May 19, 1959 H. J. MORAN 2,887,286

PARACHUTE HARNESS AND GARMENTS INCORPORATING SAME

Filed June 13, 1955

Fig. 1.

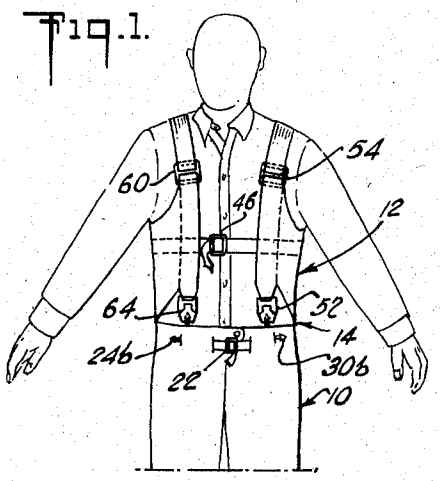


Fig. 2.

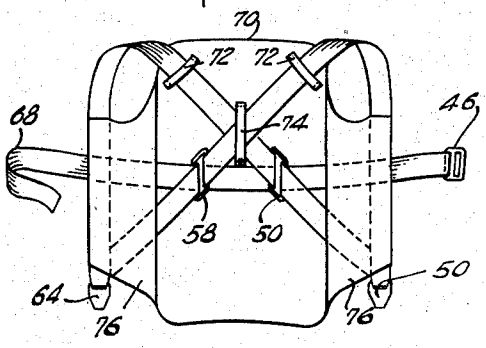


Fig. 3.

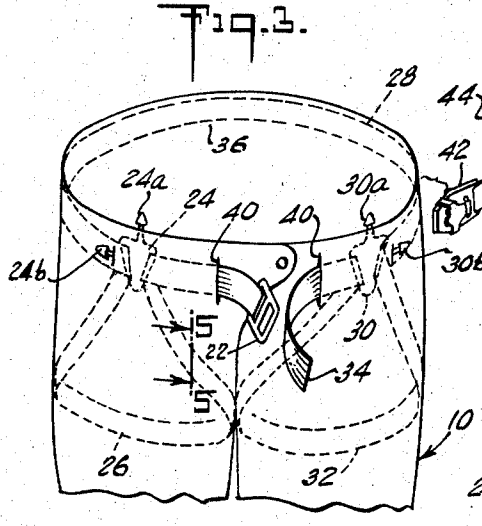


Fig. 4.

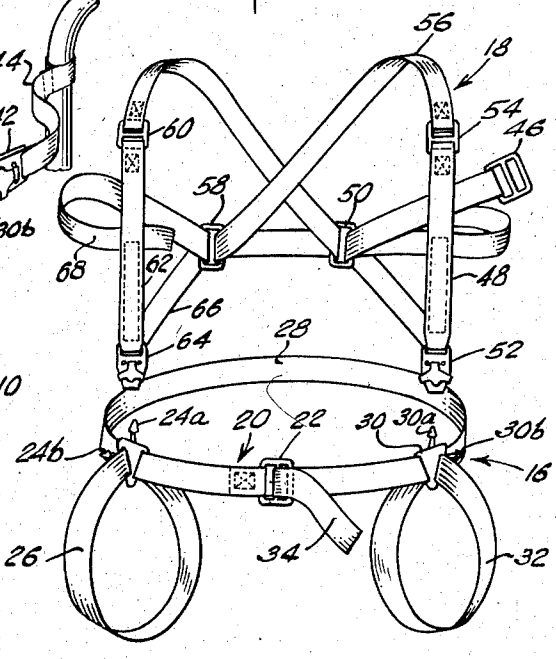
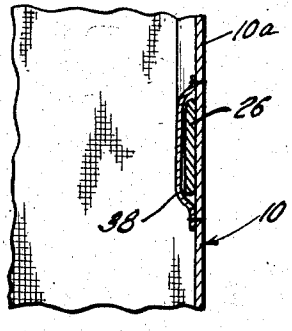


Fig. 5.



