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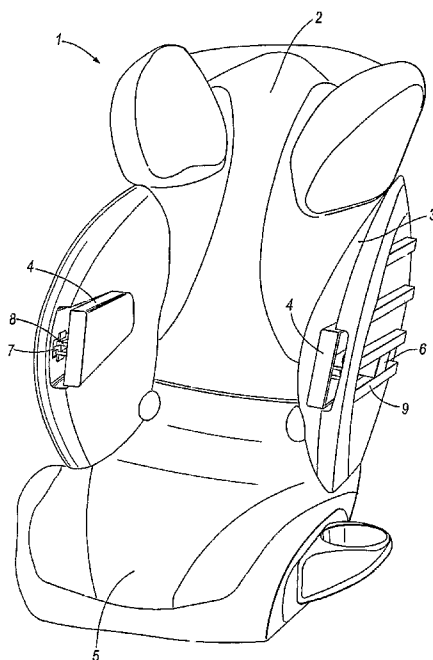
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(54) Title: CHILD SAFETY SEAT



(57) Abstract: A child safety seat (1) for a vehicle, such as a car or bicycle, comprising a seat base (5); two side supports (3), provided respectively on opposing sides of the seat (1), said side supports (3) and seat base (5) defining a user area for receiving a user; and a moveable panel (4) provided on at least one of the side supports (3); wherein the or each moveable panel (4) is adjustably extendable from its respective side support (3) into the user area for supporting the user at the sides.

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CHILD SAFETY SEAT

[001] The present invention relates to a child safety seat and in particular to child safety seat for use in cars, with
5 bicycles or with other vehicles.

[002] In this respect, child safety seats are well known for assisting in securing a child within the interior of a vehicle. Such seats take many forms, but in general involve
10 a seat base which rests on the vehicle seat base, and a seat back which, in the case of forwardly facing child seats, rests against the vehicle seat back.

[003] Increased public awareness of road safety issues has
15 meant consumers recognize the importance of child safely seats, and in particular the importance of selecting the correct size and fit child seat for ensuring the safety of their child. Conventionally, this has meant that child safety seats are only suited to children within a certain age (or
20 rather size) range, since the effectiveness of a seat in an accident situation will be reduced if a child is too small or too large for the particular seat. In the past, this has meant parents may have to buy up to three different seats to safely transport their children during different stages of
25 their childhood development. To address this problem, manufacturers have developed various modifications to child seats in order to extend the age range for which the child seat can be used. For example, one such modification involves the use of height adjustable harnesses and headrests, which
30 can be extended to allow taller children to be accommodated in the seat.

[004] In recent years it has also become common to provide side supports for child safety seats. These side supports not
35 only help to keep the child in place within the seat during

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travel, but also improve safety in the event of a side impact collision as well as improve the rigidity of the seat by linking the seat base and seat back. However, the inclusion of side supports limits the advantages associated with height adjustable seats since a narrow seat width prohibits use of the seat by larger children, and a wide seat means that the side supports are too far apart to adequately secure smaller children.

10 [005] Conventional seats overcome this problem by forming the side supports on pivotable mountings attached to the side of the seat back. In order to accommodate larger children, the side supports can thereby be pivoted outwardly to open out the space within the seat. However, such an arrangement
15 means that the side supports can no longer connect to the base of the child seat, and hence they no longer provide additional rigidity for the seat or side impact protection to the child.

20 [006] The present invention seeks to resolve such problems of known arrangements.

[007] According to the present invention there is provided a child safety seat for a vehicle, the child seat
25 comprising:- a seat base; two side supports, provided respectively on opposing sides of the seat, said side supports and seat base defining a user area for receiving a user; and a moveable panel provided on at least one of the side supports; wherein the or each moveable panel is
30 adjustably extendable from its respective side support into the user area for supporting the user at the sides.

[008] In this way, the present invention provides a child safety seat which allows the position of the moveable side
35 panels to be adjusted depending on the size of the child to

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be seated. For example, the panels may be extended inwardly to support a smaller child. If a larger child is to be accommodated, the panels can be retracted to provide a larger area in which they can sit. Furthermore, because the moveable
5 panels are moveable relative to the main body of the side supports, the side supports can still provide additional rigidity and side impact protection.

[009] Conveniently, the side supports include a cavity
10 formed therein for receiving a said moveable panel when in a retracted position. In this way, the moveable panels can be retracted into the main body of the side supports so they do not protrude from the outer surface of the side supports.

