No. 648,907. Patented May 8, 1900.

E. D. ALVORD.

MACHINE FOR FORMING LEATHER BOARD.

(Application filed Nov. 1, 1899.)

(No Model.) 3 Sheets—Sheet 1.

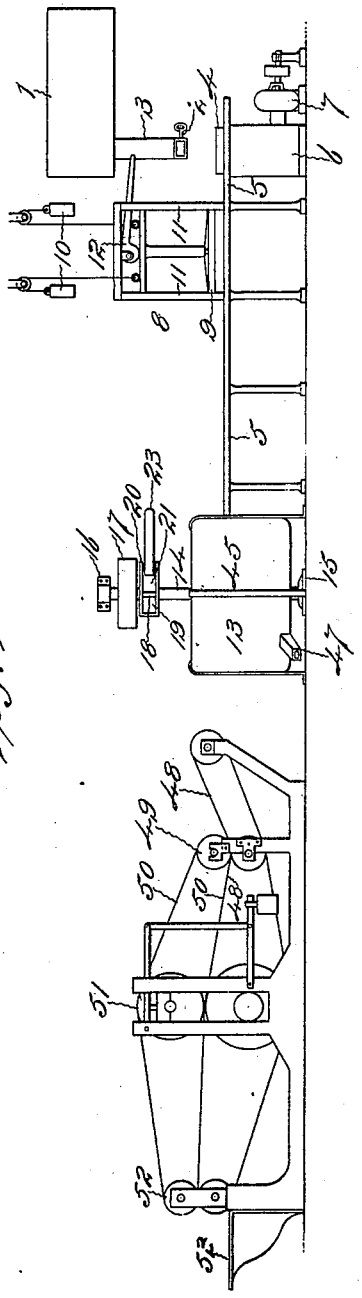

Fig. 1

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Fig. 5

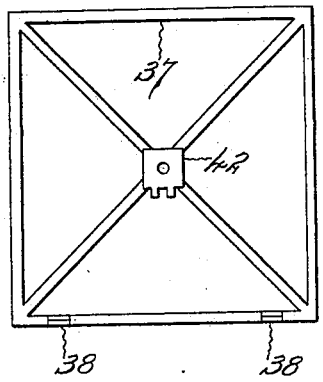


Fig. 2

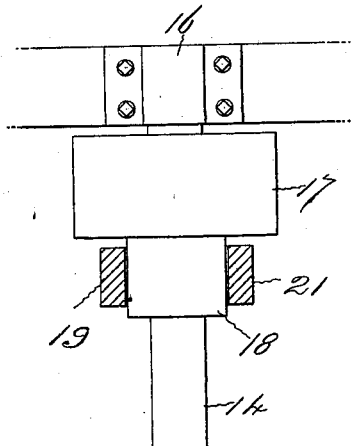
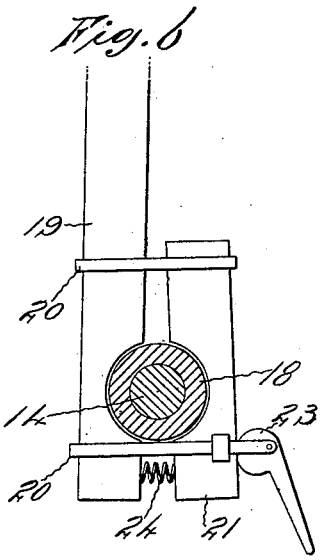
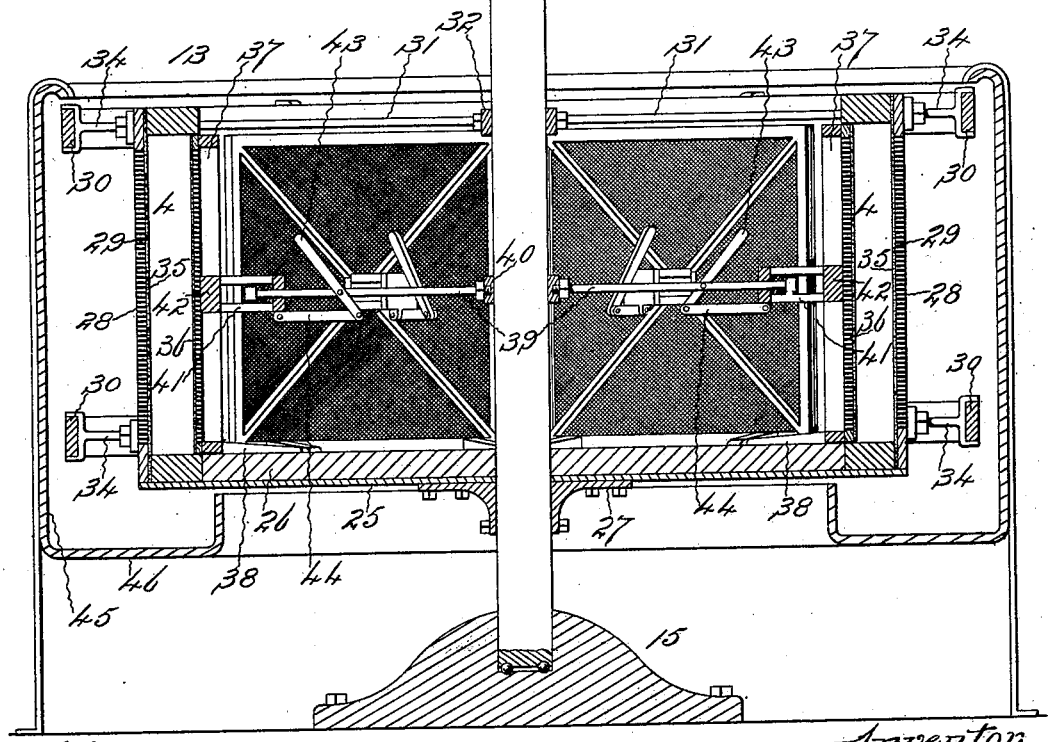


