Feb. 12, 1952 H. S. VAN BUREN, JR 2,585,900

TENSIBLE FORCE RESISTANT BUCKLE ASSEMBLY

Filed Oct. 1, 1949

FIG. 1.

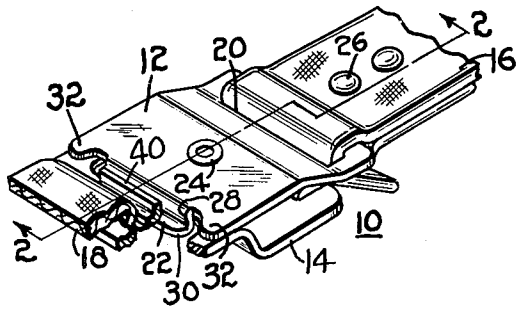


FIG. 2.

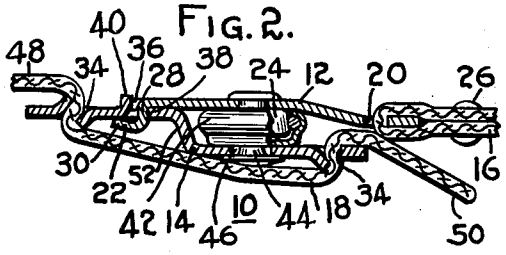


FIG. 3.

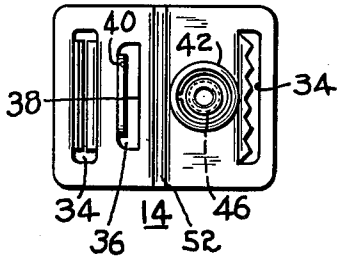


FIG. 4.

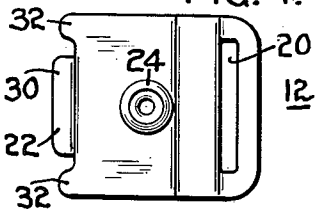


FIG. 5.

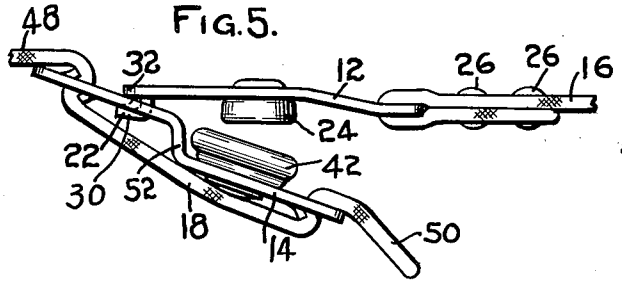


FIG. 6.

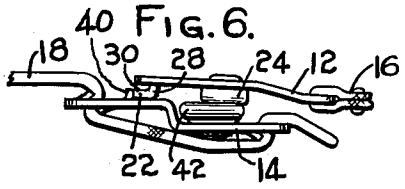


FIG. 7.

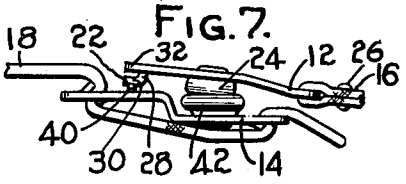
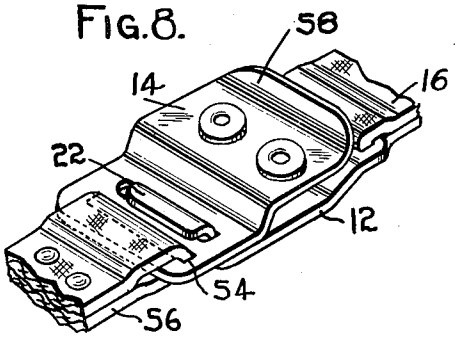


FIG. 8.



INVENTOR:
HAROLD S. VAN BUREN JR.,
BY Philip E. Parker
ATTORNEY.

