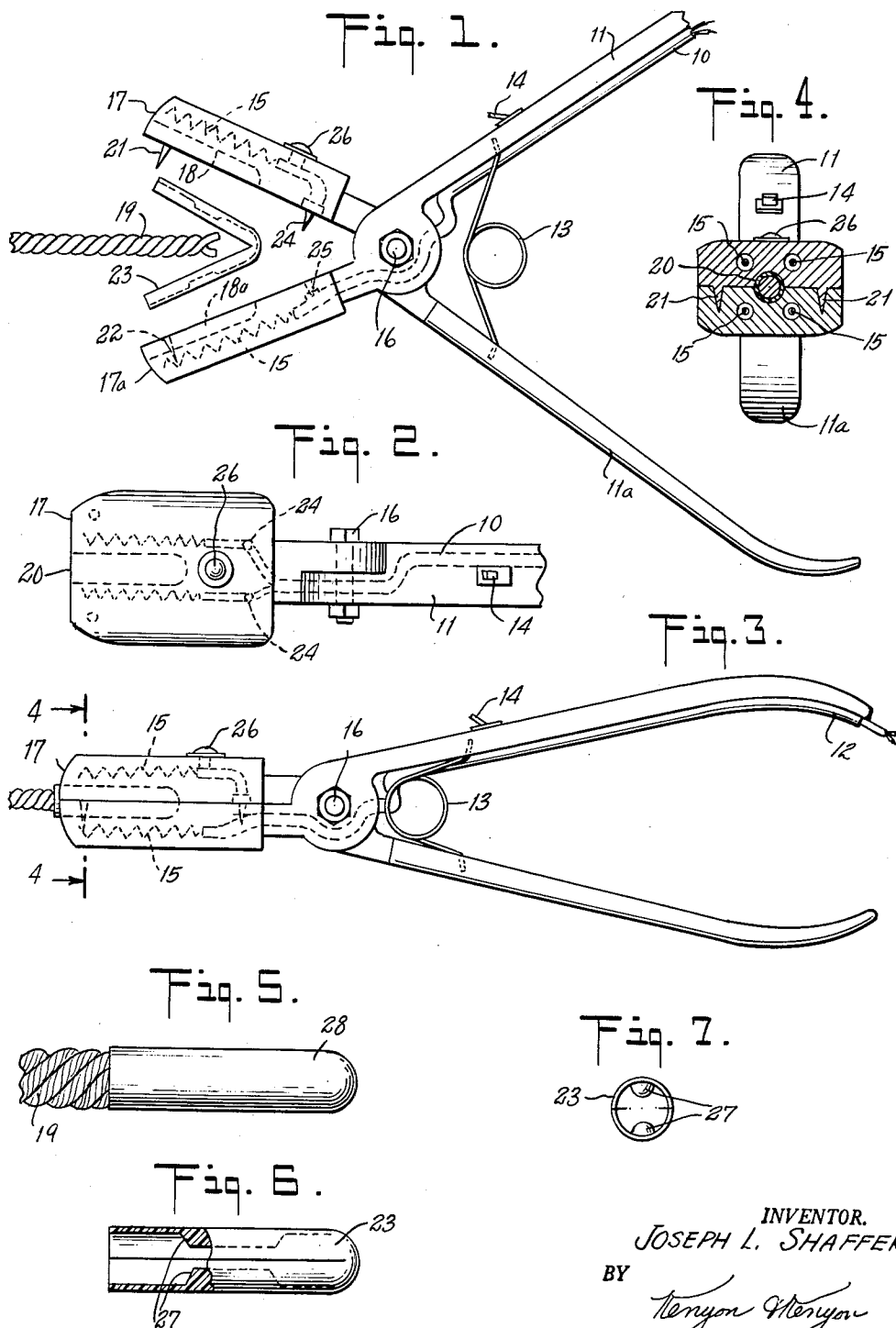


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 DEVICE TO SERVE ROPE ENDS

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DEVICE TO SERVE ROPE ENDS

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Present methods to serve rope ends are cumbersome and not adapted for use by the average small boat owner and those who do not constantly handle rope. In contrast the device of this invention can be used by anyone.

One object of the present invention is to provide a device for preparing rope so that it may easily be threaded through pulleys and guide loops without interference from frayed and unraveled ends, and which is convenient and easy to use.

Another object is to provide a process for serving rope ends so as to preserve the rope through many uses without the necessity of cutting off the end section of the rope and thus effect an economy in the use of the rope. Yet another object is to provide a device which can be used economically by anyone and which is capable of extensive use under any conditions. Other advantages will be apparent in the following disclosure. My invention is essentially of a plier-like device having a heating head comprising opposing jaws adapted to receive a thermoplastic moldable tip for serving the ends of rope.

