

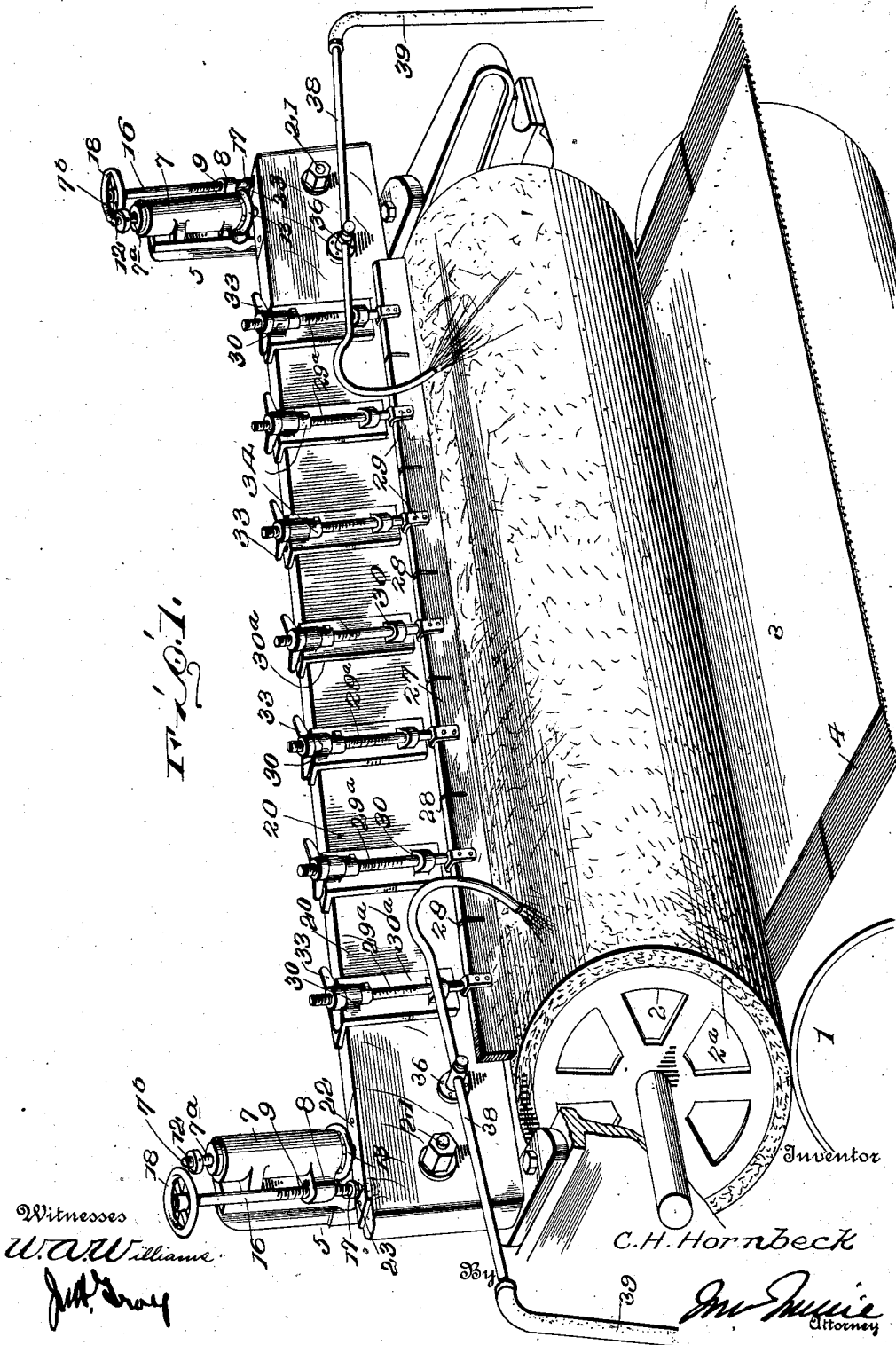
C. H. HORNBECK.
PAPER MACHINERY.

