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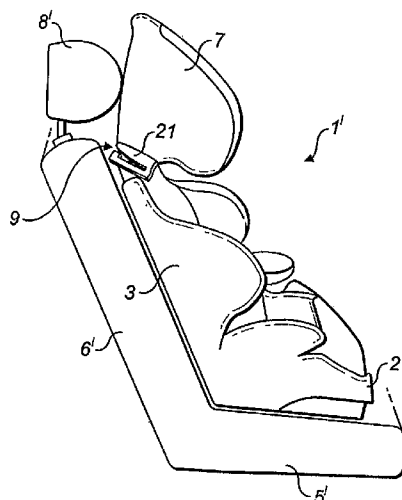
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(54) Title: CHILD SAFETY SEAT HEADREST



(57) Abstract: A child seat having a headrest, at least a portion of which is moveable to accommodate the headrest of a vehicle seat against which the child seat rests. The headrest of the child seat is pivotally mounted to a back rest of the child seat allowing it to be moved forward and away from the head rest of the vehicle seat. The headrest of the child seat can be locked in position by a clamp.

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Child Safety Seat Headrest

The present invention relates to a child safety seat and
5 more particularly to such a seat which has a headrest.

In this connection, improvements in the design of front
and rear seats within a vehicle interior have included
fitting headrests as standard to all the seats, as well as
10 designing the headrest to project further forward so as to
be naturally closer to the head of an occupant. Pitching the
headrest further forward arises from the realisation that
when seated in a seat, an occupant's head remains relatively
upright, rather than slumping back. By pitching the headrest
15 forward, the opportunity for the occupant's head to
accelerate before impact with the headrest is reduced, the
spacing between the headrest and the occupant's head
determining the extent of acceleration and accumulated
velocity. As a result, where provided on vehicle seats, such
20 headrests tend to project further forward from the vehicle
seat back.

In the field of child seats generally, there is moreover
an increased realisation that older children would benefit
25 from their use, meaning that child seat design is
increasingly trying to provide a child seat that can
accommodate a greater range of child ages and sizes.

As a result, many modern child seats offer a degree of
30 adjustment, including height adjustment of the head rest.
However, a problem associated with this flexibility is that

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a headrest set at the incorrect height for the occupying child can be both uncomfortable and potentially dangerous.

A further problem which can then arise stems from when
5 a child seat having a height adjustable head rest is used
with a vehicle seat which itself has headrests. In this
regard, with the child seat headrest raised to its upper
extension, there is a likelihood that it will impinge with
the vehicle seat headrest, such that the child seat back does
10 not lie in full contact against the vehicle seat back, and
the child seat base does not lie flat on the vehicle seat.
This destabilises the child seat, thereby potentially
resulting in serious consequences in respect of the child
seat not functioning correctly, particularly in the event of
15 an accident.

The present invention seeks to alleviate such problems
associated with the prior known arrangements.

20 According to a first aspect of the present invention
there is provided a child seat comprising a seat back and a
headrest; wherein the headrest has at least a portion which
is movable for accommodating a head rest of a vehicle seat
against which the child seat is placed. As such, when in
25 position on a vehicle seat having a headrest, the child seat
head rest is not urged forward undesirably.

Movement of the portion may cause the headrest of the
child seat to move with respect to the seat back. Preferably,
30 the portion is, on installation of the child seat on said

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vehicle seat, moveable on engagement of the headrest of the child seat and the headrest of the vehicle seat. The headrest of the child seat may be moveable forwardly in relation to said seat back.

5

Preferably, the headrest is pivotally coupled to the seat back. In this way, the vehicle seat headrest can be suitably accommodated. As such, the headrest has greater freedom of movement, allowing better matching with the movement of the child's neck joint.

Conveniently, the headrest is pivotally coupled about an axis running along the top of the seat back. The child seat head rest can thereby pivot readily to an optimal position.

The child seat may further comprise holding means for holding the child seat headrest at a preferred orientation. In this manner, the child seat headrest can be adjusted to an optimal position and then retained at that position.

