

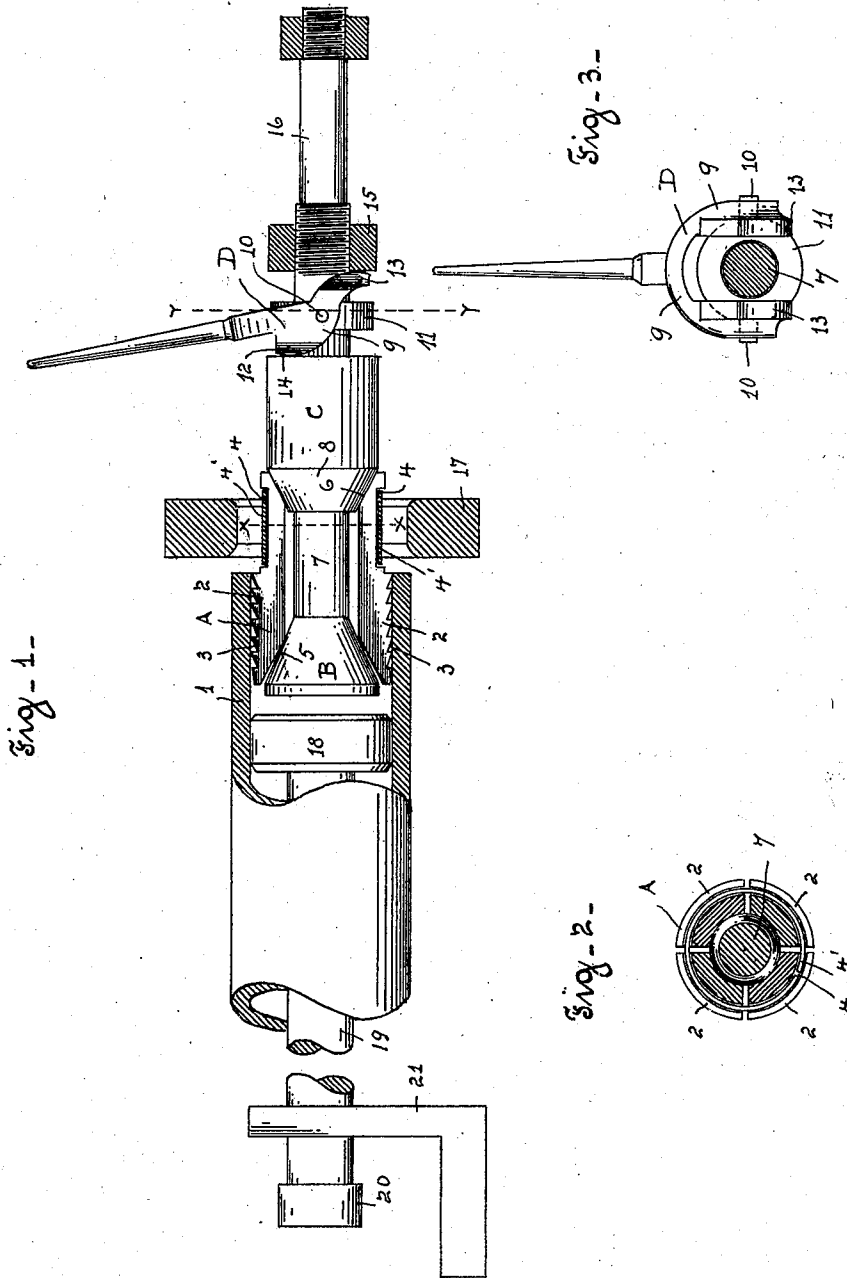
No. 701,926.

Patented June 10, 1902.

H. OBERJOHANN.
TUBE DRAWING GRIP.

(Application filed June 12, 1901.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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TUBE-DRAWING GRIP.

SPECIFICATION forming part of Letters Patent No. 701,926, dated June 10, 1902.

Application filed June 12, 1901. Serial No. 64,235. (No model.)

To all whom it may concern:

Be it known that I, HENRY OBERJOHANN, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented a new and useful Improvement in Tube-Drawing Grips, of which the following is a specification.

My invention relates to tube-drawing grips. The grips generally employed for the purpose require that a portion of the end of the tube be collapsed to form a hold for the grip. This occasions the loss of the collapsed portion and renders the processes of pickling and oiling or doping the tubes more difficult and less uniform, thereby causing lack of uniformity in the drawn tube.

The object of my invention is to provide a grip for the purpose that is adapted to grip the open end of the tube, and thereby avoid the labor and expense of collapsing the tubes and the loss of material incident thereto as well as facilitate and render more uniform the processes of pickling and oiling or doping. I accomplish these objects by the mechanism hereinafter described, and illustrated in the drawings, in which—

Figure 1 is a view of my invention, partly in elevation and partly in longitudinal section. Fig. 2 is a cross-section through line *xx* of Fig. 1, and Fig. 3 is a cross-section through line *yy* of Fig. 1.