15 [0010] Conveniently, there are provided one or more adjustment handles for adjusting the position of the one or more moveable panels, wherein moving the one or more adjustment handles causes the moveable panels to move between retracted and extended positions. In this way the position
20 of the moveable panels, and hence the available seating area of the seat can be easily adjusted.

[0011] Conveniently, the one or more adjustment handles are provided on each of the side supports. In this way each
25 moveable panel can be adjusted individually and the mechanism for moving the panels can be greatly simplified.

[0012] Conveniently, the one or more adjustment handles are slidably moveable along a track provided on the side
30 supports. In this way a parent can easily adjust the fit of the seat once the child is seated by simply pushing or pulling the slidable adjustment handles.

[0013] Conveniently, one of the or each moveable panel and
35 adjustment handle is provided with an inclined cam track

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opposing a cam follower provided to the other of the or each moveable panel and adjustment handle, wherein the or each moveable panel and adjustment handle are moveable relative to one another to retract or extend the moveable panel.

5

[0014] Conveniently, the inclined cam track has an arcuate configuration.

[0015] Alternatively, the one or more adjustment handles may
10 be rotatable to actuate, via a screw threaded shaft, the retraction or extension of the moveable panel.

[0016] Conveniently, each of the moveable panels is extendable by pivoting outwardly from its respective side
15 support.

[0017] Alternatively, each of the moveable panels is extendable by moving linearly outward from its respective side support.

20

[0018] Conveniently, said side supports are fixed in position with respect to the seat.

[0019] An example of the present invention will now be
25 described with reference to the accompanying drawings, in which:

Figure 1 shows a perspective view of a child safety seat having adjustable side supports according to an embodiment of the present invention;

30 Figure 2 shows an alternative perspective view of the child safety seat of figure 1 in which moveable panels of the adjustable side support are partially extended;

Figure 3 shows an enlarged perspective view of a side support of the child safety seat of figures 1 and 2 with the
35 movable panel removed;

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Figure 4 shows a perspective view of the moveable panel shown in figures 1 and 2;

Figure 5 shows a cross-sectional view of the side support and moveable panel shown in figures 1 and 2, when the movable panel is in an extended position; and

Figure 6 shows a cross-sectional view of the side support and moveable panel shown in figure 5, when the movable panel is in a near un-extended position.

10 [0020] Figures 1 and 2 show a child safety seat 1 according to an embodiment of the present invention. The safety seat 1 comprises seat base 5 and a seat back 2, along with two side supports 3 at each side of the seat. An extendable headrest is provided on the seat back 2 and can be raised or
15 lowered depending on the size of the child to be accommodated.

[0021] Each of the side supports 3 is provided with a number of support ridges 9 on their outer surfaces to provide
20 additional rigidity.

[0022] Each side support 3 is also provided with a slidable adjustment handle 6 on its outer surface. The adjustment handles 6 connect through aperture 7 in side support 3 to a
25 moveable panel 4 provided on the inner surface of the side support 3.

[0023] Figure 3 shows a representation of the inner surface of the side support of figures 1 and 2 where the movable
30 panel 6 has been removed. In this connection, a cavity 10, into which the moveable panel 4 fits, is formed in the surface of the side support 3. Support ridges 9 extend through the cavity 10 to maintain rigidity. Two pivot attachment apertures 11 (only one shown) are provided at
35 rearward position on the cavity 10 opposing one another. The

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pivot attachment apertures 11 provide an attachment point onto which the movable panel can pivotably attach.

[0024] The aperture 7 has an elongate configuration, and the elongate edges of the aperture 7 form a track in which which adjustment handle 6 is slidably attached and guided. The handle 6 also includes a protrusion which will be described in more detail later.

10 [0025] Figure 4 shows a perspective view of the moveable panel 4. Pivot arms 12 are provided on an outer rearward portion of the panel 4 and can be fitted into the pivot attachment apertures 11 in cavity 10 so as to pivotably attach the panel 4 to the side support 3.

15

[0026] The outer sides of the moveable panel 4 form a skirt which allows the panel to be fitted over the protruding features of the side support cavity 10, such as support ridges 9. Two elevated track members 8 are formed on an inner surface of the moveable panel 4, and these are configured so as to key into (inter engage) the protrusion of adjustment handle 6. The elevated track members 8 also have an arcuate configuration.

25 [0027] In this connection, Figures 5 and 6 show a cross sectional view through side support 3, when the moveable panel 4 is attached. Adjustment handle 6 is provided with keying members 61 which slidably attach to the attachment tracks 31 which form the elongate edges of aperture 7 in the side support 3. The adjustment handle 6 is thereby able to slidably move along the attachment track 31.

