

- [54] **CABLE CLOSURE ASSEMBLY**
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Colo.
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- [58] **Field of Search** **36/2.5 AL; 280/11.35 C;**
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71 SK, 33 A; 63/4; 59/90, 80, 82, 83, 84, 78

1,738,106	12/1929	Kuehner	63/4
2,199,444	5/1940	Rauglas	24/70 SK
3,084,066	4/1963	Dunmire	59/78 X
3,599,296	8/1971	Baso	24/70 SK

FOREIGN PATENTS OR APPLICATIONS

1,222,724	2/1971	Great Britain	59/84
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& Klose

[57] **ABSTRACT**

A cable closure for a boot including two flexible mem-
bers which are connected to each other by means of
substantially rigid tubular end members into which the
flexible members are inserted and retained.

[56] **References Cited**

UNITED STATES PATENTS

490,409	1/1893	Herman	59/84 X
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9 Claims, 5 Drawing Figures

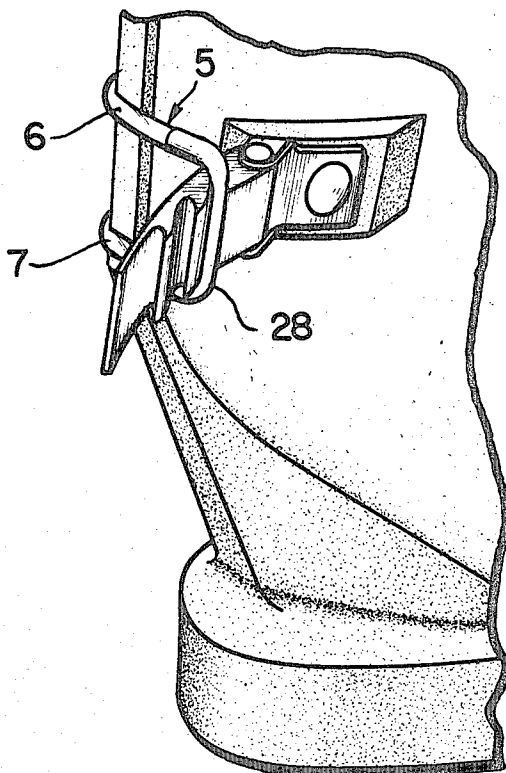


FIG. 1

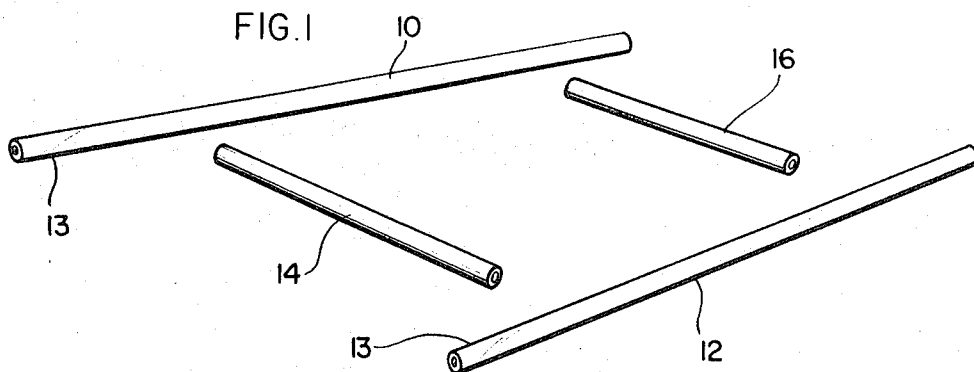


FIG. 2

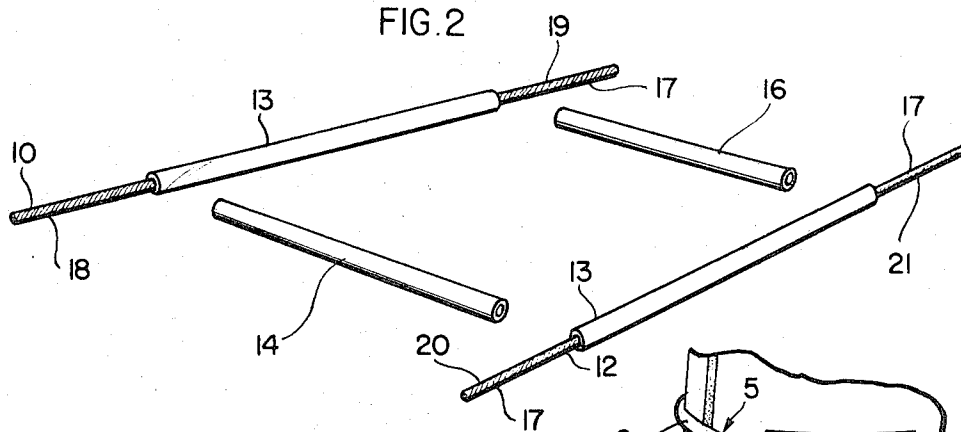


FIG. 3

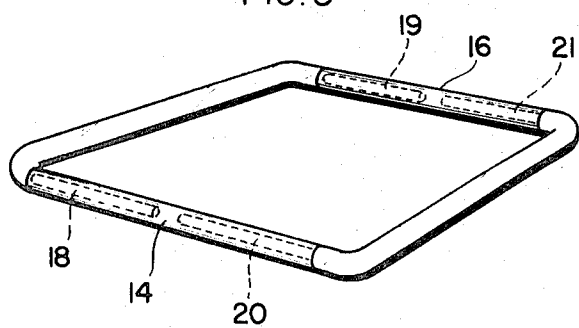


