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### (54) Safety belt

(57) A three point harness (1) for use in a child's seat is disclosed, which is designed for easy engagement and fastening when the child is in the seat. In particular, the harness (1) is intended to allow the child to keep its helmet on whilst being fastened. This is achieved by providing

the harness (1) with two straps (5, 6), one of which attaches in a removable manner to the lower part of a child's seat, the other attaches to a fixing point provided on the first strap. These straps (5, 6), therefore, form a "Y" shaped harness (1), in which the "V" portions are positioned around the head of the child.

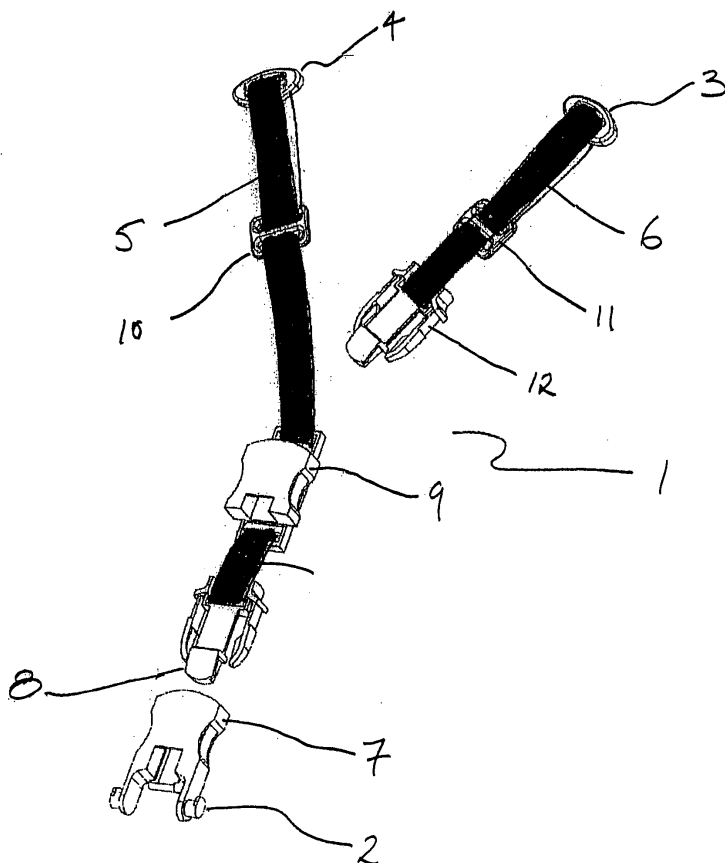


Fig. 1

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## Description

**[0001]** This invention relates generally to the field of child seats for attachment to bicycles, and in particular to the straps used for securing the child within the seat.

### Background to the invention:

**[0002]** Child seats for mounting to bicycles are well known in the art, as they provide a secure and safe way for cyclists to carry babies and children with them. The majority of seats are provided to be mounted on carriers which are positioned over the rear wheel of the cycle. As babies and small children will tend to try and move around when they are seated in one place for even a short time, it is common practice to provide the seat with a harness arrangement, often in the form of straps. Further, when the bicycle is in motion the seat will tend to be bounced up and down, with provision of a harness, however, the child will remain safe and secure within the seat.

**[0003]** One of the most reliable and simplest methods for providing straps for securing a child is that of the three point harness. This is shaped in a "Y" formation, with the two upper arms of the strapping being positioned over the shoulders of the child, and the head being positioned within the resulting "V". Problems, however, are associated with this strap design, in that it is very difficult or in some cases impossible to fit the straps over the head of a child when it is wearing a helmet. As a child's helmet is necessarily a great deal larger than the child's head, the "V" portion is not always large enough to accommodate the greater size of the helmet; indeed, it could be possible that to secure the harness requires the helmet to be removed from the child, causing great inconvenience. Furthermore, many harnesses require that the operator uses both hands to secure the child in position, which is quite unsuitable as the bike or the child may additionally require holding.

### Summary of the Invention.

**[0004]** The above problems are solved by the harness for a bicycle mounted child's seat, as recited in claim 1, with preferred embodiments discussed in the dependent claims thereof.

**[0005]** The harness for a child's seat comprises: two straps which are fixable to the upper part of the child's seat, and are positioned so as to extend in a generally downward direction toward the lower part of the child's seat. At the lower part of the child's seat, there is provided a hand operable fixing mechanism for connection of one of the straps. The strap which is connected to this point, is provided with a further connection point attached along its length in a slide-able manner. This connection point is designed to accept an insert which is provided at the end of the second strap, and thereby provides a three point "Y" shaped harness.

## Brief Description of Figures.

**[0006]** Figure 1: A three point harness for attachment to a child's seat, which can easily be fastened when the child is wearing a helmet.

