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FASTENER

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This invention relates to a fastener and has special reference to a device adapted to be adjustably associated with straps, bands, and the like, for the support of garments or other objects on the person.

More particularly, this invention relates to fasteners comprising slidably engaged frames for receiving a strap, band, or the like, threaded therebetween, the frames cooperating to clamp the strap in various adjusted positions upon the tensioning of the strap. The strap is clamped between opposed faces of cooperating cross bars, one of the cross bars having a raised portion thereon coacting with the edge of the other of the cooperating cross bar to grip the strap in its clamped position.

The device of the present invention is adaptable for use with various types of objects particularly on the person and may be employed with slight variations not departing from the spirit of the invention universally where detachable connections are desired to be made. However, in the drawing and in the following description, the fastener will be shown and described in association with a shoulder strap for lingerie and also in its association with a shoulder strap of an overall, the strap in each instance being threaded through the slots defined by the side bars and cross bars in the slidably engaged frames, the strap being clamped between the opposed faces of the cooperating cross bars and also between the edge of one of the cooperating cross bars and an abrupt raised portion or an opening provided by an abrupt raised portion of the other of the cooperating cross bars. It will of course, be readily apparent that various other uses could be mentioned and that this invention is not to be limited to the specific use herein described and illustrated.

A fastener is herein contemplated which is formed of two slidably engaged frames for the reception of a strap threaded therebetween, the frame members and associated elements cooperating to grip efficiently and at the same time to permit of a ready adjustment. The strap is held positively against slipping after an initial application of tension and the slidably engaged frames are caused to assume a predetermined locked relation from which it is substantially impossible to unlock excepting by manual application of force.

In the lingerie type of fastener the strain imposed thereon by the shoulder strap is not ordinarily very substantial and a light weight frame is shown in the drawing. It is not believed

necessary to reinforce the frames by forming the side bars and cross bars of arcuate cross section as is desirable in the instance of the overall buckle. Further, in the use of lingerie straps, it is desirable to provide for an automatic adjustment for straps of varying thicknesses and in order to permit of such an accommodation it is contemplated in this invention to form at least one of the cooperating cross bars of one of the frame members in a manner to provide for its being resilient so that it may give when a relatively thick strap is inserted between the cooperating bars or will assume its original state when used in association with relatively narrow bars.

The factors entering into the automatic adjustment of straps of various thicknesses being the compressibility of the material of the strap and the resiliency of one of the cooperating cross bars. It is, of course, to be understood that only one cross bar need be resilient since it may be desirable that the other cross bar maintain its rigidity by being formed with a raised portion for cooperating with the edge of the resilient bar.

One of the objects of this invention is to provide a fastener comprising a pair of slidably engaged frames of the type hereinabove described, in which the strap may be conveniently threaded therethrough and may be easily adjusted.

Another object of this invention is to provide a fastener comprising a pair of slidably engaged frames of the character indicated above in which cooperating cross bars clamp the strap in adjusted positions between the opposed faces thereof upon the tensioning of the strap, and also grip the strap between the edge of one of the cooperating cross bars and a raised portion or a recess provided by a raised portion on the other cross bar.

A further object of this invention is to provide a fastener comprising a pair of slidably engaged frames as hereinabove pointed out in which the construction may be relatively inexpensive to manufacture, may be durable and simple in construction, and may be simple in threading and in manipulation.

Other objects and advantages will be hereinafter more particularly pointed out and for a more complete understanding of the characteristic features of this invention, reference may now be had to the following description when taken together with the accompanying drawing, in which latter:

Figure 1 is a face view of a fastener constructed in accordance with the teachings of this invention in which the fastener is shown as connecting a portion of a shoulder strap with a fragmentary portion of a lingerie;

Figure 2 is a central vertical sectional view taken on the line 2—2 of Figure 1, showing a clamped engagement between the slidably engaged frames;

Figure 3 is a view similar to Fig. 2, showing the position of the frames during the threading operation and prior to the clamped position thereof;

Figure 4 is a plan sectional view taken on the line 4—4 of Fig. 2;

Figure 5 is a view similar to Fig. 4 taken on the line 5—5 of Fig. 2;

