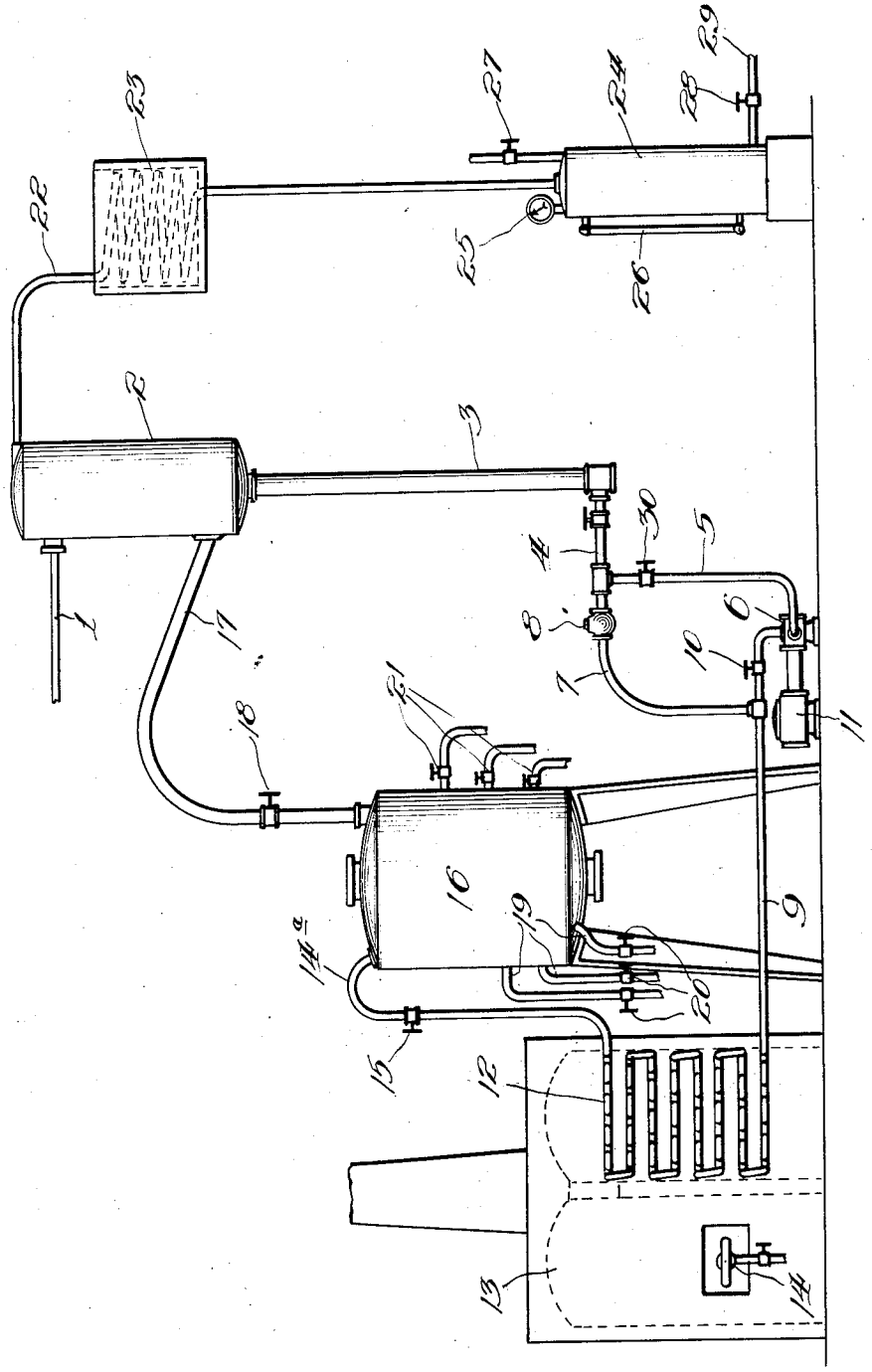
Oct. 6, 1925. 1,555,976

L. C. HUFF

APPARATUS FOR TREATING OIL

Filed April 14, 1923



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Inventor:
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Oct. 6, 1925.

