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B. HAYDEN

2,244,696

END FITTING FOR WIRE

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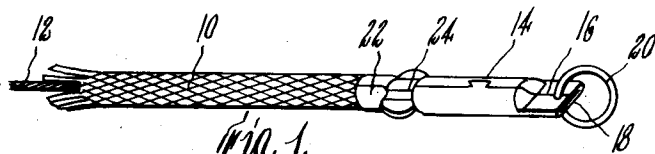


Fig. 1.

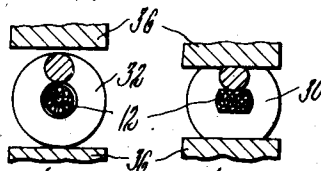


Fig. 2.

Fig. 8.

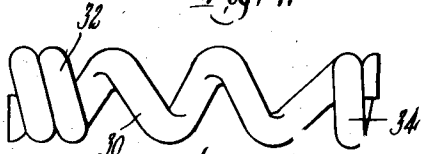


Fig. 3.

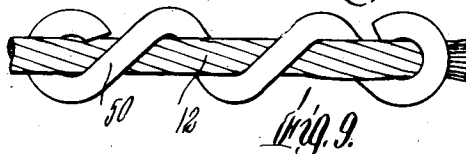


Fig. 9.

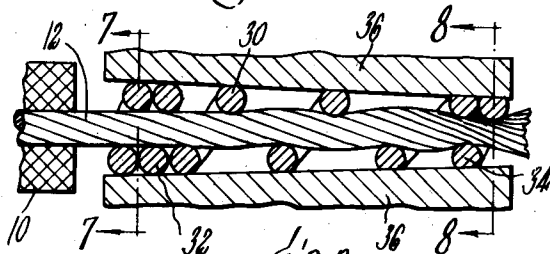


Fig. 10.



Fig. 11.

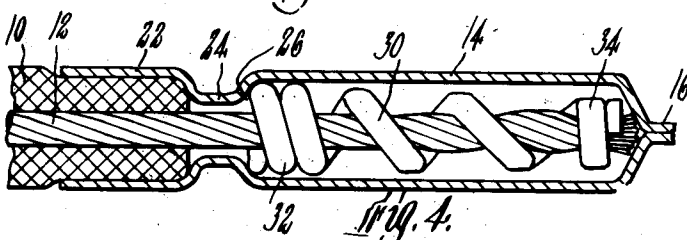


Fig. 12.

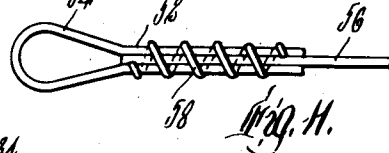


Fig. 13.

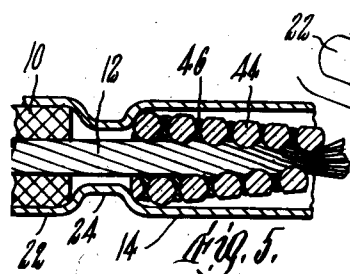


Fig. 14.

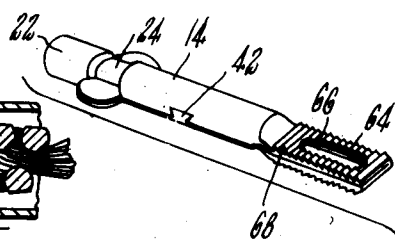


Fig. 15.

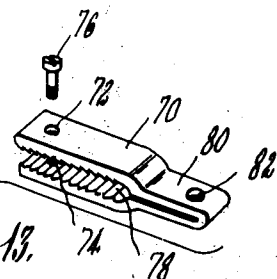


Fig. 16.

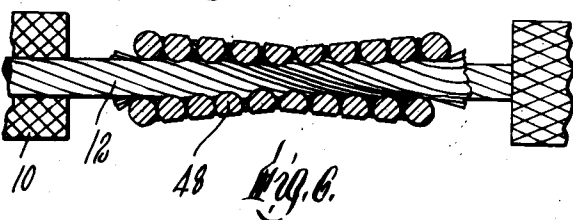


Fig. 17.

Inventor
Boyd Hayden
by Wright, Brown, Quinby & May
Attys.

UNITED STATES PATENT OFFICE

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END FITTING FOR WIRE

Boyd Hayden, Newton, Mass.

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3 Claims. (Cl. 24—123)

This invention relates to means for anchoring an end of a wire. It is an object of the invention to provide a simple, economical and effective device for such purpose. The invention may be applied to bare wires which are single or stranded, or to woven cords having wire cores.

The invention is described and illustrated herein as exemplified in dobby cords for looms. In the weaving operation, the various heddles must be raised at predetermined intervals for the formation of the desired pattern in the product. For this purpose, dobby cords are attached to the heddles. It is an object of the present invention to provide improved means by which an end fitting such as an eye can be formed upon or attached to an end of the dobby cord, the attachment being such that the life of the cord and its end fitting will be considerably longer than that of the dobby cords previously in use.

