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Casebolt et al.

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[54] **SAFETY HARNESS WITH ADJUSTABLE FRONT D-RING**

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[73] Assignee: **D B Industries, Inc.**, Red Wing, Minn.

[21] Appl. No.: **173,651**

[22] Filed: **Dec. 22, 1993**

Related U.S. Patent Documents

Reissue of:

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Issued: **Apr. 20, 1993**
Appl. No.: **782,575**
Filed: **Oct. 25, 1991**

[51] **Int. Cl.**[6] **A62B 35/00**; B64D 17/30

[52] **U.S. Cl.** **119/857**

[58] **Field of Search** ..... 119/770, 857, 907; 244/151 R; 182/3, 4

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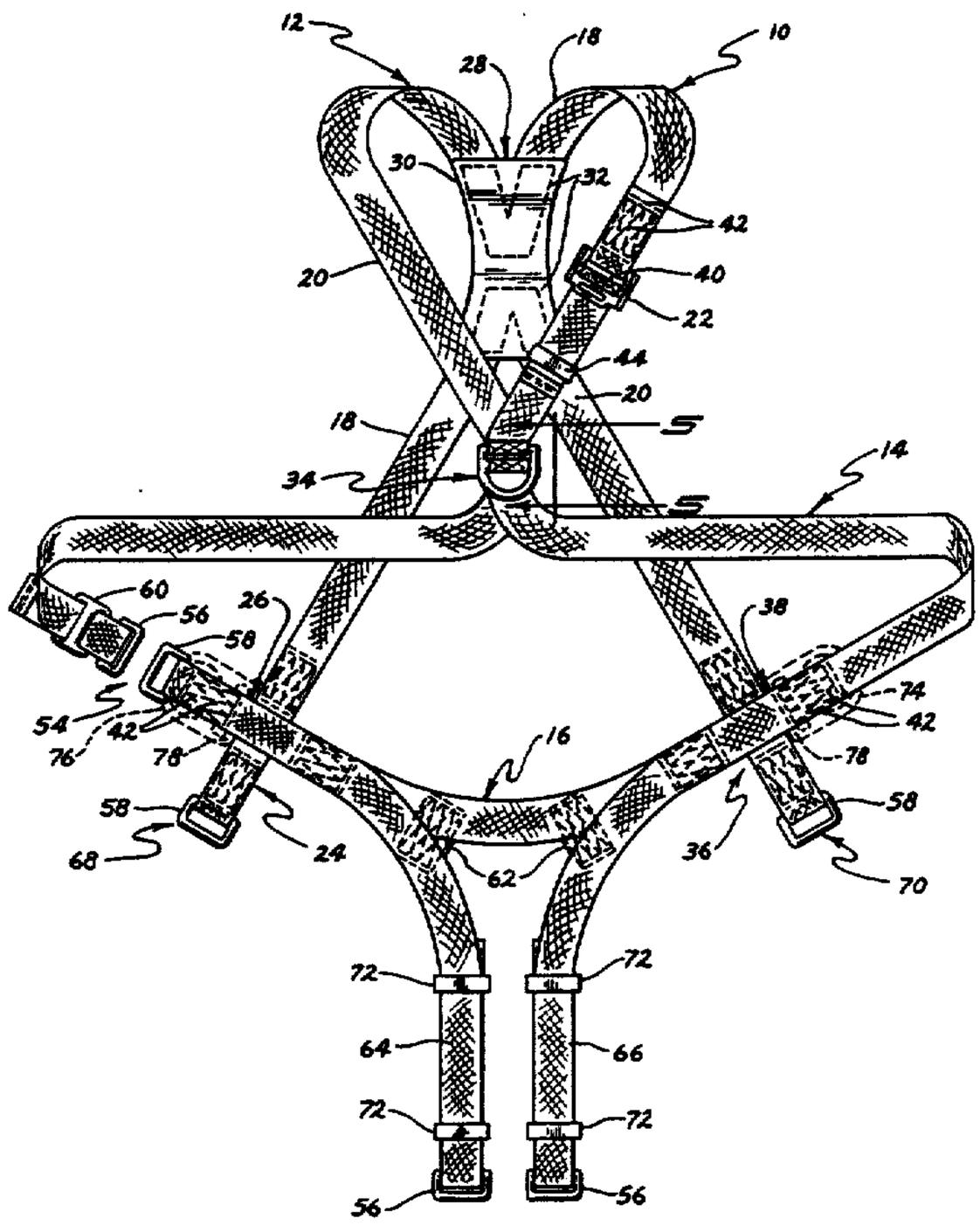
Primary Examiner—Robert P. Swiatek
Attorney, Agent, or Firm—Moore & Hansen

[57] **ABSTRACT**

The safety harness includes a shoulder strap, a waist strap and a seat strap. The seat strap includes end portions that wrap around the upper portions of the right and left legs, respectively. The shoulder strap is effectively continuous, having one break where the first and second shoulder strap portions are buckled to each other. The shoulder strap buckle is also the location for adjusting the effective length of the shoulder strap to fit the person's torso. The waist strap includes a buckle location where the safety harness is fastened to the person wearing it, the waist strap buckle permitting easy donning of the safety harness.

