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M. G. CURRAN

3,463,545

MULTIPLE-BELT SEAT HARNESS

Filed Nov. 16, 1967

Fig. 1

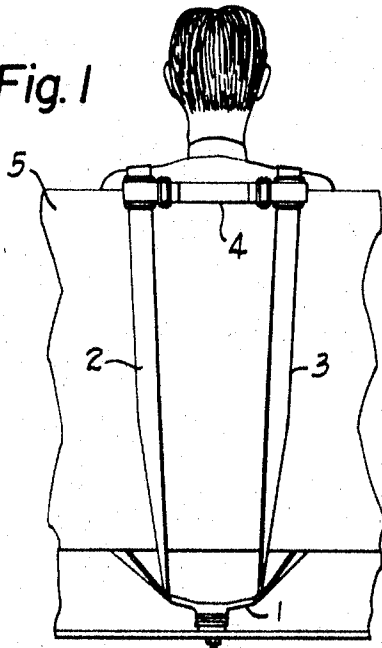


Fig. 2

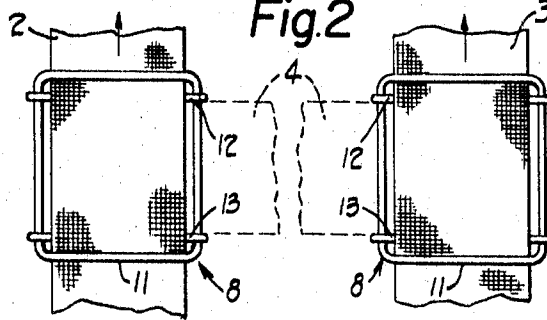


Fig. 3

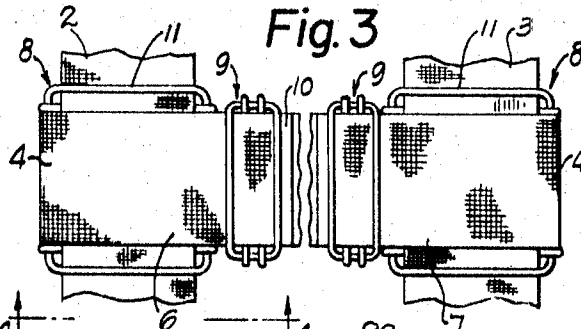


Fig. 4

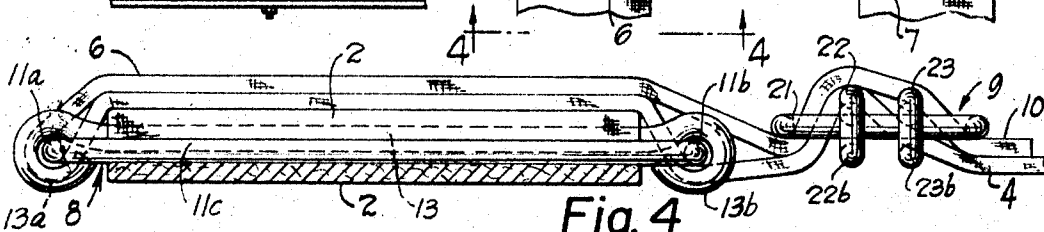


Fig. 5

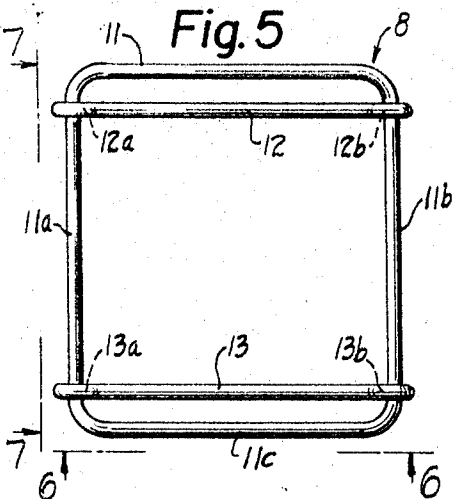


Fig. 7



Fig. 6

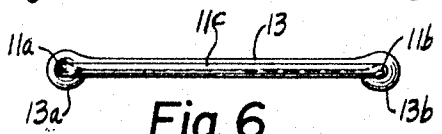


Fig. 10

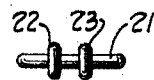


Fig. 8

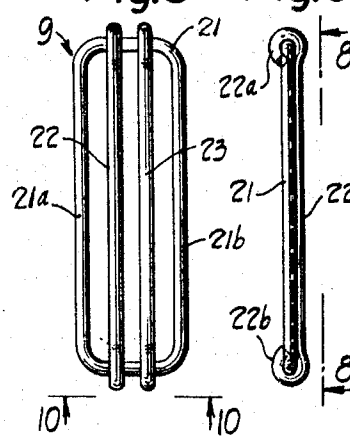
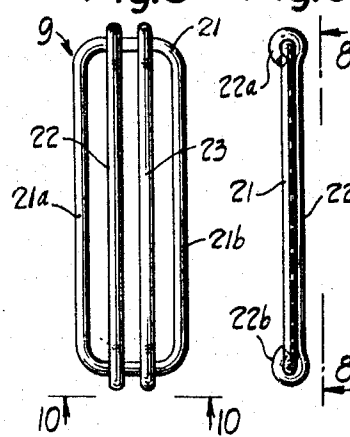


Fig. 9



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3,463,545

MULTIPLE-BELT SEAT HARNESS
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8 Claims

ABSTRACT OF THE DISCLOSURE

A multiple-belt upper body safety harness for use in automobiles and the like comprised of two generally parallel belts fastened to anchor means at the base of the vehicle seat; an adjustable transverse strap connecting the belts at the level of the wearer's shoulder blades; and a plurality of retaining members for maintaining the strap ends in doubled relation to the body of the strap, such retaining members comprising rectangular frames each of which is bridged by a plurality of laterally movable elements of the nature of fabric spreaders.

INTRODUCTION

This invention has to do with a readily adjustable upper body safety harness and associated fittings characterized in general by substantially parallel shoulder belts that follow widely spaced paths, particularly in the vicinity of the user's shoulder blades.

In upper body safety harnesses of kinds commonly recommended in the past, shoulder belts have been used which cross in front of the wearer's chest, at the small of the wearer's back, or both. A typical example is the safety harness of U.S. Patent 2,576,867, which makes use of shoulder belts that flank the wearer's chest but cross at the wearer's back in an X-shaped pattern. Such an arrangement is somewhat more convenient to use than one in which the belts cross in front of the wearer's chest, but an important disadvantage resides in the fact that the possibility of adjusting the width of the harness to conform to the width of the user's shoulders is limited or precluded by stitching or other fastening means utilized to keep the X-shaped pattern intact.