Fig. 6





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(No Model.) (Application filed Nov. 1, 1899.) 3 Sheets—Sheet 3.

Fig. 3

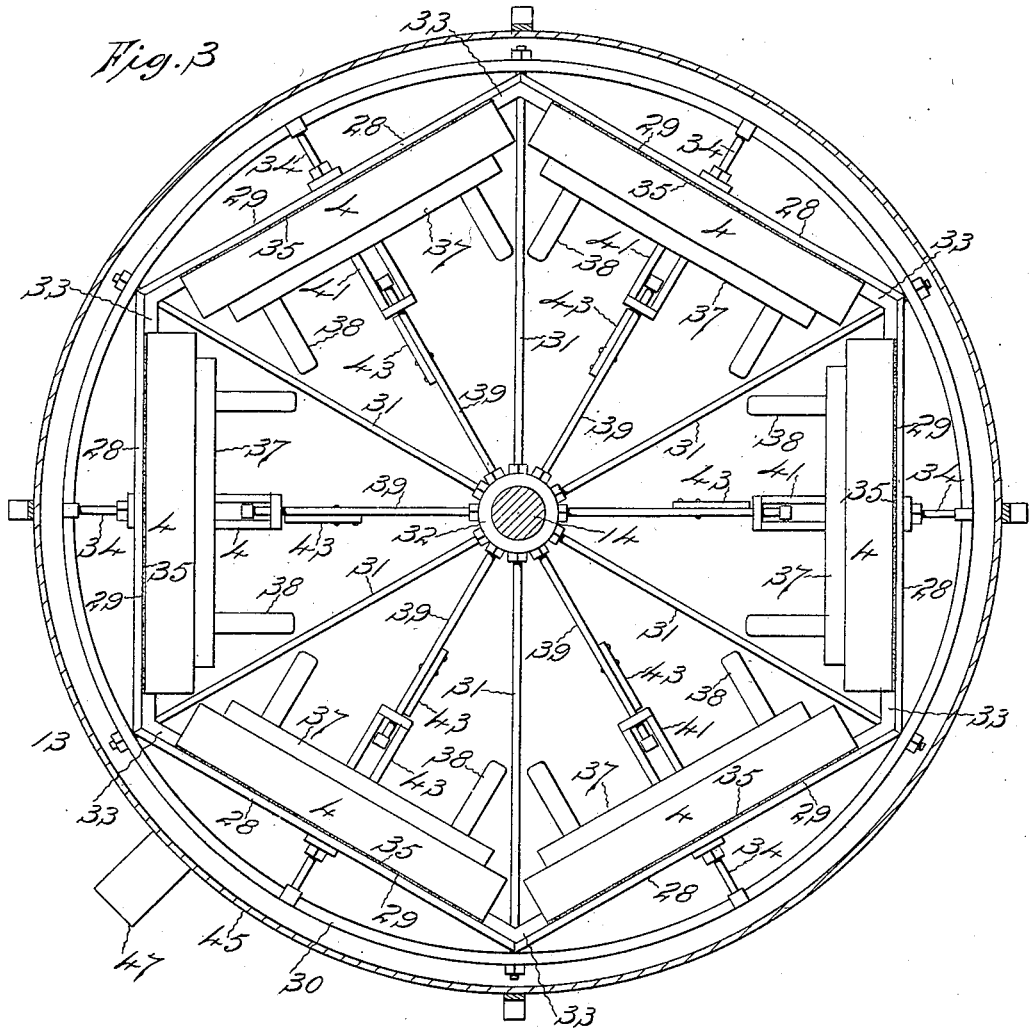
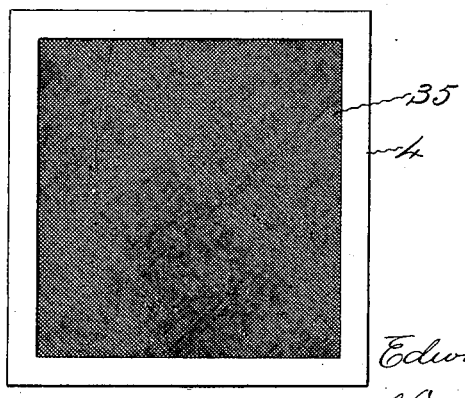


