Aug. 6, 1940. C. E. HARWOOD 2,210,170

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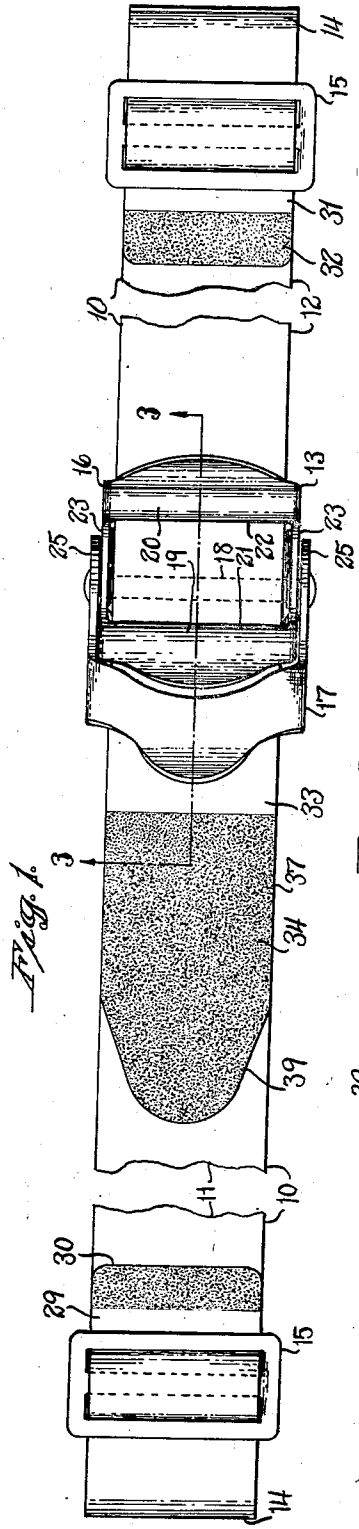


Fig. 1.

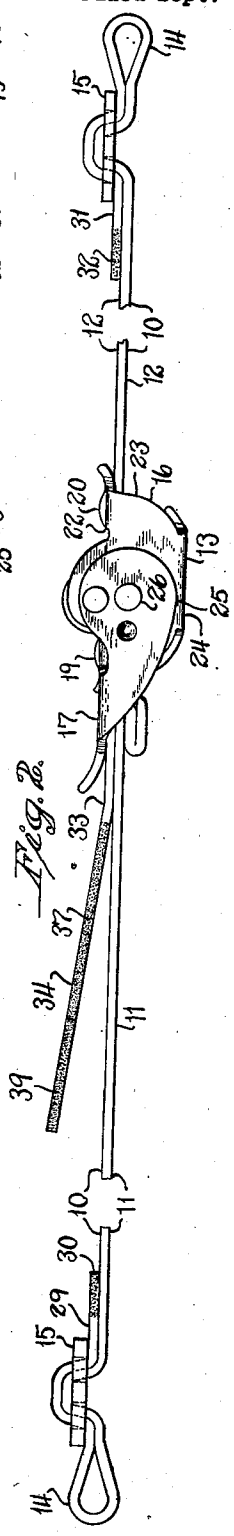


Fig. 2.

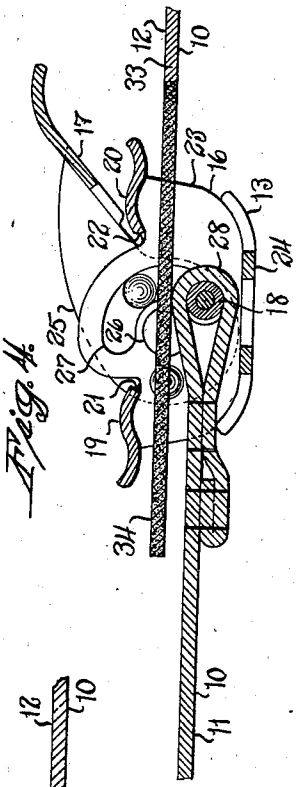


Fig. 4.

