Sept. 25, 1962 R. H. RUBLE 3,055,093

SLEEVE PULLER

Filed May 21, 1958

FIG_1

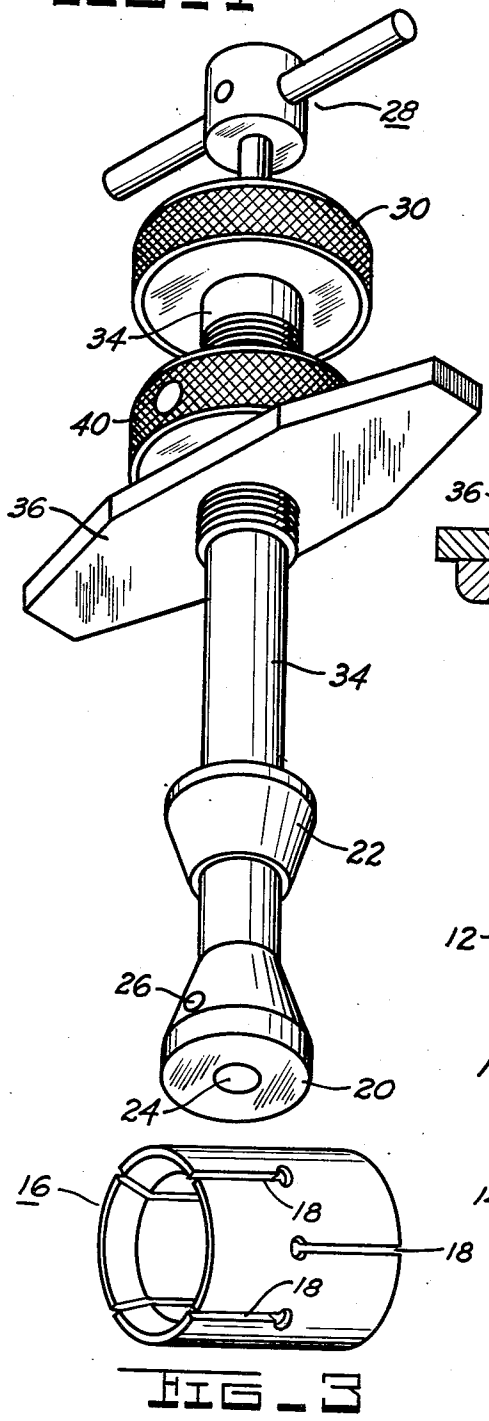


FIG_2

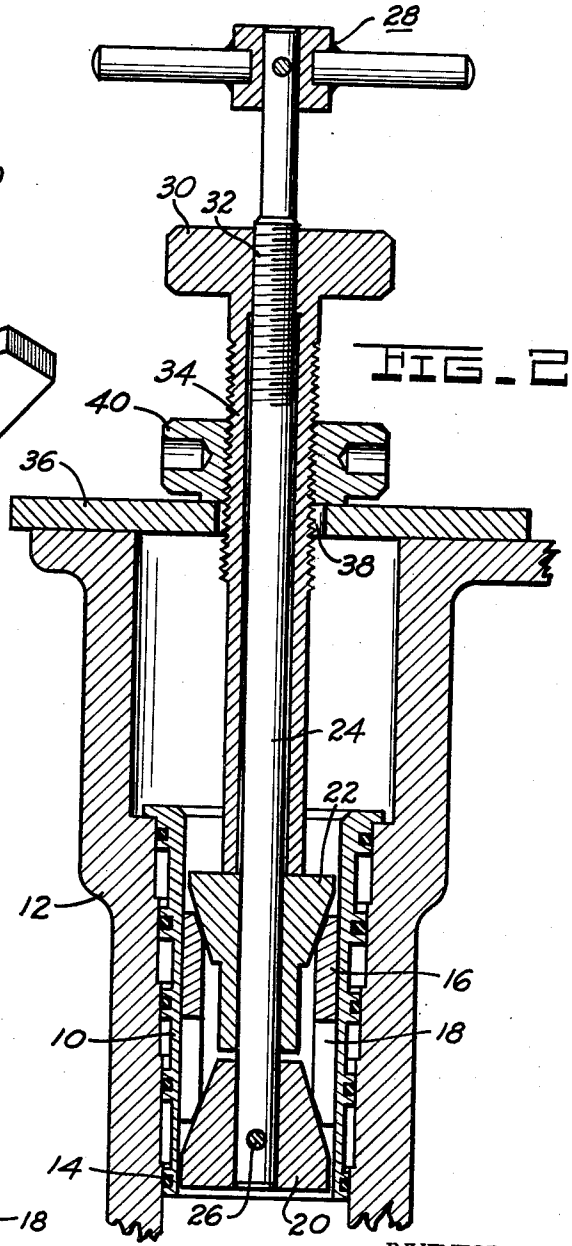


FIG_3

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This invention relates to a sleeve puller adapted, for example, to remove a sleeve from a housing said sleeve being tightly fit within said housing by virtue of a plurality of O-rings or a press fit.

Present day sleeve pullers are usually of the split bushing type; however such a puller, with its flats, is not satisfactory in removing a hard coated sleeve; for the oval expansion of such a sleeve will crack the hard coat of the sleeve.

It is accordingly an object of my invention to provide a multi-piece sleeve puller employing conical expanders instead of the aforementioned flats.

