

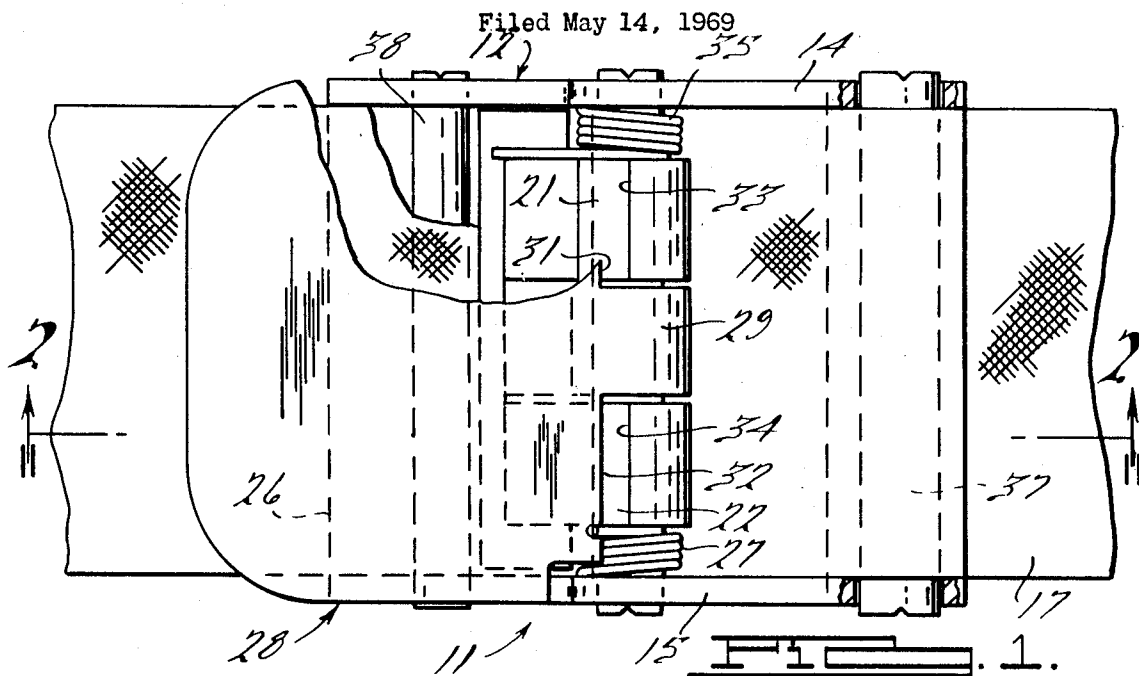
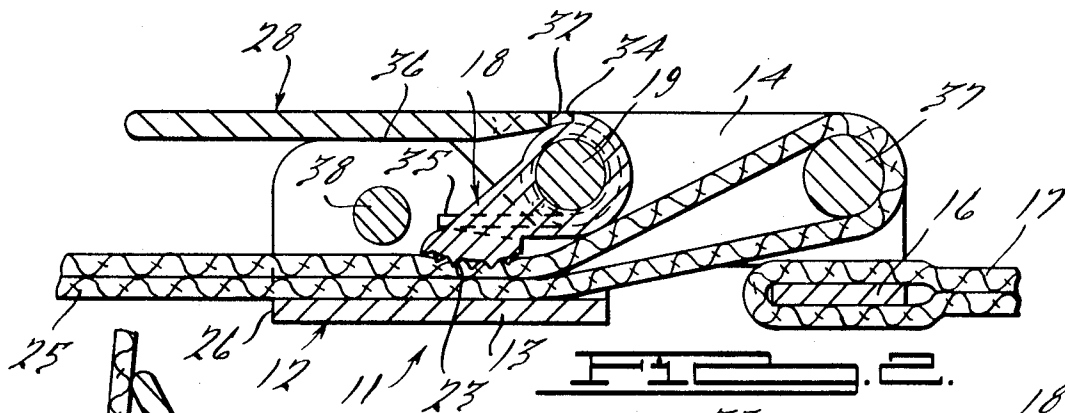
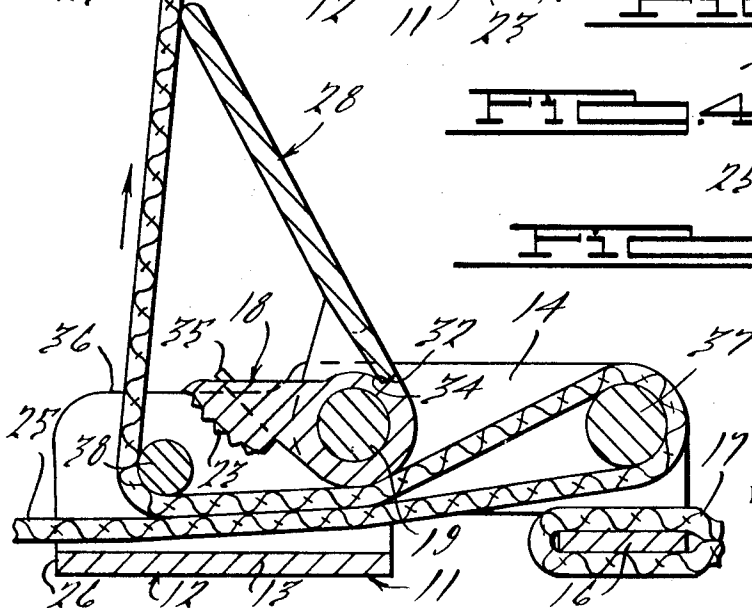
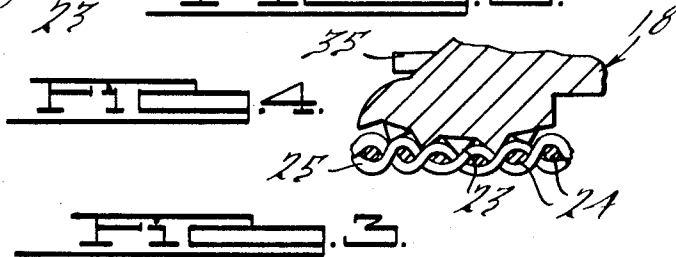
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C. F. CRISSY

