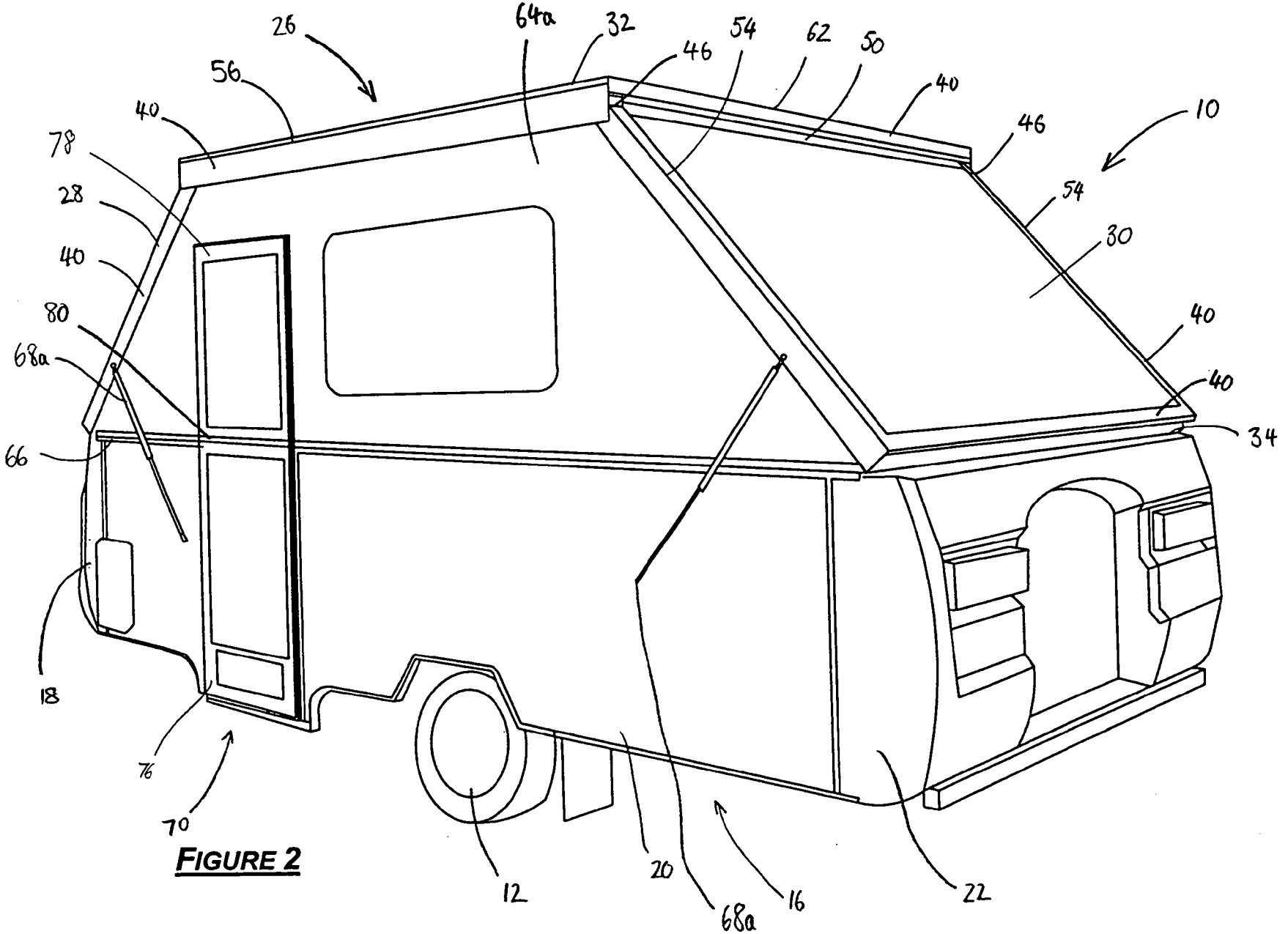
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FIGURE 2

