F. COATES.

DIE PRESS.

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1,415,018.

Patented May 9, 1922.

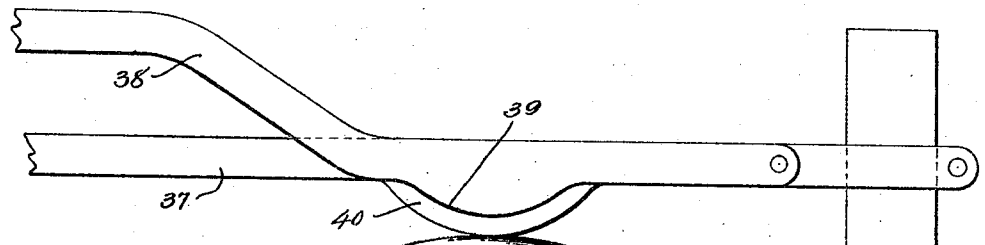


Fig. 1.

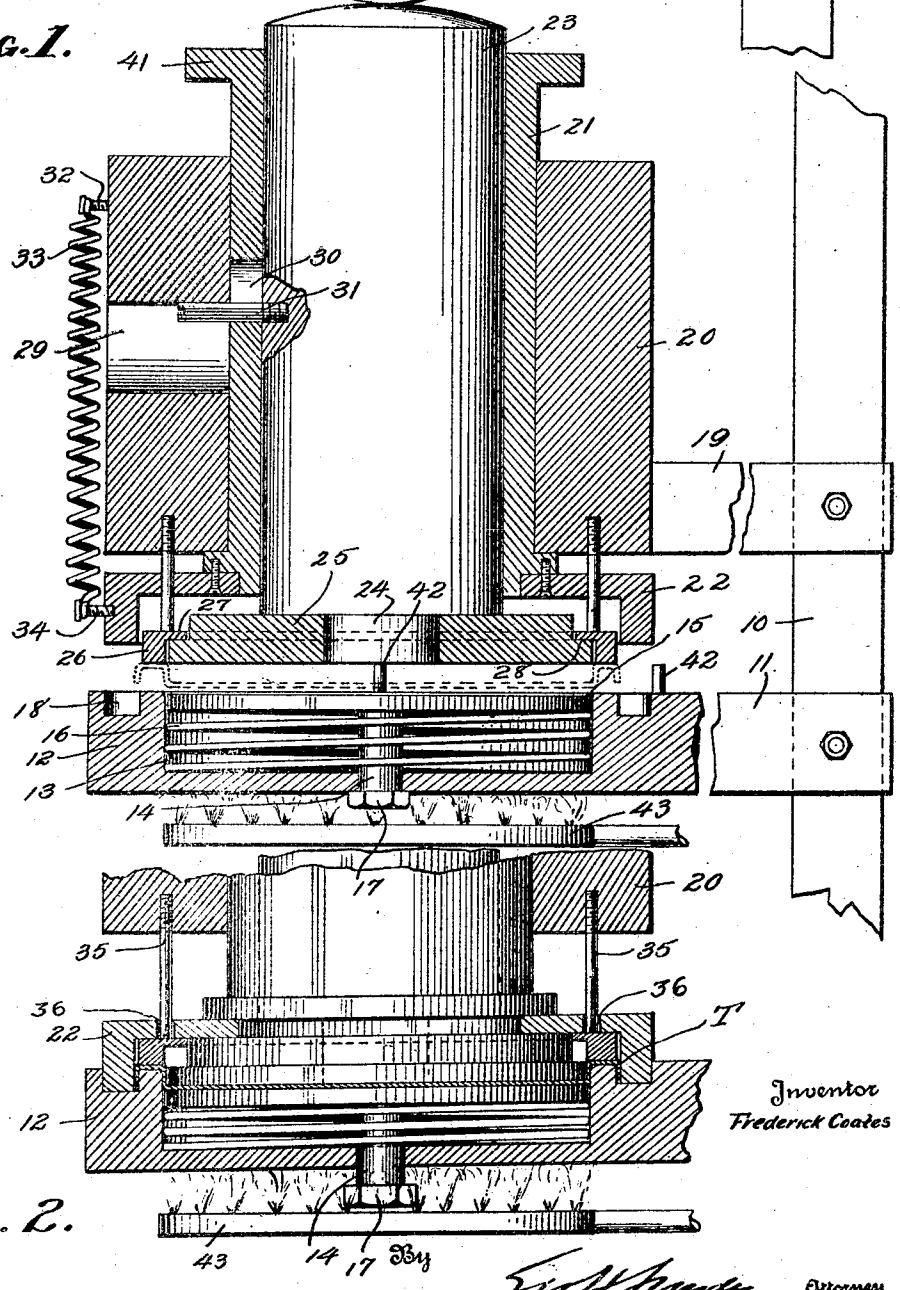


Fig. 2.