41 Claims, 4 Drawing Sheets



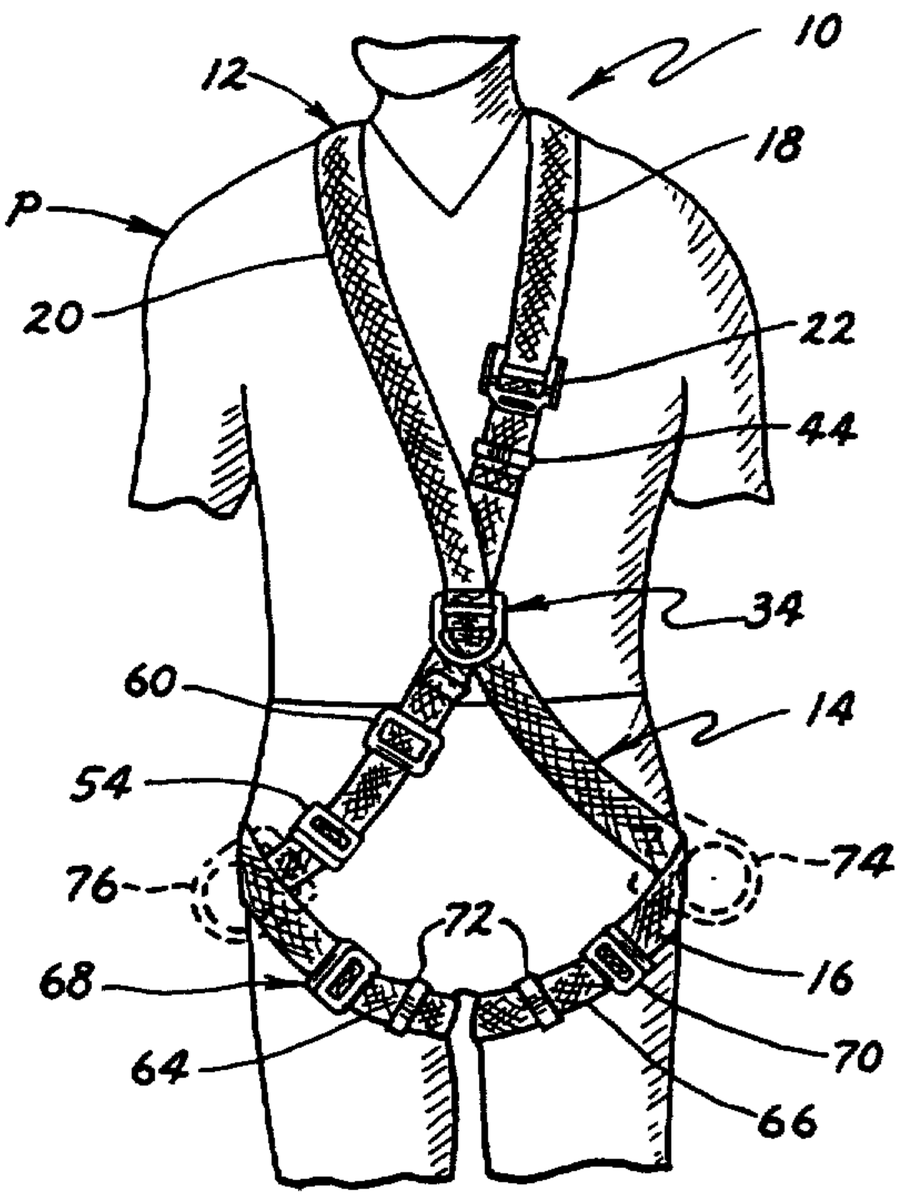


FIG. 1

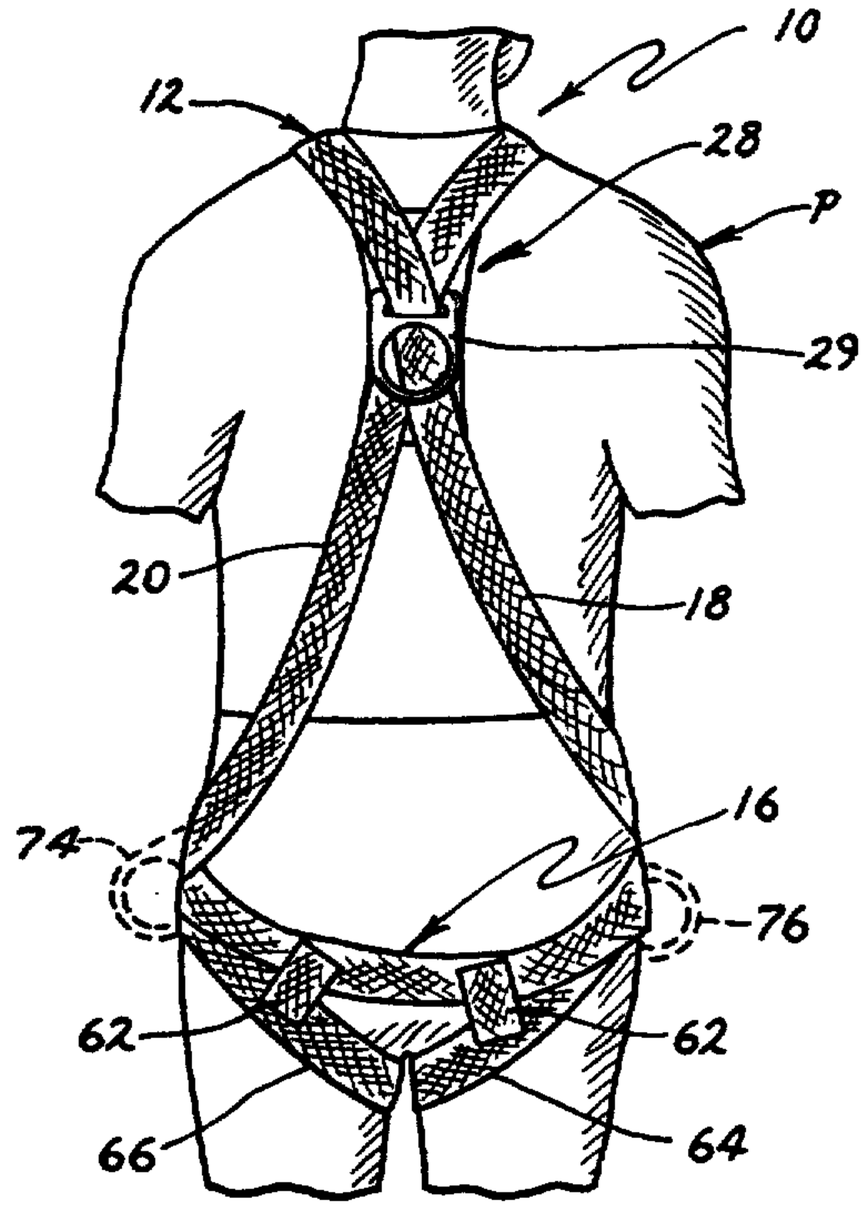


FIG. 2