3,605,205

LOW PROFILE BUCKLE

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INVENTOR.

Charles F. Crissy.

BY

Jerry A. Barnes
his ATTORNEY.

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3,605,205

LOW PROFILE BUCKLE

Charles F. Crissy, Jackson, Mich., assignor to

Aeroquip Corporation, Jackson, Mich.

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1 Claim

ABSTRACT OF THE DISCLOSURE

A buckle for securing webbing straps in systems such as are used to hold down cargo in common carriers. The buckle comprises a shallow generally channel-shaped body having a pivoted cam at a central portion thereof, a roller at one end and a restraining pin at the other end. A flat handle is pivoted coaxially with the cam and lifts it with a lost motion connection. The buckle is fastened to one strap and the other strap is fed under the restraining pin and the lifted cam, around the roller and back under the cam and restraining pin. The cam has rows of teeth with a spacing coordinated with the picks in the webbing and is spring-urged toward the strap, the handle being independently spring-urged to a flat position flush with the body. There is therefore no danger of accidentally releasing the buckle by striking the handle.

BACKGROUND OF THE INVENTION

(1) Field of the invention

The invention relates to cargo securing systems such as are used on common carriers. Such systems conventionally have two-part webbing straps fixed at their outer ends and connectable by feeding the free end of one strap through a buckle attached to the other strap and pulling the strap through the buckle until it is taut. The invention is concerned with the type of buckle which utilizes a pivoted cam under which the strap is fed and which tends to increase its grip on the strap in response to strap tension. A handle is provided in this type of buckle for swinging the cam to its retracted position.

(2) Description of the prior art

Various buckles of this type exist in the prior art and have deficiencies which it is an object of the present invention to overcome. It is desirable that the buckle have a relatively low profile so as to increase storage flexibility. However, handles on prior art buckles of this type protrude from the buckle body and are likely to be accidentally struck by other cargo, thus releasing the webbing strap. Moreover, conventional buckles of this type in which only a single layer of webbing is engaged by the cam have a tendency to cut the webbing when subjected to relatively high loads, because of the extreme web-pinching forces necessary in such buckles.

BRIEF SUMMARY OF THE INVENTION

According to the invention, a buckle is provided having a shallow channel-shaped body with a bar at one end for attachment to a strap. A cam is pivoted at a central portion of the body and has a lost motion connection with a flat coaxially pivoted handle. In its normal position this handle is flush with the outside of the body, recesses being provided in the body walls for that purpose.

To fasten the strap, it is fed under the cam while the latter is held in retracted position by the handle. The strap then is passed around a roller at said one end of the body and back under the cam. Both layers of the strap also pass under a restraining pin extending across the body at the end opposite the roller. This restraining

pin prevents accidental loss of cam grip when the strap is being tightened. To retract the cam, the handle is manually lifted. The handle extends beyond the edge of the body, and as an alternative method for retracting the cam, especially under high loads, the free end of the strap may be snapped up against the handle. Because a lifting motion is required to retract the cam, it will be easier to release than cams having handles which must be pressed to release.

Since two layers of webbing are pinched by the cam, the tendency to cut the webbing will be decreased. Furthermore, the teeth on the curved cam are in rows coordinated with the spacing of the picks (cross threads) of the webbing. The lost motion connection between the handle and cam will minimize the possibility of cam release due to vibration during transit. Moreover, the construction is such that different thicknesses of webs can be accommodated.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top plan view of a buckle constructed in accordance with invention, parts being broken away,

FIG. 2 is a cross-sectional view in elevation taken along the line 2—2 of FIG. 1,

FIG. 3 is a view similar to FIG. 2 but showing the handle being lifted by pulling up on the free end of the strap, and

FIG. 4 is an enlarged fragmentary cross-sectional view in elevation showing the coaction between the cam teeth and the webbing.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The buckle is generally indicated at 11 and comprises a body generally indicated at 12. This body is of channel-shaped construction, having a central portion 13 which acts as a pressure bar and a pair of side walls 14 and 15. The side walls extend beyond pressure bar 13 and are connected at one end by a bar 16 to which a strap 17 is permanently attached. Bar 16 is in the same plane as bar 13, and walls 14 and 15 are relatively shallow as compared with the length and width of the buckle.

