July 1, 1930.

S. H. KNIGHT

1,769,520

AVIATOR'S HARNESS

Filed Feb. 5, 1929

2 Sheets-Sheet 1

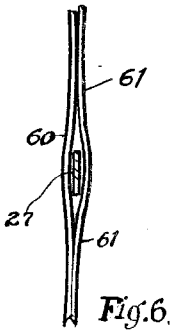


Fig. 6.

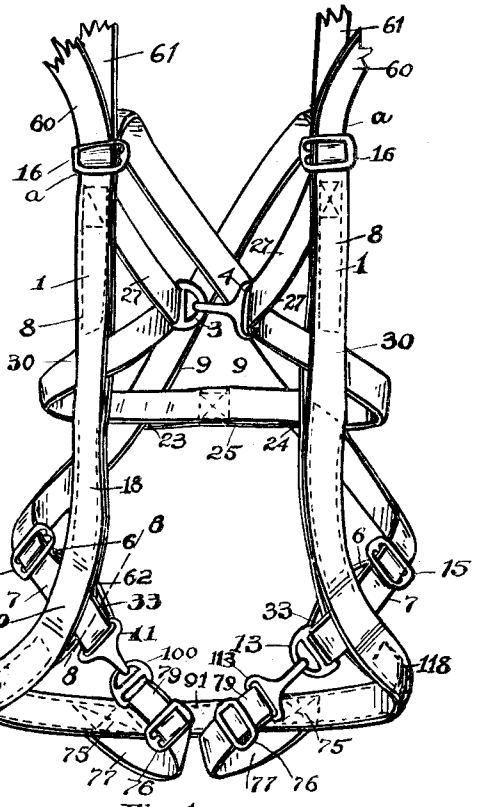


Fig. 1.

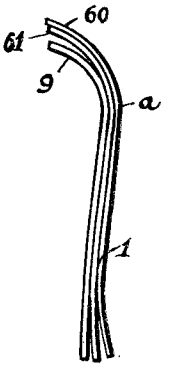


Fig. 2.

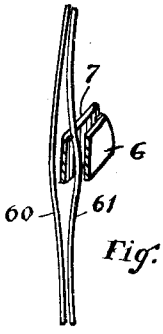


Fig. 8.

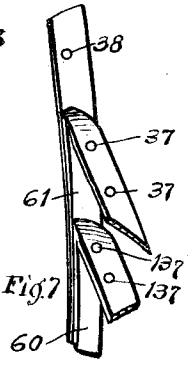


Fig. 7

Inventor
Samuel H. Knight
by his atty Marshall Cottet

July 1, 1930.

S. H. KNIGHT

1,769,520

AVIATOR'S HARNESS

Filed Feb. 5, 1929

2 Sheets-Sheet 2

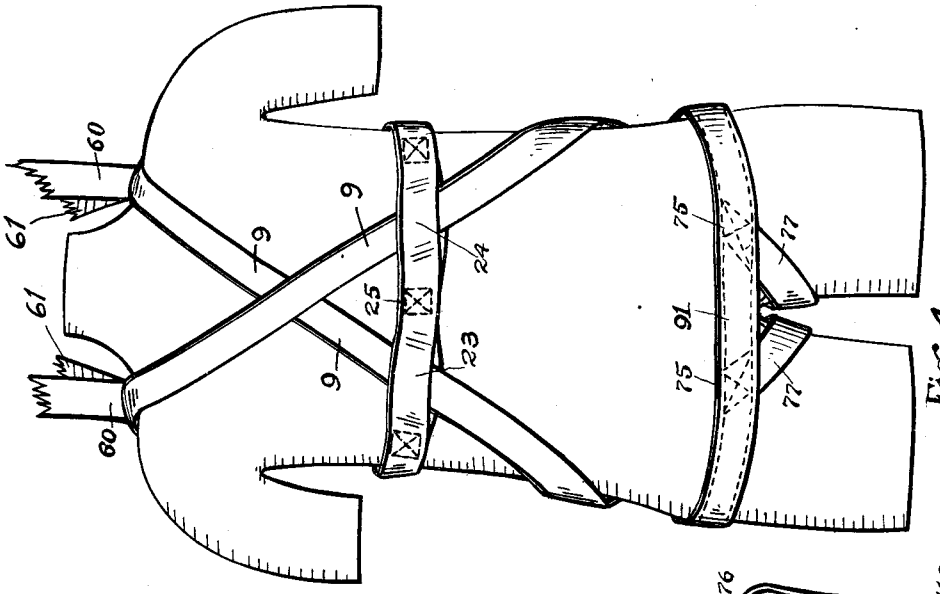


Fig. 4.

