QUICK RELEASE BUCKLE AND STRAP MEANS

United States Patent Office

3,407,452
3,407,452 QUICK RELEASE BUCKLE AND STRAP MEANS
Jack C. Abert, 511 E. Mulberry, Phoenix, Ariz., 85012, and Steve R. Perin, Phoenix, Ariz.; said Perin assignor to said Abert
Filed Dec. 5, 1966, Ser. No. 599,231
6 Claims. (Cl. 24—197)

This invention relates to a quick release buckle and strap members, and more particularly, to a quick release buckle and strap means which may be used for a variety of purposes, wherein it is desired quickly to release connected straps by a very simple pulling motion on a portion of one of the straps.

Various prior art quick release buckle mechanisms have been relatively complicated and expensive to produce.

There has been a need for a quick release buckle and strap means of simple, yet reliable construction, which may be used for various purposes, such as belts, harnesses, and other mechanical devices, wherein it is desired quickly to release a pair of connected straps by a single direct motion principally comprising the pulling of one of the straps relative to the buckle mechanism.

Accordingly, it is an object of the present invention to provide a quick release buckle and strap means, which may have a large variety of uses for the purpose of quickly releasing a pair of connected straps by means of a simple direct pulling of one of the straps.

Another object of the invention is to provide a novel quick release buckle and strap means, wherein simple inclined ramp mechanism on one buckle member is engaged by portions of another buckle member so as to permit snap action movement of a buckle member on the inclined ramp structure so as to move it into position to pass through the other buckle member and to release the strap mechanism connected by the buckle members of the invention.

Another object of the invention is to provide a very simple quick release buckle and strap means, which may instantaneously release a pair of connected straps, when a portion of one of the straps is quickly pulled in one direction toward the buckle members of the invention.

Another object of the invention is to provide a quick release buckle and strap means, which may be made of aluminum, nylon or other material, and which may be cast of such materials, so as to provide a very simple and economical structure.

Another object of the invention is to provide a quick release buckle and strap means, which may be particularly adapted for use in connection with pack frames for releasing the hip surrounding belt thereon.

Further objects and advantages of the invention may be apparent from the following specification, appended claims and accompanying drawings, in which:

FIG. 1 is a perspective view of the buckle mechanism, showing a quick release buckle and strap means in the invention in connection therewith;

FIG. 2 is an enlarged fragmentary plan view taken from the line 2—2 of FIG. 1, showing the buckle members and flexible straps of the invention;

FIG. 3 is an enlarged fragmentary side elevational view of a quick release buckle and strap means of the invention;

FIG. 4 is an enlarged fragmentary plan sectional view taken from the line 4—4 of FIG. 1;

FIG. 5 is a fragmentary plan sectional view taken from the line 5—5 of FIG. 3, showing varying positions of the buckle and strap members of the invention, when being released by a quick pulling action of one of the strap members;

FIG. 6 is another view similar to FIG. 4, showing by broken lines varying positions of the buckle and strap members of the invention after being released in a manner, as indicated in FIG. 5; and

FIG. 7 is an enlarged sectional view of the buckle members of the invention, showing a preferred embodiment of the invention.

As shown in FIG. 1, the quick release buckle and strap means of the invention are connected to a surrounding belt 10, and for the purposes of disclosure, one portion 12 of the belt is designated as a first strap and another portion 14 of the belt 10 is designated as the second strap.

It will be understood, that the first and second straps 12 and 14 may be integral with each other or separate, in accordance with the invention. When they are integral with each other they may form a surrounding belt, and when they are separate from each other they merely connect two objects together, and the buckle and strap structures of the invention operate in a similar manner as a quick release means.

The invention comprises a pair of buckle members. These buckle members are designated 16 and 18, respectively, and the buckle member 16 will be hereinafter referred to as the first buckle member and the buckle member 18 will be referred to as the second buckle member. These buckle members 16 and 18 are generally rectangular closed loop-shaped structures, each having four surrounding integral straight portions, as shown best in FIG. 3 of the drawings.