1,555,977

E. F. HULBERT

PRESS

Filed Dec. 15, 1924

4 Sheets-Sheet 2

Fig. 2.

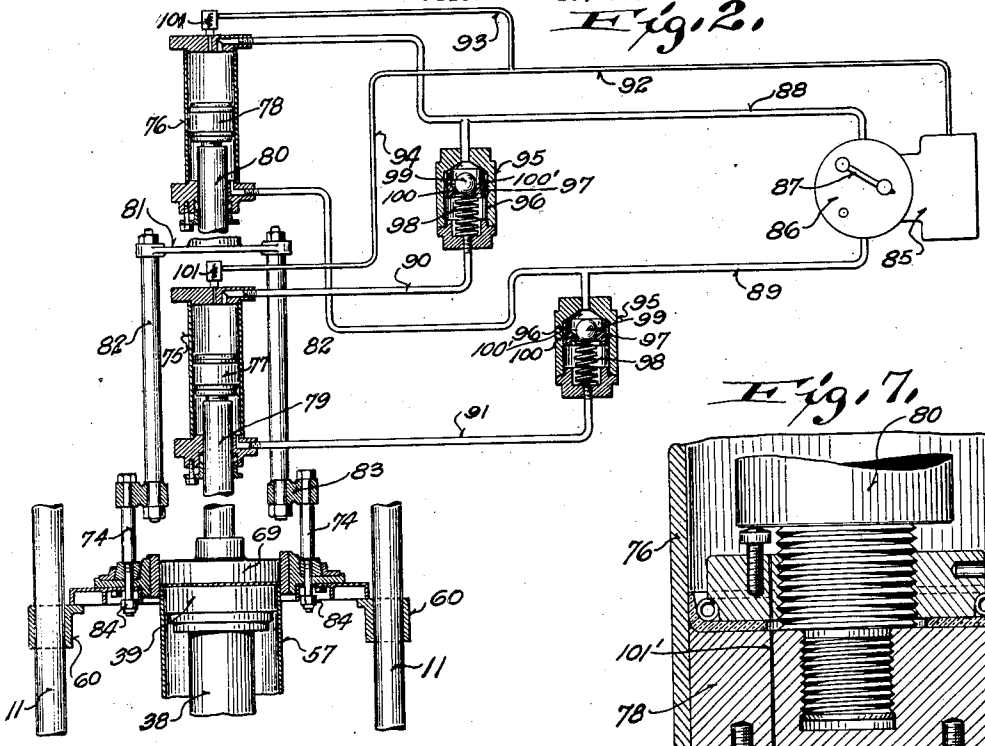
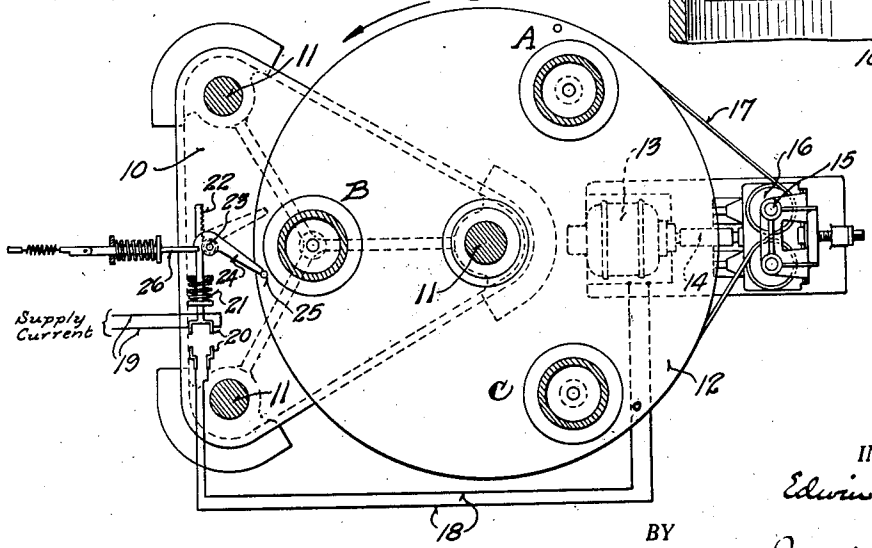


Fig. 7.

