

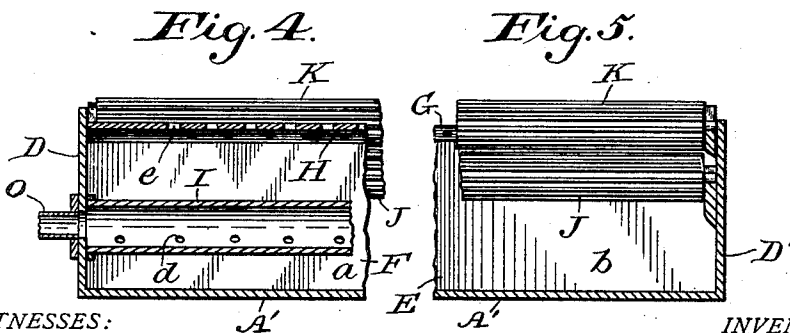
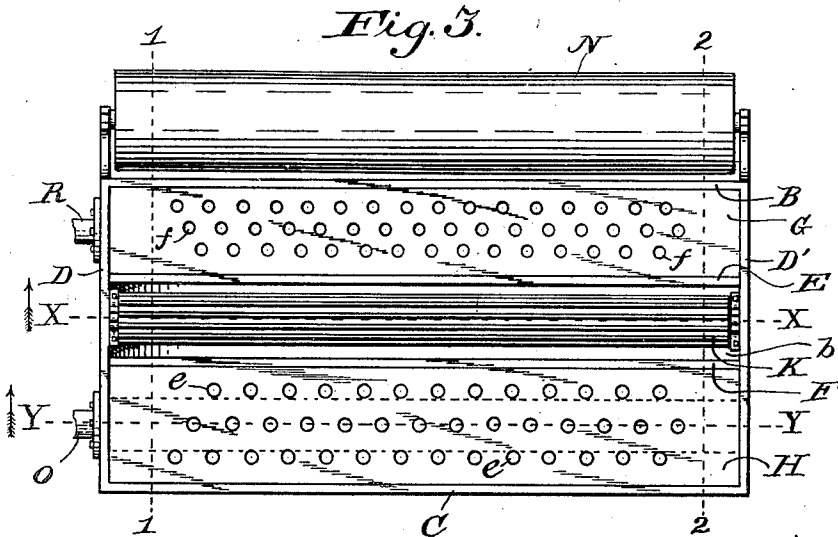
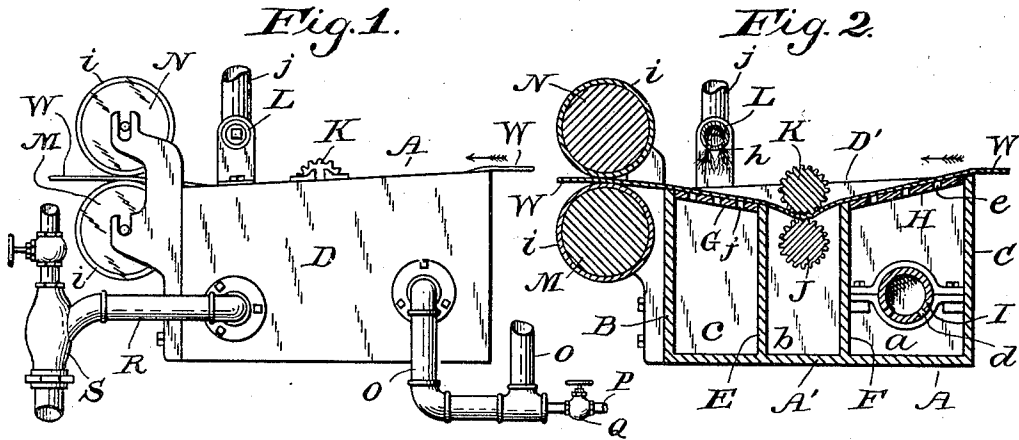
R. M. SCANLAN.

FELT CLEANER FOR PAPER MAKING MACHINES.

(Application filed Dec. 29, 1900.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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FELT CLEANER FOR PAPER MAKING MACHINES.

(Application filed Dec. 20, 1900.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 6.

