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H. K. LORENTZEN

2,637,084

CORD STOP

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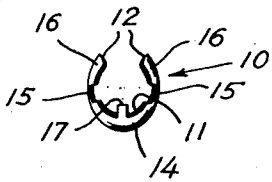


FIG. 1

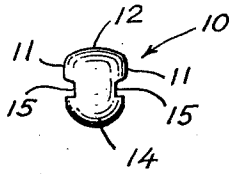


FIG. 2

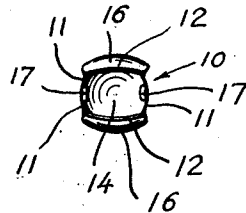


FIG. 3

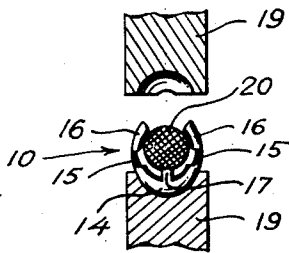


FIG. 4

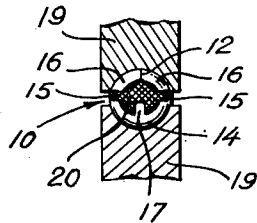


FIG. 5

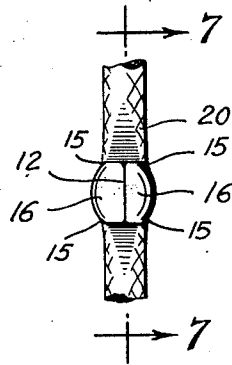


FIG. 6

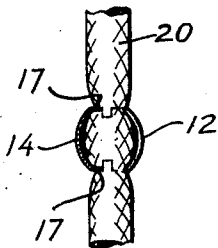


FIG. 7

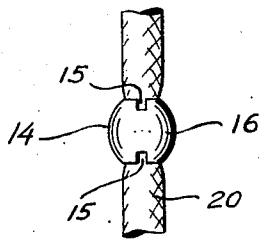


FIG. 8

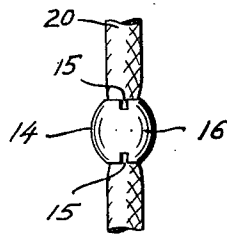


FIG. 9

INVENTOR

HANS K. LORENTZEN

BY

Ramsey, Chisholm & Hilde

HIS ATTORNEYS

UNITED STATES PATENT OFFICE

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CORD STOP

Hans K. Lorentzen, Montclair, N. J., assignor to
Lorentzen Hardware Mfg. Corp., New York,
N. Y., a corporation of New York

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4 Claims. (Cl. 24-114.5)

1

This invention relates to Venetian blinds and more particularly to a cord stop or limit bead which is permanently securable to a Venetian blind cord.

Venetian blinds customarily employ a slat-tilting mechanism, known as a tilter, to vary the inclination of the slats, and the tilter is usually actuated by a tilt cord reeved over a pulley. In the so-called "escapement" or "self-adjusting" tilters, such as disclosed in Nelson Patent 2,174,994 of October 3, 1939, the pulley rotates idly at times and the cord is often provided with limit beads or other stops to limit the movement of the cord. Two stops are provided on the cord, one for limiting cord movement in one direction and one for limiting cord movement in the other direction. The tilter is provided with stationary loops, rings, or other cord guide means through which the cord passes; and, when a stop on the cord engages the cord guide, the cord is automatically arrested.

Cord stops are also often used for securing tassels on the ends of Venetian blind tilt cords. The tassels are first slipped on the cord and the cord stops are then crimped about the end portions of the cord, the tassels being slipped back onto the cord stops which are received within a hollow counterbore of the tassel.

Cord stops are also used in the attachment of the ends of lift cords to Venetian blind bottom bars of the so-called removable slat type, in which the lift cords are secured to the bottom bar by a quick-detachable connection. In such a construction, the ends of the lift cords are often received within "keyhole" slots in the bottom bar, the larger end of each slot passing a cord stop crimped about the end of each cord and the smaller end of each slot being sufficiently small to engage and retain the cord stop so as to firmly anchor the lift cords to the bottom bar.

All of these constructions require a relatively heavy sheet metal cord stop which may be crimped about a Venetian blind cord and which will resist any ordinary force tending to displace it along the cord. In addition, particularly if the cord stop is to be used with an adjustable tilter, the cord stop must not deform the cord so that it will no longer hang straight.

In the form shown of the present invention, the cord stop is formed of a small, generally U-shaped strip of metal having an arcuate cross section and a generally hemispherical, closed bottom end. Prongs project upwardly from each edge of the closed end of the strip and, when the stop is crimped about the cord, these prongs are forced into the cord. The cord stop is designed

2

to be crimped about a cord by a pair of hemispherical dies forced together so as to form the cord stop into generally spherical form pierced by the cord.