Fig. 6.



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4 Sheets-Sheet 3

Fig. 5.

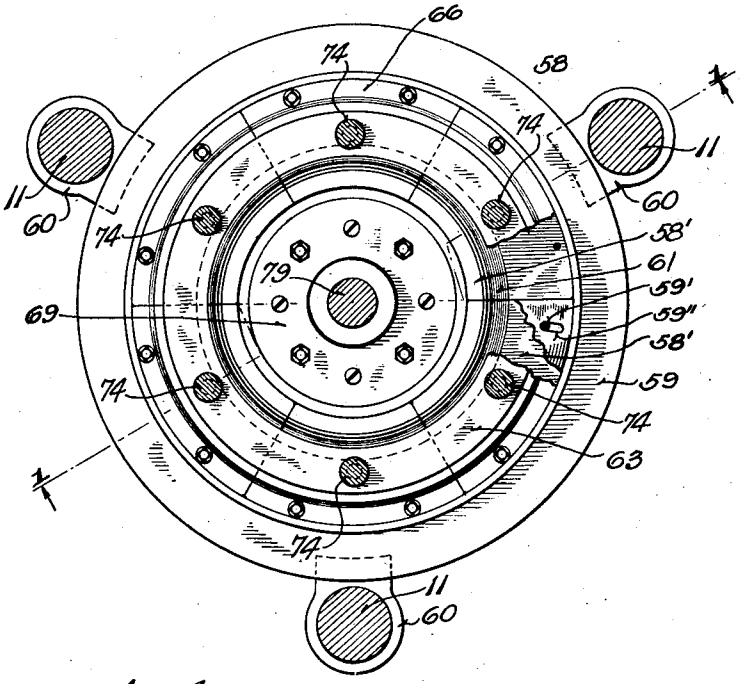
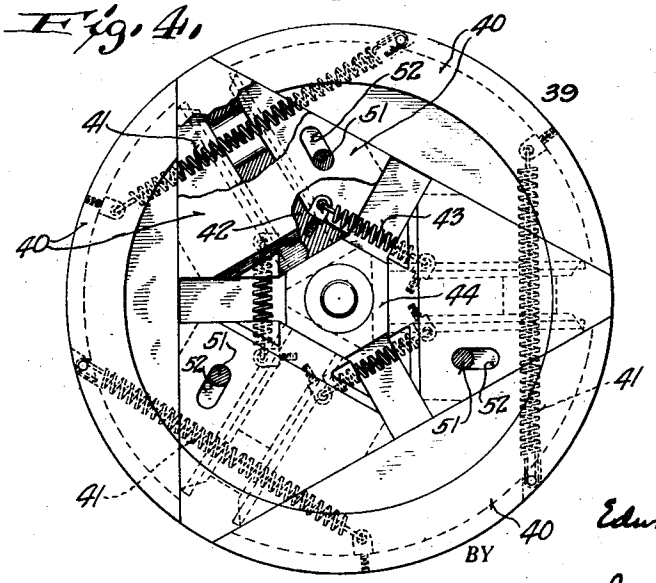


Fig. 4.



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Fig. 8.

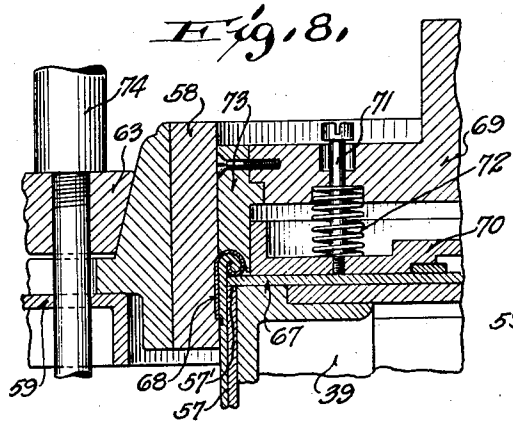


Fig. 11.