Preferably, the pivotal coupling comprises a headrest connection means and a seat back connection means each provided for rotation on a common axle pin. Conveniently, one of the headrest connection means and the seat back connection means has a through aperture for receiving an actuating cable. This provides a compact arrangement.

Preferably, the pin has a camming handle at one end, actuation thereof compressing the headrest connection means

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and the seat back connection means together to secure their relative angular position.

Conveniently, the headrest connection means and the seat
5 back connection means have mountings for slidable engagement with the headrest and seat back respectively.

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

Figure 1 shows a side view of a known child seat incorporating a headrest when in place on a vehicle having a headrest;

15 Figure 2 shows a side view of a child seat incorporating a headrest according to the present invention when in place on a vehicle having a headrest;

Figure 3 shows a perspective view from the rear of the child seat of Figure 2 with the headrest in a tilted
20 orientation;

Figures 4A-4E show perspective and cross-sectional views of a joint used with the present invention in a first orientation; and

Figures 5A-5E show perspective and cross-sectional views
25 of a joint used with the present invention in a second orientation.

Referring to the Figure 1 of the drawings, there is shown a known child seat 1', formed of a seat base 2' and a
30 seat back 3'. The child seat 1' rests upon a vehicle seat 4'

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comprised of a vehicle seat base 5' and a vehicle seat back 6'. A belt guide 21 is provided for guiding a seat belt correctly in relation to the seat.

5 In this known child seat a headrest 7' is fixed relative to the child seat back 3' so that when in a relatively high position it impinges against the vehicle seat headrest 8'. As shown, the result of this is that the child seat 1' is not correctly seated on the vehicle seat 4', either on its
10 back on or on its base, with a gap developing between the vehicle seat back 6' and the child seat back 3'. As such, the child seat can not function correctly, and its ability to protect a child residing therein in the event of an accident is substantially compromised.

15

 In Figure 2, there is shown a child seat 1 according to the present invention comprising a child seat base 2 and child seat back 3. The seat moreover comprises a head rest 7 which allows for pivotal movement relative to the seat
20 back. As such, even though the head rest 7 impinges upon the vehicle seat headrest 8', the child seat is able to seat correctly on the vehicle seat because of a joint 9 provided between the headrest 7 and the child seat back 3.

25 As illustrated in Figure 2, the headrest 7 can move away forwardly as a result of the position of the headrest 8' of the vehicle seat 4'. In particular, the headrest 7 moves forwards (with reference to the usual direction of travel) so that the head rest 8' of the vehicle seat 4' does not
30 itself support the child seat. Instead, the child seat 1 is

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supported by the back rest 6' and the seat bottom 5' of the vehicle seat 4'. In this configuration, the head rest 7 of the child seat 1 can be brought into and out of engagement with the headrest 8' of the vehicle seat 4' without changing 5 the position of the child seat 1 on the vehicle seat 4'.

The perspective and cross-sectional views of Figures 4A-4E and 5A-5E show the headrest joint 9 in alternative configurations, namely upright and tilted respectively. In 10 this connection, as shown in Figure 3, the joint 9 is incorporated into an upright neck member 20 projecting from the child seat back 3. This neck member 20 can be raised or lowered, the headrest incorporating a handle 10 which is used for uncoupling a locking mechanism for releasing the headrest 15 for such vertical adjustment. This is not discussed in detail in this application, but the locking mechanism for this vertical adjustment requires a flexible connection from the handle 10 through the joint 9 to the child seat back 3. The connection is provided in the form of a cable 11 shown in 20 Figures 4A to 4D which couples the handle 10 with a locking mechanism (not shown) provided lower in the seat back 3.