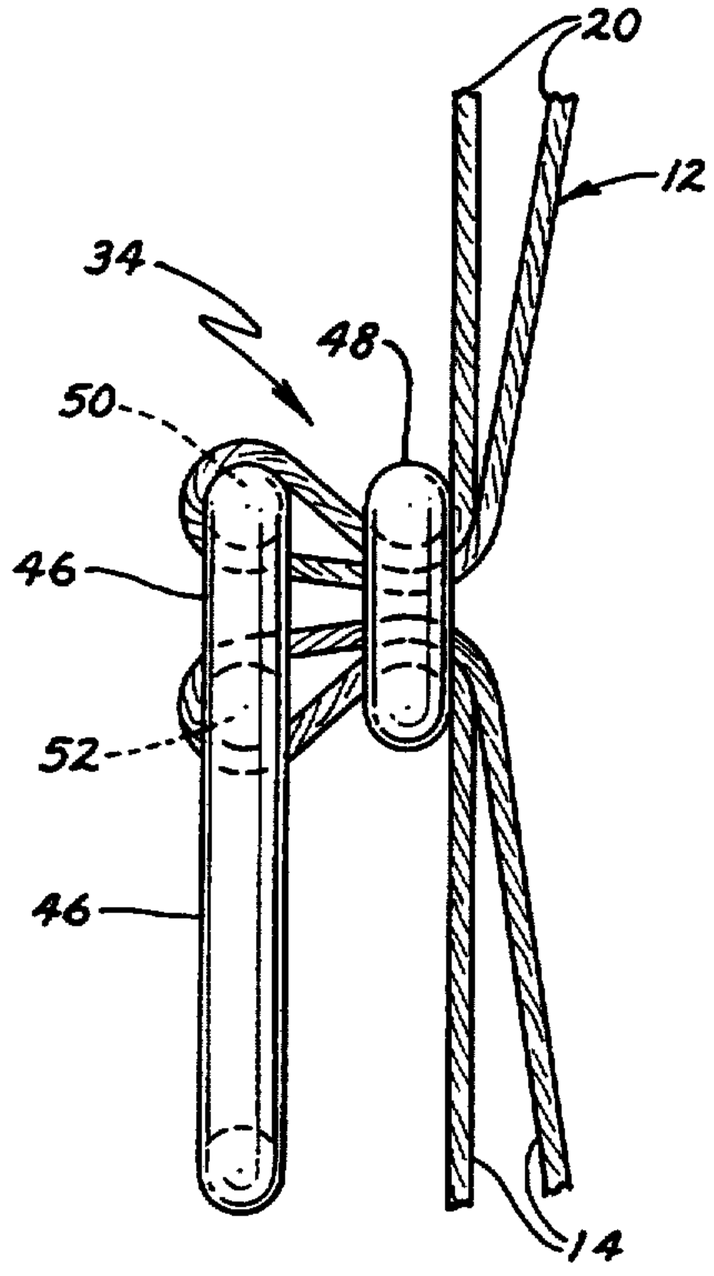


FIG. 5

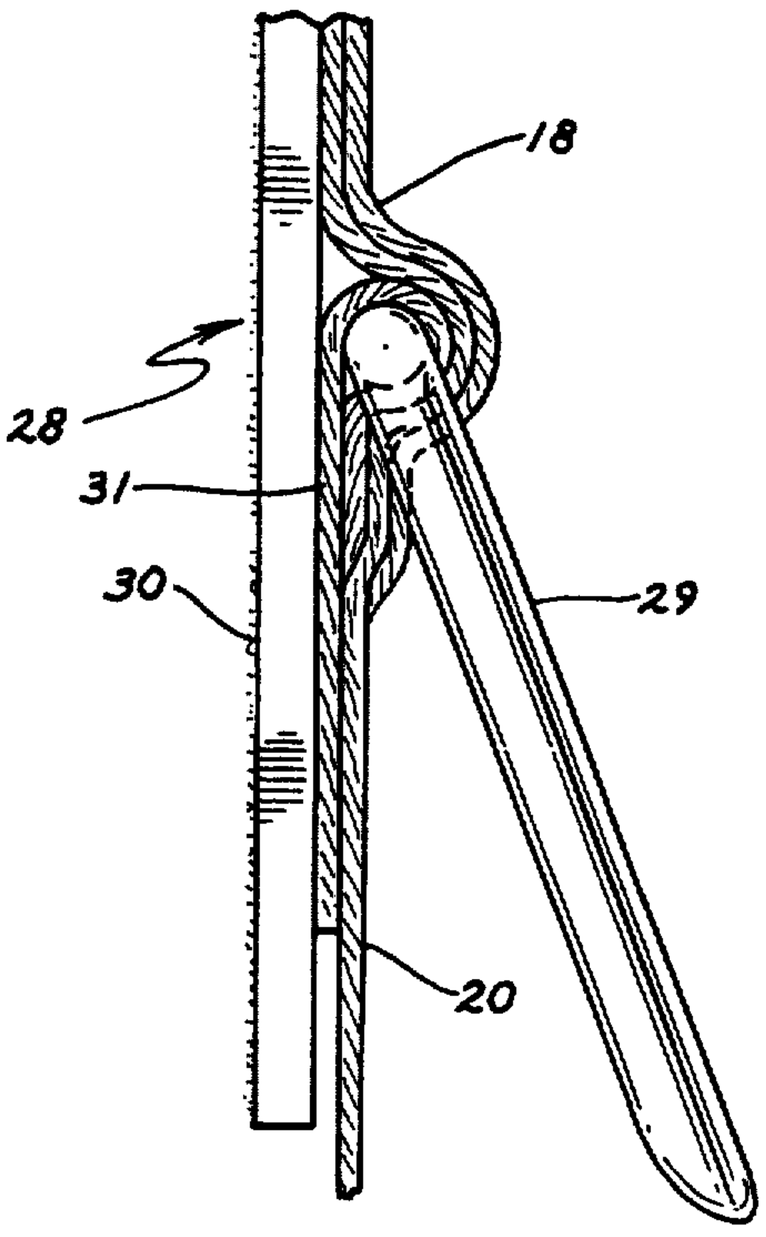
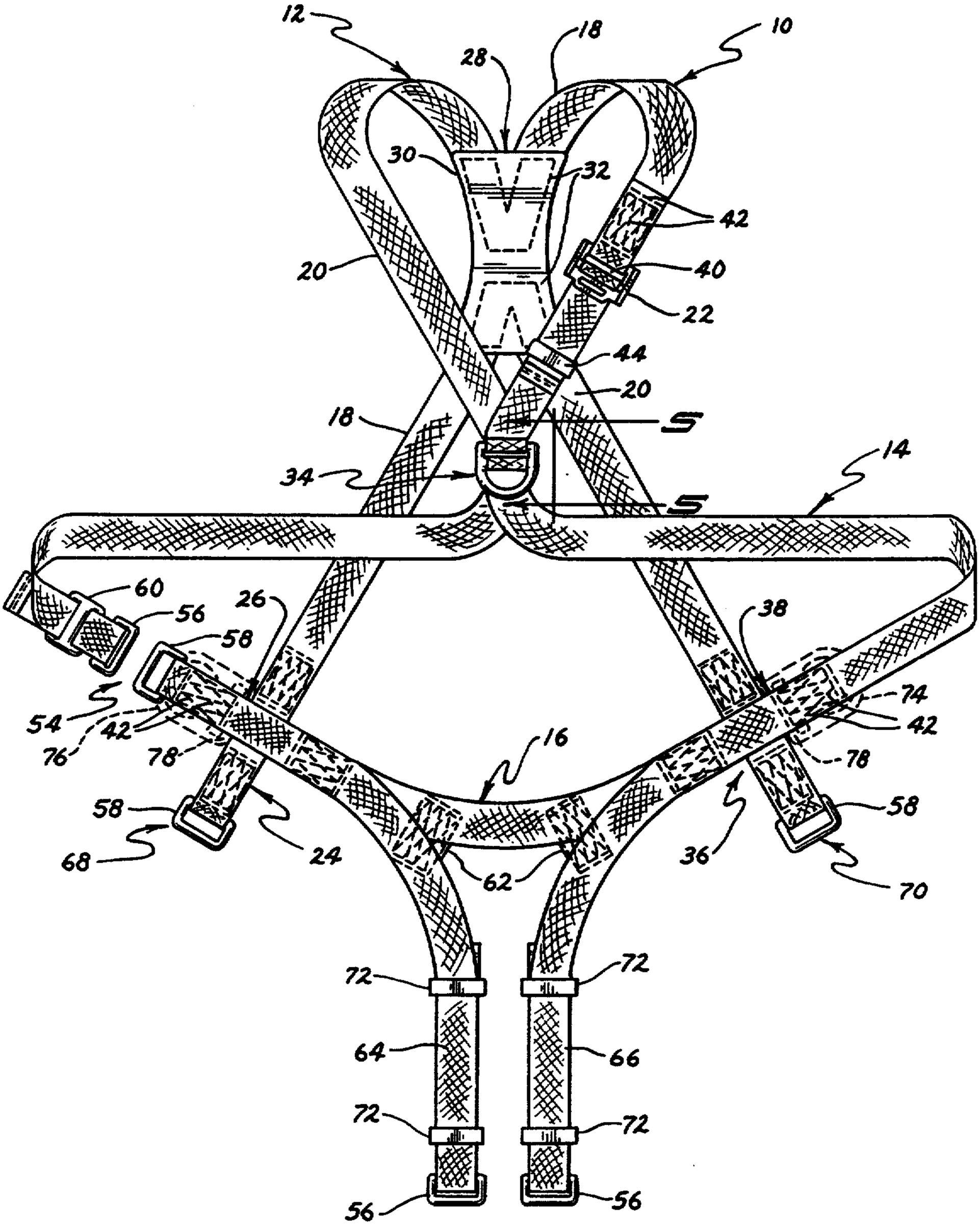


