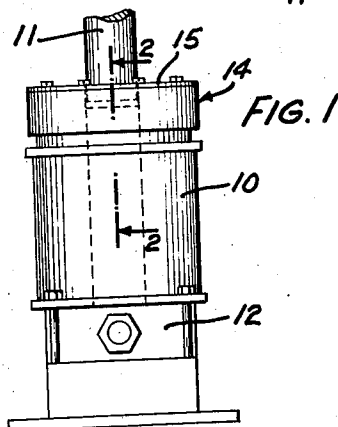
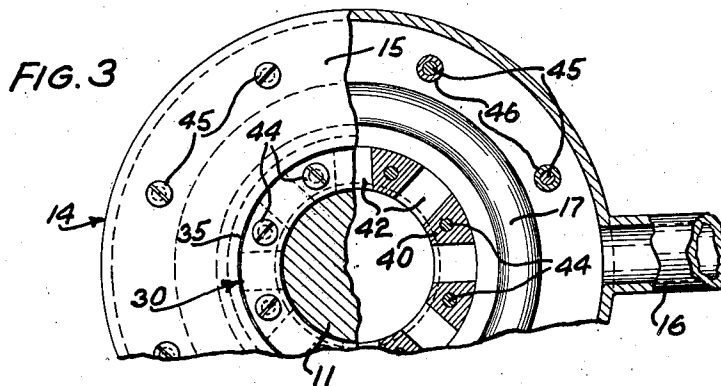
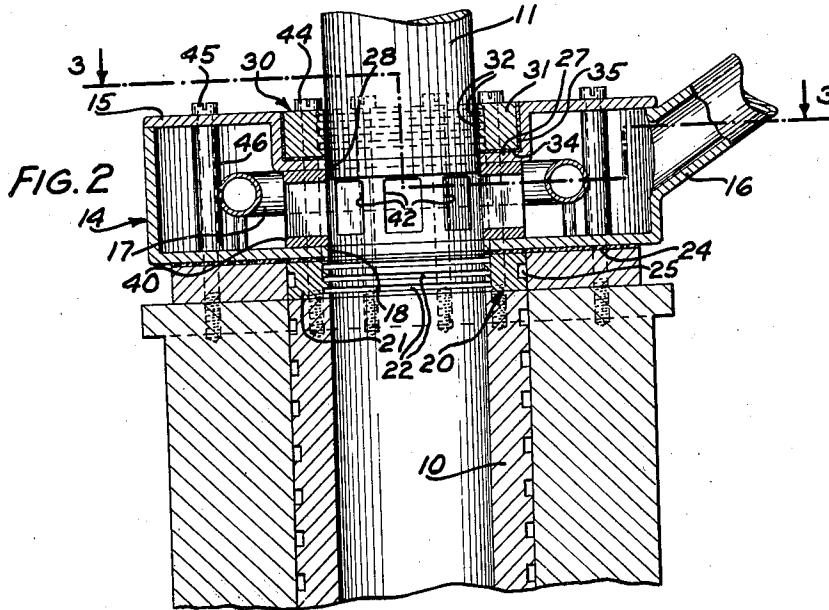


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 APPARATUS FOR EXTRUDING METALS
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APPARATUS FOR EXTRUDING METALS

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8 Claims. (Cl. 207—9)

This invention relates to apparatus for extruding metals, and more particularly to cable sheath extrusion apparatus.

The present invention is particularly applicable to cable sheath extrusion presses of the type in which a lead alloy is extruded from a cylinder through a die at one end thereof by means of a ram inserted into the opposite end of the cylinder. In the operation of extrusion presses of this type, the ram is usually completely withdrawn from the cylinder, after expressing a charge, in order to re-charge the cylinder with a fresh supply of the molten lead alloy. The molten alloy is usually poured into the cylinder through the ram entrance end thereof by means of a movable delivery spout or pipe leading from a melting kettle or reservoir containing a supply of the molten alloy.

Objects of the present invention are to reduce to a minimum the time required to charge extrusion presses of the type referred to and to prevent exposure of the molten metal to the atmosphere.

In accordance with one embodiment of the invention, a cable sheath extruding press of the type referred to is provided with a charging receptacle which is mounted above the cylinder of the press and is adapted to be connected directly to a melting kettle or reservoir containing a supply of molten lead or lead alloy. An immersion type heater is mounted within the receptacle for maintaining the lead alloy therein in a molten state. The receptacle is provided with an airtight cover and the cover and bottom of the receptacle have circular ram receiving apertures provided with self-packing glands. The ram is surrounded by a guide ring mounted within the receptacle, the guide ring having a plurality of apertures in its wall through which the molten alloy from the receptacle flows into the press cylinder when the ram is withdrawn.

