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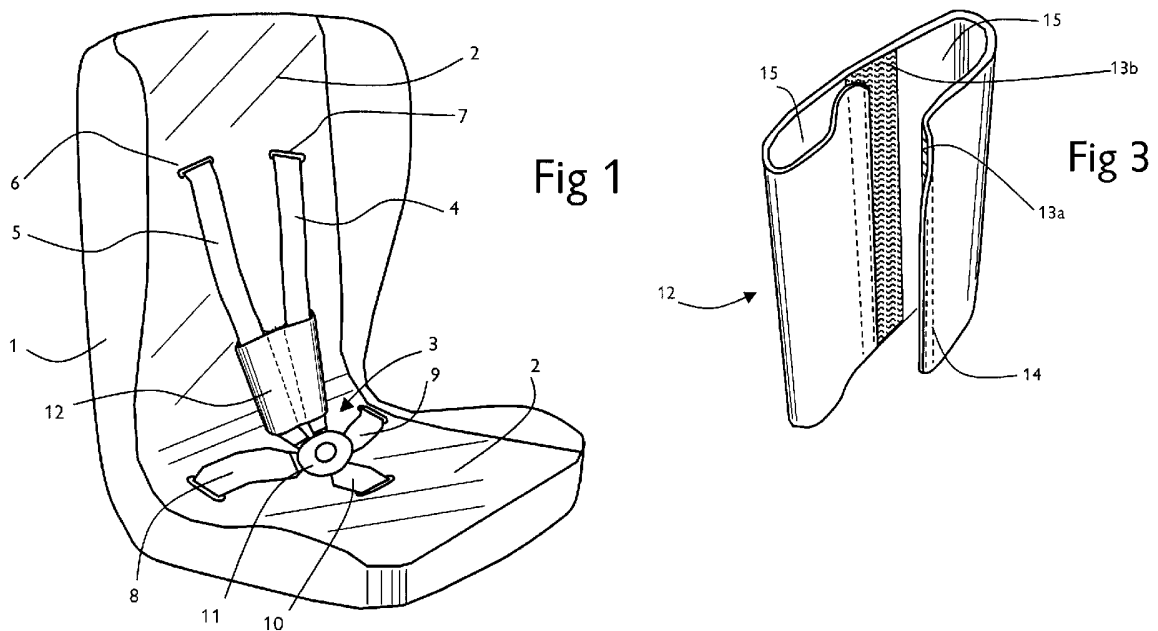
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(56) Documents Cited:
GB 2383979 A **GB 2349364 A**
EP 1245463 A1 **WO 1993/001956 A1**
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(58) Field of Search:
UK CL (Edition X) **B7B**
INT CL⁷ **B60R**
Other:

(54) Abstract Title: **Coupling device for child safety harness**

(57) A coupling device for temporarily linking together the shoulder straps of a child safety harness comprises an elongate flexible member (12) providing on each side of a central region a flat pocket (15), the pockets being open at each end and each having a lengthwise opening with separable fastening means (13) therealong, whereby the pocket may be opened to receive therein and to encircle a respective one of a pair of straps.



