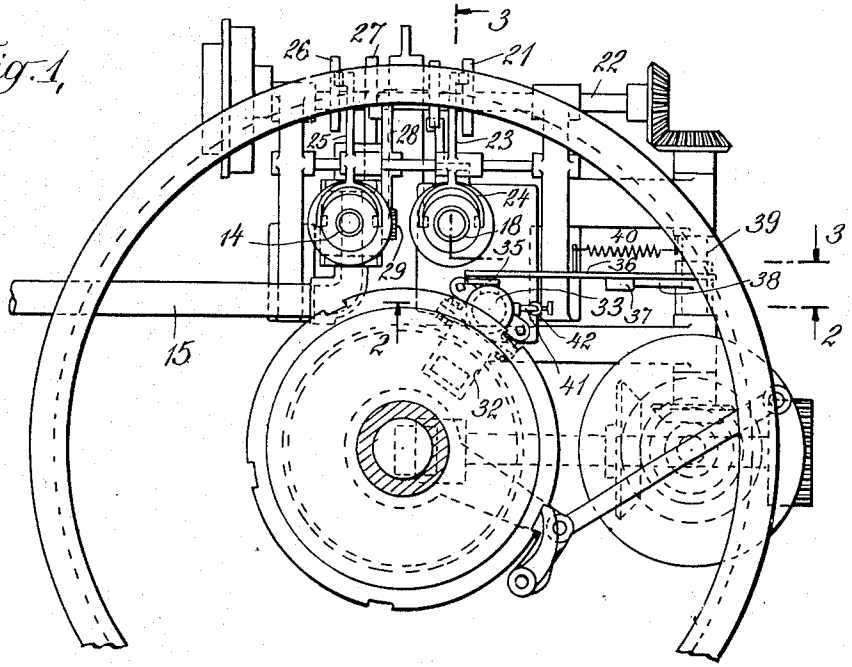
Feb. 24. 1925. **1,527,202**

F. LOUISOT

METHOD AND APPARATUS FOR MANUFACTURING ARTICLES FROM PULP WITH VARYING DEGREES OF SUCTION

Original Filed Oct. 8, 1920 2 Sheets-Sheet 1

Fig. 1.



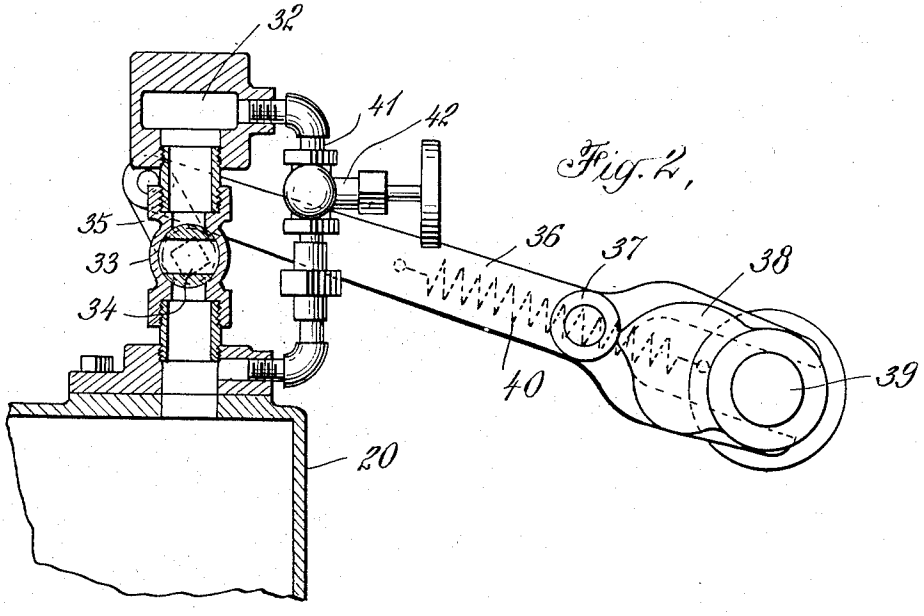




Fig. 2.

Inventor

Felix Louisot

By his Attorney

O. D. Scherer

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F. LOUISOT

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Fig. 3.