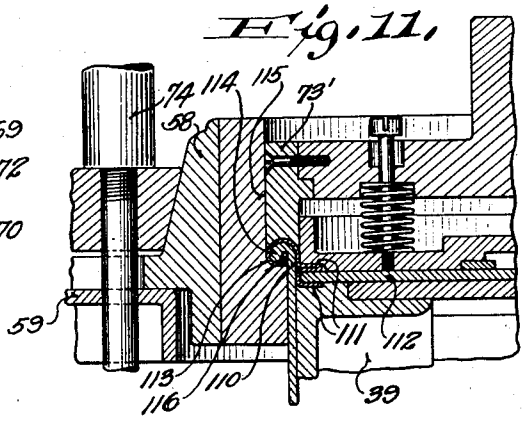


Fig. 9.

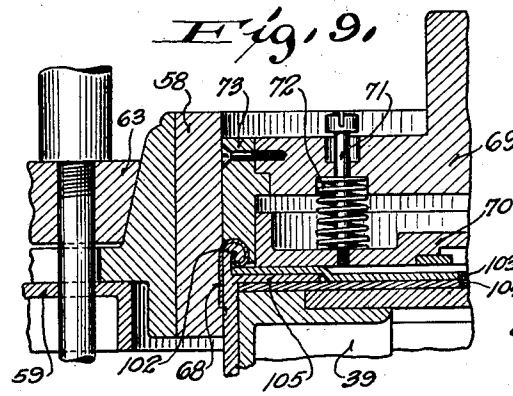


Fig. 12.

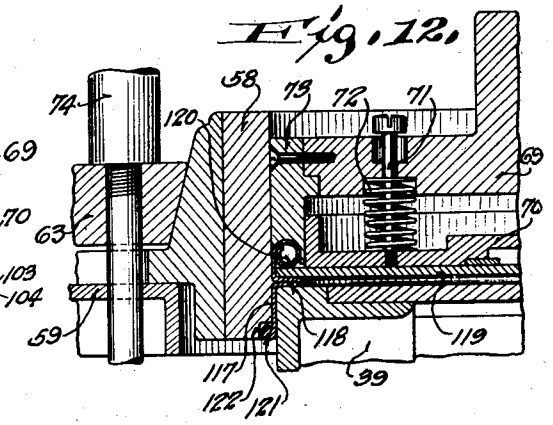
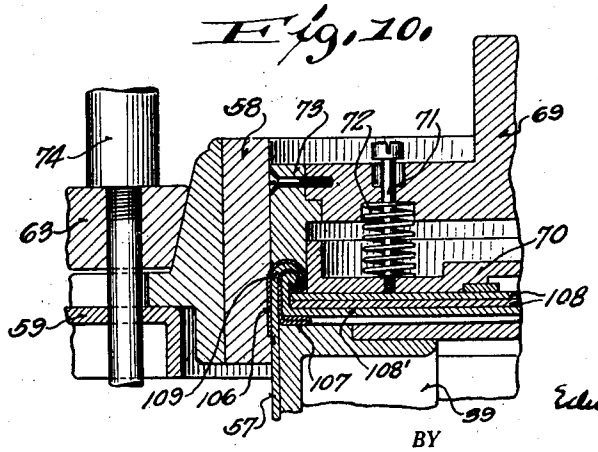


Fig. 10.



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Patented Oct. 6, 1925. 1,555,977

UNITED STATES PATENT OFFICE.

EDWIN F. HULBERT, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO THE MASTER PACKAGE CORPORATION, OF OWEN, WISCONSIN, A CORPORATION OF WISCONSIN.

PRESS.

Application filed December 15, 1924. Serial No. 755,993.

To all whom it may concern:

Be it known that I, EDWIN F. HULBERT, a citizen of the United States of America, and resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Presses, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

The invention relates to presses, and more particularly to a press for attaching the head to the siding for the body or cover of a container.