Patented Feb. 12, 1952

2,585,900

UNITED STATES PATENT OFFICE

2,585,900

TENSILE FORCE RESISTANT BUCKLE ASSEMBLY

Harold S. van Buren, Jr., Cambridge, Mass., assignor to United-Carr Fastener Corporation, Cambridge, Mass., a corporation of Massachusetts

Application October 1, 1949, Serial No. 119,105

8 Claims. (Cl. 24—77)

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This invention relates generally to buckles, and has particular reference to a buckle assembly capable of being quickly and easily released while the parts of the buckle are under tension.

The object of the invention is to provide a quick-release buckle assembly comprising a pair of buckle plates adapted to be superimposed and hooked together to resist tensile forces in which the plates are provided with means for snapping engagement to retain the plates in the hooked position.

A further object of the invention is to provide a buckle assembly comprising a pair of superimposed buckle plates having hook means at one end which is releasable by separating the plates at the other end, and a snap fastener half disposed on each plate to permit said other ends to be snapped together.

A further object of the invention is to provide a buckle assembly comprising a pair of buckle plates which are adapted to be superimposed and hooked together at one end to resist tensile forces and snapped together at the other end to retain the plates in the superimposed position in which the means for snapping the plates together is shiftable in relation to the means for hooking the plates together.

A further object of the invention is to provide a buckle plate having hook means with a downwardly extending portion to enter an opening in a supporting plate to hook the plates together, in which the buckle plate is provided with hook lifting means to lift the downwardly extending portion out of the opening during disengagement.

Other objects of the invention will, in part, be obvious, and will in part, appear hereinafter. For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description, taken in conjunction with the accompanying drawing, in which:

Fig. 1 is a perspective view, partly cut away, of a buckle assembly embodying the features of the invention;

Fig. 2 is a view in section taken on line 2—2 of Fig. 1;

Fig. 3 is a bottom plan view of the upper buckle plate shown in Fig. 1;

Fig. 4 is a top plan view of the lower buckle plate shown in Fig. 1;

Fig. 5 is a view in elevation of the component parts of the buckle illustrating the method of assembly and disassembly;

Figs. 6 and 7 are views in elevation of the buckle plates illustrating certain features of the invention; and

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Fig. 8 is a perspective view of a buckle assembly having certain modifications within the scope of the invention.

Referring to the drawing, there is illustrated a buckle assembly 10, which comprises a pair of buckle plates 12 and 14 which are adapted to be fastened together in superimposed relation to resist tensile forces imparted thereto by the straps 16 and 18.

The buckle plate 12 comprises a strap receiving slot 20 near one end thereof, a hook member 22 disposed on the other end, and a snap fastener half 24 disposed intermediate the ends. The strap 16 is threaded through the slot, and is conveniently secured therein by being folded back and attached to itself by rivets 26. The hook member 22, in the preferred embodiment, comprises a downwardly extending portion 28 having an outwardly extending tongue portion 30 disposed thereon for engagement with the plate 14 in a manner to be hereinafter described. To provide means for lifting the hook out of the opening during disengagement of the plates, a hook lifting tab 32 is provided on each side of the hook member, said tabs 32 extending outwardly from the end of the plate 12 beyond the downwardly extending portion 28 of the hook member.

The buckle plate 14 comprises strap receiving slots 34 disposed at each end thereof, and a hook receiving slot 36 intermediate the ends, forming a hook supporting edge 38. A raised portion 40 is provided on the plate at the edge of the slot opposite the hook supporting edge for a purpose to be hereinafter described. A snap fastener half 42 is disposed on the plate 14 for engagement with the snap fastener half 24 on the plate 12, and in the preferred form is attached to the plate by a rivet 44 disposed in an opening 46 which is sufficiently large to allow the snap fastener half 42 a limited amount of shifting on the plate toward and away from the hook receiving slot 36. The strap 18 is threaded through the slots 34 and across the back of the plate 14 to provide a load supporting portion 48 extending from the end of the plate which has the hook receiving slot, and a hook disengaging portion 50 extending from the other end of the plate. To allow the plates 12 and 14 to lie substantially parallel when the snap fastener halves are in engagement therebetween, a step 52 is provided in the plate 14 to compensate for the height of the engaged fasteners.