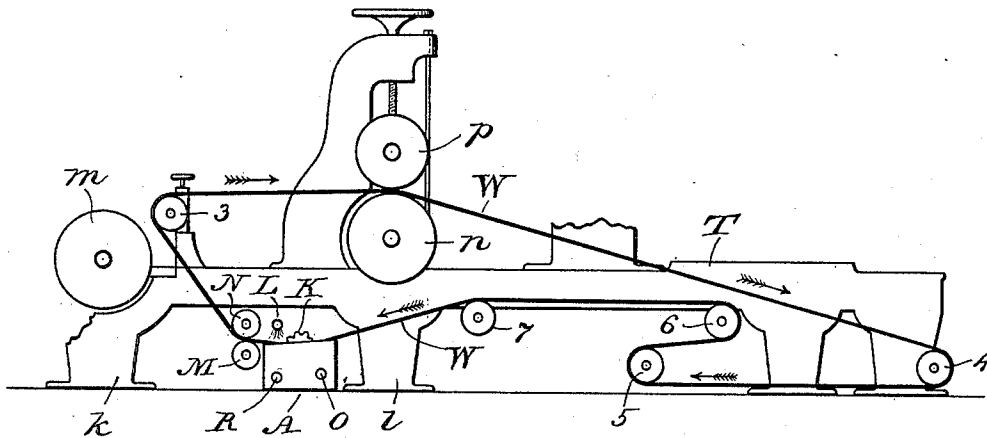


Fig. 7.

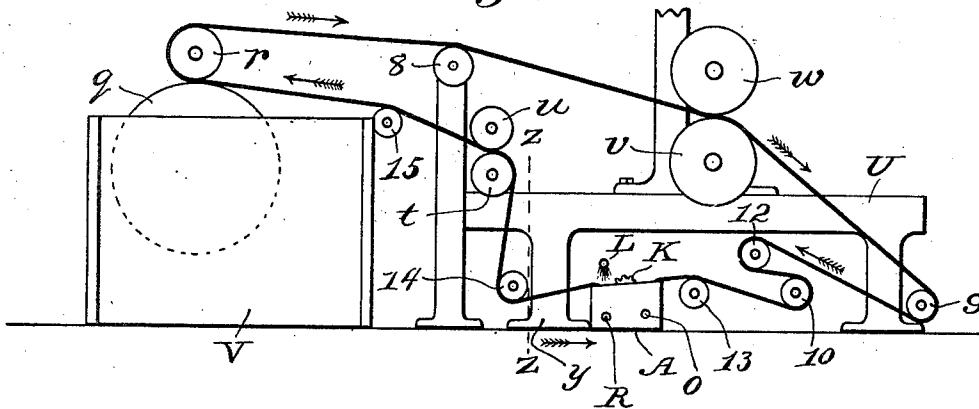
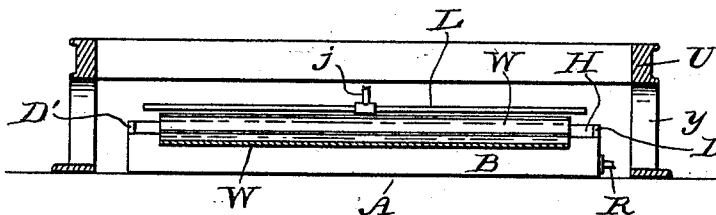


Fig. 8.



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UNITED STATES PATENT OFFICE.

ROBERT M. SCANLAN, OF BROWNSTOWN, INDIANA.

FELT-CLEANER FOR PAPER-MAKING MACHINES.

SPECIFICATION forming part of Letters Patent No. 673,970, dated May 14, 1901.

Application filed December 29, 1900. Serial No. 41,465. (No model.)

To all whom it may concern:

Be it known that I, ROBERT M. SCANLAN, a citizen of the United States, residing at Brownstown, in the county of Jackson and State of Indiana, have invented certain new and useful Improvements in Felt-Cleaners for Paper-Making Machines; and I do 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 the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to apparatus for cleaning the paper-carrying web, commonly known as a "felt," on paper-making machines.

The object of the invention is to provide means whereby the felt may be cleansed of the natural deposits of various mesh-clogging substances that invariably adhere thereto in operation and with the least degree of injury to the felt and by which the cleansing may be performed while the machine is in practical use, thus avoiding loss of valuable time. Heretofore devices such as beaters have been employed, in the use of which it was necessary to frequently stop the run of paper and operate the cleaner alone, and the beater was in itself a source of great injury to the felt by beating off the nap.