FIG. 6


12
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44
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18
S
34
S
14
60
56
58
26
38
54
42
76
78
74
42
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68
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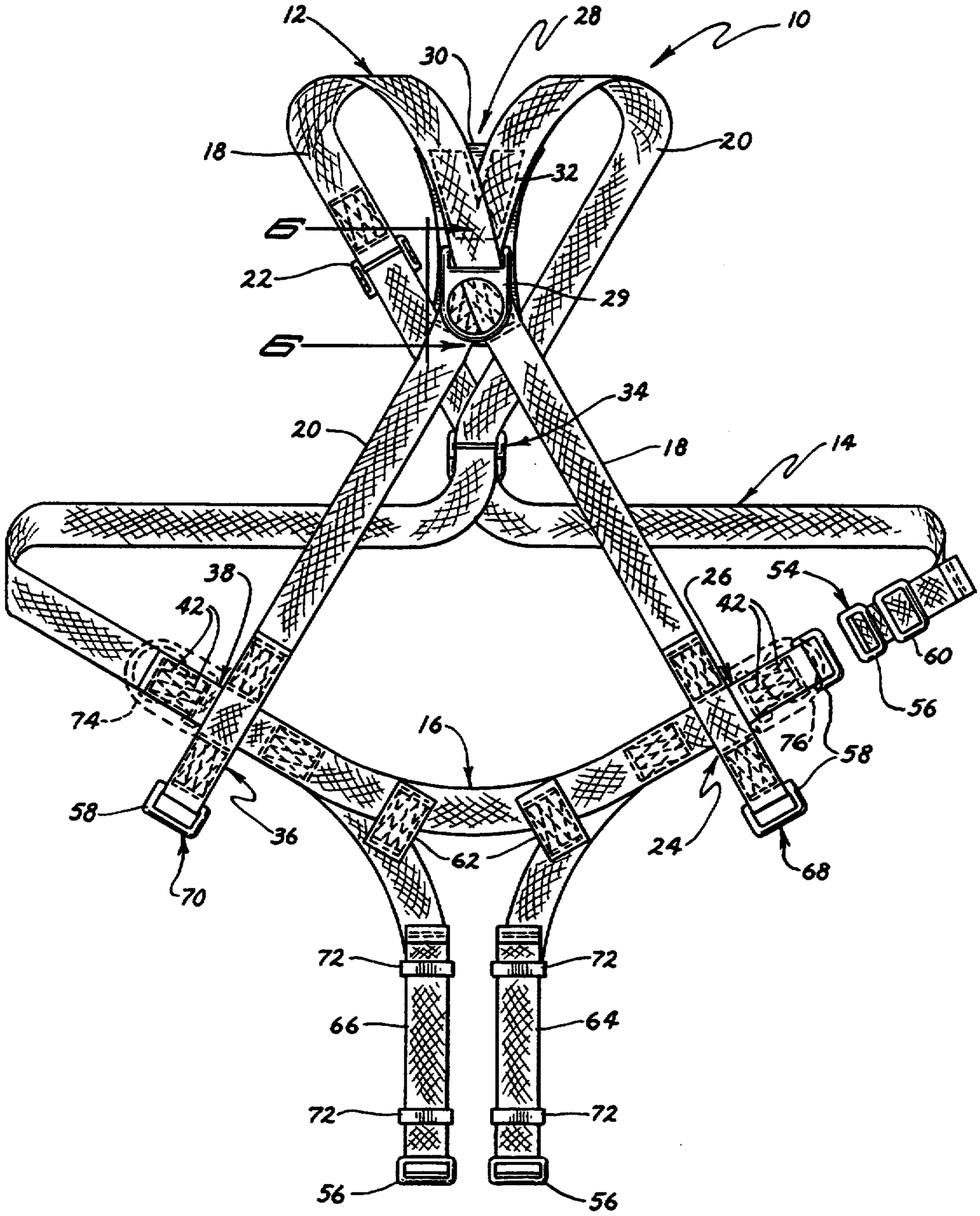
FIG. 3


12
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74
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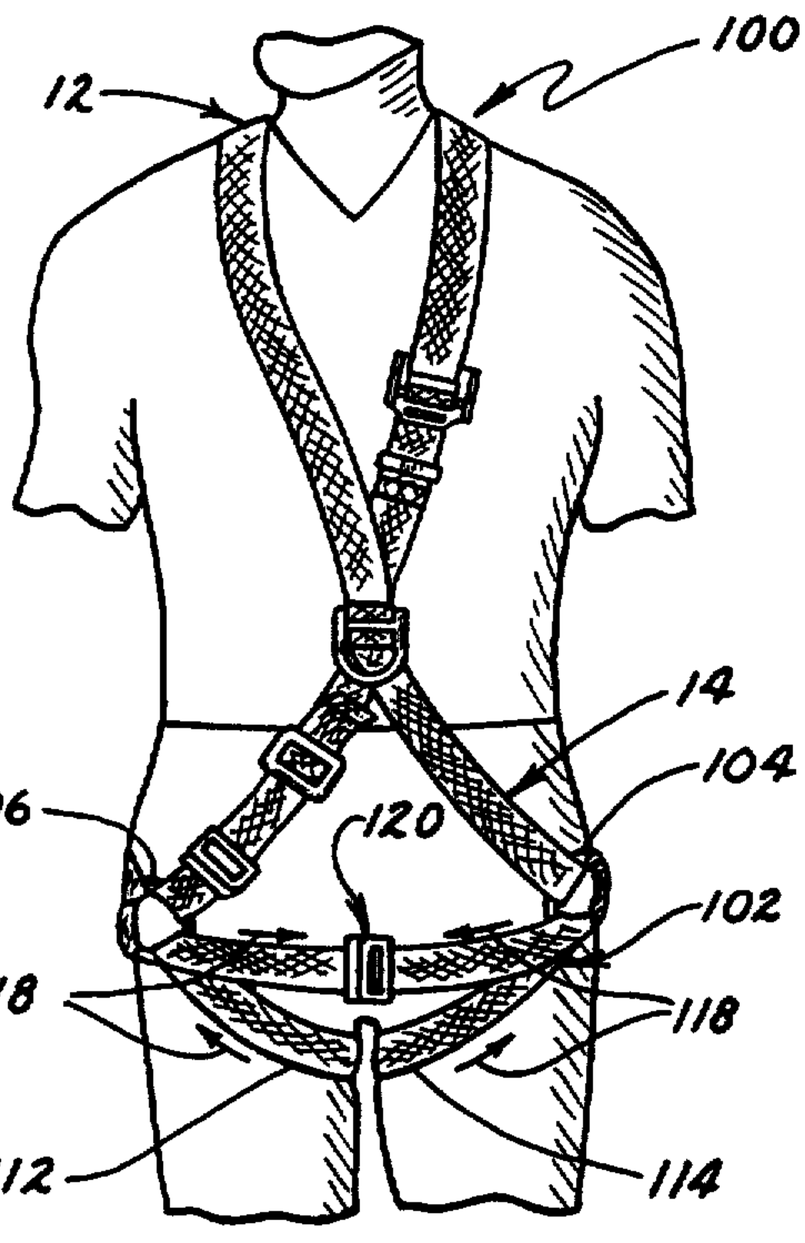
56
56

FIG. 4


12
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14
104
106
120
102
118
118
112
114