In the drawings:

FIG. 1 is a side view of my device in an open position.

FIG. 2 is a top view of the device.

FIG. 3 is a side view of the device in a closed position with the rope and a moldable tip held within its jaws.

FIG. 4 is a front sectional view of the heating head taken along the line 4—4 in FIG. 3.

FIG. 5 is a view of the plastic tip in position upon a piece of rope.

FIG. 6 is a side view, partially in section, of the moldable tip to be used in the device.

FIG. 7 is an end view of the moldable tip to be used in the heating device.

The device of the invention may readily be adapted in known manner to be used on all voltages, cycles and currents of electric energy. The electrical energy is supplied to the device of the invention by an electrical conductor 10 which is adapted to be used with a suitable outlet plug and which may also have a ground attachment not shown.

The heating device of the invention consists of two handles 11, 11a as in a pair of pliers which handles 11, 11a are insulated or made of an electrically non-conducting material and which are hinged in the normal method of pliers. One of the handles carries the electrical conductor 10 which may be positioned in channel 12. The handles 11, 11a are maintained in an extended position by a metallic spring 13 which biases the handles 11, 11a outward until overcome by sufficient pressure. Also mounted in a convenient position upon the handle 11 which holds the electrical conductor 10 is a switch 14 which controls the flow of electricity to the heating elements 15. The switch 14 is normally in the off position and must be acted upon to initiate the flow of electrical current.

At one end of the electrically insulated handles 11, 11a which are hinged in the normal manner by a nut and bolt assembly 16 are a pair of opposing jaws 17, 17a. The jaws are normally at a distended position because of the biasing action upon the handles of the spring 13.

Each jaw 17, 17a contains a groove 18 suitable to receive a moldable tip 23 insert which is used to serve the rope 19. Each of the grooves 18 has an open end 20 to accommodate a rope end. The upper jaw 17 is equipped at its end with two pins 21 which in the embodiment are placed on opposite sides of the center line. The lower jaw 17a is equipped with oppositely placed recesses 22 which receive the pins 21 of the upper jaw 17 when the jaws 17, 17a

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are brought together by sufficient pressure upon the handles, 11, 11a to overcome the biasing action of the spring 13. The purpose of the pins 21 and recesses 22 upon the upper 17 and lower 17a jaws is to make sure that when the jaws 17, 17a are brought to a shut position they will be perfectly aligned.

Both the upper 17 and lower 17a jaws contain electrical heating elements 15 which when activated heat the jaws 17, 17a and more especially that portion around the groove 18 of the jaw which is adapted to receive the moldable tip 23. The heating elements 15 are constructed in the manner well known in the art. The elements 15 are suitably insulated so that no electricity is allowed to leak to the metal of the jaws 17, 17a. The heating elements 15 are positioned around the grooves 18 of the jaws both top 17 and bottom 17a so that when electrical current flows through the elements a uniform heat is obtained through the periphery of the groove 18 which is located in the two jaws 17, 17a. Thus the heat applied by the heating elements 15 is able to uniformly soften the tip 23 which is placed in the grooves 18 adapted to receive such.

Toward the handles 11, 11a on the inner face of the upper jaw 17 are located male contact points 24. On the inner face of the lower jaw 17a are female contact points 25 which are shaped and positioned so that they will receive the male contact points 24 when the jaws 17, 17a are brought together in a closed position. When the contact points 24, 25 are in a closed position, the heating elements 15 of the upper 17 and lower 17a jaws are connected together in a parallel circuit when the electrical current is allowed to pass to the heating coils by closing the switch 14 located on the upper handle 11. Though the foregoing is the preferred electrical circuit the two heating elements may also be connected in series.

On the upper jaw 17 may be located a temperature actuated light 26 which, operating in a known manner, indicates to the user when the heating elements 15 have reached a predetermined temperature at which the plastic tip 23 is known to soften. When the current has been turned off the light 26 will go out when the temperature falls below the predetermined level.

The tip 23 which the jaws 17, 17a of the heating device of FIG. 1 are adapted to receive is composed of any suitable thermoplastic material such as a resin, wax or plastic. The tip 23 is shaped to conform to the shape of the grooves 18 in the jaws 17, 17a of the heating device. The tip 23 is generally V-shaped and semicircular in section so when pressed around a rope end the two opposing sections make a tubular casing about the rope end. If desired, two separate sections may be used, in which case one would fit into the bottom jaw recess 18a and the other into the top jaw recess 18, being joined together under the influence of heat when used.

