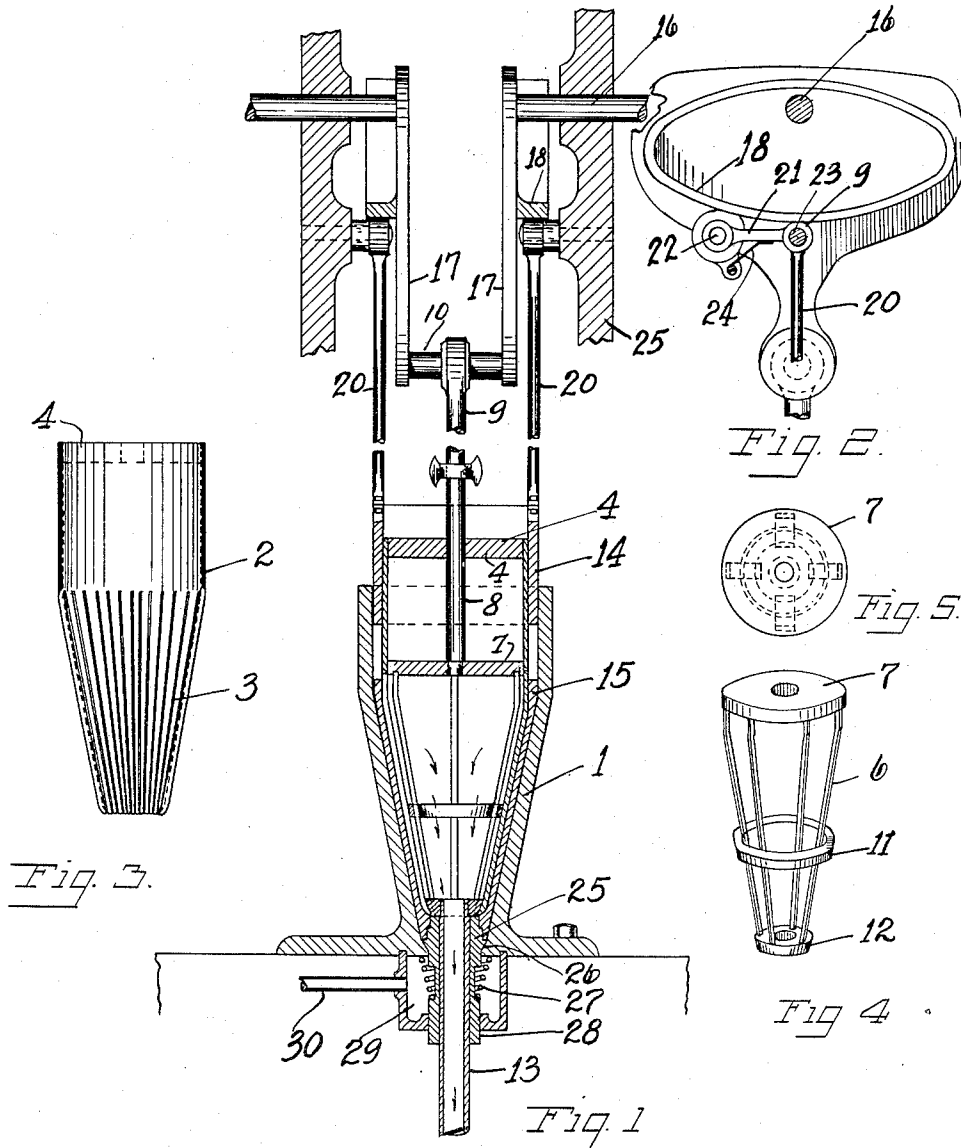


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MACHINE FOR MAKING HOLLOW WARE FROM PULP.
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1,368,217.

Patented Feb. 8, 1921.



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JACKSON B. YOUNG, OF OAKLAND, CALIFORNIA.

MACHINE FOR MAKING HOLLOW WARE FROM PULP.

1,368,217.

Specification of Letters Patent.

Patented Feb. 8, 1921.

Application filed November 1, 1919. Serial No. 334,926.

To all whom it may concern:

Be it known that I, JACKSON B. YOUNG, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented certain new and useful Improvements in Machines for Making Hollow Ware from Pulp, of which the following is a specification.