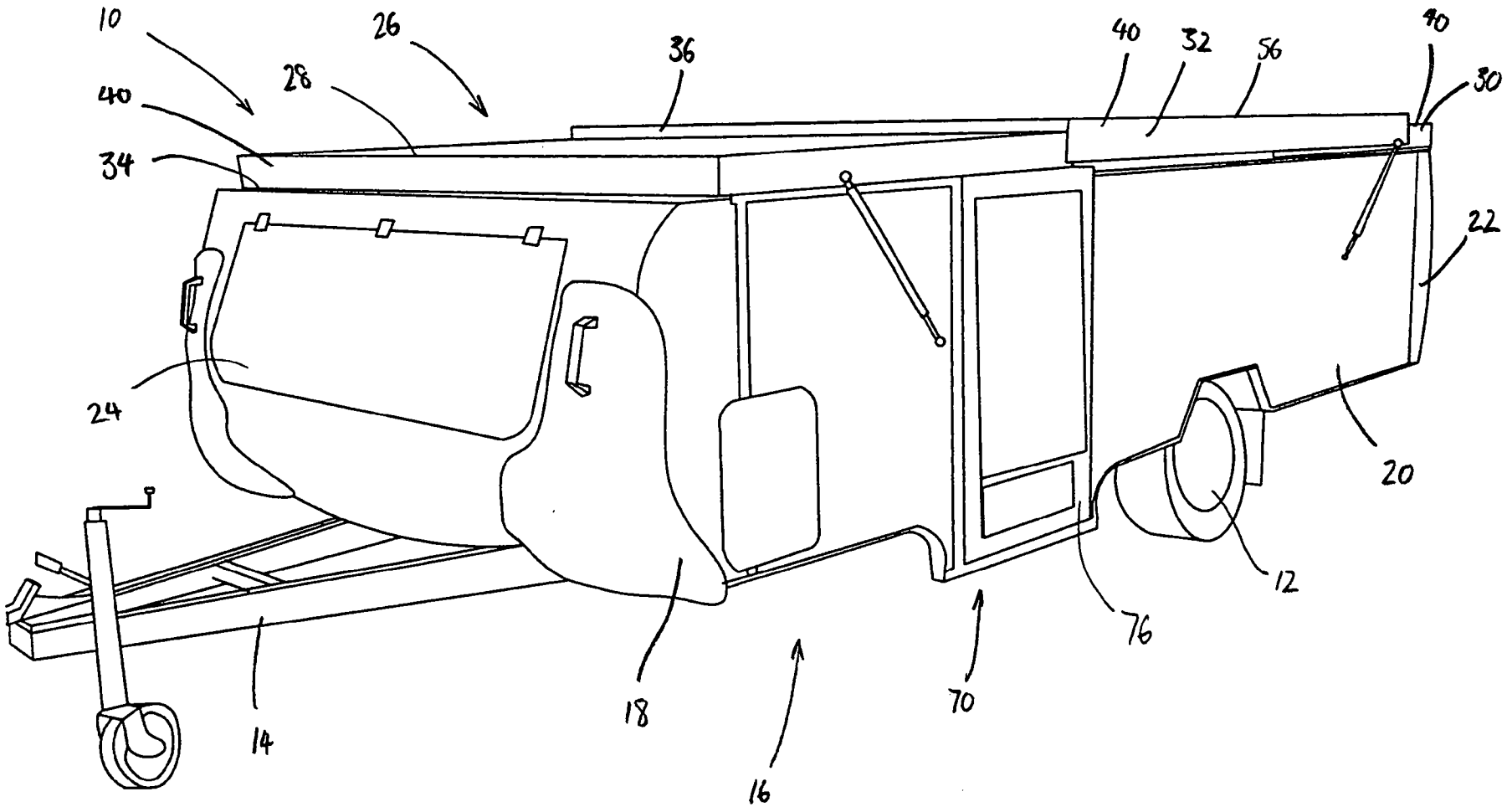

FIGURE 3

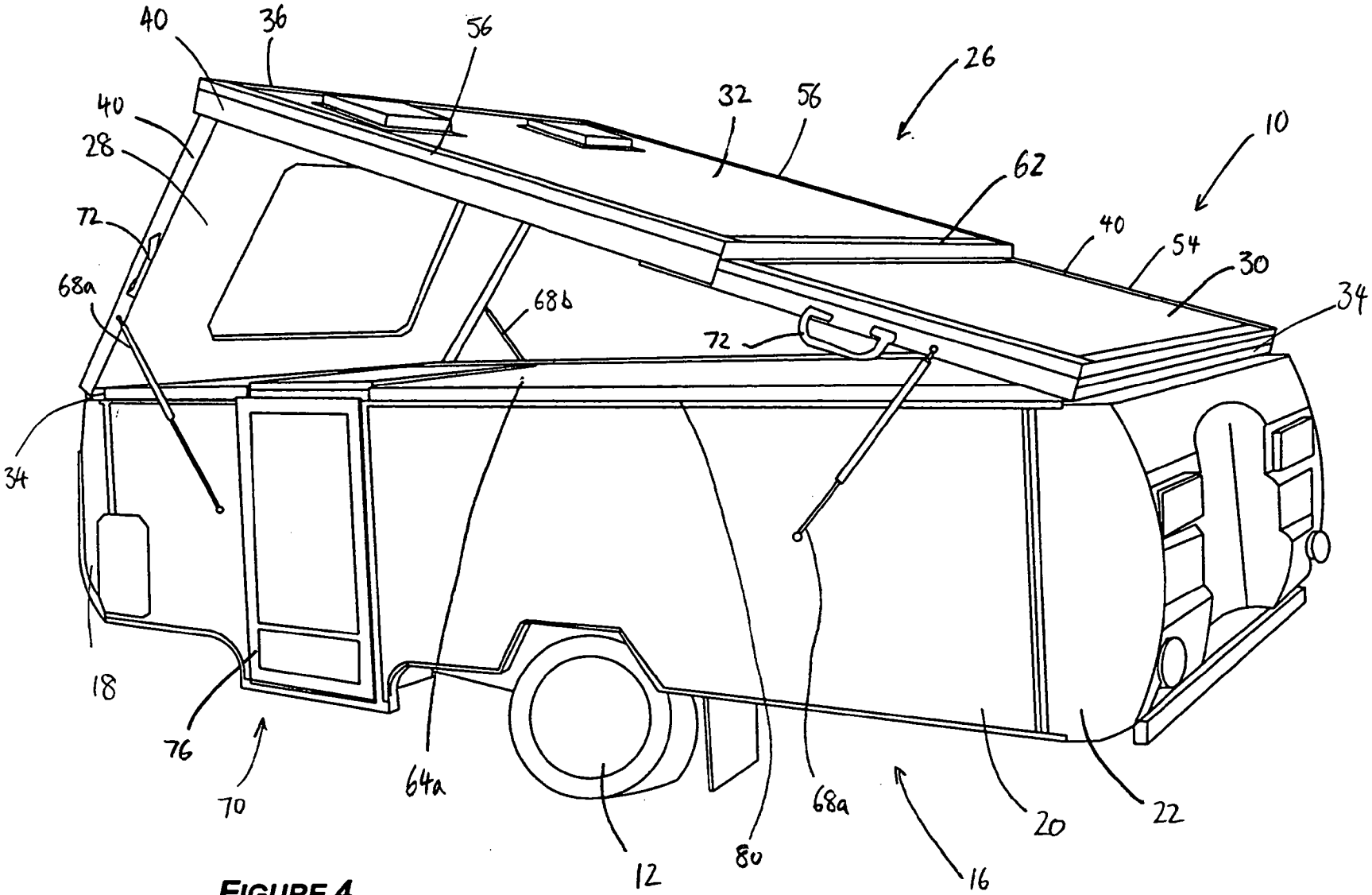
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FIGURE 4