A more complete understanding of the invention may be had by referring to the following detailed description taken in conjunction with the accompanying drawing, in which

Fig. 1 is a fragmentary elevational view of a cable sheath extruding press embodying the invention;

Fig. 2 is an enlarged fragmentary vertical section on line 2—2 of Fig. 1, and

Fig. 3 is a fragmentary plan section on line 3—3 of Fig. 2.

Referring to the drawing, the invention is illustrated as embodied in a lead cable sheath extruding press of the type comprising a stationary ver-

tical cylinder 10 and a cooperating movable ram 11 which is completely withdrawable from the cylinder to permit charging of the cylinder through the ram entrance end thereof. The ram 11 is adapted to be actuated by suitable means (not shown) to force the lead or lead alloy from the cylinder through the usual extruding die (not shown) mounted in a die block 12 supported underneath the cylinder.

In accordance with a feature of the present invention, means is provided for quickly charging the press cylinder with molten alloy without exposing the molten alloy to the atmosphere. This means, in the illustrated embodiment of the invention, comprises an annular charging receptacle 14 mounted above the press cylinder. The charging receptacle is provided with an airtight cover 15 and is formed with a tubular delivery spout 16 adapted to be connected to a melting kettle or reservoir (not shown) containing a supply of the molten alloy. The receptacle is thus constantly maintained filled with molten alloy delivered therinto through the spout 16 which, preferably, is so connected with the melting kettle or reservoir that the molten alloy is not exposed to the atmosphere while passing from the reservoir into the receptacle. The lead alloy in the receptacle is maintained in a molten state by an immersion type heater 17 suitably mounted within the receptacle.

The bottom of the charging receptacle is provided with a circular aperture 18 for the passage of the ram therethrough and in order to prevent the lead alloy in the cylinder from being extruded upwardly through this aperture and into the charging receptacle, a self-packing gland 20 is provided between the top of the cylinder and the bottom of the receptacle. This gland preferably comprises a metallic ring 21 through which the ram passes, the ring having a plurality of internal annular grooves 22, 22 within which molten alloy is collected and caused to congeal or solidify and thereby form a packing for preventing upward extrusion of the alloy through the gland. In order that the alloy collected within the internal grooves of the gland may cool sufficiently to congeal, the gland is insulated from the bottom of the charging receptacle by a gasket 24 of asbestos or other suitable heat insulating material. If necessary, the gland may be provided with one or more annular passages, such as indicated at 25, through which a cooling medium may be circulated to maintain the alloy in the gland in a solidified state.

The cover 15 of the charging receptacle is

formed with a depressed or recessed central portion 27 which is provided with a circular aperture 28 for the passage of the ram therethrough. In order to prevent the escape of molten alloy from the receptacle through the aperture in the cover, a self-packing gland 30 is provided. This gland, which is similar to the gland 20 described above, comprises a metallic ring 31 tightly fitted within the recessed central portion of the cover, as shown in Fig. 2. The ring has a plurality of internal annular grooves 32, 32 for receiving molten alloy from the charging receptacle. The molten alloy collected by the grooves 32 congeals or solidifies, thereby forming a packing which prevents the escape of molten alloy through the gland, and also prevents outside air from entering the charging receptacle through the cover aperture. Heat insulating gaskets, such as indicated at 34 and 35, may be employed to insulate the gland 30 from the charging receptacle to insure that the alloy collected in the gland is maintained in a solidified state.

A guide ring 40 is provided within the charging receptacle for maintaining the ram in alignment with the cylinder. During the normal operation of the press, the ram is never withdrawn from the guide ring and, therefore, the guide ring constantly maintains the ram in alignment with the cylinder. Consequently, the amount of clearance between the ram and the cylinder may be reduced to a minimum, whereby the amount of lead alloy that is extruded upwardly past the ram tip is decreased.

A plurality of spaced slots 42, 42 are provided in the wall of the guide ring 40, and upon withdrawal of the ram from the cylinder these slots are uncovered, as shown in Fig. 2, so that the molten alloy in the charging receptacle flows through the slots and into the cylinder.

The charging receptacle may be attached to the press cylinder by means of screws 44 and 45 which pass through the cover and bottom of the receptacle and are threaded into the inner and outer walls of the press cylinder. The inner screws 44 also pass through the guide ring 40 and glands 20 and 30, and thereby maintain the guide ring and glands in alignment with the cylinder. The guide ring 40 strengthens the assembly of the receptacle to the press by serving as a spacer member between the bottom of the receptacle and the depressed central portion of the cover. Each of the outer screws 45 passes through a separate spacing tube 46 between the cover and the bottom of the receptacle.

