Nov. 16, 1943. P. W. WHITE 2,334,462

BUCKLE

Filed July 1, 1942 2 Sheets-Sheet 1

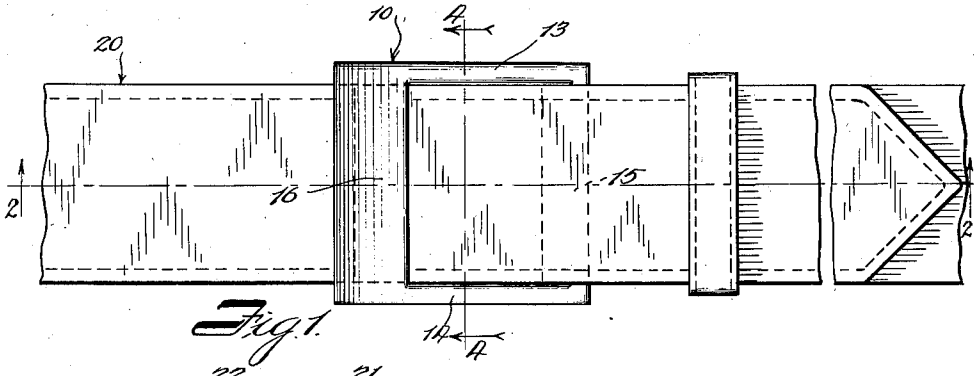


Fig. 1.

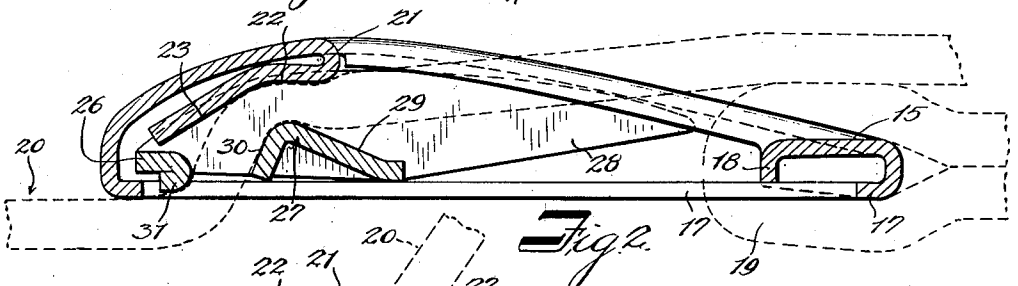


Fig. 2.

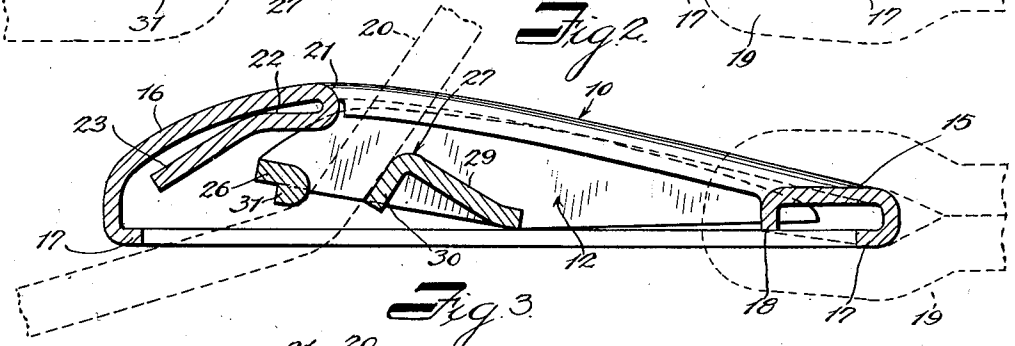


Fig. 3.

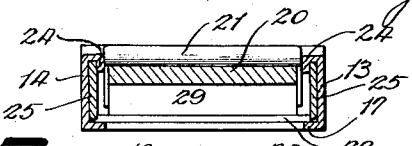


Fig. 4.