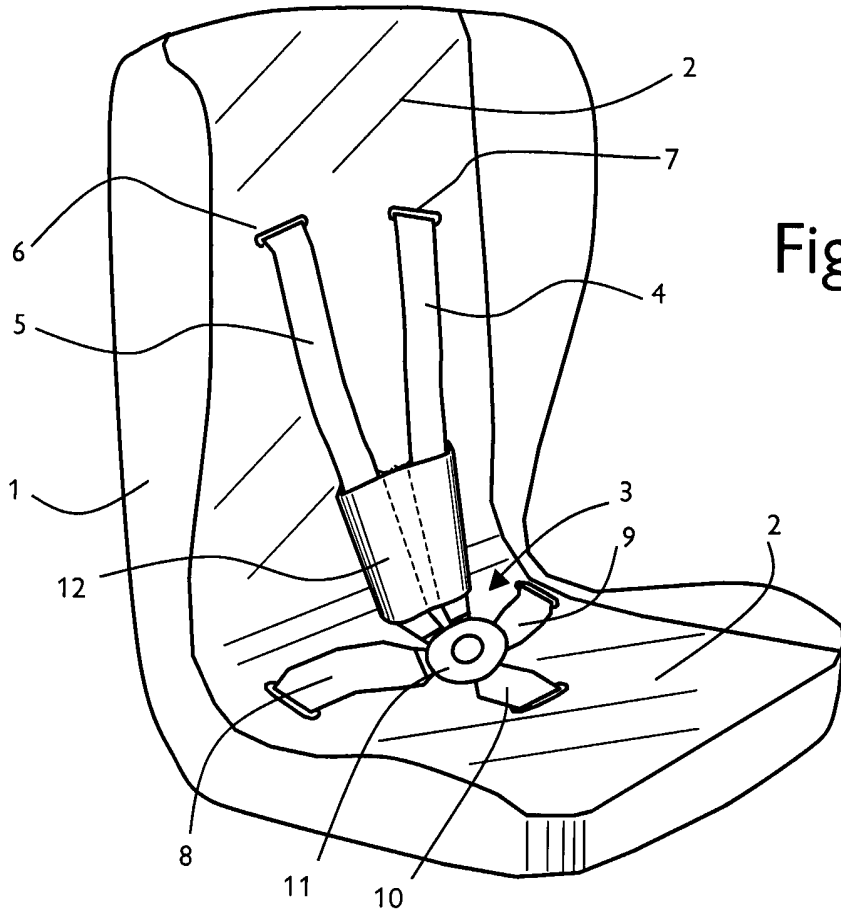
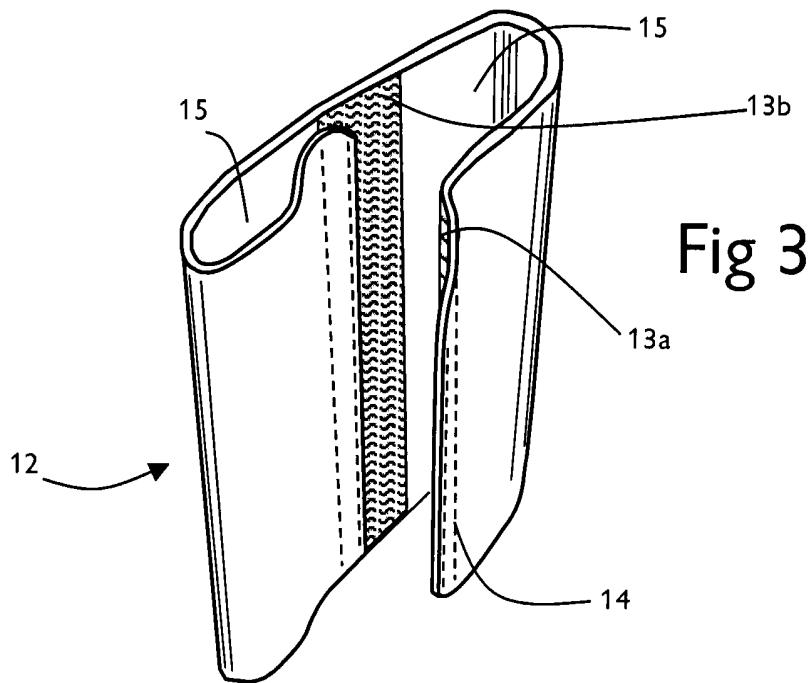
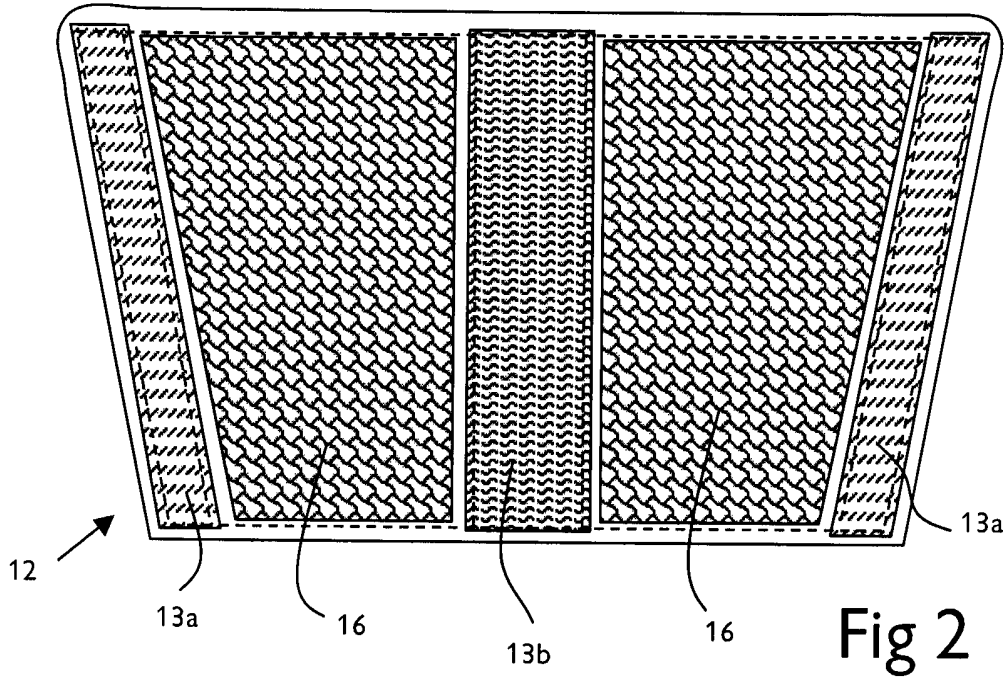