The operation of the apparatus is as follows: The charging receptacle is maintained filled with molten alloy through its direct connection with a melting kettle or reservoir (not shown) containing a supply of the molten alloy. Immediately upon withdrawal of the ram from the cylinder of the press the molten alloy flows from the charging receptacle into the press cylinder through the slots 42 in the guide ring 40. The cylinder is thus filled with a fresh charge of the molten alloy. Simultaneously therewith, molten alloy from the melting kettle or reservoir flows into the charging receptacle to replace that which flows from the receptacle into the cylinder, so that the receptacle is always full of molten alloy awaiting to be charged into the press cylinder automatically upon withdrawal of the ram. Thus, the time required to charge the press is reduced to a minimum. Furthermore, the inclusion of dross or oxides into the extruded sheath is avoided by preventing exposure of the molten alloy to the

atmosphere while it is transferred from the melting kettle or reservoir into the press cylinder.

It is to be understood that the invention is not limited to the particular embodiment thereof herein illustrated and described except insofar as is defined by the appended claims.

What is claimed is:

1. In an extrusion apparatus comprising a cylinder and a cooperating ram which is completely withdrawable from the cylinder to permit charging of the same through the ram entrance end thereof, a charging receptacle mounted upon the ram entrance end of the cylinder, and a separate guide ring mounted within the receptacle for constantly maintaining the ram in alignment with said cylinder, said guide ring having an aperture in its wall for the passage of molten material from the charging receptacle into the cylinder.

2. In an extrusion apparatus comprising a cylinder and a cooperating ram which is completely withdrawable from the cylinder to permit charging of the same with molten material, a charging receptacle mounted upon the ram entrance end of the cylinder and having an aperture in the bottom thereof for the passage of the ram therethrough, and means at the upper end of the cylinder for preventing backward extrusion of material through said aperture and into said charging receptacle.

3. In an extrusion apparatus comprising a vertical cylinder and a cooperating ram which is completely withdrawable from the upper end of the cylinder to permit charging of the cylinder with molten metal, a charging receptacle supported above the cylinder for containing a supply of molten metal, a cover for said receptacle, and a separate guide ring extending from the bottom of the receptacle to said cover for guiding the ram, said guide ring having a plurality of apertures in its wall for the passage of molten metal from said receptacle into the cylinder.

4. In a cable sheath extrusion press comprising a stationary vertical cylinder and a cooperating movable ram which is completely withdrawable from the upper end of the cylinder to permit charging of the cylinder with molten metal introduced through the ram entrance end of the cylinder, a charging receptacle supported above the cylinder for containing a supply of molten metal, said receptacle having an aperture in the bottom thereof for the passage of the ram therethrough, a self-packing gland for preventing backward extrusion of the metal through said aperture and into said charging receptacle, a cover for the receptacle having an aperture for the passage of the ram therethrough, a self-packing gland for preventing the escape of molten metal through said cover aperture, and a guide ring extending between said apertures for guiding the ram, said guide ring having a plurality of apertures in its wall for the passage of molten metal from said receptacle into the press cylinder upon withdrawal of the ram from said cylinder.

5. In an extrusion apparatus comprising a cylinder and a cooperating ram which is completely withdrawable from the cylinder to permit charging of the same with molten material, a charging receptacle mounted upon the ram entrance end of the cylinder and having an aperture in the bottom thereof for the passage of the ram therethrough, and a self-packing gland for preventing backward extrusion of material

through said aperture and into said charging receptacle.

6. In an extrusion apparatus comprising a cylinder and a cooperating ram which is completely withdrawable from the cylinder to permit charging of the same through the ram entrance end thereof, a charging receptacle mounted upon the ram entrance end of the cylinder, means for constantly maintaining said receptacle filled with molten material, and heat insulating means interposed between said charging receptacle and the ram entrance end of said cylinder.

7. In an extrusion apparatus comprising a cylinder and a cooperating ram which is completely withdrawable from the cylinder to permit charging of the same through the ram entrance end thereof, a charging receptacle mounted upon the ram entrance end of the cylinder and having an aperture in the bottom thereof for the passage of the ram therethrough, a cover for said receptacle, a guide ring within said receptacle extending from the bottom thereof to said cover for constantly maintaining the ram in alignment with the cylinder, and means for rigidly clamping said

guide ring between said cover and the bottom of said receptacle, said guide ring having an aperture in its wall for the passage of molten material from said receptacle into said cylinder upon withdrawal of the ram from the cylinder.

8. In an extrusion apparatus comprising a vertical cylinder and a cooperating ram which is completely withdrawable from the upper end of the cylinder to permit charging of the cylinder with molten metal, a charging receptacle supported above the cylinder for containing a supply of molten metal, a cover for said receptacle, and a guide ring within said receptacle extending from the bottom thereof to said cover for constantly maintaining the ram in alignment with the cylinder, said guide ring having an axial opening slidably receiving the ram and a lateral opening in its wall for the passage of molten metal from the charging receptacle into the upper end of the cylinder upon withdrawal of said ram from the cylinder.

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