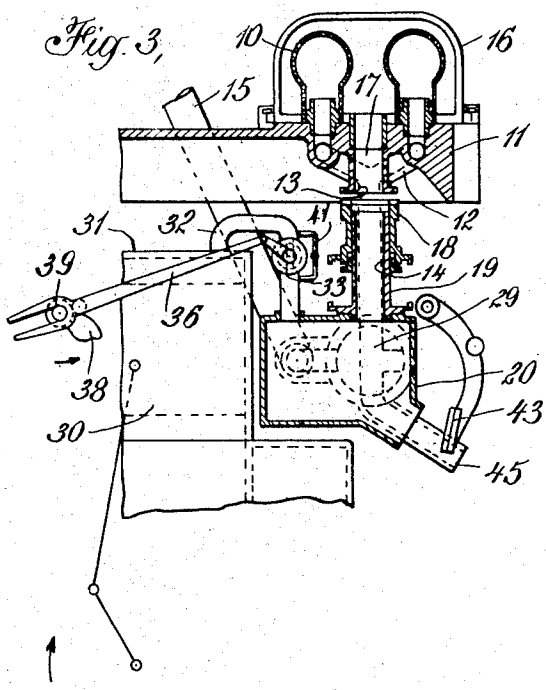



Fig. 4.

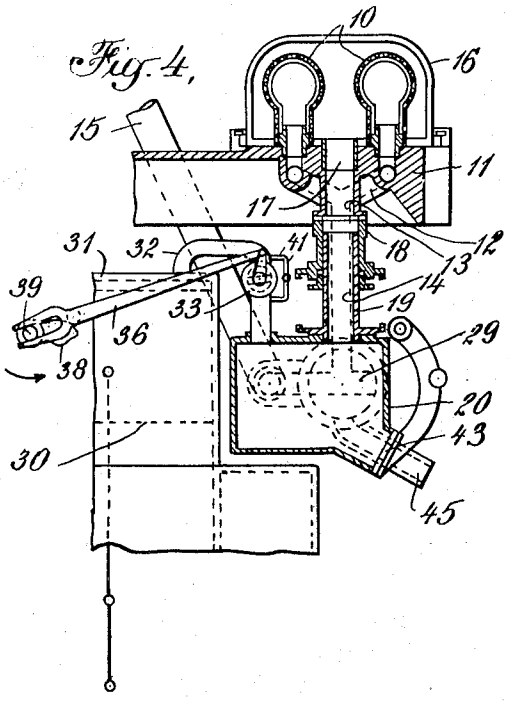



Fig. 5.

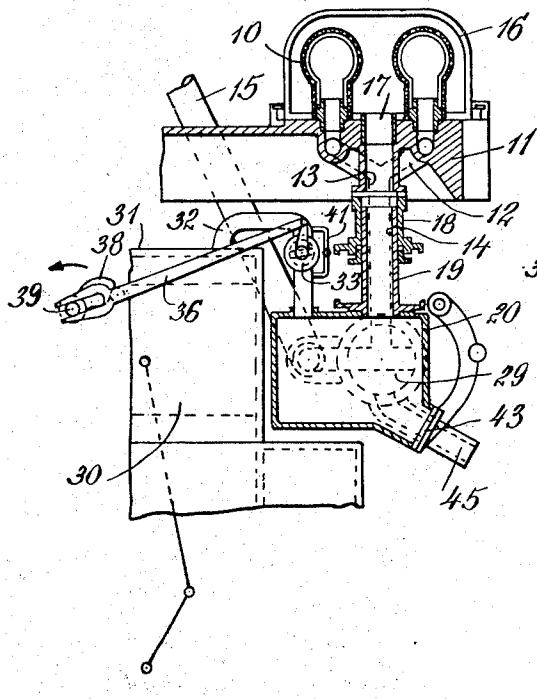
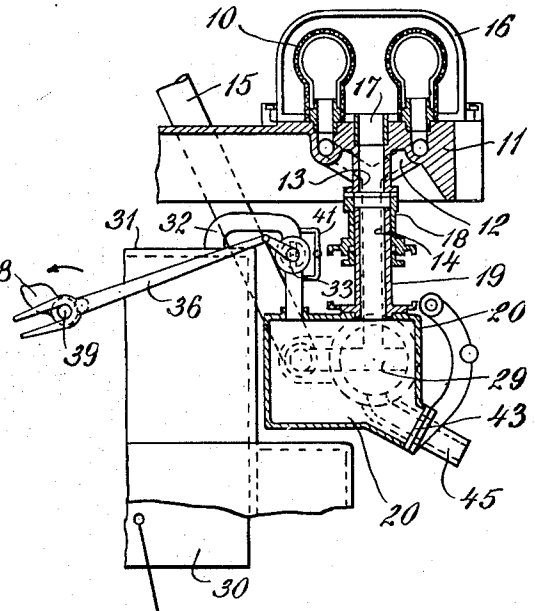



Fig. 6.