FIG. 7

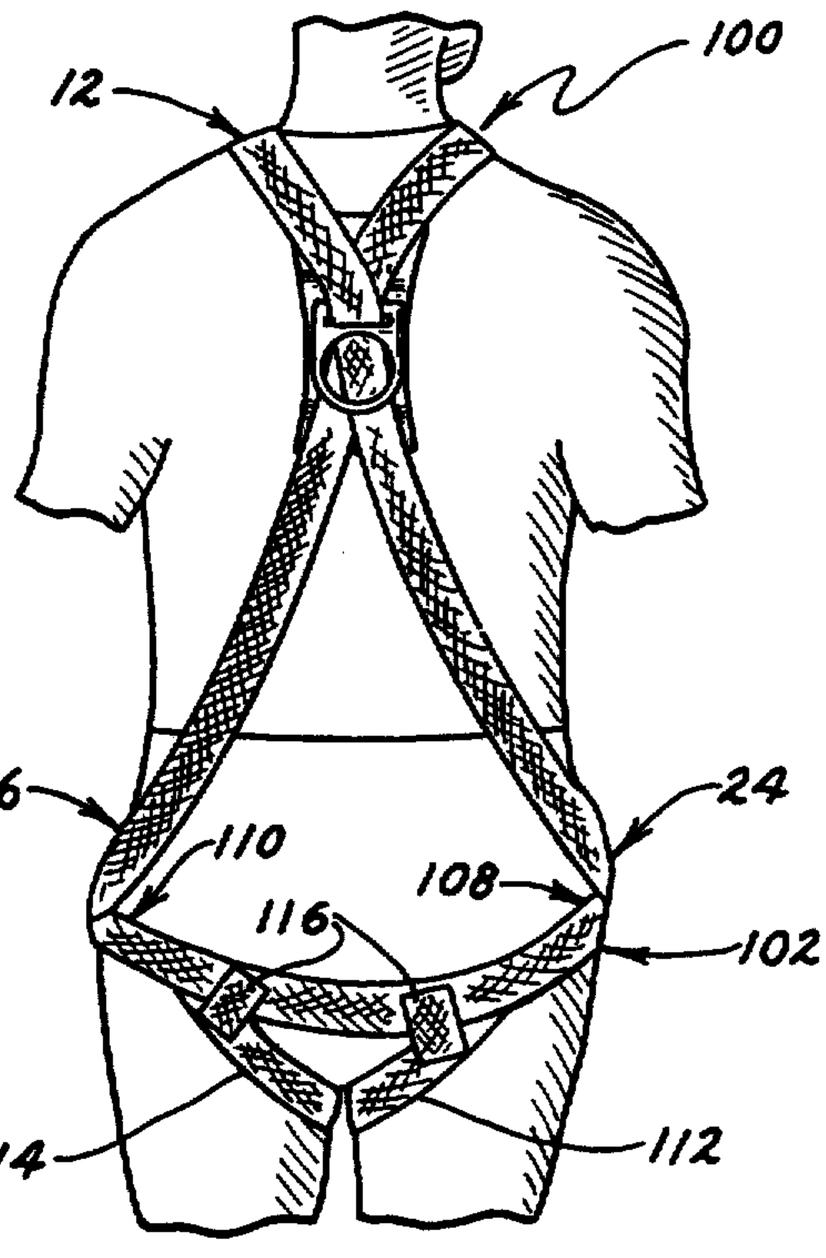
12
100
36
110
24
108
116
102
114
112

FIG. 8

SAFETY HARNESS WITH ADJUSTABLE FRONT D-RING

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue.

BACKGROUND OF THE INVENTION

1. Technical Field

The present invention relates generally to harnesses worn by humans, particularly those harnesses worn for safety purposes that may be connected as by a rope or cable to a building or other structure for breaking the descent of humans falling from great heights, and also those harnesses worn with parachutes.

2. Background Information

Safety harnesses of the type presently disclosed have been long known and commonly used, as, for example, by aviators, construction workers, mountain climbers, and even parents who wish to prevent their infants from escaping a baby carriage. Harnesses of this type generally include several straps that wrap around the torso of the person wearing the harness. These straps must be of adjustable length to conform to the bodies of different sized persons, but the process is frequently painstaking, the adjustment of one strap frequently necessitating the readjustment of one or several others.

Further, the process of donning the safety harness has often been at best confusing, and at worst quite difficult, especially for those who wear such a safety harness only infrequently. These harnesses frequently must be stepped into or pulled down over the head. The multiplicity of straps and buckles, each of which is designed to be positioned in a particular place and in a particular sequence, may be daunting, and may require some difficult physical maneuvers to ensure that they are properly positioned and fastened. Further, such harnesses are frequently uncomfortable to wear, or may inhibit the movements of the person wearing them. Sometimes this may lead to a person such as a worker in a dangerous position failing to wear the safety harness because they feel it is too great a hindrance to the performance of their duties.

Such harnesses that include a front lanyard ring for fastening a position-maintaining device such as a rope or cable frequently result in the front lanyard ring being positioned very high on the torso of the person wearing the harness, sometimes causing injury to the head of that person if they should fall. Prior art devices that illustrate this problem include U.S. Pat. No. 4,197,816, issued to Lusch on Apr. 15, 1980. This harness, which may be worn about either the upper or lower portion of the torso, may shift to a position very high on the chest and shoulders of the person wearing it when suspended by a rope or cable from the front lanyard ring, and could thereby result in harm or injury to that person. This may be true even when the straps of the harness are properly adjusted to the person wearing it.

U.S. Pat. No. 3,424,134, issued to Rosenblum on Jan. 28, 1969, discloses the common arrangement of a fixed lanyard mounting ring at the rear intersection of the shoulder straps of the harness. Also disclosed is a belt-mounted front ring to which may be attached a lanyard snap fastener or other fastening device. However, the vertical position of the front ring may not be adjusted with respect to the torso. The shoulder straps of the

harness must be adjusted in two places to conform its shape to that of the torso of the person wearing the harness. To put on the harness, a person must first step into and through the two leg loops before putting their arms through the openings defined by the shoulder straps.

Another harness of this type is disclosed in U.S. Pat. No. 4,712,513, issued to Huppertsberg on Dec. 15, 1987. This reference discloses the use of a single, discontinuous shoulder strap that permits adjustment at the point of the discontinuity, allowing adjustment of the entire torso portion of the harness. However, Huppertsberg teaches a harness with shoulder straps extending vertically from the hips to the shoulders of the person wearing the harness. When the person rotates or bends to the side, these vertical portions may bind or restrict the person's freedom of motion. Further, this reference does not allow for adjustment of the vertical position of the front lanyard ring, as the front ring is maintained in position by a transverse chest strap sewn to the opposing shoulder portions of the shoulder strap. Also, the position of the front ring is high on the torso of the person wearing the harness, subjecting that person to the possibility of being struck or injured on or about the head by the balancing device to which the front ring may be attached, in the event the person should lose their balance and fall.

The safety harness of the present invention overcomes the difficulties described above and affords other features and advantages heretofore not available.

SUMMARY OF THE INVENTION

The safety harness disclosed herein is of extremely simple construction and yet highly effective design. The harness includes a shoulder strap, a waist strap and a seat strap. The seat strap includes end portions that wrap around the upper portions of the right and left legs, respectively. The shoulder strap is effectively continuous, having one break where the first and second shoulder strap portions are buckled to each other. This buckle location is the location for adjusting the effective length of the shoulder strap to fit the person's torso.

It is preferred that the front lanyard mounting ring be positioned near the stomach area of the person wearing the harness, somewhat above the person's waist. The primary use of the front lanyard mounting ring is for work positioning, such as to stabilize the person wearing the harness by connecting the front ring to a cable or other fixed structure as by a carabiner. A person also may be suspended from the front ring, although the design of the harness renders the rear lanyard ring more suitable for fall protection.

Three buckles are required for fully donning the safety harness. The first is part of the waist strap. The other two are for the portions of the seat strap that wrap around the right and left legs, respectively. Each of the three buckles is a pass through buckle having a male portion and a female portion. The buckles are easy to use yet secure when fastened.

It is an object of this invention to provide a safe, secure safety harness that is easy to don, comfortable to wear and easily manufactured. The buckle on the waist strap is the main buckle for donning the safety harness. Its convenient location makes the safety harness easier to don. It is a further object of this invention to provide a safety harness having an adjustable front lanyard mounting ring for work positioning that may be effec-

tively positioned by the person wearing the harness in a location that is functional yet unlikely to cause injury in the event of a fall or loss of balance.

It is a further object of this invention to provide a safety harness that takes advantage of the natural tendency of webbing to drape over the object on which it is positioned. In so doing, the harness remains in a proper and effective position for protecting the person wearing it without the need for additional straps or buckles, which can add weight to the safety harness and make it more difficult to don. Similarly, it is also an object of this invention to provide a safety strap having shoulder strap portions that do not tend to slide over and off of the shoulder of the wearer when that person bends to the side. Rather, the centrally connected shoulder and waist straps cause the shoulder strap going over the lowered shoulder to be retained in position by the portion of the waist strap on the opposite side of the worker.

Another object of the invention is the improved weight distribution of a load such as a tool pouch fastened to the safety harness. In common use, a load will sometimes be attached as by a carabiner to the hip region of the safety harness to keep tools accessible to the worker wearing the safety harness. Rather than putting most of the load from the tool pouch on the shoulder of the worker on the side where the pouch is located, the present invention distributes the load over both shoulders, tending to lessen the fatigue experienced by the worker.

