June 4, 1963 I. F. BROWNSON 3,092,068

HAND GRIP

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FIG. 1

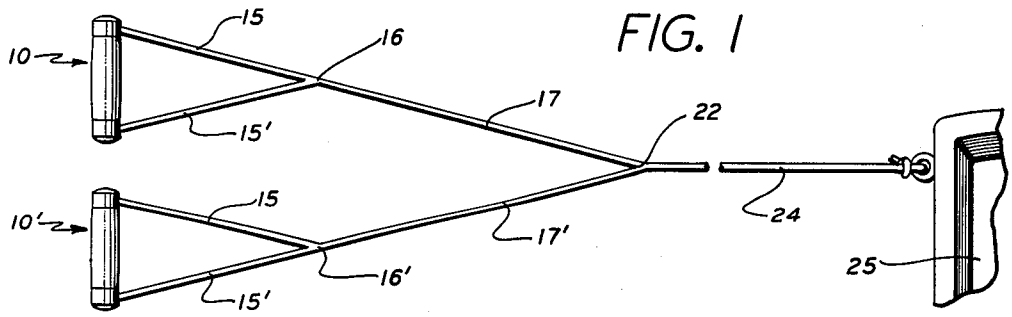



FIG. 2

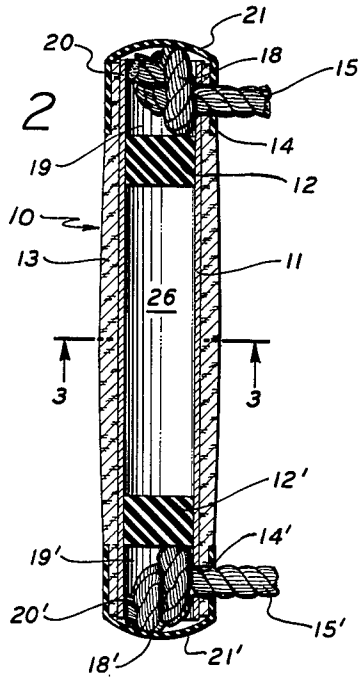



FIG. 3

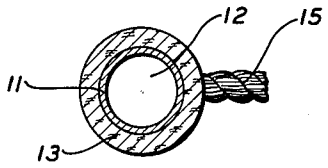
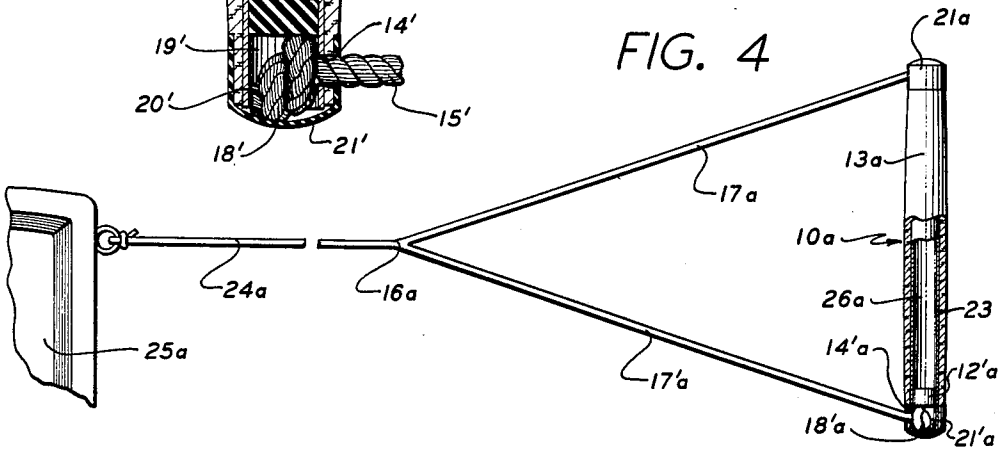



