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2,328,071

APPARATUS FOR PUG MAKING

Filed July 3, 1941

2 Sheets-Sheet 1

FIG. 1.

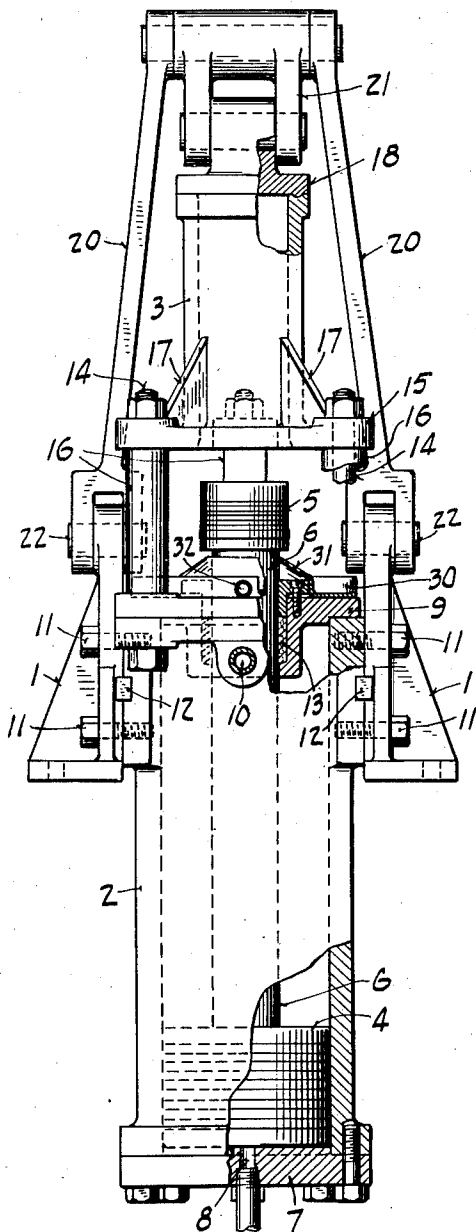
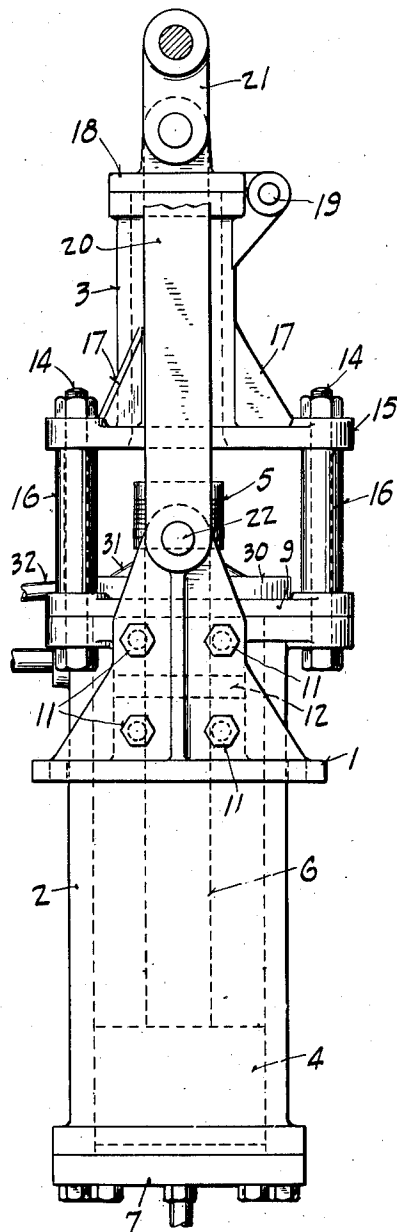


FIG. 2.



