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2,408,176

COVER FOR THE SUCTION BOXES OF PAPER MAKING MACHINES

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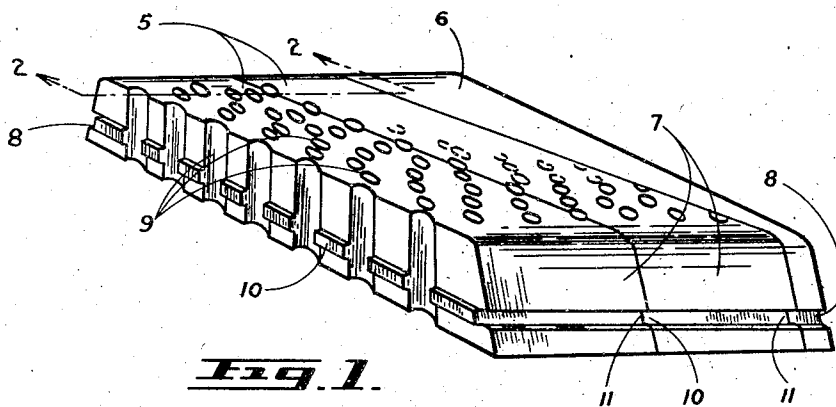


Fig. 1.

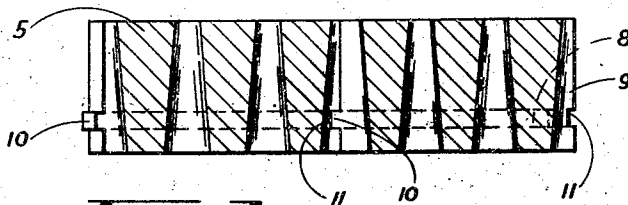


Fig. 2.

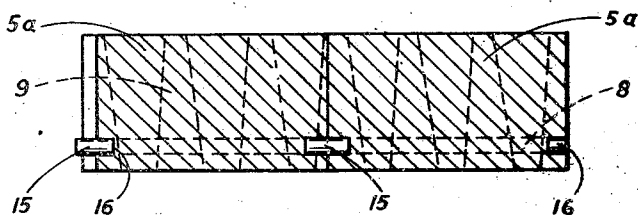


Fig. 3.

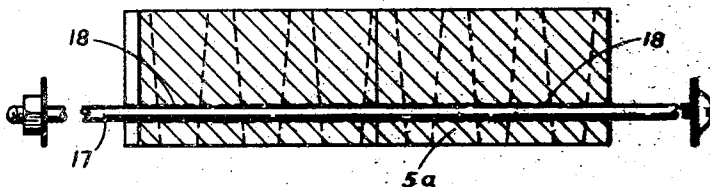


Fig. 4.

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UNITED STATES PATENT OFFICE

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COVER FOR THE SUCTION BOXES OF
PAPERMAKING MACHINES

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Application December 16, 1943, Serial No. 514,572

1 Claim. (Cl. 92—51)

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This invention relates to improvements in a cover for the suction boxes of paper making machines and appertains particularly to one composed of a number of end-of-grain wood blocks.

An object of the invention is to provide a composite, end-of-grain block cover for producing improved quality of paper, at an increased rate with less chance of damaging the wire.

A further object of the invention is to provide a wider, composite end-of-grain block cover that will not warp or check, wear longer, maintaining better suction over a greater area and require less frequent refinishing than the conventional top.

A further object of the invention is to provide a cover for the wider type suction box that is composed of a number of end-of-grain blocks spaced side-by-side across the width of the paper making machine and provided with means to prevent any relative vertical displacement between adjoining blocks.

A still further object of the invention is the provision of a cover for suction boxes composed of an improved design of end-of-grain blocks enabling the more efficient operation of the machine with reduced maintenance costs.

To the accomplishment of these and related objects as shall become apparent as the description proceeds, the invention resides in the construction, combination and arrangement of parts as shall be hereinafter more fully described, illustrated in the accompanying drawing and pointed out in the claim hereunto appended.

The invention will be best understood and can be more clearly described when reference is had to the drawing forming a part of this disclosure wherein like characters indicate like parts throughout the several views.

In the drawing:

Figure 1 is a perspective elevation of a part of one of my improved suction box covers;

Figure 2 is a vertical section thereof, on the line 2—2; and

Figures 3 and 4 are similar sections through other similar cover blocks, showing alternative forms of the invention.

Generally speaking, in making paper the prepared and screned pulp stock is flowed on to an endless Fourdrinier wire that passes over one or more suction boxes to accelerate the drawing off of the excess water. Partial vacuum maintained in these boxes draws the wire screen down tightly against the top or cover, usually formed of a hard-wood plank, and this occasions considerable wear on the suction box cover and on the

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underside of the making wire. The cover grooves and splinters causing loss of suction, marking the paper and damaging the expensive wires so that frequently the cover must be resurfaced with the resultant stopping of the machine.

Tops made of end-of-grain blocks, set side-by-side across the width of the machine, and more recently the lubricating or loading of these end-of-grain block covers have practically eliminated grooving, saved the ensuing loss of suction, cut down wire wear to a minimum and greatly reduced the times the covers need to be resurfaced.