[0028] Adjustment handle 6 is also provided with a protrusion 62 which is positioned between keying members 61. The protrusion 62 is provided with two ridges into which

35

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corresponding ridges 82, provided on elevated track members 8, slidably key. In this way, when the adjustment handle 6 is moved along attachment tracks 31, the handle is also guided along elevated track members 8.

5

[0029] Figure 5 represents the side support 3 when the adjustment handle 6 is at its furthest position away from the seat back 2. As can be seen, in this position, the elevated tracks 8 are at their most raised position such that moveable panel 4 is pivoted outwardly to protrude out from the side supports 3. The skirt formed on moveable panel 4 extends towards the side support into cavity 10, so as to overlap with the surface of side support 3. In this way, children's fingers are prevented from being caught behind the moveable panel 4.

[0030] Figure 6 represents the side support 3 when the adjustment handle 6 is close to its nearest position to the seat back 2. As can be seen, in this position, the elevated tracks 8 are much shorter, and therefore the moveable panel 4 is retracted into cavity 10. The skirt of moveable panel 4 fits over support ridges 9 as it is drawn into the cavity, and the outer surface of the moveable panel 4 moves towards a position where it is flush with the outer surface of side support 3.

[0031] The moveable panels are retained in their set positions due to the frictional forces and mechanical locking which occurs between the keying mechanisms connecting the adjustment handle 6 to side support 3 and moveable panel 4.

[0032] A more comfortable seating surface can be provided by covering the seat, including side supports 3, with a padded cover (not shown). The cover also serves to smooth over the joints between the outer surface of the side support 3 and

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moveable panel 4, and to further prevent children's fingers being caught in the joints.

[0033] As will be understood from the above, the elevated
5 tracks 8 have a camming effect on the position of the
moveable panel 4, such that when the adjustment handle 6 is
moved along the attachment tracks 31, the moveable panel can
be pivoted outwardly or retracted into the side panel 3. In
this way, the position of moveable panels can be adjusted
10 easily depending on the size of the child to be
accommodated. For example, a smaller child may at first
require the moveable panels 4 to be extended, as shown in
Figure 5, in order to provide them with support at their
sides. However, as the child grows, the adjustment handles
15 6 can be easily moved backwardly towards the rear of the
seat so as to retract the moveable panels 9 and provide more
space in the seat.

[0034] In this way, the present invention provides a child
20 safety seat in which the side supports 3 can be easily
adjusted to allow for different sized children. Furthermore,
since the side supports themselves are not required to pivot,
the side supports are able to extend fully between the rear
of the seat and the seat base in order to provide improved
25 rigidity to the seat and improved side impact protection.
Moreover, the present invention also allows for a more
simplified construction, since the main frame of the seat
base, seat rear and side supports can be formed of a single
unitary piece.

30

[0035] As will be understood, the illustrated embodiment
described above shows an example of the invention only for
the purposes of illustration. In practice the invention may
be applied to many different configurations the detailed
35 embodiments being straightforward to those skilled in the art

to implement.

[0036] For example, the elevated tracks 8 may be provided with one or more notches formed therein which help to maintain the adjustment handle 6 in a set position and may also mark out fixed level settings, for example where the moveable panels are set to 50%, 75% or 100% extended. Alternatively, a locking mechanism, such as a ratchet and paw mechanism, may be provided to maintain the adjustment handle 10 in position.

[0037] Furthermore, although in the above described embodiment the moveable panels 4 pivot outwardly and a cam mechanism is used, alternative constructions are also envisaged. For example, a rotatable adjustment handle connected to a screw threaded shaft may alternatively be provided. In such an embodiment, the adjustment handle could be twisted to elevate or retract the moveable panel. In addition, instead of a pivoting action, the moveable panel could be provided on one or more tracks extending out from the side support and allowing the moveable panel to extend linearly or in a telescopic action, for example.

[0038] In another envisaged embodiment, an electric motor with, for example, a ball/screw mechanism may be provided to move the moveable panel into an extended position.

