Feb. 6, 1945. A. J. N. DUCLOS 2,368,751

METHOD OF AND APPARATUS FOR CHARGING EXTRUSION PRESSES

Filed Dec. 27, 1941

FIG. 1

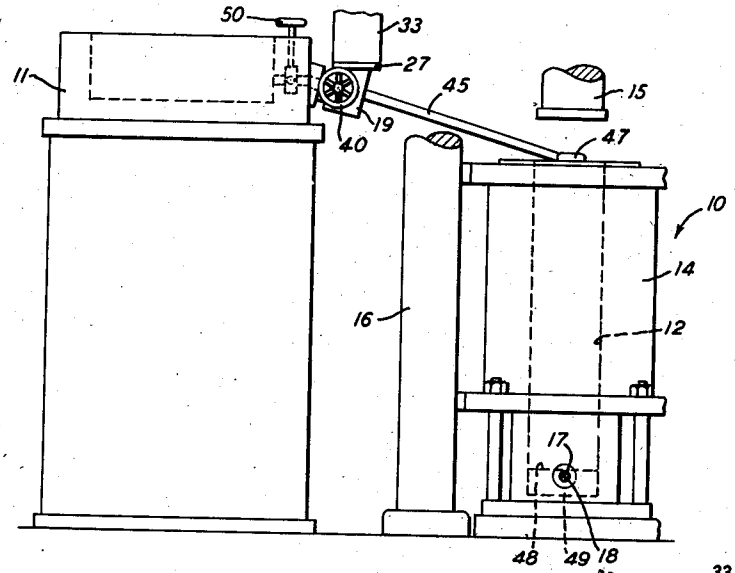


FIG. 5

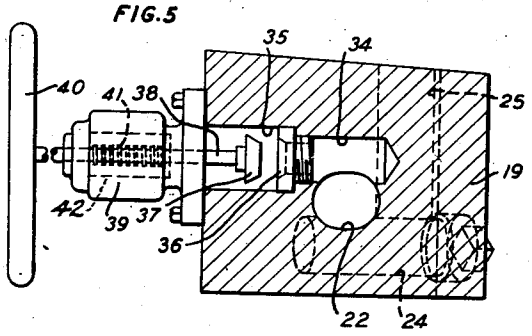
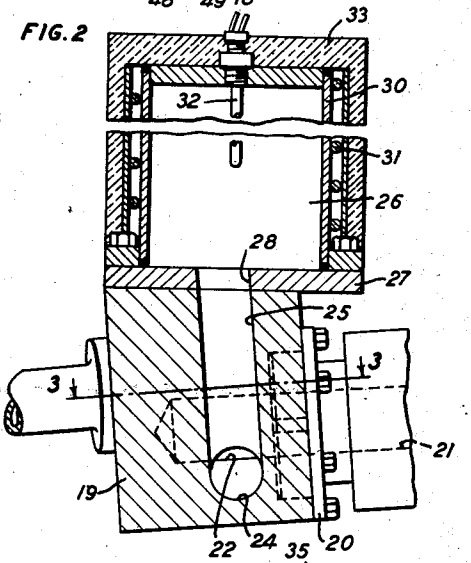


FIG. 2



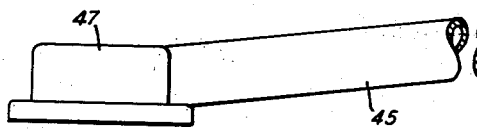


FIG. 3

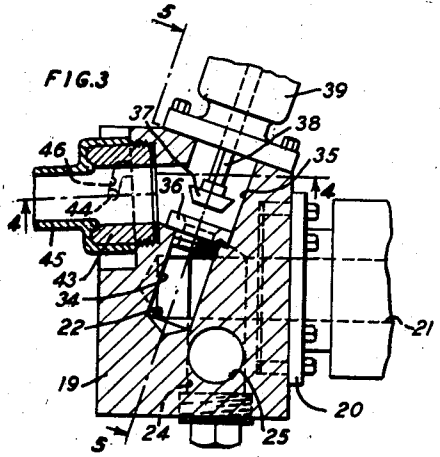
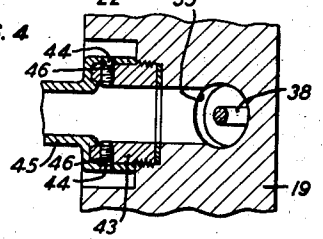


