Aug. 19, 1941. A. J. N. DUCLOS 2,252,760

MATERIAL HANDLING APPARATUS

Filed May 3, 1940

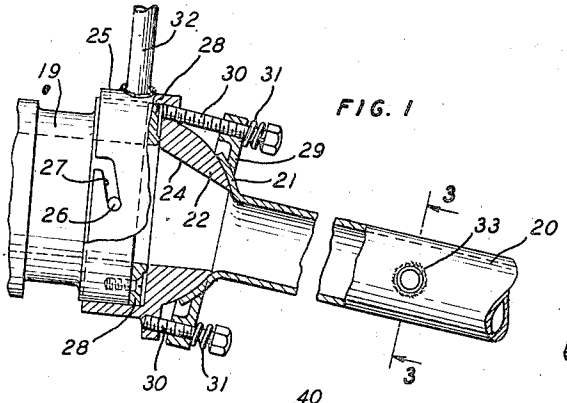
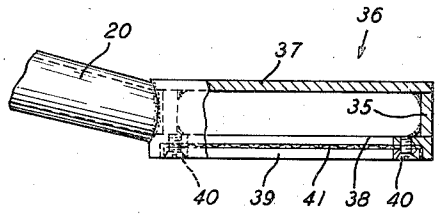


FIG. 1



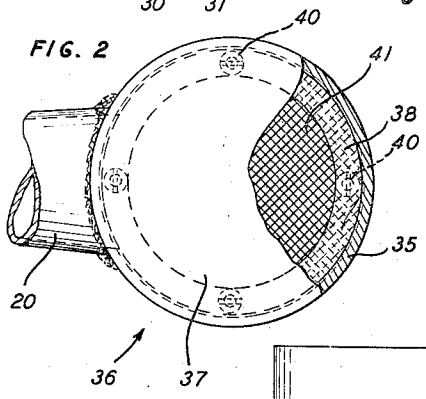


FIG. 2

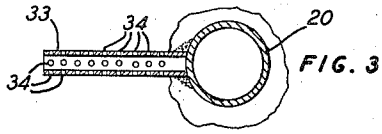


FIG. 3

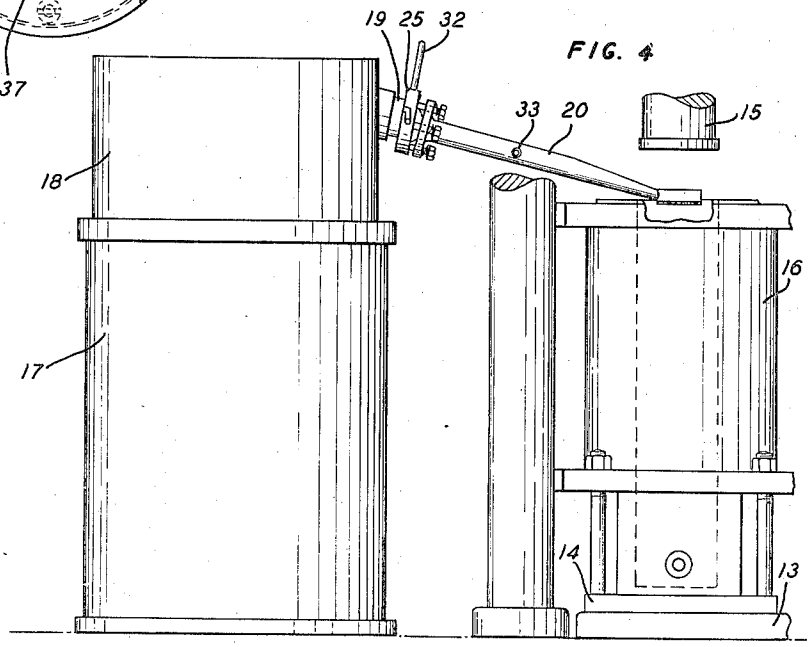


FIG. 4

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Patented Aug. 19, 1941 2,252,760

UNITED STATES PATENT OFFICE

2,252,760

MATERIAL HANDLING APPARATUS

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Application May 3, 1940, Serial No. 333,123

3 Claims. (Cl. 266—34)

This invention relates to material handling apparatus, and more particularly to an adjustable and removable spout or conduit for charging hot liquid materials from a furnace or the like into a container.

