

Aug. 30, 1966

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3,268,968

SLIP HANDLE

Filed Nov. 19, 1964

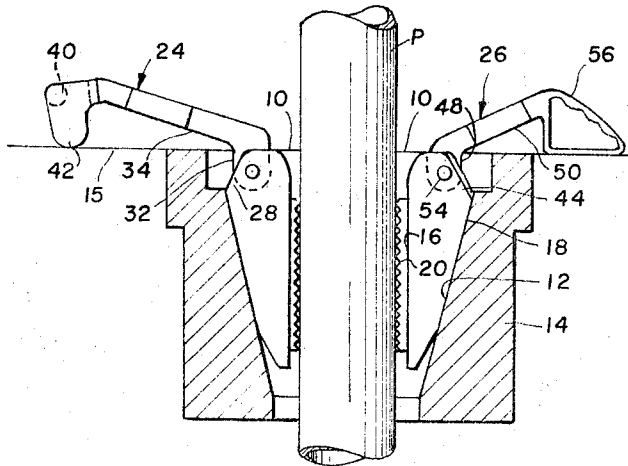


FIG. 1

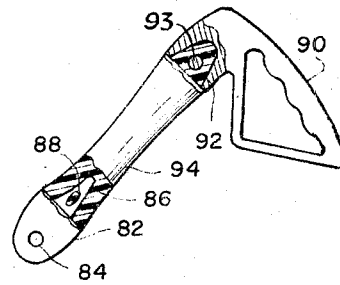


FIG. 4

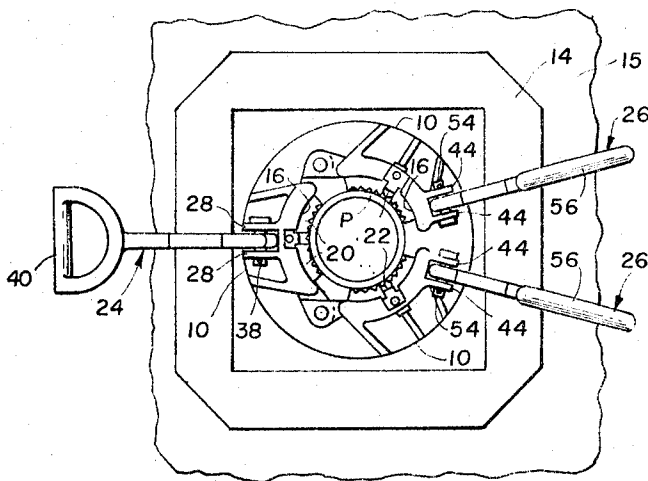


FIG. 2

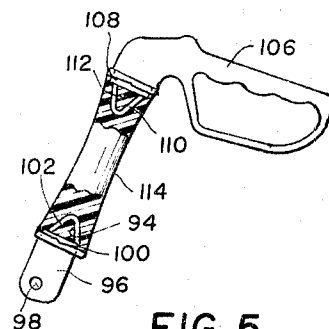


FIG. 5

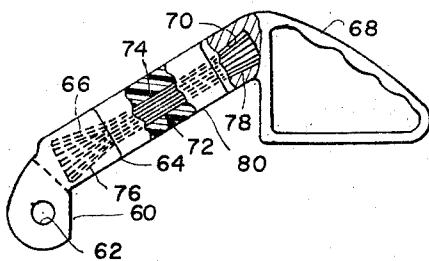


FIG. 3

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3,268,968

SLIP HANDLE

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Filed Nov. 19, 1964, Ser. No. 412,528

9 Claims. (Cl. 24-263)

This invention relates to slips employed in the rotary table of a well drilling rig and more particularly to an improved flexible handle for such slip.

It has been the general practice to employ slips in the rotary table of a well drilling rig for the purpose of supporting the work or pipe to prevent downward movement of the pipe during removal thereof by means of an elevator. Metal handles are usually provided for the slips to facilitate the ready manual manipulation of said slips.

Although such devices have served the purpose, they have not been entirely satisfactory under all conditions of operation because they did not have the ability to absorb incurred shock loads induced by being accidentally struck by pipe elevators or other objects. Such shock loads cause the handles to bend, crack or otherwise damage the slip handle so that they either become unusable or difficult to use.

Another device employed flexible wire rope or cable which has the disadvantage of individual strands breaking thereby causing the cable to be weakened and hazardous in handling. Also, this type of clip handle lacked the rigidity necessary for applying leverage to the slips.

The general purpose of this invention is to overcome the above disadvantages by providing a flexible, resilient handle for slips which can absorb shock loads by bending or deflecting out of the way and then returning to its original position so that the handle is undamaged and safe in use while providing the necessary rigidity to apply proper leverage to the slips.

It is therefore an object of the present invention to provide a new and improved handle for a slip body.

It is another object of the present invention to provide a new and improved flexible, resilient handle for a slip body used in the rotary table of a well drilling rig.

It is a more specific object of the present invention to provide new and improved pivotable, flexible, resilient handles for a slip body, each of said handles comprising a grip and a clevis or lug mechanically connected and integrally chemically bonded together by an elastomer compound.