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PARACHUTE HARNESS AND GARMENTS INCORPORATING SAME

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7 Claims. (Cl. 244—143)

This invention relates to parachute harnesses and to flying garments incorporating such harnesses, and more particularly concerns an improved harness which is divided into a plurality of portions which the wearer may put on separately and attach to each other to form a unitary harness.

The harness which is shown and described herein is divided into two portions: a lower portion which may be incorporated in the trousers of a flying suit, and an upper portion which may be incorporated in a flying jacket of either the vest or full coat type. The straps which form the harness are supported in proper position by the trousers and jacket so that even inexperienced personnel can readily put on the harness properly without fumbling or mistake. The straps of the harness are so arranged that they are slidable with respect to the trousers and jacket so that the harness may readily be adjusted to fit the wearer. The harness is simple in its construction and may be economically fabricated. It is nonetheless so constructed that it affords the desired degree of safety, while being comfortable to wear and permitting the necessary freedom of movement. When the parachute is opened, the harness distributes the lifting force over the wearer's body in such a way as to minimize the opening shock and supports him comfortably in an upright position during descent.

These advantages, which constitute the objects of the invention, are accomplished by the harness described hereinafter and shown in the accompanying drawings in which:

Figure 1 is a partial front view of a man wearing a two-piece flight suit incorporating a harness embodying features of the present invention;

Figure 2 is an inside view of the jacket or vest of the flying suit shown in Figure 1, with the position of the upper harness portion indicated by broken lines;

Figure 3 is a view of the upper portion of the trousers of the flying suit shown in Figure 1 with the position of the lower harness portion indicated in broken lines;

Figure 4 is a view of the harness of the flying suit of Figure 1 shown removed from the trousers and jacket; and

Figure 5 is a sectional view taken on the line 5—5 of Figure 3.

In Figure 1, a parachute harness embodying features of the present invention is shown incorporated in a two-piece flying suit having trousers generally indicated **10** and a sleeveless jacket or vest generally indicated **12**. These two garments adjoin each other at the waistline **14** of the wearer to form a complete flying suit of more or less conventional exterior appearance.

The trousers **10** contain the lower part of a parachute harness and the jacket **12** contains the upper part of this harness, and when both the trousers **10** and the jacket **12** are worn, the upper and lower harness portions may be secured together at the waistline **14** of the wearer to form a unitary harness.

Figure 4 shows the lower harness portion **16** and the upper harness **18** in the approximate relative positions which they occupy when worn, but with these two portions detached and slightly separated from each other. As may be seen in this figure, the lower harness portion **16** is formed of a continuous strap which is formed of a woven webbing of nylon or other suitable material. This strap may be traced from the point **20**, at which it is looped around one of the bars of a three-bar buckle **22** and securely sewn. From this point, the strap extends along the waistline of the wearer to a triangular metal fitting **24** which is positioned approximately in line above his right front leg. The strap extends slidably through an oblique slot in the fitting **24** and downwardly and around to form a leg loop **26** adapted to encircle the upper portion of the wearer's leg, and back to the fitting **24** and slidably through another oblique slot therein.

The strap continues along the waistline of the wearer around his sides and back to form the major portion of a waist loop **28**. The strap then extends slidably through a slot in another triangular fitting **30** which is positioned so as to lie approximately in line above the front of the wearer's left leg, and thence down and around to form another leg loop **32**. It then extends slidably back through another slot in the fitting **30** and on around the wearer's waistline to and through the buckle **22** to complete the waist loop **28**.

It will thus be seen that the lower harness portion **16** generally includes a waist loop **28** which is adapted to surround the wearer's waist and a pair of leg loops **26** and **32** which are adapted to encircle the upper thighs of the wearer's legs. Because this harness assembly is formed of a continuous strap which has slidable connections with the fittings **24** and **30**, adjustment of the buckle **22** by pulling the free end **34** of the strap will adjust not only the waist loop **28** but also the leg loops **26** and **32** to fit the individual wearer.