Figure 6 is a perspective view of one of the frames of the fastener construction illustrated in Figure 1;

Figure 7 is a view similar to Fig. 6, showing the other of the frame members of the fastener construction shown in Figure 1;

Figure 8 is a view similar to Fig. 4, showing the action of a resilient cross bar of one of the frame members;

Figure 9 is a face view of a fastener constructed in accordance with the teachings of this invention in which the fastener is employed as a buckle connecting a portion of a strap with a fragmentary portion of a bib of an overall;

Figure 10 is a central vertical sectional view taken on the line 10—10 of Fig. 9;

Figure 11 is a perspective view of one of the frames of the fastener construction illustrated in Fig. 9;

Figure 12 is a view similar to Fig. 11, showing the other of the frame members of the fastener construction shown in Fig. 9;

Figure 13 is a view similar to Fig. 2, showing a modified form of fastener incorporating the features of this invention;

Figure 14 is a perspective view of one of the frame members shown in Fig. 13; and

Figure 15 is a view similar to Fig. 14, showing the other frame member embodied in Fig. 13.

Referring now to the drawing and more particularly to Figs. 1 to 7, inclusive, thereof, the construction therein shown comprises a pair of frame members 15 and 16, the frame member 15 being substantially rectangular having side bars 17 and 18 and cross bars 19, 20 and 21 defining substantially rectangular slots 22 and 23, as shown more particularly in Fig. 7 of the drawing.

The frame member 16 is likewise substantially rectangular in shape and comprises side bars 24 and 25 and cross bars 26 and 27 defining a substantially rectangular shaped opening 28, as shown more particularly in Fig. 6 of the drawing. The frames 15 and 16 are preferably stamped from sheet metal or otherwise formed of a unitary construction so that the commercial production of the fastener is thus facilitated. In the stamped fastener, the bars or frames may be dished in cross-section to result in the strengthening of the fastener and the use of a relatively light gage metal, although in the particular use to which the fastener illustrated in these figures is concerned, the surfaces of the side bars and cross bars are substantially flat.

The cross bar 26 is preferably flat and has an abrupt raised portion 29 adjacent one edge thereof, the width of the raised portion being less than the width of the bar and terminating preferably a substantial distance from the side bars 24 and 25. The raised portion 29 is preferably formed by slitting and deforming the material thereof

between the slit and one edge upwardly beyond the thickness of the material to provide an opening thereat. The side bars 24 and 25 of the frame 16 are preferably bent back upon themselves in a spaced relation to form channels for receiving the opposed edges or side bars 17 and 18 of the frame 15. In the form shown in the present figures, the upper sides of the channels are substantially parallel with the frame and are spaced slightly greater than the width of the frame so that play may be had of about the thickness of a strap allowing preferably for a slight compressibility thereof.

In order to assemble one of the frames on the other frame, it is at least initially desirable to offset the bars 19 and 20 of the frame 15 to an extent such that these bars may pass over the raised portion 29 of the frame 16. The raised portion 29, therefore, extends across the path of the cross bar 21 when in an assembled relation with the side bars 17 and 18 resting in the channels formed on the side bars 24 and 25.

Referring now more particularly to Fig. 3 of the drawing, a strap 30 is shown in a threaded relation with the unclamped assembled frame members, the free end of the strap 30 being passed under the bar 19 upwardly through the opening 22 over the bar 20 and thence downwardly through the slots 23 and 28 to a position behind the bar 27. In this position of the frame members, the strap may be readily moved in either direction for adjustment.

Referring now more particularly to Fig. 2, the strap is shown in a clamped adjusted position, a tension on the strap 30 providing a relative longitudinal movement of the frame members 15 and 16 in opposite directions, the frame 15 moving upwardly with the strap and the frame 16 remaining in a fixed position relatively to the lingerie 31.

The relative longitudinal movement thus effected by the tension of the strap 30 causes a clamping of the strap between the opposed faces of the bars 21 and 26 and a pinching of the strap between the edge of the cross bar 21 and the edge of the raised portion 29 of the bar 26, the raised portion being positioned in the path of movement of the cross bar 21. An edge portion of the cross bar 21 of the frame 15 overlies the flat surface remaining adjacent the raised portion of the bar 26 and clamps the strap 30 between the opposed faces thereof. Further, the edge of the bar 21 pinches the strap against the abruptly raised portion 29 of the cross bar 26 of the frame 16 to further frictional resistance between the strap and the fastener, it being noted further that the strap assumes a substantially right angle bend.

