July 21, 1953 M. E. LEE 2,645,832

CORD GRIPPING DEVICE

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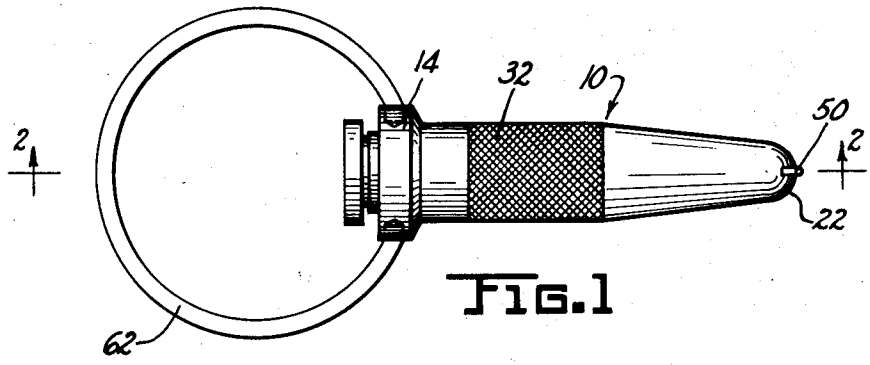

FIG. 1

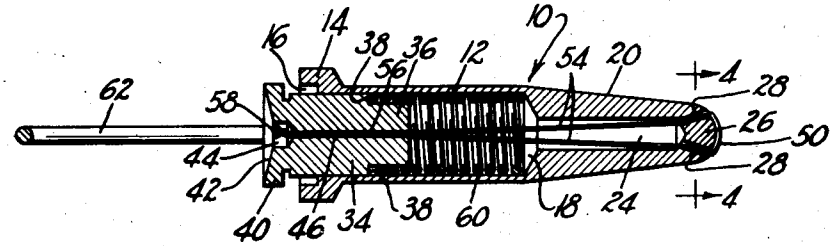

FIG. 2

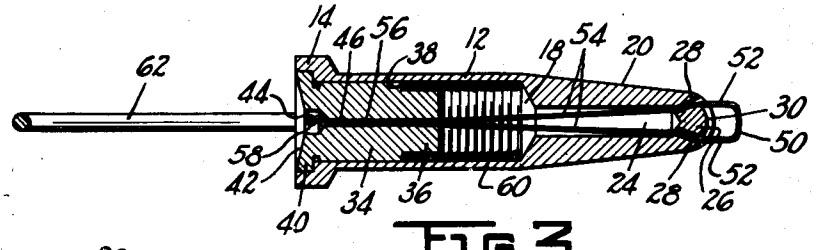

FIG. 3

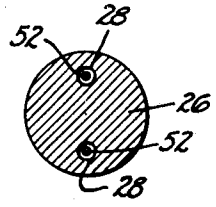

FIG. 4

INVENTOR.
MATTHEW E. LEE
BY
Oltsch & Knoblock
ATTORNEYS

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CORD GRIPPING DEVICE

Matthew E. Lee, South Bend, Ind.

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2 Claims. (Cl. 24—136)

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This invention relates to improvements in gripping devices usable for gripping and holding small, light weight objects while manipulating and working with the same.

One of the purposes for which the device is especially suited is the handling and manipulation of threads, feathers, hairs and like materials employed in the manufacture of fishing flies. The device is used in this connection in place of a conventional pair of pliers and serves to grip the thread, feather, hair, or other strand or member, in a manner which prevents its release and which eliminates the necessity for the continuous application of manual pressure to the tool. The device is also especially well suited for rapid and fast manipulation of such operations as the winding of thread or other elongated flexible members around another object with a number of turns. Among other advantages of the device are lightness of weight, compactness to facilitate storage in a small space, continuous application of gripping pressure, ready release of gripping pressure, provision of a soft grip upon the object being handled so as to avoid danger of breakage or cutting of that member, and ready manipulation and control of position of the member in its intended usage.

Other objects and advantages will be apparent from the following specification.

In the drawing:

Fig. 1 is a side view of the device in its normal position.

