

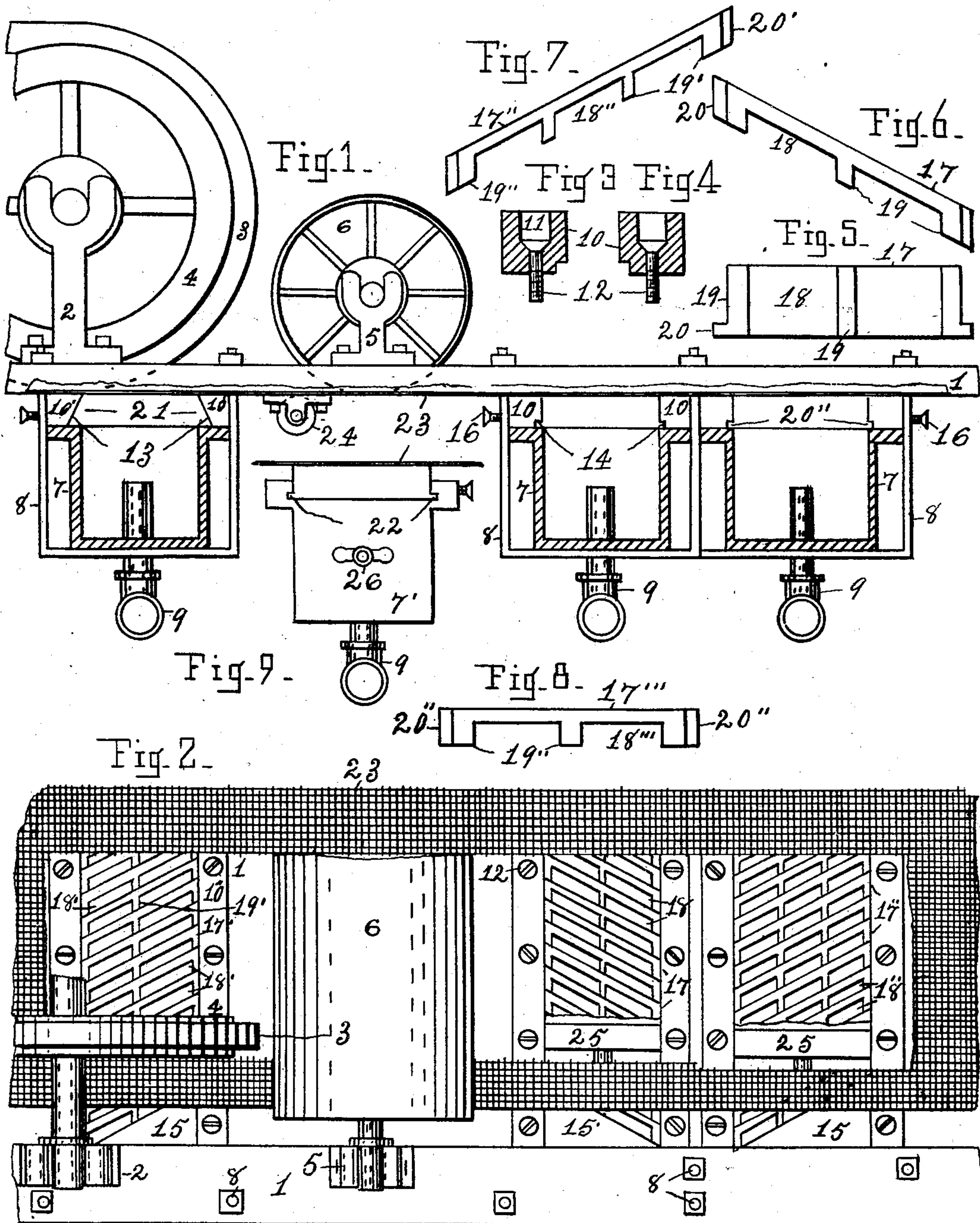
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SUCTION BOX COVER FOR PAPER MAKING MACHINES.

(Application filed July 2, 1902.)

(No Model.)



Witnesses:

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# UNITED STATES PATENT OFFICE.

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## SUCTION-BOX COVER FOR PAPER-MAKING MACHINES.

SPECIFICATION forming part of Letters Patent No. 708,219, dated September 2, 1902.

Application filed July 2, 1902. Serial No. 114,160. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM M. GILBERT, THEODORE M. GILBERT, and WILLIAM C. NASH, citizens of the United States, residing at Neenah, in the county of Winnebago and State of Wisconsin, have jointly invented a new and useful Improvement in Suction-Box Covers for Paper-Making Machines, of which the following is a specification.

