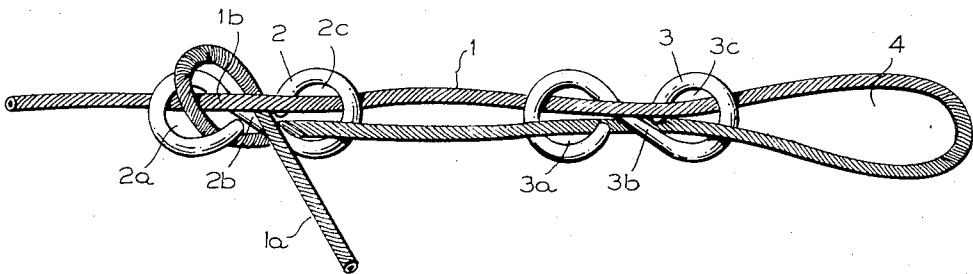


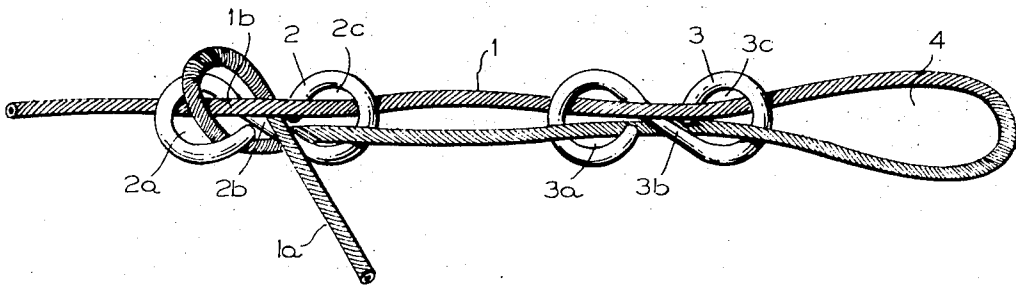
[54] **HOLDER ASSEMBLY FOR CABLES
AND METHOD**
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24/129 C, 115 H

[56] **References Cited**
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[57] **ABSTRACT**
A knot assembly for cables is obtained by introducing a flexible cable through holes defined by two relatively rigid shaped metal rods and bending it around the rods and the cable itself; a loop made with this cable is held together by this knot assembly.

3 Claims, 1 Drawing Figure





HOLDER ASSEMBLY FOR CABLES AND METHOD

The present invention relates to knot assemblies and more particularly to a knot assembly for flexible cables. Illustrative cables used in this invention are plastic coated stranded metal cables, stranded metal cables without plastic coating, plastic coated stranded fiberglass cables, plastic coated stranded dacron cables, extruded synthetic plastic (e.g., neoprene) stretch tie-down cables, and the like.

Plastic coated metal cables comprising a core of stranded metal wires and a plastic coating completely surrounding said core are well known and find widespread applications due to their flexibility, their smooth, not hurting surface and their resistance to rusting. They can be used for instance in pull cords, tennis net supports, clothes lines, animal attachment lines, in the sailing boat industry, in the camping industry and in emergency cases.

In the past the main disadvantage of this kind of cable has been the difficulty of effectively assembling two lengths of cable in order to obtain an extension, or to form a loop. A conventional knot did not resist high forces applied to it because of the relative stiffness of the cable and its smooth surface. Therefore metal clamps have been used which cut into the plastic coating, thus providing resistance to slippage, but damaging the cable.

One object of the present invention consists therefore in providing a knot assembly for flexible cables, which assures resistance to slippage and can easily be tied or untied without damaging the cable.

Another object of the present invention consists in providing a method for obtaining a knot assembly of the above features.

In accordance with these objects the present invention provides a knot assembly formed of two lengths of said flexible cable and two relatively rigid inserting means each being formed with two holes separated by an intermediate portion, said holes being larger than the double of the diameter of said flexible cable, all said holes of both inserting means being aligned in series, said lengths of cable being interlaced with said rigid inserting means.

Further features and advantages of the present invention will be apparent from the following description of a preferred embodiment thereof, with reference to the accompanied drawing, which shows a knot assembly according to the present invention.

Referring now to the drawing, two lengths 1a and 1b of a flexible cable 1 are integral to form a loop 4. Two relatively rigid, preferably equal, shaped metal rods 2 and 3 are each shaped to define a first hole 2a, 3a and a second hole 2c, 3c, separated from each other by an intermediate portion 2b, 3b of said shaped rod, thus defining, as shown in the drawing, two figure eight shaped members. Said holes are slightly larger than the double of the diameter of cable 1, so as to permit an easy insertion of two cables in each hole, but not being too large, as that would result in an undesired bulkiness of the knot assembly.

A suitable separation between said shaped rods 2 and 3 has shown to be approximately the width of one of said figure eight shaped members, but this is not intended to be a limiting factor of the invention.

Said holes 2a, 2c, 3a, 3c are aligned in series, and cable 1 extends upwardly through hole 2a, over said intermediate portion 2b, downwardly through hole 2c, upwardly through hole 3a, over said intermediate portion 3b, downwardly through hole 3c, thence forming loop 4 which can be bent around any bar, ring or the like for the purpose of fixation of the cable 1, said cable 1 then extending downwardly through hole 3c, under said intermediate portion 3b, upwardly through hole 3a, downwardly through hole 2c, under said intermediate portion 2b, upwardly through hole 2a, and around and under section 1b of cable 1 extending over said intermediate portion 2b of said shaped rod 2, section 1a of cable 1 projecting outside of the contact point with said section 1b.

It is to be understood that the words upwardly and downwardly used in this description only refer to a relative position of the shaped rods, but are intended to limit the invention.