The cord commonly used for Venetian blinds is braided cotton cord having a diameter of either four-thirty-seconds or four-and-a-half-thirty-seconds of an inch, these cords being known in the trade as No. 4 cord and No. 4½ cord, respectively. A feature of the present invention is the provision of notches along the sides of the stop to facilitate crimping the stop tightly about cords of either diameter by the use of a common die and without excessive pressure. These notches, which are almost unnoticeable after the stop has been crimped onto the cord, do not substantially weaken the cord stop and are more or less closed during the crimping operation, depending on the size of the cord upon which the cord stop is being crimped.

An object of the present invention is to provide a cord stop which may be smoothly crimped into spherical form about cords of varying diameters without the use of excessive pressure.

Another object of the invention is to provide a cord stop which may be crimped to tightly engage a cord and which will strongly resist displacement along the cord.

Another object is to generally improve cord stops of the type described.

Other objects and objects relating to details of structure and economies of manufacture and use will more definitely appear in the following description.

My invention is clearly defined in the appended claims. Where parts are, for clarity and convenience, referred to on the basis of their oriented position shown in the accompanying drawing, no limitation as to positioning of the entire structure is to be implied, since it will be understood that the structure may be used in any position. Also in both the description and the claims, parts at times may be identified by specific names for clarity and convenience, but such nomenclature is to be understood as having the broadest meaning consistent with the context and with the concept of my invention as distinguished from the pertinent prior art. The best form in which I have contemplated applying my invention is illustrated in the accompanying drawing forming part of this specification, in which:

Fig. 1 is an end elevation of the cord stop before application to a cord.

3

Fig. 2 is a side elevation of the cord stop shown in Fig. 1.

Fig. 3 is a top plan view of the cord stop.

Fig. 4 is a somewhat diagrammatic view of the application of the cord stop to a Venetian blind cord, the crimping dies being indicated and the cord and cord stop being positioned for the crimping operation.

Fig. 5 is a view similar to Fig. 4 after crimping of the cord stop.

Fig. 6 is an elevation of a section of cord having a cord stop crimped thereabout.

Fig. 7 is a longitudinal section of the cord stop taken on the line 7—7 of Fig. 6, the cord being shown in elevation.

Fig. 8 is a somewhat diagrammatic elevation of the cord stop crimped about a No. 4½ cord.

Fig. 9 is a view similar to Fig. 8 of the same cord stop crimped about a No. 4 cord.

Referring now to the drawings, the cord stop comprises a strip 10 of metal which is initially stamped into the generally U-shaped form shown in Figs. 1 to 3. The strip 10 is preferably stamped from a sheet of soft, cold rolled steel having a thickness of about .025 of an inch. This strip is constructed and arranged to be crimped about a Venetian blind cord with the outer surface of the strip forming a relatively smooth bead extending about the cord as a center and tightly crimped about the cord. The outer surface of the cord stop when crimped about a cord is generally spherical, although the curvature transversely of the cord is preferably a little greater (smaller radius) than the curvature longitudinally thereof.

The strip 10 is, except as noted below, of substantially uniform width of about ¼ inch and is initially transversely arched to approximately the curvature of the cord stop after crimping about a cord. The length of the side edges 11, 11 of the strip 10 is approximately the circumference of the size cord which the cord stop is proportioned to fit, and the end edges 12, 12 are curved as indicated in the drawings so as to meet in edge-to-edge relation when the cord stop is crimped about the cord.

The transverse and longitudinal curvature of the strip 10 forms a dome-shaped or generally hemispherical bottom portion 14 at the closed end of the strip extending a short distance up the sides of the strip. This portion, which is formed in the initial stamping operation into substantially final form, forms the bottom portion 14 and extends for nearly one-half of the cord stop when crimped about a cord.

A pair of small, opposed notches 15, 15 are formed in the side edges 11, 11 of the strip 10 immediately above the dome-shaped bottom portion 14 to reduce the cross-sectional area of the strip at these points. The edges of these notches are preferably more or less parallel and the notches may be approximately a sixteenth of an inch wide and a sixteenth of an inch deep. These notches are so located as to be diametrically opposite on the crimped cord stop and form a structurally weakened zone on each leg of the cord stop, the transverse curvature of the strip between the notches, both before and after crimping, being somewhat lesser than the rest of the strip to facilitate crimping of the strip about the cord.

The upper portions 16, 16 of the sides above the notches 15 are more or less domed, as indicated in the drawings, these parts being shaped substantially to final form in the initial stamp-

4

ing operation. The spacing between the upper portions 16, 16 of the U-shaped strip is sufficient to permit the sideways insertion of a Venetian blind cord so that the cord stop need not be threaded onto the cord. This is made possible by making the zones of the strip 10 adjacent the notches 15 of somewhat lesser longitudinal curvature (Fig. 1) than the remainder of the strip.

If desired, a pair of upwardly projecting prongs 17, 17 may be formed at the side edges 11, 11 of the closed end of the strip. Upon crimping the cord stop about a cord, these prongs are forced into the cord and aid in preventing displacement of the cord stop along the cord. The cord stop may be cadmium plated after stamping to prevent rusting.