Our invention relates to the cover of the usual suction-boxes in paper-making machines over which the making-wire travels and carries the pulp from which paper is made; and it consists of a series of grooved blocks which are held in position upon the suction-box by some effective means, the grooves in said series of blocks, excepting one at each end of the box when the blocks are assembled together in their working position, forming a series of apertures through the cover for permitting the suction through said apertures of the water in the pulp which is upon the making-wire; and the object of our improvement is to provide a cover which will allow a large area of its surface to be subject to the action of the suction apparatus while the making-wire is supported thereon in a suitable manner and also to provide an inexpensive cover and one that can be easily replaced when worn so as to be unserviceable. The covers in general use in many paper-mills consist of a single plank of hard maple or other fine-grained hard wood that is free from knots and is of uniform density, the plank being bored with many round holes over its entire working surface. Such plank are often difficult to obtain; but in making the cover, as our invention shows, of many small grooved blocks it is easy to find plank that even if somewhat knotty will contain much material that is of a fine quality for covers, whereby their cost is much reduced over those formed of a single plank and a more even wearing cover is obtained.

Our invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation showing a section of the top rail of a paper-making machine, a part of the deckle-strap wheel and its strap thereon and the dandy-roll, with their supporting-stands, the making-wire and

one of its carrying-rolls, and three suction-boxes arranged under the top rail and held in position with bolts which pass under the suction-boxes and are provided with nuts by which the boxes can be drawn up to said rail, the suction-boxes being shown in section for the purpose of showing their interior. Fig. 2 is a top view of Fig. 1, showing a section of the top side rail of one side of a paper-making-machine frame, a part of the deckle-strap and its carrying-wheel and a part of the dandy-roll, with their supporting-stands, a portion of the making-wire, (parts being broken away for showing the suction-box covers,) and one end of the covers of the three suction-boxes, with the rails for holding the series of grooved blocks and end pieces. The other side of the paper-making machine is substantially the same as the side shown, and the suction-boxes and covers are of substantially the same length as the width of the machine-frame. Figs. 3 and 4 are sectional views of the left and right hand rails, respectively, for holding the series of grooved blocks and end pieces in position when they are to be applied to old or the usual form of suction-boxes. Fig. 5 is an elevation of one of the grooved blocks of which the covers are composed, taken in the position they occupy in the middle suction-box of Fig. 2. Fig. 6 is a top view of one of the blocks which compose the middle cover of Fig. 2. Fig. 7 is a modification from Fig. 6 in the number of grooves in each block, the same being shown in the right-hand cover. Fig. 8 shows a modification in the form of the block, the form of its grooves, and in the position it is intended to occupy over the suction-box. Fig. 9 is an end view of a suction-box, which may be formed of cast metal, and the rabbeted side rails which are shown in Figs. 1 and 2 formed integral with the upper longitudinal edges of the suction-box. Figs. 3 to 8, inclusive, are upon a larger scale than Figs. 1, 2, and 9.

Similar numerals and characters indicate like parts in the several views.

1 indicates the top side rail of a paper-making machine; 2, a stand for supporting the deckle-carrying wheel; 3, the deckle-strap; 4, its carrying-wheel; 5, a stand for supporting the dandy-roll; 6, the dandy-roll; 7 7',



the suction-boxes; 8, bolts for holding the suction-boxes up to the rail 1; 9, a pipe leading from the interior of the suction-box for carrying away the surplus water from the paper-pulp by means of a suction-pump; 10 10', rails arranged longitudinally of the suction-boxes, provided with counterbores 11 and with screws 12 for securing the rails to the suction-box side walls; 13, bevels upon the rails of the left-hand suction-box; 14, a right-angled rabbet in the rails of the central and right-hand suction-box; 15 15', suction-box-cover end pieces; 16, screws for holding said end pieces in position; 17 17' 17" 17"', different forms of grooved blocks; 18 18' 18" 18"', different forms of grooves in said blocks; 19 19' 19", different forms of end walls of said grooves; 20 20' 20", different forms of tenons upon the grooved block ends and end pieces; 21, dovetails upon the end pieces of the left-hand suction-box cover; 22, a groove in the suction-box sides of Fig. 9; 23, the making-wire; 24, a carrying-roll for said wire; 25, suction-box followers for gaging the width of suction through the making-wire to correspond with the distance apart of the deckles; 26, rods extending out from each follower through the suction-box ends for gaging said width by their movement out and into the suction-box. These followers may be held in position in the suction-boxes by the rods for changing their position, being screw-threaded into the box ends or in any suitable manner.