APPLICATION FILED SEPT. 16, 1911.

1,021,603.

Patented Mar. 26, 1912.

2 SHEETS-SHEET 1.

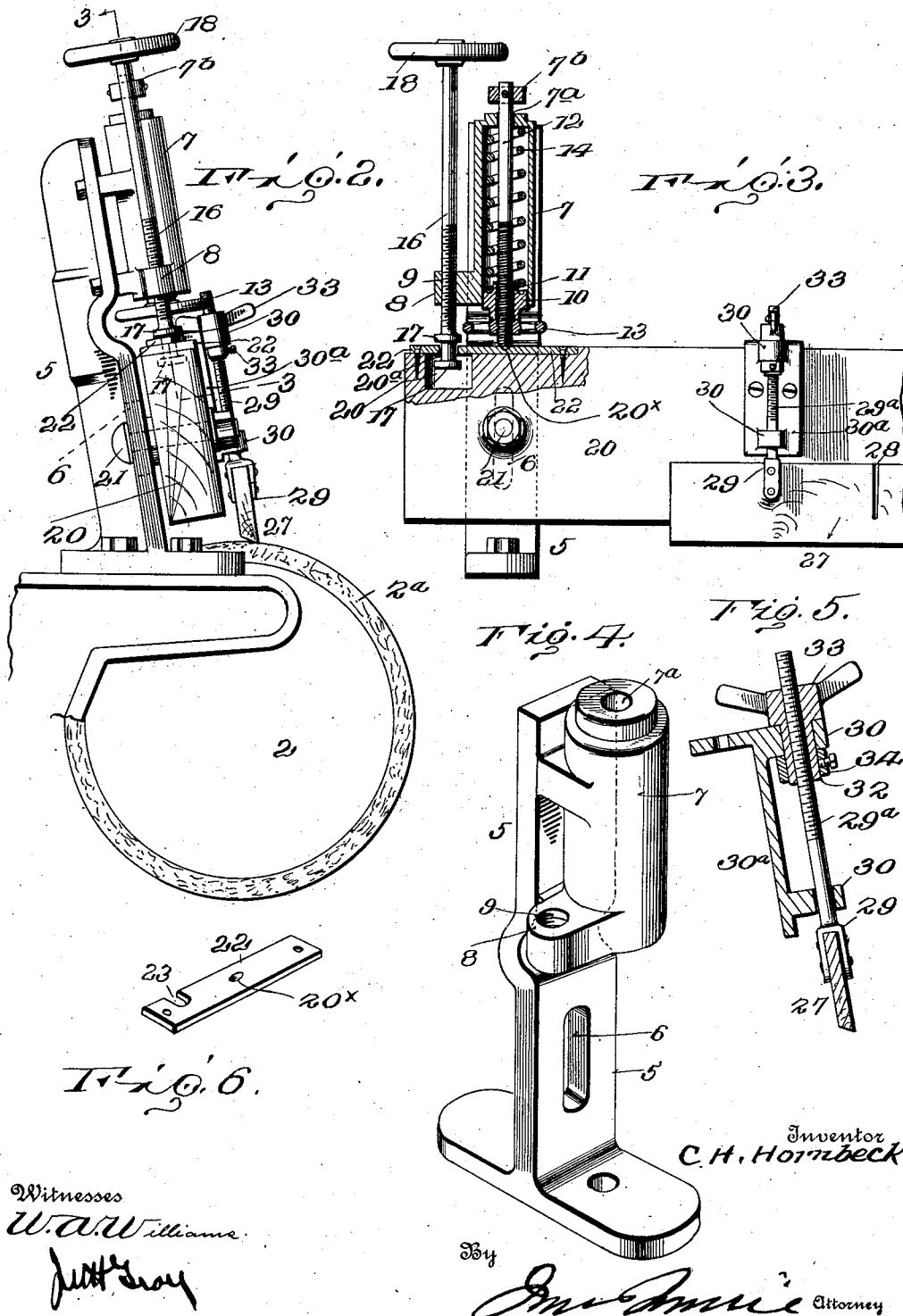


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UNITED STATES PATENT OFFICE.