FIG. 4




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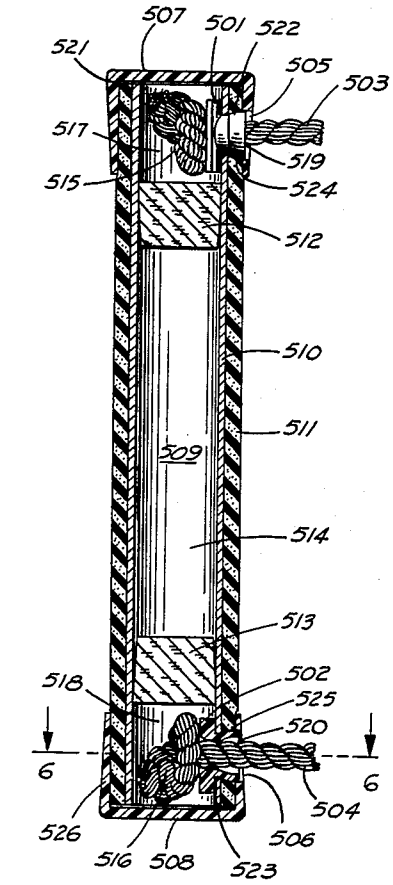



FIG. 5

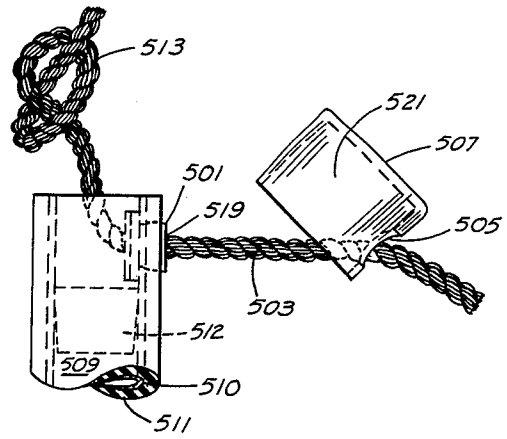



FIG. 7

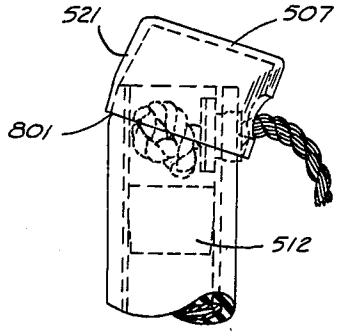



FIG. 8

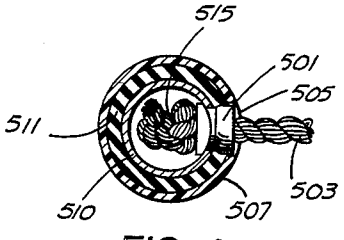



FIG. 6

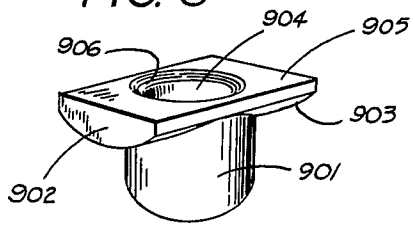



FIG. 9

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3,092,068

# HAND GRIP

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15 Claims. (Cl. 115—6.1)

This invention relates to a hand grip for sporting equipment and in particular to a hand grip for use with a water ski tow line or the like.

This application is a continuation-in-part of now pending application Serial No. 746,981 filed July 7, 1958, now abandoned, and entitled Hand Grip for Rope.

The conventional handle for water ski tow lines consists of a cylindrical length of solid water or plastic having a through transverse hole near each end. Lines are threaded through these holes and the ends knotted to prevent them from becoming disengaged from the handle. Wood has been used for these handles because, among other reasons, it is lighter than water and will float on the water when not held by the skier. An undesirable characteristic of these handles is that the wood becomes roughened on the surface due to the frequent wetting and drying to which they are subjected. Also, wood is not a durable material for this purpose, being subject to surface abrasions, cracks, splintering and other deformations. These surface conditions of wooden handles and the non-resilient properties of either plastic or wood make these handles hard on the hands of the user, and frequently cause flesh blisters to form and result in the formation of callouses after continuous use. Furthermore, hand cramps frequently result from the use of either wooden or plastic handles.