On the side of the tip 23 which is to be adjacent to the rope surface to be treated there are ridges 27 of the material of which the body of the tip is made. In the embodiment shown, there is one ridge on each side but the user may find it more advantageous to use more ridges which may be provided if desired. The ridges 27 are placed on the tip 23 so that there will be an abundance of the plastic material to permeate the rope to carry out the objects of the invention.

To use the device a molded tip 23 is placed either directly upon the rope 19 to be served or in the grooved portions 18, 18a of the open jaws 17, 17a between which is located the rope end 19. The handles 11, 11a are then depressed to overcome the action of the spring 13, which action causes the jaws 17, 17a containing the electrical heating elements 15 to close, encasing the molded plastic tip 23 and the rope 19 within the grooved portions 18, 18a of the jaws 17, 17a. The guide pins 20 cause the jaws

to close in alignment with each other so that there is complete cooperation between the upper 17 and lower 17a jaws.

The switch 14 which controls the current is then closed allowing the current to pass to the heating units 15. The heating of the coils 15 to a predetermined level activates the light 26 which indicates to the operator that the plastic tip 23 is becoming softened or plastic. While in this condition pressure exerted by the jaws causes the thermoplastic tip to impregnate the end of the rope. After a suitable interval, the operator opens the switch 14, thereby shutting off the current to the heating elements 15. The heating elements 15 are cooled for a time, allowing the thermoplastic tip 23 to harden and solidify. Then the jaws 17, 17a of the heating device of FIG. 1 are opened and the end of the rope encased in a plastic tip 28 is withdrawn. The tip thus formed is an integral part of the rope and cannot be removed without destroying the rope's basic structure. Various other and further modifications may be made of the heating device, tip and method of use without departing from the spirit of the invention claimed.

The inventor claims:

1. A device for serving the ends of rope with a thermoplastic tip comprising a pair of members, a pivot connection intermediate the ends of said members, the portions of said members on a first side of said pivot connection defining a pair of handles, the portions of said members on the other side of said pivot connection defining a pair of pivoted opposable jaws, a pair of channels one each in each opposing face of said pair of jaws, said pair of channels extending axially inward from the points of said jaws most extreme from said pivot connection, each said channel being semi-cylindrical in outline, said channels cooperating when said jaw faces mate to define a cylindrical cavity between said jaws extending from the outermost tips of said jaws straight toward said pivot connection and terminating in a dead-end short of said pivot connection, a pair of electrical heating elements one each disposed in each of said jaws along and about said channels, male guide means on one of said jaws, female guide means on the other of said jaws, said male and female guide means being mateable during closing of said jaws so as to guide said chambers together.

2. A device for serving the ends of rope with a thermoplastic tip comprising a pair of members, a pivot connection intermediate the ends of said members, the portions of said members on a first side of said pivot connection defining a pair of handles, the portions of said members on the other side of said pivot connection defining a pair of pivoted normally open opposable jaws, a pair of channels one each in each opposing face of said pair of jaws, said pair of channels extending axially inward from the points of said jaws most extreme from said pivot connection, each said channel being semi-cylindrical in outline, said channels cooperating when said jaw faces mate

to define a cylindrical cavity between said jaws extending from the outermost tips of said jaws straight toward said pivot connection and terminating in a dead-end short of said pivot connection, a pair of electrical heating elements one each disposed in each of said jaws along and about said channels, male guide means on one of said jaws, female guide means on the other of said jaws, said male and female guide means being mateable during closing of said jaws so as to guide said chambers together, said guide means further interconnecting said heating elements electrically.

3. A device for serving the ends of rope with a thermoplastic tip comprising a pair of members, a pivot connection intermediate the ends of said members, the portions of said members on a first side of said pivot connection defining a pair of handles, the portions of said members on the other side of said pivot connection defining a pair of pivoted normally open opposable jaws, a pair of channels one each in each opposing face of said pair of jaws, said pair of channels extending axially inward from the points of said jaws most extreme from said pivot connection, each said channel being semi-cylindrical in outline, said channels cooperating when said jaw faces mate to define a cylindrical cavity between said jaws extending from the outermost tips of said jaws straight toward said pivot connection and terminating in a dead-end short of said pivot connection, a pair of electrical heating elements one each disposed in each of said jaws along and about said channels, male guide means on one of said jaws, female guide means on the other of said jaws, said male and female guide means being mateable during closing of said jaws so as to guide said chambers together, said guide means further interconnecting said heating elements electrically, and switch means adapted to energize said heating elements.

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