One object of the invention is to provide a press in which the siding for the body or cover is gripped between outer and inner chucks and the head clamped in position while being attached to the siding, the machine accomplishing these operations in sequence during a single pressing cycle.

A further object of the invention is to provide a press of the character above described in which the parts are operated hydraulically with a predetermined sequence of operations.

The invention further consists in the several features hereinafter set forth and more particularly defined by claims at the conclusion hereof.

In the drawings: Fig. 1 is a vertical sectional view through a part of the press embodying the invention;

Fig. 2 is a view similar to Fig. 1, showing more particularly the operating mechanism;

Fig. 3 is a detail sectional view taken on the line 3—3 of Fig. 1, parts being broken away;

Fig. 4 is a detail sectional view taken on the line 4—4 of Fig. 1, parts being broken away and parts being shown in section;

Fig. 5 is a detail sectional view taken on the line 5—5 of Fig. 1;

Fig. 6 is a detail plan view of the feeding table and its driving mechanism;

Fig. 7 is a detail sectional view through one of the hydraulically-operated pistons;

Fig. 8 is an enlarged detail sectional view of press parts shown in Fig. 1, operating on the container there shown;

Figs. 9 and 10 are views similar to Fig. 8, showing the press parts operating on other forms of container closures;

Fig. 11 is a view similar to Fig. 8, showing the press parts modified to operate on a container cover;

Fig. 12 is a view similar to Fig. 8, showing the press parts formed to produce another form of container closure.

The press includes a base plate 10, upright frame members 11, a feeding table 12 rotatably mounted on one of the uprights 11, a motor 13 connected through shaft 14 and enclosed reduction gearing to a shaft 15 carrying a pulley 16 connected by a belt 17 with the pulley face of the table 12.

The motor circuit 18 is connected to the supply circuit 19 through a switch 20 which is normally closed by a spring 21 but adapted to be opened intermittently, as the table rotates, by a rack 22 on the movable member of the switch meshing with a pinion on a shaft 23 secured to a lever 24 which is swung to move the rack to open the switch by the engagement of a pin 25 on the rotating table, and is held in position, to hold the switch open while the press is operating, by means of a spring-pressed detent 26 under the control of the operator. Thus, the motor turns the table intermittently from a position A to a pressing station B to an unloading station C and is automatically stopped at these stations through the operation of the lever 24 by the table, and is put into motion through the operation by the operator on the detent 26.

The table is held against movement on reaching the pressing station by a dog or latch 27 automatically engageable with a locking recess 28 as the table reaches this station and is released by the operator after the pressing operation and just before the release of the detent 26. As shown, the latch 27 has a roller 29 cooperating with a cam 30 on the table to effect its outward movement prior to locking, with a limited sliding movement produced by the sliding movement of a part 31 of the latch in opposition to a spring 32, both of which parts are carried on a member 33 slidably mounted in a guide 34 on the base plate, said member 33 being moved to bring the latch to operative position by springs 35, and the whole latch assembly being released by the operator through the operation of a treadle lever 36 connected by a cable 37 with the member 33.

The table 12 carries a plurality of tubular uprights 38. Upon each of these uprights an internal expanding chuck 39 is

mounted. This chuck may be of any suitable construction and one form is shown in detail in Fig. 4, wherein arcuate chuck jaws 40 are normally held in contracted position by springs 41 connecting adjacent jaws, and are moved outwardly by wedge blocks 42 which are normally held in contracted position by springs 43 connecting adjacent blocks, the blocks 42 being moved outwardly through the downward movement of a centrally disposed actuator 44 which has wedging engagement with blocks 42, the wedge surfaces being 45 and 46, respectively, and the chuck is held in expanded position by engagement of the straight sides 47 of the actuator with the straight sides 48 of the blocks 42. The jaws 40 and blocks 42 are slidably mounted between plates 49 and 50 and are guided by bolts 51 working in slots 52 in the jaws 40. The actuator or expander 44 is connected to a rod 53 that carries rollers 54 which engage the surfaces 55 of a two-part wedge cam 56 on the base plate 10 as the table 12 moves to its pressing position, the cam 56 being of two parts to allow of the passage of the rod 53. With this construction, while one of the chucks is moving from the position A to the position B, the operator places the tubing 57, forming the siding of the container, over the chuck and as this chuck reaches the pressing position the chuck jaws are moved outwardly against the interior of the tubing through the operation of the chuck parts effected by the downward movement of the actuator 44 and rod 53 cooperating with the cam 56. Thus, the siding of the container is automatically and firmly clamped in place as it reaches the pressing position.