In the manufacture of lead sheathed telephone cable, the finished cable cores are sometimes sheathed with a seamlessly continuous outer envelope or protective sheath, by extruding about them in a suitable extrusion press a continuously seamless, snug fitting tube or sheath of lead or of a suitable alloy of lead. The sheathing metal is usually charged while molten into the extrusion cylinder of the press, and, for this purpose, there is ordinarily a melting furnace close by the press to supply the molten sheathing metal. In some instances one such furnace may be a supply for two or even more presses grouped conveniently with it. In such case the pot or kettle of the furnace may be situated with its discharge outlet above the inlet opening of each cylinder to be charged when the latter is in its charging position, so that the molten charge may be transferred by gravity. It is, of course, important to avoid contamination of the molten metal during the passage from kettle to cylinder, and, if any contamination occurs, to prevent entry of impurities into the cylinder with the clean charge. Lead and its alloys are peculiarly prone to oxidation upon exposure to the air, especially while molten, and the results of such oxidation are drosses and slags particularly apt to mar the seamless continuity of the cable sheaths here in question.

An object of the present invention is to provide a simple, rugged and reliable device for transferring molten materials, which shall be easy and safe to handle and shall prevent the contamination from without of the material being transferred as well as remove contaminations therefrom.

With the above and other objects in view, the invention may be embodied in a spout to be detachably secured to a delivery member on a heating kettle, the spout having means to render it adjustable as to orientation with respect to the kettle and having means therein to remove solid particles from molten material running therethrough.

Other objects and features of the invention will appear from the following detailed description of an embodiment thereof, taken in connection with the accompanying drawing in which the same reference numerals are applied to identical parts in the several figures, and in which

Fig. 1 is a view in side elevation and partly in central longitudinal section of a spout constructed in accordance with the invention;

Fig. 2 is an enlarged broken plan view of the delivery end thereof;

Fig. 3 is a section on the line 3—3 of Fig. 1; and

Fig. 4 is an elevational view on a reduced scale of the spout in use.

The embodiment of the invention herein disclosed has as its principal member a tubular body 20, preferably of seamless drawn steel or other suitable material, of substantially uniform diameter and circular cross section over the greater part of its length, but flattened to be progressively narrower from top to bottom and wider from side to side toward its lower or right hand end. The upper or left hand end is flared spherically at 21 to form the concave part of a ball and socket joint whose convex member is an annulus or ring 22 with a convexly spherical outer surface to match the flare 21 of the member 20 and against which the flare is apposed. The right end of the central bore 24 of the ring 22 has about the same diameter as the bore of the body 20 and is normally aligned therewith, while the left end of the bore 24 is about of the same diameter as the bore of the furnace kettle discharge nozzle 19 to which the spout generally is removably secured. The nozzle 19 is ordinarily formed with a square faced cylindrical end. The ring 22 is formed with a cylindrical flange 25 fitting over the end of the nozzle and lockable thereon with a camming effect by one or more bayonet locks and consisting of a radial pin 26 set in the nozzle and a corresponding slot 27 in the flange. Preferably, a seal is interposed between the end of the nozzle 19 and the abutting end of the ring 22. As herein shown this seal is a relatively soft ring 28 of aluminum, shown as attached by screws to the end of the nozzle, but which might instead be similarly secured to the ring 22, or might be left free of both. Also it need not be of aluminum but might be of copper or other suitable metal or of material such as asbestos. The flare 21 is held on the matching outer surface of the ring 22 by a collar 29 around the flare and held to the ring 22 by screws 30 entering the integral base which joins the flange 25 to the ring 22. Compression springs 31 are preferably used between the collar 29 and the heads of the screws 30 as shown. By setting the screws 30 up tightly the flare 21 is secured frictionally substantially immovably to the ring 22. If the screws 30 are loosened a trifle the flare may be slid in any direction on the ring to alter the orientation of the body 20 with respect to the flange 25 and therefore to the nozzle 19. A handle 32 welded or otherwise secured to the flange 25 and a handle 33 welded or otherwise secured to the body 20 serve to lift, transport and manipulate the entire device. Preferably each of these

handles is made as shown in Fig. 3 by welding the end of a convenient length of suitably sized metal tube to its support, the tube being formed with a number of radial perforations 34 through its wall, as such a handle will remain cool enough to be grasped with the bare hand even when the body to which it is attached is far too hot to be handled. However, if desired these handles 32 and 33 may be solid, as shown at 32.

The lower or right end of the body 20 is welded around the edge of a corresponding aperture formed in the side wall 35 of a short, wide, horizontal cylindrical drum, generally indicated by 36, whose top is a solid sheet 37 welded thereon. An inwardly projecting angular flange 38 is welded around the bottom edge of the wall member 35. A like annulus 39 is secured against the under side of the flange 38 by screws 40, and a woven wire screen 41 is clamped between the rings 38 and 39 as floor for the drum 36.

