Aug. 26, 1924. 1,506,515

J. CORMIE

APPARATUS FOR THE MANUFACTURE OF PULP BOARDS

Filed Nov. 2, 1922

Fig. 1.

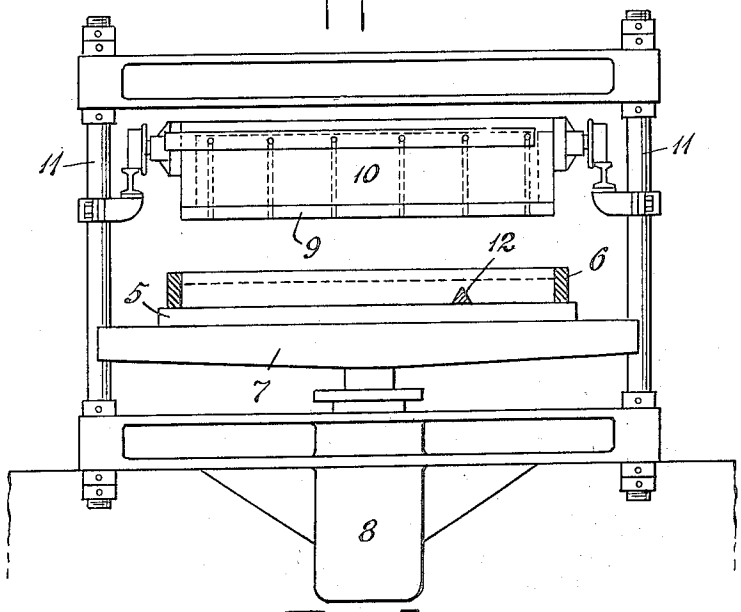


Fig. 2.

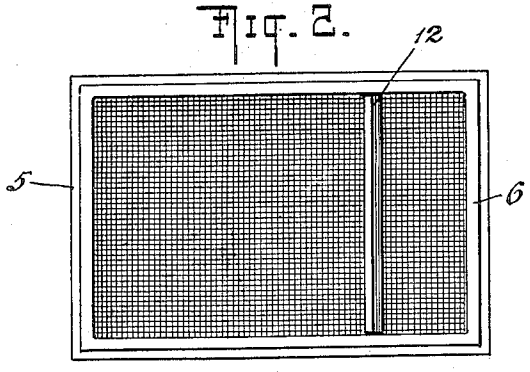
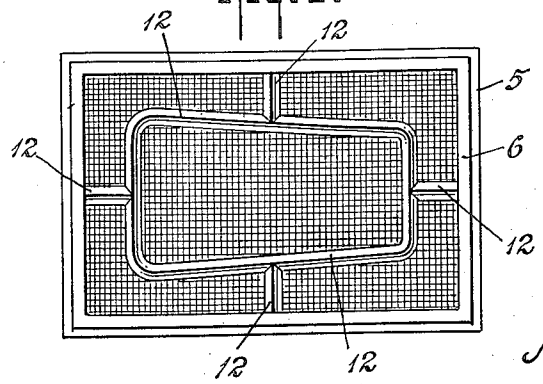


Fig. 3.



WITNESS

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR THE MANUFACTURE OF PULPBOARDS.

Application filed November 2, 1922. Serial No. 598,518.

To all whom it may concern:

Be it known that I, JOHN CORMIE, a citizen of England, and resident of the township of Ewing, county of Mercer and State of New Jersey, have invented certain new and useful Improvements in Apparatus for the Manufacture of Pulpboards, of which the following is a specification.

My invention relates to apparatus for the manufacture of pulp boards, and more particularly to that type thereof in which the pulp liquid is caused to flow into a suitable mold and then subjected therein to mechanical pressure and air suction to expel the liquid therefrom. In this type of apparatus the mold is of approximately the dimensions desired in the pulp board; in order to produce pulp boards of varying dimensions or of special configuration additional apparatus constructed for the purpose is required or otherwise the product of a larger apparatus is cut down to provide pulp board of the desired dimensions or shape. Obviously, the first method requires the installation of a large amount of machinery and thereby increases the cost of production while the second process, because of the fact that the board can be successfully trimmed or cut down only after the pulp has reached a stage in its production in which it may be handled and in which the trimmed-off portions represent so much waste, is also costly and furthermore is wasteful of material. The object of the present invention is to overcome these objections and disadvantages by providing means adapted to be removably incorporated in the mold whereby the pulp board in a given mold is weakened along lines corresponding to the reduced size or the predetermined configuration desired and upon which the pulp board may be broken when still in a condition to permit those parts thereof which are removed to be returned to the pulp supply and used. The invention will be described fully hereinafter and the features of novelty will be pointed out in the appended claims.

In the accompanying drawings, which illustrate an example of the invention without defining its limits, Figure 1 is an elevation of an apparatus, partly in section, with my improvement applied thereto; Fig. 2 is a plan view of the mold with my invention combined therewith, and Fig. 3 is a similar view showing another application of the invention.

The apparatus, in so far as its general construction and arrangement are concerned, may be of any suitable type and accordingly, as shown, may include a mold consisting of a bottom frame 5 (preferably provided with a false bottom of woven wire) and a deckle 6 suitably supported upon a platen 7 arranged to be raised and lowered in any convenient manner, as by means of a hydraulic press 8. The apparatus may further comprise an upper mold frame 9 fitted to a suction box 10 arranged to drain or suck away water and air, said suction box being suitably mounted upon the frame 11 of the apparatus in a manner to resist upward pressure and preferably so as to serve as a medium whereby the pulp board is removed from the apparatus; suitable provision may be made in any well-known way for introducing the liquid-containing pulp into the lower mold frame 5.