Fig. 2 is a longitudinal sectional view taken on line 2—2 of Fig. 1, and illustrating the device in its closed position.

Fig. 3 is a longitudinal sectional view similar to Fig. 2, and illustrating the device in its open or releasing position.

Fig. 4 is a detail sectional view taken on line 4—4 of Fig. 2.

Referring to the drawing which illustrates the preferred embodiment of the invention, the numeral 10 designates the body of the device which is of elongated cup-shape form. The body has a tubular wall portion 12 provided with an enlarged flange portion 14 at its open end. The portion 14 may have a counter-bored mouth portion 16 whose inner transverse dimension is greater than the inner transverse dimension of the tubular portion 12. The bore 18 of the tubular portion 12 extends for substantially one-half of the total length of the body 10.

The remaining portion of the body has an externally tapered surface 20 terminating in a part-spherical or generally rounded end 22. A bore 24 of a diameter reduced compared to the diameter of the bore 18 extends for the major portion of the length of the tapered portion 20 concentrically thereof and terminates spaced from the end surface 22 in order to provide an end wall 26. The end wall 26 has a pair of apertures 28

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formed therein, the same being spaced apart and preferably diverging outwardly so that their outer ends are spaced apart substantially, as best illustrated in Fig. 4. The rounded end surface 22 is preferably interrupted by a groove 30 which extends between the outer ends of the apertures 28 and is preferably of substantially uniform depth throughout. If desired, a portion of the body may be knurled externally at 32.

A plunger member 34 has a snug sliding fit within the bore 18 of the body. The inner end portion 36 of the plunger is of reduced dimension and provides a shoulder 38 intermediate the length of the plunger. An enlarged head or flange portion 40 is formed at the outer end of the plunger, and the end surface 42 of the plunger at the head 40 is preferably concave as illustrated. A socket or recess 44 interrupts the end surface 42 centrally thereof. An elongated reduced dimension bore 46 communicates with the socket 44 at one end and extends longitudinally centrally through the plunger, being open at the inner end of the plunger. The transverse dimension of the flange 40 is preferably slightly less than the transverse dimension of the socket 16 so that said flange may seat in said socket at the innermost end of its sliding movement within the bore 18 as illustrated in Fig. 3.

A strong elongated flexible strand of a material having a tendency to retain its shape is utilized in the device. Among the materials which are suited for use in this purpose are fine metal wire having substantial tensile strength, such as piano wire, a strand of surgical suture material, either natural or synthetic, strong heavy woven thread, either untreated or treated with wax or other material tending to strengthen and stiffen the same, and filaments of synthetic resinous material, of which that known commercially as "nylon" is one example, the latter being preferred.

The central portion 50 of the strand seats in the groove 30 in the end surface 22 of the body member. A pair of runs 52 projecting from the central portion 50 extend slidably through the apertures 28. Converging runs 54 extend from the apertures 28 to the plunger 36, and runs 56 extend through the bore 46 of the plunger to project therefrom and into the socket 44. The free end portions of the strand are knotted, twisted or otherwise secured together at 58 with the knot normally seating in and being confined in the socket 44. The length of the strand is such as to permit the flange 40 of the plunger to project from the open end of the body 10 as illustrated in Fig. 2, and the plunger is normally urged to the Fig. 2 position by the coil spring 60 which fits within the bore 18 to bear at one end against the inner end of that bore and to bear at its opposite end against the shoulder 38 of the plunger, said spring encircling the reduced portion 36 of the plunger.

If desired, the flange 14 of the body 10 may be provided with sockets which receive and pivot the end portions of a large finger ring 62. The ring will preferably be resilient so that it may be spread for removal from the sockets in the body. The ring will be of a size to fit freely around the finger of a user.

In the use of the device to grip an article, the plunger 34 is depressed against the action of the spring 60 to cause the central portion 50 of the strand to be spaced from the end surface 22 of the body in the manner illustrated in Fig. 3. This can be accomplished easily by grasping the body at the knurled part 32 between two or more fingers and pressing upon the end of the plunger at the surface 42 with another finger.