CHARLES H. HORNBECK, OF WATERFORD, NEW YORK.

PAPER MACHINERY.

1,021,603.

Specification of Letters Patent.

Patented Mar. 26, 1912.

Application filed September 16, 1911. Serial No. 649,744.

To all whom it may concern:

Be it known that I, CHARLES H. HORNBECK, a citizen of the United States, residing at Waterford, in the county of Saratoga and State of New York, have invented certain new and useful Improvements in Paper Machinery; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to improvements in means for mounting the guard-board carrying the doctor-blade of a paper machine of the "Fourdrinier" type.

The primary object of the invention is to provide means for resiliently mounting the guard-board and the doctor-blade.

The invention also relates to the particular construction of the doctor-blade, whereby any particular portion of said blade may be brought into close relation with the couch-roll without affecting the tension exerted by the other portions of said blade.

The invention also comprehends improvements in the particular details of construction and arrangement of parts to be hereinafter described and particularly pointed out in the claims.

In the drawings: Figure 1 is a perspective view illustrating the application of my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a detail transverse section on the line 3—3 of Fig. 2. Fig. 4 is a detail perspective view of one of the standards forming one of the features of the invention. Fig. 5 is a detail section of the doctor-blade and its connection with the guard-board. Fig. 6 is a detail view.

The numeral 1 indicates a lower couch-roll, and above the same is the upper couch-roll 2, the latter having the usual jacket of felt 2^a. Between these two rolls pass the endless conveyer 3 on which the paper is supported while in transit through the machine. The conveyer is of the usual wire cloth construction indicated by the numeral 4, which as a rule causes trouble with the couch-rolls, owing to the necessary pressure between them which crushes the wires, or they become embedded in the felt jacket and

soon wear it out. This has been found expensive and causes delay.

Bolted or otherwise fastened to the frame of the paper machine, are two standards 5. The standards are exactly alike, and a description of one will serve for an understanding of both.

Each standard is formed near its lower portion with a slot 6, and at the upper end is a cylindrical chamber 7, open at its bottom and substantially closed at the top, except for a perforation 7^a. From one side of the standard projects an ear 8, formed with a threaded opening 9. Fitting in the lower end of the cylindrical chamber is a head 10, formed with a centrally disposed opening 11, through which extends a threaded rod 12, the upper end of the latter passing through the perforation 7^a in the top of said cylinder and is provided with a stop collar 7^b. Below the head the threaded rod is provided with a nut 13 in the form of a hand wheel for convenience in operation, and between the top of the cylindrical chamber and the head is a stout spiral spring 14, the tension of which serves to force the head consequently the rod 12 down toward a guard board.

Fitting in the threaded opening 9 in the ear 8 is a threaded rod 16, provided at its lower end with two spaced apart flanges 17, and on the upper end of the said rod is a hand wheel 18.

Mounted on the standard below the cylindrical chambers 7 is a guard-board 20, the same being adjustably held in position by means of a pair of bolts 21, fitting in the slots 6—6. On the upper surface of the guard-board and near the ends of the latter are wear plates 22. Each of said plates is formed with a slot 23, to receive one of the screws 16 and a depression 20^{*} to receive the ends of said screws.

The plates engage the screws between the flanges 17, so as to permit a vertical movement of the guard-board independently of the screws 16, for a purpose to be described. The guard-board is formed with openings 20^a directly under the slots 23, to provide space for the lower flanges 17. The ends of the threaded rods 12—12 fit in the depressions 20^{*}, formed in the wear plates and force the guard-board down toward the upper couch roll.