The space in the channel members in which the opposed edges of the frame 15 ride may be slightly less than the combined thicknesses of the frame 15 and the strap to allow for compressibility of the material of the strap and when desirable, to allow for resiliency of the bar 21' as shown more particularly in Fig. 8. The flat surface of the bar 26, therefore, provides a flat ledge on which the cooperating bar rides and the compressibility of the material of the strap and, also when desired, a resiliency of the cooperating cross bar prevent displacement of these members from a clamped position except by manual force since there is a substantial frictional resistance to overcome in separating the frame members.

Referring now more particularly to Figs. 9 to 12, inclusive, the construction therein shown is particularly adapted for use in connection with

overalls and comprises a pair of frame members 32 and 33, the frame member 32 being substantially rectangular and having side bars 34 and 35 connected between cross bars 36, 37 and 38 to define substantially rectangular slots 39 and 40, as shown more particularly in Fig. 12 of the drawing.

The frame member 33 is likewise substantially rectangular in shape and comprises sides 41 and 42 connected by a cross bar 43 at one end thereof and by a cross bar 44 at the other end thereof, which latter cross bar is shaped to define a loop 45, the button receiving opening 46 of which opens into a substantially rectangular slot 47 defined by the side bars and cross bars. The loop 45 is preferably provided with offset portions 48 extending forwardly or upwardly with reference to the remainder of the face of the loop and, further, portions 49 of the bar 44 are offset to extend in a direction rearwardly of the loop for facilitating the entrance of the button into the loop, the forwardly extending offset portions 48 directing the button forwardly over the bar 43 when tension is released from the strap to prevent displacement of the button from the loop.

The frame members 32 and 33 may be conveniently stamped from sheet metal or otherwise formed preferably of a unitary construction so that the commercial production of the buckle may be facilitated. The cross bars of the frame 32, together with the bar 44 and its integrally formed loop, are preferably of dished or arciform cross section to provide for a relatively high strength in comparison to the light weight material. The opposed edges 41 and 42 of the frame 33 are preferably bent back upon themselves in a spaced relation to form channels for receiving the opposed edges 34 and 35 of the frame 32. The flat bar 43 of the frame 33 has an abrupt raised portion 50, which latter is substantially shorter than the width between the inner portions of the side bars and is narrower than the width of the bar from which it is raised.

The cross bars 36 and 37 of the frame 32 are preferably at least initially raised in order that the frames may be assembled in a slidably engaged relation, the bars 36 and 37 being sufficiently high to pass over the raised portion 50 of the frame 33. After they are once in position, it may be desirable to straighten one or both of the bars so as to definitely limit the slidable movement therebetween and so that the frame members of the buckle may not become displaced one from the other, the bar 38 limiting the relative movement of the frames in one direction and either the bar 36 or 37 limiting the relative movement of the frame members in the other direction. However, it may be desirable to permit the cross bars 36 and 37 to retain their initially raised positions in order that the frame members 32 and 33 may be disengaged one from the other.

After the frame members 32 and 33 are in an assembled condition, the bar 38 cooperates with the flat surface of the bar 43 to clamp the strap in adjusted positions between the opposed faces thereof upon tensioning of the strap, the spacing of the channels being preferably less than the combined thicknesses of the strap and the engaging edges. Also, the edge of the abrupt raised portion 50 may coact with the edge of the cross bar 38 to pinch the strap therebetween when the strap is in a clamped adjusted position, the strap not only being pinched between the opposed faces above described, but the strap is turned at substantially a right angle which provides a maxi-

mum friction practically impossible to overcome in any instance of ordinary use without either tearing the strap or distorting the frames out of shape. Such a tension on the strap is, of course, never had in the use of a garment even such as an overall which receives the most severe usage. In this instance, as in the previous embodiment, the frames now being operated into a clamped adjusted position are, in effect, engaged in a manner similar to that of a clasp since it necessitates manual force and manipulation to disengage the frame members once they are associated in the manner stated.