Fig. 4



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UNITED STATES PATENT OFFICE.

EDWIN D. ALVORD, OF TALCOTTVILLE, CONNECTICUT.

MACHINE FOR FORMING LEATHER-BOARD.

SPECIFICATION forming part of Letters Patent No. 648,907, dated May 8, 1900.

Application filed November 1, 1899. Serial No. 735,488. (No model.)

To all whom it may concern:

Be it known that I, EDWIN D. ALVORD, a citizen of the United States, residing at Talcottville, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Machines for Forming Leather-Board, of which the following is a specification.

This invention relates to a machine that is more particularly adapted for forming sheets of board from pulp composed entirely or partly of leather fiber.

The object of this invention is to provide a machine which will, in a simple and inexpensive manner, form solid and compact sheets of board of uniform thickness and density from heavy fiber that is liable to contain more or less oil and grease.

In the apparatus illustrated by the accompanying drawings as embodying the invention pulp properly mixed is allowed to flow from the stuff-reservoir through a spout onto a box having a perforated bottom which is located above a tank that may be exhausted by a rotary fan for hastening the escape of water from the fiber in the box. This box, with the fiber laid upon the perforated bottom, after the free water has been drained out and a cover put upon it, is placed beneath the platen of a press and more water expressed, after which the box is placed in a centrifugal machine, and by the rotary action of such a machine the remaining moisture is removed from the pulp. When the sheet thus formed has become sufficiently dry, it is placed upon the apron of a roller-press and subjected to the action of cylinders and then deposited upon a table.

Figure 1 of the views represents a side elevation of an apparatus for forming sheets of board as above outlined. Fig. 2 is a central vertical section, on a larger scale, of the centrifugal machine. Fig. 3 is a plan of the centrifugal machine. Fig. 4 is a plan of one of the pulp-boxes. Fig. 5 is a view of one of the weights employed in the centrifugal machine, and Fig. 6 is a detail view of the brake employed on the centrifugal machine.

The pulp, properly mixed, is run into the stuff-reservoir 1. From there it flows, when the valve 2 is open, through the spout 3 into a box 4 with a perforated bottom that is placed on the side rails 5 above a tank 6. This tank is made air-tight and connected with a fan 7, that when rotated will exhaust the tank and by suction assist the draining of water from the pulp and leave the fiber on the perforated bottom of the box. After the free water has been drained off and a cover placed on the pulp the box is moved along the side rails to the press 8. The platen 9, that is normally held raised by weights 10 and is guided in its movement up and down by the posts 11, is forced down upon the cover by a cam-lever 12. The bed of this press is perforated to permit the escape of water expressed from the pulp by the pressure of this platen. From this press the box is moved to a centrifugal machine 13, which is arranged for six of the boxes. The centrifugal machine has a vertical shaft 14, supported at its lower end by balls placed in a socket in the base 15 and supported at its upper end by a box 16, secured to a convenient timber. This shaft is provided with a driving-pulley 17 and a brake-pulley 18. Upon one side of the brake-pulley is a bar 19 and on the other side and loosely held by straps 20 is a block 21. The block and bar are arranged to be forced together by a cam-lever 23, so as to grip the brake-pulley and stop the rotation of the machine. A spring 24 is arranged to thrust the bar and block free from the brake-pulley, Figs. 2 and 6.

The bottom of the centrifugal machine is formed of a metal plate 25 and a wooden flooring 26, which flooring, however, does not extend quite to the outer edges of the plate. This bottom is supported by a flange 27, fastened to the shaft. Perforated plates 28 are supported by the outer edges of the floor-plate. In the form of machine illustrated there are six of these plates placed on edge, as shown in Fig. 3. Bands 30 surround the plates near the top and bottom, and tie-bolts 31 extend from a collar 32, fastened to the shaft through angle-pieces 33, the plates 28, also the bands 30 for holding the plates to-

gether. Truss-bolts 34 are placed between the plates and the bands for bracing the plates against outward strains, Figs. 2 and 3.