An external contracting chuck 58 is used to engage the tubing during the pressing operation. This chuck may be of any suitable construction and one form is shown in detail in Figs. 1 and 3, wherein arcuate chuck jaws 58′ are slidably mounted on a support 59 adapted to rest upon supports 60 on the three frame members 11. Each jaw 58′ has a wedge surface 61 engageable with a corresponding wedge surface 62 on a wedge ring 63 and when downward pressure is put upon said ring the jaws 58′ move radially inwardly into clamping engagement with the exterior of the tubing 57 adjacent its upper end. The jaws 58′ are retracted by engagement of a wedge surface 64 on the ring with corresponding wedge surfaces 65 on ring sections 66 respectively connected to each jaw 58′. The jaws 58′ are mounted to be lifted with support 58 by means of bolts 59′ having their shanks secured to said jaws and passing through slots 59″ in the support 59 with heads engageable with the bottom parts of said support.

Thus the siding is held both inside and outside during the pressing operation and the top of the inner chuck forms an anvil upon which the head 67 of the container or cover is placed before the external chuck is applied.

With the head 67 in place and the chucks 39 and 58 applied, the head is next clamped down firmly against the chuck 39 and in Figs. 1 and 8 seats on a shoulder 57′ formed by the siding and then a sheet metal band 68 on the siding is pressed with the siding to secure the head in place. For this purpose a pressing plunger comprising a main plunger 69 and a clamping plunger 70 is used. The plunger 70 is in the form of a disk carried by the plunger 69 through bolts 71 which are slidably mounted in the plunger 69 and surrounded by compression springs 72 which cause the plunger 70 to engage the head 67 as the entire plunger moves downwardly and thereafter as the springs 72 are compressed the annular forming and pressing edge 73 of the plunger 70 comes into operation to crimp the siding and the band 68 together and to secure the head in place.

The chuck 58 is carried on rods 74 which are fast to the ring 63 and slidably mounted for limited movement relative to the chuck jaws 58′ and the support 59, the extent of this movement being determined by the position of stop nuts 74′. Thus, on the first part of the upward movement of said rods 74 the wedge ring 63 bears against the ring sections 66 to cause a release of the chuck jaws 58′ from the work, the support 59 being then held down by its own weight, and thereafter upon a further movement of said rods the support 59 is engaged by the nuts 64 and lifted with the rest of the chuck parts to an elevated position so that the operator may put the head 67 of the container in place within the siding prior to the pressing operation.

Both the operating means for the chuck 58 and the plunger are preferably hydraulic and so arranged that the chuck 58 is applied before the plunger starts its pressing operation. For this purpose there are two cylinders 75 and 76 suitably supported and having pistons 77 and 78 operating therein.

The piston 77 is connected by the piston rod 79 with the main plunger 69 and the piston 78 is connected by a piston rod 80 to a cross-head 81 carrying rods 82 connected by a ring 83 with rods 74.

A motor-driven oil pump 85 furnishes the motive fluid for the system and a mechanism 86 of known construction and under the control of an operating lever 87 regulates the output of the pump.

The pump here shown is of a type in which oil under pressure may be supplied to either of two pipes 88 or 89. The pipe

88 connects direct with the upper end of the cylinder 76 and the pipe 89 direct with the lower end of said cylinder. A branch pipe 90 connects the pipe 88 with the upper end of the cylinder 75 and a branch pipe 91 connects the pipe 89 with the lower end of the cylinder 75. An air and waste oil pipe 92 leading to the sump of the pump has branch pipes 93 and 94 connected respectively with the upper ends of the cylinders 75 and 76.