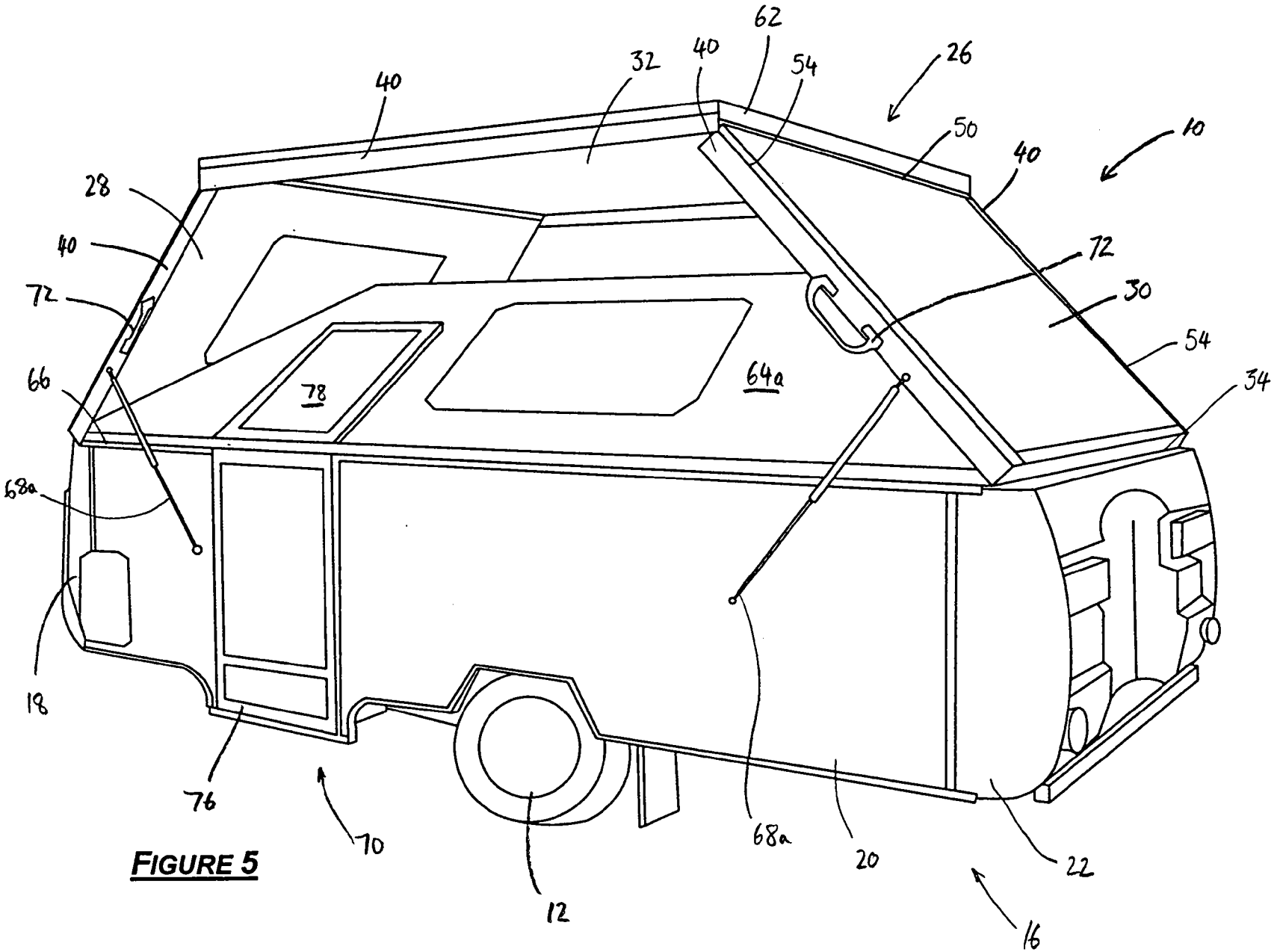
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FIGURE 5