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DIE PRESS.

1,415,018. Specification of Letters Patent. Patented May 9, 1922.

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To all whom it may concern:

Be it known that FREDERICK COATES, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, has invented certain new and useful Improvements in Die Presses, of which the following is a specification.

This invention relates to the manufacture of paper containers of the type known as paper cans.

More especially the invention relates to a die press for the manufacture of ends or closures for paper cans.

One important object of the invention is to improve and simplify the general construction of devices of this character.

A second important object of the invention is to provide an improved form of die press especially adapted for operating upon paper in a plastic state.

A third important object of the invention is to provide an improved form of die press having special arrangements for stripping the formed can end from the dies automatically so that no injury is done to the material.

A fourth important object of the invention is to provide an improved form of die press wherein the material may be formed while plastic and dried out in the press.

A fifth important object of the invention is to provide an improved form of die press for this purpose which is peculiarly adapted to be used in connection with automatic or semi-automatic end forming machinery.

With the above and other objects in view, the invention consists in general of certain novel details of construction and combinations of parts hereinafter fully described, illustrated in the accompanying drawings, and specifically claimed.

In the accompanying drawings, like characters of reference indicate like parts in the several views, and:—

Figure 1 is a vertical median section through a die press constructed in accordance with this invention, the several parts being shown in stripped position.

Figure 2 is a section similar to Figure 1 but showing only the lower part of that figure and with the several parts in pressing position.

In the embodiment of the invention as herein illustrated there is provided a standard 10 and projecting from this standard is an arm 11 carrying the lower or female die. This die consists of a substantially circular body portion 12 having a recess 13 in its upper base corresponding in size with the inside of the can or container the top for which is to be pressed by this machine. Extending through the bottom of the die 12 is a stem or plunger 14 which carries on its upper end a stripper plate 15 of substantially the same diameter as the recess 13. Normally holding this stripper plate in elevated position is a coil spring 16. A nut 17 on the lower end of the stem 14 prevents the stripper plate from rising out of the recess 13. Surrounding the recess 13 an annular channel 18 which is formed concentric with said recess.

Extending out from the prop or support 10 above the bracket 11 is a second bracket 19 which carries on its outer end a sleeve 20 forming a guide sleeve. Slidable within the sleeve 20 is a die support 21 in the form of a hollow cylinder and carrying at its lower end an annular die 22 cooperating with the annular recess 18 as will be hereinafter described. Within the die support 21 is a plunger 23 which is of somewhat greater length than the die support and has a reduced lower end 24 whereon is mounted a male die 25 cooperating with the recess 13. While the annular recess 18 is concentric to the recess 13 there is left a considerable space between said annular recess and the recess 13. In like manner space is left between the male dies 22 and 25 and within this space is a floating stripper ring 26 having an internal flange 27 normally resting on a peripheral flange surface 28 formed on a male die 25. In one side of the guide sleeve 20 is a vertical slot 29 and in the die support 21 is a similar slot 30. Screwed to the plunger 23 and projecting through the slot 30 into the slot 29 is a pin 31. It will thus be seen that this pin in its action within the slot 29 will limit the movement of the plunger 23 vertically. At the same time this pin will also limit the movement of the die support 21 both with reference to the hollow sleeve 20 and to the plunger 23. Secured to a pin 32 projecting from the side of the sleeve 20 is a coil tension spring 33 which has its lower end secured to a pin 34 projecting from the die 22. The action of the spring 33 is to normally hold the die support 21

raised and, as a consequence of the co-action of the stop pin 31 and slot 30, this spring will also hold the plunger 23 and its die 25 raised.