Alternatively, the device can be used by holding the body between the index finger and the middle finger and pressing upon the plunger with the thumb, the index finger and middle finger bearing against the ring in direct opposition to the direction in which the pressure is applied to the plunger. The object or objects to be gripped are passed through the loop defined by the runs 50, 52 of the strand which projects outwardly of the end of the body, and pressure upon the plunger is then released. The spring 60 draws the strand inwardly and produces a gripping action upon the article within the loop of the strand, pressing and gripping the same between the strand portion 50 and the end surface 22 of the body. The grip thus effected is strong and is maintained continuously by the spring. Thus the user is free to manipulate the gripping device in any manner found suitable, for instance, in a manner to cause the wrapping of a thread or a hair around the shank of a hook in tying a fishing fly.

The manipulation is also facilitated by the finger ring 62, it being possible for the user, by passing his index finger through the ring and then effecting a circular motion around the object which is to be wrapped, to quickly effect the desired wrapping, maintaining continuously the desired tension upon the article being wrapped and being free from concern about the gripping tension applied to the strand, thread or feather being worked, because the spring 60 exerts such gripping tension.

While the provision of a groove 30 has been illustrated herein, it will be understood that such a groove is not essential to the successful operation of the device. Where employed, it serves to enhance the gripping action of the device by reason of the fact that the thread or other member being gripped, where flexible, tends to be slightly bent or to be pressed into the groove by the pressure of the strand portion 50. Where employed, the groove is preferably quite shallow and usually will be of a depth less than the diameter of the strand. It is also important, where the groove is provided, that the occurrence of sharp edges on its sides, that is, at the junction of the groove with the rounded surface 22, shall be avoided.

The strand employed in the device must possess properties both of flexibility and stiffness. Stiffness is required to insure that there will be an endwise bodily displacement of the strand from the Fig. 2 position to the Fig. 3 position incident to the depression of the plunger 34. Thus the use of a strand of very limp material will not be wholly satisfactory. At the same time the use of a wholly rigid or excessively stiff member will not be satisfactory because the strand must flex slightly at the runs 52 thereof as the device is shifted from the Fig. 2 to the Fig. 3 position.

It will be observed that the strand is the sole means which holds the parts of the device in their assembled relation. Consequently, if the strand breaks, the device becomes wholly and immediately inoperative. Thus the user is assured that at any time the device is operative, it may be used to its full utility so that no danger will exist that the gripping tension will relax during usage. In the event the strand breaks, the parts can be disassembled if required for removal of the broken portions of the strand, and then can be reassembled by the simple operation of applying a new strand operatively in position and tying a knot in the end of the strand while the plunger is held depressed. This operation can be performed without great difficulty and expeditiously where clamping means, such as a vise, are provided which embrace the flange 14 and engage the end of the plunger to hold the same in the position shown in Fig. 3. For this purpose it is preferred that the flange 40 of the plunger shall be of a diameter substantially equal to or preferably slightly greater than the diameter of the tubular portion 12 of the body.

While the preferred embodiment of the invention has been illustrated and described, it will be understood that changes in the construction may be made within the scope of the appended claims without departing from the spirit of the invention.

I claim:

1. A gripping device comprising a cup-shaped body, an end wall of said body having a pair of spaced apertures, a plunger slidable axially in said body and having an open-ended passage therethrough and a socket therein communicating with the outer end of said passage, an elongated strand having its ends knotted together, said knotted portion seating in said socket and said strand extending from said knotted portion through said passage with separate runs extending through said apertures whereby a portion of said strand extends across the outer surface of said end wall between said apertures, and a spring pressing said plunger outwardly of said body.

2. A gripping device comprising a cup-shaped body, an end wall of said body having a pair of spaced apertures, a plunger slidable axially in said body, an elongated strand having its end portion anchored at said plunger and including a loop portion having runs extending through said apertures and a bight portion extending across the outer surface of said end wall between said apertures, and a spring pressing said plunger outwardly of said body, the exterior surface of the end wall of said body being rounded and having a groove therein between said apertures of a depth less than the thickness of said strand.

MATTHEW E. LEE.

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