By the use of my invention a felt, which is expensive in itself and is usually worn out in use in about one week, may be made serviceable for at least two weeks or longer, comparatively in given instances, thus effecting a great saving both in time and material.

My invention consists of a new and novel washing-box and in its application to the felt of paper-making machines, whereby the felt may be continuously cleansed after the paper web may have left it in its regular course in operation; and it consists, further, in the novel parts and in the combination and arrangement of parts as hereinafter particularly described, and pointed out in the appended claims.

Referring to the drawings, Figure 1 represents an end elevation of the washing-box, showing the application of pipes for conveying water thereto and drawing off the water with the refuse and also showing wringer-

rolls or "squeeze-rolls" which in some instances may be employed therewith; Fig. 2, a transverse vertical sectional view showing the interior devices forming parts of the apparatus; Fig. 3, a top plan view of the complete apparatus; Fig. 4, a fragmentary longitudinal vertical sectional view as on a line Y Y in Fig. 3 looking in the direction indicated by the arrow; Fig. 5, a fragmentary longitudinal vertical sectional view as on a line X X in Fig. 3 looking in the direction indicated by the arrow; Fig. 6, a diagrammatic view illustrating the path of the first felt and the usual manner of mounting and employing the same in a well-known Fourdrinier type of paper-making machine and showing my invention in connection therewith; Fig. 7, a diagrammatic view illustrating the path of the felt and the usual manner of mounting and employing the same in a well-known type of cylinder paper-making machine and showing my invention in connection therewith. Fig. 8 is a transverse sectional view as on a line Z Z in Fig. 7, showing the manner in which my invention may be arranged relative to the machine-frame and the felt. Figs. 6 and 7 may be considered as having the near parts of the side frame removed and parts of the farther side frame broken away, such parts only being shown as may be necessary to a correct understanding of the practical application of the invention.

Similar reference characters in the several figures of the drawings indicate corresponding parts.

In practically carrying out my invention I provide as the most essential feature a washing-box A, constructed of suitable material, rectangular in plan and of dimensions suitable to the machine and felt to which it may be designed to be applied. The box is provided with corrugated rolls for kneading the felt, and for some machines I also provide wringer or squeeze rolls, which may be mounted on the box, or they may be independently mounted near the box or at a convenient point in the path of the felt between the box and the place where the felt receives the paper web. In some machines the wringer-rolls may be dispensed with, or the machine may be already provided with their equivalents.

The following is a specific description of

the devices embodied in my invention as at present constructed, subject to minor variations in details within the scope of my invention.

5 The cleaner embraces the principal features above mentioned, together with other obviously requisite elements. The washing-box A comprises a base or bottom A', a side B, and an opposite side C, preferably of greater
10 height than the side B, and counterpart ends D and D', and includes water-tight partitions E and F, spaced a suitable distance apart and from the sides, so as to provide three separate water-tanks *a b c*, the tanks *a* and *c* being
15 covered by the lids, as G, inclined toward the tank *b* and having perforations *f* and H, also inclined toward the tank *b* and having perforations *e* therethrough. The lids are preferably removably supported near the top of the box, and as will be seen together form a water-
20 shed emptying into the intermediate tank *b* and extending from the end D to the end D' of the box.

A distributing-pipe I, having perforations
25 *d*, is supported horizontally in the water-supplying tank *a* and preferably extends from end to end thereof.

A corrugated roll J is revolubly mounted in the tank *b*, so as to be entirely below the
30 top edge of the tank partition-walls, and a corresponding corrugated roll K is revolubly mounted above the roll J and meshes therewith. The tank *b* is for holding water up to the roll J and to the felt passing over it.

35 Above the lid G of the drawing-off tank *c* is a spray-pipe L, having perforations *h* at the under side thereof, and is fed by a supply-pipe *j*, suitably connected with a source of water. The pipe L may be either supported by the box or independently. The
40 box may also have a roof extending above the spray-pipe, if desired. Any suitable well-known means may be employed, as a lever and weights, for pressing the upper corrugated roll toward its companion roll.

The wringer or squeeze rolls M and N may be suitably supported revolubly, as before mentioned, and may be provided with double
50 levers and weights or other suitable means for pressing the two together. They each have a cover *i* of hard rubber.

