

Jan. 29, 1963

M. SCHWARTZ
ADJUSTING STRAP BUCKLE

3,075,268

Filed Feb. 9, 1961

FIG. 4

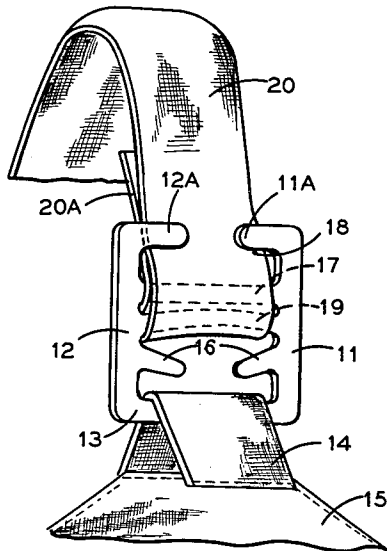


FIG. 2

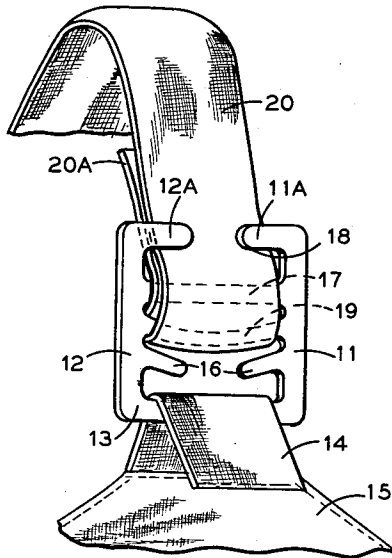


FIG. 1

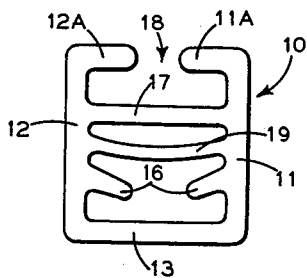


FIG. 3

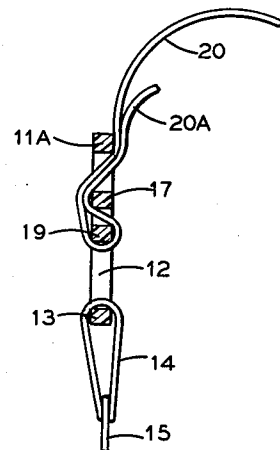
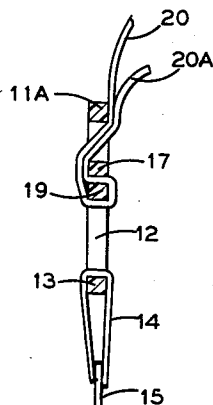


FIG. 5



INVENTOR.
Marcus Schwartz
BY *Irving Seidman*
ATTORNEY

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ADJUSTING STRAP BUCKLE

Marcus Schwartz, Kew Garden Hills, N.Y., assignor to
S. & S. Industries, Inc., New York, N.Y., a corporation
Filed Feb. 9, 1961, Ser. No. 88,117
3 Claims. (Cl. 24-200)

This invention relates in general to a strap buckle, and more specifically to an improvement in garment buckles for rendering garment straps readily adjustable to the body of the wearer, and for positively securing the strap in the adjusted position. The buckle to which the instant invention pertains is that class of buckle associated with straps, bands, ribbons or the like for supporting and adjusting garments, such as slips, brassieres, undergarments of various kinds, harnesses and the like to the body of a person.

Heretofore, it had been customary to employ a rigid metallic buckle having a frame formed with end members interconnected by a plurality of cross bars, one of which has looped thereover the fixed strap of the garment and the others of which have threaded or laced thereover the free end of the adjustable strap, e.g. the shoulder strap. In the known conventional type of strap buckle the free end of the adjustable strap was merely looped about one cross bar and doubled over onto itself to adjust the strap to the required length, and the strap then held fast by lacing the doubled over portion of the strap over one cross bar and under another. Consequently, in the buckles of the known constructions the adjusted strap was held merely by the frictional force of the lacing arrangement of the strap over and under opposite cross-bars. Thus in the event of an exaggerated body movement, or in the event the strap is thin, shiny or worn, the mere lacing of the strap in the known manner over the cross bars of the buckle is insufficient to prevent slippage. Consequently, the known buckles under certain conditions proved troublesome, requiring the wearer to either endure the uncomfortable feeling of a mal-adjusted garment, which is particularly annoying if the garment is an undergarment, or else be annoyed by a continual need for readjusting the strap to take up the unavoidable slippage.