A cam generally indicated at 18 is located at a central portion of body 12 being pivotally mounted on a pin 19 which extends between the side walls and is fixed thereto. This cam has a pair of arms 21 and 22 which extend from pin 19, and a toothed surface 23 extends across at the outer ends of arms. This surface is slightly convex and has a plurality of rows of teeth, the rows being spaced with the same pitch as the picks or cross threads 24 of a strap 25 which is to be secured by the buckle. Arms 21 and 22 extend toward the entrance end 26 of the buckle, and cam 18 is urged counterclockwise as seen in FIG. 2 by a spring 27 (FIG. 1), thereby urging toothed surface 23 toward pressure bar 13.

A handle generally indicated at 28 is also pivotally mounted on pin 19, this handle having a flat shape with a pivot portion 29 disposed between arms 21 and 22 of cam 18. The width of handle 28 is equal to the outside width of body 13.

Handle 28 has a pair of shoulders 31 and 32 which coact with shoulders 33 and 34 respectively, on arms 21 and 22 of the cam. The handle is urged toward a normal position as shown in FIGS. 1 and 2 by a spring 35 on pin 19. In this position the handle rests in a pair of recesses 36 in the upper edges of walls 14 and 15 so that the upper surface of the handle will be flush with the upper edges of the walls. When in this position, shoulders 31 and 32 will be spaced a short distance from shoulders 33 and 34 as seen in FIGS. 1 and 2. The distance between the shoulders on the cam and handle will depend upon

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the position of the cam which in turn is dependent upon the thickness of strap 25. Upward movement of handle 28 will not result in retraction of cam 18 until the shoulders of the handle engage those on the cam.

A roller 37 is rotatably mounted on and extends between walls 14 and 15 above bar 16 and at about the same level as pin 19. A restraining pin 38 of somewhat smaller diameter than roller 37 is secured to and extends between the side walls of the body adjacent the other end thereof.

In operation, strap 25 will be attached to the buckle by first lifting handle 28 to retract cam 18. With the cam held in its retracted position, strap 25 will be fed to the right in FIG. 2 until it passes under pin 38, cam 18 and around roller 37. The strap will then be fed back under cam 18 and pin 38. Handle 28 may then be released and strap 25 drawn taut by pulling on its upper layer which is the free end.

Tension in the lower level of strap 25 will be transmitted to the upper layer around roller 37, this tension therefore being to the right in FIG. 2 against cam 18. This action therefore will tend to pull cam 18 more tightly against the two layers of strap 25. It should be noted that the pinching tendency of the cam will be exerted on two rather than one webbing layer and that rows of teeth 23 will interfit with picks 24 in a coordinated manner (see FIG. 4) to lessen the tendency to cut the webbing.

During use, handle 28 will be flush with the top of body 12, thus preventing accidental dislodgement of cam 18 by cargo striking the handle. If it is desired to further tighten strap 25 this may be done by pulling on the free end of the strap, and during this movement restraining pin 38 will prevent cam 18 from being lifted to such an extent that its grip on the strap will be released.

To release strap 25, handle 28 may be manually grasped and swung clockwise to the FIG. 3 position. Alternatively, the free end of strap 25 may be lifted as shown in FIG. 3 and snapped against the outer edge of handle 28, lifting the handle as shown. This manner of releasing the buckle is useful when higher loads are encountered.

I claim:

1. In a buckle for securing a strap, a channel-shaped body having a central pressure bar and a pair of side walls, each side wall having a first section and a second sec-

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tion wherein said second section is greater in dimension in the direction perpendicular to said pressure bar providing a step between said sections, a gripping cam pivotally mounted between said side walls adjacent a central portion of said bar, means at one end of said body for securing the body to a first strap, a roller on one end of the body mounted between the second sections of said side walls, a notched handle co-axially pivoted with said cam and having a width sufficient to substantially cover the upper edges of said first sections of said walls wherein the thickness of said first handle is substantially equal to the height of the step between the sections of said side walls, spring means urging said handle toward a normal position in which it engages the top edges of the first sections of said side walls, a connection between said handle and cam responsive to lifting of the handle away from said pressure bar to retract the cam from the pressure bar, so that a second strap to be attached to the buckle may be passed under said cam, around said roller and back under said cam, said handle being movable to a full release position wherein the notched portion of said handle engages the upper edges of said second sections of said side walls, and a restraining pin extending between the first sections of said side walls and being disposed above the free end of said second strap when attached to the buckle, whereby lifting of said free end the strap will not cause the cam to be accidentally dislodged.

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BERNARD A. GELAK, Primary Examiner