April 2, 1929. M. P. CHAPLIN 1,707,429

METHOD OF AND APPARATUS FOR FORMING ARTICLES FROM PULP

Filed Feb. 7, 1927

Fig. 1,

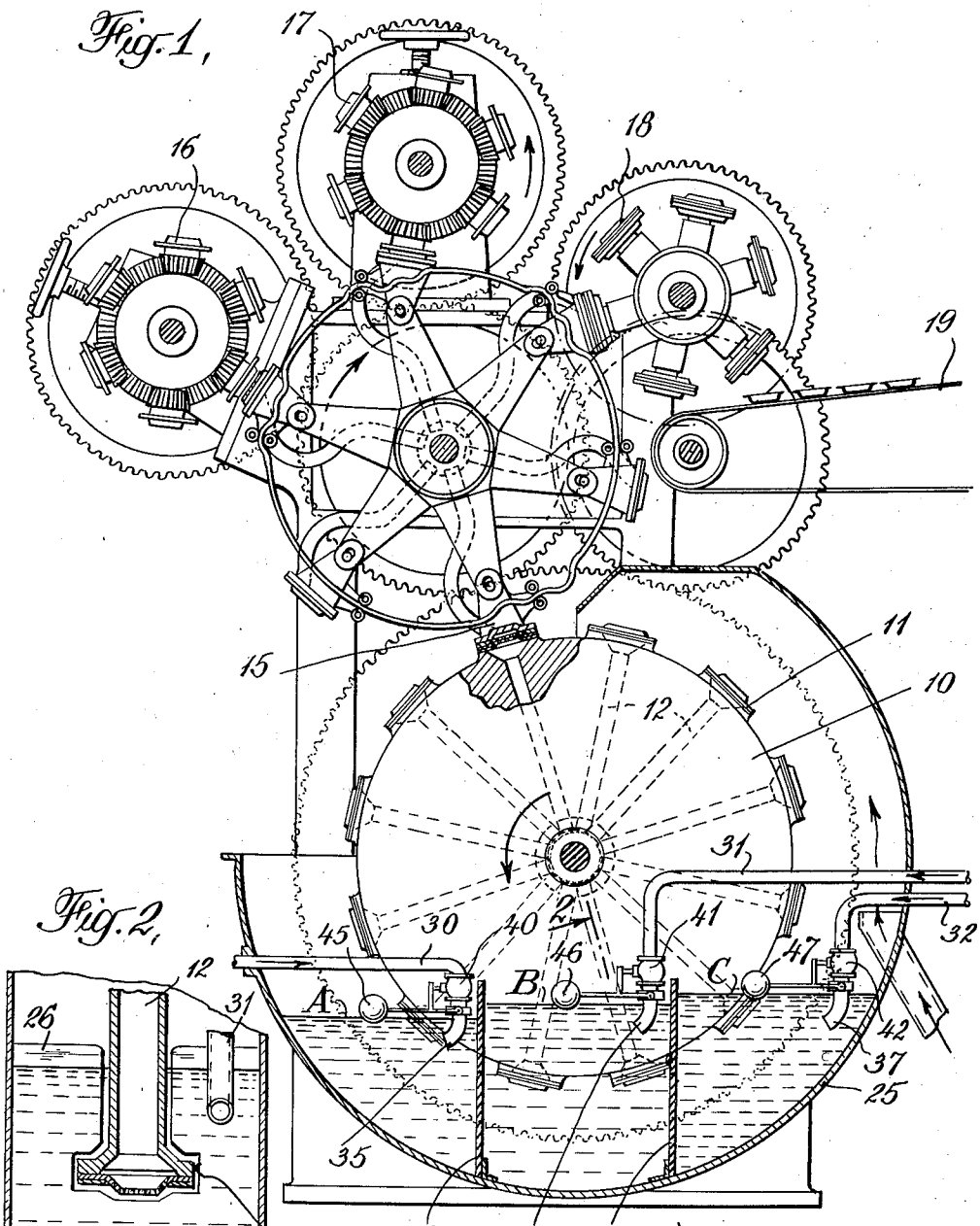


Fig. 2,

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UNITED STATES PATENT OFFICE.