FIG. 5

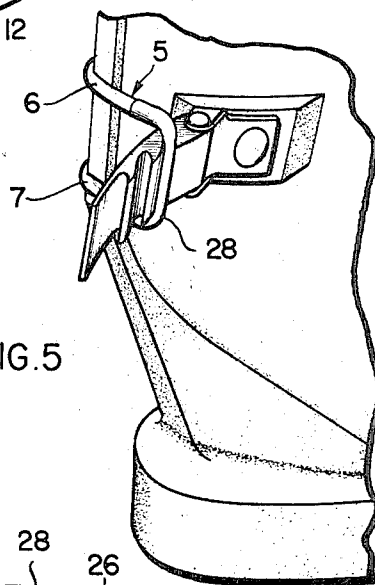
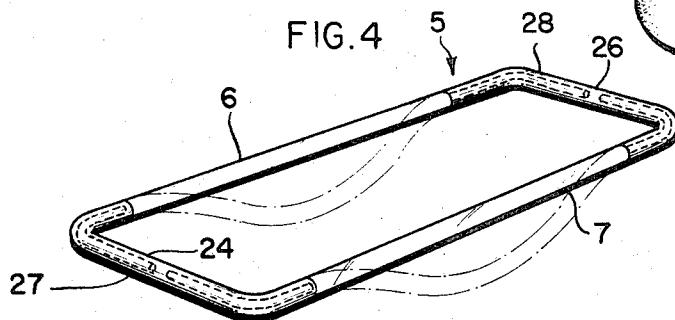


FIG. 4



CABLE CLOSURE ASSEMBLY

This invention relates to a cable closure device and the method for making the closure and more particularly to a cable closure assembly for use with a securing means for a ski boot.

Since the advent of buckle closure systems for use with ski boots, many different closure means have been utilized to secure a ski boot about the foot of a wearer. Many of these closure means utilize a wire form member in which a wire loop or form, such as exemplified in U.S. Pat. Nos. 3,570,148, 3,486,247 and 3,362,091, is employed in clamping the boot firmly onto the foot of a skier.

Unfortunately, many wire or loop forms have been unsatisfactory. In some instances in which a solid wire is employed as the closure, it has been found necessary to have more than one die size so that the various lengths or sizes of wire form can be made. Thus, in those applications where wire forms vary in length, for example, from a short to an extra long length, separate dies are required for each size wire form.

