

May 7, 1940.

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2,199,496

WIRE-DRAWING APPARATUS

Filed Dec. 17, 1938

2 Sheets-Sheet 1

Fig.1.

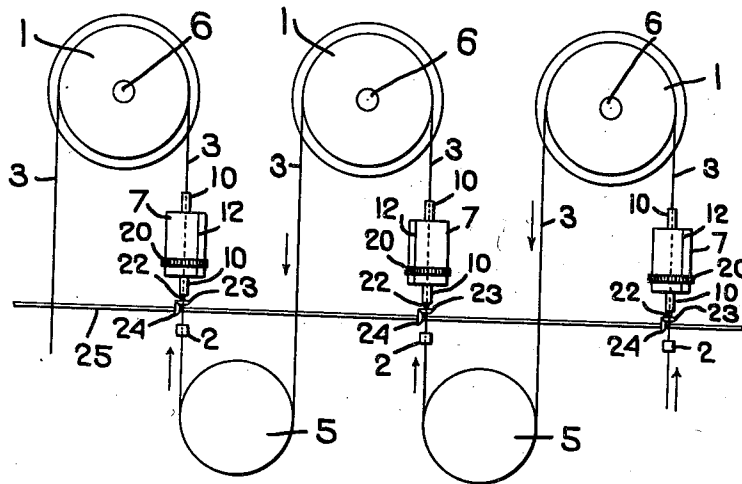


Fig.2.

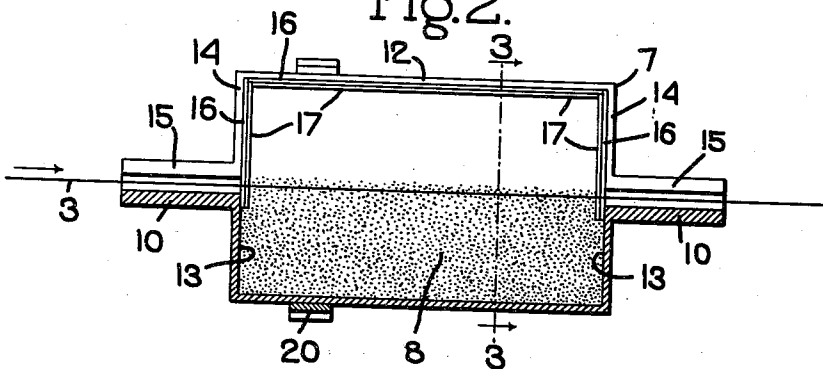


Fig.3.

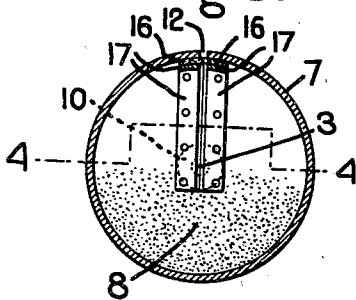
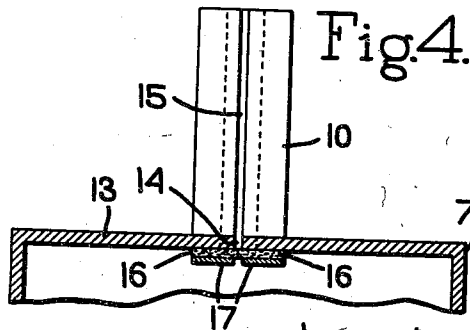


Fig.4.



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Fig. 5.

