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SHOESTRING FASTENING APPARATUS

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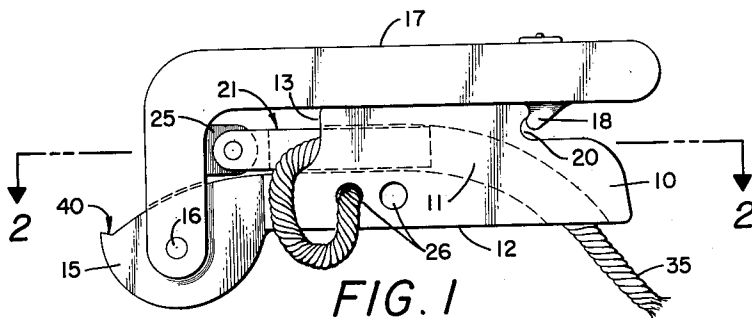


FIG. 1

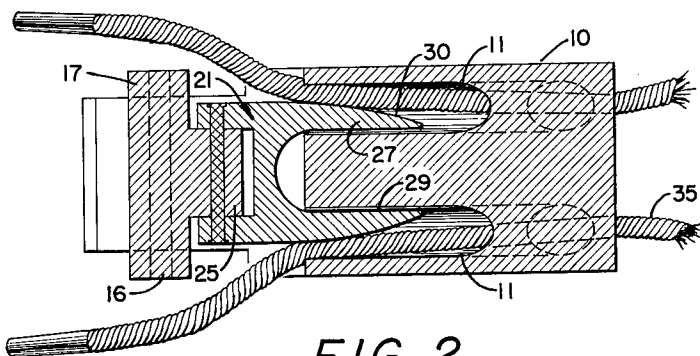


FIG. 2

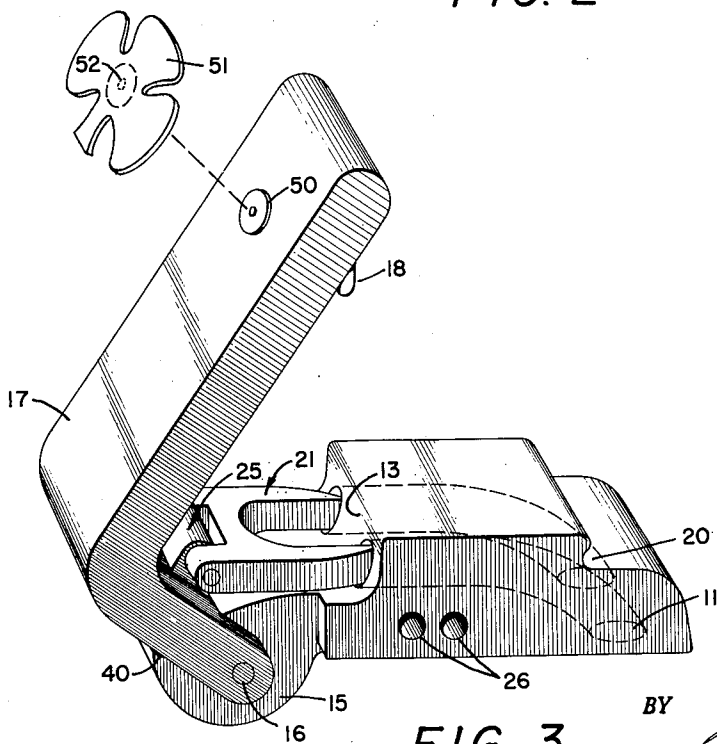


FIG. 3

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SHOESTRING FASTENING APPARATUS

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8 Claims. (Cl. 24-120)

This invention relates in general to a shoestring fastener and in particular to a mechanical device for securing the ends of a shoestring after the shoe has been laced.

Devices have been constructed in the past for securing the ends of shoestrings; however, these devices not only are complex and costly to construct but also are complicated and difficult to operate.

Therefore, it is an object of this invention to provide a shoestring fastener that is simple and economical to build.

It is another object of this invention to provide a fastener that is simple to operate.