As shown in the perspective and cross-sectional views of Figure 4A-4E and 5A-5E, the joint 9 itself comprises 25 headrest connection means 12 and child seat back connection means 13, provided on a common axle or pin 14. As such the headrest and seat back connection means can pivot relative to one another about the axle. The pin 14 runs through from one end of the headrest connection means, through the seat 30 back connection means and is secured to the far headrest

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connection means. A clamping handle 15 is provided to the near end of the pin and forms a locking/release handle. By turning or flipping the clamping handle, a cam surface 17 provided thereon acts on follower 16 to pull the pin 14 5 relative to the headrest connection means and child seat back connection means. As such the headrest and child seat back connection means 12,13 are compressed together, locking them in their relative positions/orientations.

10 Rotating or flipping the clamping handle in the opposite direction releases the tension in the pin 14, thereby allowing relative rotational movement between the headrest and child seat back connection means.

15 The headrest and child seat back connection means 12,13 have box-shaped protrusions which are mounted in the headrest 7 and neck member 20 of the seat back respectively. These protrusions have reinforcing webbing.

20 Alternative means for accommodating a vehicle seat headrest are envisaged within the scope of the invention, such as a cavity in the rear of the headrest having a movable cover panel.

25

Claims:

1. A child seat comprising a seat back and a headrest;
wherein the headrest has at least a portion which is
5 movable for accommodating a head rest of a vehicle seat
against which the child seat is placed.
2. A child seat according to claim 1, wherein the portion
is, on installation of the child seat on said vehicle seat,
10 moveable on engagement of the headrest of the child seat and
the headrest of the vehicle seat.
3. A child seat according to claim 1 or claim 2 wherein
the headrest of the child seat is moveable forwardly in
15 relation to said seat back.
4. A child seat according to any preceding claim, wherein
the headrest is pivotally coupled to the seat back.
- 20 5. A child seat according to any preceding claim, wherein
the headrest is pivotally coupled about an axis running along
the top of the seat back.
6. A child seat according to any one of claims 3 to 5,
25 further comprising holding means for holding the headrest at
a preferred orientation.
7. A child seat according to claim 6, wherein the holding
means is for holding the headrest at a chosen position
30 relative to said seat back.

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8. A child seat according to claim any one of claims 4 to 7, wherein the pivotal coupling comprises a headrest connection means and a seat back connection means each provided for rotation on a common axle pin.

5

9. A child seat according to claim 8, wherein one of the headrest connection means and the seat back connection means has a through aperture for receiving an actuating cable.

10 10. A child seat according to claim 8 or claim 9, wherein the pin has a camming handle at one end, actuation thereof compressing the headrest connection means and the seat back connection means together to secure their relative angular position.

15

11. A child seat according to any one of claims 8 to 10, wherein the headrest connection means and the seat back connection means have mountings for slidable engagement with the headrest and seat back respectively.