Other objects and advantages of the invention will become apparent from the following detailed description and from the appended drawings in which like numbers have been used to describe like parts throughout the several views.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a front elevation of the safety harness in normal use;

FIG. **2** is a rear elevation of the safety harness in normal use;

FIG. **3** is a front elevation of a disassembled safety harness ready to be donned for use;

FIG. **4** is a rear elevation of a disassembled safety harness ready to be donned for use;

FIG. **5** is a section view taken along line **5**—**5** of FIG. **3**;

FIG. **6** is a section view taken along line **6**—**6** of FIG. **4**;

FIG. **7** is a front elevation of an alternative embodiment of the safety harness in normal use; and

FIG. **8** is a rear elevation of the alternative embodiment of the safety harness illustrated in FIG. **7** in normal use.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to the drawings, and in particular to FIG. **3**, the safety harness is generally indicated by reference numeral **10**. Safety harness **10** includes shoulder strap **12**, waist strap **14** and seat strap **16**. In the preferred embodiment, the effective length of each of these straps may be adjusted by the person P wearing safety harness **10**, although safety harness **10** may be fabricated with straps having a fixed length. Shoulder strap **12** includes first strap segment **18** and second strap segment **20**.

As illustrated in FIGS. **1** and **2**, first strap segment **18** passes over the left shoulder of the person P wearing safety harness **10**, while second strap segment **20** passes over the person's right shoulder. As illustrated in FIGS. **1** and **3**, first strap segment **18** and second strap segment **20** of shoulder strap **12** are joined by shoulder strap adjuster **22**. As best shown in FIGS. **3** and **4**, shoulder strap **12** includes a first end region **24** that intersects and interlaces with the folds of a first intermediate portion **26** of seat strap **16**. First end region **24** of shoulder strap **12** coincides with the first end of first strap segment **18**. First strap segment **18** then intersects and crosses over second strap segment **20** at rear suspension assembly **28**, which includes a harness back pad **30** (FIG. **6**), preferably made of leather, to which first strap segment **18** and second strap segment **20** are both attached as by stitching **32**. Also attached to back pad **30** of rear suspension assembly **28** is a rear lanyard mounting ring in the form of D-ring **29**. D-ring **29** is fastened to back pad **30** as by attachment webbing **31** (FIG. **6**). First strap segment **18** then continues to shoulder strap adjuster **22**, as shown in FIG. **3**, where it joins second strap segment **20**. Second strap segment **20** then passes through front slide assembly **34** (FIG. **5**) before turning back on itself at an angle of not greater than approximately 90 degrees. Shoulder strap **12** then continues back to rear suspension assembly **28**, where second strap segment **20** intersects first strap segment **18**, and terminates at second end region **36**, which coincides with the second end of second strap segment **20**. Second end region **36** of shoulder strap **12** intersects and interlaces with the folds of a second intermediate portion **38** of seat strap **16**.

As discussed above, it is preferred that first strap segment **18** and second strap segment **20** are attached to back pad **30** of rear suspension assembly **28** as by stitching **32**, thereby securing rear suspension assembly **28** in a fixed location. However, the position of rear suspension assembly **28** may also be adjustable, although it is important that the range of motion of rear suspension assembly **28** be limited to prevent it from moving too close to the head of person P. This is because in the event of a fall, if rear suspension assembly **28** were able to move too far upward toward the head of person P, the person's neck could be pinched between rear suspension assembly **28** and front slide assembly **34**, resulting in injury to the person P.

The fabric used for shoulder strap **12**, waist strap **14**, seat strap **16** and attachment webbing **31** is preferably a polyester webbing, approximately $1\frac{3}{4}$ inches wide. First strap segment **18** of shoulder strap **12** is approximately $56\frac{3}{4}$ inches long, and second strap segment **20** of shoulder strap **12** is approximately $85\frac{3}{4}$ inches long. Waist strap **14** is approximately 35 inches long, and seat strap **16** is approximately 123 inches long. Attachment webbing **31** is approximately eight inches long. For purposes of identifying the various straps when donning the safety harness **10**, it is preferred that shoulder strap **12** and waist strap **14** be made of yellow polyester webbing, while seat strap **16** be made of black webbing, although any contrasting colors permitting easy identification of the various straps is sufficient.

As noted, the second end of first strap segment **18** joins the first end of second strap segment **20** at shoulder strap adjuster **22**. The effective length of shoulder strap **12** may be changed by altering the length of second strap segment **20** using shoulder strap adjuster **22**. The shoulder strap adjuster. **22** illustrated in FIG. **3** is of a conventional design, although any such device may be

used that facilitates the simple, secure adjustment of the length of a harness strap. The second end of first strap segment **18** passes through an opening **40** in adjuster **22**, then wraps around a first spanning member (not shown) before folding back on itself, where it is fixedly positioned as by stitching **42**. (As shall be seen, stitching **42** is frequently relied on for retaining segments of safety harness **10** in position, It is preferred that where such stitching is called for, there should typically be approximately five to seven stitches per inch.) The first end of second strap segment **20** passes through opening **40** in adjuster **22**, then wraps around a second spanning member (not shown) before folding back on itself, where it is kept in position by a plastic loop keeper **44**.

As noted, after adjustably fastening to adjuster **22**, second strap segment **20** of shoulder strap **12** passes through front slide assembly **34** before partially folding back on itself and passing over the right shoulder of the person P wearing safety harness **10**. Also passing through front slide assembly **34**, which may be repositioned with respect to the torso of the person P wearing safety harness **10**, is waist strap **14**. As illustrated in FIG. **5**, front slide assembly **34** includes D-ring **46** and generally rectangular adjuster link **48**. Second strap segment **20** of shoulder strap **12** loops around first cross piece **50** of D-ring **46** after passing through the opening formed by adjuster link **48**. Similarly, waist strap **14** loops around second cross piece **52** of D-ring **46** after passing through the opening formed by adjuster link **48**. To adjust the vertical position of front slide assembly **34**, adjuster link **48** is loosened by sliding it away from D-ring **46** along second strap segment **20** and waist strap **14**. Second strap segment **20** and waist strap **14** may then be repositioned about first cross piece **50** and second cross piece **52**, respectively, until D-ring **46** is in the desired location. Finally, adjuster link **48** is slid toward D-ring **46** and snugged up to it, causing front slide assembly **34**, including D-ring **46**, to maintain securely a constant relative position on the person P wearing safety harness **10**.

As illustrated in FIGS. **3** and **4**, waist strap **14** fastens on its first end to an intermediate region of seat strap **16** adjacent second intermediate portion **38** as by stitching **42**. The second end of waist strap **14** releasably fastens to an intermediate region of seat strap **16** adjacent first intermediate portion **26** as by first pass through buckle **54**. First pass through buckle **54**, as do other such buckles included on safety harness **10**, includes a male, insertable portion **56** and a female, receiving portion **58**. The second end of waist strap **14**, to which insertable portion **56** of first pass through buckle **54** is attached, includes means for adjusting the effective length of waist strap **14**. Means for adjusting the length of waist strap **14** includes a waist strap adjuster **60** that permits the secure length adjustment of waist strap **14**. When adjusting the effective length of waist strap **14**, the position of front slide assembly **34** may easily be relocated by following the procedure described above for adjusting the vertical position of front slide assembly **34**. After loosening adjuster link **48** (FIG. **5**), waist strap **14** may be repositioned about second cross piece **52** of D-ring **46** until front slide assembly **34** is appropriately centered on the front of the torso of the person P wearing safety harness **10**. As described, adjuster link **48** is then snugged up to D-ring **46**, securely maintaining front slide assembly **34** in an appropriate position.