The invention of the present application has for its principal object to provide an improved upper-body safety harness equipped with suitable fittings characterized by adjustably connected, but nevertheless substantially independent, shoulder belts rigidly affixed to anchor means at the base of the vehicle seat.

RELATED APPLICATION

An upper body safety harness of closely related nature is shown, described and claimed in prior application Ser. No. 591,173 (now Patent No. 3,367,715) for "Multiple Belt Seat Harness With Common Anchoring System for the Belts." The present invention improves upon that of the prior application by providing a connecting strap at approximately the level of the user's shoulder blades capable of being manually adjusted to conform to the width of the user's shoulders. To that end, it makes use of a plurality of novel retaining members, usually four in all.

DRAWINGS

In the accompanying drawings,
FIGURE 1 is a small scale representation of the improved safety harness as seen from the rear;

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FIGURES 2 and 3 are rear elevations on a larger scale showing the two shoulder belts and the associated retaining members before and after application thereto of the adjustable connecting strap of the present invention;

FIGURE 4 is a greatly enlarged bottom view of the left-hand half of the connecting strap seen as if from line 4—4 of FIGURE 3;

FIGURES 5, 6 and 7 are views of one of two square retaining members employed in association with the two shoulder belts; and

FIGURES 8, 9 and 10 are views of one of two oblong retaining members associated with the two opposite ends of the connecting strap.

DESCRIPTION

Referring to FIGURE 1, means for anchoring the safety harness as a whole are indicated generally at 1. For present purposes, left shoulder belt 2 and right shoulder belt 3 may be considered as originating in anchor means 1. The structural details of such anchor means are not a significant feature of the present invention. They are fully disclosed in the above-mentioned prior application. Before turning upward, upward belts 2 and 3 pass endwise through the anchor means which they approach from generally opposite directions.