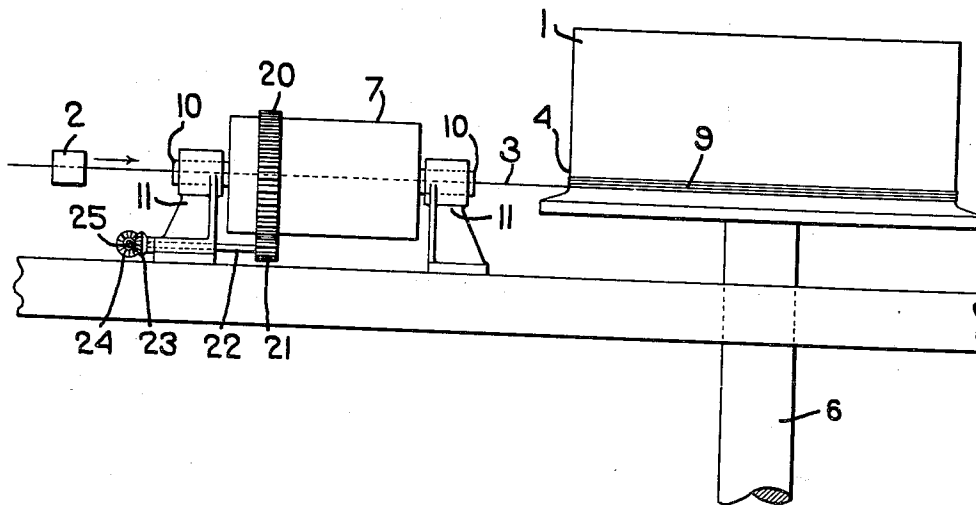
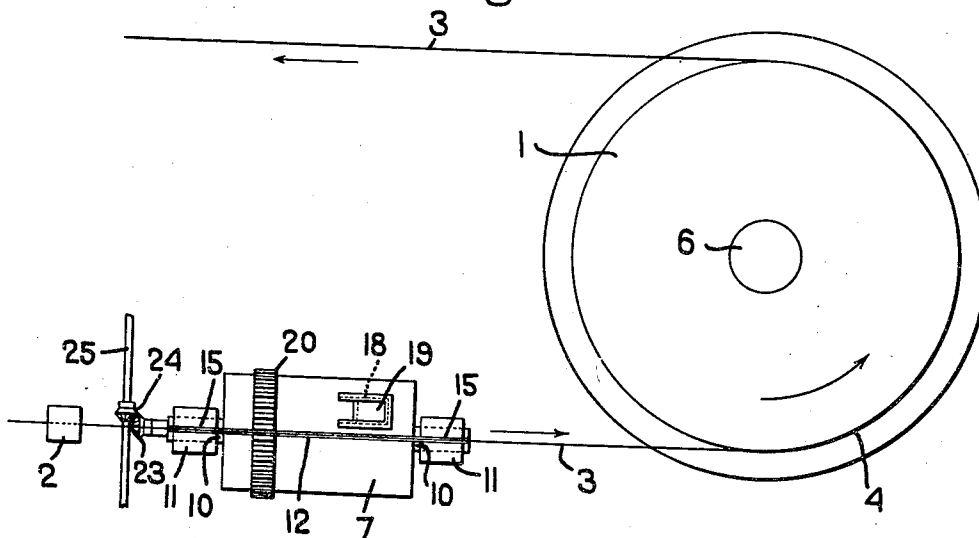


Fig. 6.



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## UNITED STATES PATENT OFFICE

2,199,496

## WIRE-DRAWING APPARATUS

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Application December 17, 1938, Serial No. 246,355.

3 Claims. (Cl. 205-19)

This invention relates to continuous wire-drawing machines of the type in which the wire is lubricated for its passage through the die by means of a dry lubricant, this manner of drawing the wire sometimes being referred to as dry drawing method.

In some dry drawing machines, the dry lubricant is applied to the wire after it has passed through the die and either before or at the time that the wire is being wound on the drawing drum. With this method of applying the dry lubricant, the latter not only supplies the wire with sufficient lubricant for its passage through the next die but also serves to lubricate the wire-receiving surface of the drum so that the wire will not be injured by any slippage which may occur between the wire and the drum.

It is one of the objects of the present invention to provide an improved means for thus applying the dry lubricant to the wire after it passes through any die and before it is wound on the corresponding drawing drum.

According to my improvements, the dry lubricant is applied by passing the wire as it comes from any die through a rotating container containing the dry lubricant, said container being supported to rotate about an axis coinciding with the portion of the wire passing therethrough.

Means are provided for rotating the container while the wire is being drawn therethrough, and the rotation of the container serves to continuously deposit the dry lubricant on the wire passing through the container. The wire comes from the die somewhat heated due to the action of the die thereon, and as the heated wire passes into the rotating container and the dry lubricant is deposited on the wire, the heat of the wire causes dry lubricant to adhere thereto so that the wire passes out of the rotating container carrying a coating of dry lubricant.

This lubricant serves to provide the necessary lubrication between the wire and the drawing drum on which it is wound, and as the wire leaves any drawing drum and passes to the next drawing die, it will still carry sufficient dry lubricant for properly lubricating the die as the wire passes therethrough.

The rotary containers operate somewhat as "tumblers" in that the rotation of the container results in agitating the dry lubricant within it, and also provides for a continual application of the lubricant to the wire passing therethrough.

In order to give an understanding of the invention, I have illustrated in the drawings, a selected embodiment thereof which will now be

described, after which the novel features will be pointed out in the appended claims.

In the drawings:

Fig. 1 is a somewhat diagrammatic view illustrating a portion of a continuous wire-drawing machine embodying the present invention;

Fig. 2 is a sectional view through one of the containers for dry lubricant showing the wire passing therethrough;

Fig. 3 is a section on the line 3-3, Fig. 2;

Fig. 4 is an enlarged fragmentary sectional view showing the manner of closing the slot in the container;

Fig. 5 is a side view of one drawing drum of a continuous wire-drawing machine together with its drawing die and the rotary container for applying dry lubricant to the wire;

Fig. 6 is a plan view of Fig. 5.

In the drawings, 1 indicates a plurality of drawing drums of a continuous wire-drawing machine and 2 indicates the drawing dies for the drums.

The wire 3 which is being drawn passes through a die 2 and thence passes to the wire-receiving surface 4 of the corresponding drawing drum 1, said wire being wound around the drum several turns and then passing from the drum to the next drawing die 2, and from said next drawing die 2 to the wire-receiving surface of the next drawing drum 1, and so on.