20

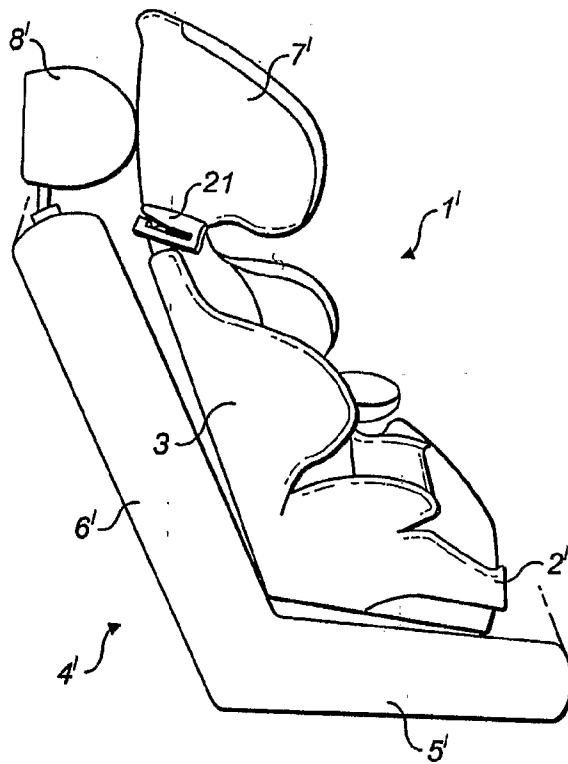


FIG. 1

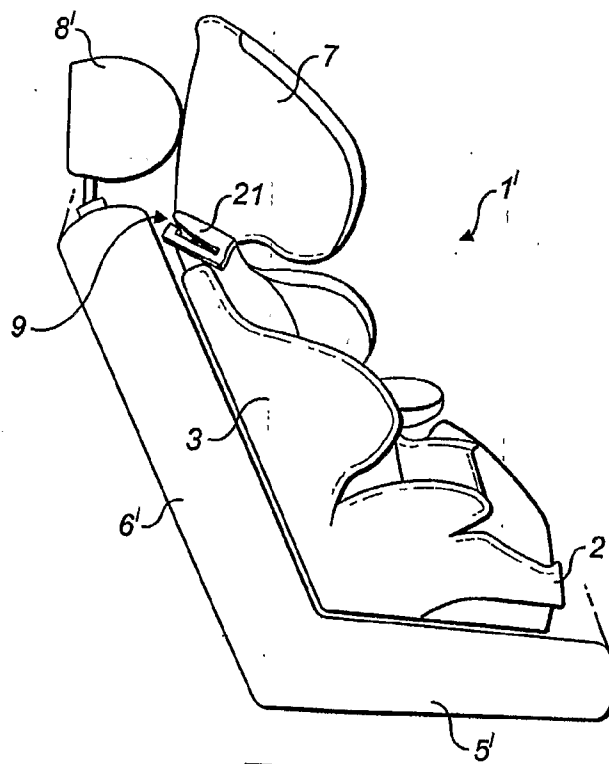


FIG. 2

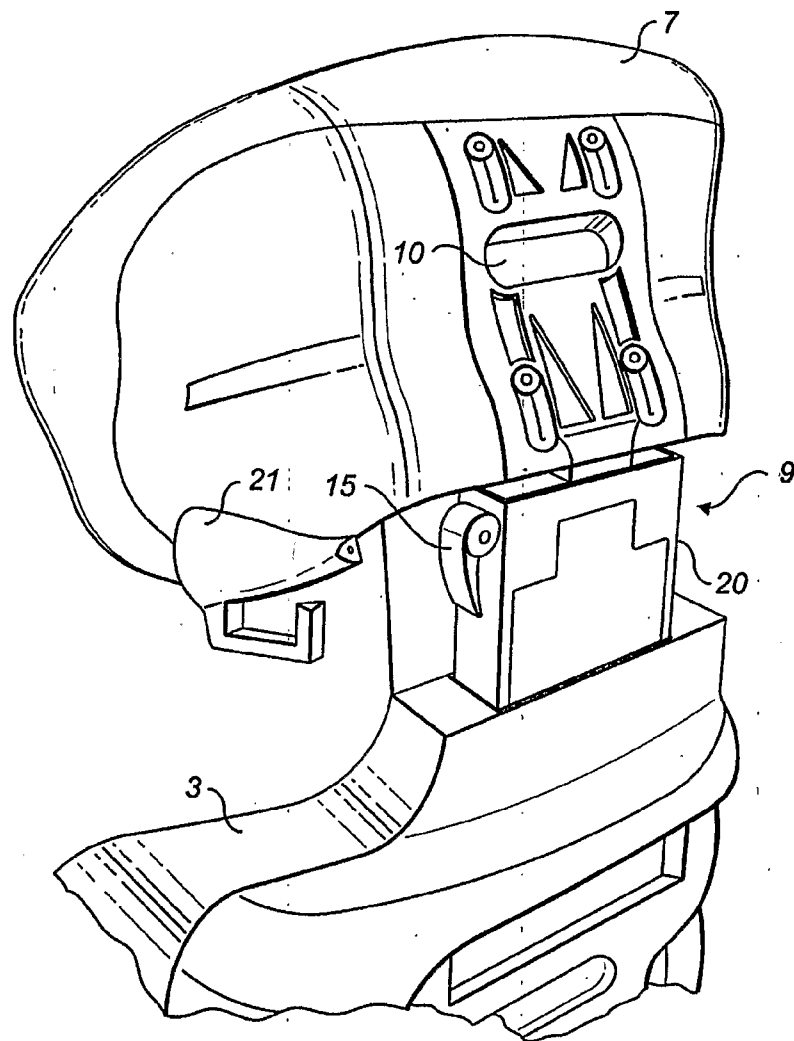


FIG. 3