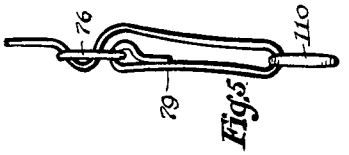


Fig. 5

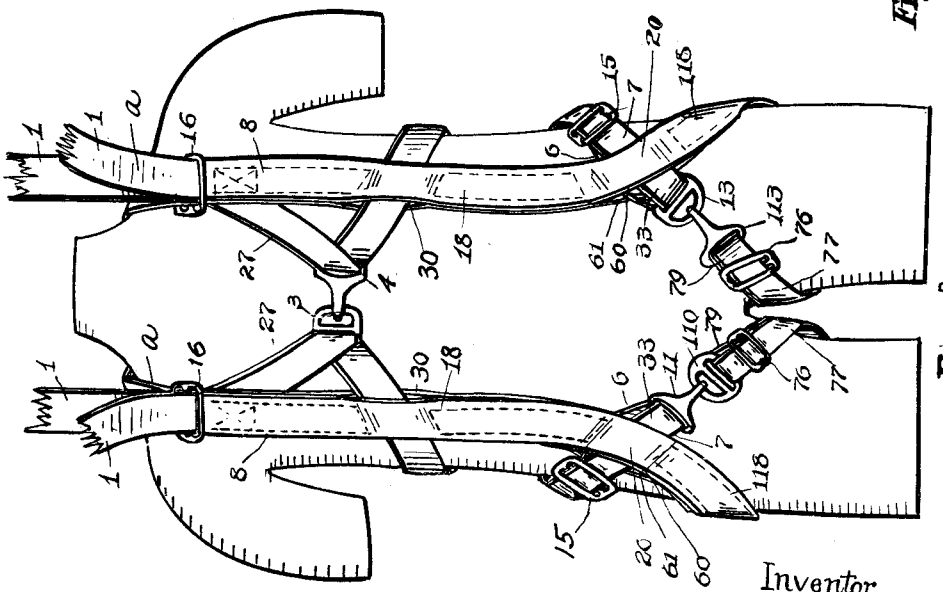


Fig. 3

Inventor
Samuel H. Knight
by his atty
Mark W. Collett

Patented July 1, 1930

1,769,520

UNITED STATES PATENT OFFICE

SAMUEL H. KNIGHT, OF LANCASTER, PENNSYLVANIA, ASSIGNOR TO FOLLMER, CLOGG AND COMPANY, A CORPORATION OF NEW YORK

AVIATOR'S HARNESS

Application filed February 5, 1929. Serial No. 337,621.

The present harness adapts itself automatically to all of the aviator's movements; the load straps can be continued from one place of connection with the shrouds to their other place of connection without break. The device can be adjusted quickly and simply to fit aviators of different sizes, and does not restrict the free movements of the aviator. The relative arrangements and proportions of the parts, and the universality of the sliding of the body straps on each other and on the load carrying straps of the harness assure the automatic adjustments above mentioned and the arrangement of the adjusting of the various buckles enables the required changes in size to be made readily and swiftly. It also provides an unusually secure seat for the aviator during the descent and through the continuity of the load cords, a greater certainty of the requisite strength. It is not displaceable from its position on the aviator by any force he is likely to be subjected to. In a device used in an emergency so full of peril as an escape from an airplane, a very great importance is attached to small changes that produce an assurance of greater safety.

The harness belongs to the class of strap harnesses, wherein the weight of the aviator is carried by load strapping running down the front of the body on either side. In my device this load strapping is continuous (thus avoiding any juncture by sewing) and passes behind the aviator's thighs. Thus it forms a seat for him during his descent. Leg straps adapted to pass on the inside of the aviator's thighs are firmly secured to it and enclose the thighs. A body strapping is clasped at its ends into connection with them and is held in position on both sides, by means of sliding loops in the load straps at the point of the hips, through which the lower portions of the body strapping pass. By this construction the sling of the load strap is prevented from riding up onto the back of the aviator and the whole lower part of the harness very firmly positioned with reference to the load straps and the aviator's body. The body strapping consists preferably of a single piece of strapping for most of its length. In practice, each end of the body strapping is turned over to form a loop, holding therein a clasping element and is secured by an adapter to the body strapping. Between the clasp and the adapter, it passes through a slip loop in the load strap. This slip loop is, in practice, an anchorage that limits the relative movements of the load strapping and body strapping and thus aids materially in positioning exactly and firmly the harness in the neighborhood of the seat and thighs. From the adapters, near its ends, the strapping runs diagonally up the back and across the shoulders, and is adjustable at a point near the shoulders by another pair of adapters to the load strapping. It then passes down, in front of the body, having a clasp for attachment across the chest, after which it slides adjustably through a pair of slip loops in the load strap and crosses the back of the aviator, holding the diagonal portion of the strapping in slip loops.