A method according to the present invention to obtain the said knot assembly will now be described. Said flexible cable 1 is introduced upwardly through hole 2a, led over said intermediate portion 2b, introduced downwardly through hole 2c, upwardly through hole 3a, led over said intermediate portion 3b, introduced through hole 3c, bent into said loop 4, introduced downwardly through hole 3c, led under said intermediate portion 3b, introduced upwardly through hole 3a, downwardly through hole 2c, led under said intermediate portion 2b, introduced upwardly through hole 2a, bent tightly around section 1b of cable 1 and inserted between said intermediate portion 2b and said section 1b. Finally both sections 1a and 1b are pulled together to make sure that section 1a is fixedly clenched. Section 1a should project outside the clenching point approximately a length sufficient to permit to be plied over itself, since a too short length causes the section 1a to be stiff, thus not allowing it to seat itself against the intermediate portion 2b, and provides the danger of said section slipping out under load conditions.

The use of at least two shaped metal rods has been found to be necessary to provide the required resistance to slippage of the knot assembly since one shaped rod alone would not develop enough breaking strength of the cable. This resistance to slippage or breaking strength is based on the friction created between the cable and the shaped metal rods by the assembly according to the invention. Said friction is basically produced by three different characteristic features of the knot assembly:

a. In the clenching point of the section 1a between section 1b and the intermediate portion 2b an increase of the force applied to the section 1b results in an increase of the clenching pressure on the section 1a, thus also resulting in an increase of the friction which prevents said section 1a from slippage.

b. The changes of direction of the axis of the cable due to the fact of interlacing it with the shaped metal rods cause the pressure of the cable against the said shaped rods to be increased when applying a force on said cable, resulting in a further increase of the friction preventing the slippage of the cable on said shaped rods. The use of two shaped rods is important because it increases the number of said changes of direction.

c. The scissor effect accomplished on several parts of the shaped metal rods contributes to clench the metal rod between two portions of cable, thus increasing the pressure between said rod and the cable and consequently the friction preventing the slippage of the cable on said shaped rods. The greatest contribution to the whole resistance to slippage of the assembly is originated by the feature described under a, that is in the clenching point of section 1a.

Thus, the present invention provides an efficient knot assembly for flexible cables, which can easily be tied or untied despite the relative stiffness of such a cable.

It is to be understood that the present invention shall not be limited to the specific embodiment herein described, as various modifications can be realized within the scope covered by the following claims.

What is claimed is:

1. Holder assembly for cables, including two lengths of flexible cable, two relatively rigid inserting means each being formed with two holes separated by an intermediate portion, said holes being larger than the double of the diameter of said flexible cable, all said holes of both inserting means being aligned in series, a first length of said cable extending upwardly through a first said hole of a first said inserting means, over said intermediate portion thereof, downwardly through the second said hole thereof, upwardly through a first said hole of the second said inserting means, over said intermediate portion thereof, downwardly through the second said hole thereof, the second length of said cable extending downwardly through the second said hole of the second said inserting means, under said intermediate portion thereof to provide a scissor effect in combination with that part of said first length passing over said intermediate portion to clench said intermediate portion, upwardly through the first said hole thereof, downwardly through the second said hole of the first said inserting means, under said intermediate portion thereof to provide a scissor effect in combination with that part of said first length passing over said intermediate portion to clench said intermediate portion, upwardly through the first said hole thereof and around and under the first length of cable extending over said intermediate portion of the first said inserting means.

2. Holder assembly as defined in claim 1 providing a loop termination, wherein said two lengths of flexible cable are integral and form a loop and said inserting means comprises two, relatively rigid, shaped metal rods each of which is shaped to define two holes separated from each other by an intermediate portion of said shaped rods, said holes being larger than the double of the diameter of said flexible cable, all said holes of both shaped rods being aligned in series, said

cable extending upwardly through a first said hole of a first said shaped rod, over said intermediate portion thereof, downwardly through the second said hole thereof, upwardly through a first said hole of the second said shaped rod, over said intermediate portion thereof, downwardly through the second said hole thereof, thence forming said loop, and extending downwardly through the second said hole of the second said shaped rod, under the intermediate portion thereof to provide a scissor effect in combination with that part of said first length passing over said intermediate portion to clench said intermediate portion, upwardly through the first said hole thereof, downwardly through the second said hole of the first said shaped rod, under said intermediate portion thereof to provide a scissor effect in combination with that part of said first length passing over said intermediate portion to clench said intermediate portion, upwardly through the first said hole thereof, and around and under the cable extending over said intermediate portion of the first said shaped rod.

3. A method to obtain a holder assembly for cable to provide a loop including two relatively rigid inserting means which comprise two, relatively rigid, shaped metal rods each of which is shaped to define two holes separated from each other by an intermediate portion of said shaped rods, said holes being larger than the double of the diameter of said flexible cable, all said holes of both shaped rods being aligned in series, comprising the steps of introducing said flexible cable upwardly through a first said hole of a first shaped metal rod, leading it over said intermediate portion thereof, introducing said cable downwardly through the second said hole thereof, upwardly through a first said hole of the second said shaped rod, leading it over said intermediate portion thereof, introducing said cable downwardly through the second said hole thereof, bending the cable into said loop, introducing said cable downwardly through the second said hole of the second said shaped rod, leading it under said intermediate portion thereof to provide a scissor effect in combination with that part of said first length passing over said intermediate portion to clench said intermediate portion, introducing it upwardly through the first said hole thereof, downwardly through the second said hole of the first said shaped rod, leading the cable under said intermediate portion thereof to provide a scissor effect in combination with that part of said first length passing over said intermediate portion to clench said intermediate portion, introducing it upwardly through the first said hole thereof, bending the cable tightly around the said cable extending over said intermediate portion, and clenching it between said intermediate portion and said cable extending over said intermediate portion.

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