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E. PRETE, JR., ET AL

2,816,339

BUCKLE

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FIG. 1.

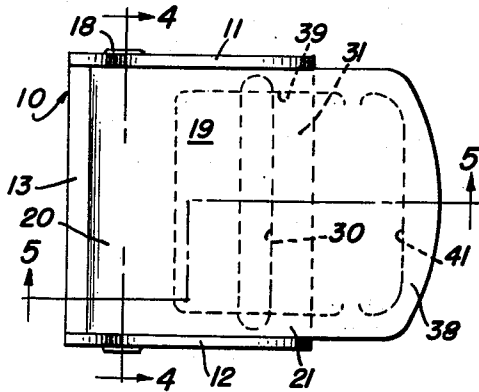


FIG. 2.

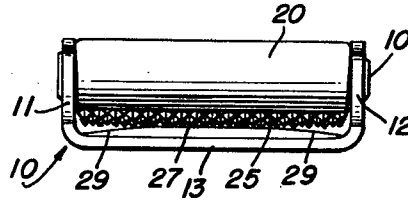


FIG. 3.

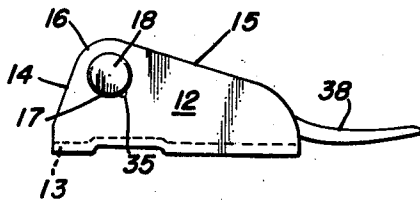


FIG. 4.

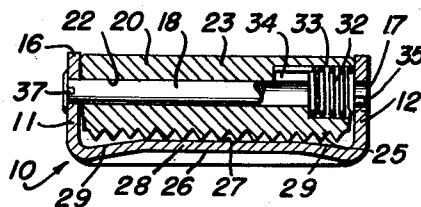


FIG. 5.

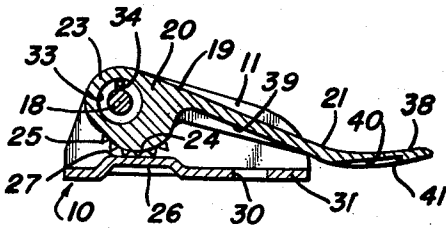


FIG. 6.

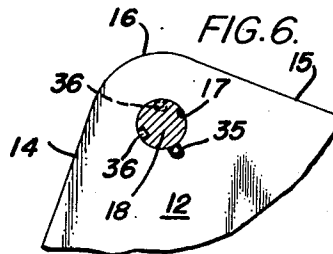
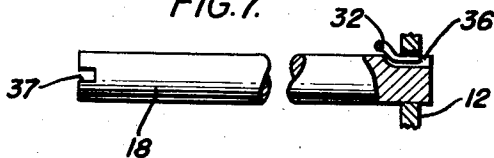


FIG. 7.



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2,816,339

BUCKLE

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12 Claims. (Cl. 24—170)

The present invention relates generally to a fastening device, and is more particularly concerned with a buckle of the type used for releasably gripping a belt or strap like member, and especially a strap like member constructed of a webbing material.

It is one object of the present invention to provide a unique construction which will enable a spring actuated clamping member to be preloaded during assembly of the buckle, and wherein the pivotal member of the clamping means is utilized for stressing the spring and thereafter locking the spring end in anchored position.

A further object of the invention is to provide a raised abutment surface which is cooperatively associated with the clamping means, the abutment surface being normally curved and adapted under clamping pressure to form a substantially plane surface and provide substantially uniform gripping action transversely of the belt or strap member.

Another object of the invention is to provide an improved actuating handle for the clamping means, this handle being made lighter of weight, and at the same time providing a roughened, non-slipping surface of engagement for the fingers of the operator actuating the handle to release the clamping means.

Still another object is to provide an improved construction wherein relatively narrow edges and surfaces are substantially eliminated in the most prominently projecting portions of the frame structure and clamping means, whereby in the case of safety belts and the like, the wearer will be protected against injury.

Further objects of the invention will be brought out in the following part of the specification, wherein detailed description is for the purpose of fully disclosing the invention without placing limitations thereon.