Fig. 1 is an elevation of the harness. Fig. 2 is a side view of a part of the load straps and of the body strapping at the shoulder. Fig. 3 is a front view of the harness on a dummy. Fig. 4 is a back view of the harness on a dummy. Fig. 5 is a view of the parts at the ends of the leg straps. Fig. 6 is a view of a slip loop. Fig. 7 is a perspective of the parts shown at the shoulder in Fig. 2. Fig. 8 is a view of one of the slip loops at the hips.

The load strap, 1, 1, is attached at its ends to a parachute (not shown and the particular form of which is not a limitation on my invention) and passes over the shoulders of the aviator, and is adapted to fit over his chest and abdomen and continues down on each side towards the aviator's hips and passes behind the thighs forming a sling or seat, 91. This load strap consists, in practice, of two thicknesses of strapping, 60, and 61, that are sewed together at portions of their length by rows of stitches, 8, 18, 118. In practice, this load strap is formed of a single integral length of strapping. To this load strap are fastened by the stitches of the seams, 75, 75, the leg straps, 77, 77. The body strapping is, in practice, a single thickness of strapping except at the ends where it is turned over and held to the adapters, 15,

15, thus forming adjustable loops, 33, that carry the clasping instrumentalities, 11, and 13, which engage with other clasping instrumentalities, 110, and 113, attached to the leg straps, 77, 77.

The body strapping is fixed in position at the shoulders by the two adapters, 16, and 16, to the load straps, 1. The total length of the body strapping is regulated by the extent to which the turned over parts 6, are turned over and secured, by the adapters, 15, 15, to the parts, 7, 7 or by the adjusting of the length of the leg strapping as below described, or by both. After these adjustments have been made, to fit the size of the aviator, all the remaining connections between the various parts of the body strapping and all the other connections between the body strapping and the load strap are made by slip loops, or by sliding clasps, that ride freely along the body strapping. The lower ends, 6, and 7, of the body straps forming the loop, 33, pass through the lower slip loops, 20, in the load carrying strap, 1. This, in practice, is a compound slip loop, as is particularly shown in Fig. 8, the portion, 6, of the slip loop, 33, being positioned between the layers, 60, and 61, and the layer, 61, being positioned between the portions, 6, and 7. This form of slip loop retains the body strapping relatively to the load strap without injuriously interfering with the play along the slip loop, 20. From the retainers, 15, the body strapping is turned over the side of the wearer and slantingly upwards along his back, to the slip loops, 23, 24.

The slip loops, 23, and 24, are positioned at the portion, 25, of the body strapping that forms the back of the belt. Through these slip loops, 23, and 24, the portions, 9, 9, of the body strapping pass. The portions, 9, 9, of the body strapping extend from the slip loops, 23, and 24, crossing each other diagonally and passing over the shoulders to the adapters, 16, 16, on the load strap, 1, to which it is held by them, and are continued downward over the wearer's chest by the portions, 27, that carry the clasping elements, 3, and 4, which are loosely slidable on the portions, 27. The portions, 27, form loops of automatically varying length and shape, between the adapters, 16, 16, and the slip loops, 30, 30, along which the links of the clasping elements, 3, and 4, can slide. The portion 25, of the body strapping forming the back of the belt is a continuation of the parts, 27, 27, and has on it the slip loops, 23, and 24, as above described. The lower ends, 33, 33, of the slip loops have the portions that are marked, 6, and 7, and that pass through the slip loops, 20, 20, as above described. These portions, 6, and 7, carry the clasping elements, 13, and 11, that engage with the clasping elements, 110, and 113, that are secured to the leg straps, 77, 77, which are positively secured to the load strap, 1, at the seat portion, as shown in the drawings by rows of stitching. In practice, the length of the leg straps, 77, is made adjustable; the adapters, 76, regulating the length of the loops, 79, 79. The harness, therefore, will be positioned quite positively at the hips and shoulders, after it has been adjusted by the adapters to the size of the aviator, and will automatically adjust itself to the body without displacing or bulging on the body.