Extending downward from the sleeve 20 is a series of pins 35 which are so positioned as to pass through openings 36 in the die 22 and engage the upper surface of the ring 26 when the latter is raised. These pins thus substitute limit stops for the ring 26 and through the co-action of this ring and the die 25 also aid in limiting the upward movement of the die 25.

Above the dies is arranged a pair of levers 37 and 38 pivotally connected to the support 10. One of these levers is arranged to engage the top of the plunger 23, a projection 39 being provided on the lever for that purpose. The other lever 37 has a projection 40 which is arranged to engage, when the lever is depressed, a flange 41 formed on the top of the die support 21.

On the die 12 are arranged positioning pins 42 and beneath said die is a heater ring 43 in the form of an ordinary gas ring so that the die 12 is at all times kept hot.

For the purpose of illustrating the action of the device a can end or top T has been shown in position in the die.

In the operation of the device the parts start in the position shown in Figure 1. When the parts are in this position the operator takes a disk of the material from which the can top is to be made and places the same, while still in its plastic state, on the female die against the positioning pins 42. The lever 38 is then depressed and this forces the plunger 23 downward. The die 25 enters the recess 13 and bends the central portion of the disk downward to form a "bumped" center for the closure. At the same time the pin 31 causes the die support 21 with its die 22 to move downward but it is to be noted that in the position of Figure 1 the die 22 is raised above the die 25. Consequently in this stage of the operation the peripheral portion of the disk T is not acted upon. After the die 25 has reached the lowermost position the lever 37 is then depressed. This causes downward movement of the die support 21 with its annular die 22. Consequently the peripheral portion of the disk T is bent downward as clearly shown in the figures, the rib between the recess 18 and recess 13 forming a channel around the center of the disk. The parts will then be in the position shown in Figure 2. The operator then releases the lever and the spring 29 draws the dies 25 and 22 upward. In the first part of the operation the stripper plate 15 forces the formed disk, which has been held in the dies until the heat from the burner 43 has dried it sufficiently to attain the form, out of the recess 13. At this time the top T will be engaged on the die 25. As further upward movement takes place the ring stripper 26 engages the pins 35 and is held against upward movement while at the same time the die 25 continues to move upwardly. This forces the formed top off of the die 25. It is then removed by the operator and a fresh disk put in position.

There has thus been provided a simple and efficient device of the kind described and for the purpose specified.

It is obvious that minor changes may be made in the form and construction of the invention without departing from the material principles thereof. It is not therefore desired to confine the invention to the exact form therein shown and described, but it is wished to include all such as properly come within the scope claimed.

Having thus described the invention, what is claimed as new, is:—

1. In a device of the kind described, a hollow die support having longitudinal slot in one side, a die carrying plunger slidable in said support and having a pin projecting into said slot, dies on the support and plunger, yieldable means normally holding the support and plunger out of operation with the pin in the lower end of the slot, means to engage the plunger and move the same against the action of the yieldable means whereby said pin will cause similar movement of the hollow die support, and means to engage said support to continue movement thereof after the plunger ceases to move.

2. In a device of the kind described, a hollow die support having longitudinal slot in one side, a die carrying plunger slidable in said support and having a pin projecting into said slot, dies on the support and plunger, yieldable means normally holding the support and plunger out of operation with the pin in the lower end of the slot, means to engage the plunger and move the same against the action of the yieldable means whereby said pin will cause similar movement of the hollow die support, means to engage said support to continue movement thereof after the plunger ceases to move, a clamp and stripper ring mounted between the dies, and movable with respect to said dies in a direction longitudinally of the support and plunger, and means to limit movement of said clamp ring.

3. In a die press for forming tops for paper containers, a guide sleeve, a die supporting sleeve slidable therein and having a slot extending longitudinally of one side, a plunger slidable within the last sleeve and carrying a pin projecting into the slot, an annular die carried by the second sleeve, a male die carried by the plunger and having its periphery in spaced relation to the inside of the annular die, a clamp and stripper ring

arranged in the space between said dies and having a flange engaging the male die to limit downward movement of the ring, a female die having a central recess for the second die and an annular channel for the first mentioned die, the wall between said recess and channel being opposed to the clamp and stripper ring, and limit pins fixed to the first sleeve and projecting through the annular die to engage the ring.

In testimony whereof I affix my signature.

FREDERICK COATES.