Referring to the accompanying drawings, which are for illustrative purposes only:

Fig. 1 is a plan view of a buckle embodying the features of the herein described invention;

Fig. 2 is an end view showing the cooperative relationship between the clamping means and abutment surface carried by the buckle frame;

Fig. 3 is a side elevational view;

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

Fig. 5 is a longitudinal sectional view, taken substantially on line 5—5 of Fig. 1;

Fig. 6 is an enlarged fragmentary detail view, partly in section, schematically illustrating the stressing and locking action of the pivot for the cam means; and

Fig. 7 is an enlarged detail view showing the details of construction of the cross-shaft used for pivotally mounting the clamping means.

As more specifically shown in the drawings, the buckle of the present invention comprises a frame 10 which is deformed or otherwise fabricated to provide spaced side walls 11 and 12 connected together by a crosspiece 13.

As more clearly shown in Fig. 3, each side wall con-

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sists of an upstanding portion in which peripheral edges 14 and 15 angularly converge and are joined by an arcuate edge 16 at the highest point of the side wall. This portion of the side wall is provided with an opening 17, these openings being adapted to receive the opposite ends of a cross-shaft 18 which provides a pivotal support for a clamping member as generally indicated by the numeral 19.

The clamping member 19 is constructed with an enlarged end 20 and an integrally formed projecting tongue 21 forming a handle by which the clamping member may be pivotally swung about the cross-shaft 18 which extends through a bore passage 22 in the enlarged end 20.

As shown primarily in Fig. 5, the enlarged end 20 has a portion 23 the outer surface of which is concentric of the bore 22 and in the normal position of the clamping means registers with the arcuate edge 16 of the side walls so that this highest projecting portion of the buckle will present a relatively blunt projection, rather than a projection having narrow projecting edges which might inflict injury upon a wearer, should the body of a person be forcibly thrown against the buckle.

There is also formed at the enlarged end an eccentric portion which forms a camming surface 24 on which a plurality of serrations 25 are mounted. These serrations may take different forms, but are shown in the present instance as comprising rows of pyramidal teeth which extend transversely across the length of the camming surface 24 between the side walls of the frame.

Positioned generally below the camming surface 24 is a raised portion in the crosspiece 13, which forms a platform or pad 26, the upper surface 27 of which forms an abutment surface confronting the serrations 25 and co-operable therewith to clampingly engage the end of a strap positioned over the surface 27 under the serrations.

As best shown in Fig. 4, the pad 26 has a central portion 28, the upper surface of which is substantially planar. The lateral portions of the pad have downwardly inclined margins 29. This construction is especially advantageous in that when pressure is applied against the strap end, the central portion 28 is deflected downwardly so that there is a tendency to form a planar abutment surface including the marginal portions 29, and thus uniformly grip the strap throughout its width. In conventional constructions, where the pad 26 has an initial planar surface, the gripping forces deflect the central section of the pad in such a way that the gripping action on the strap is confined substantially to the marginal edges and an inefficiently operating buckle is obtained.

Underlying the tongue 21, the crosspiece is provided with a slot 30 which forms at this end of the crosspiece a cross-bar 31 which may be utilized as an anchor connection for the anchored end of the strap or belt.

The clamping member 19 is normally biased towards clamping position by a coil spring 32 which is positioned within a counterbored portion 33 at one end of the bore passage 22. This coiled spring surrounds the adjacent portion of the cross-shaft 18 and has one end extending into a retaining notch 34 in the enlarged end 20. The other end of the spring is anchored in a radial notch 35 associated with the adjacent opening 17 of the side wall 12.

A unique arrangement is utilized, which permits pre-stressing of the coil spring 32 during assembly of the buckle. In this connection, it will be noted in Fig. 7 that the cross-shaft 18 is provided at one end with an end slot or notch 36 adapted to initially receive the adjacent end of the spring 32, this initial position being indicated in dotted lines in Fig. 6.

The opposite end of the cross-shaft is provided with a

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slot 37, or is otherwise arranged for receiving a tool by which the cross-shaft may be rotated. By rotating the cross-shaft in a clockwise direction, as shown in Fig. 6, the notch 36 will move to a point wherein it is in registration with the radial notch 35. This movement acts to stress the coil spring, and at this position of registration, the end of the spring which is in the notch 36 will automatically move outwardly into the notch 35. Continued movement of the cross-shaft will carry the notch 36 to a position such as shown in full lines in Fig. 6. It will be apparent that as soon as the notch 36 moves out of registration with the notch 35, the surface of the cross-shaft overlies the notch 35 and thus serves to lock the associated end of the spring 32 against removal therefrom. The cross-shaft is now permanently secured as by staking its ends, or otherwise to hold it in locking position.