As additional features, I use, to keep the straps, 1, 1, at the points, *a*, *a*, from slipping down and off the shoulder, the snaps 38, 38, 38, arranged to adjust with the socket, 37, by which the strap, 1, can be secured to the body strapping. (See Figs. 4 and 5). The load strap layers, 60, 61, can be secured together by a snap, 137.

By attaching the hook, 13, to one of the leg straps and the eye, 110, to the other leg strap the aviator will be prevented from unintentionally reversing the clasps.

I claim:—

1. In a harness for aviators composed wholly of strapping, the combination of a load strap adapted to be positioned vertically in front of each side of the body of the wearer, and to pass behind the thighs of the aviator at the portion thereof between the portions positioned vertically in front of the body of the wearer to form a sling, a body strapping that consists of a single piece of strapping having clasping members attached to the ends thereof, the load strap and the body strapping having co-operating slip loops positioned on either side of the sling portion and adjacent to each end of the body strapping, said load straps also having slip loops in each of the portions thereof adapted to pass in front of the body of the wearer midway between the hips and shoulders, leg straps secured to the load straps at points on their sling forming portion and provided with clasps engaging with the clasps at the ends of the body strapping, and adapters securing the body strapping and the load carrying straps together at each side of the wearer at the shoulders, the intermediate portion of the body strapping between the shoulders and leg straps being provided with slip loops, in which portions of the body strapping slip, whereby the body portion of the said strapping becomes automatically self-adjusting.

2. The device as defined in claim 1, wherein the body strapping is furnished with adapters near each end and which hold folded over ends of this strapping forming loops holding the clasping devices.

3. The device as defined in claim 1, wherein the body strapping is folded forward on each side beneath the shoulders, and is provided at each side with a clasp, sliding on said fold, said clasps engaging with each other.

4. In a harness for aviators composed

wholly of strapping the combination of load strapping adapted to be positioned vertically in front of each side of the body of the wearer, and to pass beneath his thighs, at the portion of said strapping between the portions positioned vertically in front of the body of the wearer to form a sling, a pair of leg strappings extending from said load strappings adjacent to the sling portion thereof, and provided with clasping members, a body strapping that consists of a single piece of strapping having clasping members at the ends of the same, and adapted to engage with the clasping members on the leg strapping, adjusting means operating to determine the length of the sum of the leg strapping and the body strapping positioned adjacently to the clasping members aforesaid, adapters connecting the said body strapping and load strapping adjacently to the shoulders of the wearer, a series of slip loops connecting the body strapping with itself and with the load strapping between the said clasping members and said adapters that are at the shoulders of the wearer, said body strapping having also clasping members that are slidable along said body strapping at the chest of the wearer and engage with each other.

5. The device as defined in claim 4 wherein the load strapping and the body strapping are each provided with slip loops interlocking with each other, at the level of the hip of the wearer, said slip loops mutually engaging and limiting the relative movements of the load and body strapping.

6. An aviator's harness comprising in combination a load strapping composed of a single length of strapping passing in the form of a sling behind the thighs of the wearer, and having its portions on either side of the aviator, running vertically and in front of the body of the aviator, and provided with slip loops adapted to receive the body strapping, a pair of leg strappings solidly secured to the load strapping adjacent to the sling portion thereof, a body strapping having a central portion lying at the back of the waist of the aviator, and provided with slip loops on either side of its middle, the portions of said body strapping on either side of said central portion, passing to the front of the body of the aviator and through said slip loops in the said load strapping, over the shoulders of the aviator, down the back of the aviator and through the said slip loops in the said central portion of the body strapping and then around the hips of the aviator to the front of his body, said body strapping being provided, at both side of the body of the aviator, with an adjustable anchorage to the leg strapping adjacent to the aviator's thighs and with an adjustable anchorage to the load strapping adjacent to the aviator's shoulders, and with a self-adjusting connection between the load strapping and the body strapping at each of the aviator's hips, and with self adjusting connection between the two opposite portions of the body strapping at the front of the chest.

7. The device as defined in claim 6 wherein the portions of the body strapping positioned at the back of the aviator, and extending from the shoulders to the hips run diagonally and cross each other.

SAMUEL H. KNIGHT.