Referring now to Fig. 5, the buckle plates are illustrated in a position which occurs during both assembly and disassembly of the buckle. To as-

semble the plates, the hook member 22 of plate 12 is inserted into the slot 36 of plate 14, so that the tongue portion 30 of the hook passes under the portion of the plate 14 adjacent the edge of the slot. The opposite ends of the plates are then forced together so that the snap fastener halves snap into engagement to retain the plates in superimposed relation. (See Fig. 2.) When a load is applied to the buckle through the straps 16 and 18, the downwardly extending portion 28 of the hook member bears against the hook supporting edge 38 of the plate 14, thereby resisting the tensile forces imparted thereto. Since the snap fastener half 42 is slightly shiftable on the plate 14, no part of the load applied to the buckle is carried by the snap fastener halves, which might tend to distort them or impair their ability to snap into engagement.

The assembled buckle plates may be quickly and easily disengaged while under tension by pulling on the disengaging portion 50 of the strap 18, which unsnaps the snap fastener halves and separates the ends of the plates opposite the hook as illustrated in Fig. 5. As the plates are separated, the hook lifting tabs 32 extending from the plate 12 bear against the surface of the plate 14 and provide a fulcrum about which the plate 12 moves, thereby lifting the downwardly extending portion 28 of the hook out of the slot 36. The tabs 32, by providing a positive lifting action to remove the hook from the slot, make it impossible for the hook to jam in the opening during disengagement under a heavy load.

As illustrated in Figs. 6 and 7, unless the hook member of plate 12 is properly disposed in the hook receiving opening of plate 16, it is impossible to force the snap fastener halves into engagement. For example in Fig. 6, if the hook member is placed against the plate 14, the raised portion 40 engages the tongue portion 30 of the hook and prevents the snap fastener halves from being aligned for engagement. If the tongue portion 30 is placed on top of the raised portion as illustrated in Fig. 7, the plate 12 is tilted at an angle to the plate 14 which also prevents engagement of the snap fastener halves.

Referring now to Fig. 8, there is illustrated a buckle embodying certain modifications within the scope of the invention. In this form of the device, the plate 14 is provided with only a single strap receiving slot 54, for receiving the load supporting strap 56, and disengaging tongue 58 is provided on the opposite end of the plate 12, which extends upwardly and outwardly from the end of the plate. The tongue 58 may be readily grasped by the fingers to unsnap the snap fastener halves and the buckle plates become disengaged in the manner hereinbefore described.

It will be understood that for large buckles, any desired number of snap fasteners may be provided on the plates, all of which may be made shiftable for the purpose hereinbefore described. The step may be provided on the plate 12 instead of on the plate 14, or steps may be provided on both plates with equally satisfactory results. The device is not limited to use with flat straps, as illustrated, but may be used to join any elongated flexible tension resisting members such as ropes, wires and the like, provided that suitable means are provided for attaching to the plates.

The device is prticularly adapted for use in applications where a strap or the like must be quickly released while under tension, and it is a characteristic of the device that the amount of tension applied to the buckle does not affect the ability of the buckle to be quickly released by a sharp pull on the disengaging means.

Since certain other obvious modifications may be made in the device without departing from the scope of the invention, it is intended that all matter contained herein be interpreted in an illustrative, and not in a limiting sense.

I claim:

1. A quick release buckle assembly, comprising a pair of buckle plates having strap-receiving means at opposite ends thereof, one of said plates having hook means at one end thereof, the other plate having an opening therein near one end to permit the plates to be hooked together, said hook means being shaped and arranged to be released by separating the plates at the ends opposite the hook means, each of said plates having a snap fastener half disposed thereon to permit said ends opposite the hook means to be snapped together, said one plate having a hook-lifting portion extending from said one end, said hook-lifting portion being adapted to bear against said other plate when the ends opposite the hook means are separated to provide a fulcrum to lift the hook out of the opening.