One of the principal objects of the invention is to provide for a machine for making hollow ware from pulp, a shell containing rigid or stationary fingers for pressing the material against the wall of the outer mold. This rigid finger shell is a simple and efficient one, permitting water free access through it at all times.

Another object of the invention is the provision of a skeleton framework for supporting the rigid finger shell. There is no danger of this framework being clogged up, since the water has a free passage through it at all times.

Other important and incidental objects will be brought out in the following specification, and particularly set forth in the subjoined claims.

Referring to the accompanying drawings, Figure 1 is an elevational view, partly in section, of my improved machine for making hollow ware from pulp. Fig. 2 is a side elevational view of the cam and follower mechanism for the compression sleeve. Fig. 3 is a side elevational view of the shell having the rigid fingers. Fig. 4 is a perspective view of the skeleton frame for supporting the latter shell. And Fig. 5 is a top plan view of said skeleton frame.

Throughout the specification and drawings similar reference characters denote corresponding parts.

Referring to the accompanying drawings, the numeral 1 designates an outer mold which has the tapering shape of an inverted truncated cone. The numeral 2 designates the inner mold which comprises a series of rigid or stationary fingers 3 that project downwardly from a head 4 in the form of an inverted truncated cone. These rigid fingers are disposed a sufficient distance apart for the drainage of the excluded water surplus from the material. This water enters a skeleton framework 6 also of the shape of an inverted truncated cone, and having a ring top 7 that is firmly secured within the hollow head portion 4 of the inner mold.

For carrying and operating the inner mold, an axis rod 8 is provided, said rod projecting from the head portion of said inner mold upwardly to a point where it is pivotally connected by a connecting rod 9 to a double crank 10. By the latter the inner mold is forced into the outer one, to compress the material in the intervening mold space, as described in my former Patent No. 1,244,820 granted October 30th, 1917. The water which is excluded from said material is afforded a free outlet through the stationary fingers 3, into the open framework 6, whence it passes downwardly through the open ring partitions 11 and 12 of the latter, into a water outlet tube 13. The course of this excluded water is delineated by the arrows in Fig. 1, and since it passes downwardly through the open framework 6, there is no danger of clogging up its outlet passage as is often the case where a perforated tube is used instead of said framework. The rigid fingers 3 not only permit the excluded surplus water a free passage into the open framework 6, but allow the cleaning water to spread through them to dislodge any particles of adhering material. They also act as a sieve to admit air to break the more or less intimate contact of the fingers and the molded product.

For the purpose of subjecting the pulp that forms the bottom portion of the bottle, or its upper portion as it is held in the mold, to the same pressure as the lower part, the following means are provided. Surrounding the upper portion of the inner mold 2 is a ring sleeve 14 which is started down into engagement with the top portion of the pulp after the inner mold begins to descend into the outer one, by the following device. Referring to Figs. 1 and 2, the numeral 16 designates the crank shaft for the crank 10. Each web portion 17 of the latter is preferably bulb shaped in cross section, so that there may be firmly secured thereto an elliptic cam 18 with whose circumference a follower 9 carried by the upper end of a compression rod 20, is in engagement. The upper end of each compression rod 20 is pivotally secured to a crank arm 21 on a shaft 22, by a pin 23, while the lower end of each rod is pivotally secured to said sleeve 14. The follower 23 is always held in engagement with the cam 18 by a spring 24, one end of which is secured to

the frame 25 in which the shaft 22 is journaled, while its other end exerts an upward pressure on the rocker arm 21. Any other means for accomplishing this purpose, may be employed if desired.

In operation, as the inner mold 2 begins to descend into the outer mold 1, the cam 18 on each web portion of the crank 10 will begin to assume a position to press upon the follower 19; and after the mold is well on its downward movement, the curved surface of the cam, will gradually force the follower downwardly to press the ring sleeve 14 against the upper portion of the pulp 15. In other words, the inner mold is the first to go down, being followed by the ring sleeve 14 which some time thereafter is pressed against the top portion of the pulp by the compression rods 20 carrying the followers 19. The sleeve 14, which is the last to go down, is also the last to ascend after the bottle is formed, since the crank 10 must make a substantial movement before the surface of the cam permits an upward movement to its respective compression rod upon which an upward pressure is continually exerted by the spring 24. It is therefore possible by these means to form the bottom portion of the bottle as perfectly as its middle and upper part.