The free end of a strap 51 is passed under the bar 36 upwardly through the opening 39 over the bar 37 and thence downwardly through the slots 40 and 47 to a position behind the loop 45, which threading is shown more clearly in Fig. 10. In such a position of the frame members, the strap is in a substantially locked adjusted position and requires manual manipulation of the frames in a direction toward each other to free the strap from such a position.

The construction shown in Figs. 13 to 15, inclusive, is very much similar to the embodiment first described in connection with Figs. 1 to 7, inclusive, and comprises a pair of frame members 15a and 16a, the frame member 15a being substantially rectangular having side bars 17a and 18a and cross bars 19a, 20a, and 21a defining substantially rectangular slots 22a and 23a, as shown more particularly in Fig. 15 of the drawing.

The frame member 16a is likewise substantially rectangular in shape and comprises side bars 24a and 25a and cross bars 26a and 27a defining a substantially rectangular slot 28a, as shown more particularly in Fig. 14 of the drawing. The frames 15a and 16a are preferably stamped from sheet metal or otherwise formed of a unitary construction and, as in the previously described embodiment, the bars or frames may be dished in cross section and may be formed with the bar 27a having a loop opening into the interior of the frame to form the usual overall buckle construction.

The cross bar 26a has a substantially flat surface having an abrupt raised portion 29a extending transversely of the cross bar and terminating a spaced distance from the inner edges 24a and 25a, one edge of the flat surface being inclined rearwardly as at 52 from the plane of the frame so that the cross bar is provided with portions displaced out of the plane thereof in opposite directions. The abrupt raised portion 29a is preferably formed by slitting and deforming a portion of the material of the cross bar 26a upwardly beyond the thickness thereof, thereby providing an opening 53 which cooperates with a downwardly projecting tongue portion 54 of the cross bar 21a of the frame 15a for purposes which will hereinafter be more particularly pointed out.

The cross bars 24a and 25a of the frame 16a are preferably bent back upon themselves in a spaced relation to form channels for receiving the opposed edges or side bars 27a and 28a of the frame 15a. The upper sides of the channel formed on the edges 24a and 25a are substantially parallel with the frame and are spaced a sufficient distance to receive the opposed edges 17a and 18a in slidable engagement therewith.

In assembling the frames in a cooperative relation, the bars 19a and 20a are offset with respect to the plane of the frame to such an extent that the cross bars may pass over the raised portion 29a of the frame 16a. When the fasteners of the

present invention are sold with the garment as a part thereof, the bar 27a is fastened to the garment after the frames are assembled which prevents a displacement of the bars, one from the other. However, when the fastener is sold as a unit to be subsequently fastened to a garment, it may be desirable to provide that the frames remain in a non-separable relation and in such instance it may be desirable to straighten the offset bar 19a to limit the slidable engagement of the frame members in one direction, it being noted that the bar 21a will limit the slidable engagement in the other direction.

After the buckles are in operable condition, a strap may be threaded therebetween in a manner shown more particularly in Fig. 13 of the drawing, the free end of the strap 30a being passed under the bar 19a upwardly through the opening 22a over the bar 20a and thence downwardly through the slots 23a and 28a to a position behind the bar 27a. However, the strap 30a is shown in a clamped adjusted position in Fig. 13, whereby a tension of the strap 30a has provided a relative longitudinal movement of the frame members 15a and 16a in opposite directions away from each other, the frame 15a having moved upwardly with the strap and the frame 16a having remained in a fixed relation relatively to the lingerie 31a.

The relative longitudinal movement thus initiated by the tension of the strap causes a clamping of the strap between the opposed faces of the bars 21a and 26a and a clinching of the strap in the opening 53 by reason of the tongue 54 urging the strap thereinto. The inclined portion 52 of the bar 26a facilitates the introduction of the strap into the opening 53, the tongue portion 54 being substantially the width of the inclination 52 of the bar 26a. The strap 30a, therefore, is clamped between the flat edges of the bars 21a and 26a and the clinching of the strap is accomplished by the inclined tongue 54 urging a portion of the strap 30a into the recess 53.