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Claims

1. A child safety seat for a vehicle, the child seat
5 comprising:-
 a seat base;
 two side supports, provided respectively on opposing
sides of the seat, said side supports and seat base defining
a user area for receiving a user; and
10 a moveable panel provided on at least one of the side
supports;
 wherein the or each moveable panel is adjustably
extendable from its respective side support into the user
area for supporting the user at the sides.
15
2. A child safety seat according to claim 1, wherein said
side supports include a cavity formed therein for receiving
a said moveable panel when in a retracted position.
- 20 3. A child safety seat according to claims 1 or 2, further
comprising one or more adjustment handles for adjusting the
position of the one or more moveable panels, wherein moving
the one or more adjustment handles causes the moveable panels
to move between retracted and extended positions.
25
4. A child safety seat according to claim 3, wherein the one
or more adjustment handles are provided on each of the side
supports.
- 30 5. A child safety seat according to claim 4, wherein the one
or more adjustment handles are slidably moveable along a
track provided on the side supports.
6. A child safety seat according to claims 4 or 5, wherein
35 one of the or each moveable panel and adjustment handle is

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provided with an inclined cam track opposing a cam follower provided to the other of the or each moveable panel and adjustment handle, wherein the or each moveable panel and adjustment handle are moveable relative to one another to
5 retract or extend the moveable panel.

7. A child safety seat according to claim 6, wherein the inclined cam track has an arcuate configuration.

10 8. A child safety seat according to claim 4, wherein the one or more adjustment handles are rotatable to actuate, via a screw threaded shaft, the retraction or extension of the moveable panel.

15 9. A child safety seat according to any preceding claim, wherein each of the moveable panels is extendable by pivoting outwardly from its respective side support.

10. A child safety seat according to any one of claims 1 to
20 8, wherein each of the moveable panels is extendable by moving linearly outward from its respective side support.

11. A child safety seat according to any preceding claim, wherein said side supports are fixed in position with respect
25 to the seat.

12. A child safety seat substantially as hereinbefore described with reference to the accompanying figures.

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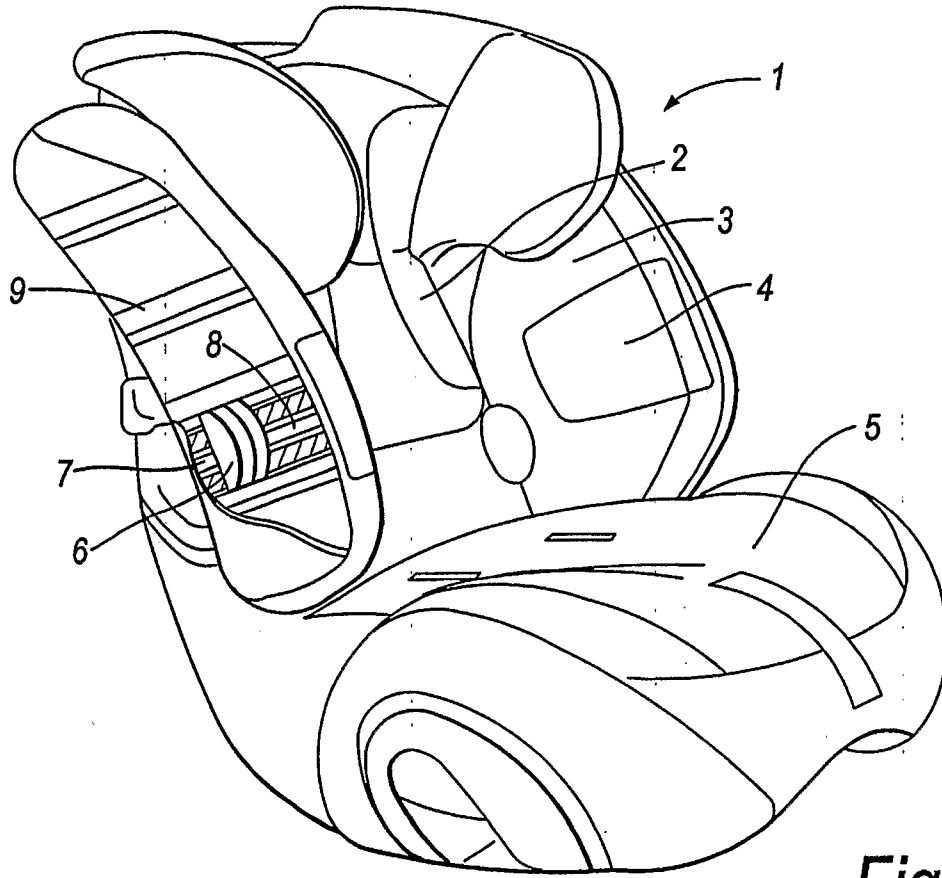