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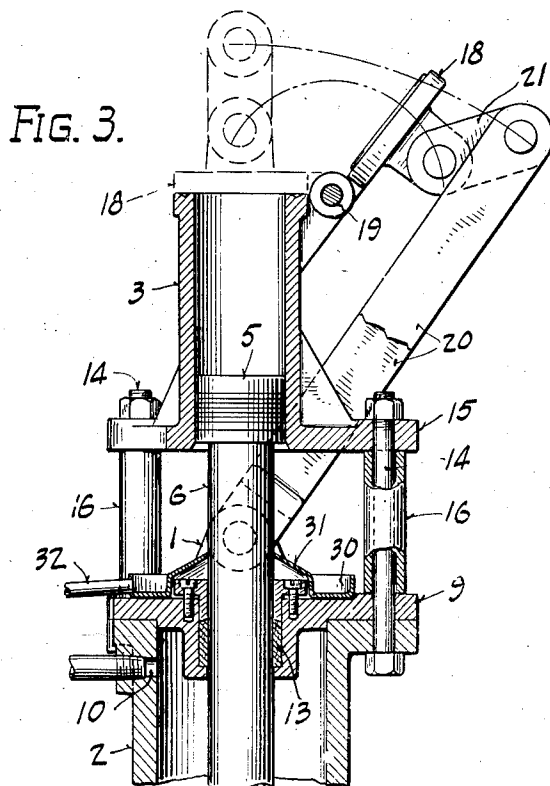
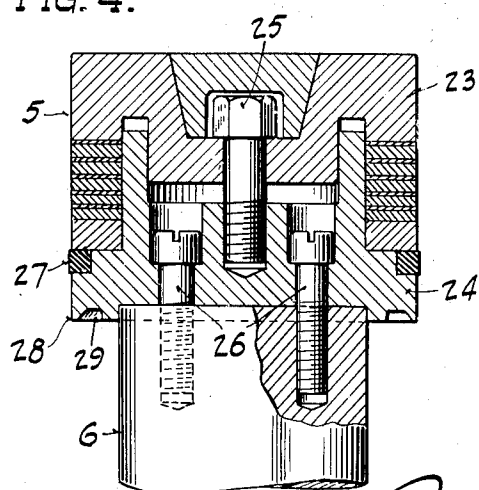


FIG. 4.



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UNITED STATES PATENT OFFICE

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APPARATUS FOR PUG MAKING

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2 Claims. (Cl. 18—5)

This invention relates to an improved pug making press.

Cylindrical pugs of plastic material in varying sizes are utilized in extrusion presses in the coating of welding electrodes and other similar objects.

Heretofore, pugs have been made in various ways, one of the principal ways being to employ a press in which the pugging cylinder is disposed below the power cylinder. Positioning these cylinders in this manner requires a press of considerable height and weight, as the pugging piston must be capable of being raised above the upper end of the pugging cylinder to make such end accessible for loading purposes. With the piston above the cylinder during loading there was considerable danger of injury to the operator.

Also in the old type of press the pugging cylinder was provided with a sliding bottom to permit the formed pug to drop to the floor for removal which was at an inconvenient height for the operator of the machine.

The main object of the present invention is to provide an improved pug making press which will eliminate the drawbacks of the former types of presses and which is more compact, more efficient and less costly to operate than the presses heretofore used.

Generally speaking the invention comprises a machine wherein the power cylinder and piston are located below the pugging piston and cylinder. These pistons are connected by a common piston rod causing the pugging piston to be driven by the power piston.

A removable head is provided to close the top of the pugging cylinder and the removal of this head permits the operator to load and unload the pugging cylinder and yet it is so constructed that it is held as a seal tight cover on the top of the pugging cylinder when closed. The head is hinged to the cylinder and is held in place by tension members which are pivoted to the cylinder support and linked to the head to provide for tilting of the head on its hinge.

With the machine constructed in this manner the operator can perform the loading and unloading operations at a convenient height without any overhead apparatus to hinder him, thereby saving time and increasing production.

This type of construction facilitates cleaning operations, as the pugging piston can be either withdrawn from the lower end of its cylinder or raised above the top end.

Other objects of this invention will be apparent

from the following description and the accompanying drawings in which:

Figure 1 is a front elevation showing a press embodying the invention, part of which has been broken and sectioned away to show its construction;

Fig. 2 is a side elevation of the press with the head of the pugging cylinder in closed position;

Fig. 3 is a detailed view showing the head in open position; and

Fig. 4 is a longitudinal central sectional view of the pugging piston.

The pug making press shown by the drawings comprises standards 1 carrying a vertically disposed hydraulic or power cylinder 2 located in axial alignment below a vertically disposed pugging cylinder 3, supported by the power cylinder.

Power piston 4 is reciprocally disposed in hydraulic cylinder 2, and pugging piston 5 is adapted for reciprocation in pugging cylinder 3. A common piston rod 6 connects power piston 4 to pugging piston 5 causing power piston 4 to reciprocally drive pugging piston 5.

Hydraulic cylinder 2 is double acting and has a head 7 at its lower end with a suitable aperture 8 for connection with a source of fluid power. The upper end of the hydraulic cylinder 2 is closed by a head 9 and is provided with an aperture 10 above the piston 4 for connection with a source of fluid power. Hydraulic cylinder 2 at its top is attached to standards 1 by screws 11 and keys 12. Packing material or gland 13 encases piston rod 6, where it passes through head 9, to prevent leakage of fluid from hydraulic cylinder 2.

Bolts 14 pass through ears on the lower flanged end 15 of cylinder 3, head 9 and the upper flanged end of cylinder 2 to secure the parts together. Spacer sleeves 16 encircle the bolts intermediate the cylinder 3 and head 9 to maintain the cylinder 3 in spaced relation above cylinder 2 and thus permit withdrawal of pugging piston 5 from the bottom of cylinder 3, as shown in Figure 1, and allow the operator to examine and clean the cylinder and piston. Angular webs 17 reinforce the flange at the lower end of cylinder 3.