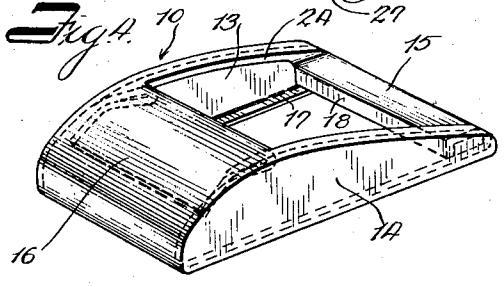


Fig. 5.

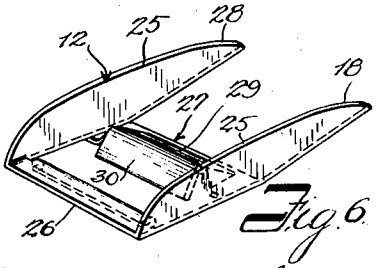


Fig. 6.

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BUCKLE

Filed July 1, 1942 2 Sheets-Sheet 2

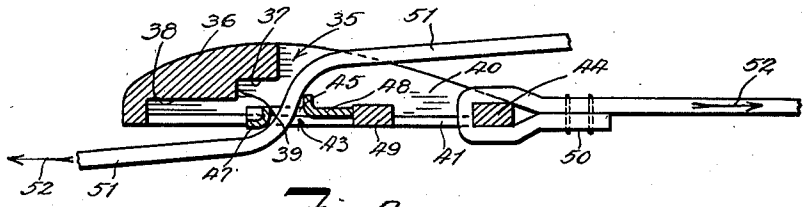


Fig. 7.

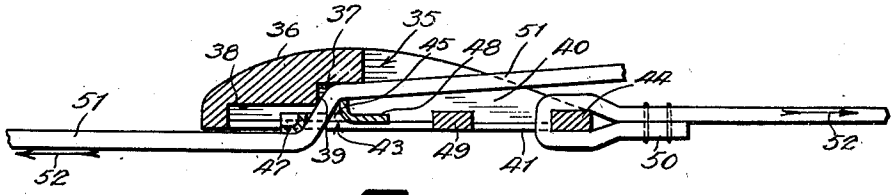


Fig. 8.

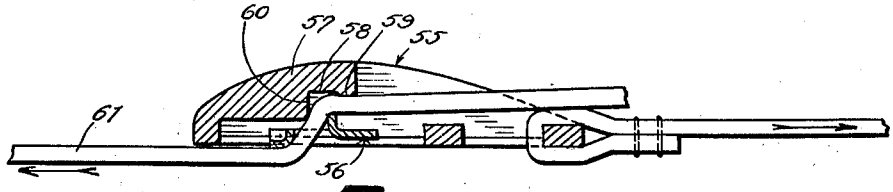


Fig. 9.

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UNITED STATES PATENT OFFICE

2,334,462

BUCKLE

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Application July 1, 1942, Serial No. 449,236

8 Claims. (Cl. 24—194)

This invention relates to buckles, more particularly to slide buckles adapted to be mounted on straps such as belts or the like, and the invention has for an object the provision of an improved slide buckle which, in use, will permit the belt or strap to lie closely adjacent the body of the wearer.

The invention is applicable to slide buckles generally and is particularly useful in connection with buckles of the general type described and claimed in the applicant's prior patents, No. 2,152,119, issued March 28, 1939, and No. 2,249,409, issued July 15, 1941, and in Patent No. 2,232,188, issued February 18, 1941, to Clarence M. Smith. In the buckle constructions shown in these patents, a pair of interrelated frames are disposed in face-to-face relation for relative longitudinal movement to engage a strap therebetween in adjusted clamping relation, each frame comprising spaced side bars and spaced cross bars defining openings through the frames for receiving a strap or belt. The frames are interengaged in a manner to direct relative longitudinal movements thereof, and a cross bar on one of the frames is provided with an angularly extending portion which presents a strap-engaging face inclined relative to the path of movement of the frames. A cross bar on the other frame is disposed to co-operate with this inclined face to clamp the strap or belt therebetween when tension is applied to the strap. As in the aforesaid White and Smith patents, the buckle is herein shown in connection with a belt, but it will of course be understood that the buckle is suitable for various other uses and is not limited to its application to belts or similarly used straps.