Other objects of my invention and desirable details of construction of parts will become apparent from the following detailed description of an illustrative embodiment of the invention, taken in conjunction with the accompanying drawing illustrating said embodiment, in which:

FIGURE 1 is an isometric view disclosing the parts of the sleeve puller constituting my invention;

FIGURE 2 is a longitudinal sectional view of the sleeve puller of FIGURE 1; and

FIGURE 3 is a view disclosing the split collet body portion of the puller of my invention.

Referring to FIGURES 1 and 2 of the drawings disclosing a preferred embodiment of my invention a sleeve 10, to be removed from a housing 12, is tightly retained in said housing by a plurality of O-rings 14.

The multi-piece sleeve puller constituting my invention includes a collet type cylindrically shaped body member 16 slotted at 18 as is disclosed in FIGURE 3. This body member is uniformly expanded outwardly, to grip the sleeve 10 to be removed, by means of juxtaposed cone shaped expander members 20 and 22. The member 20 is fixed to a rod 24 by a pin 26; and the member 22 is sleeved over said rod the latter being rotatable within said member.

As is disclosed in FIGURE 2 the rod 24 extends outwardly and beyond the outer face of the housing 12; and at its end there is secured a handle member 28. A nut like member 30, threadedly mounted on the rod 24 at 32, serves, by virtue of a cylindrically shaped extension portion 34 thereof, to insure the expansion of the collet member 16 when the handle is rotated to rotate the member 20; for the member 34 is in abutment with the conically shaped expander member 22.

To properly position and to support the cone shaped members 20 and 22 and rod 24 there is provided a generally rectangular shaped stop 36 having an opening 38 through which the extension 34 extends. A locking member 40, threadedly mounted on the member 34, serves to position the stop 36 against the face of the housing 12. The stop 36, locking member 40, handle 28 and nut like member 30, 34 together serve as means for supporting the members 20, 22 and 16 and for drawing the members 20 and 22 toward each other in the operation of expanding the member 16 prior to pulling the sleeve

10 out of the housing 12. Should the stop 36 and locking member 40 be omitted from the structure of FIGURES 1 and 2 the rod 24 would then tend to bend when the handle 28 is turned; and this operation would tend to prevent an even distribution of the expanding forces exerted by the cone shaped members 20 and 22 when the member 20 is moved toward the member 22.

As to the operation of the sleeve puller of my invention as will be noted from a study of the figures of the drawing, after the parts of the sleeve puller are positioned in place a rotation of the handle 28 will result in the cone shaped members 20 and 22 expanding or flaring the ends of the member 16; and this operation results in a very tight and uniform fit of the member 16 within the sleeve 10 to be removed. The attendant operating the puller will then pull the puller to the right, FIGURE 2, to remove the sleeve 10 from the housing 12.

While the preferred embodiment of the invention has been described in considerable detail, I do not wish to be limited to the particular construction shown which may be varied within the scope of the invention, and it is my intention to cover hereby all adaptations, modifications and arrangements thereof which come within the practice of those skilled in the art to which the invention relates.

I claim:

1. A sleeve puller mechanism adapted to remove a sleeve from a housing member, said mechanism comprising a slotted cylindrically shaped member adapted to fit within the sleeve to be removed, two cone shaped members positioned within the slotted member, a relatively long rod having one of its end portions positioned within the cone shaped members one of said members being fixedly secured to one end of the rod; and means for maintaining the cone shaped members in their proper position during the operation of the sleeve puller mechanism and for effecting a relative movement of said members during said operation, said means comprising a nut like member threadedly mounted on a portion of the rod and having a relatively long sleeve portion thereof sleeved over the rod and abutting one of the cone shaped members, a stop member loosely sleeved over the aforementioned sleeve portion of the nut like member, a locking means for the stop member threadedly mounted on the sleeve portion of the nut like member, and a handle member secured to one end of the rod.

2. A sleeve puller mechanism as claimed in claim 1 wherein said slotted cylindrically shaped member is provided with a plurality of circumferentially spaced longitudinally extending slots which extend from the ends of said cylindrical shaped member and terminate between the ends thereof, said slots permitting said cylindrically shaped member to expand circumferentially and engage the sleeve in response to relative movement of said cone shaped members.

3. A sleeve puller as claimed in claim 1 wherein said slotted cylindrically shaped member is provided with a plurality of circumferentially spaced slots which extend longitudinally from one end of said cylindrically shaped member over a portion thereof, and a plurality of circumferentially spaced slots which extend longitudinally from the opposite end of said cylindrically shaped member over the remaining portion thereof, said slots permitting the end portions of said cylindrically shaped member to

expand circumferentially and engage the sleeve in response to relative movement of said cone shaped members.

4. A sleeve puller mechanism adapted to remove a sleeve from a housing member, said mechanism comprising a slotted cylindrically shaped member adapted to fit within the sleeve to be removed, two cone shaped members positioned within the slotted member, a relatively long rod having one of its end portions positioned within the cone shaped members one of said members being fixedly secured to one end of the rod and the other of said members being loosely sleeved over a portion of said rod; and means for maintaining the cone shaped members in their proper position during the operation of the sleeve puller mechanism and for effecting a relative movement of said members during said operation, said means comprising a nut like member threadedly mounted on a portion of the rod and having a relatively long sleeve portion thereof relatively loosely sleeved over the rod and abutting one of the cone shaped members, a stop member loosely sleeved over the aforementioned sleeve portion of the nut like member, a locking means for the stop member threadedly mounted on the sleeve portion of the nut like member, and a handle member secured to one end of the rod.

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