### Detailed description of one way of implementing the invention.

**[0007]** Figure 1 shows in detail the structure of the current invention. The child's harness (1) is constructed as a three point "Y" harness, with connection points to the child's seat (seat not shown) denoted by reference numerals (2, 3 & 4). As is commonly known in the art, the three point harness is one of a number of options for securing a child in a seat, and has the advantage of being a simple yet safe design. The two upper seat connections (3, 4) are preferably provided as fixed permanent connections, as is shown in the figure. Such connections could be provided quite simply as rigid loops attached to the seat through which the straps (5, 6) of the harness pass. These loops would allow for the free movement of the straps (5, 6), whilst additionally permitting any adjustment required to their. Clearly, other connection methods exist; for instance, holes could be provided on the seat for allowing the straps to pass through, or the straps could be integrally formed with the child's seat during construction. Another option is to provide the loops, as shown in figure 1, attached to the child's seat by further short straps, again this allows for even greater freedom of movement. A final option, is to provide the straps (5, 6) with removable fixing means, such as buckles, wherein one half of the buckle is provided at the end of the strap (5, 6) with the other fixed to the child's seat.

**[0008]** One or both of the two main straps (5, 6) are provided with length adjustment means (10, 11), so that the harness (1) can be used with a variety of baby sizes. As shown in the figure, these adjustment means (10, 11) can be of the form of a rigid plate with two slots cut out which are wide enough for accepting the straps (5, 6). These straps pass through the plate (10, 11) and extend to the upper seat connections (3, 4), pass through the loops provided here, and return to the adjustment means (10, 11) to be permanently fastened there. Movement of the adjustment plate (10, 11) with respect to the upper seat connections (3, 4), will adjust the length of the doubled up section in the attached strap (5, 6) and therefore the overall length. Clearly, other configurations of this system are available, for instance the doubled up section could be formed at the other end of the straps, with a permanent non-adjustable connection made to the upper seat connection points (3, 4).

**[0009]** The third connection point on the harness (2), is preferably provided by a rotatably mounted connection buckle (7) and buckle insert (8) attached to the end of one of the straps (5 in the figure). This buckle (7) is so designed as to be operable with just one hand, the key reason for this being that an operator's second hand is

required for holding the baby in the seat and for stabilising the cycle. As detailed in figure 1, the buckle (7) has a main slot on one of its side edges, for accepting the buckle insert (8).

**[0010]** This insert (8) is provided with two arms which are so biased that when positioned through the slot and within the buckle (7), they engage with two further slots provided in the side edges of the buckle (7) which are adjacent to the main slot. This engagement system stops the insert (8) from being removed from the buckle (7), without the two arms being squeezed against the bias and removing them from the side slots. Clearly, other fixing mechanisms exist which can be operated with only one hand, and this is merely provided as an example, and is not meant to be in any way limiting. Furthermore, rather than being mounted directly onto the child's seat, the buckle (7) could be attached by means of a short strap. A second connection buckle (9) is provided and attached to one of the straps (5, 6) in a slide-able manner. In figure 1, this is detailed as being attached to the strap (5) via two rigid loops at opposite ends of the buckle (9), through which the strap (5) passes. Once again, this buckle (9) is so designed as to be operated using just one hand, leaving the other free for the bike and child.

**[0011]** The second buckle (9) is provided so that the second strap (6) can be disengaged from the harness (1) to allow easier fitting when a child is wearing a helmet. As the helmet on a child is necessarily much larger than the child's head, attempting to attach a harness by sliding the straps making up the "V" section of the "Y" over the child's head and helmet can be very difficult, if indeed it is possible at all. The current system operates in a very simple manner: initially, both the straps (5, 6) are disengaged from the buckles (7, 9) to leave the seat completely accessible. Once the baby is seated, the first strap (shown as 5 in the figure) is brought over the baby's shoulder and is attached to the lower fixing buckle (7) by means of the insert (8). Then, the second strap (shown as 6 in the figure) is brought around the baby over its other shoulder, and is attached to the middle buckle (9) by means of the insert (12). As discussed above, the procedure of engaging the inserts with the buckles is fully possible with just one hand, the other being used for stabilising the baby and/or bike.

**[0012]** A final adjustment is possible to the harness (1), so as to account for different baby sizes. Older babies will tend to require a larger "V" section at the upper part of the harness (1), to account for their larger frames. This is readily achieved thanks to the combination of adjusting the length of the shorter strap (shown as 6 in the figure), and by sliding the middle buckle (9) along the other strap (shown as 5 in the figure). In this way, it is possible to adjust the straps (5, 6) such that the middle buckle (9) is positioned right next to the lower buckle (7), for large babies; and the middle buckle (9) can be placed much higher on the strapping for small babies, as they tend to require the support on their chest to stop them from falling out of the harness (1) and chair.