The perforated bottoms 35 of the six boxes 4 are preferably formed of several thicknesses of wire-screening and open-mesh cloth, Fig. 2. The covers 36 of these boxes are shaped to fit within the side walls, and these covers are formed of perforated plates lined on the inside with wire-screening and open-mesh cloth. The boxes, filled with leather-pulp and provided with their perforated covers, after having been subjected to the first press are placed vertically upon the metal flooring between the outer edges of the wooden flooring and the perforated plates, with their perforated bottoms facing against the plates, Fig. 2. The angle-pieces 33 by engagement with the edges of the boxes keep them from sidewise displacement, Fig. 3.

Located in front of the covers of the boxes are open frame-like or skeleton weights 37, Fig. 5. These weights are of rectangular form substantially the same size as the covers, and they are loosely supported in front of the covers upon the wooden flooring by feet 38, that project from the lower edges of the weights. The weights are open, so that they will not interfere with the free passage of air from the center outwardly through the boxes when the centrifugal machine is in operation. Rods 39 extend from a collar 40, fastened to the shaft, to yokes 41, fastened to the middle of the braces 42 of the weights. A lever 43 is mounted upon each of these rods, and the lower end of each lever is connected by a link 44 to a weight-yoke. By means of these levers the weights may be closed up against the covers of the boxes when they are located in place and may be withdrawn from the boxes after the machine has been operated. As the machine is rotated and the moisture is thrown from the sheets of pulp formed in the boxes the weights under centrifugal action force outwardly and keep the perforated covers close against the sheets, Figs. 2 and 3.

The cylindrical shell 45 is placed about the sides of the centrifugal machine to collect the water that is thrown off from the pulp when revolving, Fig. 2. The shell has a trough 46 at the bottom for holding the water, and from this leads a spout 47 for conducting away this water.

After the moisture has been thrown out and the pulp compacted into sheets by centrifugal action by the revolution of the boxes on the centrifugal machine the boxes are removed and the sheets taken out and laid upon the endless apron 48. By this apron the sheets are carried between the rolls 49, and then by the apron 48 and another apron 50 are carried between the press-rolls 51 and are finally delivered by the rolls 52 upon the table 53.

With this apparatus sheets of board may be formed with fibers of leather laid and compacted in a desirable manner, and fibers that are heavy and so saturated with oil and grease that they cannot be laid evenly by the ordinary process of forming paper-board may be successfully used and formed into sheets having the desired toughness, density, and surface.

I claim as my invention—

1. A centrifugal machine for forming sheets of pulp, consisting of a rotary shaft, boxes with outwardly-facing perforated bottoms supported by the shaft, and perforated movable covers loosely located in the openings in the boxes and free to move outwardly from the shaft toward the bottoms of the boxes under centrifugal action when the machine is in operation, substantially as specified.

2. A pulp-box for a centrifugal machine, consisting of solid side and end walls, a perforated bottom fixed to the side walls, and a perforated weighted cover freely movable flatwise into and out of the opening between the side and end walls and capable of movement in the box under centrifugal action toward the bottom for compressing the stock, substantially as specified.

3. A centrifugal machine for forming sheets of pulp consisting of a rotary shaft, perforated plates supported by the shaft, boxes with perforated bottoms located with their bottoms facing the plates, and perforated movable covers located in the openings in the boxes, substantially as specified.

4. A centrifugal machine for forming sheets of pulp, consisting of a rotary shaft, perforated plates supported by the shaft, boxes with perforated bottoms located with their bottoms facing the plates, perforated movable covers located in the openings in the boxes, and skeleton weights located in front of the covers in such positions that they will move outwardly under centrifugal action as the moisture is thrown from the sheets of pulp, substantially as specified.

5. A centrifugal machine for forming sheets of pulp consisting of a rotary shaft, perforated plates supported by the shaft, boxes with perforated bottoms located with their bottoms facing the plates, perforated movable covers located in the openings in the boxes, skeleton weights located in front of the covers, and levers loosely connected with the weights in such manner that the weights may be moved outwardly by centrifugal action, and inwardly by the levers, substantially as specified.

6. A centrifugal machine for forming sheets of pulp, consisting of a rotary shaft, perforated plates supported by the shaft, boxes with perforated bottoms located with their bottoms facing the plates, perforated movable covers located in the openings in the boxes, skeleton weights loosely placed in front of the covers and a stationary shell surrounding the plates, substantially as specified.

7. A centrifugal machine for forming sheets of pulp, consisting of a rotary shaft, a floor-plate supported by the shaft, perforated plates mounted vertically upon the floor-plate, bands and bolts for retaining the plates in position, boxes with perforated bottoms located with their bottoms facing the plates, perforated movable covers located in the openings in the boxes, skeleton weights loosely placed in front of the covers, rods loosely connecting the weights with the shaft, levers mounted upon the rods and connected with the weights, and a shell surrounding the plates, substantially as specified.

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