FIG. 4



INVENTOR
A. J. N. DUCLOS

BY

E. R. Nowlan

ATTORNEY

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METHOD OF AND APPARATUS FOR CHARGING EXTRUSION PRESSES

Aeneas J. N. Duclos, South Orange, N. J., assignor to Western Electric Company, Incorporated, New York, N. Y., a corporation of New York

Application December 27, 1941, Serial No. 424,558

5 Claims. (Cl. 207—2)

This invention relates to methods of and apparatus for charging extrusion presses, and more particularly to methods of and apparatus for charging cable sheathing presses.

Certain types of extrusion presses employed for sheathing electrical cables, have heating kettles associated therewith to heat a charge of material for the press while the charge in the press is being extruded. Due to the inner contour of the outlet ends of presses of this type, a certain amount of one charge remains therein and is forced out of the press ahead of the next charge. However, the upper surfaces of such remaining fractional charges have twice been exposed to air, at the beginning and at the end of each extrusion operation when the press is open, resulting in the forming of oxidized coatings thereon.

Objects of the invention are to provide a simple, efficient and practical method of and apparatus for charging extrusion presses, and more particularly to a method of and apparatus for superheating portions of material charges for extrusion presses.

With these and other objects in view, one embodiment of the invention comprises an apparatus by the aid of which the method may be practised to superheat a portion of a material charge for an extrusion press and feed the superheated portion of the charge to the press in advance of the other portion of the charge to cause melting of the oxidized remaining fractional charge in the press, effecting passing of the oxidized material upwardly to the surface of the new charge and further effecting welding of the new and fractional charges.

Other objects and advantages will be apparent from the following detailed description when taken in conjunction with the accompanying drawing, wherein

Fig. 1 illustrates an extrusion press and an associated heating kettle embodying the apparatus of the invention;

Fig. 2 is a fragmentary vertical sectional view of the apparatus by means of which the method may be practised;

Fig. 3 is a fragmentary sectional view taken along the line 3—3 of Fig. 2;

Fig. 4 is a fragmentary sectional view taken along the line 4—4 of Fig. 3, and

Fig. 5 is a sectional view taken along the line 5—5 of Fig. 3.

Referring now to the drawing, which illustrates the apparatus by means of which the method may be practised, attention is first directed to Fig. 1, which illustrates an extrusion press, indicated generally at 10, and a heating kettle, indicated generally at 11. The extrusion press may be of the conventional type, including a cylinder 12, in which the material charges are disposed, provided with a suitable casing 14 including a heating unit (not shown) to maintain the charge in the cylinder at a desired temperature. A ram 15, operated through suitable mechanism (not shown) guided by one or more columns 16, may be moved downwardly, when the cylinder 12 is supplied with a charge of material, to effect extrusion of the material through an outlet 17 equipped with a suitable extrusion head to extrude the material on a cable 18.

The kettle 11 may be of the conventional type, to receive the material in solid form and to convert it into an extrudable state by heating it uniformly to a suitable temperature. It will be apparent that during the transferring of a charge of the material from the kettle to the press, the ram 15 is positioned out of the cylinder 12, as illustrated in Fig. 1. The ram is then lowered into the cylinder and the extrusion operation may then begin. It is not possible, however, for the ram to force all of the charge out of the cylinder during its downward movement in the cylinder. Therefore, a slug or fractional portion of the charge remains in the cylinder of the press. To eliminate defects in the extruded sheath on the cable, due to the presence of an oxide coating on the remaining charge resulting in the prevention of perfect welding of adjacent charges, it is the purpose of the present apparatus and method to remove the causes of such possible defects by melting the remaining charge to free surface oxides and thus effect welding of the adjacent charges. This result is brought about through the superheating of a portion of the next charge to be supplied to the press.