For this purpose, a small coil of wire is provided adapted to fit over the end portion of the wire core of a dobby cord. The coil is preferably but not necessarily made with spaced turns. After such a coil has been fitted over the end portion of a wire, it is compressed or squeezed laterally between two opposing surfaces so as to flatten it, this treatment resulting in the formation of waves or crimps in the wire between the turns of the coil. The wire is thus firmly gripped by the coil so that, by inserting the resulting anchoring element in a hollow fitting having interior shoulders against which an end of the coil may bear, the end fitting may be strongly anchored to the wire.

For a more complete understanding of the invention, reference may be had to the following description of certain embodiments thereof, and to the drawing of which—

Figure 1 is a perspective view of an end fitting embodying the invention and applied to the end of a woven cotton cord having a stranded wire core.

Figure 2 is an elevational view, on a larger scale, of a coil which is adapted to fit over the end portion of a wire.

Figure 3 is a sectional view showing a coil being compressed on the end portion of a wire.

Figure 4 is a sectional view of a cord and end fitting such as is shown in Figure 1.

Figure 5 is a sectional view of a modified form of end fitting on a wire core.

Figure 6 is a modified form of anchoring element adapted for clamping two or more wires together.

Figure 7 is a section on the line 7—7 of Figure 3.

Figure 8 is a section on the line 8—8 of Figure 3.

Figure 9 is a plan view of an anchoring element.

Figure 10 is a side elevation of the anchoring element shown in Figure 9.

Figure 11 is an elevational view of a wire having an eye or loop secured to the end thereof.

Figure 12 is an elevational view of a wire having an eye or loop formed on the end portion thereof.

Figure 13 is a perspective view of an end fitting of the type shown in Figure 1, but provided with an adjustable extension.

The invention may be applied to wires of various kinds. As illustrated in Figure 1, a woven cotton cord 10 having a stranded wire core 12 is provided with an end fitting 14. This end fitting may include a tension member made of sheet metal bent to approximate cylindrical form or made of seamless tubing. One end portion of the fitting may be flattened as at 16, this flattened portion being perforated as at 18 to receive a ring 20 or S-hook (not shown). The other end 22 of the fitting 14 is preferably in the form of a ferrule which embraces the cut end of the woven fibrous sheath to prevent unraveling of this sheath. Adjacent to the ferrule 22 is a constricted portion 24 which is pressed to a smaller diameter so as to fit closely around the wire core 12. As indicated in Figure 4, this portion of reduced diameter results in an interior shoulder 26 which serves as an abutment against which bears any enlargement or anchoring element which may be formed on the end portion of the wire core 12.

According to the invention, a simple but effective abutment or anchoring element is formed on the end wire core 12 by the use of a coil 30 such as is illustrated in Figure 2. This coil 30 is helical in character and consists of a series of convolutions or turns adapted to fit snugly over the core 12. The arrangement or spacing of the several turns of the coil may be arranged as desired. As shown in Figure 2, the coil is provided with two turns 32 at one end arranged close together so as to be contiguous. At the opposite end of the coil the end turn 34 is a closed loop. The intermediate loops between these end turns are spaced apart. It is to be understood that this particular arrangement may be varied by having all of the turns close together, or all of the turns spaced apart, or

some of the turns close together and some spaced in other combinations than that shown.

In forming an anchoring element on the end of a wire core, a coil of wire such as illustrated in Figure 2 is slipped over the bared end portion of the wire core 12. The coil 30 is then subjected to lateral pressure from opposite directions, this pressure being exerted by means of the jaws of a vise or by a press or other equivalent mechanism. Pressing elements 36 are illustrated in Figure 3. As shown therein, the spacing between these pressing surfaces is preferably tapered so that the end turn 34 of the coil and the portion of the core embraced thereby are subjected to the greatest pressure and greatest degree of flattening as indicated in Figure 8, the end turns 32 being subjected to little, if any, pressure or flattening, as indicated in Figure 7. In such case, the successive turns in the coil vary progressively from a substantially circular shape at the end remote from the end of the strand 12 to an ellipsoid shape adjacent to the end of the strand. Thus the maximum pinching, flattening and gripping of the core 12 by the turns of the coil 30 occur at the end 34, the coils 32 having little or no grip on the core 12. Hence the tensile strength of the core 12 is undiminished in that portion of the core which is surrounded by the turns 32 of the coil. The spaced intermediate turns of the coil grip the core with increasing firmness and also form waves or crimps in the core with which they interfit to anchor the core securely within the coil 30. The coil 30, when thus pressed into engagement with the core 12, may then be inserted into the fitting 14, the fitting being left open laterally for such purpose. At the same time the end portion 38 of the woven cord is inserted in the ferrule 22, a portion of the bared core extending through the narrow neck 24 of the fitting. The fitting is then stamped or squeezed so as to close the edges together and form a casing enclosing the anchoring element. A casing made as indicated in Figure 1 will not open up or spread in use if made of reasonably stiff sheet stock. If, however, the casing should tend to spread when subjected to stresses, it may be secured in any suitable manner, as, for example, a dovetail lock 42 (Figure 13) or by a rivet (not shown) at the neck 24. If desired, the coil 30 may be anchored more securely to the end portion of the core 12 by soldering the coil after it has been squeezed on the end portion of the core, the coil 30 being shown in the drawing without solder, but in most cases the grip of the coil on the waved or crimped core will be sufficient for practical purposes. Instead of squeezing the coil against the wire or core prior to its insertion in the fitting 14, the coil 30 may be slipped over the bared end of the core 12, and the coil and core inserted in the open fitting 14; or a coil may be inserted in one end of a tubular casing having a constriction such as illustrated in Figure 5, a core being inserted into the other end of the casing past the constriction and into the coil. Squeezing pressure may then be applied to the fitting so as to close or flatten it and at the same time to squeeze and flatten the turns of the coil 30 upon the core 12. An anchoring element (not shown on the drawing) may also be made by casting a lump of solder or harder metal on the wire core, the portion of the core embedded in the casting being preferably crimped or kinked.