Moreover, with a solid wire form closure, there is too little flexibility with the result that little or no provision is made for the problem of misalignment which sometimes occurs with boot securing means. This is undesirable for, as revealed in our pending application Ser. No. 231,967 filed Mar. 26, 1972, it is often desired to have the wire form seat snugly in a slot or groove in a buckle or clamp employed in the securing means. If misalignment between a buckle and clamp occurs in a closure system in which a solid wire form is used, it is difficult to properly align the securing means.

In those instances where a cable-type loop closure is employed, disadvantages exist in that there often is substantially point or edge loading as opposed to having a section of the cable closure receiving the load in a more uniform manner.

What is desired is to have a closure for use in a boot securing means which provides not only the desired flexibility to permit alleviation of misalignment, but also the necessary rigidity to obviate point or edge loading on the closure. Moreover, it is desired to have more than one size cable closure manufactured using only one die for the various length closures.

SUMMARY OF THE INVENTION

With the view of eliminating the deficiencies associated with various closure assemblies presently available in the art, applicants have invented a new and unobvious cable closure which comprises two flexible cable members which are connected to each other preferably by substantially rigid U-shaped members. The flexible cable portions of the closure of the present invention permit the desired flexibility whereas the rigid U-shaped members are adapted to reside in the slot or groove of a buckle or clamp member of a ski boot securing means. Because flexible members are utilized to connect the solid U-shaped members together, only one crimping and forming die is required to make different length closures and the flexible members allow for correction of misalignment problems.

DESCRIPTION OF THE DRAWINGS

The invention will be further described with reference to the accompanying drawings wherein:

FIG. 1 shows two flexible, plastic coated cables and two substantially rigid, tubular members prior to assembly;

FIG. 2 shows the two flexible cables of FIG. 1 with their respective end portions devoid of the plastic coating;

FIG. 3 shows the flexible cable of FIG. 2 inserted into the substantially rigid tubular members prior to a forming and crimping operation;

FIG. 4 shows a cable closure of the present invention following a crimping and forming operation wherein the rigid members are crimped onto the cable end portions inserted therein and the rigid members have been formed into U-shaped members; and,

FIG. 5 shows the cable closure of the present invention partially installed in a ski boot buckle securing means.

DETAILED DESCRIPTION

Referring to the drawings, there is shown first and second flexible cable members 10, 12 which are made up of a plurality of fine wires. The cable members are covered with a plastic coating 13 which can be any suitable material such as a vinyl polymer including polyvinyl chloride, polyolefin, polyethylene, polypropylene or nylon. Members 14, 16 are substantially rigid, metal tubular members. The inner diameter of each tubular member is preferably slightly larger than the outer diameter of the end portions 17 of the flexible cables which have been stripped of plastic as shown in FIG. 2.

In assembly, end portion 18 of steel cable 10 is inserted in tubular member 14 while the remaining end portion 19 is inserted in tubular member 16. Preferably, the portions are inserted into the respective tubular members to the point where the end of the tubular member abuts the end of the plastic coating on the flexible members.

The end portions 20, 21 of cable member 13 are inserted into tubular members 14, 16 respectively in the same manner that the end portions of cable 10 were inserted into the tubular members.

The end portions on each cable are of a length that each portion will be inserted a substantial distance into members 14, 16 in order that a sufficient amount of each cable is in a position to be properly crimped within the tubular members whereby the cable closure will withstand the desired loading in tension.

Subsequent to insertion of the cables within the tubular members, the assembly is inserted in a crimping and forming die wherein the inserted end portions of the flexible cables are crimped within the tubular members after which the tubular members are bent to form substantially U-shaped sections 24, 26 as illustrated in FIG. 4. The final form of the cable closure is substantially rectangular in shape. Cable closure 5 has two substantially parallel flexible sections 6, 7 connected together by two substantially rigid U-shaped end members 24, 26. In assembly, the base sections 27, 28 of the respective U-shaped sections will be seated in grooves or slots of a clamp or buckle or the like as illustrated in FIG. 5.