Therefore an object of this invention is to provide in a buckle of the type described an improvement which will effect a positive gripping of the strap in the adjusted position and thus minimize slippage of the strap due to either exaggerated body movements or worn or shiny straps.

Another object is to provide an improved strap buckle in which the positive gripping action of the buckle on the strap is rendered more positive as the stresses tending to produce slippage of the strap is increased.

Another object is to provide an improved strap buckle that is relatively simple in construction, inexpensive to produce, and which is positive in operation.

Other objects, features and advantages will become more readily apparent when considered in view of the description and drawings in which:

FIG. 1 is a detail view of the buckle incorporating the improvement of this invention.

FIG. 2 is a perspective view illustrating the buckle as applied to a garment, e.g. a slip or brassiere in which the straps are not under a stress.

FIG. 3 is a right end view of FIG. 2, with the buckle shown in section.

FIG. 4 is a perspective view of the buckle as applied to a garment illustrating the buckle as it appears when the garment strap is under a stress.

FIG. 5 is a right end view of FIG. 4, with the buckle shown in section.

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Referring to the drawings, FIG. 1 illustrates a strap buckle 10 in accordance with this invention. It comprises essentially a frame having a pair of side members 11 and 12 interconnected by end cross member 13 at one end thereof, and over which the fixed strap 14 of a garment 15 is adapted to be looped. Projections 16 may extend inwardly from both side members to serve as positioning means for the strap 14. A second cross member 17 is extended between the side members intermediate the ends thereof, and the end portions 11A, 12A of the respective side members 11, 12 are turned inwardly to define with cross member 17 a T-shape slot 18.

In accordance with this invention a flexible cross bar 19 is extended between the side members at a position intermediate cross members 11 and 17. As shown the bar 19 is arcuate in shape and it is normally bowed in the direction of cross member 13. The important aspect of this invention is that the bar 19 is adapted to flex between the stressed strap position as shown in FIG. 4 and the unstressed strap position as shown in FIG. 2.

According to this invention the adjustable strap 20, which has one end (not shown) fixed to the back of the garment, e.g. a slip or brassiere, in a suitable manner, and has its free end 20A looped about the flexible bar 19 which is reversed upon itself as seen in FIGS. 2 to 5. Thus the strap is adjusted to the wearer simply by taking up or letting out on the free end of the strap 20. To fasten the free end 20A of the adjustable strap 20 in the desired adjusted position the doubled over strap portion is laced over cross member 17 and under inturned ends 11A, 12A. This lacing frictionally secures the straps in adjusted position, as in the conventional type buckles.

However, in the arrangement described it will be noted that any tendency of the strap 20 to slip, when in the laced position thereof, due to exaggerated body movement, or too worn, thin or shiny smooth straps when excessively stressed, is resisted due to the flexing action of the bar 19 about which strap 20 is looped. As shown in FIGS. 4 and 5, when the strap is placed in tension or otherwise stressed, it causes bar 19 to flex in the nature of a toggle. That is, the arcuate portion of the bar is flexed through its dead center position. Thus a positive gripping of the strap is attained by the flexing action of bar 19 as the strap is stressed. The buckle arrangement is such that as the bar 19 flexes from its normal bowed position, as shown in FIGS. 2 and 3, to its stressed position of FIGS. 4 and 5, the strap portion looped between cross members 17 and 19 become firmly wedged therebetween. Thus it will be noted that the more strap 20 is stressed, the greater will be the force exerted by the flexible bar 19 against bar 17 and the strap 20 wedged therebetween due to the toggle-like action of flexing bar 19. Thus the positive gripping action of the strap of the buckle construction herein described prohibits any tendency of the strap 20 to slip. Consequently a garment equipped with a strap buckle described is less likely to become maladjusted.