The apparatus comprises a housing 19 rigidly mounted by the aid of a bracket 20, at an outlet 21 of the kettle 11. A passageway 22 in the housing 19 communicates with the outlet 21 of the kettle 11 and extends laterally at a slightly downward angle with an outlet to communicate with another lateral passageway 24, the latter communicating with a passageway 25 which extends vertically to a superheated chamber 26. The chamber 26 has a base 27 mounted upon the housing 19, with an aperture 28 therein, completing the passageway 25 into the chamber 26. A cylindrical inner wall 30 of the chamber is surrounded by a suitable heating unit, such as an electrical heating coil 31, the latter being suitably insulated and disposed in an electrical circuit

(not shown) under the control of a thermocouple 32 and other suitable means to effect heating of material in the chamber to a desired temperature. The thermocouple 32 is supported by an outer insulated casing 33 constituting the outer covering for the chamber 26.

A passageway 34, communicating with the passageway 25 above the passageway 24, opens into a valve chamber 35 through an apertured valve seat 36. A valve 37, formed to cooperate with the valve seat 36 in opening or closing the passageway 34, is mounted upon a valve stem 38, the latter extending through a housing 39 and supporting a hand wheel 40 at the outer end thereof. A threaded portion 41 of the stem 38 cooperates with an internally threaded element 42 in the housing 39 to effect axial movement of the stem and valve upon rotation thereof. The valve chamber 35 has an outlet connection 43 threadedly secured in the housing 19 and provided with diametrically opposed pins 44 for the removable securing of a feeding spout 45 thereto, the latter having notches 46 (Fig. 3) of the bayonet slot type to receive the pins 44. The spout 45 extends at a suitable angle, as illustrated in Figs. 1 and 2, and is provided with a hooded outlet end 47 to extend over the open end of the cylinder 12 of the extrusion press, when the ram 15 has been removed, to direct a material charge into the extrusion press. A suitable valve 50, actuable by a hand wheel or other desired means, is mounted to open and close the outlet 21 of the kettle.

Upon considering the operation of the apparatus and the carrying out of the method steps, let it be assumed that the extrusion press has completed one extruding operation and that the ram 15 has been removed from the cylinder 12 for another charge of material to be supplied to the press. At this time, however, there remains a fractional portion 49 of the previous charge in the cylinder, an upper surface 48 of which is being subjected to air by the removal of the ram from the cylinder. However, during the previous operation of the press, material for another charge has been heated to an extrudable state in the kettle and, by gravity or other suitable force, a portion of the material in the kettle passed through the outlet 21 of the kettle, through the passageways 22, 24, 25 and 28 into the chamber 26. This occurs, however, when the valve 37 is closed and the valve 50 is open. The chamber 26 thus becomes filled with a portion of the material for the subsequent charge, after which the valve 50 is closed and the material in the chamber 26 is subjected to greater heat than that to which the material in the kettle 11 is subjected. As a result, the material in the chamber 26 is heated to a temperature far in excess of that essential for extruding.

At the time previously stated, when the ram 15 is in the position shown in Fig. 1 and the spout 45 is disposed in place, the valve 37 may be moved into the open position to allow the charge to pass into the cylinder 12. The superheated material from the chamber 26 will contact the remaining fractional charge 49 in the cylinder 12, melting all or the upper portion of the fractional charge and thus freeing the surface oxides. After the superheated portion of the charge has had sufficient time to melt the remaining charge in the press or a portion thereof, the valve 50 is opened for the passage of enough material from the kettle to complete the charge. The freed surface oxides may then pass upwardly through the material of the charge to the top thereof, where they may be skimmed off. The melting of the fractional portion 49 not only frees the surface oxides but effects a welding of the material of the two charges, so that the existence of defective portions in the sheath of the extruded cable will not exist.

After the charge has been supplied to the press, the spout 45 is removed and the oxidized material is skimmed off the charge. The ram 15 is then caused to move downwardly to enter the cylinder 12 and to begin another extruding operation. However, prior to the removal of the spout 45 the valves 37 and 50 have been closed, to cut off communication between the chamber 26, as well as the kettle 11, and the spout. The kettle 11 may then be supplied with additional material in solid form, to carry on the heating of material for another charge, the chamber with its heating unit again functioning, when supplied with its portion of the material through the actuation of the valve 50, to superheat the portion to bring about the same result to the fractional portion of the charge remaining in the cylinder. The relative locations of the passageways provide a trap or seal against air entering the chamber 26 or kettle 11.

