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WIRE FINISHING DEVICE

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Fig. 1

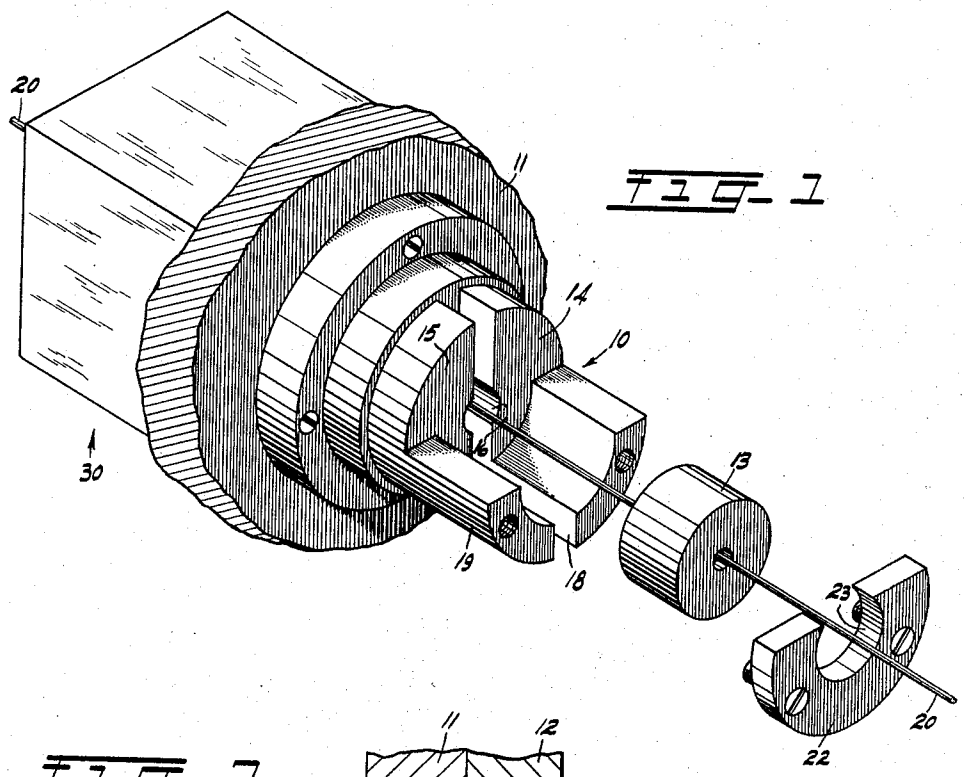
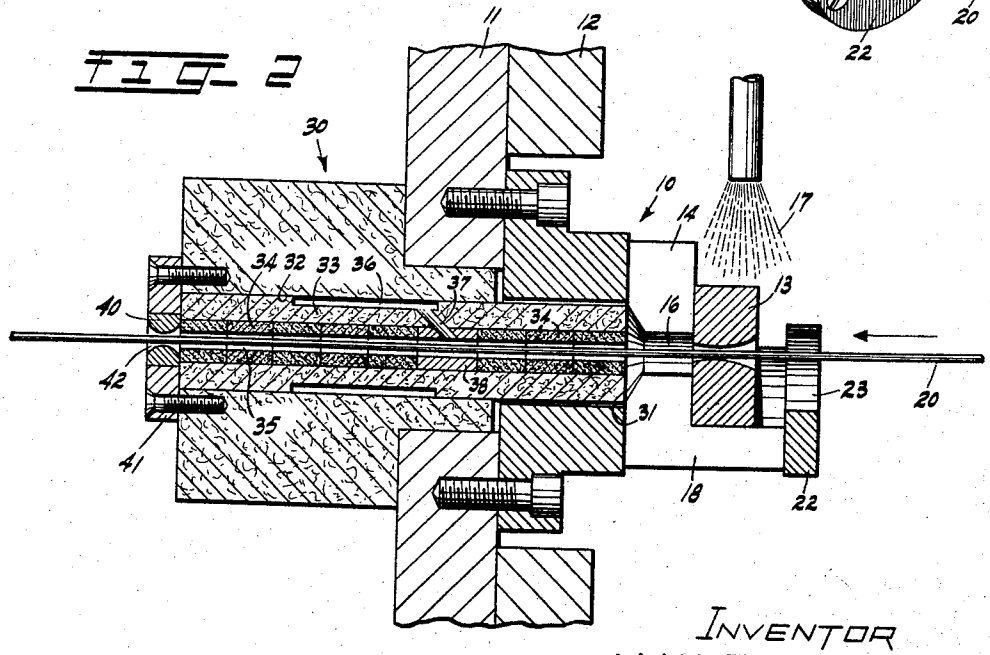


Fig. 2



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WIRE FINISHING DEVICE

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2 Claims. (Cl. 205—25)

This invention relates to wire drawing and particularly to finishing and cleaning the drawn wire.