All of the elements thus far described, except the seal ring 28 whose material is specified above and the screen 41, will preferably, in the present case, be made of suitable steels, although, where other molten materials than lead and its alloys are in question, other more costly material may be required to resist corrosion or for other reasons. Also, in the present case it is preferred to make the screen 41 of rust and corrosion resisting material such as Monel metal or stainless steel. In the present case also it is found that this screen 41 serves satisfactorily if woven about fourteen meshes to the inch and of Monel metal wire about 0.020 inch in diameter.

In the particular instance here illustrated, a furnace 17 has a melting kettle 18 provided with a discharge nozzle 19. The details of construction and operation of the furnace and kettle are no part of the present invention and so are not disclosed here. Suffice it to say that such kettles are usually provided with some form of valve or gate to allow the molten contents of the kettle to flow out through the nozzle 19 only when desired. Adjacent to the kettle is located an extrusion press of the usual type comprising essentially an extrusion cylinder 16 and a ram 15 to coact therewith, the cylinder 16 being mounted on the ram 14 of a hydraulic cylinder 13 to be driven up thereby against the stationary extrusion ram 15. When the cylinder 16 is in its lowest position as shown in Fig. 4, it is retired entirely from the ram 15, leaving the mouth of the cylinder 16 open for supplying lead thereto from the kettle 18.

For this purpose the device of the invention is installed as shown in Fig. 4. Locking of the bayonet locks 26, 27 cams the ring 22 closely against the seal ring 28, so that there is a sealed and wholly enclosed passage from the nozzle 19 to the screen 41. Molten lead or lead alloy allowed to run from the nozzle 19 will promptly fill the tube 20, driving the air out of tube 20, driving the air out of it until the weight behind the fluid lead on the screen 41 breaks the surface tension of the molten material on the screen and the lead flows through the screen and falls into the cylinder 16, filling this rapidly. Contact with air in the tube 20 is practically nil. Any dross or other harmful solids present in the lead in the kettle will be screened out on the screen 41. As there is practically no circulation of air into and out of the cylinder 16, oxidation of the metal falling from the screen is negligible as compared with what takes place if an open trough be used to carry the molten metal from the nozzle to the cylinder exposed to the circulating air of the room. The previous charge being clean, the remnant of it in the bottom of the extrusion cylinder tends to weld more cleanly with the new charge being poured, and when extrusion is continued scoring or excessive wear on the extrusion die tends to be markedly decreased if not entirely obviated.

While the invention is illustrated as applied in the conveyance of molten lead from a kettle to an extrusion press it is not so limited. The embodiment disclosed is illustrative and may be variously modified and departed from without departing from the spirit and scope of the invention as pointed out in and limited only by the appended claims.

What is claimed is:

1. A detachable and adjustable, portable material handling device to transfer liquid material from a container having a delivery aperture, the device comprising a tubular body, means at one end of the body to removably secure the same to the edge of the aperture to receive liquid material therethrough, means to vary the orientation of the body with respect to the container when secured thereto, an enlarged chamber at the other end of the body formed with a discharge aperture in the floor of the chamber, and means positioned in the discharge aperture to purify liquid material passing therethrough.

2. A detachable and adjustable, portable material handling device to transfer liquid material from a container having a delivery aperture, the device comprising a laterally closed tubular body, a tubular attaching member connected to one end of the body by a ball and socket joint and thereby adjustably variable in orientation with respect to the body, clamp elements on the member to coact with corresponding elements on the container to removably secure the attaching member and therewith the body to the container to receive liquid material from the delivery aperture, an enlarged chamber at the other end of the body formed with a discharge aperture in the floor of the chamber, and a screen positioned across the discharge aperture to purify liquid material passing therethrough.

3. A detachable and adjustable, portable material handling device to transfer liquid material from a container having a delivery nozzle, the device comprising a laterally closed tubular body, a tubular attaching member to fit over the end of the nozzle, camming bayonet lock elements on the attaching member to coact with corresponding elements on the nozzle to removably lock the member in place on the nozzle, ball and socket joint members on the attaching member and on one end of the body to secure the body on the member to be adjustable thereon as to orientation with respect thereto, an enlarged chamber at the other end of the body formed with a discharge aperture in the floor of the chamber, and a screen positioned across the discharge aperture to purify liquid material passing therethrough.

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