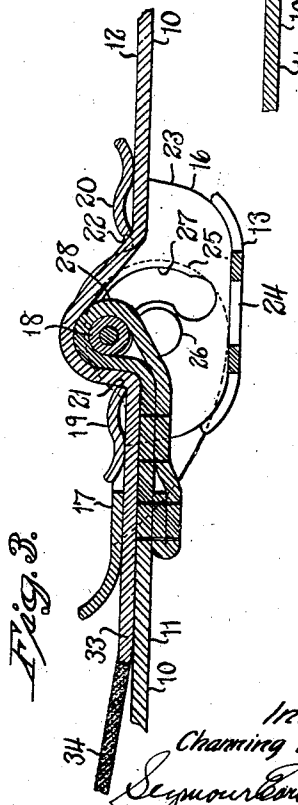


Fig. 3.

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Fig. 5.

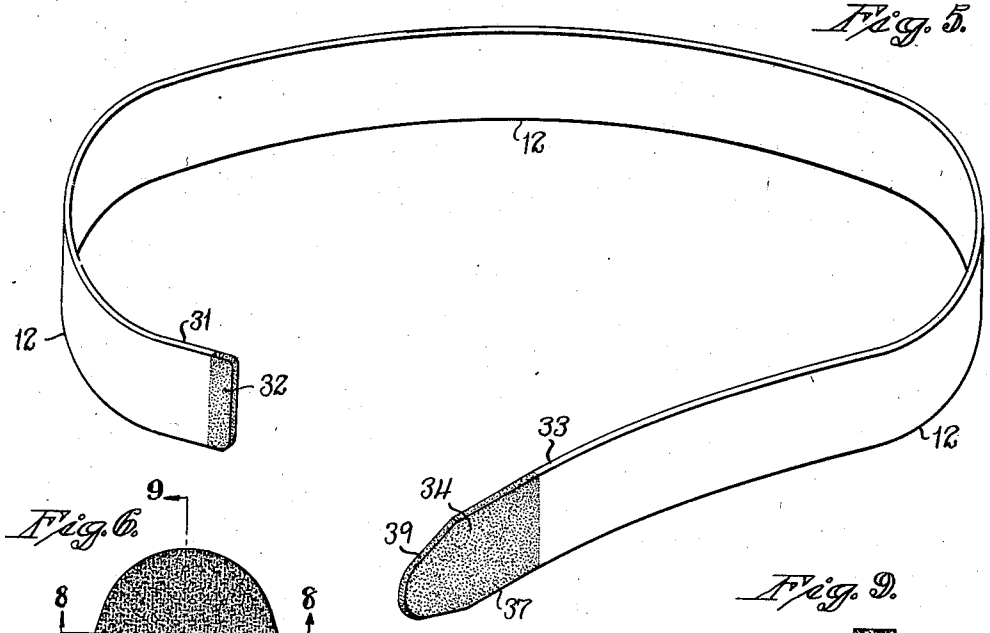


Fig. 6.

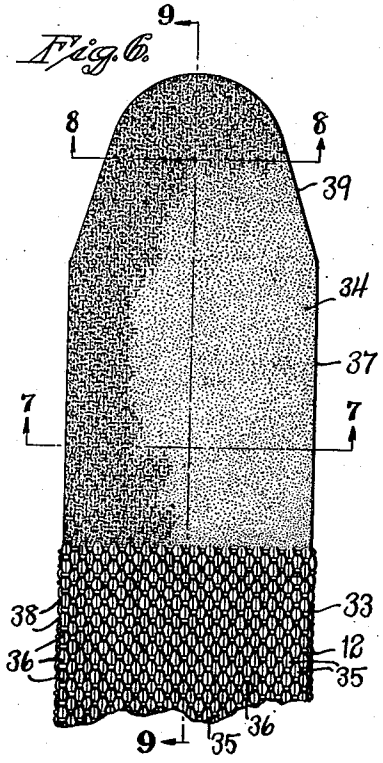


Fig. 9.