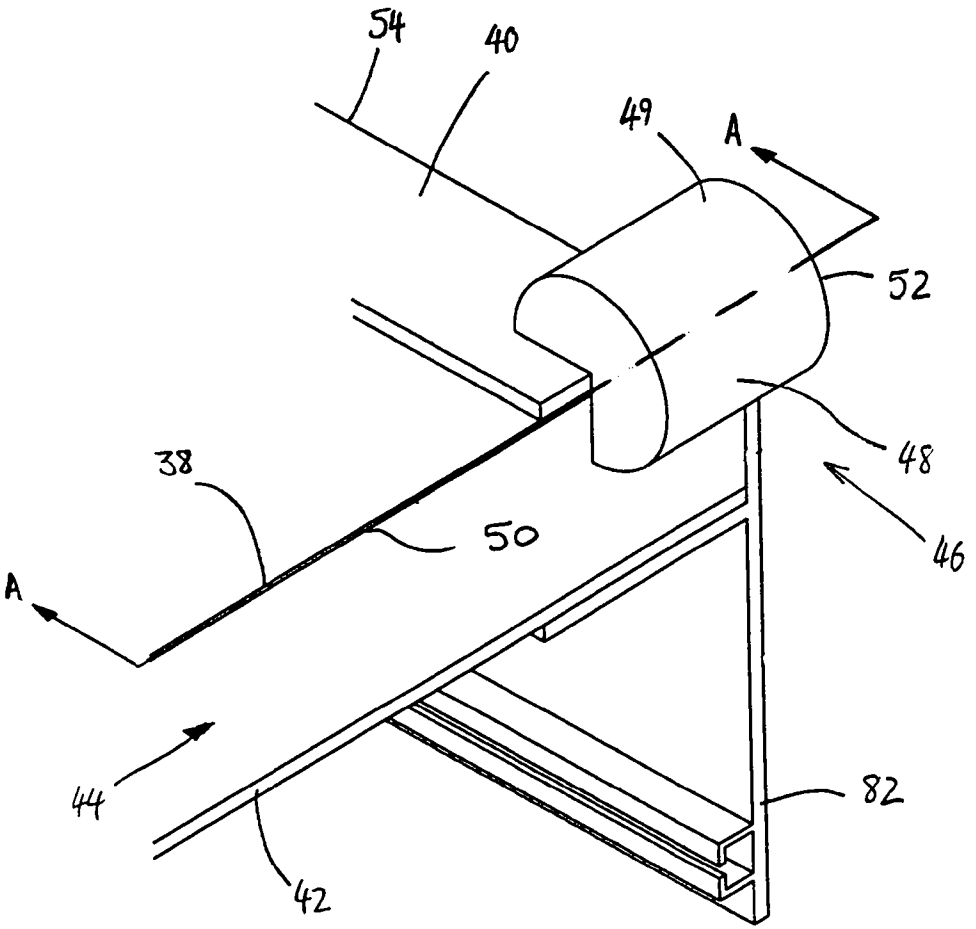

FIGURE 6

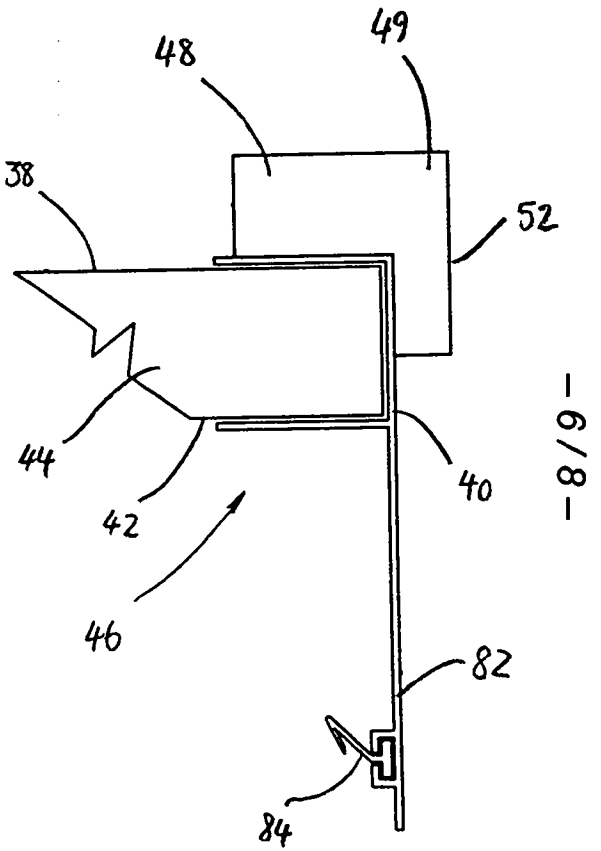

FIGURE 7