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METHOD OF AND APPARATUS FOR FORMING ARTICLES FROM PULP.

Application filed February 7, 1927. Serial No. 166,363.

This invention relates to methods of and apparatus for forming or molding articles from pulp or like material.

It has been found desirable for various reasons to form pulp articles in several layers or interfelted laminations. For instance, fine grades of pulp can be combined with coarser and less expensive grades to produce articles that are inexpensive but attractive in appearance. Also, pulps of different colors and strengths can be combined.

This invention has for its salient object to provide a simple and practical method of and apparatus for forming a laminated, interfelted pulp article.

Another object of the invention is to provide a continuous process or method of forming interfelted, laminated molded articles.

Another object of the invention is to provide pulp forming and molding mechanism so constructed and arranged that an article of the character specified will be formed on the forming die upon a single continuous movement thereof.

Another object of the invention is to provide a vat for pulp molding machines so constructed and arranged that one travel of the dies through the vat will produce on the forming dies articles having a plurality of superposed and interfelted layers of material.

Further objects of the invention will appear from the following specification taken in connection with the drawings, which form a part of this application, and in which

Fig. 1 is a sectional elevation of a pulp molding machine constructed in accordance with the invention; and

Fig. 2 is a transverse sectional elevation taken substantially on line 2—2 of Fig. 1.

The invention briefly described consists of a method of forming laminated pulp articles by a single continuous movement of the forming die through a plurality of different solutions of material and the apparatus for carrying out the method consists of a vat or receptacle having a plurality of compartments separated by partitions having openings therein permitting the passage of the dies through the partitions. As the forming dies pass through the successive compartments in the vat, successive layers of pulp will be deposited thereon. Further details of the invention will appear from the following description.

The invention is adapted for use with any desired form of pulp molding apparatus or machine but in the form of the invention illustrated there is shown a rotatable carrier or wheel 10 having mounted on the periphery thereof a plurality of pulp forming dies 11. Each of the forming dies has connected thereto a conduit 12 which extends inwardly toward the axis of rotation of the carrier and communicates at its inner end with a suitable air and suction control mechanism so arranged that the forming die will be under suction during its travel through the vat and to the point of discharge of the molded articles on the compression dies. Any suitable form of control mechanism may be utilized such, for instance, as that shown in my copending application Serial No. 129,130 filed August 14, 1926.

In the particular embodiment of the invention shown, the pulp articles are discharged from the forming dies onto compression dies 15 and are acted on successively by finishing dies 16 and 17. The articles are then discharged by the compression dies onto transfer dies 18 from which they are discharged on an endless conveyor 19. This apparatus is fully described in the application referred to and forms no part of the present invention.

The gist of the invention consists in so constructing the vat or pulp receptacle 25 that as the forming dies 11 pass therethrough, a plurality of different layers of material will be superposed thereon. In order to accomplish this, the vat is formed with a plurality of compartments A, B and C. The compartments are separated by partitions or baffle plates 26 and 27 having openings 28 therein adapted to permit the rotation of the carrier therethrough, a slight clearance being provided.

Each compartment has a separate feed pipe, these pipes being designated as 30, 31 and 32. The pipe 31 has a discharge nozzle 35 and it will be noted that this nozzle is directed toward the left in Fig. 1 or in a direction opposite to the direction of rotation of the carrier and forming dies. By introducing the pulp through the nozzle 35 in the direction indicated, the tendency of the pulp in the compartment A to travel into the compartment B is counteracted.

Similarly, the discharge nozzle 36 of the pipe 31 is directed toward the left and this is also true of the nozzle 37 of pipe 32.