A timing valve mechanism 95 is located in each of the branch pipes 90 and 91. In each instance this comprises a two-part cylinder 96, a valve 97 slidably mounted therein and acted upon by a spring 98 to oppose its movement and controlling passage of fluid from the upper part of said cylinder through passages 100′, and a check valve 99 seating in a passage 100 in said valve 97 to permit return of fluid on the reverse movement of the actuating piston.

With the hydraulic mechanism above described, when oil under pressure is admitted to the pipe 88, it passes therefrom into the upper part of the cylinder 76 and into the upper part of the valve cylinder 96. As the resistance to pressure by the piston 78 and its associated parts is less than that produced by the spring 98 against the valve 97, the piston 78 moves downwardly and thereby causes an operation of the external expanding chuck, as previously described. Thereafter, when the chuck 58 has been set, further movement of the piston 78 is arrested and then the total pressure of the oil in the line 88 acts upon the valve 97 and moves it downwardly against the action of the spring 98 and oil then flows through the passage 100′ between the valve and the cylinder 96 to the pipe 90 and the upper end of the cylinder 75 and acts on the piston 77 to move it downwardly and cause the plunger to operate in the manner previously described to perform the pressing operation. For the return movement of the pistons the oil under pressure is admitted to pipe 89 and passes therefrom into the lower end of the cylinder 76 and into the upper part of the valve cylinder associated with the pipe 91 and operates in a manner identical with the timing valve in the pipe 90 to first permit the piston 78 to move upwardly and thereby release the external chuck 58 and then allow oil to pass into the lower part of the cylinder 75 and move the piston 77, and hence the plunger 69, upwardly to an inoperative position and so that the work may then be turned to the unloading position C.

It is important that air be prevented from becoming trapped in the cylinders 76 and 75 on opposite sides of the piston, and to avoid this I have provided air bleed pipes 101 communicating with the upper ends of each cylinder and associated with a small opening 101′ leading from the under side of each of the pistons, one of the pistons 78 being shown in Fig. 7 in an inverted position. The pipes 100 are so small that while those on the piston permit entrapped air from the lower end of the cylinder to pass through them to the upper end and then through the pipes 101 in the upper cylinders 76 and 75 to the pipes 94 and 93, they offer great resistance to the passage of oil through them. Hence during the movement of the pistons any air that may be trapped in the hydraulic cylinders is forced out into the pipes 93 and 94 into the pipe 92 and into the sump of the pump with such waste oil as may be forced out through said pipes 101 with the air.

In Figs. 9 to 12, inclusive, I show the operation of the press upon various closures. In Fig. 9 the band 68 and a part 102 of the siding are pressed down into clamping engagement with a head formed of two parts 103 and 104 which are secured together and to an inwardly-extending flange 105 of the siding 102, by suitable adhesive, and pressed between the chuck 39 and plunger 70 before the forming tool 73 comes into operation. In Fig. 10 the metal band 106 is provided with a cover seating flange 107 and the dished part 108′ of the laminated cover 108 is crimped with the band 106 and a part 109 of the siding down against the head when the tool 73 comes into operation. In Fig. 11 the band 110 is provided with spaced inwardly-extending flanges 111 forming a head-receiving recess and the head 112 is clamped between said flanges by the plunger 70 and chuck 39 while the outer edge 113 of the band is crimped or pressed outwardly and inwardly with the upper edge 114 of the siding against said siding, the forming tool 73′ in this case working in a recess 115 formed in the blocks of the external chuck, said recess having a curved lower end 116. In Fig. 12, to form the cover of the pail, a metal band 117 which forms the siding of the cover is clamped between the internal chuck 39 and the external chuck 58 and has an inwardly-extending flange 118 upon which the cover 119 is seated, and the tool 73 acts to roll, by a direct pressing action, the upper edge 120 of said band into clamping engagement with said cover. Where the siding has a bead 121, the face of the chuck plates are recessed, as at 122, to accommodate this bead.