As may be seen in Figure 3, the lower harness portion **16** is supported in the trousers **10** of the flying suit. The waist loop **28** of the harness extends around the waistband of the trousers, with the fabric which forms the trousers doubled over along the waistband to form a channel **36** through which the strap is slidably received. As may be seen in Figure 5, the leg loop **26** is similarly enclosed in a channel formed between the outer fabric **10***a* of the leg of the trousers **10** and an inner fabric layer **38** which is stitched thereto. The right leg loop **32** is similarly enclosed. Thus, the harness is held in proper position and cannot become twisted or snarled so as to make it difficult for an inexperienced person to ascertain the proper way to put it on. Moreover, the fact that the harness is fully enclosed in the fabric of the trousers enables the wearer's feet and legs to be slipped into the legs of the trousers **10** without snagging on the harness.

The buckle **22** and the loose end **34** of the strap extend through reinforced slits **40** near the front of the trousers **10** and are exposed so that the buckle may be readily fastened and unfastened. The fittings **24** and **30** are provided with upstanding male fastener tongues **24***a* and **30***a* which extend upwardly from these fittings through openings at the upper edge of the trousers in position to be engaged by cooperating fastener elements on the upper harness portion, as will be described hereinafter. These fittings **24** and **30** also include similar male fastener tongues **24***b* and **30***b* which project laterally from the fittings through reinforced openings in the waistband of the trousers so that these fastener elements may be engaged by cooperating female snap-latch fasteners which are illustrated at **42** in Figure 3 and which are secured at the ends of safety straps **44** secured to the frame of the

aircraft. This arrangement permits the parachute harness to serve the additional function of a safety belt.

Referring again to Figure 4, it may be seen that the upper harness portion **18** generally comprises a webbing strap assembly which may be traced in effective continuity from a buckle **46** adapted to overlie the front center of the wearer's chest, across the wearer's chest and slidably between the two layers of a riser portion **48** of the harness which is adapted to extend vertically along the left side of the front of the wearer's body. The strap then extends around the wearer's left side to and slidably through an adapter **50** which is arranged so as to overlie the left side of the wearer's back and from thence diagonally down and back around the wearer's side to the lower end of the aforementioned riser portion **48**.

The lower end of this riser portion **48** is secured to a female snap-latch fastener **52** adapted to cooperate with the male fastener tongue **30***a* of the fitting **30** of the lower harness portion **16**. The upper end of this riser portion **48** is secured to the lower bar of a three-bar ring **54** which is positioned to overlie the wearer's left breast. Connected to the upper bar of this ring **54** is another strap which forms an effective continuation of the riser portion **48**. This latter strap **56** extends over the wearer's left shoulder and diagonally down and across his back to an adapter **58** positioned on the right side of the wearer's back.

The strap extends slidably through this adapter **58** and across the wearer's back to the first-mentioned adapter **50** and slidably therethrough. From thence the strap extends diagonally up and across the wearer's back and over his right shoulder and is secured to the upper bar of another three-bar ring **60** which is adapted to overlie the wearer's right breast. To the lower bar of this ring **60** is secured the upper end of another riser portion **62** which extends vertically downward along the wearer's right side and is secured at its lower end to another female fastener member **64** which is adapted to cooperate with the fastener tongue **24***a* of the fitting **24** on the lower harness portion **16**.

Also secured to the lower end of the riser portion **62** is another strap **66**, this latter strap extending diagonally upward and around the wearer's side and slidably through the aforementioned adapter **58** at the right side of the wearer's back. Thence the strap extends around the wearer's right side and slidably between the layers of the fabric of the riser portion **62** with its loose end **68** in position for adjustable engagement with the buckle **46**.

It will thus be seen that the upper harness portion **18** constitutes an effectively continuous strap assembly and that pulling the loose end **68** of the strap through the buckle **46** will not only tighten the harness circumferentially about the wearer's body but also will shorten the shoulder straps.

Figure 2 shows the upper harness portion incorporated in the flying jacket. As may be seen in this figure, the back **70** of the jacket is provided with straps **72** and **74** which hold the straps in position at the center and at the upper corners of the back of the jacket. These straps **72** and **74** are sewn to the fabric of the back **70** of the jacket at one end and at the other end are equipped with snap fasteners which cooperate with mating fasteners on the jacket to permit the straps to be opened for insertion or removal of the harness.