5 indicates idler rolls around which the wire passes between successive drawing drums, these idlers 5 being herein shown as between each drum and next drawing die of the series.

Each drawing drum 1 is supported on a suitable shaft 6 by which it is rotated and any suitable means (not shown) may be employed for rotating the various shafts 6 at the correct speed.

The parts thus far described are such as may be commonly found in continuous wire-drawing machines and form no part of my present invention, which relates particularly to a novel way of applying dry lubricant to the wire.

Situated between each drawing die 2 and its drawing drum is a rotary container 7 adapted to contain dry lubricant 8 and through which the wire passes in its travel from the die 2 to the drum 1. This container 7 is mounted for rotation about an axis which coincides with the portion of the wire passing therethrough, the wire thus passing axially through the container. The rotation of the container keeps the dry lubricant 8 therein agitated, and at the same time keeps dropping or depositing dry lubricant on to the wire. The wire comes from the die 2 somewhat

heated, and as the hot wire passes through the container 7, the dry lubricant which is deposited on the wire will be softened somewhat by the heat of the wire and will adhere to the wire so that the wire emerges from the container 7 with a coating of dry lubricant thereon.

This coating of dry lubricant is sufficient to provide the necessary lubrication between the turns 9 of the wire which are wound about the drum 7 and the wire-receiving surface 4 of the drum, and as the wire 3 leaves the drum 1 and passes to the next die 2, said wire will still carry a sufficient coating of dry lubricant to properly lubricate the die 2.

The container 7 may be made in various ways without departing from the invention. As herein shown, it is in the form of a cylindrical shell provided with trunnions 10 which are journaled in suitable supports 11. The side wall of the container shell 7 is provided with a slot 12 and the end walls 13 are provided with radial slots 14 which communicate with the slot 12. The trunnions 10 are also provided with radial slots 15 corresponding to the slots 14. These slots 12 and 14 and 15 provide means for placing the wire into the container.

In order to prevent the dry lubricant from leaking out from the slots 12 and 14 as the container is rotated, I propose to employ felt strips 16 at the edges of the slots, said strips being secured to the shell in any suitable way, as by means of clamping plates 17.

The felt strips 16 close the slots sufficiently to prevent the dry lubricant from leaking through the slots as the container is rotated, but the yielding or flexible quality of the felt strips permits the wire to be forced through the slots into the container, as shown in Fig. 2.

The container is shown as formed in its side wall with a filling opening 18 through which dry lubricant may be deposited into the container, said opening being adapted to be closed by a sliding cover 19.

Any suitable means may be employed for rotating the container 7. In the illustrated embodiment of the invention, each container is supplied exteriorly with a ring gear 20 which meshes with a driving pinion 21 mounted on a driving shaft 22. The shafts 22 may be rotated from any suitable source of power, and by their rotation, they give the necessary rotary movement to the containers 7.

In the illustrated embodiment of the invention, the driving shafts 22 are all operatively connected to and driven by a power shaft 25. Each shaft 22 is shown as having a beveled gear 23 thereon which meshes with beveled gear 24 on the power shaft 25, this power shaft 25 thus being common to all of the rotary containers. The

shaft 25 may be driven from any suitable source of power.

It will be understood, of course, that the ring gear 20 is to have a slot coinciding with the slot 12 and through which the wire may be passed.

With the above construction, the dry lubricant will be supplied to the wire after it emerges from any die and before it is wound on the corresponding drawing drum, and the heat in the wire will cause the dry lubricant which is deposited thereon within the container 7 to be sufficiently softened so that the lubricant will adhere to the wire and the wire will emerge from the container with a coating of dry lubricant thereon which is sufficient to provide not only the necessary lubrication between the turns 9 of the wire and the wire-receiving surface 4 of the drum, but also the necessary lubrication for the wire as it passes through the next drawing die 2.

I claim:

1. A continuous wire-drawing machine comprising a plurality of drawing dies through which the wire is drawn successively, a drawing drum for each die, a rotary container for dry lubricant associated with each die, the side wall and end walls of each container being slotted to permit the wire to be introduced therinto, means for closing said slots against the escape therethrough of the dry lubricant in the container while permitting the wire to be entered into the container through the slots, and means to rotate said containers.

2. A wire-drawing machine comprising a drawing die, a drawing drum for drawing wire through said die, a rotary container for dry lubricant associated with the die, said container having a trunnion at each end provided with an axial wire-receiving bore, said container also having communicating slots in its side wall, end walls and trunnions through which the wire can be introduced, said wire passing axially through the trunnions and container, and means to rotate the container.

3. A wire-drawing machine comprising a drawing die, a drawing drum for drawing wire through said die, a rotary container for dry lubricant associated with the die, said container having a trunnion at each end provided with an axial wire-receiving bore, said container also having communicating slots in its side wall, end wall and trunnions through which the wire can be introduced, said wire passing axially through the trunnions and container, means to rotate the container, and means for closing the slots in the side wall and end walls of the container against the escape therethrough of the dry lubricant in the container while permitting the wire to be introduced into the container through said slots.

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