Although in the drawings in the aforesaid patents the free end of the strap or belt is shown as closely overlying the buckle, it has been found in actual practice that this free end portion tends to follow the surface of the inclined face of the clamping bar and thus extends outwardly from the front of the buckle when the belt is clamped therein in the desired adjusted position. Although retaining loops are in the usual case provided on the belt adjacent the buckle for insertion of the free end portion of the belt, such loops will not cause the free end portion to lie as flat as may be desired, and the outward bulge of the belt between the buckle itself and the retaining loops has in some cases been found objectionable. Similarly, in buckles other than those having inclined strap-engaging faces it has been found that the belt tends to bulge outwardly in front of the buckle.

It is an object of the present invention to provide a slide buckle which will snugly clamp a strap inserted therethrough and at the same time will tend to retain the exposed end portion of the strap in a plane parallel with the normal plane of the buckle.

A further object is to provide a buckle in which all of the co-operating clamping elements are so constructed and related as to prevent any material disfigurement or mutilation of the strap used therewith and which will also provide an efficient strap clamping means.

Another object is the provision of a buckle of the character described which is cheap to manufacture, convenient in use, and will not easily get out of order.

Other objects will be apparent from the specification and the appended claims.

Fig. 1 is a front view of a belt or strap having a buckle associated therewith which embodies the present invention;

Fig. 2 is an enlarged longitudinal section through the buckle and is taken on line 2—2 of Fig. 1, the belt strap being shown in dotted lines and in clamped position in the buckle;

Fig. 3 is an enlarged sectional view similar to Fig. 2, with the frames moved to a relative position to enable threading of the strap therethrough, the strap again being shown in dotted lines more clearly to illustrate the buckle construction;

Fig. 4 is a transverse sectional view taken on line 4—4 of Fig. 1;

Fig. 5 is a perspective view of one of the buckle frame members, which in the present embodiment is in the form of a housing for enclosing the slidable clamping frame member shown in Fig. 6;

Fig. 6 is a perspective view of the other frame member which is slidably mounted in the housing shown in Fig. 5;

Fig. 7 is a somewhat diagrammatical sectional view of a buckle comprising another embodiment of my invention;

Fig. 8 is a similar sectional view showing the buckle of Fig. 7 in clamping position; and

Fig. 9 illustrates a still further embodiment of the invention.

Referring now to Figs. 1 to 6, inclusive, of the drawings in detail, the invention is shown as embodied in a buckle comprising an outer frame member 10 which is in the form of a housing and encloses a second or inner frame member 12, the latter being mounted in the housing for longitudinal slidable movement relative thereto. The out-

er frame member or housing 10 comprises side bars 13 and 14 which are connected together by means of end cross bars 15 and 16, all of the side bars and end cross bars being formed to provide a narrow inturned marginal flange 17 which extends completely around the frame 10 and provides a support and guide for the inner frame 12. The cross bar 15 is preferably provided, as shown, at its inner edge with a downturned flange 18, and this cross bar is adapted to have the loop 19 of a belt 20 secured thereto as illustrated by dotted lines in Figs. 2 and 3. The front cross bar 16 is preferably of arcuate formation in cross section, as shown, with its inner edge formed with a return bend to provide a smooth rounded edge 21 and an underlying flange portion 22 which extends substantially parallel with the lower marginal flange 17. This underlying flange 22 terminates in an angularly and downwardly extending portion 23 which provides a suitable inclined plane or clamping surface for co-operation with a cross bar of the inner frame member 12 to clamp the belt or strap therebetween. The upper edges of the side bars 13 and 14 of the housing 10 are turned inwardly and downwardly, as shown, to provide flanges 24, each of which is spaced from its respective side bar to provide a groove to receive and guide the side bars of the inner frame 12, as shown in Fig. 4.