The tongue 21 has its outer end portion extending beyond the bar 31 of the frame and is deflected into an upwardly curved end portion 38 so that it may be easily engaged by the fingers when it is desired to swing the clamping member to unclamped position and thus unbuckle the belt or strap. The construction of the tongue is lightened by cutting out portions of the under surface, as indicated by the numeral 39. The under surface of the end portion 38 is also cut out as indicated by numeral 40, this operation forming an edge or shoulder 41 which forms a non-slipping surface of engagement and facilitates movement of the clamping member to non-clamped position.

Various modifications may suggest themselves to those skilled in the art without departing from the spirit of our invention, and, hence, we do not wish to be restricted to the specific form shown or uses mentioned, except to the extent indicated in the appended claims.

We claim:

1. A buckle for connection with an end portion of a strap like member, comprising: a frame having spaced side walls connected together by a crosspiece extending transversely between said side walls; a clamping member having an enlarged end and a tongue portion affixed thereto forming an actuating handle; a cross-shaft extending through the enlarged end of said clamping member pivoting the clamping member for swinging movement between said side walls into clamped and non-clamped relation to said cross-piece, said shaft having its ends respectively supported in openings in said side walls one of said openings having a peripheral notch; and a coiled spring surrounding said shaft for biasing said clamping member towards clamped position, one end of said spring being anchored in said enlarged end, and the other end of said spring being positioned in said notch, and retained in said notch by the adjacent end of said shaft.

2. A buckle for connection with an end portion of a strap like member, comprising: a frame having spaced side walls connected together by a crosspiece extending transversely between said side walls; a clamping member having an enlarged end and a tongue portion affixed thereto forming an actuating handle; a cross-shaft extending through the enlarged end of said clamping member pivoting the clamping member for swinging movement between said side walls into clamped and non-clamped relation to said cross-piece, said shaft having its ends respectively supported in openings in said side walls, one of said openings having a peripheral notch; a coiled spring surrounding said shaft, one end of said spring being anchored in said enlarged end, and the other end of said spring being initially assembled in a notch at the end of said shaft associated with said one of said openings, said shaft upon initial rotational movement being adapted to stress the spring and position said notches in registration so that said other spring end is free to move into said peripheral notch, and upon further rotational movement of said shaft to move the notches out of registration and lock said spring end in said peripheral notch; and means for securing said shaft in its spring end locking position.

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3. A buckle for connection with an end portion of a strap like member, comprising: a frame having spaced side walls connected together by a crosspiece having a raised surface portion extending transversely between said side walls; a clamping member having an enlarged end and a tongue portion affixed thereto forming an actuating handle; a cross-shaft extending through the enlarged end of said clamping member pivoting the said clamping member for swinging movement between said side walls, said clamping member having a surface co-operable in clamping position with said raised surface to grip a strap member extending therebetween, and in unclamped position to permit free movement of the strap member between said surfaces, said surfaces being relatively so formed as to compensate for deformation of said raised surface under clamping pressure of said clamping member, whereby the strap will be gripped substantially uniformly throughout its entire width.

4. A buckle for connection with an end portion of a strap like member, comprising: a frame having spaced side walls connected together by a crosspiece having a raised surface portion extending transversely between said side walls; a clamping member having an enlarged end and a tongue portion affixed thereto forming an actuating handle; a cross-shaft extending through the enlarged end of said clamping member pivoting the said clamping member for swinging movement between said side walls, said clamping member having a surface co-operable in clamping position with said raised surface to grip a strap member extending therebetween, and in unclamped position to permit free movement of the strap member between said surfaces, at least one of said surfaces being longitudinally changed in its configuration in the clamping position of the clamping member so as to cause a substantially uniform gripping of the strap throughout its entire width.