It is another more specific object of the present invention to provide pivotable, flexible, resilient handles for a slip body, said handles comprising a clevis or lug, a grip and a wire cable or other reinforcing means, such as chain, nylon, glass rope, etc., all mechanically connected and integrally chemically bonded together by an elastomer compound.

These and other objects of the present invention will become more apparent when taken in conjunction with the following detailed description and drawings in which:

FIGURE 1 is a side elevation of a slip construction of the present invention arranged in the operative position in a rotary table bushing and engaging about a pipe, the bushing appearing in vertical section;

FIGURE 2 is a plan view of the structure shown in FIGURE 1;

FIGURE 3 is an enlarged view of the slip handle shown in FIGURE 1, constructed in accordance with the principles of this invention with portions thereof broken away to more clearly show the structure thereof;

FIGURE 4 is a view similar to FIGURE 3 illustrating a second embodiment of the device of this invention with portions broken away to more clearly show the structure thereof; and

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FIGURE 5 is a view similar to FIGURE 3 illustrating a third embodiment of the device of this invention with portions broken away to more clearly show the structure thereof.

Referring to the drawings and particularly to FIGURES 1 and 2, it will be observed that a slip body constructed in accordance with the principles of this invention comprises three connected or hinged slip bodies 10, it being understood that the invention is not restricted to this type of construction and is capable of embodiment in slips or slip sets having two, three or more individual or connected slip bodies. The bodies 10 are tapered or wedge shaped parts adapted to be inserted in a tapered opening 12 of a rotary table bushing 14 of a rotary table 15 to engage about and grip or support the pipe P. The slip bodies 10 are alike or complementary and have substantially vertical inner sides 16 and sloping tapered outer sides 18, which are disposed in an abutting relationship with the opening 12. The inner sides 16 of the slip bodies 10 are of special formation to receive liners 20 and retaining means 22. The liners 20 are the work or pipe engaging elements of the slips and are movable and replaceable. For a more detailed description of the general arrangement of the slip body of the present invention, reference may be had to Patent No. 2,245,979.

Elongated handles generally indicated as 24 and 26 are provided to facilitate the manual manipulation of the slip. A pair of spaced lugs 28 are provided on the rear side of the slip body which is positioned on the left hand side as seen in FIGURE 2. Handle 24 is curved or bent having an inner substantially vertical portion 32 and an outwardly projecting portion 34. Openings are provided in the lugs 28 and the vertical portion 32 of handle 24 respectively, for receiving a pin 38, so that the handle is pivotally supported between the lugs 28 by means of the pin 38. Extending outwardly from the upper handle portion 34 is a loop-like or stirrup shaped grip 40, which is provided with depending skirts 42, adapted to rest on the surface of the table to hold the body of the grip elevated for ease in engagement.

Two pair of spaced lugs 44 are provided on the rear side of the slip bodies positioned on the right hand side as viewed in FIGURE 2. Handles 26 are curved similarly to handle 24 and have inner portions 48 and upper outwardly extending portions 50 respectively. Openings are provided in the lugs 44 and the inner portions 48 of handles 26 respectively, for receiving pins 54 so that the handles are pivotally supported between lugs 44 by means of such pins 54. Extending laterally outwardly from the upper handle portions 50 are loop-like grips 56 respectively, which are adapted to rest on the upper surface of the rotary table when the slips are disposed in the opening 12. The handles 24 and 26 will assume the lowered positions (see FIGURE 1) upon being released and in these positions are out of the paths of the descending elevators and yet are conveniently accessible for manual engagement.

With reference to FIGURE 3, it will be seen that the flexible handle of the present invention comprises a metal clevis or lug 60 having a circular opening or aperture 62 therein for receiving a pin about which said lug is pivotally mounted on the slip body. A portion 64 of the lug remote from the opening 62 is provided with a hollowed, belled-out recess portion 66. A metal hand grip 68 having a hollowed, belled-out recess portion 70 constitutes the other end of the handle. A flexible rope or cable, generally designated at 72 and preferably made of steel, is provided with a central portion 74 and end portions 76 and 78, such end portions being disposed in the recess portions 66 and 70 respectively, and rigidly secured therein in a manner well known in the art. Although a wire cable is

preferable, it is to be understood that the principles of this invention contemplate the use of any suitable material having similar reinforcing properties such as chain, nylon, glass rope, etc.

The lug, hand grip, and cable are mechanically connected and integrally chemically bonded together by an elastomer compound 80. Although the composition of the compound is preferably polyurethane, any elastomer or molding, including the forms of natural rubber having elastomeric properties, may be utilized which has the similar properties of polyurethane such as toughness, high strength, abrasive resistance, resiliency, and has the characteristic of being stretchable, self-supporting, but impermeable. This type of material is impervious to attack by other compounds of a petroleum base such as oil, gases and solvents and also possesses excellent resistance to weather and sunlight aging.