Fig 1



**COUPLING DEVICE FOR CHILD SAFETY HARNESS AND HARNESS AND SEAT
INCORPORATING THE SAME**

Field of the Invention

This invention relates to child safety seats for vehicles, and in particular to a coupling device for holding together the shoulder straps in harnesses for such seats.

Background to the Invention

Child safety seats for vehicles typically comprise a rigid shell attachable to one or more anchorage points inside the vehicle, or to existing vehicle safety belts, and having straps to hold the child safely within the shell. These straps typically consist of a pair of shoulder straps joinable together and with a strap passing between the child's legs by means of a quick-release buckle. There may additionally be a waist strap, also joining together with the other straps at the buckle. Although these seats are generally satisfactory, they need to be adaptable for a range of sizes of child. Some seats allow for this by providing a number of alternative anchorage points for the shoulder straps, along with length adjustment for the straps. While this is acceptable for initial set-up of the seat, it does not readily permit adaptation for different children in use. It is also possible for some children to slip their arms between the shoulder straps and thus leave themselves unprotected. While this might be countered to some extent by bringing the anchorage points of the shoulder straps closer together, it is not possible to do this without rendering the straps too close to the child's neck for comfort and safety.

One attempt to overcome these problems provides a plastics clip to secure the two shoulder straps together temporarily. This suffers from two main disadvantages: it is readily slidable downwards over the shoulder straps to a position near to the buckle, and is thus rendered largely ineffective; and it is difficult to remove rapidly in the event of an emergency, and so may delay freeing the child from the harness/seat.

Summary of the Invention

Accordingly, the invention provides a coupling device for temporarily linking together the shoulder straps of a child safety harness, comprising an elongate flexible member providing on each side of a central region a flat pocket, the pockets being open at each end and each having a lengthwise opening with separable fastening means there-

realong, whereby the pocket may be opened to receive therein and to encircle a respective one of a pair of straps.

Preferably, the coupling device is formed from an inelastic flexible material, for example a padded fabric, and the fastening means is preferably a readily-releasable fastening such as poppers or press-studs or, more preferably, a hook-and-loop fastening, for example that sold under the Registered Trade Mark Velcro.