The breast portions **76** of the jacket are formed of double layers of fabric which are stitched to provide channels through which the harness straps are slidably received. The front edges of the jacket extend just beyond the inner edges of the riser portions **48** and **62** of the harness so that, as may be seen in Figure 1, the buckle **46** and the loose end **68** are exposed and in position to be readily engaged by the wearer to secure the jacket in position.

The female fastener elements **52** and **64** extend beneath the lower edge of the jacket **12** and when both the jacket **12** and trousers **10** are worn these fasteners may be readily engaged with the tongues **24***a* and **30***a* of the fittings **24** and **30** of the lower harness portion to form a unitary harness.

The risers or shroud cords of the parachute may be readily attached to the center bars of the three-bar rings **54** and **60** at either side of the wearer's chest. The parachute pack may be of the seat, back or quick-attachable-chest type. In the latter case the pack may be provided at its rear face with snap hooks spaced to engage the center bars of the rings **54** and **60** so that the pack may be attached to the harness in a moment's time. If the parachute pack is of the back type it may preferably be integrated with the back of the jacket **12**, with the parachute risers passing over the wearer's shoulders and being permanently secured to the rings **54** and **60**. If the parachute pack is of the seat type, it may be integrated with the cushion of a seat in the airplane with the parachute risers being readily attachable to the rings **54** and **60** by means of snap hooks.

From the foregoing description it will be appreciated that the construction described permits the wearer to put on the pants and jacket individually and that the arrangement of the harness within these garments makes it possible for even inexperienced personnel to place the harness in proper position without any hesitation or guesswork. The harness is readily adjustable to fit the wearer. It also is provided with means for ready connection to safety straps and therefore eliminates the need for a separate safety belt. It will therefore be appreciated that the aforementioned and other desirable objects have been achieved by the present invention. However, it should be emphasized that the embodiment of the invention which is shown and described herein is intended as merely illustrative and not restrictive of the invention.

I claim:

1. A parachute harness comprising a lower strap assembly having an adjustable belt portion adapted to encircle the wearer's waist, a pair of adjustable leg loops connected to said belt portion at union points overlying opposite sides of the front of the wearer's body and depending from said belt portion in position to encircle the wearer's legs, and a pair of detachable fastener elements attached to said lower strap assembly adjacent said union points, an upper strap assembly having strap portions adapted to encircle the upper trunk of the wearer's body, a pair of cooperating fastener elements on the upper strap assembly positioned and adapted separately to detachably engage the aforesaid pair of fastener elements on the lower strap assembly to permit said assemblies either to be fastened together to form a unitary harness or completely detached and worn separately.

2. A parachute harness comprising a lower strap assembly having a waist strap portion adapted to extend around the wearer's waist, said waist strap portion being provided with an adjustable buckle at a point overlying the front of the wearer's waist, and two leg strap portions attached to said waist strap portion at union points along the front of the wearer's legs and each of said leg strap portions being adapted to extend around one of the wearer's upper legs, an upper strap assembly having riser strap portions adapted to extend from said union points up the front of the wearer's body at either side to points for attachment with the risers of a parachute harness, and back strap portions adapted to extend from said attachment points over the wearer's shoulders, down and across his back and around to said union points, and separable fasteners having cooperating elements, said upper and lower strap assemblies at said union points to permit said assemblies either to be fastened together to form a unitary harness or completely detached and worn separately.