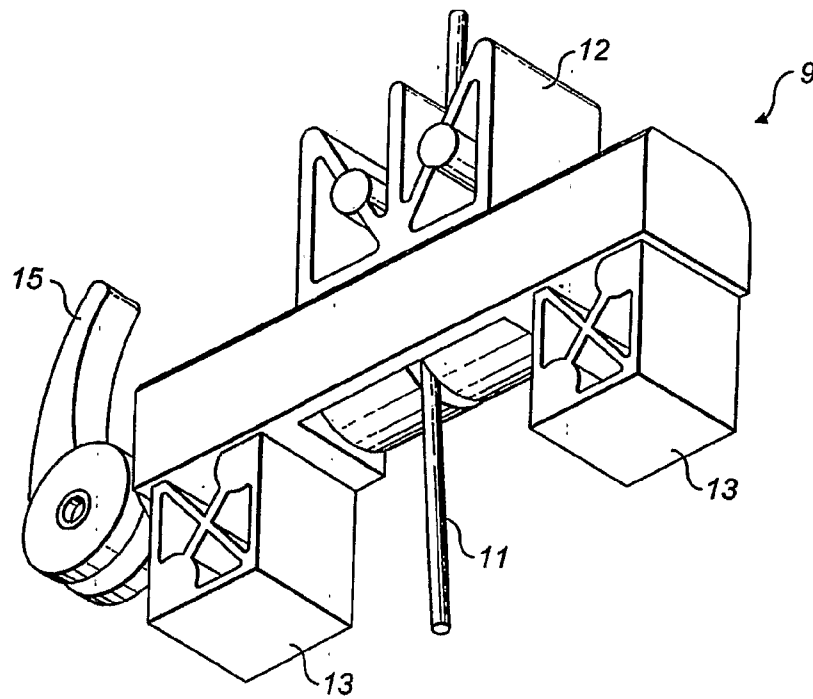


FIG. 4A

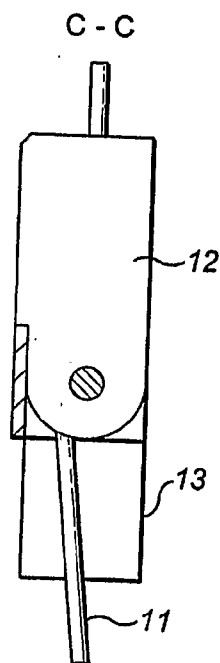


FIG. 4B

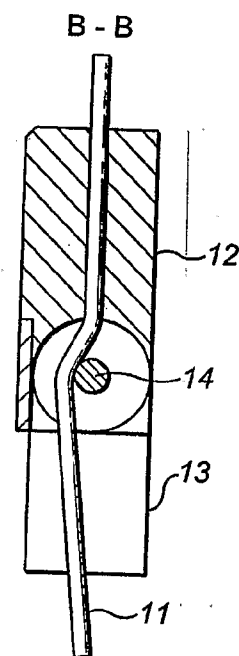


FIG. 4C

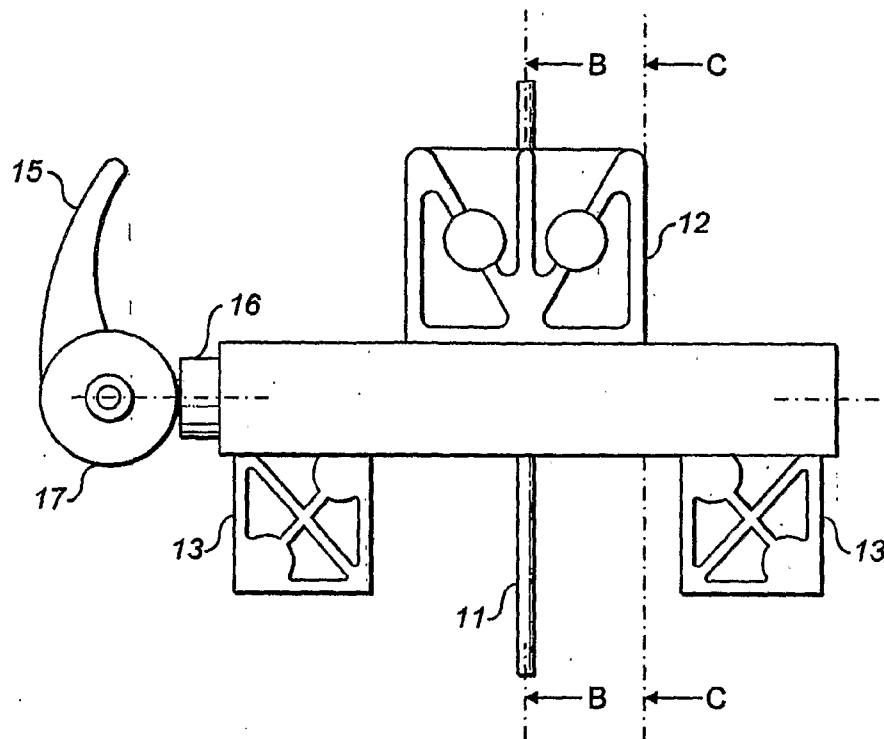