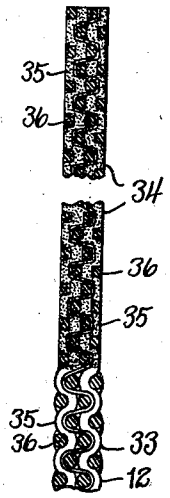


Fig. 8.

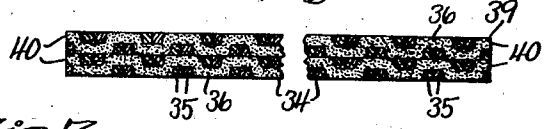
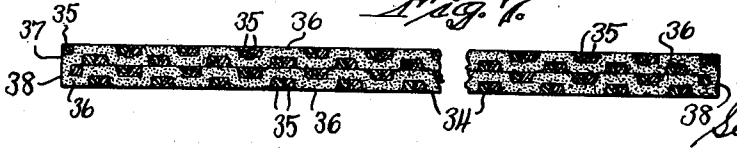


Fig. 7.



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UNITED STATES PATENT OFFICE

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Application September 30, 1939, Serial No. 297,303

1 Claim. (Cl. 24—143)

This invention relates to improvements in straps, and more particularly to providing stiffened tips thereon.

One object of this invention is to provide a strap having an improved stiffened tip on one or both of its ends.

With the above and other objects in view, as will appear to those skilled in the art from the present disclosure, this invention includes all features in the said disclosure which are novel over the prior art.

In the accompanying drawings forming part of the present disclosure, in which one way of carrying out the invention is shown for illustrative purposes:

Fig. 1 is a broken top plan view illustrating one embodiment of the invention;

Fig. 2 is a broken side elevation of Fig. 1;

Fig. 3 is a sectional view taken on line 3—3 of Fig. 1;

Fig. 4 is a sectional view similar to Fig. 3 but with the buckle shown in its unlocked position;

Fig. 5 is a perspective view of a strap made in accordance with the present invention;

Fig. 6 is an enlarged top plan view of one end of the strap shown in Fig. 5;

Fig. 7 is a broken transverse sectional view on line 7—7 of Fig. 6;

Fig. 8 is a broken transverse sectional view on line 8—8 of Fig. 6; and

Fig. 9 is a broken longitudinal sectional view on line 9—9 of Fig. 6.

In the description and claim, the various parts and steps are identified by specific names for convenience, but they are intended to be as generic in their application as the prior art will permit.

Referring to the drawings showing the particular form of the invention chosen for illustration, a belt 10 includes the two flexible woven straps or strap-members 11 and 12 and a buckle 13 which serves to secure the straps 11 and 12 together. The particular belt illustrated may serve as a safety belt or seat belt in airplanes or other vehicles. Each strap 11, 12 has a loop or eye-member 14 formed by means of a three-bar or double-slot slide- or adjustment-buckle 15 in a way that is well known in the art, the eyes 14 serving to secure the straps 11 and 12 to fixed portions of the airplane or other vehicle.

The particular buckle 13 illustrated, includes a frame 16, a locking-and-release lever 17 pivoted to the frame 16, and a locking-bar 18 carried by the locking-lever 17.

The frame 16 includes two bar-portions 19 and 20 having approximately parallel bar-edges 21 and 22, side-portions 23, and a bottom-plate 24, all formed as one integral piece.

The locking-lever 17 has a pair of ears 25 outside of and adjacent the side-portions 23 of the frame 16, the ears 25 being pivoted at 26 to the side-portions 23.

The locking-bar 18 is eccentrically mounted in the ears 25 relatively to the pivot 26 and extends freely through the arcuate slots 27 in the side-portions 23 of the frame 16.

The strap 11 has a loop or eye 28 formed at one end in any suitable way as, for example, by stitching, to anchor the strap 11 to the locking-bar 18, and the other end-portion 29 of the strap 11 is provided with a stiffened tip 30, more fully hereinafter described.

