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THREAD PROTECTORS FOR WELL SUCKER-RODS

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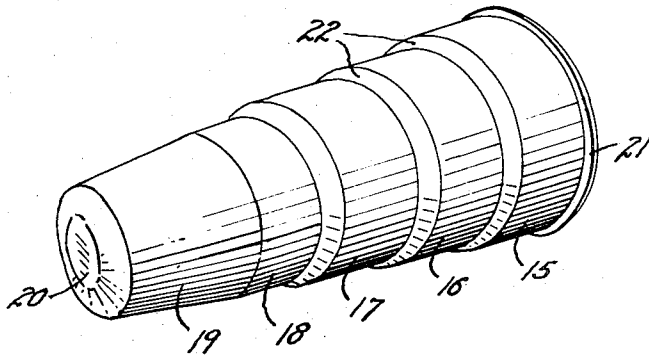


Fig. 1

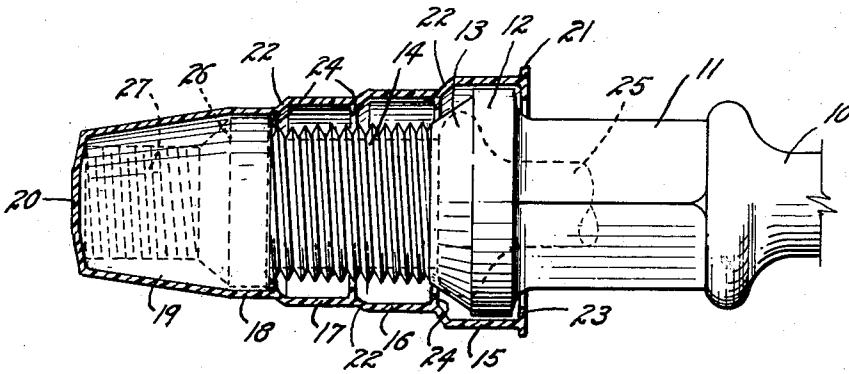


Fig. 2

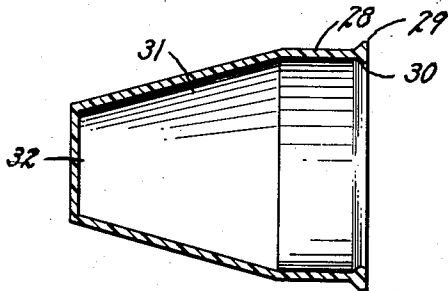


Fig. 3

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THREAD PROTECTORS FOR WELL SUCKER-RODS

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3 Claims. (Cl. 138—96)

This invention relates to a thread protector for well sucker-rods and is more particularly applicable to the type of sucker-rods used in oil well pumping. Such rods are provided with male threads at one extremity and female threads at the opposite extremity. These rods receive relatively rough treatment in transport and in oil field use. It is necessary to withdraw the rods from the well at intervals for cleaning, pump repairing, etc. During this usage, the male threads become damaged from impact with other sucker-rods or with adjacent structures. The rethreading and discard or damaged sucker-rods becomes an extremely great cost feature in oil field production.

The principal object of this invention is to provide a highly efficient and inexpensive protection device which can be quickly and easily slipped over the externally threaded extremities of the well sucker-rods without the use of tools and which acts to protect the threads from injury when the rods are out of use.

Another object of the invention is to so construct the protector that it will be interchangeable on sucker-rods of differing diameter and which will securely retain itself in position until manually removed.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention, reference is had to the accompanying drawing which forms a part hereof. Like numerals refer to like parts in all views of the drawing and throughout the description.

In the drawing:

Fig. 1 is a perspective view illustrating the improved sucker-rod thread protector;

Fig. 2 is a longitudinal section therethrough illustrating, in solid line, the position of the externally threaded extremity of a relatively large sucker-rod therein and, in broken line, the position of a relatively small sucker-rod therein; and

Fig. 3 is a longitudinal section through an alternate form of the invention.

The improved sucker-rod thread protector comprises an elongated cup formed from a flexible, elastic plastic such as a polyethylene of a size and shape which can be slipped over the externally threaded extremity of a sucker-rod and which will securely retain itself in place therein.

The extremity of a relatively large sucker-rod 10 is shown in Fig. 2 provided with the usual wrench-receiving shank 11, terminal flange 12, and threaded stud 14. The extremity of a relatively small sucker-rod is shown in broken line at 25 provided with the usual flange 26 and threaded stud 27. In conventional rods, the terminal flanges 12 and 26 are formed with tapered portions 13 which fit against the rim of the female threaded extremity of an adjacent rod.