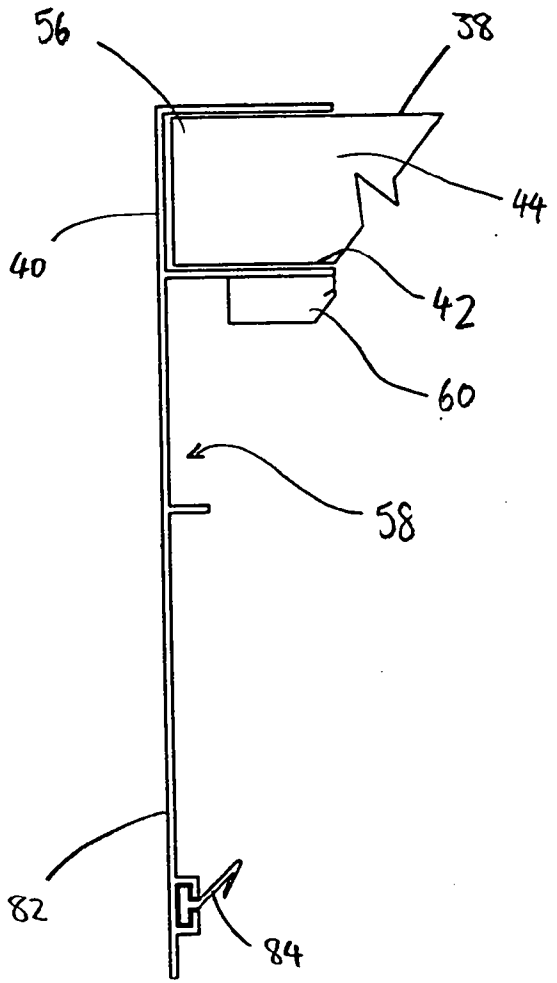

FIGURE 8

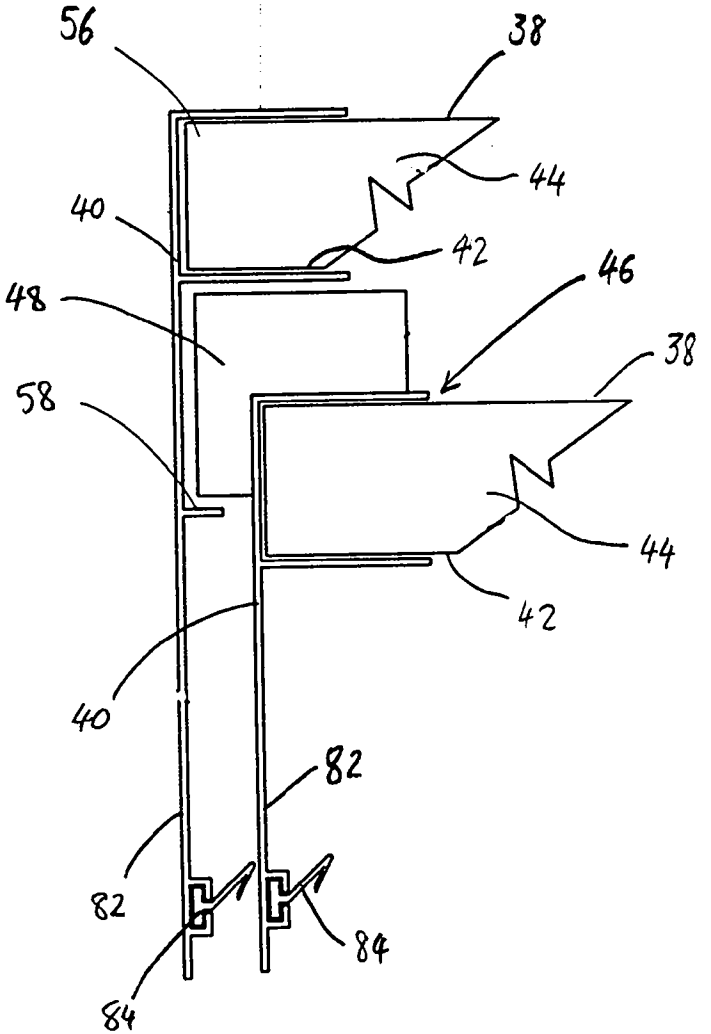

FIGURE 9

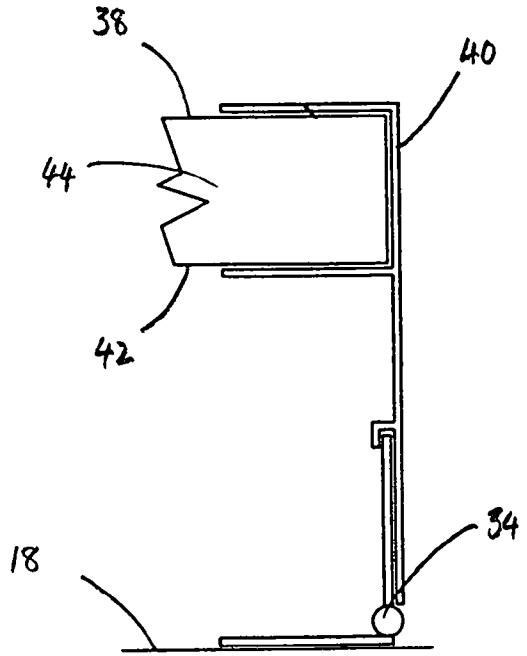