It shall be understood that the method includes the heating of a charge of material to an extrudable state, superheating a portion of that charge, delivering the charge to a cylinder of an extrusion press, with the superheated portion of the charge in advance of the remaining portion of the charge to cause melting of a portion of a fractional charge remaining in the cylinder of the press to effect freeing the surface oxides and welding the materials of the charges.

Although specific improvements of the invention have been shown and described it will be understood that they are but illustrative and that various modifications may be made therein without departing from the scope and spirit of this invention as defined by the appended claims.

What is claimed is:

1. The method of charging an extrusion press having a fractional remaining charge of material in the cylinder thereof, the method comprising heating a supply of material to a temperature sufficient to melt it, superheating another supply of material to a higher temperature than that of the first supply to condition the second supply to melt the exposed surface of the remaining charge when poured thereon, pouring the superheated supply into the cylinder to melt the portion of the said remaining charge and to effect welding of the materials of the charges therewith, and charging the cylinder with the first supply of material.

2. The combination with an extrusion press adapted to receive a charge of material in a cylinder thereof and to leave a fractional portion of the charge in the cylinder after an extrusion operation, of a kettle adapted to heat a supply of material to a molten state, a spout to deliver the material to the cylinder of the press to charge the press, hollow means having a passageway affording communication between the kettle and the spout, a heated chamber communicating with the passageway at a given portion thereof to receive a portion of the material from the kettle and superheat it sufficiently to melt a portion of the fractional charge when poured thereon, and valves disposed at opposing sides of the said given portion and actuable to selectively open and close their respective portions of the passageway

to free the superheated portion of the material from the chamber in advance of the main body of the material to effect welding of the materials in the cylinder by the superheated portion melting a portion of the fractional charge.

3. The combination with an extrusion press adapted to receive a charge of material in a cylinder thereof and to leave a fractional portion of the charge in the cylinder after an extrusion operation, of a kettle adapted to heat a supply of material to a molten state, a spout to deliver the material to the cylinder of the press to charge the press, a passageway, affording communication between the kettle and the spout, formed to retain a portion of the material therein to serve as a seal against the entrance of air, a heated chamber, communicating with the passageway at a given portion thereof between the seal forming portion and the kettle, to receive a portion of the material from the kettle and superheat it sufficiently to melt a portion of the fractional charge when poured thereon, and valves disposed at opposing sides of the said given portion and actuable to selectively open and close their respective portions of the passageway to free the superheated portion of the material from the chamber in advance of the main body of the material to effect welding of the materials in the cylinder by the superheated portion melting a portion of the fractional charge.

4. The combination with an extrusion press adapted to receive a charge of material in a cylinder thereof and to leave a fractional portion of the charge in the cylinder after an extrusion operation, of a kettle adapted to heat a supply of material to a temperature sufficient to melt the material, means to superheat another supply of material to a temperature higher than that of the first supply to condition the second supply to melt the exposed portion of the fractional charge when poured thereon, a passageway extending from the kettle to the cylinder and having an intermediate connection with the said superheating means, means to control the passageway to deliver the superheated material to the cylinder of the press to melt a portion of the fractional charge, and additional means to control the passageway to subsequently free the material from the kettle to charge the cylinder therewith.

5. The combination with an extrusion press adapted to receive a charge of material in a cylinder thereof and to leave a fractional portion of the charge in the cylinder after an extrusion operation, of a kettle adapted to heat a supply of material to a temperature sufficient to melt the material, a chamber adapted to superheat a portion of the material to a temperature higher than that of the supply to melt the exposed portion of the fractional charge when poured thereon, a feeding spout adapted to receive the material from the kettle and chamber, a valve to control the flow of the material from the chamber to cause the superheated portion to pass through the spout and into the cylinder to cause melting of a portion of the fractional charge, and a valve actuable to free the material in the kettle to flow therefrom and through the spout to the cylinder to charge the cylinder.

AENEAS J. N. DUCLOS.