While a particular length for cable closure 5 has been illustrated in the drawings, it is appreciated that other size closures may be necessary in order to provide an appropriate range of adjustment for ski boot buckle assemblies. With the cable closure of the present inven-

tion, only one crimping and forming die is required to assemble different lengths of cable closures. As shown in FIG. 4, when a larger length closure is required, the assembly is made in the same manner as previously described. However, because sections 6 and 7 are flexible, they can be easily bent to fit within the crimping and forming die, as shown in dotted lines in FIG. 4, so that following the crimping and forming operation, the cable closure will be of an increased length.

While the closure assembly has been illustrated as being rectangular in shape, it is appreciated that other shapes could be used; however, it is important that the shape permit sections 27, 28 to bear against the length of the slot or groove in which closure 5 is inserted so that loading on the closure is not confined to only a small section of the closure.

Moreover, while portions of the plastic have been stripped away prior to inserting the flexible cable members into the tubular members, the assembly could be made with the plastic on the end portions. Preferably, however, it is desired to achieve a cable closure 5 which is of substantially uniform outer diameter following the assembly operation.

The foregoing detailed description has been given for clearness of understanding only and no unnecessary limitations should be understood therefrom as modifications will be obvious to those skilled in the art.

What is claimed is:

1. A continuous closure or loop assembly for use in an adjustable, releasable fastening device for boots, which closure or loop assembly comprises a pair of elongated, spaced-apart, flexible cable members connected to and held in spaced-apart relationship by a pair of spaced-apart end members, each of said end members being elongated, uninterrupted, substantially rigid and having end portions which are securely connected to different end portions of said cable members to provide an interconnected, continuous closure or loop assembly formed of separate but interconnected cable and end members, one of said end members being shaped and constructed to be alignable and engageable with, securely fastened by, and releasable from slotted, tensioning buckle means secured to a boot, the other end member being shaped and constructed to be secured to a boot, and each of said cable members being shaped and constructed both to flex to assist in alignment of said one end member to tensioning buckle means and to be placed under tension along its length when said closure or loop assembly is fastened by the wearer.

2. The cable closure or loop assembly of claim 1 wherein opposed, free end portions of each cable member extend into axial tubular entryways of different end

members and are securely retained in and by said end members.

3. The cable closure or loop assembly of claim 1 wherein each of said end members is substantially U-shaped.

4. The cable closure or loop assembly of claim 1 wherein said assembly has a substantially rectangular configuration when not fastened.

5. The cable closure or loop assembly of claim 1 wherein said cable and end members are formed of metal and elongated, flexible plastic covering means extend along and over a length of each of said cable members.

6. The cable closure or loop assembly of claim 1 wherein each of said end members is tubular and is substantially U-shaped and opposed, free end portions of each cable member extend into axial tubular entryways of different end members and are securely retained in and by said end members.

7. The cable closure or loop assembly of claim 1 wherein said assembly has a substantially circular cross section of substantially uniform outer diameter.

8. A continuous closure or loop assembly for use in an adjustable, releasable fastening device for boots, said closure assembly comprising:

a first flexible member having two ends;

a second flexible member having two ends;

first and second substantially U-shaped, substantially rigid members;

each of said substantially U-shaped members comprising a base and first and second legs, each of said legs extending outward from said base to an outboard end and being tubular for at least a portion thereof;

one end of said first flexible member being inserted in and connected to the outboard end of the first tubular leg of said first, substantially U-shaped member and the remaining end of said first flexible member being inserted in and connected to the outboard end of the first tubular leg of said second, substantially U-shaped member; and,

one end of said second flexible member being inserted in and connected to the outboard end of the second tubular leg of said first, substantially U-shaped member and the remaining end of said second flexible member being inserted in and connected to the outboard end of said second leg of said second, substantially U-shaped member.

9. The continuous closure or loop assembly of claim 8 wherein said assembly is of substantially uniform, outer diameter and substantially uniform, circular cross section.

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