(No Model.) 2 Sheets—Sheet 1.

G. D. KING.

PULP MOLDING MACHINE.

No. 459,174. Patented Sept. 8, 1891.

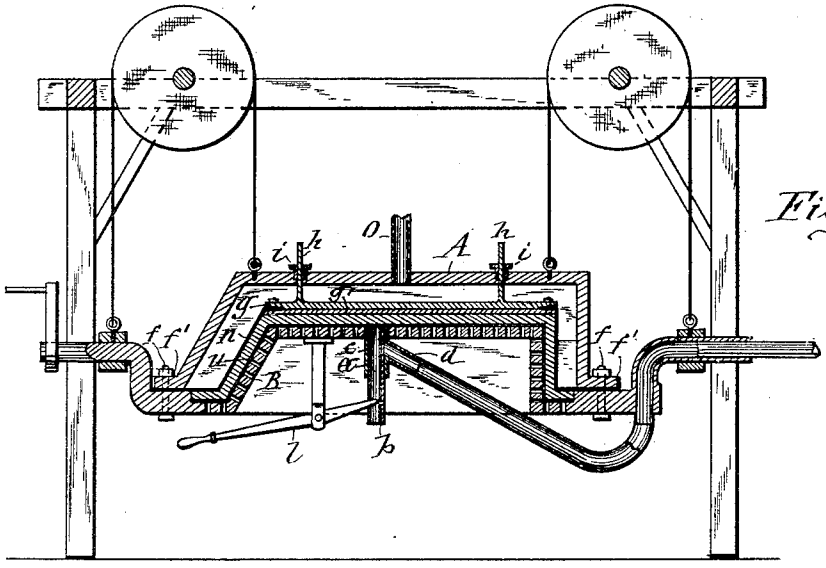


Fig. 1

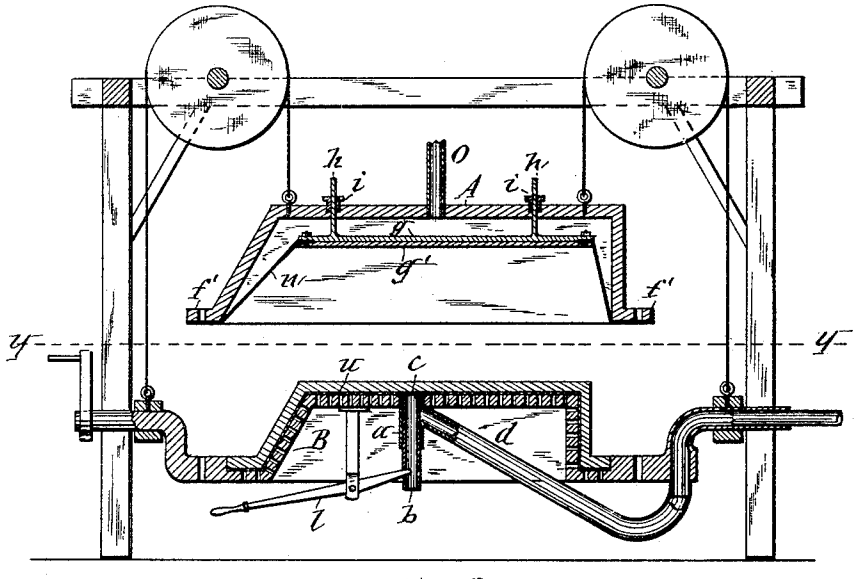


Fig. 2

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By his Attorneys
Dodd, Laasez & Dodd

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

G. D. KING.

PULP MOLDING MACHINE.

No. 459,174. Patented Sept. 8, 1891.