Tow line handles for water skiing conventionally have an overall diameter of 1" to 1⅛"; in practice, this dimension has been found to be most satisfactory for a comfortable grasp by the average skier. To provide a soft, yielding surface of a durable and otherwise satisfactory character on the handle of this invention it is coated with a layer of a soft, resilient material, preferably foam neoprene. It was learned in developing the invention that such a layer should be at least ⅛ inch in thickness. If applied to a conventional wooden handle, this layer would exceed, by at least one-quarter inch, the most desirable and conventional thicknes deemed suitable for handles (i.e., 1" to 1⅛ inches overall diameter). If the diameter of the wooden core be then correspondingly reduced to bring the overall diameter within the desired range, the flexure strength of the handle will be so reduced that bending and breaking will occur.

According to this invetnion, a length of light-weight metal tubing, preferably aluminum or magnesium, is substituted for the wooden core; the ends of the tubing are sealed in a novel manner to provide an airtight and watertight flotation chamber. The use of light-weight metal tubing not only solves the problem of selecting a suitable diameter for the provision of a resilient coating, without weakening the handle or making it too heavy to float on the water, but also makes possible other improvements and advantages which will be discussed and described hereinafter.

There is also shown and described a modification of the invention which extends its life and usefulness. This embodiment employs strain-relieving inserts which preclude wear between the handle and the lines to which it is attached, and utilizes novel end caps constructed to be retained in place by the strain-relieving inserts.

It is an object of the invention to provide a handle constructed to be resistant to wear, maintain its original, true, cylindrical shape and have sufficient strength in flexure to resist bending or breaking.

It is another object of this invention to provide a handle having a soft, yielding surface capable of conforming comfortably to the hand grasp to prevent blisters, callouses, and cramps.



It is another object of the invention to provide a handle which, in addition to being both durable and comfortable to the hand, will also have an overall specific gravity which is less-than-unity so that it is capable of floating on the surface of the water.

It is still another object of the invention to provide a handle which may be easily, yet securely, attached to a tow line, rope, or the like and will distribute the stress applied to the handle by the line in such a manner as to obviate weakening of the line at its joinder with the handle.

Yet another object of the invention is to provide a novel handle for sporting equipment and the like having novel strain-relieving inserts carried within the structure of the handle at the joinder between the handle and a connecting line.

A still further object of the invention is to provide a handle having, in addition to the qualities mentioned above, an attractive appearance.

These and other objects and advantages of the invention will be more readily understood from the description of the invention as set forth in the accompanying specification and drawings, in which:

FIGURE 1 is a plan view of a water ski tow line or rope system characterized by the provision of two handles, one for each hand of skier.

FIGURE 2 is a longitudinal sectional view of one of the handles of FIGURE 1, showing the manner in which the ends of the lines are secured thereto.

FIGURE 3 is a transverse sectional view of the handle, taken along line 3—3 of FIGURE 2.

FIGURE 4 is a plan view of a rope tow system having a single longer handle which may be grasped by both hands of the skier.

FIGURE 5 is a longitudinal sectional view of a second embodiment of a handle according to the invention.

FIGURE 6 is a transverse sectional view of the handle taken along line 6—6 of FIGURE 5.

FIGURE 7 is a fragmentary view of one end of the handle of FIGURE 5 showing the method of securing the line to the handle.

FIGURE 8 is a fragmentary view of the handle of FIGURE 5 showing the manner in which the end cap is fitted over the end of handle.

FIGURE 9 is a perspective view of the strain-relieving insert of the handle of FIGURE 5.

A handle 10 shown in longitudinal section in FIGURE 2, has a core 11 which is a length of light-weight tubing. Since many of the dimensions of the handle are related to the dimensions of the human hand of an average person, it is pertinent to state that stock aluminum tubing of an outside diameter of ¾ inch, and a tubular wall thickness of about 1/20 of an inch has been found very satisfactory in the manufacture of the handles of this invention. A piece of tubing about 5½ inches long and of the above transverse dimensions is long enough for the grasp of the average hand, will resist bending stresses applied to it in use, and has an outside diameter which provides an encircling cylindrical space within the optimum diameter of one inch to one and one-eighth inches for the layer of cushioning material of sufficient depth to have the desired cushioning effect. It is of course understood that these given dimensions may be varied somewhat without departing from the principles of the invention.