Inventor

Felix Louisot

By his Attorney

O. D. Scherr Jr

Patented Feb. 24, 1925. 1,527,202

# UNITED STATES PATENT OFFICE.

FELIX LOUISOT, OF NEW YORK, N. Y., ASSIGNOR TO VACUUM PULP PRODUCTS CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF VIRGINIA.

## METHOD AND APPARATUS FOR MANUFACTURING ARTICLES FROM PULP WITH VARYING DEGREES OF SUCTION.

Application filed October 8, 1920, Serial No. 415,653. Renewed July 17, 1924.

*To all whom it may concern:*

Be it known that I, FELIX LOUISOT, a citizen of the Republic of France, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Methods and Apparatus for Manufacturing Articles from Pulp with Varying Degrees of Suction, of which the following is a specification.

This invention relates to the manufacture of articles from liquid pulp mixtures.

In an earlier application of mine, Serial No. 258,187, filed October 15, 1918, I have disclosed a method and apparatus for the manufacture of pulp articles in which the articles are formed by suction applied to the outside of a perforate mold containing a liquid pulp mixture.

My present invention involves apparatus of a similar nature and has to do more particularly with the filling of the mold and the formation of the pulp deposit therein, the object of the invention being to produce a relatively compact uniform pulp deposit, forming a wall of the required thickness and strength and to accomplish this without entangling or forcing the fibers of the pulp into the mesh work of the perforate mold.

These objects I have attained by subjecting the mold first to a relatively light degree of suction adapted to produce a preliminary deposit of the pulp against the wall of the mold, and then materially increasing the suction so as to build up and apply a final deposit on the "shell" first formed.

Various other features of the invention will appear as the specification proceeds.

In the accompanying drawings, I have disclosed the invention as embodied in one of its simplest and most practical forms, but wish it understood that various modifications may be made in form and structure without departing from the true spirit and scope of the invention as hereinafter defined and claimed.

In the drawings referred to:

Figure 1 is a plan view of the present form of the invention as applied to the apparatus of my former application.

Figure 2 is an enlarged part sectional view of the intermittently operated suction controlling valve and the cam mechanism for actuating the same, this view being taken on substantially the plane of line 2—2 of Figure 1.

Figures 3, 4, 5 and 6 are broken sectional and more or less diagrammatic views, illustrating the operation and relation of the invention to the mold, the mold carrying turn-table in all these views appearing in section, and the parts being shown as lying in a single plane, as would be the case if taken on substantially the plane of lines 3—3 of Figure 1.

At 10 in Figures 3 to 6, I have indicated a pair of the perforate molds, mounted on the turn-table or rotating mold carrier 11 and connected by convergent branch passages 12 with a neck 13 with which there is engaged, in the rest periods of the turn-table, a coupling 14 from the mold supply conduit 15 (Figure 1).

The molds are constructed of suitable foraminous material, such as screening of the proper mesh and they are enclosed within chambers 16, which latter at the proper time are opened to enable removal of the molded products.

Suction is applied to the outside of the molds through a passage 17, opening into the chamber 16 and terminating at the lower end in a mouth arranged to be engaged by the coupling 18. This coupling is slidingly mounted on a neck 19 projecting upwardly from a tank or receptacle 20 and is operated, as in my former machine, by cam 21 on the cam shaft 22 (Figure 1), engaging the rock arm 23 which has a forked end 24 connected with the coupling. Similarly, the coupling sleeve 14 for the pulp supply is shown in Figure 1 as operated by a rock lever 25 actuated by a cam 26 on cam shaft 22.

Another cam 27 is shown provided on this same cam shaft for operating a rock lever 28 which operates the pulp supply valve 29, as in my former application.

The suction for forming the deposit in the mold is provided in this, as in my prior case, by means of a piston 30 operating in a pump cylinder 31 (Figures 3 to 6). This pump cylinder is connected by a suitable conduit 32 with the exhaust tank 20.

The suction is controlled in the present disclosure by mechanism interposed in this connection between the suction pump and

the exhaust chamber and shown in the form of a valve 33 having a rotatable valve plug 34 provided with a passage therethrough and operated by a crank arm 35 connected with a push link 36 carrying a roll 37 in engagement with a cam 38 on a secondary cam shaft 39. The cam link 36 is shown as acted on by a spring 40 to cause it to closely follow the movement of the actuating cam.

About the valve thus described, there is provided a by-pass 41 and the extent of flow through this by-pass is governed as by means of a hand valve, indicated at 42.