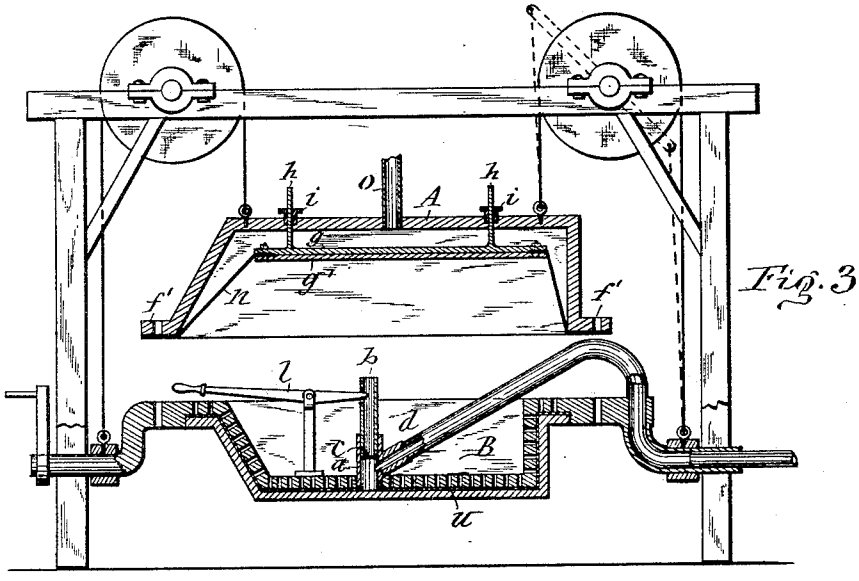


Fig. 3

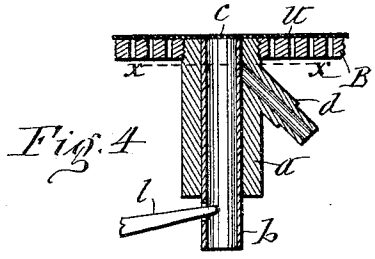


Fig. 4

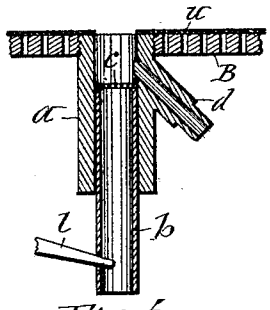


Fig. 5

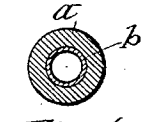


Fig. 6

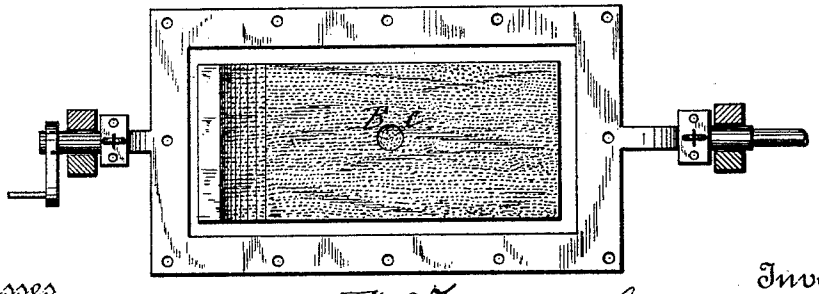


Fig. 7

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UNITED STATES PATENT OFFICE.

GEORGE D. KING, OF OSWEGO, NEW YORK.

PULP-MOLDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 459,174, dated September 8, 1891.

Original application filed April 22, 1889, Serial No. 308,168. Divided and this application filed February 24, 1891. Serial No. 382,452. (No model.)

To all whom it may concern:

Be it known that I, GEORGE D. KING, of Oswego, in the county of Oswego, in the State of New York, have invented new and useful Improvements in Pulp-Molding Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to the class of pulp-molding machines in which a pervious or foraminated male die enters a solid female die or mold, which latter is provided with a piston connected to the base of said die by an expansible rubber bag surrounding the male die when in operation. The pulp being introduced between the male die and the aforesaid rubber bag and piston and subjected to pressure of water admitted between the female die and rubber bag expresses the liquid from the pulp deposited on the male die and presses the pulp into shape, the expressed liquid escaping through the perforations of the male die.

Heretofore it has been customary to connect the pulp-induction pipe to the piston of the female die, or arranged in such a manner as to deposit the pulp upon the male die from a point above the same. This arrangement has proved to be defective in its operation, in that the inflowing pulp drove the pulp away from the top of the male die, and therefore the layer of pulp on top of said die was liable to be too thin and not sufficiently compact.

This application is a division of my application, Serial No. 308,168, filed April 22, 1889.

The chief object of this invention is to obviate the aforesaid defect; and to that end the invention consists in the attachment of the pulp-induction pipe to the male die and in the arrangement of a valve which controls the flow of pulp and when closed forms a part of said die, all as hereinafter more fully described, and specifically set forth in the claims.