3. A parachute harness comprising a lower strap as-

sembly comprising a strap having a buckle and slotted adapters slidable thereon, and detachable fasteners for connecting the lower and upper strap assemblies, said detachable fasteners comprising members on the fitting of said lower strap assembly and said strap of the upper strap assembly, said upper strap assembly being positioned and adapted to extend continuously from a buckle in front of the wearer's waist, laterally to a fitting positioned above the front of one of the wearer's legs, slidably through said fitting, around the wearer's said leg, slidably through said fitting again, around the sides and back of the wearer's waist to a second fitting positioned above the front of the wearer's other leg, slidably through said second fitting, around the wearer's other said leg, slidably through said fitting again and finally back to said buckle for adjustable connection thereto, an upper strap assembly having a strap positioned and adapted to extend continuously from the buckle at the front of the wearer's chest, around the wearer's chest to a first adapter at one side of the wearer's back, slidably through said first adapter and down and around the wearer's back and side to a member of one detachable fastener positioned and adapted for releasable fastening engagement with a cooperating member of the fastener mounted on one of said fittings on said lower strap assembly, thence up one side of the front of the wearer's upper body, over one of his shoulders and diagonally down and across his back to a second adapter at the other side of the wearer's back, slidably through said second adapter and across his back to said first adapter, slidably through said first adapter and diagonally up and across the wearer's back and over his other shoulder and down the other side of his body to a member of another fastener positioned and adapted for releasable fastening engagement with a cooperating member of the fastener mounted on the other of said fittings on said lower strap assembly, thence up and around the wearer's side and back to said second adapter, slidably through said second adapter and finally around the wearer's chest and back to the latter to said buckle for adjustable engagement therewith, whereby said upper and lower strap assemblies are independently adjustable and may be connected together by said separable fasteners to form a unitary harness or may be completely separated and independently worn.

4. A parachute harness as claimed in claim 3 wherein said fittings are provided with fastener elements adapted to engage cooperating fastener elements on safety straps secured to the frame of an airplane.

5. A two-piece flying suit with incorporated parachute harness comprising a trousers carrying a strap assembly having a waist loop portion extending around the waist thereof with an adjustable buckle for closing said waist loop portion at the front of said trousers and leg loop portions encircling the upper legs of said trousers, said waist loop portion of the strap having fittings thereon and said leg loop portions being attached to said waist loop portion by said fittings above the front of the legs of said trousers, said fittings having connecting portions of detachable fasteners extending upwardly from the waistband of said trousers, and a jacket carrying a strap assembly having elements of the detachable fasteners projecting downwardly from the skirt of said jacket and adapted to be detachably connected to the connecting portions of said fittings, said strap assembly having straps extending upwardly from said fastener elements over the shoulders of said jacket down and across the back thereof and back to said fastener elements, whereby said trousers

and jacket may be attached to provide an adjustable unitary harness or completely separated and independently worn.

6. A flying suit as claimed in claim 5 wherein said fittings are provided at their outer edges with fastener elements which project through openings in said trousers for engagement with cooperating fastener elements at the ends of safety straps secured to the frame of an airplane.

7. A two-piece flying suit with incorporated parachute harness comprising a trousers having inner and outer fabric layers connected so as to provide channels and a strap slidably enclosed in said channels, said strap having a buckle and slotted fitting mounted thereon and extending continuously from said buckle at the front of the waist band of said trousers laterally to a fitting positioned above the front of one of the legs of said trousers, slidably through said fitting, around said leg, slidably through said fitting again, around the back of the waistband of said trousers to a second fitting positioned above the front of the other leg of said trousers, slidably through said second fitting, around said other leg, slidably through said second fitting again and finally back to said buckle for adjustable engagement therewith, a jacket having loops, a strap assembly slidably enclosed by said loops and having a buckle and slotted adapters slidably mounted thereon, and detachable fasteners for connecting the trousers to the jacket comprising cooperating members on the fittings on the trousers and belt on the jacket, respectively, said strap on the jacket, extending from the buckle at the front of said jacket around said jacket to a first adapter at one side of the back of said jacket, slidably through said first adapter and down and around said jacket to a fastener member projecting downwardly from the skirt of said jacket in position for releasable fastening engagement with one of said fastening members on the fittings on said trousers, thence up one side of the front of said jacket, over one of the shoulders of said jacket and diagonally down and across the back of said jacket to a second adapter at the other side of the back thereof, slidably through said second adapter and across the back of said jacket to said first adapter, slidably through said first adapter and diagonally up and across the back of said jacket and over the other shoulder thereof and down the other side of the front thereof to another fastener member projecting from the skirt of said jacket in position for releasable fastening engagement with the other of said fastening members on the fittings on said trousers, thence up and around the side of said jacket and across the back thereof to said second adapter, slidably through said second adapter and finally around said jacket and back to the latter said buckle for adjustable engagement therewith, whereby said trousers and jacket may be attached to provide an adjustable unitary harness or completely separated and independently worn.

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