FIG. 4D

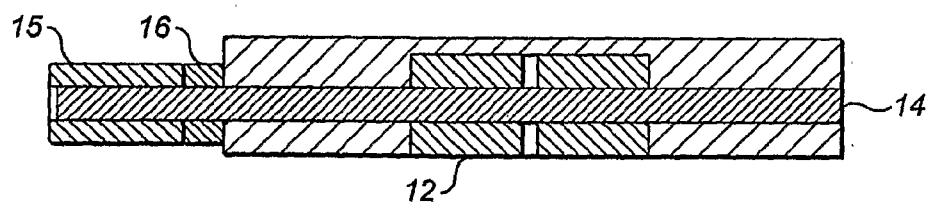


FIG. 4E

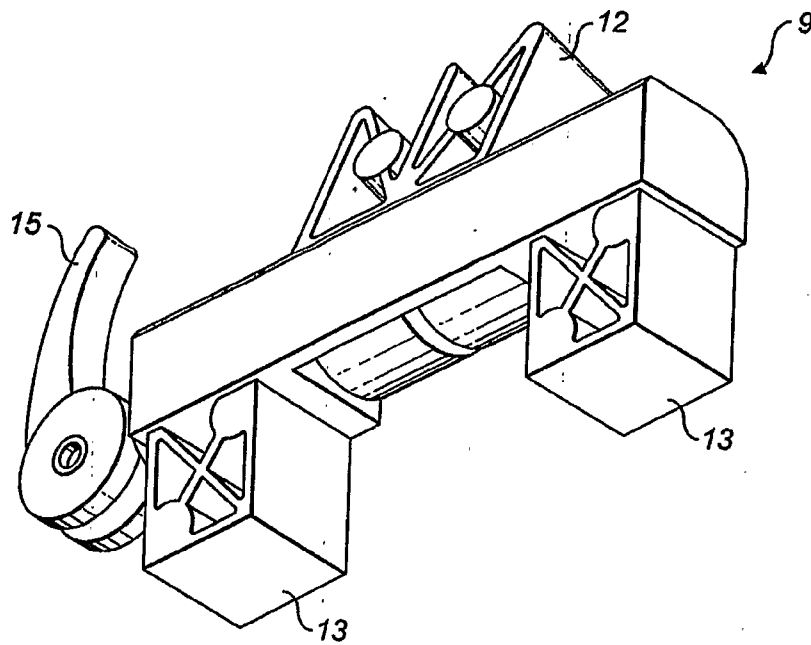


FIG. 5A

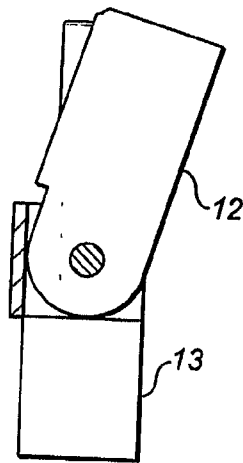