In considering the operation of the invention, reference should be had to Figures 3, 4, 5 and 6. In the first of these views, the parts are shown in the position they occupy when the turn-table is moving or has moved, to bring the molds into register with the pulp supply and suction conduit. During this table movement, the coupling sleeves are withdrawn, but as soon as the mold comes to rest, the sleeves are projected to couple the interior of the molds with the pulp conduit and the interior of the suction chamber with the exhaust tank. At this time, with the piston approaching its upper dead center, (Figure 4) the relief valve 43 of the exhaust tank is closed and the pulp valve 29, which is of the three-way type is turned to permit a gravity flow of the liquid pulp mixture from the supply conduit 15 up through the branch passages 12 into the molds. The suction controlling valve 33 at this time is closed and remains closed during the first part of the downward suction producing stroke of the piston 30 (Figure 5). The by-pass around the suction controlling valve is regulated to permit sufficient leakage about the valve to produce a modified or reduced suction on the outside of the molds, such suction it will be observed, being exerted through the by-pass, the exhaust tank 20 and the conduit 19, 18, 17 to the interior of the chamber containing the molds.

In this first stage of operations, the suction exerted on the outside of the perforate molds draws out the free liquid and lays the pulp fibers against the inner wall of the molds, producing a preliminary or formative deposit of pulp on the inner wall of the mold, the degree of suction being governed to prevent the fibers being drawn into the mesh of the mold. This reduced suction is maintained, in the construction illustrated, during the greater part of the suction producing stroke of the piston, so as to form a preliminary deposit of appreciable thickness.

As the suction producing piston nears the end of its stroke, the controlling valve 33 is suddenly opened, so as to cause the full suction to be exerted on the mold (see Figure 6). This increased suction produces a second or further deposit on the initially formed shell or deposit of pulp, in effect building up the first deposit and compacting the structure thereof.

Upon completion of the final deposit substantially at the bottom of the stroke of the piston, the pulp valve 29 is turned back into the position indicated in Figure 3, to cut off the supply of pulp and to drain the excess in the molds and the upright portion of the pipe conduit through a drain 45 into a so-called "back-wash" tank, the valve 43 of the water tank 20 is opened and the pulp and suction couplings are withdrawn to disconnect the mold and enable the table to be moved to carry the mold to the next station of the machine, where preparations are usually made for removing the molded product from the molds. During the return of the piston to the upper end of its stroke, the suction valve 33 may be allowed to stand open, as indicated in Figure 3, to cause the water tank to be thoroughly flushed in readiness for the succeeding cycle of operations.

It will be clear from the foregoing that with my invention, a preliminary or initial deposit of pulp is produced in the mold under conditions which will prevent the pulp from being forced into the mesh of the screen and that the necessary thickness of wall is obtained by subsequently building up a further deposit against this first or preliminary deposit, which forms in effect a guard to prevent the heavier suction from drawing the pulp into the screen.

What I claim is:

1. The improvement in the art of molding pulp articles which comprises filling a perforate mold with a liquid pulp mixture, applying first a relatively low and then a materially greater degree of suction to the outside of the mold to produce a pulp deposit on the interior of the mold and discontinuing the suction and draining the excess pulp away from the deposit.

2. In apparatus of the character described, a mold, suction producing means, a conduit from said suction producing means to the mold, a valve interposed in said conduit and a regulatable by-pass around said valve.

3. In apparatus of the character described, a mold, suction producing means, a conduit from said suction producing means to the mold, a valve interposed in said conduit, a regulatable by-pass around said valve and means for intermittently opening and closing the valve.

4. In apparatus of the character set forth, a mold, a pressure creating device connected with said mold, a valve interposed between said pressure creating device and the mold, means for automatically operating said valve and a by-pass around said valve.

5. In apparatus of the character set forth,

a mold, a pump cylinder, connections from said pump cylinder to the mold, a valve interposed in said connections, means for opening and closing said valve for each cycle of operations of the pump cylinder and a regulatable by-pass around said valve.

6. In pulp molding apparatus, a perforate mold, means for connecting the interior of the same with a supply of liquid pulp mixture, a suction producing pump, including a cylinder and a piston therein, connections from said cylinder to the outside of the perforate mold, a valve interposed in said connections, a by-pass around said valve and means for operating said valve to close the same at about the commencement of the suction producing stroke of the piston and to open the same at a later point in the suction producing stroke of the piston.

7. In pulp molding apparatus, a perforate mold, means for connecting the interior of the same with a supply of liquid pulp mixture, a suction producing pump, including a cylinder and a piston therein, connections from said cylinder to the outside of the perforate mold, a valve interposed in said connections, a by-pass around said valve, means for operating said valve to close the same at about the commencement of the suction producing stroke of the piston and to open the same at a later point in the suction producing stroke of the piston, said means including a cam driven in time with the piston and operating connections from said cam to the valve.

In testimony whereof I affix my signature.

FELIX LOUISOT.