In wire drawing machines it is a common practice to use a finishing die at the exit end of the machine to smooth out minor irregularities from the wire surface and at the same time remove most of the lubricant or drawing compound remaining on the wire after it passes through the drawing dies. With the mountings usually used for these finishing dies, it is difficult to apply sufficient lubricant to keep the die cool and to prevent accumulation of metal dust from the wire at the die with the result that the die tends to wear prematurely. The surface of the wire may also be scratched and wire breaks may occur during operation.

The object of this invention is a wire finishing device which eliminates these difficulties in the operation of wire drawing machines.

According to the general features of the invention, the finish die is supported within the housing of the wire drawing machine in the path of the wire leaving the machine and in such a manner that both sides of the die and the sections of wire entering and leaving the die may be flooded with lubricating or drawing compound to keep the die cool and flush away all foreign substances particularly the metal dust produced in the drawing operation.

The wire leaving the die passes through a member extending through the machine wall and having an elongated bore terminating in a wear-resisting, restricted passage which accurately aligns the wire in the direction normal to the face of the die. At an intermediate point in the bore, means is provided for directing wiping fluid, such as compressed air, against the wire at an angle to force any lubricant on the wire back into the machine so that the wire emerging from the passage is even cleaner and drier than when the finish die alone is relied upon to clean it. The remainder of the bore is filled with wear resisting material which, for example, may be a single element or a plurality of ceramic beads but in any case the bore should have a slightly larger diameter than the exit passage so as to prevent the wire from vibrating excessively without subjecting the material to constant wear and also to provide clearance around the wire for the flow of wiping fluid.

Other objects and a fuller understanding of the invention may be had by referring to the following description and claims, taken in conjunction with the accompanying drawings in which:

Fig. 1 is an exploded isometric view of a strand of wire passing through a finish die and wiper apparatus embodying the invention.

Fig. 2 is a sectional view of the apparatus of Fig. 1.

In the particular apparatus herein disclosed, the die retainer 10 is mounted within the housing 11 of the wire drawing machine extending beyond the inside wall 12 of the machine. Within the die retainer 10 is a finishing die 13 vertically supported by two laterally spaced arcuate members 18 and 19. The die 13 engages lateral

die-face engaging surfaces 14—15 on either side of central recessed portion 16 defining a passage across the die-faces 14—15 for wire drawing compound 17. In this manner the drawing compound 17 not only completely floods the finish die 13 thereby providing it with adequate lubrication and efficient cooling but also floods those sections of wire 20 entering and leaving the die 13 enabling all the foreign substances to be flushed away particularly the metal dust produced in the drawing operation.

Extending from the lower rear portion of the die-face engaging surfaces 14—15, the laterally spaced members 18—19 support an end plate 22 having an aperture 23 for the wire 20. The die 13 has restricted freedom of movement along the members 18—19 and when the machine is stopped thus releasing the tension on the wire, this area provides the necessary back-off space for the die 13.

Mounted on the exterior side of the machine is a wiper 30 which extends through the housing 11 fitting inside the central recessed cavity 31 of the die retainer 10. Extending throughout the length of the wiper is an elongated bore 32 for receiving a nylon sleeve 33 which in turn has a central bore lined with a wear resisting substance 34, preferably ceramic beads or the like, to reduce enlargement of the air passage 35 by vibrations in the wire 20.

At an intermediate point in the bore 32, an annular chamber 36 formed by a recess in the external surface of the nylon sleeve 33, receives a supply of wiping fluid, such as compressed air, from an outside source, not shown. An angular aperture 37 is provided from the chamber through the nylon sleeve and tubing 38, preferably brass, for passing the wiping fluid to the oncoming wire to force any lubricant on the wire back into the machine.

The wire leaving the air passage passes through a wire drawing nib 40 formed of a wear resisting material such as tungsten carbide, mounted in an end plate 41 and having a restricted passage 42, with a diameter smaller than the passage 35 but slightly larger than the wire 20, which accurately aligns the wire in the direction normal to the face of the die.

In operation, the wire 20 after passing through a plurality of wire drawing reducing dies (not shown), travels longitudinally through the aperture 23 of the end plate 22 into the finishing die 13 where the drawing compound 17 floods the entire die and those sections of the wire entering and leaving the die. As the wire passes through the air passage 35, wiping fluid passing through tubing 38 forces any compound 17 on the wire back into the machine resulting in the wire emerging from the passage even cleaner and drier than when the finish die alone is relied upon to clean it.

It is to be understood that the above described arrangement is simply illustrative of the application of the principles of the invention. Numerous other arrangements may be readily devised by those skilled in the art which will embody the principles of the invention and fall within the spirit and scope thereof.

What is claimed is:

1. In a wire finishing device for wire drawing machines, a die retainer for supporting a finish die in the path of the wire, having lateral die-face engaging surfaces, a central recessed portion between the surfaces defining a passage across one end of the die for receiving flooding compound for cooling the face of the die and cleaning the wire leaving the die.

2. In a wire finishing device for wire drawing machines, a die retainer for supporting a finish die in the path of the wire, having lateral die face engaging surfaces, a central recessed portion between the surfaces

defining a passage across one end of the die for receiving lubricant discharge therethrough, laterally spaced arcuate members extending from the surfaces to support the die for longitudinal movement thereon and means at the end of the members for limiting the longitudinal movement of the die.

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