The strap 12 has one end-portion 31 provided with a stiffened tip 32 similar to the tip 30, and the other end-portion 33 provided with a straight stiffened tip 34 of suitable length which can be readily inserted in a straight line through the frame 16 between the locking-bar 18 and the bar-edges 21 and 22 when the buckle is in the open position shown in Fig. 4.

The stiffened tips 30, 32 and 34 are produced by stiffening the end-portions of the woven straps with what, for convenience, may be referred to as resin-like material. In producing the stiffened tips, the end-portions of the straps are impregnated or coated with the resin-like material, which may be of a type containing solvent which, on evaporating out, leaves the resin-like material in a relatively-stiff condition to give sufficient stiffness or rigidity to the end of the strap. Or the resin-like material may consist of a synthetic or other resin such, for example, as a Bakelite type of resin which, after being applied to the end of the strap, can be placed in a suitably-shaped mold, which is preferably heated, and which may hold the strap-end firmly compressed while the heat is applied to produce the stiffened tip-end. This is the way in which the particular form of tip-end 34, illustrated in Fig. 6, has been formed. The resin-like material may consist not only of resins, but combinations of resins, rubber and various oils may be used. Also lacquers, which include a resin-like material, preferably non-inflammable, such, for example, as cellulose acetate, dissolved in a suitable solvent could be employed. The term "resin-like material" is intended to broadly mean any suitable liquid or solid material which, with or without heat, can be caused to impregnate or adhere to the end-portion of a strap to form a stiffened tip.

The woven fabric illustrated in Figs. 6, 7, 8 and

9 is a two-ply fabric formed of longitudinal or warp strands 35 and transverse or weft strands or picks 36. In the full-width portion 37 of the stiffened tip 34, the transverse strands 36 form a selvage edge by the return-loops 38 (Fig. 7), but in the tapered portion 39, which has been cut either before or after applying the resin-like material, the transverse strands 36 have non-selvage or severed ends 40 (Fig. 8), and inasmuch as the transverse strands in this tapered portion are of relatively-short length, they not only would readily become roughed-up but would be liable to be pulled out of the strap-ends if they were not firmly cemented in position by the resin-like material. The tapered portion 39 can be finish-formed either by molding, or cutting, or grinding after the resin-like material is applied and is hardened. The resin-like material and/or the mode of applying it will preferably be such that the stiffened tip will remain in, or return to, its proper flat condition, and have sufficient firmness to facilitate threading through adjustment-loops and buckles, but will have reasonable flexibility so that the material will not break or crack in ordinary usage, and also will be non-crocking, so that it will not soil clothing of persons wearing belts employing such straps.

By employing stiffened tips in accordance with the present invention, straps so tipped produce a minimum of noise, have minimum weight, and the tips cannot become distorted, or the edges catch on buckles or passengers' clothing, which catching on clothing can be serious. In the case of metal tips which have heretofore been employed they not only are noisier and heavier but—far more serious—they tend to become distorted with risk of the edges catching on buckles or persons' clothing, which is serious in that the tip is liable to foul in the buckle upon making an emergency release. This distortion of a metal tip causing it to catch on the buckle, as just described, may completely remove it from the webbing, leaving a ragged edge which is virtually impossible to thread through the buckles or adjustment-loops.

The invention may be carried out in other specific ways than those herein set forth without departing from the spirit and essential characteristics of the invention, and the present embodiments are therefore, to be considered in all respects as illustrative and not restrictive, and all changes coming within the meaning and equivalency range of the appended claim are intended to be embraced therein.

I claim:

A strap including: a flat relatively-wide strap-member woven of longitudinal and transverse strands and having an end-portion impregnated with resin-like material to form a flat relatively-wide stiffened tip, said tip having a tapered end-portion tapered in a direction toward its end to produce an end which is substantially narrower than the width of the strap, the transverse strands in said tapered end-portion having severed ends anchored by said resin-like material.

CHANNING E. HARWOOD.