As shown in FIGS. 3 and 4 of the drawings, the buckle member 16 is provided with a strap anchor bar 20, and the buckle member 18 is provided with a strap anchor bar 22. The first strap 12 is provided with a large loop portion 24 looped around the bars 20 and 22. A fixture 26 holds the loop 24, which permits relative movement of the buckle member 16, such that it is movable relative to the buckle member 18, and the strap loop 24 in a direction longitudinally of the axis of the first strap 12, all as will be hereinafter described in detail. The buckle member 16 is provided with a cross bar 28 located in spaced relation to the anchor bar 20 and the loop portion 24 of the strap 12 passes between the bars 20 and 22. Likewise, the buckle member 18 is provided with a cross bar 30 closely spaced relative to the anchor bar 22 and this arrangement permits the loop 24 of the strap 12 to pass between the bars 22 and 30.

Integral with the anchor bar 20 and the cross bar 28 are side bars 32 and 34 of the buckle member 16. These bars 32 and 34 are integral with a strap fastening bar 36 which is spaced from and substantially parallel with the cross bar 28.

The buckle member 18 is provided with side bars 38 and 40 integral with the anchor bar 22 and cross bar 30, and integral with the side bars 38 and 40 is a fastening bar 42, all as shown best in FIGS. 3 and 4 of the drawings.

An Intermediate portion 44 of the second strap 14 is looped over the fastening bar portion 36 of the buckle member 16, and the strap 14 is provided with a pair of contiguous portions 46 and 48 extending from the intermediate portion 44, and engaged around the bar portion 42 on the opposite side thereof from the fastening bar 36. When tension is applied to the strap members 12 and 14 tending to pull in an opposite direction, the fastening bar 36 is pulled toward the bar 42, and opposite end portions 50 and 52 of the fastening bar 36 which project beyond opposite edges 54 and 56 of the second strap 14 are on inclined ramp portions 58 and 60, which are disposed in the corners of the buckle member 18, and which project inwardly from the corners thereof, and convergingly away from the fastening bar portion 42. These ramp portions 58 and 60 are provided with respective terminal edges 62 and 64 which extend away from the bar portion 42,
and convergingly away from the buckle member 16 toward an opposite side of the buckle member 18, as shown best in FIGS. 5 and 6 of the drawings.

It will be seen that opposite edges 54 and 56 of the contiguous portions 46 and 48 of the second belt 14 are disposed between respective end portions 68 and 70 of the ramp portions 58 and 60. These ends 68 and 70 project inwardly from the bar portions 49 and 38, respectively, of the buckle member 18. Opposite end portions 50 and 52 of the first fastening bar portion 36 at the corners of the buckle member 16 bear on the ramp portions 58 and 60, and these ramp portions thus tend to hold the fastening bar portion 36 in position to engage the contiguous portion 46 of the strap 14 between the bar portion 36 and the bar portion 42 of the buckle members 16 and 18, respectively, for locking the contiguous portions 46 and 48 and fastening the strap 14 to the strap 12.

Operation of the quick release buckle and strap means of the invention is substantially, as follows:

When the invention is as shown in FIG. 1 of the drawings, and the buckle members 16 and 18 are holding the first strap 12 and second strap 14 connected together, as heretofore described, the contiguous strap portion 48 of the strap 14 may be pulled backward in a direction, as indicated by an arrow A in FIGS. 5 and 6 of the drawings, whereupon the buckle member 18 is pivoted relative to the buckle member 16 substantially, as shown in FIG. 5, wherein the fastening bar 36 of the buckle 16 is forced to move slidably on the ramp portions 58 and 60 toward the terminal edges 62 and 64 thereof, until the end portions 50 and 52 pass over the terminal edges and permit the buckle member 16 to pass through the buckle member 18, which the bar portion 36 thereof, and to a position as indicated by broken lines B in FIG. 6 of the drawings. In this position, the contiguous portions 46 and 48 of the straps 14 are released and are then permitted to slide through the buckle member 16 around the bar portion 36 and the buckle mechanism is thus quickly released.