With the advance in speed of modern machines, it is sometimes found desirable to increase the width of the suction boxes, i. e., their dimension in the line of travel of the machine. The instant construction of end-of-grain wood block is designed especially for these wider suction boxes.

Heretofore the blocks that extend cross the suction box, or diagonally or at a slight angle but in general parallel with the line of travel of the belt and machine have had only frictional engagement with adjoining blocks, being anchored only at their opposite ends by the side rails or other conventional clamping devices on the suction boxes. This was sufficient before the days of end-of-grain block tops and prior to the advent of the wider boxes. With these wider block covers however, in recent years, the warping of an occasional block caused loss of suction, paper marking and increased wire wear.

To maintain a smooth unbroken surface at all times over the entire operating area of my block-composed cover, I provide blocks 5, that are shown in Figure 1 as lying across the suction box but at an angle to the wire's line of travel so that a filler end block 6 is used.

These blocks are preferably made of hard maple cut with the grain standing vertically and thoroughly impregnated with a waxy mixture in accordance with my Patents #1,977,352 (1934) and #2,312,978 (1943) and #2,346,785 (1944), for as such they give longer wear with the lowest coefficient of friction and only so can they be most easily finished in the form now described. The ends 7 of the blocks 5 are bevelled or tapered outwards to the bottom and across each of these tapered ends a horizontal groove 8 a quarter inch wide and a quarter inch deep is cut to receive a conventional side rail (not shown) by which they attach to the upper edge of the suction box side walls. Sometimes only a tapered or sloping flange occurs on the suction box, under which the tapered ends of the blocks fit.

The blocks are bored with suction openings

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9 that may enlarge or flare to the bottom thus providing non-clogging perforations.

Along one side of each block 5 a tongue 10 is cut extending horizontally from end to end. It may be from $\frac{1}{8}$ to $\frac{3}{8}$ of an inch in lateral thickness and from $\frac{1}{8}$ to $\frac{3}{8}$ of an inch high but the preferred dimensions are $\frac{1}{8}$ and $\frac{1}{4}$ inch respectively. This tongue occurs about $\frac{1}{2}$ of the way up from the bottom of the block so that in an average block of say $2\frac{1}{4}$ inches in thickness, this $\frac{1}{8} \times \frac{1}{4}$ tongue would be $\frac{3}{8}$ inch from the bottom and $1\frac{5}{8}$ inches from the top.

A corresponding or matching groove 11 is similarly cut in the opposite side of the block 5, thus the same would probably lie at just about the same level as the side rail receiving grooves 8 across the ends. It is important here to note that these tongues and grooves 10 and 11, but particularly the tongues, being broken at intervals by the flaring suction openings 9 and having vertical grain could not easily be formed satisfactorily except after the thorough impregnation of the blocks with the waxy mixture previously mentioned.

When these blocks 5 are assembled as a cover across the top of a suction box and their ends 7 secured thereto the laterally engaging tongue-and-grooved faces prevent any possibility of a block warping to rise or fall from the true level of the box cover. Because of the greater thickness of the block above the tongue-and-groove, repeated replanings of the top can be made without impairing its full usefulness so that improved wearing qualities of the waxed, end-of-grain block cover, the life of this box top far exceeds those used heretofore.

Alternative forms of inter-block fasteners are shown in Figures 3 and 4, the former being dowel pins 15 inserted in laterally drilled seats 16 at two or more spaced intervals across the length of the blocks 5a. A rod 17 passing through transverse, horizontal bores 18 and running the length of the suction box is shown in Figure 4 as a substitute, any desired number of these rods 17 at needed intervals may be used. In either case, the fasteners are preferably located at substantially the

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same below-centre level as the tongue-and-groove 10—11.

From the foregoing description taken in connection with the accompanying drawing it will be manifest that a cover for the suction boxes of paper making machines is provided that will fulfill all the necessary requirements of such a device but as many changes could be made in the above description and many apparently widely different embodiments of the invention may be constructed within the scope of the appended claim without departing from the spirit or scope thereof, it is intended that all matters contained in the said accompanying specification and drawing shall be interpreted as illustrative and not in a limitative or restrictive sense.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent is:

In a Fourdrinier paper making machine, including a moving wire member for supporting wet paper stock, a suction box disposed below a portion of said member, a smooth wear-resistant cover on said box, the cover consisting of a plurality of elongated wax-impregnated end-of-grain wood blocks which extend transversely across the suction box at an angle to the line of travel of the moving wire member, the blocks each having their ends beveled and tapering downwardly and outwardly, each of the blocks having a side rail engaging groove at their opposite ends and adjacent the bottoms thereof, means for securing the blocks together consisting of a tongue and groove connection between the opposite sides of each of the blocks adjacent the bottoms thereof and in substantially the same plane as the said groove at the ends of each of the blocks which groove engages opposite side rails of the suction box to maintain the blocks in place with respect thereto and which tongue and groove connections prevent displacement of the blocks with respect to each other, and the said blocks being provided with tapered openings, certain of which openings extend through and interrupt the said tongue and groove connections.

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