In the manufacturing process, according to a preferred method, the outside surface of the tubing 11 is preferably roughened by any suitable method, such as sand blasting,

and a layer 13 of hot soft material, of the thermosetting synthetic rubber type, preferably foam neoprene, is deposited upon the piece of tubing from end to end thereof. A satisfactory method of accomplishing this is by the extrusion of the heated material upon the surface of the tubing, as the latter is fed longitudinally through an extrusion die, which has an opening in its circumferential wall for the movement of the plastic material therethrough onto the moving tube. When completely processed, the gas filled cellular spongy character of the coating of foam neoprene gives it the two desirable qualities of lightness and softness. In the drawing, this layer of neoprene is shown in FIGURE 2 to be somewhat thicker at the middle portion of the handle, a feature which is a matter of choice and not an essential feature of the invention. A uniformly thick covering is employed in the embodiment shown in FIGURE 5. The neoprene may be mixed with comminuted cork or similar material prior to the extrusion of the material upon the tubing, which may have the effect of further increasing the two qualities of lightness and softness.

Two tightly fitting plugs 12, 12' are mounted in the interior chamber 26 of the tubing 11. These may be made of any suitable material and must be so inserted in the chamber 26, that they are stationary relatively to the tubing wall, and have a fluid tight joint with the inner surface of the tubing. Tight fitting cork disks forced into the tubing under pressure have proven satisfactory. Since the plugs 12, 12' are spaced a short distance from the adjacent tube ends 20, 20' respectively, they provide a central air flotation chamber 26 between them, and a pair of cylindrically shaped end pockets 19, 19' at the tube ends 20, 20' respectively.

The tube ends 20, 20' are formed with longitudinally alined, preferably circular holes 14, 14' respectively. Referring to FIGURE 1, two handles 10, 10', one for each hand of the skier, are shown connected by a system of ropes to the tow boat 25. The ropes of the rope system may be of any conventional kind. Ropes of woven plastic strands, which float on the water are in common use. In the rope system shown in FIGURE 1, a pair of rope lengths 15, 15' are connected to the two ends respectively of each of the bundles 10, 10'. The rope lengths 15, 15' of the two pairs of rope lengths are spliced at 16, 16' to the rope lengths 17, 17' respectively which are in turn spliced at 22 to the rope length 24 which is secured to the boat 25.

The ends of rope lengths 15, and 15' are threaded through the holes 14, 14' respectively and knotted at 18, 18' respectively. These knots prevent the rope ends from being pulled back through the holes 14, 14', and are neatly seated within the pockets 19, 19' where they are hidden from view, obviating any interference by the knots with the operation of the equipment.

The end pockets 19, 19' are closed by caps 21, 21' which are preferably made of a suitable plastic material, preferably a material of a fair degree of rigidity. These caps, while fitting tightly over the rims of the tube ends, need not fit so tightly as to make fluid tight joints. They cover the sharp edges of the rims of the tubing ends, prevent wear of objects against the knots in the pockets, and give the handle ends a neat appearance. They and the neoprene coating on the tube, may be variously colored to add a pleasing appearance to the handle. The neoprene coating 13 is shown in the drawing as shouldered at the tube ends to receive the cylindrical flanges of the caps 20, 20'. Such shoulders may or may not be provided as desired.

The flanges of the caps 20, 20' are apertured each with a hole the size of the rope holes 14, 14' in the tubing 11. In assembling the equipment, the rope end is first passed through the cap flange hole and then through the tubing hole 14, the rope end is knotted, the rope pulled out until the knot seats in the pocket, and the cap is moved along on the rope up against the side of the tubing from which position it is readily moved into position over the rim of the tube end. The rope end then serves to lock the cap against displacement endwise of the tubing.

FIGURE 4 shows a handle 10*a* of greater length than handles 10, 10' and a rope system connecting the longer handle to the boat 25*a*. Some skiers prefer the one long handle (which they may hold in one or both hands). It is constructed similarly to the handles 10, 10' having a core 23, plugs 12*a* (not shown) and 12'*a*, neoprene coating 13*a*, apertures 14*a* (not shown) and 14'*a*, the flotation air chamber 26*a* and end pockets containing the knots 18*a* (not shown) and 18'*a*, of the rope lengths 17*a* and 17'*a*. These rope lengths are spliced at 16*a* to rope length 24*a* which extends to and is secured to the boat 25*a* when the rope system and handle is assembled for use. The caps 21*a* and 21'*a* serve the same purpose as the caps 21, 21' of the assembly shown in FIGURE 1.