It is a still further object of this invention to provide a fastener that can secure the ends of the shoestrings with a simple movement of a lever and release said strings by an opposite movement of the same lever.

It is a still further object of this invention to provide a locking lever that is adapted to mount ornamental objects thereon, thereby enhancing the appearance of said fastener.

It is a further object of this invention to provide a shoestring fastener that has a provision for securing the ends of the shoestring, thereby preventing said ends from becoming entangled or otherwise damaged during normal wear by the user.

This invention features a substantially rectangular casing having a pair of arcuate and parallel openings therethrough, said openings permitting communication between a side and a bottom of the casing. The openings are further adapted to receive shoestrings therethrough. An L-shaped lever is pivotally mounted to the side of the casing. A U-shaped or bifurcated cam is adapted to slidably enter the parallel openings in the side of the casing. The cam is pivotally hinged to the L-shaped lever such that when the L-shaped lever is moved away from the casing, the cam is removed from the pair of openings. When shoestrings are pushed into the bottom of the openings and out the side openings, they are secured by moving the lever toward the casing which will close against the top of the casing and cause the cam to enter the pair of side openings and to wedge the shoestrings tightly therein.

This invention further features a pair of holes in opposite sides of the casing. Each hole is adapted to receive the end of a shoestring, thereby protecting the shoestrings from abuse during wear.

This invention further features a snap or other means mounted on the top of the L-shaped lever which provides a method for attaching ornaments, initials, or other trinkets, such that the beauty of said fastener might be enhanced.

Further objects, features, and advantages of the invention will become apparent from the following description and claims when read in view of the accompanying drawings, in which:

FIG. 1 is a side view of the fastener;

FIG. 2 is a cross-sectional view taken through 2-2 in FIG. 1; and

FIG. 3 is a perspective drawing of the fastener showing the method of attaching the ornament.

Similar numbers will be used throughout all figures where common structural elements are shown.

Referring to the figures in general and in particular to FIG. 1, a substantially rectangular casing 10 has a pair

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of parallel and arcuate holes 11 therein. Holes 11 begin at the bottom 12 of casing 10 and curve upward through casing 10 and end in the side 13. An extension 15 projects from side 13 and provides a hinge or pivot type mounting about a pin 16 for a lever arm 17. A locking member 18 extends from lever arm 17 and is adapted to engage a mating notch 20. A U-shaped or bifurcated cam 21 is pivotally attached to L-shaped lever arm 17 by a hinge 25. A pair of holes 26 is provided through the sides of casing 10. Each hole has a size slightly larger than the metal end of a shoestring.

Casing 10 and lever arm 17 may be formed from any material including moldable metals or alloys; however, we prefer to use a plastic such as a linear polyformaldehyde or a polystyrene resin having a high impact resistance which is easy to mold and extremely adaptable to modern manufacturing methods.

Referring to FIG. 2, a cross-section of the fastener is shown. A bifurcated cam 21 includes pivot 25 centrally attached to the base of the cam. Arms or extensions 27 each contain a substantially straight inner edge 29 and a tapered outer edge 30. The width of the arm 27 is slightly less than the diameter of the hole. Cam 21 likewise can be made of the same plastic as the casing.

The operation of the fastener is extremely simple and is particularly adapted for the preschool age child that has not yet learned to tie his shoes. Referring to the drawings, lever 17 is disengaged from a locked position by applying pressure on the under side of lever 17. This pressure will cause locking member 18 to disengage notch 20 and permit lever 17 to pivot about pin 16. As the lever 17 is moved away from casing 10, cam 21 will move out of the holes 11. Pivot 25 permits the ends of cam 21 to remain in holes 11 without damage thereto. A stop 40 may be provided to prevent lever 17 from pivoting too far back thus allowing the ends of cam 21 to leave the holes 11. For obvious reasons, it is desired to maintain the cam within holes 11 since once removed the cam would need to be reinserted. Further, young children would find it difficult to use the fastener if the cam were permitted to leave the holes 11.