In actual operation, the contiguous strap portion 48 is quickly pulled backward in the direction of the arrow A to snap the ends 50 and 52 of the fastening bar 36 past the terminal edges 62 and 64 of the ramp portions 58 and 60, respectively.

As shown in FIG. 7 of the drawings, the bar portion 36 is provided with a belt engaging edge 37 which is disposed at an angle less than 90° to provide for efficient gripping of the belt 14 at said edge 37, all as indicated best in FIG. 7 of the drawings. This provides for efficient gripping of the belt member 14.

It will be obvious to those skilled in the art that various modifications of the present invention may be resorted to in a manner limited only by a just interpretation of the following claims.

We claim:

1. In a quick release buckle and strap means, the combination of: first and second elongated substantially flat flexible strap members each having opposite edges; first and second substantially loop-shaped buckle members connected to said first strap member; said first buckle member being movable relative to said second buckle member and said first strap in a direction longitudinally of the axis of said first strap; said first buckle member also being pivoted and mounted relative to said second buckle member and said first strap about an axis disposed transversely relative to the longitudinal axis of said first strap and generally in a plane intersecting both said opposite edges thereof; said first buckle member having a first strap fastening bar portion spaced from its connection with said first strap, said second strap having an intermediate portion looped over said first strap fastening bar portion, said second strap having contiguous portions extending from said intermediate portion and said first strap fastening bar; said second buckle member having a second strap fastening bar disposed adjacent said contiguous portions in such position as to clamp them against said first fastening bar portion; said first fastening bar portion extending beyond opposite edges of said intermediate portion of said second strap, said second fastening bar portion of said second buckle member being longer than said first bar portion of said first buckle member to thereby permit said first fastening bar portion to pass through said looped-shaped second buckle member; and ramp portions secured to said second bar portion near opposite ends thereof, said ramp portions having terminal edges and converging from said second bar portion to said terminal edges of said ramp portions, said ramp portions being disposed to be engaged by opposite ends of said first bar portion, ramp portions also converging away from the adjacent side of said first fastening bar portion to said terminal edges, whereby one of said contiguous strap portions which bears against said second bar portion of said second buckle portion may be pulled toward said buckle members to thereby slide said first bar portion of said first buckle member on said ramp portions to a position beyond said terminal edges of said ramp portions and to thereby permit said first buckle member to pass through said second buckle member and to release said second strap to slide around said first fastening bar portions.

2. The invention, as defined in claim 1, wherein: said buckle members are each a substantially rectangular closed loop structure comprising four integral bar portions.

3. The invention, as defined in claim 2, wherein: said buckle members are each provided with a cross bar disposed substantially parallel to the respective first and second bar portions, said cross bars being disposed adjacent said first strap to hold it in spaced relation to said first and second bar portions.

4. The invention, as defined in claim 2, wherein: said ramp portions are disposed generally in the corners of said substantially rectangular second buckle member.

5. The invention, as defined in claim 1, wherein: said terminal edges of said ramp portions are disposed at a side of said second buckle member opposite to a side thereof which is adjacent said first buckle member.

6. The invention, as defined in claim 1, wherein: said first strap fastening bar of said first buckle member is provided with a strap engaging edge portion having an acute angle less than 109° to provide a belt gripping edge portion, said belt gripping edge portion being adjacent to said second fastening bar portion of said second buckle member, and being on the opposite side of said first bar portion from the side thereof directed toward said ramp portion.

References Cited

UNITED STATES PATENTS
1,697,833 1/1929 Lane -------------- 24—197
1,997,653 4/1935 Reiter -------------- 24—193

BOBBY R. GAY, Primary Examiner.
E. SIMONSEN, Assistant Examiner.