In accordance with this invention the buckle is preferably formed of a plastic material such as "Delrin" or the like. Thus, by merely sizing the shape and thickness of the respective buckle component parts, the respective components can be rendered as rigid or flexible as required to effect the operation of the buckle as herein described.

It is common practice in the brassiere and undergarment industries to use different types and thickness of materials for garment straps. In order that these various materials used for garment straps be properly secured without slippage in the strap buckles heretofore known, it has always been necessary to maintain a large buckle inventory of a great many different kinds of buckles, in

order to accommodate the different kinds of materials. For example garment straps are manufactured in approximately four widths, such as $\frac{1}{2}$ ", $\frac{5}{8}$ ", $\frac{3}{4}$ " and $\frac{7}{8}$ ", and may be made from single ply ribbon, double ply cloth, laminated cloth, i.e. two materials laminated together, stitched nylon, satin and many other materials, all having different thicknesses. For each thickness of these materials a different size slot opening is required in the buckle so that the buckle could work without slippage. Thus the buckles had to be stocked according to both width and size of slot in order to accommodate the present varieties of straps. Thus complete inventories of such buckles would consume much of the manufacturer's space, time and money.

With the instant invention the wedging or toggle like action of the flexible bar 19 greatly reduces the need of stocking buckles with different slot sizes of any given width since the toggle action permits the buckle to be applicable with straps or varying thickness. Thus the instant buckle is readily adapted to securely fasten without slippage and with equal facility straps of varying thicknesses. Thus the heretofore large inventories of buckles, heretofore required, can be greatly reduced, thereby affording a garment manufacturer substantial savings in time, money and space.

While the instant invention has been disclosed with reference to a particular embodiment thereof, it is to be appreciated that the invention is not to be taken as limited to all of the details thereof as modifications and variations thereof may be made without departing from the spirit or scope of the invention.

What is claimed is:

1. A buckle for rendering garment straps adjustable comprising a frame having a pair of side members, a connecting member over which a fixed garment strap is looped, a cross member extending transversely of said side members intermediate the ends thereof, and a flexible cross bar about which an adjustable strap is looped extended between said side members and disposed between the connecting member and said cross member, said flexible cross bar having its opposed ends integrally connected to the adjacent side member being normally bowed toward said connecting member and adapted to flex toward said cross member when stressed by a force applied to said adjustable strap whereby said adjustable strap is positively secured between said flexible cross bar and said cross member so as to prevent slippage of the adjustable strap when stressed.

2. A buckle for rendering garment straps adjustable comprising an integral formed frame having a pair of side members, a connecting end member extending transversely between said side members over which a fixed garment strap is adapted to be looped, a cross member connected to and extended transversely between said side members intermediate the ends thereof, said side members having inwardly turned end portions spaced from said cross members to define therewith a T-shaped slot, and a flexible bar about which an adjustable strap is looped extending between said side members and disposed between said end member and said cross member, said flexible bar having its opposed ends integrally connected to the side members, said flexible bar being normally bowed toward said end member and adapted to flex toward said cross member when stressed by a force applied to the adjustable strap, the ends of which extend over said cross member and under said inwardly turned ends of said side members so that the looped ends of the adjustable strap are positively secured between the flexible bar and said cross member to prevent slippage of the adjustable strap when stressed.

3. A buckle for rendering garment straps adjustable comprising a frame having side members terminating in an inwardly turned end portion at one end thereof and a connecting member over which a fixed garment strap is looped extending between said side member at the other end thereof, a cross member extending transversely of said frame intermediate the ends of said side members, and a flexible bar extending between said side members and having its opposed ends integrally connected to the adjacent side member, said flexible bar being disposed between said connecting member and said cross member wherein said bar is normally bowed toward said connecting member and adapted to flex toward said cross member when stressed by a force applied to an adjustable strap adapted to be looped about said flexible bar and the ends of which extend over said cross member and under said intumed ends of said frame.

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