The embodiment shown in FIGURES 5–9 extends the life and usefulness of the handle of the invention. After prolonged usage there is a tendency for the joinder between the two line and the handle to cut into the line and cause failure or parting of the rope. Also there may be a tendency for the end caps to become dislodged from the ends of the handle under the action of water entering the holes through which the tow line is fastened, whenever the handle falls into the water and is towed at high speed.

Looking now at FIGURE 5 there is shown an alternative embodiment of the invention directed to further extending the life of the handle of the invention. There is provided by strain-relieving grommets or inserts 501 and 502, as shown in FIGURE 5, means for relieving the strain extant at the joinder between the tow lines 503 and 504 and the point of attachment to handle 509. Furthermore, the inserts 501 and 502 serve to retain end caps 507 and 508 in place thereby preventing them from being inadvertently forced off. The construction of handle 509 is similar to that shown and described above; however, certain additional elements and construction features are included as will be hereinafter described.

The handle comprises a length of light-weight metal tubing 510 having a wall thickness sufficient to resist bending stress applied to it in use, and an outside diameter which, after being covered with the resilient cushioning material, will have an overall diameter within the optimum diameter of 1 to 1⅛ inches. The cushioning material 511 may be conventionally applied to tubing 510 by an extrusion process thereby forming an adhesive bond at their interface.

A pair of water-tight plugs 512 and 513 are inserted in chamber 514 so that they are relatively stationary within the tubing 510 and will have a fluid-tight joint within the surface of the tubing 510. Compressible cork plugs forced into the tubing under pressure are suitable for this purpose. The area defined by the two facing surfaces of plugs 512 and 513 comprises an air or flotation chamber which provides the necessary buoyancy required to make the handle float on the water. Tubing 510 and covering 511 carry a pair of longitudinally aligned holes 522, 523 and 524, 525, respectively. Strain-relieving inserts 501 and 502 extend from the interior of the tubing to the exterior of the handle through holes 522, 523 in tubing 510, holes 524, 525 in covering 511 and holes 505 and 506 in caps 507 and 508, respectively. The ends of the tow line pass through the central opening of inserts 501 and 502.

Having been threaded through the strain-relieving inserts 501 and 502, lines 503 and 504 are knotted at 515 and 516, respectively. These knots prevent the line ends from being pulled back through the openings in inserts 501 and 502. Knots 515 and 516 are carried within spaces 517 and 518, respectively, which are defined by plugs 512 and 513 and end caps 507 and 508, respectively.

Caps 507 and 508 are preferably fabricated from a flex-

ible plastic material such as nylon or polyethylene. The cylindrical rim flanges **521** and **526** of caps **507** and **508**, while fitting tightly over the ends of the handle **509** need not fit so tightly as to make water-tight joints, since buoyancy is provided by flotation chamber **514**. Being flexible and removable, caps **507** and **508** may be forced over the ends of the handle and/or may be removed in order to replace lines **503** and **504**.

The steps of assembling the handle **509** are shown in FIGURES 7 and 8. Cap **507** is initially separated from the end of the handle **509**. Line **503** is threaded through hole **505**, then through hole **519** and knotted at **515**. Grommet or insert **501** passes through hole **505** in covering **511** and tubing **510**. A portion of insert **501** will extend beyond the outer surface of covering **511**. This extended portion of insert **501** will engage hole **505** in rim flange **521** of cap **507** when moved into place as shown in FIGURE 8. Insert **501** will then serve to retain cap **507** in place and prevent its turning or pulling off from the ends of the handle. It is preferred that the extended portion of insert **501** be of such a length as to be flush with the outer surface of the rim flange **521** of cap **507** when the handle is completely assembled. This arrangement is shown in FIGURE 6. The resilient quality of covering **511** will permit to to compress at **801** as shown in FIGURE 8 to permit the cap **507** to make a snug friction fit onto the end of the handle.