Figures 5 and 6 illustrate modifications of the invention, Figure 5 showing a coil 44 consisting of

helical turns all of which are close together. The strongly pressed turns indent the contiguous surfaces of the core 12 so as to grip the core firmly, the turns of the coil remote from the extreme end of the core being preferably pressed to a lesser degree so as not to weaken the core where it enters the coil. After the coil has been pressed upon the end portion of the core as shown, it may be soldered as at 46 if desired. Figure 6 shows a coil 48 used to join together the end portions of two cores 12 or other wires, this coil being squeezed in such a manner as to grip the core most strongly at the center of the coil, the two end turns of the coil being compressed little if any.

Figures 9 and 10 show a slightly modified form of coil 50 having no closely spaced turns. This coil may be slipped over the end portion of the wire core 12 and thereby pressed so as to crimp the core as illustrated in Figure 10.

Instead of providing a ring 26 and a hole 16 therefor as shown in Figure 1, an eye may be formed by or upon the end portion of the wire as illustrated in Figures 11 and 12. For example, a short piece of wire 52 may be bent so that its mid-portion forms an eye 54, the end portions of this piece of wire being arranged parallel. These parallel end portions are placed alongside of the end portion of a wire 56. A helical coil 58 is then placed or formed upon the assembled wires 56 and 52 and the coil 58 is subjected to lateral pressure in the manner illustrated in Figure 3 or Figure 10. The turns of the coil 58 produce waves or crimps in the wires 52 and 56 so that the wires are thus prevented from being pulled out under stress. Instead of employing a separate wire 52, the end portion of the wire 56 may be bent back upon itself to form an eye 60, a coil 58 being employed in the manner hereinbefore described to anchor the end portion of the wire to the standing part adjacent to the eye 60.

It is sometimes desirable to adjust the effective length of a dobbie cord. For this purpose, the end fitting 14 may be formed with an extension 64 having an elongated longitudinal slot 66 therein and side faces which are serrated as at 68. These serrations are transverse and are preferably made with teeth of the buttress type or of the undercut type. Cooperating with this extension 64 is an element 70 having a U-shaped portion adapted to fit over the extension 64. The legs of the U-shaped portion are provided with aligned bores 72 and 74, one of these bores being tapped to receive a screw 76. The inner faces of the legs of the element 70 are serrated as at 78 to fit the serrations on the faces 68 of the extension 64. Thus the element 70 may be placed in adjusted position upon the extension 64 and may be firmly clamped thereon by means of a screw 76 which passes through the bore 72 and the slot 66 for threaded engagement in the bore 74. The element 70 has an end extension 80 with an aperture 82 therein to receive a ring or other connecting device.

While the invention has been thus described as embodied in fittings for dobbie cords and the like, it is evident that it may be employed in other equivalent structures for connecting the ends of wires or wire cords to other elements. It is further evident that various modifications and changes may be made in the specific embodiments of the invention herein shown and described without departing from the spirit or scope thereof as defined in the following claims.

I claim:

1. An end fitting for a fiber cord having a wire core, comprising an enlargement formed on a bared end portion of the core, and a casing of substantially rigid material having a portion surrounding said enlargement, a portion surrounding the portion of the fiber cord adjacent to the bared core and a constriction between the two said portions of the fitting forming an abutment for said enlargement.

2. A strand having an abutment element on the end portion thereof, said end portion having a wavy form, said element comprising a coil of wire having a progressively increasing pinch-

ing engagement with said end portion and interfitting with the waves thereof, and tension means engaging said element remote from the end of said strand.

3. A strand having an abutment element secured on the end portion thereof, said element comprising a wire coil surrounding said end portion and in pinching engagement therewith, the successive turns of said coil varying progressively from a substantially circular shape at the end remote from the end of the strand to an ellipsoid shape adjacent to the end of the strand.

BOYD HAYDEN.