The inner frame 12, as shown best in Fig. 6, comprises side bars 25 connected together by spaced cross bars 26 and 27, respectively, the side bars 25 conforming generally to the shape of the interior of the frame 10 and being tapered to provide rearward extensions 28 which are adapted to tilt the inner frame 12 when it is moved rearwardly in the frame 10. The lower edges of the side bars 25 and the extensions 28 are angularly disposed with the apex of the angle closely adjacent the cross bar 27, and the extensions 28 co-operate with the frame 10 during relative longitudinal movement of the frames to tilt the frame 12 upon movement of the frames from the position shown in Fig. 2 to the threading position shown in Fig. 3. The cross bar 27, which constitutes the clamping bar of the frame 12, is provided with an upwardly extending angular portion 29 terminating in a downwardly extending angular flange 30 which extends generally parallel to the plane of the engaged portion of a strap threaded between the cross bars. The cross bar 26, which constitutes the pull-up bar, is provided with a downwardly extending return bend 31 which provides a rounded edge for engagement with the strap 20 and prevents cutting or other disfiguration of the strap at this point.

It will be apparent that the inner frame member 12 is retained in slidable and tiltable relation with the outer frame or housing 10, and the side bars 25 of the frame 12 are longitudinally guided therein so that the frame 12 may assume the threading position shown in Fig. 3 to enable the strap 20 to be readily threaded through the buckle, and when tension is applied to the strap, engagement of the strap with the rounded edge of the pull-up bar 26 causes the frame members to move longitudinally to the clamping position shown in Fig. 2 so that the strap is snugly clamped between the cross bar 27 of the inner frame and the inclined clamping surface 23 of the cross bar 16 on the frame 10. In this position the upper surface of the strap engages the inturned horizontal portion 22 of the housing 10, and the preferably arcuate form of the intersection between the portions 22 and 23 prevents any material distortion or other disfiguration of the outer surface of the belt. Therefore, the belt or strap is snugly retained in clamped engagement in the buckle, and the horizontal portion 22 of the housing cross bar will bend the strap end out of a plane parallel to the inclined surface 23 so that it will tend to lie flat against the buckle, as shown by dotted lines. This is an important feature of the invention.

In adjusting or releasing the belt strap, the free end of the belt is pulled rearwardly, or may be pulled back over the rounded edge 21 on the cross bar 16, whereupon the inner frame will be caused to move toward the rear of the housing 10 until the belt is released from clamping engagement between the co-operating cross bars. At the same time, the tapered extensions 28 of the inner frame co-operating with the guides formed by the side bars 13 and 14 of the housing or frame 10, tend to tilt the inner frame to the position shown in Fig. 3 so that the belt is easily released from the buckle, or when in this position, the end of the belt strap may easily be inserted therethrough.

In all relative positions of the frames, the space between the cross bar 26 of the inner frame 12 and the portions 22 and 23 of the cross bar 16 on the frame 10 is always less than the thickness of the strap, so that this space is obstructed and improper threading of the strap therebetween is prevented.

In the embodiment shown in Figs. 7 and 8, no inclined clamping face is provided for engaging the belt or strap, but a somewhat similar effect is obtained by the provision of spaced apart contact points or surfaces so located that a plane passing therethrough is inclined with respect to the plane of the buckle frame. Thus, as shown in Figs. 7 and 8, the outer frame or housing 35 includes an end cross bar 36, the undersurface of which is shaped to provide portions 37 and 38 extending substantially parallel to the plane of the frame and connected by a portion 39 extending substantially at right angles thereto. The side bars 40 of the frame 35, only one of which is shown, include inwardly extending flanges 41 for supporting the inner or second frame 43, and the opposite ends of the side bars are connected by a second end cross bar 44.

The inner frame 43 includes side bars 45, only one of which is shown, and suitably shaped end cross bars 47 and 48 which respectively comprise the pull-up bar and the strap-engaging clamping bar. An additional cross bar 49 may be provided, as shown, on the frame 35 to engage the cross bar 48 on the frame 43 and serve as a stop therefor.