In the preferred embodiment of the present invention, shoulder belts 2 and 3 are connected at or just above the top of seat back 5 by an adjustable transverse strap 4; see FIGURE 1. Strap 4 consists of a stout strip of square-woven nylon webbing measuring about 2" in width and about 20" in length. As appears from FIGURES 3 and 4, the relatively long portions designated 6 and 7 in the former are turned toward each other. These portions should not, however, be so long that they overlap.

Associated with each of portions 6 and 7 are two rectangular retaining members, 8 and 9. Although other shapes are not precluded, one of the retaining members is essentially square and the other is essentially oblong in shape. Thus there are in all four separate retaining members, preferably, but not necessarily, two nearly square retaining members 8 adapted to cooperate with belts 2 and 3 and two oblong retaining members 9 disposed laterally thereof; see FIGURE 3.

Each of the two square retaining members 8 includes a sturdy frame 11 which may conveniently be of heavy-duty steel wire stock. The wire is preferably bent to shape on a template or the like, after which the opposite ends of the wire are welded together. Unless stainless steel is employed, the component parts of retaining member 8 are preferably plated with chromium, nickel, cadmium or some other suitable corrosion-resistant metal.

A plurality of captive links 12 and 13 of mutually similar construction and of heavy-duty wire stock bridge the opening in frame 11 in the manner shown in FIGURE 5. Links 12 and 13, which to a large extent act as fabric spreaders, are formed by reversely bending their opposite ends; i.e., ends 12a, 12b and 13a, 13b (FIGURE 6). Care should be taken to make sure that the latter are not so sharply bent as to preclude all movement of the links on sides 11a and 11b of frame 11.

Each of the two oblong retaining members 9 is similarly constructed of a rectangular wire frame 21 and two captive links 22 and 23 of the nature of fabric spreaders the ends of which are reversely bent; see 22a and 22b in FIGURE 9.

In the two square retaining members, captive links 12 and 13 extend in a direction running parallel to the

longitudinal axis of connecting strap 4. Thus they extend normally to the axes of belts 2 and 3. In oblong retaining members 9, links 22 and 23 extend normally to the longitudinal axis of strap 4. Unlike links 12 and 13, links 22 and 23 operate only on strap 4 and not at all on belts 2 and 3. In each of the four retaining members, there may be more than two captive links if desired; e.g., three and possibly four.

In incorporating transverse strap 4 in the safety harness of the present invention, the first step normally involves attaching square retaining members 8 to belts 2 and 3 at approximately the desired horizontal level. Working from a somewhat lower level, the leading ends of belts 2 and 3 are then threaded into retaining members 8 by urging them upward behind bottom portions 11c of frames 11 and thence into the openings above lower links 13. Continuing in a generally upward direction, but outwardly of both the lower and the upper links, they are then turned inward behind the upper portions of frames 11 of the respective retaining members. The arrows in FIGURE 2 indicate the direction in which belts 2 and 3 are pulled to cause them to pass as described into and then out of retaining members 8.

Notwithstanding the fact that belts are engaged by lower links 13 and bottom portions 11c of frames 11, they may, if desired, be adjusted at this stage by lifting links 13 and moving the belts up or down in relation to the frames. With retaining members 8 suitably positioned, strap 4 is next introduced. Taking the left-hand half of the strap, seen as in FIGURE 1, and working toward the left from the central vertical axis of the space separating belts 2 and 3, the leading end of the strap must be threaded successively through the two retaining members to the left of such central axis. This course takes it into and out of oblong retaining member 9 and square retaining member 8 in that order.

Initially, the leading end of the strap must first be fed endwise into oblong retaining member 9. This is done by passing it successively under side 21b of frame 21, under link 23, over link 22, and under side 21a of frame 21; see FIGURES 4 and 8. This sequence of steps brings the leading end of strap 4 into juxtaposition to square retaining member 8, into which it is urged from beneath side 11b of frame 11. With links 12 and 13 separated by a distance equal to the width of strap 4, the leading end of the strap is then drawn across frame 11 from side 11b to side 11a thereof, always outwardly of both links.