27 indicates a doctor-blade having a se-

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ries of vertical slots 28, to provide means for adjusting the lower operative edge to accommodate irregularities in the surface of the jacket on the upper couch roll. Between adjacent slots 28, the doctor-blade is provided with means for fastening said blade to the guard board. This means includes a series of stems, each of which comprises a bifurcated end 29, to embrace the edge of the blade, and an upwardly extended stem 29^a, threaded on its upper end. The stem passes through ears 30 extending from a bracket 30^a, fastened to the face of the guard-board. The upper ear 30, receives the hub portion 32 of a nut 33, the latter engaging the threaded stem. On the lower end of the hub portion below the ear 30 is a retaining collar 34. This construction permits of the nut turning freely in the ear, and at the same time retains it in fixed relation to the bracket.

The stems are arranged side by side and extend across the doctor blade, so that any particular portion of the edge of the latter may be adjusted to suit the surface of the jacket. Obviously if one portion of the peripheral surface of the upper couch roll should be out of alinement, (either smaller or larger than another portion,) a respective nut can readily be adjusted to regulate the edge of the doctor-blade to accommodate the irregularity.

Attached to the guard-board are perforated studs 36—36 to support water pipes 38, the ends of which are turned downwardly toward the surface of the couch roll. These latter pipes are used for flushing the felt surface, for cleaning purposes, and are connected to hose, indicated at 39, and may be slid back and forth in the lugs 36 to flush the whole surface of the jacket.

In operation, the parts being assembled as shown in Fig. 1, that is the screws 16, are adjusted to prevent the flanges 17, engaging the wear plates, these screws at this time being inactive, while the doctor blade is held down on the jacket of the couch roll by the action of the springs 14. The springs 14 are set by adjusting the hand wheels 13 to give the desired pressure of the doctor blade on the jacket. This adjustment however will not be even throughout the length of the surface of the jacket, if perchance there should be any irregularity in the surface of the jacket, which frequently occurs, then the nuts must be adjusted. Obviously by the peculiar construction of the doctor-blade it possesses a certain amount of elasticity, so that when one or combination of nuts are adjusted the lower edge of the doctor-blade is made to conform to the surface of the jacket. Once the edge of the doctor-blade is adjusted to conform to the surface of the jacket, the nuts hold the entire blade in fixed relation to the guard-

board and the blade is prevented from trembling, or moving in any manner. The edge of the blade can be adjusted to cause it to contact with any particular point in the length of the jacket so that it makes no difference how irregular the surface may be, a uniform contact can always be maintained by properly adjusting the nuts.

When starting the paper machine, it frequently happens that extra pressure must be applied to the guard-board for a short period on account of the usual excess water not leaving the web of paper. Under these circumstances I adjust the screws 16, so as to cause the upper flange 17, to contact with the wear plates, which forces the guard-board, hence the doctor-blade down on the felt jacket, which obviously removes the excess moisture. Then the screws are again released. This same operation is performed when a new jacket is applied. This is necessary owing to the fact that the nap of the felt does not lay down at once consequently an excess of moisture occurs, and must be removed. These screws however perform another function, that is when the machine is not in use, there are adjusted to bring the lower flanges 17 up into contact with the wear plates which compresses the springs 14, and at the same time elevated the doctor-blade from the jacket.

By mounting the guard-board and doctor-blade as described, it holds the edge of the blade in resilient contact with the felt jacket which greatly prolongs the life of the material. Furthermore the resilient contact between the doctor-blade and the jacket prevents the couch roll pushing the stock or web of paper back from the wire seam.

From practical experience I find that by arranging the parts as described, the life of the felt covering on the couch roll is materially prolonged, and furthermore because of the adjustment of the nuts and the disposition of the springs the wires forming the conveyer are not crushed or destroyed. The item of saving expense of constantly renewing the conveyer is of vital importance. The pressure between the rolls is so equally distributed, the life of the conveyer when employing this invention is materially prolonged.