In manufacturing pulp board with an apparatus of the kind illustrated, the liquid-containing pulp is introduced in the desired amount into the lower mold frame 5, which is then raised by the press 8 into engagement with the upper mold frame 9 in which suction is maintained at this stage. In this way the pulp in the mold is simultaneously subjected to the mechanical pressure of the press 8 and the suction effect of the suction box 10, whereby liquid is extracted from the pulp. After this liquid has been expressed to the desired extent, the resulting pulp board, held upon the upper mold frame 9 by suction, is transferred from the apparatus and passed through the subsequent steps required to produce the desired board.

Obviously, the dimensions and configuration of the boards manufactured by the above apparatus are determined by the size and shape of the deckel 6. In order to produce pulp boards of dimensions or shape other than those for which the apparatus is primarily designed, I propose to provide the mold with means removably positioned therein whereby the pulp board, coincidentally with the expression of liquid therefrom, is weakened along lines corresponding to the dimensions or shape of the board it is desired to produce. Those sections of the

board located outwardly beyond these weakening lines are removed when the pulp board is taken from the above-described apparatus, and because of the fact that the condition of the pulp board at this stage makes it possible, the removed sections are returned to the pulp supply and used again, thereby avoiding any waste of material.

In the preferred form the weakening means referred to comprises strips 12 of suitable material and predetermined shape and of proper length to enable them to be set upon the bottom of the mold frame 5, either individually or in combination with other strips, in positions to define the lines along which it is desired to weaken the pulp board. The strips 12 may be of any suitable cross-sectional form and in the drawings are shown of triangular outline, with the apical edge projecting upwardly and the base resting upon the mold frame 5, to which, if desired, it may be temporarily secured by any suitable means. The height of said strips above the bottom of the mold is always less than the ultimate thickness reached by the pulp board in the mold. Thus, as the liquid-containing pulp is introduced into the mold frame 5, it will bury these strips, and as said pulp is progressively compressed and deprived of water, it will be, in part, forced to opposite sides of said strips and partly compacted above the same to form a cushion which prevents said strips from injuring the pressure-exerting medium and from themselves becoming damaged thereby. As a result of this the thickness of the pulp board along lines in registry with said strips is materially less than its thickness at other points, so that said board is weakened along the lines defined by said strips. This permits those sections of the pulp board which are located outwardly beyond the weakening lines to be readily broken away or otherwise removed as soon as the pulp board is taken from the apparatus; as the pulp board at this stage is still "broke" (that is to say, the fibrous ingredient thereof has not yet been chemically changed), although it is capable of being handled, these sections may be returned to the supply of pulp and used.

It will readily be seen that the waste represented by sections cut from finished pulp boards to reduce the dimensions thereof is entirely avoided, while at the same time an apparatus designed to produce pulp board of one size or shape may readily and easily be converted into an apparatus for manufacturing pulp boards of lesser dimensions and of different configuration. It will be understood that the strips 12 are in no sense partitions which divide the mold into separate chambers or close any part thereof against the entrance of the liquid-containing pulp; on the contrary, said strips serve simply to provide weakened lines in said pulp board along which it may readily be broken to produce a board of lesser dimensions or different configurations than the dimensions or configuration for which the particular mold is designed, this being accomplished at a stage when the broken-off sections of the board are still in a condition enabling them to be converted back into liquid-containing pulp and utilized in the manufacture of subsequent boards.

By making the strips 12 of a cross-section to provide active edges of relative fineness, breaking lines of maximum efficiency are secured and at the same time surfaces of minimum area are presented to the suction agency, whereby the possibility of said strips being affected by the suction is reduced to a minimum. The strips 12 may be set in any desired adjustment and relation in said mold and may be shifted about at will to locate the weakening lines in any predetermined relation to produce pulp boards of any size or configuration within the range of the apparatus. For instance, as shown in Fig. 3, said strips 12 may be located so as to define a predetermined outline or configuration which it is desired to have in the pulp board.

Various modifications may be made within the scope of the claims without departing from the nature of my invention.

I claim:

1. In apparatus for the manufacture of pulp boards, a mold adapted to receive liquid-containing pulp, means for expelling liquid from said pulp, and means removably positioned in said mold for weakening the pulp board therein coincidentally with the expression of the liquid, along predetermined lines without however severing the pulp board, to permit sections thereof to be subsequently readily removed and returned to the pulp supply, substantially as and for the purpose described.

2. In apparatus for the manufacture of pulp boards, a mold adapted to receive liquid-containing pulp, means for expelling liquid from said pulp, and members removably positioned upon the bottom of said mold for weakening the pulp board, coincidentally with the expression of liquid, along predetermined lines to permit sections thereof to be subsequently readily removed and returned to the pulp supply, said members extending above the bottom of said mold to an extent less than the ultimate thickness reached by the pulp board therein, whereby the latter is scored without however being completely severed; substantially as and for the purpose described.

3. In apparatus for the manufacture of pulp boards, a mold adapted to receive liquid-containing pulp, means for expelling liquid from said pulp, and triangular strips

removably positioned upon the bottom of said mold for weakening the pulp board, coincidentally with the expression of liquid, along predetermined lines to permit sections thereof to be subsequently readily removed and returned to the pulp supply, said triangular strips extending above the bottom of said mold to an extent less than the ultimate thickness reached by the pulp board therein whereby the latter is scored without however being completely severed, substantially as and for the purpose described.

In testimony whereof I have hereunto set my hand.

JOHN CORMIE.