On reaching the left-hand side 11a of frame 11, seen as in FIGURES 3 and 4, the direction of travel of the leading end of the strap is reversed by wrapping it around side 11a, thus doubling the strap back on itself. By this time, the leading end of strap 4 is the outside layer of three superimposed layers of fabric all of which are associated with square retaining member 8; see FIGURE 4. Throughout, belt 2 remains the innermost layer.

The leading end of strap 4 is next drawn to the right beyond retaining member 8 and introduced into retaining member 9 behind the rear side 21a of frame 21. Assuming that the free segment of strap 4 is long enough to permit it, the leading end of the strap is then pulled from left to right over links 22 and 23 and passed under right-hand side 21b of frame 21. This is illustrated at the extreme right-hand end of FIGURE 4, wherein, as in FIGURE 3, the terminal portion of the strap is designated 10. The latter is held firmly in place by frame 21 of retaining member 9.

This completes the operation of threading up retaining elements 8 and 9 in the left-of-center portion of the space between the belts, seen as in FIGURE 1.

Essentially the same sequence of operations is performed in threading up the retaining elements in the right-of-center portion. The latter are present in mirror-image relation to those in the left-hand portion. Thus the threading-up operation begins near the center in FIGURE 1 and proceeds from left to right until the right-hand side

of retaining member 8 is reached. There the leading end is reversed as already described, after which the threading-up operation proceeds from right to left until concluded.

Notwithstanding the fact that retaining members 8 are used to receive and accommodate strap 4, the possibility remains of further adjusting retaining member 8 up or down, as desired. It is only necessary to loosen and separate links 1 and 13 slightly after which the adjustment can be made as already described. In adjusting for width, a similar procedure is followed: links 22 and 23 are moved in directions such as to loosen the two plies of fabric passing through retaining member 9; see FIGURE 4.

Once links 22 and 23 have been moved to the left or right, as the case may be, retaining member 9 may be moved laterally on strap 4. By pulling on terminal portion 10, that part of the strap which projects from retaining member 9 toward the central axis of the space separating belts 2 and 3 may be lengthened, thus shortening strap 4. If it is desired to lengthen strap 4, the portion of strap 4 lying between retaining members 8 and 9 is pulled in the opposite direction.

Thus the invention provides a simple, practical way of incorporating a doubly adjustable strap at or about shoulder level in a safety harness characterized by two shoulder belts designed to follow widely spaced paths. In the strap itself, no stitching is needed, thus obviating a possible source of failure under stress. The use of retaining members of the type described provides a far stronger fastening system than would be possible with stitching, one that is at the same time adjustable to conform to the width of the user's shoulders.

What is claimed is:

1. A multiple belt seat harness for vehicular use comprising right and left shoulder belts extending upwardly to the wearer's shoulders in spaced paths originating in anchoring means at the base of the vehicle seat; means connecting the belts to each other at approximately the level of the wearer's shoulder blades, such means taking the form of a transversely extending strap, portions of which are doubled together; and two movable retaining members at each end of the strap coupling the doubled portions of the strap to the two shoulder belts, wherein each of the retaining members takes the form of a rectangular frame provided with a plurality of captive links each of which is movable toward and from two of the four sides of the frame.

2. A vehicular seat harness according to claim 1 wherein the links comprise elongated elements the ends of which are looped over the intervening sides of the frame.

3. A vehicular seat harness according to claim 2 wherein the overall length of each link is less than the overall length of the diagonal of the frame.

4. A vehicular seat harness according to claim 2 wherein the overall length of each link is greater than the overall diagonal of the frame.

5. A multiple belt seat harness for vehicular use comprising right and left shoulder belts extending upwardly to the wearer's shoulders in spaced paths originating in anchoring means at the base of the vehicle seat; means connecting the belts to each other at approximately the level of the wearer's shoulder blades, such means taking the form of a transversely extending strap, portions of which are doubled together; and two unlike but generally similar retaining members at each end of the strap coupling the doubled strap portions together, wherein each of the retaining members takes the form of a rectangular frame provided with a plurality of captive links each of which is movable toward and from two of the four sides of the frame.

6. A vehicular seat harness according to claim 5 wherein one of the two retaining members is square in shape.

7. A vehicular seat harness according to claim 5 wherein one of the two retaining members is oblong in shape.

8. A vehicular seat harness according to claim 5 where-

in one of the two retaining members is movable normally to and the other is movable laterally of the axis of the strap.

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U.S. Cl. X.R.

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