In the drawings, A designates an expandible grip of a normal external diameter to freely enter the bore of a tube 1 when the grip is contracted or collapsed for such entry. The grip comprises a plurality of sectors 2, forming when assembled a tubular sleeve, and the sleeve is provided with exterior serrations 3, extending from one end toward the middle of the sleeve. For the remainder of its length the sleeve is reduced in diameter and provided with an annular groove 4 to receive an annular spring 4' to contract and yieldingly hold the sectors in their normal position. The ends of the sleeve are provided with conical counterbores 5 and 6 for the purpose hereinafter described.

7 designates the pull-rod of the draw-bench, which has formed on the rear end thereof a conical plug B, adapted to enter the conical bore 5 of the grip A, but formed with a differential taper of less angle.

C designates a sleeve mounted on the pull-rod 7 and movable thereon and is provided with a conical taper 8 at one end, adapted to fit the conical bore 6 of the grip.

D designates a cam-lever for expanding the grip A. The lever is pivoted by yoke-arms 9 on trunnions 10 of a collar 11, movably mounted on the pull-rod 7. Integral with each of the yoke-arms 9 are cams 12 and 13. The cams 12 are adapted to engage the end 14 of the sleeve C, and cams 13 are adapted to engage with a collar or nut 15, screw-threaded and run upon the pull-rod to adjust the throw of the cams. The end 16 of the pull-rod is adapted for the attachment of the pliers.

17 designates the die through which tube 1 is to be drawn, which is supported in any suitable manner on the draw-bench, and 18 designates the mandrel formed upon the mandrel-rod 19, which is provided with a stop 20, adapted to engage with the tail-stock 21 of the draw-bench when the mandrel is centered in the die.

In operation to attach the grip to the tube when mounted on the mandrel the grip A, being mounted on the pull-rod, as shown in Fig. 1, is inserted with the pull-rod in the end of the tube the full length of the serrations 3. The cam-lever D is then thrown toward the die, whereby the cams force the sleeve C and the conical plug B into the conical bores 5 and 6 and expand the grip. By reason of the differential taper of the conical bore 5 and the conical plug B the pressure of plug B is applied nearly central to the serrations, and the outer end of the grip A being expanded more than the inner end by the throw of the lever by reason of its having less resistance the serrations 3, which are angled to cut in the direction of the pull of the pull-rod, are put under a strain that tends to direct their edges to cut into the inner face of the tube, in which position, when the end of the tube is drawn by the pull-rod into engagement with the flare of the die, the force of the pull forces the serrations deeper into the metal of the tube as the tube is drawn within the die, thereby securing a grip on the tube that is sufficient to resist the friction of drawing the tube through the die. To release the grip after the tube is drawn, the lever D is reversed and the pull-rod is forced back until the serrations are re-

leased from their indentations in the tube, upon which the spring 4' contracts the sectors 2 of the grip to their normal position, after which the pull-rod and grip may be readily withdrawn from the end of the tube.

What I claim to be new is—

1. A tube-drawing grip comprising an expansible sleeve formed of a plurality of sectors held assembled around a pull-rod by an annular spring, the sleeve so formed having an external diameter to freely enter the open end of a tube and provided with exterior serrations and internal conical counterbores at both ends, a conical pulling-plug on the rear end of the pull-rod, tapered to enter the conical bore of one end of the grip-sleeve, a plug-sleeve mounted upon the pull-rod and moveable thereon, and provided with a conical shoulder to enter the conical bore of the opposite end of the grip-sleeve, and means mounted upon the pull-rod to simultaneously urge the plug-sleeve and the pulling-plug into the conical counterbores of the grip-sleeve, to expand it to grip the tube.

2. In an internal grip for tube-drawing, the combination with a pull-rod, provided with a conical pulling-head at the rear end, and with a shoulder adjacent thereto, of a plug-sleeve movably mounted on the rod between the head and the shoulder, having a conical shoulder facing the conical pulling-head, an expansible grip-sleeve mounted on the pull-rod between the pulling-head and plug-sleeve, comprising a plurality of sectors held yieldingly assembled by an annular spring around

the circumference of the sleeve, the grip-sleeve being provided with external serrations for a portion of its length and with a conical counterbore at each end, adapted to receive the conical pulling-head at one end and the conical shoulder of the plug-sleeve at the other, a collar movably mounted on the pull-rod between the plug-sleeve and the rod-shoulder, and a lever pivotally mounted on the collar, having cams adapted to simultaneously engage the front end of the plug-sleeve and the rod-shoulder, and to force the plug-sleeve and pull-rod in opposite directions by the throw of the lever, substantially as shown and described, and for the purpose set forth.

3. In an internal grip for drawing tubes, the combination of a plurality of complementary longitudinal sections forming, when assembled, a sectional tubular sleeve having an internal conical counterbore at each end, and external annular serrations for a part of its length, and a reduced diameter for the remainder of its length, the reduced portion being provided with an external annular groove, and an annular spring in the groove around the sections, adapted to yieldingly hold them assembled, substantially as shown and described, and for the purpose set forth.

In witness whereof I have hereunto set my hand this 8th day of June, A. D. 1901.

HENRY OBERJOHANN.

Witnesses:

C. R. KONOPAK,

VERNER W. MOREHOUSE.