Fig. 1

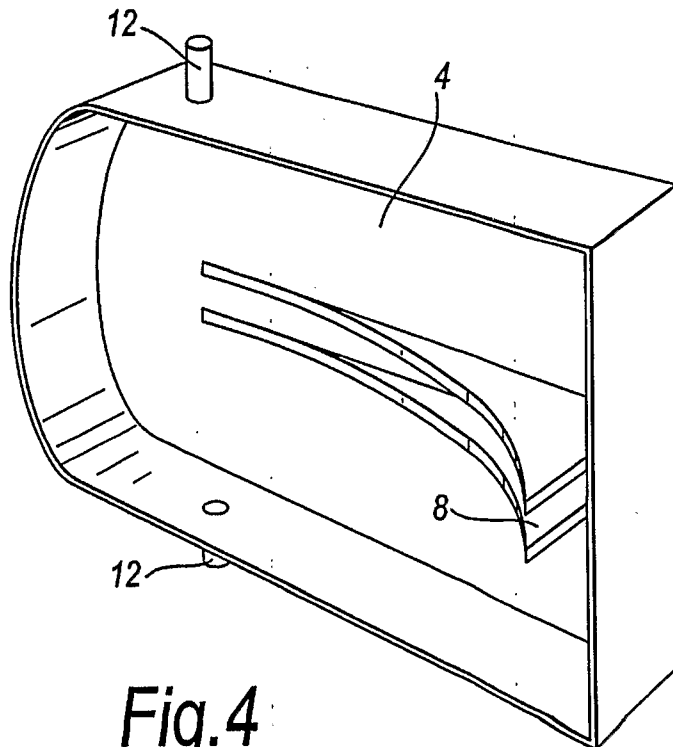


Fig. 4

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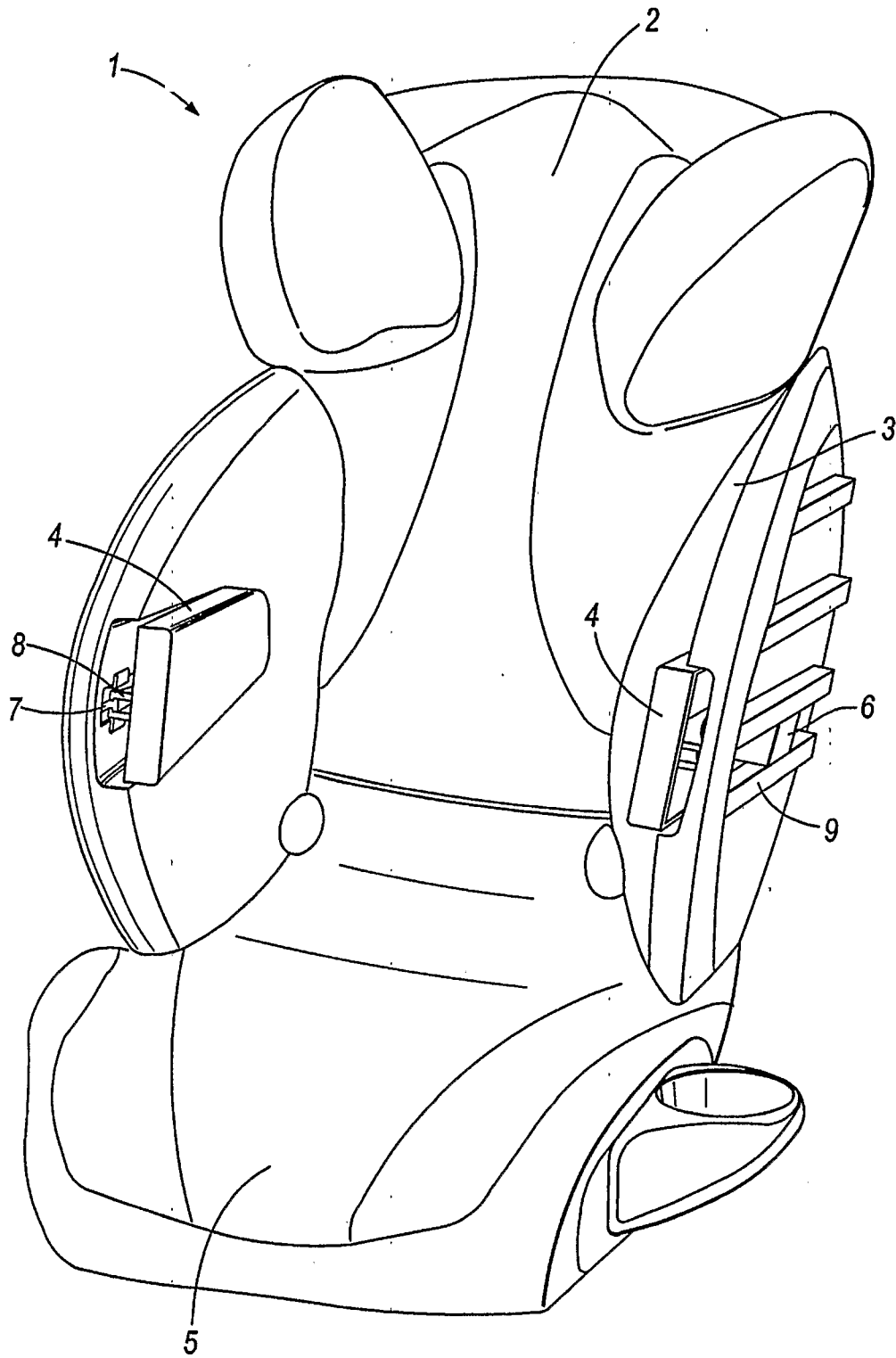