The cord stop is crimped about a cord by a pair of spherical dies 19, 19. Each die 19 has a spherical recess of a little less than a hemisphere having a curvature of approximately the radius of curvature of the crimped bead transversely of the cord. The dies 19, 19 are mounted in a light press or other suitable machine for forcing the dies together, such a machine being shown in copending application S. N. 699,287 now Patent 2,565,983 issued August 28, 1951.

In crimping the cord stop about a Venetian blind cord 20, the cord stop is positioned with the bottom portion 14 resting on the lower die 19, and the cord is positioned within the cord stop as indicated in Fig. 4. The upper spherical die 19 is then forced downwardly towards the lower die in order to crimp the cord stop about the cord. The dies are never completely closed.

During the initial stage of the crimping operation, the end edges 12, 12 of the strip 10 are engaged by the upper die and forced inwardly into tight edge-to-edge contact, as indicated in Fig. 5. In this first stage of the crimping operation, the greater part of the bending and working of the metal appears to take place in the net section of lesser curvature lying in the zone of the slots 15, 15 on each side of the strip, the other portions of the cord stop having been formed substantially to final form during manufacture. When the cord stop is crimped about a No. 4½ Venetian blind cord, the proportions of the cord stop are such that the side edges 11, 11 of the strip 10 are, after the initial stage, tightly crimped about the cord and the prongs 17, 17 are pressed into the cord. The cord 20 is somewhat compressed by this initial stage of the crimping operation and more or less forced into the slots 15.

The curvature of the dies 19, 19 is preferably somewhat sharper than the curvature transversely of the strip 10 (longitudinally of the cord stop after it is crimped about a cord). Accordingly, during the initial stage of the crimping operation, the crimping dies principally engage the side portions of the strip 10; and, after the end edges 12, 12 have been forced into edge-to-edge contact, the principal constricting pressure of the dies 19, 19 falls on the side edge portions of the strip 10 and tends to further constrict these portions about the cord.

When the cord stop is applied to a No. 4½ cord, the compressed cord largely resists further constriction of the cord stop; but, when the cord stop is applied to a No. 4 cord or a No. 4½ cord that is somewhat undersize, the side edges 11, 11 of the strip 10 are crimped inwardly tightly on the smaller cord, forcing the prongs 17, 17 into the cord. This further or second stage of crimping is greatly facilitated by the notches

15, in that these notches are narrowed and more or less closed during this stage of the crimping operation (Figs. 8 and 9) and also help to grip the cord. During this second stage of the crimping operation, the principal working of the metal appears to be in the zones of the notches 15.

The cord stop of the present invention may be used for either a No. 4 cord or a No. 4½ cord without change in dimensions, may be tightly crimped about either cord with relatively little pressure, and can not be displaced along the cord by any ordinary force.

I claim:

1. A cord stop for application to a Venetian blind cord, said cord stop comprising: a stamped, U-shaped sheet metal strip of arcuate transverse cross section, the closed end of the strip and the upper portions of the upstanding legs having substantially the same generally spherical curvature and the closed end and the upper portions of the legs being separated by a structurally weakened zone of reduced cross-sectional area and lesser transverse and longitudinal curvature on each leg, the strip being deformable into a smooth, circular, transversely arched form embracing the cord with the ends of the legs of the strip in edge-to-edge contact by deforming the structurally weakened zones of the legs.

2. A cord stop for application to a Venetian blind cord, said cord stop comprising: a stamped, U-shaped sheet metal strip of arcuate transverse cross section, the closed end of the strip and the upper portions of the upstanding legs having substantially the same generally spherical curvature and the closed end and the upper portions of the legs being separated by a structurally weakened zone of reduced cross-sectional area and lesser transverse and longitudinal curvature on each leg just above the closed end, the strip being deformable into a smooth, circular, transversely arched form embracing the cord with the end of the legs of the strip in edge-to-edge contact and the structurally weakened portions of the legs located on diametrically opposite sides of the cord stop by deforming said structurally weakened portions.

3. A cord stop for application to a Venetian blind cord, said cord stop comprising: a stamped,

U-shaped sheet metal strip of arcuate transverse cross section, the closed end of the strip and the upper portions of the upstanding legs having substantially the same generally spherical curvature and the closed end and the upper portions of the legs being separated by a structurally weakened zone of reduced cross-sectional area and lesser transverse and longitudinal curvature on each leg, and a prong projecting upwardly from an edge of the closed end, the strip being deformable into a smooth, circular, transversely arched form embracing the cord with the ends of the legs of the strip in edge-to-edge contact and the prong pressed into the cord by deforming the structurally weakened zones of the legs.

4. A cord stop for application to a Venetian blind cord, said cord stop comprising a stamped, U-shaped sheet metal strip of arcuate transverse cross section, the closed end of the strip and the upper portions of the upstanding legs having substantially the same generally spherical curvature and the closed end and the upper portions of the legs being separated by a zone of lesser curvature on each leg provided with opposed notches formed one on each side edge of each leg, the strip being deformable into a smooth, circular, transversely arched form embracing the cord with the ends of the legs of the strip in edge-to-edge contact by deforming the notched zone of the legs.

HANS K. LORENTZEN.

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