With lever 17 back and cam 21 substantially withdrawn from holes 11 (see FIG. 3), the ends of a shoestring are inserted in said holes from the bottom 12 and out the side 13 of casing 10. With the strings pulled tight, lever 17 is forcibly pressed causing cam 21 to enter holes 11. Since the side of the cam has a taper 30, the shoestring will be snugly wedged against the side of holes 11. When completely closed, the lever will be locked by member 18 entering notch 20.

A unique advantage of this invention is provided by the lever arm 18 and pivot location of 25 and 16. The extreme length of the lever arm between pivot 16 and the end as compared to the lever arm between pivot 16 and pivot 25 provides for an extreme increase in pressure at the cam 21 which is provided by the lever arm arrangement.

After closing the lever 17 (see FIG. 1), the shoestring ends may be inserted in holes 26, thereby preventing them from becoming dirty or damaged during wear by the user.

Other means may be provided to retain the strings, as for example, clips on the sides or spring-loaded slots or holes.

Referring to FIG. 3, a snap 50 is shown mounted on the top of lever 17. Snap 50 provides an easy method for mounting an ornament 51 to the lever. Ornament 51 will need to be provided with a mating snap 52 for proper mounting. Other means such as staples may be used if the mounting is to be permanent.

While certain plastics have been described as usable,

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any plastic may be used that is within the intent and scope of this invention.

Although this invention has been described with respect to particular embodiments thereof, it is not to be so limited, as changes and modifications may be made therein which are within the spirit and scope of the invention as defined by the appended claims.

We claim:

1. A shoestring fastener comprising: a casing having spaced openings therethrough which are adapted to receive the ends of a shoestring, a lever pivotally attached at one end to said casing, a bifurcated cam having a base and two parallel extensions adapted to enter said spaced openings, the junction point of said two parallel extensions pivotally attached to said lever at a point intermediate its pivotally attached end and the remaining end of said lever, whereby movement of said lever toward said casing moves the parallel extensions of said cam into said openings thus forceably compressing said shoestrings against the sides of said openings and movement of said lever away from said casing moves said parallel extensions of said cam out of said openings thus releasing said shoestrings.

2. A device as described in claim 1 and additionally including mating locking means on said lever and said casing.

3. A device as described in claim 1 and additionally including a means mounted on an exposed surface of said lever for mounting ornaments.

4. A shoestring fastening device comprising: a casing having spaced openings therethrough which are adapted to receive the ends of a shoestring, an L-shaped lever means pivotally attached to said casing at a first end of said L-shaped lever means, a U-shaped cam comprising a pair of arms, wherein said arms have a substantially straight parallel inside contour and a tapered external contour, said arms adapted to enter said spaced openings, and a pivot attachment means connecting said L-shaped lever means to said U-shaped cam at a point intermediate the first and second end of said L-shaped lever means whereby movement of said lever toward said casing moves said pair of arms into said openings thus forceably compressing the tapered contour of said arms against said shoestrings and against the sides of said openings, and movement of said lever away from said casing moves the

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contour portion of said pair of arms away from said sides of said openings thereby releasing said shoestrings.

5. A device as described in claim 4 and additionally including a mating locking means on said L-shaped lever and said casing.

6. A device as described in claim 4 wherein said casing has a pair of holes adapted to securely accept the metal ends of a pair of shoestrings.

7. A device as described in claim 4 and additionally including an ornament and means for mounting said ornament to an exposed portion of said L-shaped lever.

8. In a shoestring fastening device of the type that includes a wedge-shaped shoestring retaining means, a casing having a shoestring guide means therein which is adapted to receive the wedge portion of said wedge-shaped shoestring retaining means, and a lever locking means for said wedge-shaped retaining means, an improvement comprising:

(a) means for pivotally attaching one end of said lever locking means to said casing,

(b) means for releasably locking the other end of said lever locking means to said casing, and

(c) means for operably attaching said wedge-shaped retaining means intermediate the ends of said lever locking means,

whereby movement of said lever locking means into the locked position will forceably clamp a pair of shoestring ends which are inserted into said guide means and between said wedge-shaped retaining means and said guide means, and movement of said lever locking means away from the locked position will move said wedge-shaped retaining means away from forceable engagement with said guide means, thereby releasing said shoestring ends.

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