In the annexed drawings, Figure 1 is a vertical longitudinal section of a machine for forming bath-tubs and showing the same with the formed article between the dies or molds. Fig. 2 shows the same with the dies or molds separated from each other. Fig. 3 shows the same with the male die inverted preparatory to removing the molded article from the die. Figs. 4 and 5 are detached enlarged longitudinal sectional views of the pulp-induction pipe and conduit connected therewith and the valve by which the induction-pipe is closed. Fig. 6 is a detached enlarged transverse section on line $x\,x$, Fig. 4; and Fig. 7 is a horizontal transverse section on line $y\,y$, Fig. 2.

Similar letters of reference indicate corresponding parts.

A denotes the hollow mold or female die, and B the male die, designed for forming bath-tubs. These dies are shown arranged to be separated from each other in the same manner as described and shown in my prior application for patent, Serial No. 308,168, filed April 22, 1889; but in this present case my invention is not limited to any specific arrangement of the aforesaid feature. The male die B is foraminous in the usual manner and covered with perforated sheet-brass or other suitable material, as shown at u, to allow free escape of the liquid from the pulp subjected to pressure between the two dies. By means of bolts $f\,f$ passing through a flange f' on the base of the female die and through a horizontal projection or flange on the base of the male die said dies are fastened to each other during the process of compressing the pulp into form.

In the female die is arranged the piston g, consisting of a stout metallic plate of the shape of the bottom of the bath-tub or article to be formed. Said piston is guided by stems $h\,h$, projecting vertically from the top of the piston and through stuffing-boxes $i\,i$ on the top portion of the female die.

n denotes the rubber bag, which is usually employed in connection with the piston and dies in this class of machines. Said rubber bag is attached at its upper edge between the marginal portions of the under side of the piston g and a plate g', fastened to said side of the piston, and the lower edge of the rubber bag is fastened to the flanges of the die A.

O denotes a pipe through which to introduce water under pressure between the piston g and female die, said pipe tapping the die, preferably, near the center of its top, as shown.

a is the pulp-induction pipe, which I connect stationary to the lower or male die at or near the center of the raised portion thereof for the purpose of distributing the pulp as uniformly and as quickly as possible, which is especially essential in the process of molding large articles. The distribution of the pulp over the die is further facilitated and accelerated by the delivery of the pulp direct from the end of the pipe. This induction-pipe is preferably, but not arbitrarily, at right angles to the part of the die to which it is attached; but in every case the discharge end is to be permanently flush with the inner side of the die. In said pipe is arranged a valve *b*, preferably of the form of a tubular plunger, across the upper end of which is secured a perforated brass plate or other suitable strainer *c* to allow drainage through the plunger and prevent loss of pulp.

l is a lever by which to operate the plunger *b*. The pulp is introduced under pressure into the induction-pipe *a* by a branch pipe *d*, tapping the pipe *a* at its side and at a point to allow the plunger *b* to be moved outward past the intersection of the said two pipes, and thus allow the pulp to pass into the pipe *a* in advance of the plunger. The plunger has a stroke to carry the head thereof flush with the inner side of the die, and thus form by the strainer *c* a part of the die when said plunger or valve is in its closed position, as shown in Fig. 4 of the drawings.

I do not herein claim the combination of the male and female dies, supports for said dies, and pivotal connections between the male die and its supports, whereby said die is adapted to swing in a vertical plane. Neither do I claim in this present application the combination, with the dies arranged as aforesaid, of the pulleys and cables or chains supporting the dies, inasmuch as said combinations of elements are embodied in my prior application for patent, Serial No. 308,168, filed April 22, 1889, of which this is a division.

What I claim is—

1. In a pulp-molding machine, the combination of a pervious die on the surface of which the pulp is deposited, a pulp-induction pipe for admitting pulp through said die, and a valve connected to said induction-pipe to control the flow of pulp and having a pervious surface which when said valve is closed forms a portion of said die.

2. In combination with the male and female dies, the pulp-induction pipe attached to the male die and having its discharge end flush with the inner side of the said die, and a tubular valve in said induction-pipe and provided with a strainer across the end adjacent to the male die, substantially as described.

3. In combination with the inverted female die and male die, the pulp-induction pipe *a*, connected to the center of the male die, the tubular valve *b* in said pipe, the strainer *c* on the head of the valve, the lever *l* for operating the valve, and the pulp-conduit *d*, tapping the side of the pipe *a*, substantially as described.

In testimony whereof I have hereunto signed my name this 3d day of October, 1890.

GEORGE D. KING. [L. S.]

Witnesses:
MARK W. DEWEY,
H. M. SEAMANS.