What I claim is:

1. In a machine of the class described, the combination of a couch roll, a guard-board, an elastic doctor-blade having its ends free and adjustably secured to the guard-board, means located at intervals in the length of the doctor-blade for adjusting any part of the lower edge of the doctor-blade to accommodate irregularities in the surface of the couch roll, and springs located adjacent the ends of and in contact with the guard-board to force the doctor-blade into contact

with the couch roll, said spring being operable in exerting tension on the doctor blade independently of the means for adjusting the edge of said doctor blade.

5 2. In a machine of the class described, the combination of a couch roll, a guard board, an elastic doctor-blade formed with a series of slits and free at its ends and adjustably secured to the guard-board, springs located
10 adjacent the ends of the guard-board to force the doctor-blade into contact with the couch roll, and means for raising the guard-board against the tension of the springs.

3. In a machine of the class described,
15 the combination of a couch roll, an elastic doctor-blade having a plurality of slits, said blade having secured thereto a series of stems, there being a stem between every two adjacent slits, brackets mounted on the
20 guard-board to receive the stems, each stem having a nut to adjust the edge of the doctor-blade, guides for the guard-board, and springs located near the ends of the guard-board to force the doctor-blade toward the
25 couch roll.

4. In a machine of the class described, the combination of a couch roll, a guard-board, a doctor-blade on the guard-board, springs for forcing the doctor-blade toward the
30 couch roll, means for adjusting the springs, and means bearing on the guard-board for elevating the latter and the doctor-blade against the tension of the springs.

5. In a machine of the class described, the
35 combination of a couch roll, a guard-board, a doctor-blade secured to the guard-board, said doctor-blade having a series of slits to make it elastic, means for adjustably mounting the doctor-blade on the guard-
40 board, springs normally engaging the guard-board to force the latter toward the couch roll, means for adjusting the springs, and means independent of the springs for increasing the pressure on the guard-board to
45 force the edge of the doctor-blade toward the couch roll.

6. In a machine of the class described, the combination of a couch roll, a guard-board, means for guiding the movement of the
50 guard-board, a doctor-blade secured to the guard-board, springs normally exerting pressure downwardly on the guard-board, lock nuts for adjusting said springs, screw rods having flanges adapted to bear on the

guard-board to increase the pressure of the
55 doctor-blade on the couch roll or to elevate the doctor-blade independent of the springs.

7. In a machine of the class described, the combination of a couch-roll, a guard-board, a doctor-blade secured thereto, standards
60 formed with slots, cylinders and threaded ears, bolts passing through the slots to form guides for the guard-board, threaded rods mounted in the cylinders, nuts on the thread-
65 ed rods, springs compressed between the nuts and the ends of the cylinders to hold the ends of the rods in contact with the guard-boards, and screw rods having flanges adapted to engage the guard-board to force the same downward or to elevate the same,
70 said screw rods fitting in the threaded openings in the ears.

8. In a machine of the class described, the combination of a couch roll, a guard-board formed with pockets, an elastic doctor-blade
75 having a series of slits, adjustable means for securing the doctor-blade to the guard-board, screws having spaced flanges, the lower flanges fitting in the pockets and the upper flanges being located above the
80 guard-board, whereby said lower flanges will elevate the guard-board from the couch-roll, and the upper flanges will force the same toward the couch roll when the screws are adjusted, springs for normally
85 forcing the guard-board and doctor-blade toward the couch roll, and means for adjusting the tension of said springs.

9. In a machine of the class described, the combination of a couch roll, a guard-board,
90 means for guiding the movements of the guard-board, a doctor-blade secured to the guard-board, springs normally exerting pressure downwardly on the guard-board, means for locking the springs in adjusted
95 position, an element operable independent of the springs for raising and lowering the guard-board to increase or decrease the pressure on the couch-roll without altering
100 spring adjustment.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHAS. H. HORNBECK.

Witnesses:

HENRY C. MILLER,
WILLARD E. ROGERS.