Pugging cylinder 3 has a removable top head 18 attached to it by hinge 19 permitting head 18 to close the top of the pugging cylinder 3 in a seal tight manner or to be swung back when desired. Pivotal arms 20 linked to the top of head 18 by bifurcated link 21 and secured to standards 1 by pins 22, serve as a pair of tension members

to sustain the pressure against head 18 when the pugging process is in operation. Other suitable methods of securing head 18 to the upper end of pugging cylinder 3 may be employed.

Pugging piston 5 consists of a metallic head or top 23 attached to the bottom 24 by a bolt 25. Bolts 26 connect the pugging piston 5 to piston rod 6. Packing material 27 serves as a wiper or cleaning means when the piston is operating in its cylinder.

On the bottom of pugging piston 5 is located a circumferential skirt 28 which may be formed by providing an annular groove 29 between the rim of the piston 5 and piston rod 6. The purpose of the circumferential skirt 28 is to prevent leakage fluid that may be squeezed or expressed from the material being pugged or water used in cleaning the cylinder from reaching piston rod 6.

When leakage fluid reaches circumferential skirt 28 its passage toward piston rod 6 is obstructed and it either runs down the cylinder wall or drips into receptor 30 positioned on the head 9 of power cylinder 2. Leakage fluid from the cylinder wall also drips into the receptor.

Receptor 30 may be of annular trough shape having an inner generally conical flange 31 loosely encircling the piston rod. A drain pipe 32 is connected to the trough for carrying off the leakage fluid.

In the operation of the machine shown and described, head 18 is first removed or swung back from the top of pugging cylinder 3. Fluid is then forced into the bottom of power cylinder 2 through aperture 8 causing power piston 4 to be pushed upwards. The movement of power piston 4 upwards advances pugging piston 5 into the lower end of pugging cylinder 3 by means of the connecting or common piston rod 6.

After pugging piston 5 enters pugging cylinder 3 its upward movement is stopped by the withholding of further entry of fluid into the bottom of power cylinder 2 to permit the loading of the plastic material through the open top of pugging cylinder 3. When such loading has been completed head 18 is closed over pugging cylinder 3 and the toggle links formed by pivotal arms 20 linked to head 18 by links 21 and to frame 1 by pins 22 are pushed into place to securely seal head 18 on the top of pugging cylinder 3.

Pugging piston 5 supporting its plastic content is then advanced upwardly toward head 18 by the forcing of more fluid into the bottom of power cylinder 2, until the material in cylinder 3 is pressed into a pug of the desired consistency. The pressure in cylinder 2 is then released, the toggles links loosened, the head 18 swung back and reduced pressure applied to cylinder 2 to raise the pug out of cylinder 3, where it will be conveniently accessible to the operator.

When the pug has been removed the pugging piston 5 is lowered to the bottom of the pugging cylinder 3 by the entry of pressure fluid through aperture 10 at the top of power cylinder 2 above piston 4 and exhausting the fluid out of the bottom of power cylinder 2 through aperture 8. After the pugging piston 5 is lowered to its position in the bottom of the pugging cylinder 3, as shown in Fig. 3, the operator reloads the cylinder 3 and replaces the head 18 for repeating the pugging operation.

While the above described operation is in process fluid squeezed out of the material being pugged leaks by piston 5 and is prevented from reaching the piston rod by skirt 28. The fluid runs down the cylinder wall and drips into receptor 30 or if the piston is withdrawn from the bottom of its cylinder the fluid will drip directly from the skirt 28. Fluid in the trough will be drained through connection 32.

After a number of pugging operations have been completed, pugging piston 5 may be either raised above the upper end of cylinder 3, or withdrawn from the bottom of the cylinder so that the apparatus may be thoroughly inspected and cleaned before further operations are resumed.

I claim:

1. In a machine of the class described, a cylinder having a piston operating therein through one end thereof, a support for said cylinder, a removable head for said cylinder hinged to one side thereof for tipping out of the way to provide for loading the cylinder with material to be compressed, and a toggle link having a shorter member pivoted to said head above and near the center thereof and a pair of longer members pivoted to said cylinder support on opposite sides of the cylinder constituting tension members to secure the head tightly against the cylinder when closed and relieving said hinge from substantial pressure.

2. In a machine of the class described, a cylinder, a support for said cylinder, a removable head for said cylinder hinged to one side thereof for tipping out of the way to provide for loading the cylinder with material to be compressed, and a toggle link having a shorter member pivoted to said head above and near the center thereof and a pair of longer members pivoted at their upper ends to said shorter member and at their lower ends to said cylinder support on opposite sides of the cylinder constituting tension members to secure the head tightly against the cylinder when closed and relieving the hinge from substantial pressure, said pivot point between the toggle members being laterally movable to provide for lifting said head and tilting the same on its hinge.

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