As discussed; seat strap **16** includes first and second intermediate portions **26**, **38**, respectively. As may be seen in FIGS. **3** and **4**, seat strap **16** folds back on itself in the areas of first and second intermediate portions **26**, **38**, respectively, where seat strap **16** connects with waist strap **14**. Stitching **42** is indicated on areas of first intermediate portion **26** of seat strap **16** on either side of its intersection with first end region **24** of shoulder strap **12**. Similarly, stitching **42** is indicated on areas of second intermediate portion **38** of seat strap **16** on either side of its intersection with second end region **36** of shoulder strap **12**. Likewise, stitching **42** is indicated on portions of first end region **24** of shoulder strap **12** on either side of its intersection with first intermediate portion **26** of seat strap **16**. And stitching **42** is indicated on portions of second end region **36** of shoulder strap **12** on either side of its intersection with second intermediate portion **38** of seat strap **16**. Each of these pairs of stitching **42** indicate locations where portions of shoulder strap **12** or seat strap **16**, respectively, have been folded back upon themselves. Thus, between each pair of stitching **42** there exists a double layer region of the respective strap. These double layer regions are interlaced before completing the stitching process to provide secure, permanent locations for fixed attachment of the respective straps one to another. Since shoulder strap **12** and seat strap **16** are not sewn directly to each other, the force on the intersections of shoulder strap **12** and seat strap **16** of a sudden jolt caused by a falling body reaching the end of a safety line fastened to rear suspension assembly **28** is spread out over eight sets of stitching **42**, rather than only two, greatly reducing the likelihood that any stitches might separate, which could result in the failure of safety harness **10**.

Spacing tabs **62** are stitched to portions of seat strap **16** to ensure the proper location of the right and left leg portions **64**, **66**, respectively, of seat strap **16** that wrap around the legs of the person P wearing safety harness **10**, as illustrated in FIGS. **1** and **2**. Right and left leg portions **64**, **66** comprise the first and second end regions of seat strap **16**, although separate straps may be employed to replace right and left leg portions **64**, **66**, the separate straps being appropriately fastened to seat strap **16** as by stitching. Spacing tabs **62** are made of the same polyester webbing as seat strap **16**, and are approximately $1\frac{3}{4}$ inches wide by three inches long.

At the ends of right and left leg portions **64**, **66**, respectively, are insertable portions **56** of second and third pass through buckles **68**, **70**, respectively. Male, insertable portions **56** connect to female, receiving portions **58** of second and third pass through buckles **68**, **70**, located on first and second end regions **24**, **36**, respectively, of shoulder strap **12**. As shown in FIG. **1**, second and third pass through buckles **68**, **70** are connected generally on the front of the legs of the person P wearing safety harness **10**. The effective length of right and left leg portions **64**, **66** may be adjusted by repositioning seat strap **16** between plastic keepers **72**, similar to loop keeper **44**. It must be emphasized that all three pass through buckles **54**, **68**, **70** be fastened when using safety harness **10** for the proper operation of the harness.

As illustrated in FIGS. **1**, **2** and **4**, left and right auxiliary D-rings **74**, **76**, drawn in phantom, also may be provided for work positioning, serving generally the same purpose as front D-ring **46**. Auxiliary D-rings **74**, **76** each include a crossbar **78** captured between the folds of first and second intermediate portions **26**, **38**, respectively, of seat strap **16**. Additionally, a fabric reinforcing segment (not shown) also may be sewn into

safety harness **10** in these regions to provide added strength and support.

To don safety harness **10**, the person P first puts their head between first strap segment **18** and second strap segment **20** of shoulder strap **12** from the left side. In so doing, rear suspension assembly **28** should be positioned on the back of person P, and front slide assembly **34** should be positioned near the stomach of person P. First pass through buckle **54** on waist strap **14** should then be fastened by passing insertable portion **56** through receiving portion **58**. Person P should then reach between their legs and grasp left leg portion **66** and fasten third pass through buckle **70**. Person P then reaches between their legs and grasps right leg portion **64** and fastens second pass through buckle **68**. Right and left leg portions **64**, **66** should then be adjusted snugly. Similarly, shoulder strap **12** should be adjusted snugly at shoulder strap adjuster **22**, and waist strap **14** also should be adjusted snugly at the insertable portion **56** of first pass through buckle **54**. The left and right sides of shoulder strap **12** should be adjusted to the same length, and front slide assembly **34** should be centered on the lower chest of person P.

With reference to FIGS. **7** and **8**, an alternative embodiment **100** of safety harness is illustrated that incorporates the shoulder strap **12** and the waist strap **14** of the main embodiment of safety harness **10**, but includes a different form of seat strap **102**. Alternative seat strap **102**, also known as a European style sub-pelvic support, includes left and right junction rings **104**, **106**. First and second end regions **24**, **36** of shoulder strap **12** are joined as by stitching to right and left junction rings **106**, **104**, respectively. Further, the first and second ends of waist strap **14** are also joined as by stitching to left and right junction rings **104**, **106**, respectively. Alternative seat strap **102** is fastened as by stitching at first and second intermediate regions **108**, **110** to right and left junction rings **106**, **104**, respectively. When seat strap **102** is so fastened to right and left junction rings **106**, **104**, right and left leg portions **112**, **114** hang downwardly from the rear portion of safety harness **100**. Spacing tabs **116** are stitched to portions of seat strap **102** to ensure the proper location of the right and left leg portions **112**, **114**, respectively, of seat strap **102** that wrap around the legs of the person P wearing safety harness **100**, as illustrated in FIGS. **7** and **8**.

To don safety harness **100**, the person P adjusts and fastens shoulder strap **12** and waist strap **14** in the same manner as described for the preferred embodiment of safety harness **10**, above. However, when adjusting and fastening seat strap **102**, person P first reaches between their legs and grasps left leg portion **116** and passes the end of it through left junction ring **104**, Then the end of right leg portion **112** is passed through right junction ring **106**. The ends of right and left leg portions **112**, **114** travel generally in the directions indicated by direction arrows **118** shown in FIG. **7** as seat strap **102** is being adjusted for a proper fit. The end of left leg portion **114** includes an adjustable buckle **120** through which the end of right leg portion **112** is passed to maintain seat strap **102** in a secure, restraining position, as shown in FIGS. **7** and **8**.

While the preferred embodiments of the invention have been described, it should be understood that various changes, adaptations, and modifications may be made therein without departing from the spirit of the invention and the scope of the appended claims.

What is claimed is:

1. A safety harness, comprising:

a shoulder strap having a first end region and a second end region;

a waist strap having a first end region and a second end region;

a front slide assembly, through which pass said shoulder strap and said waist strap;

a rear suspension assembly, engaging intersecting intermediate portions of said shoulder strap; and

an adjustable seat strap having first and second end regions and first and second intermediate portions, whereby said first and second end regions of said shoulder strap intersect and engage said first and second intermediate portions of said seat strap, respectively, said second end region of said waist strap is releasably attached to said first intermediate portion of said seat strap, said first end region of said waist strap engages said second intermediate portion of said seat strap, said first end region of said shoulder strap is releasably attached to said first end region of said seat strap, said second end region of said shoulder strap is releasably attached to said second end region of said seat strap, and said rear suspension assembly is maintained in a fixed position relative to said seat strap.

2. A safety harness as described in claim **1**, wherein:

said shoulder strap and said waist strap adjustably engage said front slide assembly, whereby said front slide assembly may be selectively positioned along the height of the front side of the torso of the person wearing the safety harness.

3. A safety harness as described in claim **1**, further comprising:

means for adjusting the effective length of said first and second end regions, respectively, of said seat strap.

4. A safety harness as described in claim **1**, wherein:

said front slide assembly includes means for attaching an item thereto.

5. A safety harness as described in claim **4**, wherein:

said means for attaching an item to said front slide assembly is a D-ring.

6. A safety harness as described in claim **1**, wherein:

said first and second end regions of said shoulder strap intersect and engage said first and second intermediate portions of said seat strap by means of interlacing folds in said respective regions of said shoulder strap and said seat strap.

7. A safety harness as described in claim **6**, further comprising:

strap retaining means for maintaining in position said interlacing folds of said first and second end regions of said shoulder strap and said first and second intermediate portions of said seat strap.