FIG. 5B

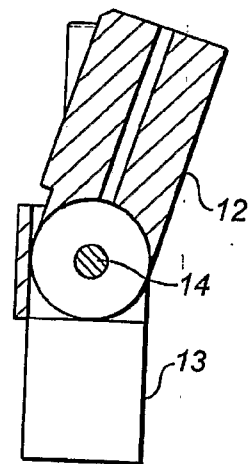


FIG. 5C

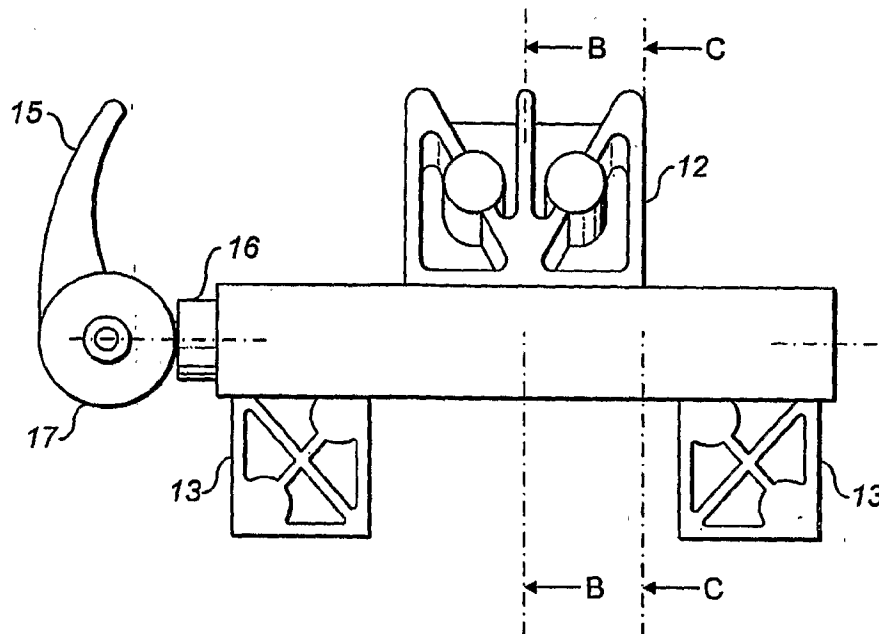


FIG. 5D

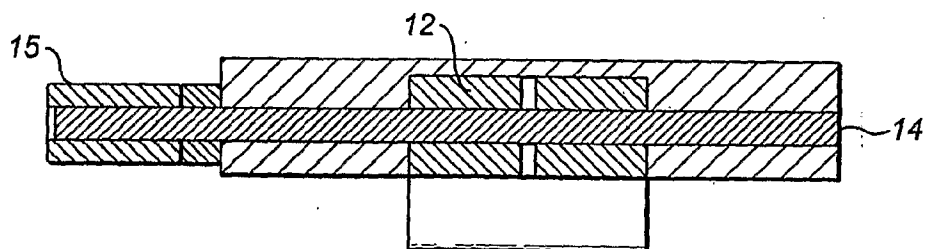


FIG. 5E