2. A quick release buckle assembly, comprising a first buckle plate having a wide hook disposed on one end thereof, said hook extending downwardly and then outwardly from the end of the plate, means for receiving a strap at the other end, and a snap fastener half disposed thereon intermediate the ends, said first buckle plate being provided with a hook-lifting tab disposed on each side of the hook, said tabs extending slightly beyond the downwardly extending portion of the hook; and a second buckle plate adapted to be assembled with the first buckle plate in superimposed relation, said second buckle plate having means at one end for receiving a strap, a transverse slot for receiving the hook of the first buckle plate to allow the plates to be hooked together to resist tensile stresses imparted thereto by the straps, and a snap fastener half assembled thereon for engagement with the snap fastener half on the first plate, the shape of said hook permitting disengagement from the opening by separating the plates at the ends opposite the hook, said tabs bearing against said second buckle plate when the ends opposite the hook are separated to provide a fulcrum to lift said hook out of the opening, said snap fastener halves being adapted to retain said ends opposite the hook means together, whereby disengagement of the hook when the plates are assembled may be effected only by unsnapping said snap fastener halves.

3. A quick release buckle assembly, comprising a pair of buckle plates having strap-receiving means at opposite ends thereof, one of said plates having hook means at one end thereof, said hook means having a shear resisting portion disposed substantially normal to said one plate and a hook portion at the end of said shear resisting portion extending substantially parallel said one plate laterally outward from said one end, the other plate having an opening therein near one end to permit the plates to be hooked together and to provide surfaces for engaging said shear resisting portion, said hook means being shaped and arranged to be released by separating the plates at the ends opposite the hook means, each of said plates having a snap fastener half disposed thereon to permit said ends opposite the hook means to be snapped together.

4. A quick release buckle assembly as set forth

in claim 3 in which at least one of the plates has an elongated longitudinally extending aperture intermediate the ends thereof and the snap fastener half on said plate having an attaching portion extending through said aperture and securing portions slidably engaging opposite sides of said plate on opposite sides of said aperture to permit said snap fastener half to be longitudinally shiftable relative to said plate, whereby shear forces applied to the buckle assembly will be carried only by the shear resisting portion of the hook means, and the surfaces for engaging the shear resisting portion.

5. A quick release buckle assembly in accordance with claim 3 in which the plate having an opening near one end to permit the plates to be hooked together has a tongue extending upwardly therefrom on the face on which the snap fastener half is disposed and adjacent the side edge of the opening therein opposite the snap fastener half, said tongue being spaced from said snap fastener half a distance less than the distance between the snap fastener half of the other plate and the free end of the hook portion of said other plate, whereby the snap fastener halves of said plates are prevented from engaging each other when the free end of said hook portion engages said tongue.

6. A quick release buckle assembly in accordance with claim 5 wherein the tongue extending upwardly from the plate having an opening to permit the plates to be hooked together is of such length as to cause when said tongue is engaged with the hook portion of the hook means of the other plate a substantial tilting of said other plate preventing the snap fastener halves on said plates from being snapped together.

7. A buckle plate for a buckle assembly, said plate having hook means at one end thereof, said hook means having a downwardly extending portion adapted to enter an opening in a support plate and to engage an edge of such opening under the tension of opposed shear forces applied to such buckle assembly and a hook portion extending laterally outwardly from the end of said downwardly extending portion opposite said plate and substantially parallel thereto, said hook means being adapted to enter said opening in such a support plate to hook the plates together and to be released by separating the buckle plate from the support plate at the end opposite the hook means, and hook lifting means disposed on said one end of said buckle plate, said hook lifting means extending from said one end beyond the outer end of said hook portion of said hook means to bear against the support plate during disengagement of the hook means to provide a fulcrum to lift the hook means out of the opening.

8. A buckle plate for a buckle assembly as set forth in claim 7 in which the hook lifting means comprises tabs disposed on each side of the hook means extending outwardly from the buckle plate beyond the outer end of the hook portion of the hook means.

HAROLD S. VAN BUREN, JR.

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