The rails 10 or 10' are to be used with suction-boxes already in use in paper-mills; but in making new machines these rails may be dispensed with and the longitudinal side walls of the suction-boxes extended upward above the end walls and provided with grooves, as 22, or with any other suitable means for holding the grooved blocks and end pieces in position. The rails and grooved blocks should be made of the same material for their being evenly worn by the travel of the making-wire over them, said material being wood, metal, or any suitable material having good wearing qualities and being adapted for having the making-wire travel over it with but little friction. The rails should be so formed as to hold the tops of the grooved blocks from rising above the tops of said rails, two methods being shown in Fig. 2, one over the left-hand suction-box having a dovetail connection of blocks and rails and the other over the two other boxes having the rails provided with the rabbeted-out recesses 14 on their inner lower corners and forming when the rails are secured upon the top of the side walls of the suction-box a groove into which the tenons upon the end pieces and grooved blocks are fitted, the latter method being preferable. The screws 12 in the rails being countersunk, the blocks and rails can be worn down quite thin without the making-wire coming in contact with said screws. The grooved blocks are each formed with a plurality of grooves of such form that when the

blocks of any one modification are assembled together in position for use across the box said grooves form a series of apertures through the cover of rectangular or rhomboidal form, the latter form being preferable, whereby the blocks being arranged in a diagonal position across the suction-box, as shown, the strands of the making-wire are better supported by the cover of the box than when the lengths of said apertures lie parallel with the longitudinal or transverse strands of said wire. These blocks may be fitted to lie straight across the suction-box or diagonally at any desired angle to the right or left of the line of travel of the making-wire, as may be desired. Suitably-shaped end pieces 15 and 15' are to be made so as to fit the angle at which the grooved blocks are arranged. They must be provided with the same means for holding them in position over the suction-box as the grooved blocks have and may be secured from movement longitudinally of the side rails by means of the screws 16.

In suction-boxes not having the means for holding the grooved blocks integral with them the rails 10 or 10' are first to be secured in position by means of the screws 12. An end piece is then to be inserted and secured with the screw 16. Then the grooved blocks are to be inserted one after another until the box is nearly covered, when the other end piece is to be inserted and secured in place with the screw 16, and thereby holding all of the series of blocks securely in place.

In manufacturing the grooved blocks the grooves may be formed by sawing them with a narrow band-saw, and if it should be advantageous to form the inside corners of said grooves with a round boring-tool it may be done without materially affecting the results desired or departing from the principles of our invention.

Having described our invention and the manner of applying it, what we claim, and desire to secure by Letters Patent, is—

1. A suction-box cover for paper-making machines formed of a series of blocks having grooves therein of such form that when said blocks are assembled together side by side with their ends upon opposite sides of the suction-box, said grooves form a series of apertures through said cover having parallel sides and ends which are of greater length than width, suitably-shaped end pieces for each end of said cover, and means for holding said blocks and end pieces in position over the suction-box, substantially as described.

2. A suction-box cover for paper-making machines formed of a series of blocks having grooves therein of such form that when said blocks are assembled together side by side diagonally across said box with their ends upon opposite sides thereof, said grooves form a series of apertures through said cover of a rhomboidal form, suitably-shaped end pieces for each end of the cover, and means for holding said blocks and end pieces in position



over said suction-box, substantially as set forth.

3. A suction-box cover for paper-making machines formed of a series of blocks having  
5 grooves therein of such form that when said blocks are assembled together side by side with their ends upon opposite sides of the suction-box, said grooves form a series of  
10 apertures through said cover having parallel sides and ends which are of greater length than width, suitably-shaped end pieces for each end of said cover, a tenon upon opposite ends of each block and end piece, and a  
15 groove upon opposite sides of the suction-box above the ends thereof for receiving said tenons and holding said blocks and end pieces in position therein, substantially as described.

4. A suction-box cover for paper-making machines formed of a series of blocks having  
20 grooves therein of such form that when said blocks are assembled together side by side

with their ends upon opposite sides of the suction-box, said grooves form a series of apertures through said cover having parallel sides and ends which are of greater length  
25 than width, suitably-shaped end pieces for each end of the cover, a tenon upon the opposite ends of each block and end piece, a rail secured upon the top of the opposite longitudinal side walls of the suction-box, and  
30 a groove at the meeting edges of said rails and side walls for receiving said tenons and holding said blocks and end pieces in position over the suction-box, substantially as set forth.

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