One end portion 50 of the belt or strap to which the buckle is applied may be connected in any suitable manner to the end cross bar 44 of the frame 35, and when the inner frame 43 is in the position shown in Fig. 7, the other or free end portion 51 of the belt or strap may be threaded through the buckle so as to pass under the cross bars 36 and 47, between the cross bars 47 and 48 of the frame 43, and through the outer frame or housing 35, as shown. The application of tension on the strap portions 50 and 51 in the direction of the arrows 52 will, by reason of the engagement of the strap portion 51 with the pull-up bar 47, cause the frame 43 to move to the position shown in Fig. 8, wherein the strap will be snugly clamped between the right angularly extending portions 37 and 39 on the cross bar 36 and the upper edge of the clamping bar

48 on the frame 43. During movement to this position the pull-up bar 47 passes beneath the surface 38 on the cross bar 36, but the height of the clamping bar 48 is sufficiently great to prevent it from passing thereunder and accordingly the strap is snugly clamped as above described. It will be observed that the points of contact between the strap portion 51 and the surfaces 37 and 39 on the cross bar 36 are so spaced apart that a plane passing therethrough is inclined with respect to the plane of the frame 35. Accordingly, a wedging action is obtained which is similar to the clamping effect obtained by the use of the inclined clamping surface 23 in the embodiment of Fig. 1.

The length of the inner frame 43 is preferably so correlated with the locations of the cross bars 36 and 49 on the frame 35 that the pull-up bar 47 lies at least partially beneath the surface 38 on the cross bar 36, and accordingly improper threading of the strap through the buckle is prevented. It will of course be understood that the additional cross bar 49 may be omitted and the end cross bar 44 on the frame 35 so located as to provide a stop for the inner frame 43. As shown in Fig. 8, the portion 37 of the cross bar 36 is effective to bend the portion 51 of the strap into a plane substantially parallel to the plane of the buckle, so that its free end portion tends to lie flat against the buckle in the manner heretofore explained in connection with the embodiment of Fig. 1.

In the embodiment shown in Fig. 9, the frames 55 and 56 correspond to the frames 35 and 43 of Fig. 7 and are substantially identical therewith except that the undersurface of the cross bar 57 is shaped to provide a pair of offset portions 58 and 59 extending substantially parallel to the plane of the buckle frame in place of the single flat portion 37 of Fig. 7, the portion 58 terminating in a substantially right angular portion 60 corresponding to the portion 39 of Fig. 7. As shown in Fig. 9, when the buckle is in clamping position the free end portion 61 of the strap engages the portions 59 and 60 in wedging relation so as tightly to clamp the strap, the upwardly offset portion 58 permitting a slight bulge in the strap as shown so as to crimp the strap about the rear edge of the portion 58 and thus increase the clamping action. As in the previously described embodiments, the portion 59, which extends substantially parallel to the plane of the buckle frame, causes the extending free end of the strap to lie closely adjacent the front of the buckle, but in this embodiment the additional deformation of the strap caused by the offset portions 58 and 59 effects a more positive gripping action.

It is intended, of course, that the invention should not be limited to the specific embodiments disclosed herein, since modifications may be made, and it is contemplated, therefore, by the appended claims to cover any such modifications as fall within the true spirit and scope of this invention.

Having thus described this invention, what is claimed and desired to be secured by Letters Patent is:

1. A buckle comprising a pair of frames in longitudinally slidable face-to-face relation, each having side bars and spaced cross bars so related that a strap may be passed through said buckle when said frames are in one relative position and will be clamped between said frames in adjusted position when said frames are moved to another position, and means on said buckle to bend said strap simultaneously with said clamping operation so that the free end of said strap tends to lie snugly against said buckle.

2. A buckle comprising a pair of frames in longitudinally slidable face-to-face relation, each having side bars and spaced cross bars so related that a strap may be passed through said buckle when said frames are in one relative position and will be clamped between said frames in adjusted position when said frames are moved to another position, a cross bar on one of said frames having a portion of the inner surface thereof substantially parallel with the path of movement of said frames and another portion thereof transverse to said path of movement, a cross bar on the other of said frames being movable under said substantially parallel portion and having a strap engaging portion co-operating with said transverse portion to clamp said strap in adjusted position, said parallel portion engaging the upper surface of said strap in said clamped position to bend the free end of said strap out of the plane of said inclined portion and direct said free end substantially parallel to the plane of said frames.