Looking now at FIGURE 9, the strain-relieving grommet or insert comprises a unitary structural element, preferably fabricated from a corrosion-resistant material either of metal or plastic. Cylindrical portion **901** extends from shoulder portion **902**; the latter having a convex surface **903** which will conform to the mating surface of the interior of the handle, again shown in FIGURE 6. Hole **904**, through which the tow line is threaded, passes through cylindrical portion **901** and shoulder portion **902**. The tow line knot is urged against planar surface **905**. Hole **904** carries a chamferred edge **906** to prevent cutting of the line and to aid in distributing the applied stress from the line over a large area. The handles of this invention may replace the conventional handles used with any of the ropes or lines customarily used to pull the skier over the water.

By this invention there is provided a hand grip for a rope or line used for water ski towing or for other purposes in which the rope is in or on a body of water, which floats on the water, which has strength in flexure, which is easy on the flesh of the hands, is long lived, is durably assembled, is smoothly contoured at its ends and from end to end, and is of neat and pleasing appearance.

A handle of this invention has another major advantage. It is the usual practice in water skiing for someone on the tow boat to throw the handle or handles and the attached rope away from the boat as near as may be to the skier where he is swimming or is stationary in shallow water, so that the skier may grasp the handle and take position for starting his sit run. Even though this throw is skillfully made, the motion of the boat and the difficulty of correctly judging the distance to the skier results many times in the handle striking the body, possibly the head of the skier. The handle of this invention, because of its cushioned surface, and its rounded, smoothly contoured ends, is little apt to injure or even disconcert the skier, in the event of the handle striking any part of his body. It is apparent that the invention may have varied embodiments without departure from its principles and it is therefore to be limited only by the definitive language of the appended claims.

What is claimed is:

1. In a hand grip for a water ski tow rope and the like, the combination of: a relatively short length of hollow tubing of rigid material; and a pair of water tight transverse sealing walls in the tubing spaced a relative short distance from the adjacent tube ends respectively,



the two cylindrical tube end portions being formed with two longitudinally aligned apertures respectively, each disposed between the adjacent sealing wall and the adjacent tube end, the pair of sealing walls providing a fluid tight chamber therebetween and providing a pair of pocket chambers at the two tube ends respectively.

2. The hand grip defined in claim 1, in which: the external surface of the grip is coated with a bonded layer of a soft compressible material.

3. The hand grip defined in claim 1, in which each of the said pocket chambers is relatively large extending longitudinally from the sealing wall to the outer end of the tubing and extending diametrically between the walls of the tubing, and in addition thereto: a flexible rope structure adapted for connecting the grip to a tow boat, including a rope end threaded through each of said apertures respectively and provided on its end, within an associated one of said pocket chambers, with a knot for preventing disassembling reverse passage of the rope end through the aperture, said knot fitting snugly within and occupying substantially the entire space of the associated pocket chamber.

4. The hand grip and rope assembly defined in claim 1, and in addition thereto: a pair of circular caps each with a rim flange of a diameter to snugly fit over the tubing end to close the two said pocket chambers respectively.

5. The hand grip defined in claim 3, and in addition thereto: a pair of circular caps, each with a rim flange of a diameter to snugly fit over the tubing end to close the two said pocket chambers respectively.

6. The hand grip and rope assembly defined in claim 5, in which each of said rim flanges is formed with a hole therethrough of a diameter to receive said rope, and the hole is located longitudinally of the flange at a distance on center from its end closure wall, which is not less than the distance on center of said tubing apertures from the associated end of said tubing, whereby the rope end associated with said flange hole and tubing aperture locks the associated cap in position longitudinally of the tubing.

7. The hand grip defined in claim 4, in which the rim flange of each of the circular caps is formed with a hole which is so located longitudinally of the cap as to register with the associated aperture in the tube end, whereby a rope end when threaded through said hole and aperture locks the associated cap in position longitudinally of the tubing.