The distributing-pipe I is connected by a supply-pipe O, through which hot water enters the tank *a*, the water being suitably taken
55 from the driers, the water being the result of condensation of the steam used and may be very hot and mixed with steam, but can be economically utilized in my apparatus, the pipe O being connected by a cold-water pipe
60 P, having a regulating-valve Q, whereby the hot water may be tempered, so as to prevent the discharge of steam into the tank *a*, and thence into the work-room.

The tank *c* is connected by a suction-pipe
65 R, which is connected with a steam-siphon S or with a suction-pump of suitable type,

whereby to draw off the water and refuse from the tank *c*.

In Fig. 3 the dotted lines 1 1 and 2 2 should be taken as indicating the approximate width
70 of the felt relative to the spacing of the perforations in the lids G and H over which the felt must slide.

The arrows indicate in Figs. 1, 2, 6, and 7 the direction of movement of the felt W, frag-
75 ments of which are shown in the first two figures in their operative positions relative to my cleaner.

In Fig. 6, T indicates the machine-frame generally. The felt W receives the web of
80 paper from the couch-roll *m* (the companion of which is omitted) and carries it over the roller 3 to the first press-rolls *n p*, the felt running empty over the roller 4, the rollers 5 and 6, if they be included, and the roller 7
85 and over any other guide-rollers that may be included in the construction. I apply my cleaner at any suitable convenient point, as between the legs *k* and *l*, where there may be ample clear space, so that the box may ex-
90 tend from the foundation-sill at one side of the machine to the sill at the opposite side thereof, resting upon the sills, and is so arranged relatively that the felt shall slide in close contact with both the lids G and H and
95 pass between the rolls J and K in its course. The wringer-rolls M N are suitably situate between the box A and the roller 3, so that the cleansing-water may be squeezed therefrom before the felt takes up the paper web, this
100 felt being run substantially dry in machines of this type or should be nearly so at the point where the paper goes to it.

In Fig. 7, U indicates the machine-frame generally, and V the pulp-vat, and in the
105 latter is mounted the paper-making roll *q*, over which is the couch-roll *r*, the felt W running thence with the paper web over the roller 8 to the press-rolls *v w* and empty over the roller 9, the rollers 10 and 12, if employed,
110 and the rollers 13 and 14, and between the squeeze-rolls *t* and *u* and over the roller 15 comparatively dry, to again receive the wet paper web. At a suitable point, as near the leg *y*, I situate the cleaner upon the sills or
115 otherwise in a manner as above indicated and make the pipe connections as described. In some cases where the deposits on the felt may not be excessive I may dispense with the spray-pipe L, or, if supplied, may not
120 use it when making some classes of paper. In the cylinder type and in the Harper type, which is a combination of the Fourdrinier and the cylinder types of machines, squeeze-rolls, as *t* and *u*, being already employed, I may dis-
125 pense with the rolls M and N.

In operation my apparatus having been set and connected with relation to a machine and the felt, as above described, hot water
130 may be admitted to the tank *a*, and as the felt W in its travel passes over the lid H the water flows through the perforations *e* and satu-

rates the befouled meshes of the felt, especially soaking the side on which the deposits were made from the pulpy paper. The felt then passes between the corrugated rolls J and K, which with the water that flows into the tank *b* aid in rendering the felt more pliable and in breaking up the deposits which may have been pressed into the meshes of the felt. The felt then passes over the lid G, entirely covering the perforations *f*, so that a partial vacuum may be formed in the tank *c* by the siphon or its equivalent that may be employed for that purpose, and thereby draw off the dirty water from the felt into and thence from the tank *c*. Clean water may also be sprayed upon the opposite side of the felt W from the pipe L, if desired, which would be drawn through the felt into the tank below. The felt then passes through the squeeze-rolls, which may be provided for pressing out what water may remain in the felt before taking on the paper web again in its course.

In the use of my apparatus the frequent breaking of the paper web due to refuse matter is avoided, as the felt is kept clean continuously without appreciable injury to the nap, and the operations are automatic after having been set in operation, so that little or no attention is required aside from that required by the main machine itself, and better results in the quality of the output are attained, besides the great saving in direct expense for removals of the felt.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A felt-cleaner including a water-supplying tank, a suction-tank, and a pair of opposing corrugated kneading-rolls mounted in the path of the felt between the water-supplying tank and the suction-tank.