There is preferably a desired resiliency in the bar 21a so that in riding up the incline 52 the tongue will be permitted to give sufficiently to accommodate the strap therebetween and when in registration with the aperture or recess 53, the tongue will tend to return to its initial position due to the resiliency of the material and will cause the strap to be urged into the recess.

While several embodiments of this invention are herein shown and described, it is to be understood that various modifications thereof may be apparent to those skilled in the art without departing from the spirit and scope of this invention and, therefore, the same are only to be limited by the scope of the prior art and the appended claims.

We claim:

1. A slide buckle, comprising a pair of slidably engaged frames having cooperating bars for engaging a strap threaded therebetween, one of said cooperating bars having a portion displaced out of the plane thereof and the other of said cooperating bars having portions displaced out of the plane thereof in opposite directions with a recess therebetween, the displaced portion of said first mentioned cooperating bar coacting with the walls of said recess to clamp said strap in adjusted positions upon the movement of said frames in opposite directions, one of the displaced portions of said second mentioned cooperating bars facilitating the introduction of the displaced portion of said first mentioned cooperating bar

into cooperative relation with the walls of said recess and the other displaced portion of said second mentioned cooperating bar extending into the path of movement of said first mentioned cooperating bar to engage said strap extending from between the opposed faces of said cooperating bars.

2. A slide buckle, comprising a pair of slidably engaged frames each having side bars and cross bars connecting said side bars defining at least one slot for receiving straps threaded therethrough, a cross bar of one of said frames acting to support a garment or other article and the other cross bar having a raised portion and engaging said strap, a cross bar of the other of said frames overlying a portion of said strap engaging cross bar of said first mentioned frame and cooperating therewith to clamp said strap in adjusted positions between the opposed faces thereof and between the edges of said cross bar and said raised portion upon the tensioning of said strap, and a pair of cross bars of said second mentioned frame being raised out of the plane thereof to pass over said strap engaging raised portion.

3. A slide buckle, comprising a pair of slidably engaged frames each having side bars and cross bars connecting said side bars defining at least one slot for receiving straps threaded therethrough, a cross bar of one of said frames acting to support a garment or other article and the other cross bar having portions displaced from the frame in opposite directions and a recess therebetween, and a cross bar of the other of said frames overlying a portion of said first mentioned cross bar and having a displaced portion for cooperating with the walls of said recess to clamp said strap in adjusted positions upon the tensioning of said strap, one of said displaced portions of said first mentioned cooperating cross bars facilitating the introduction of the displaced portion of said second mentioned cooperating cross bar into cooperative relation with the walls of said recess and the other displaced portion of said first mentioned cooperating cross bar extending into the path of movement of said second mentioned cooperating cross bar to engage said strap extending from between the opposed faces of said cooperating bars.

4. A slide buckle, comprising a pair of slidably engaged frames having cooperating substantially flat bars for engaging a strap threaded therebetween, one of said cooperating bars being slit and having a portion deformed from the material thereat to extend out of the plane thereof providing a recess thereat, and the other bar having movement in the path of said deformed portion and cooperating with the walls of said recess to clamp said strap therebetween in adjusted positions and between the opposed faces of said cooperating bars upon the movement of said frames in opposite directions.

5. A slide buckle, comprising a pair of slidably engaged frames each having side bars and cross bars connecting said side bars defining at least one slot for receiving straps threaded therethrough, a cross bar of one of said frames being slit and having a portion deformed from the material thereat to extend out of the plane thereof providing a recess thereat, and a cross bar of the other of said frames cooperating with said first mentioned cross bar to clamp said strap between the opposed faces thereof and having movement in the path of said deformed portion and having a portion cooperating with the walls of said recess to clamp said strap therebetween

in adjusted positions upon the tensioning of said strap.

5 6. A slide buckle, comprising a pair of slidably engaged frames each having side bars and cross bars connecting said side bars defining at least one slot for receiving straps threaded therethrough, one of said frames having a cross bar acting to support a garment or other article and another cross bar having a raised portion engaging said
10 strap, the other of said frames having three cross

bars in which one of these cooperates with said strap engaging bar to clamp said strap in adjusted positions therebetween upon the tensioning of said strap and the other cross bars are raised out of the plane of the frame to pass over the strap engaging raised portion of the other frame. 5

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