The discharge of pulp from the pipes 30, 31 and 32 is controlled by valves 40, 41 and 42 which in turn are controlled by floats 45, 46 and 47. It will be noted that the float 47 is so positioned that the level of the pulp in compartment C will be higher than the level in compartment B and the float 46 is so located that the level of the pulp in compartment B will be higher than the level in compartment A. In other words, the successive levels in the successive compartments are higher and this also counteracts the tendency of the pulp in compartment A to flow into the compartment B and of the pulp in compartment B to flow into compartment C due to the dies traveling from one compartment to another.

From the foregoing description it will be evident that as the forming dies pass through the successive compartments A, B and C, three different layers of material will be superposed thereon. Since the successive layers are superposed on each other during the progress of the forming dies through successive solutions and before any drying or pressing of the articles, the fibers of the layers or laminations are interfelted and intermatted to form an integral or unitary mass and there are no lines of demarkation or separation between the layers. If desired, the compartments A and C may receive one grade of pulp and the compartment B may receive another or cheaper grade of pulp. In this case, the article will have a plurality of interfelted layers of pulp. Any desired combination of pulps may be used.

From the foregoing specification it will be clear that a simple and practical method and apparatus has been provided for forming laminated, interfelted pulp articles.

Although one specific embodiment of the invention has been particularly shown and described, it will be understood that the invention is capable of modification and that changes in the construction and in the arrangement of the various cooperating parts may be made without departing from the spirit or scope of the invention, as expressed in the following claims.

What I claim is:

1. A continuous method of forming a series of interfelted, laminated pulp articles which consists in continuously and successively moving forming dies through a plurality of different solutions of material and depositing said materials in successive layers on said dies.

2. A continuous method of forming a series of interfelted, laminated pulp articles which consists in moving forming dies successively through a plurality of different solutions of material and depositing said materials in successive layers on said dies.

3. A continuous method of forming a series of interfelted, laminated pulp articles which consists in successively moving forming dies through a plurality of different solutions of material and depositing said materials in successive layers on said dies.

4. Apparatus of the character specified comprising a carrier, forming dies mounted thereon, a vat having a plurality of compartments, and partitions between said compartments having openings therein adapted to permit the passage of said forming dies therethrough.

5. Apparatus of the character specified comprising a carrier, forming dies mounted thereon, a vat having a plurality of compartments, and partitions between said compartments having openings therein adapted to permit the passage of said forming dies therethrough, and means for maintaining a higher level of solution in one compartment than in another compartment.

6. Apparatus of the character specified comprising a carrier, forming dies mounted thereon, a vat having a plurality of compartments, and partitions between said compartments having openings therein adapted to permit the passage of said forming dies therethrough, and means for maintaining successively higher levels of solution in the successive compartments through which the dies travel.

7. Apparatus of the character specified comprising a carrier, forming dies mounted thereon, a vat having different solutions therein, and a partition separating said solutions, said partition having an opening therein dimensioned to permit the passage of the forming dies therethrough.

8. Apparatus of the character specified comprising a carrier, forming dies mounted thereon, a vat having different solutions therein, a partition separating said solutions, said partition having an opening therein dimensioned to permit the passage of the forming dies therethrough, and means for maintaining a higher level of solution on one side of the partition than on the other side thereof.

9. Apparatus of the character specified comprising a carrier, forming dies mounted thereon, a vat having a plurality of compartments, partitions between said compartments having openings therein adapted to

permit the passage of said forming dies therethrough, and means for introducing into each compartment a solution for deposit on the dies, said means being constructed and arranged to introduce the solution in a direction opposite to the direction of travel of the dies through the compartment.

10. Apparatus of the character specified comprising a carrier, forming dies mounted thereon, a vat having a plurality of compartments, and a partition between said compartments having an opening therein adapted to permit the passage of said forming dies therethrough.

In witness whereof, I have hereunto set my hand this 3rd day of February, 1927.

MERLE P. CHAPLIN.