FIGURE 10

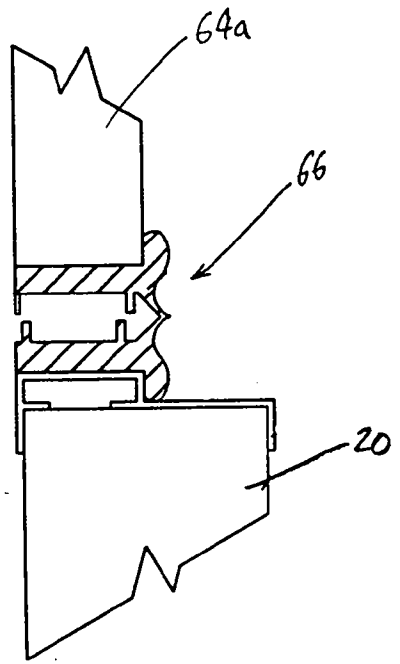

FIGURE 11

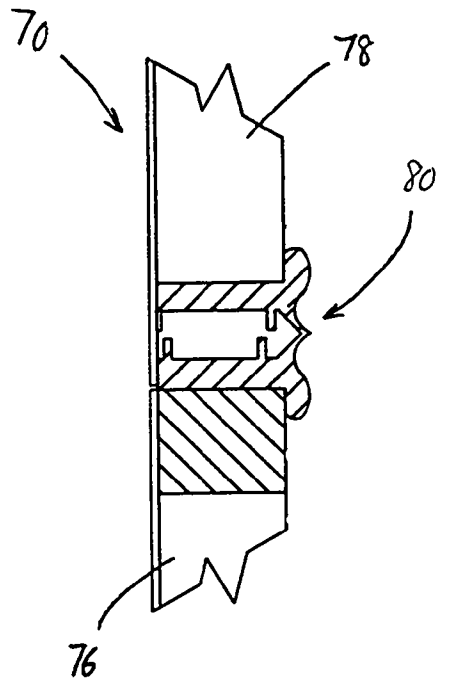

FIGURE 12