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The embodiment illustrated in Figs. 1 and 2 comprises a cup-shaped member molded from flexible plastic, such as polyethylene, and having an open outer end and a closed inner end. The cup-shaped member is formed with four cylindrical portions of differing diameters.

In its preferred form, the member comprises an open-ended, cylindrical portion 15 having an internal diameter of approximately $1\frac{13}{16}$ " , a second cylindrical portion 16 having an internal diameter of $1\frac{5}{8}$ " , a third cylindrical portion 17 having an internal diameter of $1\frac{1}{2}$ " and a fourth cylindrical portion 18 having an internal diameter of $1\frac{3}{8}$ " . The walls of the cup-shaped member are conically inclined from the fourth cylindrical portion 18, as shown at 19, and terminate in a closed-bottom disc 20.

The periphery of the open outer end of the cup-shaped member is preferably surrounded by an annular projecting reinforcing flange 21. The various cylindrical portions 15, 16, 17 and 18 are joined together by means of conically inclined portions 22. An annular, internally-projecting locking bead 23 is formed on and surrounds the open outer extremity of the cylindrical portion 15 and a similar annular, internally-projecting locking bead 24 is formed in the cup-shaped member about the outer extremity of each of the remaining cylindrical portions 16, 17 and 18.

The protector as above described is positioned in the nature of a cap over the threaded stud 14 or 27 and is pressed thereon until the resilient locking bead 23, or one of the internal locking beads 24, snaps behind the sucker-rod flange 12 or 26, as shown in Fig. 2. It can be seen that the cup-shaped member will form a resilient, elastic cap completely protecting the threaded stud 14. Two intermediate sizes of sucker-rods can be accommodated by fitting their flanges within the cylindrical portions 16 and 17 and locking the same with the internal locking beads 24 similarly to the method employed with the largest and smallest sucker-rods above described.

In Fig. 3 an alternate, more economical form of the invention is illustrated for use on a single size of sucker-rod. This form comprises a cylindrical portion 28 having an internal diameter to allow it to fit over the flange of the main sucker-rod. This form is also provided with an external reinforcing flange 29 and an internally projecting annular locking bead 30. The alternate form is moulded with a conical portion 31 adapted to fit over and surround the threaded stud of the sucker rod and having a closed end 32 similar to the closed bottom disc 20 of the first form. The alternate form is used similarly to the first form but is adaptable for use on only a single size of sucker-rod. It is also formed from an elastic, resilient material, such as polyethylene plastic which will enable the open extremity to be flexed to pass the bead 30 over the sucker-rod flange.

While a specific form of the improvement has been described and illustrated herein, it is to be understood that the same may be varied within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired secured by Letters Patent is:

1. A thread protector for well sucker-rods of the type having a terminal flange from which a threaded stud projects comprising: a cup-shaped member formed from flexible, resilient material and having an open outer extremity, the wall of said cup-shaped member comprising more than two cylindrical portions of decreasing diameters, each cylindrical portion being adapted to fit over the flange of a sucker-rod of a given diameter; tapered portions joining the cylindrical portions to form a continuous wall; a tapered cup portion closing the inner ex-

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tremity of the cylindrical portion of least diameter, said cup portion having a closed bottom; and an internally projecting annular locking bead formed in said cup-shaped member adjacent the outer extremity of each cylindrical portion for locking that portion to a sucker-rod flange having a diameter to snugly fit within the said cylindrical portion.

2. A thread protector for well sucker-rods of the type having a terminal flange from which a threaded stud projects, comprising: a flexible plastic protector having: a first cylindrical portion; a second cylindrical portion of less diameter than the first portion; a first conically tapered portion joining said first cylindrical portion to the second cylindrical portion; a third cylindrical portion of less diameter than said second portion; a second conically tapered portion joining said second cylindrical portion to said third cylindrical portion; a fourth cylindrical portion; a third conically inclined portion joining

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said third cylindrical portion to said fourth cylindrical portion; a fourth conically inclined portion joined to and extending concentrically from said fourth cylindrical portion; and a bottom disc closing said fourth cylindrical portion.

3. A thread protector for well sucker-rods as described in claim 2 having an annular locking bead formed on and extending internally inward from the junction of each conically inclined portion with the cylindrical portion of next smaller diameter.

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