From the foregoing it will be noted that the chucks grip the siding whether of one or more parts between them, and that while the head is firmly clamped down a part or parts of the siding are turned by direct longitudinal pressure into a bead to secure the head to the siding.

I desire it to be understood that this invention is not to be limited to any particular form or arrangement of parts except in so far as such limitations are included in the claims or necessitated by the prior art.

What I claim as my invention is:

1. In a press of the character described, the combination of an internal holder for the siding to be headed, an external clamping means for the siding, a plunger having a head-clamping part and a forming part movable relative to said head-clamping part, means for operating said plunger to move said head-clamping part to clamp the head between it and said internal holder and thereafter move said forming part to its work, and means for operating said external clamping means before said plunger comes into operation.

2. In a press of the character described, means for holding the siding to be headed both internally and externally, means for clamping the head in position, and means for pressing the siding into position to attach the head to said siding.

3. In a press of the character described, the combination of a movable support having an internal expanding chuck mounted thereon to engage the siding to be headed, chuck-actuating means operated by the movement of said support as it comes to a pressing position, an external contracting chuck engageable with said siding when in a pressing position, and a pressing plunger movable to clamp the head in position and press a part of said siding into a head-affixing position.

4. In a press of the character described, the combination of a rotary feed table having an internal expanding chuck mounted thereon to engage the siding to be headed, chuck-actuating means operated by the movement of said table as it turns to a pressing position, means for locking said table in pressing position, an external contracting chuck engageable with said siding when in a pressing position, and a pressing plunger movable to clamp said head in position and press the siding to a head-affixing position.

5. In a press of the character described, the combination of an internal holder for the siding to be headed, a head-attaching plunger, an external contracting chuck engageable with the siding, of a pair of hydraulically-operated pistons associated respectively with said plunger and external chuck, a supply of pressure fluid, and means for causing the pressure fluid to operate the actuating piston of the external holder in advance of the piston for said plunger.

6. In a press of the character described, the combination of an internal holder for the siding to be headed, a head-attaching plunger, an external contracting chuck engageable with the siding, a pair of hydraulic cylinders, pistons working in said cylinders and operatively connected respectively to actuate said external chuck and said plunger, a supply of pressure fluid, means for cutting off the supply of pressure fluid to the piston-operating plunger until the piston of the external chuck has been operated and then operable through the increase of pressure occasioned thereby to connect the supply of pressure fluid for actuating the plunger-operating piston.

7. In a press of the character described, the combination of means for clamping the siding in position to receive a head, of head-attaching means including a plunger having a head-clamping portion and an annular crimping portion, said head-clamping portion being yieldably mounted to move relative to said crimping portion.

8. In a press of the character described, the combination of means for clamping the siding in position to receive a head including an external contracting chuck, of head-attaching means including a plunger having a head-clamping portion and an annular crimping portion guided in said external chuck, said chuck cooperating with said crimping portion of the plunger to form an enclosed space in which part of the siding is crimped to a head-affixing position.

9. In a press of the character described, the combination of means for clamping the siding and its band in position to receive the head, of head-clamping means, and means to crimp a part of said siding and band together to affix the head.

10. In a press of the character described, the combination of a support having an internal expanding chuck engageable with the siding, an external contracting chuck engageable with the siding, means for raising and lowering said last-named chuck, said last-named means also serving to apply and release said external contracting chuck, and means for clamping the head in position and thereafter acting on a part of said siding to affix the head thereto.

11. In a press of the character described, the combination of an internal holder for the siding, an external contracting chuck engageable with the siding, a head-attaching plunger, a pair of hydraulic cylinders, pistons operating in said cylinders and operatively connected respectively to said chuck and plunger, a source of pressure fluid, piping conducting said pressure fluid to said cylinders to actuate said pistons, and pressure-operated timing valves associated with said piping whereby the piston connected to said chuck is operated in advance of the piston associated with said plunger.

In testimony whereof, I affix my signature.

EDWIN F. HULBERT.