Fig.2

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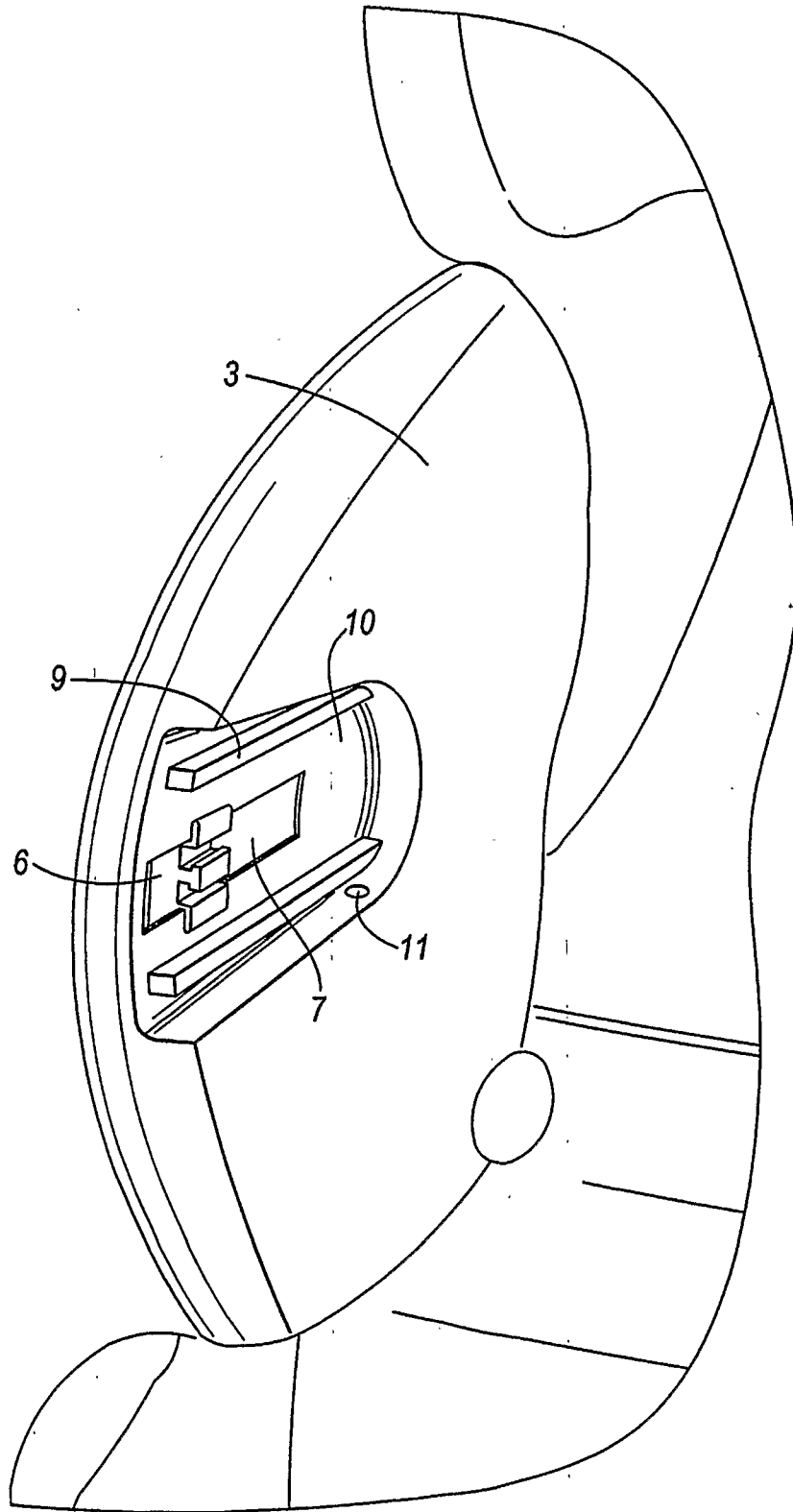
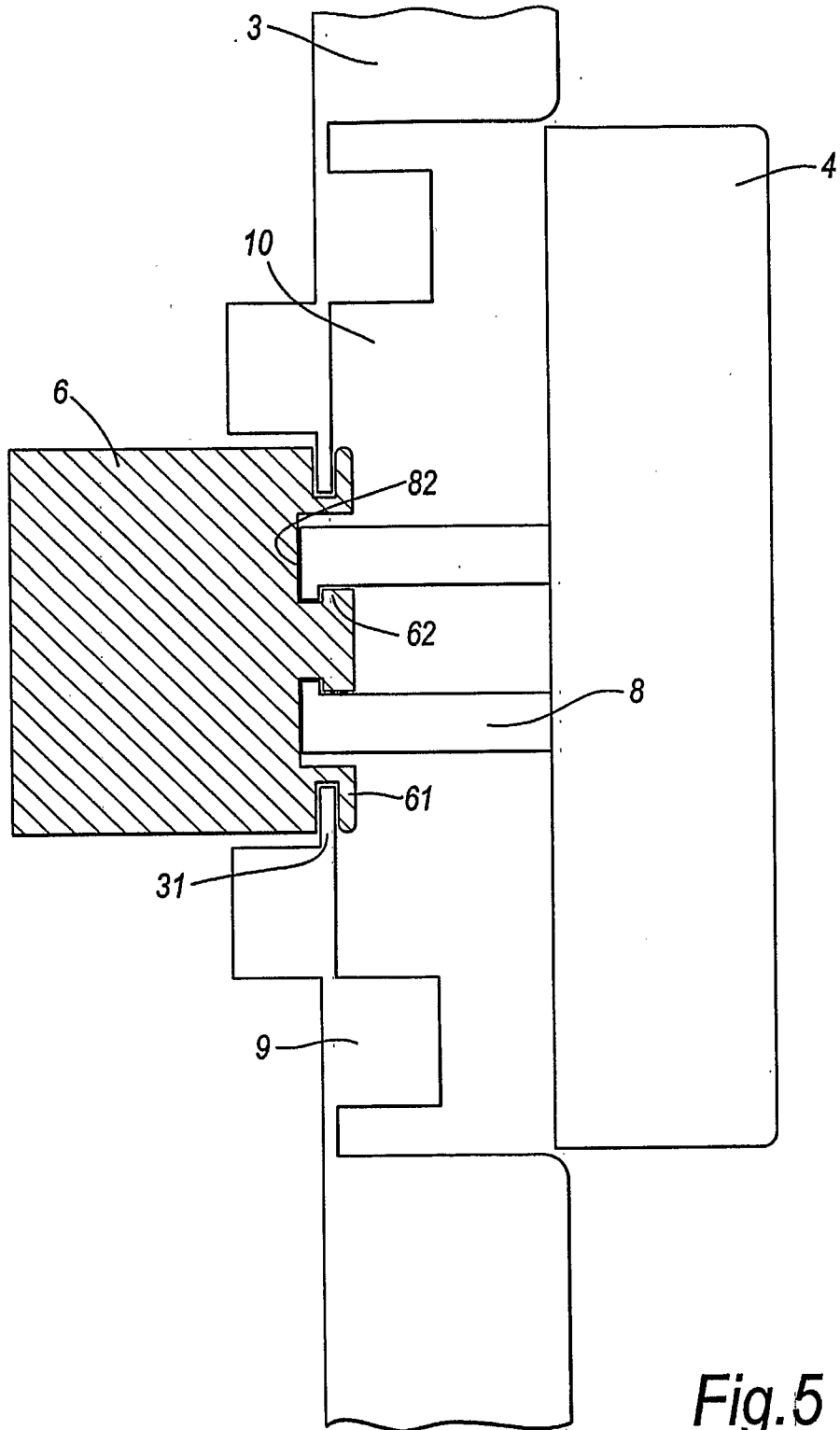
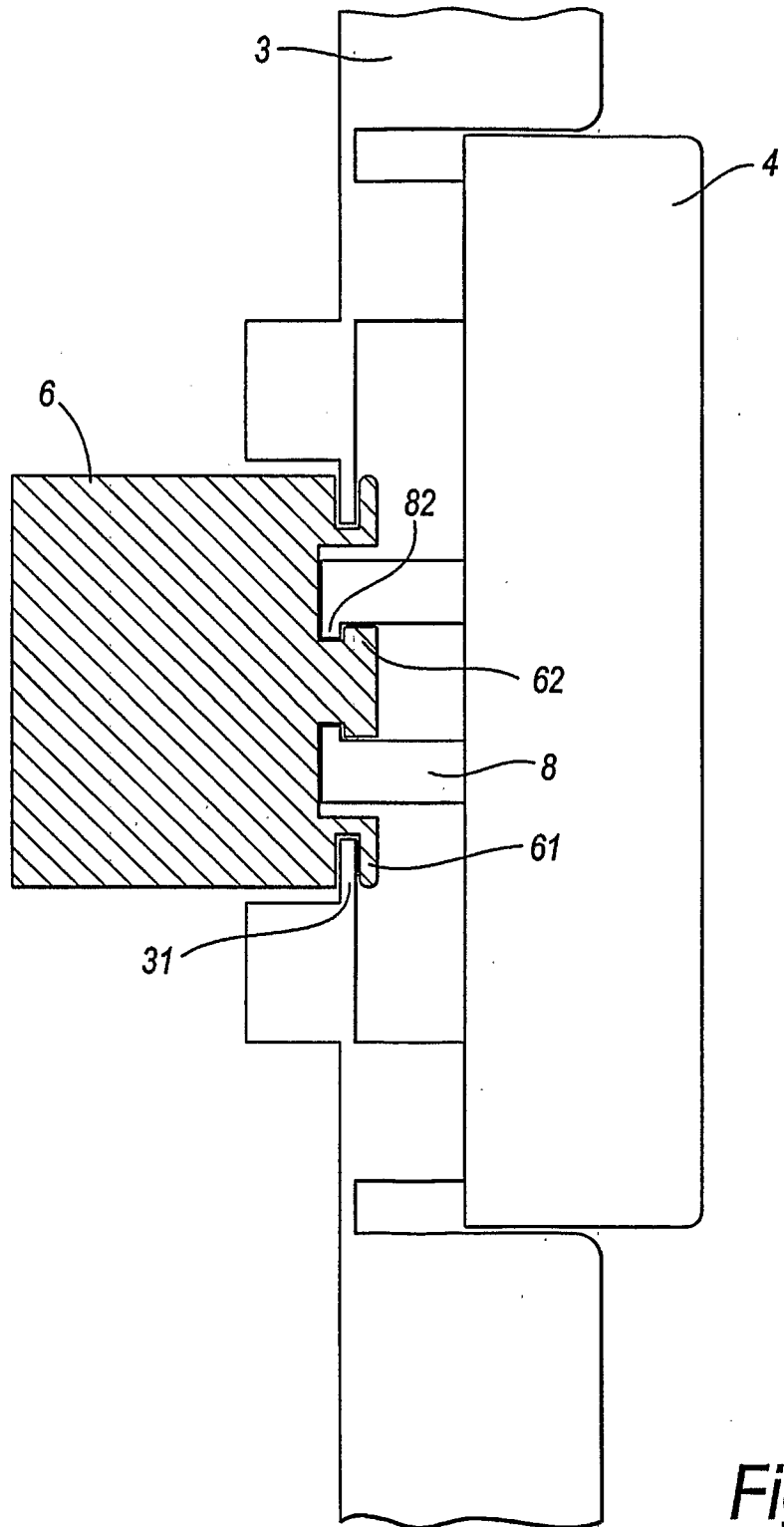


Fig.3

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
INV. B60N2/28 B60N2/44

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)
B60N

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 practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	US 5 810 445 A (SUROT ET AL) 22 September 1998 (1998-09-22) abstract; figures 1-5	8
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Further documents are listed in the continuation of Box C.

See patent family annex.

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INTERNATIONAL SEARCH REPORT

International application No
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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INTERNATIONAL SEARCH REPORT

Information on patent family members

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