The coupling device encircles each of the straps separately, and while there may be a separate fastening for each, for example along the outer lengthwise edge thereof, it is preferred to provide fastenings centrally of the device, whereby each side of the device loops around the respective strap to fasten side-by-side at the central region of the device. Where a hook-and-loop fastening is used, a common hook or common loop strip may be employed.

The internal surface of the device is preferably selected to resist sliding along the straps so as to resist being displaced by the child, in use, to permit its removal. For example, the device may be lined with an elastomeric mesh material. Alternatively, or additionally, the device may be designed to be a close fit around the straps, for example by the use of padding, so that the pockets grip on to the straps, in use.

Where central fastening is employed, it may be desirable to fasten the free edges of each side of the device to the central region adjacent to the child's chest, rather than facing outwardly from the child, to make it more difficult for the child to unfasten the device when travelling.

A preferred configuration will be a pair of flattened tubes such as arises from the use of a non-rigid material such as cloth. Padding may be achieved by the use of wadding or resilient expanded plastics materials.

The invention also provides a child safety harness for a vehicle, the harness comprising shoulder straps and a central strap extending upwardly between the child's legs, in use, the shoulder straps and central strap being separably joined together by a quick-release fastening, and a coupling device according to the invention temporarily linking together the shoulder straps. The invention further provides a child safety seat for a vehicle, the seat incorporating the safety harness of the invention.

The device of the invention ensures that the child is correctly, and therefore safely, held in the harness at all times during a journey, avoiding the risk of the child becoming free of the protection of the harness, which is not only unsafe for the child and potentially the people in the front of the vehicle, but is also distracting for the driver. If
5 necessary in an emergency, the device can be quickly pulled free of the straps so as not to inhibit removal of the child from the harness.

Brief Description of the Drawings

In the drawings, which illustrate an exemplary embodiment of the invention:

Figure 1 is a perspective view of a child safety seat for a vehicle;

10 Figure 2 is a plan view of the interior of the coupling device of the invention, prior to fitting to the straps; and

Figure 2 is an enlarged view of the coupling device of Figure 2, when formed into operative shape.

Detailed Description of the Illustrated Embodiment

15 The child safety seat illustrated in Figure 1 is of the conventional type designed to be temporarily anchored on a vehicle's normal seating, for example by special anchorage straps (not shown) extending between the shell 1 of the seat and the vehicle body, or by engagement with the vehicle's adult seat belts. The shell 1 contains padded support cushions 2 for the child to sit on and rest against, and has a restraint harness 3 to hold the
20 child safely in the event of a sudden deceleration, for example as caused by a crash. The harness consists of two shoulder straps 4 and 5, each secured at one end thereof in the shell of the seat. Typically, the straps 4 and 5 will each pass through a slot 6 and 7 in the shell, and the free end of the strap projecting from the rear of the shell is provided with a buckle (not shown) permitting the length of the strap to be adjusted, while preventing it
25 from passing back through the slot 6 or 7. Similar arrangements secure a pair of waist straps 8 and 9 and a between-leg strap 10. The straps 4, 5, 8, 9 and 10 are typically formed from webbing woven from polyamide fibres, and each may be provided at its end within the seat with a metal tongue which engages in a central quick-release latching mechanism 11. It will be understood that, for convenience, one or more of the straps
30 may be permanently joined together or attached to the latching mechanism 11.

It will be seen that the positioning of the slots 6 and 7 in the upright back of the seat must be such as to permit the straps 4 and 5 to pass downwards over the child's shoulders, in use, to meet at the latching mechanism, and while they should be close enough together to provide adequate support for the child's chest, the slots 6 and 7
5 should not be so close to the child's neck or head to affect safety or comfort. This is a difficult balance to achieve, and often if the slots 6 and 7 are far enough apart for the straps to be comfortable and safe in relation to the head and neck, there is a risk that the child will be able to bring its arms forward between the straps, removing any chest restraint, and even permitting the child to climb out of the seat. Unrestrained, the child is at
10 considerable danger in the event of an accident, and the driver of the vehicle may be committing a traffic offence.