## Claims

1. A harness (1) for a child's seat comprising:

- 5 two straps (5, 6) fixable to the upper part of a child's seat, positioned so as to extend in a generally downward direction toward the lower part of the child's seat, at which position there is provided a hand operable fixing mechanism (7, 8), for connection of one of the straps (5), wherein, the strap (5) which is connected to the hand operable fixing mechanism (7, 8) has a further connection point (9) attached along its length in a slide-able manner, this connection point (9) being so designed as to accept an insert (12) provided at the end of the second strap (6), thus providing a three point "Y" shaped harness (1).
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- 15
- 20 2. The harness (1) of claim 1, wherein the hand operable fixing mechanism (7, 8) and the connection point (9, 12) are provided by buckles which can be operated using only one hand.
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- 30 3. The harness (1) of both claims 1 and 2, wherein one or both of the straps (5, 6) are further provided with length adjustment means (10, 11).
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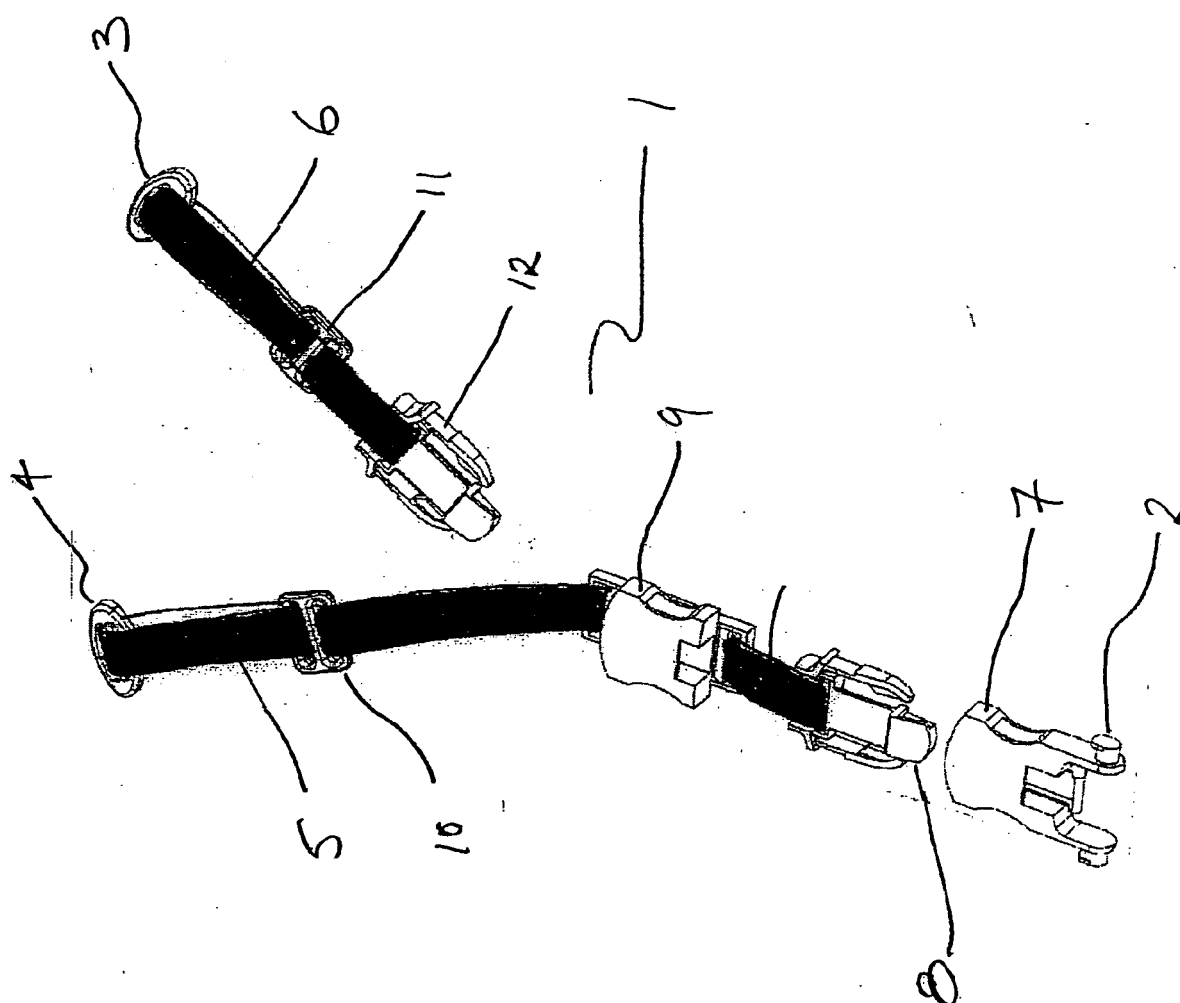


Fig. 1



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# EUROPEAN SEARCH REPORT

Application Number  
EP 05 00 7189

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 4 685 741 A (TSUGE ET AL) 11 August 1987 (1987-08-11) * column 2, line 16 - column 5, line 26; figures 1-4 *	1,3	B62J27/00
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			TECHNICAL FIELDS SEARCHED (IPC)
			B62J A47D B60R B60N
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 1 February 2006	Examiner Kus, S
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**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
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01-02-2006

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