5. A buckle for connection with an end portion of a strap like member, comprising: a frame having spaced side walls connected together by a crosspiece having a raised surface portion extending transversely between said side walls, said surface being upwardly bowed between its ends; a clamping member having an enlarged end and a tongue portion affixed thereto forming an actuating handle; a cross-shaft extending through the enlarged end of said clamping member pivoting the said clamping member for swinging movement between said side walls, said clamping member having a surface co-operable in clamping position with said raised surface to grip a strap member extending therebetween, and in unclamped position to permit free movement of the strap member between said surfaces, said bowed surface being deflectable under clamping pressure of the clamping member to substantially conform longitudinally with the surface of the clamping member, whereby the strap will be gripped substantially uniformly throughout its entire width.

6. A buckle for connection with an end portion of a strap like member, comprising: a frame having spaced side walls connected together by a crosspiece having a raised surface portion extending transversely between said side walls; a clamping member having an enlarged end and a tongue portion affixed thereto forming an actuating handle; a cross-shaft extending through the enlarged end of said clamping member pivoting the said clamping member for swinging movement between said side walls, said clamping member having a surface co-operable in clamping position with said raised surface to grip a strap member extending therebetween, and in unclamped position to permit free movement of the strap member between said surfaces, said raised surface having a substantially flat central portion elevated above inclined end portions thereof adjacent said side walls, whereby clamping pressure is initially applied to said flat portion and the raised surface deformed so as to force the flat portion and inclined end portions to approach a planar surface throughout the strap width.

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7. A buckle for connection with an end portion of a strap like member, comprising: a frame having spaced side walls connected together by a crosspiece having a raised surface portion extending transversely between said side walls; a clamping member having an enlarged end and a tongue portion affixed thereto forming an actuating handle; a cross-shaft extending through the enlarged end of said clamping member pivoting the said clamping member for swinging movement between said side walls, said clamping member having a serrated surface cooperable in clamping position with said raised surface to grip a strap member extending therebetween and in unclamped position to permit free movement of the strap member between said surfaces, said surfaces being relatively so formed longitudinally as to compensate for longitudinal deformation of said raised surface under clamping pressure of said clamping member, whereby the strap will be transversely gripped uniformly substantially throughout its width.

8. A device comprising: a pair of hingedly connected members, one of said members including a wall having an opening with a peripheral notch, and the other of said members having a bore passage; a pivot pin positioned in said bore with one end extending through said opening; a coiled spring surrounding said pin, one end of said spring being anchored in said other of said members and the other end of said spring being initially assembled in a notch at the end of the pivot pin associated with said opening, said pin upon an initial rotational movement being adapted to load the spring and position said notches in registration so that the adjacent spring end is free to move into said peripheral notch, and upon further rotational movement of the pin to move the notches out of registration and lock said spring end in said peripheral notch; and means for securing said pin in its final position of movement.

9. A device comprising: a pair of members hingedly connected by a pivot pin; a coiled spring surrounding said pin and having ends respectively anchored in said members; means carried by said pin adapted during assembly of the member to initially engage an unanchored end of said spring and upon rotation of the pin to load the spring and move said end into anchored position in the member associated therewith.

10. A device comprising: a pair of members hingedly connected by a pivot pin; a coiled spring surrounding said

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pin and having ends respectively anchored in said members; means carried by said pin adapted during assembly of the members to initially engage an unanchored end of said spring and upon rotation of the pin to load the spring and move said end into anchored position in the member associated therewith, and said pin upon movement to assembled position acting as a keeper for retaining said end in its anchored position.

11. A device comprising: a pair of members hingedly connected by a pivot pin; a coiled spring surrounding said pin and having ends respectively anchored in said members; a slot at one end of said pin adapted during assembly of the members to initially receive an unanchored end of said spring and upon rotation of the pin to load the spring and move said end into an anchored position outside of said slot in the member associated therewith; and said pin upon movement to assembled position acting as a keeper for retaining said end in its anchored position.

12. A device comprising: a pair of members hingedly connected by a pivot pin, one of said members having a pin receiving opening with a peripheral notch; a coiled spring surrounding said pin and having ends respectively anchored in said members; a slot at one end of said pin adapted during assembly of the members to initially receive an unanchored end of said spring and upon rotation of the pin to load the spring and move said end into an anchored position in said peripheral notch; and said pin upon movement to fully assembled position acting as a keeper for retaining said end in its anchored position in said notch.

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