To prevent this, the invention provides a coupling device 12 which temporarily passes around the two shoulder straps 4 and 5 above the latching mechanism 11 to hold the straps together, thus ensuring that the child is unable to withdraw its shoulders from
15 beneath the straps and therefore remains fully protected at all times. The device, which is described herein more fully hereinafter with reference to Figures 2 and 3, is preferably arranged with its opening side towards the child's chest to make access by the child more difficult, thereby preventing its premature removal.

As may be seen from Figure 2, the coupling device 12 is formed from a trapezium
20 of padded fabric having attached along opposed edges thereof one part, for example the hook part 13a, of a hook-and-loop fastening strip 13. Along a central region of the trapezium is attached the opposite part 13b of the fastening strip, for example the loop part. The edges with the hook parts 13a may each be folded inwards and pressed into contact with the loop part 13b to form the device into two open-ended pockets 15 as shown in
25 Figure 1 and as shown partially formed in Figure 3; the force required to separate the two parts of the strip 13 again is typically greater than can be exerted by a child, and so the child cannot remove the device 12. Panels 16 of a non-slip material such as an elastomeric mesh material are provided on the inner side of the device to make it more difficult for the child to push to the top of the device downward on the straps to attempt its
30 removal.

The padded fabric may be conveniently be formed by sewing together two layers of woven or non-woven textile fabric with a layer of wadding between. A plurality of lines of stitching may be used to achieve a quilting effect.

5 In use, the device 12 becomes flattened under the straps 4 and 5 against the child's chest, the padding ensuring the comfort of the child. The device conveniently rests on the buckle 11, and so may be made in a range of lengths to suit different sized children. However, the principal need for such a device is with older babies who have developed the skill and strength required to free themselves from the straps.

CLAIMS

1. A coupling device for temporarily linking together the shoulder straps of a child safety harness, comprising an elongate flexible member providing on each side of a central region a flat pocket, the pockets being open at each end and each having a lengthwise opening with separable fastening means therealong, whereby the pocket may be opened to receive therein and to encircle a respective one of a pair of straps.
5
2. A device according to Claim 1, formed from a padded fabric.
3. A device according to Claim 1 or 2, wherein the fastening means comprises a plurality of press-stud fastenings.
- 10 4. A device according to Claim 1 or 2, wherein the fastening means comprises a hook-and-loop fastening strip.
5. A device according to any preceding claim, wherein the fastening means are located on the central region.
6. A device according to any preceding claim, wherein the pockets are lined
15 with an elastomeric mesh material.
7. A device according to any preceding claim, wherein the pockets are padded so as to grip on to the straps, in use.
8. A coupling device for temporarily linking together the shoulder straps of a child safety harness, substantially as described with reference to, and/or as shown in, the
20 drawings.
9. A child safety harness for a vehicle, the harness comprising shoulder straps and a central strap extending upwardly between the child's legs, in use, the shoulder straps and central strap being separably joined together by a quick-release fastening, and a coupling device according to any preceding claim temporarily linking together the shoulder straps.
25
10. A child safety seat for a vehicle, the seat having mounted therein a harness according to Claim 9.



INVESTOR IN PEOPLE

Application No: GB0418616.9

Examiner: Mr Philip Osman

Claims searched: 1-10

Date of search: 19 October 2005

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1-5, 9, 10	WO1993/01956 A1 (MARTIN) See whole document
X	1, 2, 4, 5, 9, 10	EP1245463 A1 (LEIMER) See English language abstract and figures
X	1, 4, 5, 7, 9, 10	GB2383979 A (BRENNAN) See whole document
X	1, 2, 4, 9, 10	GB2349364 A (YOUNG) See whole document
X	1, 4, 5, 9, 10	US2002/0158457 A1 (SIMMONS) See figure 6

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^X :

B7B

Worldwide search of patent documents classified in the following areas of the IPC⁰⁷

B60R

The following online and other databases have been used in the preparation of this search report

Online: EPODOC, WPI