2. A felt-cleaner including a water-supplying tank, a suction-tank, an intermediate tank situated so as to receive the overflow from the water-supplying tank, and a corrugated roll mounted near the top of the intermediate tank so as to be in contact with water when the tank may be full.

3. A felt-cleaner including a water-supplying tank, a suction-tank, an intermediate tank situated between the water-supplying tank and the suction-tank, a perforated lid inclined upon the water-supplying tank so as to shed water into the intermediate tank, a perforated lid inclined upon the suction-tank so as to normally shed water into the intermediate tank, and a pair of opposing corrugated kneading-rolls mounted in the upper portion of the intermediate tank.

4. A felt-cleaner including a washing-box having a tank for saturating the felt with water, a pair of corrugated rolls, a tank for holding water up to the rolls, a suction-tank, and means whereby a partial vacuum may be maintained in the suction-tank.

5. A felt-cleaner comprising a washing-box

having a fresh-water tank, a refuse-water tank, and an intermediate tank; a water-supplying pipe, a pair of opposing corrugated rolls mounted in the intermediate tank, a drawing-off pipe connected with the refuse-water tank, and means connected with the drawing-off pipe whereby a suction may be produced in the refuse-water tank.

6. A felt-cleaner comprising a washing-box provided with a pair of kneading-rolls mounted one above the other, a fresh-water tank at one side of the rolls, a refuse-water tank at the opposite side of the rolls, a water-supplying pipe, a suction-pipe, a spray-pipe mounted above the refuse-water tank, and a pair of wringer-rolls suitably mounted, whereby residual water may be squeezed from the felt after it may have passed the refuse-water tank.

7. The combination, with a paper-making machine having a felt, of a felt-cleaner comprising a washing-box situated below the felt and provided with a pair of opposing kneading-rolls, one below the felt and the other above the felt in contact therewith, a fresh-water-saturating tank, a tank for holding water to the kneading-rolls, and a tank for receiving the saturating-water and refuse matter from the felt, and means for supplying the saturating-water and drawing off the resultant refuse matter.

8. The combination, with a paper-making machine having a felt, of a felt-cleaner comprising a washing-box having a water-supplying tank provided with a perforated distributing-pipe therein, a hot-water-supplying pipe, a cold-water-supplying pipe, a lid having perforations therein covering the water-supplying tank and supported at the under side of the felt so that water may flow from the perforations into the meshes of the felt, kneading-rolls mounted in the washing-box, and a suction-box mounted against the under side of the felt, said cleaner being supported between the side frames of the machine.

9. The combination, with a paper-making machine having a felt, of a washing-box comprising a water-supplying tank mounted against the felt, a pair of opposing kneading-rolls engaging the felt, a tank for holding water against the rolls, a drawing-off tank mounted against the felt, a water-supplying pipe, a suction-pipe connected to the drawing-off tank, means for sucking the felt against the top of the drawing-off tank whereby the felt may be cleansed, and a pair of wringer-rolls suitably mounted.

10. The combination with a paper-making machine having a felt, of the washing-box having the water-supplying tank, the drawing-off or vacuum tank, and the intermediate tank; the distributing-pipe in the water-supplying tank, the lid having perforations therein at the top of the water-supplying tank in contact with the felt, the corrugated rolls mounted in the intermediate tank in contact with the felt, the lid having perforations

therein at the top of the drawing-off tank in contact with the felt, the spraying-pipe mounted above the drawing-off tank, the suction-pipe and means whereby a partial vacuum may be produced therein, and the wringer-rolls suitably mounted in contact with the felt.

5 11. In a paper-making machine having a traveling felt, the combination with the felt, of a pair of opposing kneading-rolls having
10 substantially corrugated surfaces, one roll at one side of the felt and the other roll at the opposite side of the felt in contact therewith, means whereby the felt may be saturated

with water before its passage to the rolls, and means whereby the water and refuse matter 15 therewith may be drawn from the felt after passing between the kneading-rolls, whereby the matter clogging the meshes of the felt may be directly flexed and broken up and extracted therefrom. 20

In testimony whereof I affix my signature in presence of two witnesses.

ROBERT M. SCANLAN.

Witnesses:

JOHN B. BURRELL,
CHAS. E. GREGER.