8. A safety harness as described in claim **7**, wherein:

said strap retaining means includes threads stitched through said folds in said straps.

9. A safety harness as described in claim **1**, further comprising:

means for adjusting the effective length of said shoulder strap.

10. A safety harness as described in claim **9**, wherein said shoulder strap further comprises:

a first strap segment having a first end and a second end; and

a second strap segment having a first end and a second end.

11. A safety harness as described in claim **10**, wherein:

said first end of said first strap segment coincides with said first end region of said shoulder strap and said second end of said second strap segment coincides with said second end region of said shoulder strap.

12. A safety harness as described in claim 11, said means for adjusting the effective length of said shoulder strap comprises:

a shoulder strap adjuster joining said first strap segment and said second strap segment.

13. A safety harness as described in claim 12, wherein:

said second end of said first strap segment is fixedly attached to said shoulder strap adjuster; and

said first end of said second strap segment slidably engages said shoulder strap adjuster.

14. A safety harness as described in claim 13, further comprising:

means for adjusting the effective length of said waist strap.

15. A safety harness as described in claim 1, further comprising:

means for adjusting the effective length of said waist strap.

16. A safety harness as described in claim 1, wherein:

said rear suspension assembly is fixedly attached to said intermediate portions of said shoulder strap.

17. A safety harness, comprising:

a shoulder strap having a first end region and a second end region;

a waist strap having a first end region, a second end region, a first strap segment including said first end region of said waist strap and a second strap segment including said second end region of said waist strap;

fastening means for releasably fastening said first strap segment and said second strap segment;

a front slide assembly, through which pass said shoulder strap and said waist strap;

a rear suspension assembly, engaging intersecting intermediate portions of said shoulder strap; and

an adjustable seat strap having first and second end regions and first and second intermediate portions, whereby said first and second end regions of said shoulder strap intersect and engage said first and second intermediate portions of said seat strap, respectively, said first end region of said waist strap engages said second intermediate portion of said seat strap, said second end region of said waist strap engages said first intermediate portion of said seat strap, said first end region of said shoulder strap is releasably attached to said first end region of said seat strap, said second end region of said shoulder strap is releasably attached to said second end region of said seat strap, and said rear suspension assembly is maintained in a fixed position relative to said seat strap.

18. A safety harness as described in claim 17, wherein:

said shoulder strap and said waist strap adjustably engage said front slide assembly, whereby said front slide assembly may be selectively positioned along the height of the front side of the torso of the person wearing the safety harness.

19. A safety harness as described in claim 17, further comprising:

means for adjusting the effective length of said first and second end regions, respectively, of said seat strap.

20. A safety harness as described in claim 17, wherein:

said front slide assembly includes means for attaching an item thereto.

21. A safety harness as described in claim 20, wherein:

said means for attaching an item to said front slide assembly is a D-ring.

22. A safety harness as described in claim 17, wherein:

said first and second end regions of said shoulder strap intersect and engage said first and second intermediate portions of said seat strap by means of interlacing folds in said respective regions of said shoulder strap and said seat strap.

23. A safety harness as described in claim 22, further comprising:

strap retaining means for maintaining in position said interlacing folds of said first and second end regions of said shoulder strap and said first and second intermediate portions of said seat strap.

24. A safety harness as described in claim 23, wherein:

said strap retaining means includes threads stitched through said folds in said straps,

25. A safety harness as described in claim 17, further comprising:

means for adjusting the effective length of said shoulder strap.

26. A safety harness as described in claim 25, wherein said shoulder strap further comprises:

a first strap segment having a first end and a second end; and

a second strap segment having a first end and a second end.

27. A safety harness as described in claim 26, wherein:

said first end of said first strap segment coincides with said first end region of said shoulder strap and said second end of said second strap segment coincides with said second end region of said shoulder strap.

28. A safety harness as described in claim 27, said means for adjusting the effective length of said shoulder strap comprises:

a shoulder strap adjuster joining said first strap segment and said second strap segment.

29. A safety harness as described in claim 28, wherein:

said second end of said first strap segment is fixedly attached to said shoulder strap adjuster; and

said first end of said second strap segment slidably engages said shoulder strap adjuster.

30. A safety harness as described in claim 29, further comprising:

means for adjusting the effective length of said waist strap.

31. A safety harness as described in claim 17, further comprising:

means for adjusting the effective length of said waist strap.

32. A safety harness as described in claim 17, wherein:

said rear suspension assembly is fixedly attached to said intermediate portions of said shoulder strap.

33. A safety harness, comprising:

a shoulder strap having a first end and a second end, said shoulder strap including a first strap segment and a second strap segment;

means for adjusting the effective length of said second strap segment;

a waist strap having a first end and a second end;

means for adjusting the effective length of said waist strap;

a front slide assembly, through which slidably pass in tangential, non-intersecting relation said second strap segment and said waist strap;

a rear suspension assembly, engaging in fixed, intersecting relation said first strap segment and said second strap segment;

a seat strap having first and second end regions and first and second intermediate portions, said first and second ends of said shoulder strap intersect and engage said first and second intermediate portions of said seat strap, respectively, said first intermediate portion of said seat strap being releasably engaged to said second end of said waist strap, said second intermediate portion of said seat strap being fixedly attached to said first end of said waist strap, said first end region of said seat strap being releasably engaged to said first end of said shoulder strap, and said second end region of said seat strap being releasably engaged to said second end of said shoulder strap;

means for adjusting the effective length of said first end region of said seat strap; and

means for adjusting the effective length of said second end region of said seat strap.

34. A safety harness, comprising:

a shoulder strap having a first end region and a second end region;

a waist strap segment having a first end region and a second end region;

a front slide assembly, through which pass said shoulder strap and said waist strap segment;

a rear suspension assembly, engaging intersecting intermediate portions of said shoulder strap; and

an adjustable seat strap having first and second end regions and first and second intermediate portions, and wherein said first and second end regions of said shoulder strap intersect and engage said first and second intermediate portions of said seat strap, respectively, said second end region of said waist strap segment is releasably attached to said first intermediate portion of said seat strap, said first end region of said waist strap segment engages said second intermediate portion of said seat strap, said first end region of said shoulder strap is releasably attached to said first end region of said seat strap, and said second end region of said shoulder strap is releasably attached to said second end region of said seat strap.

35. A safety harness as described in claim 34, wherein: said waist strap segment is a separate strap.

36. A safety harness, comprising:

a shoulder strap having a first end and a second end, said shoulder strap including a first strap segment and a second strap segment;

a waist strap having a first end and a second end;

a front slide assembly, through which slidably pass in tangential, non-intersecting relation said second strap segment and said waist strap;

a rear suspension assembly engaging in intersecting relation said first strap segment and said second strap segment; and

a seat strap having first and second end regions and first and second intermediate portions, said first and second ends of said shoulder strap intersect and engage said first and second intermediate portions of said seat strap, respectively, said first intermediate portion of said seat strap being releasably engaged to said second end of said waist strap, said second intermediate portion of said seat strap being fixedly attached to said first end of said waist strap, said first end region of said seat strap being releasably engaged to said first end of said shoulder strap, and said second end region of said seat strap being releasably engaged to said second end of said shoulder strap.

37. A safety harness as described in claim 36, further comprising:

means for limiting the range of movement of said rear suspension assembly, whereby said rear suspension assembly is restrained from moving toward the neck of the person wearing the safety harness.

38. A safety harness as described in claim 36, further comprising:

means for adjusting the effective length of said second strap segment.

39. A safety harness as described in claim 36, further comprising:

means for adjusting the effective length of said waist strap.

40. A safety harness as described in claim 36, further comprising:

means for adjusting the effective length of said first end region of said seat strap.

41. A safety harness as described in claim 36, further comprising:

means for adjusting the effective length of said second end region of said seat strap.

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