Another embodiment of the flexible slip handle of this invention is shown in FIGURE 4 and comprises a metal clevis or lug 82 having a circular opening or aperture 84 therethrough for receiving a pin about which said lug is pivotally mounted on the slip body, said lug being provided with a conical projection 86 having an aperture 88 therein. A metal hand grip 90 having a recessed portion or cavity 92 therein with a pin or bar 93 extending therethrough constitutes the other end of the handle. Pin 93 in conjunction with cavity 92 provides more bonding area in order to reduce unit stress and to achieve a mechanical lock between the elastomer and the metal.

The lug and hand grip are mechanically connected and integrally chemically bonded together by an elastomer compound 94. As hereinbefore indicated in connection with the first embodiment described, although polyurethane is preferable, other materials having similar properties are envisaged without departing from the spirit of the present invention.

The third embodiment of the flexible slip handle of this invention is shown in FIGURE 5 and comprises a metal clevis or lug 96 having an opening or aperture 98 therein for receiving a pin about which said lug is pivotally mounted on the slip body, said lug being provided with a flange 100 adjacent the end remote from the opening 98. Extending outwardly from said flange is an integral projection 102 having an opening 94 therein. A metal hand grip 106 having a flange 108 constitutes the other end of the handle. Extending outwardly from said flange is an integral projection 110 having an opening 112 therein. The apertured projections provide more bonding area for the purpose of reducing unit stress and achieving a better mechanical lock between the elastomer and the metal.

The lug and hand grip are mechanically connected and integrally chemically bonded together by an elastomer compound 114. As previously stated with respect to the first and second embodiments, polyurethane is preferable as the elastomer compound; however, other materials having similar properties are contemplated within the scope of the present invention.

The specific configuration of the lug or clevis, the hand grip, the handle and the angle of the handle to the slip body can be readily varied, if desired, within the purview of this invention.

Although the lugs and hand grips of the above three embodiments are preferably metallic, any suitable material having the durable, substantially rigid properties of metal is contemplated within the purview of this invention. Furthermore, it is to be understood that the principles of this invention envisage flexible handles having a clevis composed of metal or any other suitable material with the balance of the handle composed of elastomer, and alternatively, a flexible handle having a hand grip composed of metal or any other suitable material with the rest of the handle composed of elastomer.

As a result of this invention improved flexible, resilient slip handles are provided which have the ability to absorb

shock loads induced by elevators or other objects without being readily broken or permanently distorted. Furthermore, the flexible slip handles of the present invention are rigid and self-supporting enough to stand upright so that they are easy to manipulate and also to provide the necessary leverage for proper lifting of the slips from the rotary table bushing.

Preferred embodiments of the principles of this invention having been hereinabove described and illustrated, it is to be realized that variations in design may be applied without departing from the broad spirit and scope of the invention. It is therefore respectfully requested that this invention be interpreted as broadly as possible and be limited only by the prior art.

What is claimed is:

1. A slip handle comprising, an elongated member adapted to be connected with a slip body; said member being shock absorbing and composed at least in part of a self-supporting, non-metallic, resilient material.

2. A slip handle comprising, an elongated member adapted to be connected with a slip body; said member being shock absorbing and composed throughout a substantial portion of the length thereof at least in part of a self-supporting, non-metallic, resilient material.

3. A slip handle comprising an elongated member adapted to be connected with a slip body; said member being shock absorbing and composed throughout a substantial portion of the length thereof at least in part of a self-supporting, non-metallic, resilient molding compound.

4. A slip handle comprising, an elongated member adapted to be connected with a slip body; said member being shock absorbing and composed throughout a substantial portion of the length thereof at least in part of a resilient elastomer compound.

5. A slip handle comprising, an elongated member adapted to be connected with a slip body; said member being shock absorbing and composed throughout a substantial portion of the length thereof at least in part of polyurethane.

6. A slip handle comprising, a lug portion adapted to be connected with a slip body; a hand grip portion; an elongated flexible reinforcing means connected adjacent the opposite ends thereof to said lug portions and said hand grip portion respectively; a self-supporting, non-metallic, resilient, shock absorbing material mechanically connected and integrally chemically bonded to said lug portion, said hand grip portion and said flexible reinforcing means.

7. A slip handle comprising, a lug adapted to be connected with a slip body, said lug having a cavity therein; a hand grip having a cavity therein; an elongated flexible reinforcing means having end portions secured within the cavity of said lug and said hand grip respectively; a self-supporting, non-metallic, resilient, shock absorbing material encapsulating an intermediate portion of said flexible reinforcing means and integrally bonded to said intermediate portion.

8. A slip handle comprising, a lug portion adapted to be connected with a slip body; a hand grip portion; an elongated intermediate portion connecting said lug portion and said hand grip portion, said intermediate portion composed of a self-supporting, resilient, shock absorbing, elastomer compound mechanically connected and integrally bonded to said lug portion and said hand grip portion.

9. A slip handle comprising, a lug portion adapted to be connected with a slip body; a hand grip portion; an elongated intermediate portion connecting said lug portion and said hand grip portion; said intermediate portion being composed of polyurethane mechanically connected and integrally chemically bonded to said lug portion and said hand grip portion.

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