3. A buckle comprising a pair of frames in longitudinally slidable face-to-face relation, each having side bars and spaced cross bars so related that a strap may be passed through said buckle when said frames are in one relative position and will be clamped between said frames in adjusted position when said frames are moved to another position, a cross bar on one of said frames having a portion of the inner surface thereof substantially parallel with the path of movement of said frames and another portion thereof inclined relative to said path of movement, a cross bar on the other of said frames being movable under said substantially parallel portion and having a strap engaging face co-operating with said inclined portion to clamp said strap in adjusted position, said parallel portion engaging the upper surface of said strap in said clamped position to bend the free end of said strap out of the plane of said inclined portion and direct said free end substantially parallel to the plane of said frames.

4. A slide buckle comprising a pair of relatively slidable frames disposed in face-to-face substantially parallel relation, said frames having side bars and spaced cross bars connecting said side bars for defining openings through said frames to receive a strap therethrough, means on said frames for directing relative longitudinal movements thereof to move said openings into and out of alignment, one cross bar of one of said frames having its underlying surface adjacent the inner edge of said bar substantially parallel with the direction of relative movement of said frames, and a continuation of said parallel surface being substantially right-angularly and downwardly disposed, one cross bar on the other frame co-operating with said angularly disposed surface to clamp a strap threaded therebetween in adjusted position and with said substantially parallel surface to deflect the extending portion of said strap from the plane of said angular surface.

5. A slide buckle comprising a pair of relatively slidable frames disposed in face-to-face substantially parallel relation, said frames having side bars and spaced cross bars connecting said side bars for defining openings through said frames to receive a strap therethrough, means on said frames for directing relative longitudinal

movements thereof to move said openings into and out of alignment, one cross bar of one of said frames having its underlying surface adjacent the inner edge of said bar substantially parallel with the direction of relative movement of said frames, and a continuation of said parallel surface being angularly and downwardly disposed, one cross bar on the other frame co-operating with said angularly disposed surface to clamp a strap threaded therebetween in adjusted position and with said substantially parallel surface to deflect the extending portion of said strap from the plane of said angular surface.

6. A slide buckle comprising a pair of relatively slidable frames disposed in face-to-face substantially parallel relation, said frames having side bars and spaced cross bars connecting said side bars for defining openings through said frames to receive a strap therethrough, means on said frames for directing relative longitudinal movements thereof to move said openings into and out of alignment, one cross bar of one of said frames having an integrally formed underlying portion presenting a strap engaging surface substantially parallel to the path of movement of said frames and a strap engaging surface inclined thereto, and one cross bar of the other frame being positioned to clamp a strap in adjusted positions against said inclined surface, said substantially parallel surface engaging said strap to change the normal direction of said strap through said buckle.

7. A buckle comprising an outer frame having side bars, an upwardly and rearwardly inclined front cross bar and a rear cross bar, said side bars having upper and lower inturned marginal flanges, an inner frame having side bars embraced by said flanges for longitudinal sliding movement and simultaneous tilting movement of said inner frame in said outer frame, said inner frame having cross bars connecting the side bars thereof, the front cross bar of said outer frame having a material portion of its undersurface adjacent its inner edge substantially parallel with the plane of the buckle and having a continuing downwardly inclined surface, the longitudinal and tilting movement of said inner frame being limited and controlled by said outer frame so that a front cross bar of said inner frame is under and adjacent said parallel surface to obstruct the opening therebetween when said inner frame is in one extreme position, and is under said inclined surface when said inner frame is in the other extreme position.

8. A buckle comprising a pair of frames in longitudinally slidable face-to-face relation, each having side bars and spaced cross bars so related that a strap may be passed through said buckle when said frames are in one relative position and will be clamped between said frames in adjusted position when said frames are moved to another position, a cross bar on one of said frames having portions of the inner surface thereof extending substantially parallel to the path of movement of said frames in offset relation to each other and connected by a transversely extending surface, a cross bar on one of said frames being movable under the uppermost one of said parallel portions to clamp said strap against said transverse portion and said one parallel portion at points disposed in a plane inclined to said path of movement, engagement of said one parallel portion with said strap being effective to direct the free end of said strap substantially parallel to the plane of said frames.

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