8. A hand grip for a water ski tow rope and the like, including in combination: a relatively short length of aluminum tubing; a pair of cork stoppers tightly fitting within the cylindrical wall of the tubing adjacent the two ends of the tubing respectively, and providing a fluid tight air filled chamber between the said stoppers, and providing a pair of pocket chambers at the two ends of the tubing respectively, the tubing wall being formed with two longitudinally aligned apertures, each disposed between an associated one of said stoppers and the adjacent end of the tubing; a bonded layer characterized by the presence therein of foam neoprene on the external surface of said tubing; and a pair of closing caps, one on each open end of the tubing.

9. A hand grip and rope assembly including the hand grip defined in claim 8, and in addition thereto: a flexible rope structure adapted for connecting the grip to a tow boat, including a rope end threaded through each of said apertures respectively, and provided on its end, within an associated one of said pocket chambers, with a knot too large for passage through the associated aperture.

10. The hand grip and rope assembly defined in claim 9, in which each of the closing caps has a longitudinally extending rim flange in which is formed a hole which is longitudinally so located as to register with the associated aperture in the tube end, and in which the associated rope

end is threaded through both the aperture and hole, locking the cap in position longitudinally of the handle.

11. A tubular handle for attachment to a pair of flexible lines, comprising: a length of substantially rigid tubing, a pair of apertures in a wall of said tubing each of said apertures being located a relatively short distance from a corresponding end thereof, a pair of flexible caps each having a rim flange of a diameter to snugly fit over a corresponding end of said tubing each of said rim flanges being formed with an opening adapted for coaxial alignment with a corresponding one of said apertures, a pair of inserts each having a central passage through which a corresponding one of said flexible lines is received in threaded relationship, each of said inserts being adapted for snug insertion through said corresponding aperture and said opening, said inserts having a flange surface for engaging the interior wall surface of said tubing for retaining said inserts in said tubing.

12. A tubular handle as defined in claim 11 wherein the ends of said flexible lines are knotted within said tubing for engagement with said flange surface, the force applied to said lines holding said flange surface against said interior wall surface of said tubing.

13. In a hand grip for a water ski tow line and the like, the combination of: a relatively short length of lightweight rigid tubing, a pair of watertight transverse sealing partitions within said tubing spaced a relatively short distance from the adjacent ends of said tubing respectively, the two end portions of said tubing each being formed with an aperture, said apertures being longitudinally aligned and each disposed between the adjacent sealing partion and the adjacent end of said tubing, a pair of end caps each having a rim flange of a diameter to snugly fit over a respective tubing end to close the two ends of said tubing, each of said caps being formed with an opening in said rim flange adapted for coaxial alignment with one of said transverse apertures, and a pair of strain-relieving inserts adapted for snug insertion through said apertures and said openings, each of said inserts having a hole therethrough for communicating the interior of said tubing with the exterior of said caps and through which said tow line may be threaded and thereafter knotted.

14. In a hand grip as defined in claim 13 wherein said strain relieving inserts each comprise a unitary structure of corrosion-resistant material having an extended cylindrical portion adapted for coaxial engagement with said apertures and said openings, a shoulder portion in said insert and located at right angles to said cylindrical portion, and a convex surface in said shoulder portion for engagement with the interior wall of said tubing, and a planar surface in said shoulder portion for engaging said knotted line in abutting relationship, the hole in said insert having a chamferred annular edge at said planar surface.

15. A hand grip and rope assembly comprising: a hollow tubing member of rigid material having a pair of longitudinally aligned apertures spaced a relatively short distance from the adjacent ends of said tubing member, respectively; the exterior of said tubing being coated with a layer of soft compressible material; a pair of circular caps each with a rim flange of a diameter to snugly fit over said tubing ends, a hole through each of said rim flanges adapted to coaxially align with said tubing apertures; a pair of strain-relieving inserts each with a cylindrical portion extending from a flange portion, each of said cylindrical portions being adapted for engagement within one of said flange holes and said tubing apertures, each of said inserts having an opening therethrough for communicating the interior of said tubing with the exterior of said caps; and, a flexible rope structure including a rope end threaded through each of said openings and having a knot formed on each of said rope ends, said flange portion having a convex surface in abutting engagement with said interior surface of said tubing and a planar surface for engaging said knots in abutting relationship, the opening in each of said inserts having a chamferred annular edge at said planar surface for distributing the forces applied to said rope ends.

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