For the purpose of assisting in removing the pulp after being formed into a bottle, compressed air is admitted to the lower portion of the mold 1 past a puppet valve 25 which is pressed against a seat 26 in the lower end of said mold, by a spring 27 that surrounds the stem of said valve between its lower protuberant portion 28 and the bottom of said mold. Now when the inner mold is elevated after the forming operation, compressed air is admitted to a chamber 29 surrounding the stem of the valve, through an inlet tube 30, the force of this air being sufficient to raise the valve from its seat against the tension of the spring 27. The air is then afforded entrance to the lower portion of the mold 1 to contribute its pressure for the purpose of assisting in the operation of removing the formed bottle from said mold. (See Fig. 1.)

Having described my invention, I claim:

1. A device of the type described comprising a tapered outer mold, and a tapered inner mold movable into and out of the outer mold, and formed of a circumferential series of rigid fingers.

2. A device of the type described comprising a tapered outer mold; a tapered inner mold movable into and out of the outer mold and composed of a circumferential series of fingers, and a skeleton frame within said inner mold, for draining the water excluded between said fingers from the pulp.

3. A device of the type described comprising a tapered outer mold, a tapered in-

ner mold movable into and out of the outer mold and composed of a circumferential series of fingers, a skeleton frame within said inner mold, and ring partitions within said frame through which the water excluded between said fingers from the pulp, may freely drain.

4. A device of the type described comprising a tapered outer mold, a tapered inner mold movable into and out of the outer mold and composed of a circumferential series of fingers, a tapered skeleton frame within said inner mold, an outlet tube in communication with the lower end of said frame, and ring partitions within said frame through which the water excluded between the fingers from the pulp, may freely drain into the outlet tube.

5. A device of the type described comprising a tapered outer mold, a tapered inner mold movable into and out of the outer mold and composed of a circumferential series of fingers, and a valve in the bottom of the outer mold, adapted to admit compressed air thereto for the purpose specified.

6. A device of the type described, comprising a tapered outer mold, a tapered inner mold movable into and out of the outer mold and composed of a circumferential series of fingers, a puppet valve normally seated in the open lower end of the outer mold, and a spring against whose tension said valve is adapted to be raised by compressed air, to admit the latter to the space between the inner and outer molds for the purpose specified.

7. A device of the type described, comprising a tapered outer mold, a tapered inner mold, means for forcing the latter into and out of the outer mold to compress the material in the intervening mold space, and means controlled by said forcing means to press down upon the top portion of said material for the purpose specified.

8. A device of the type described, comprising a tapered outer mold, a tapered inner mold, a crank for moving the latter into and out of the outer mold to compress the material in the intervening mold space, a cam carried by said crank, and means adapted to be pressed by the cam, upon the top portion of the material in the intervening mold space, for the purpose specified.

9. A device of the type described, comprising a tapered outer mold, a tapered inner mold, a crank for moving the latter into and out of the outer mold to compress the material in the intervening mold space, a sleeve surrounding the top portion of the inner mold and adapted to press upon the top portion of the material in the intervening mold space, and means connected to said crank for forcing the sleeve against said material after the inner mold has descended

into the outer one, and for withdrawing said inner mold before said sleeve is raised above said material.

5 10. A device of the type described, comprising a tapered outer mold, a tapered inner mold, a crank for moving the latter into and out of the outer mold to compress the material in the intervening mold space, a sleeve surrounding the top portion of the
10 inner mold and adapted to press upon the top portion of the material in the intervening mold space, a connecting rod secured to the top portion of said sleeve, a follower

carried by the upper end of said connecting rod, and an elliptical cam carried by said 15 crank for engaging said follower to force the sleeve into contact with the top portion of said material, after the inner mold has descended well into the outer mold.

In testimony whereof I have hereunto set 20 my hand this 25th day of October, 1919.

JACKSON B. YOUNG.

Witnesses:

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