

UNITED STATES PATENT OFFICE.

MAXIM LA FOUNTAIN, JR., OF LAWRENCE, MASSACHUSETTS, ASSIGNOR
TO DAVIS & FURBER MACHINE COMPANY, OF NORTH ANDOVER, MASSACHUSETTS.

NAPPING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 756,029, dated March 29, 1904.

Application filed November 17, 1902. Serial No. 131,615. (No model.)

To all whom it may concern:

Be it known that I, MAXIM LA FOUNTAIN, JR., a citizen of the United States, residing at Lawrence, in the county of Essex and State of Massachusetts, have invented an Improvement in Napping-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

Some classes of woven webs or cloth have to be napped on both sides, and this is done in a napping-machine, the web being run through the machine while one side thereof is being napped, and then the web is run through the machine a second time that the other side of the web may be napped.

The object of the invention to be herein described is to provide a napping-machine of any usual character with web-turning means, whereby a web being fed through the machine may be delivered therefrom with both sides napped.

In accordance with the invention to be herein claimed after the napping means has raised the nap on one side of the web and the web has retired from contact with the napping means the web is turned over, and while being fed in the same direction the other side is subjected to the action of the napping means, so that napping is being carried on continuously at different points in the length of the web at opposite sides thereof. The web may be turned over two or more times during its continuous passage through the napping-machine, and each side of the web may be subjected to a plurality of napping operations.

Another object of this invention is to provide novel means for stretching and holding the web of material being napped and keep the same at normal width.

Figure 1 is a front view of the machine shown in Fig. 2 at the right of the section-line *xx*, said view showing a sufficient portion of a napping-machine embodying my invention in one of the best forms now known to me, the drawings showing part of the web in position. Fig. 2 is a side elevation of said machine. Fig. 3 is a detail showing some of

the stretching and guiding rolls for the web. Fig. 4 is a plan view of Fig. 3, one of the series of stretching and guiding rolls being omitted; and Fig. 5 is a detail showing the manner of connecting the web-turning fingers with their respective sustaining-rods.

The framework A, the cylinder B, mounted on the shaft C and provided with usual napping-rollers D, and the web feeding and guiding rollers 2 3 4 5 6 7 8 9 10 12 13 14 15 are and may be all as usual in napping-machines, and they may all be actuated as now commonly done.

This invention for its efficiency does not aim at any change in the construction of the napping means, and any napping means may be employed without departing from this invention.

In front of the napping-cylinder on a suitable tie-bar E, crossing from one to the other side of the machine and shown enlarged in Figs. 3 and 4, there is mounted, as shown, a plurality of pairs of stretching-rollers G, covered with pointed pins or wire clothing. Each of these rollers has its journal sustained in uprights of forked brackets H. Each bracket midway its ends is provided with a stud-screw J, that is extended through a slot L in a slide-bar M, and each bracket has, as shown, a pin N, that enters an inclined slot O in the bracket between said stud-screw and the end of the bracket. The slots O in the under sides of the brackets of each pair of stretching-rolls are inclined oppositely, so that when the slide-bar M is moved longitudinally, the stud-screw J being at such time slackened, the pin N of the slide-bar working in the slots O will simultaneously turn the brackets, placing the longitudinal axes of each stretching-roller more or less out of line, as necessity may require, to insure more or less stretch or just the proper stretching of the cloth as it is fed through to the napping means. A second series of pairs of like stretching-rolls P are mounted in the standards of brackets Q, pivotally sustained on a cross-bar immediately above the napping-cylinder and its shaft, and are adjusted in like manner as those of the

first set to provide for the proper stretching and direction of the cloth as it is being fed through the machine.

To enable the web to be turned over that both sides thereof may be napped in a continuous passage of the web through the machine, I have provided web-turning means, said means comprising, as herein shown, a series of fingers $b^6 c^6 d^6 e^6$, to be described. To sustain these fingers operatively, I have provided the upper part of the machine at each end thereof with rods a , on which I have adjustably secured by suitable set-screws a series of stands $b c d$, which, together with opposite stands, receive and sustain rods $b' c' d'$. The rod b' has secured upon it by suitable set-screws, as shown, a plurality of sleeves b^2 . Each sleeve has rising from it a stud b^x , and over this stud is fitted a sleeve b^3 , having extended from its side a stud b^4 , on which is placed a sleeve b^5 , having a recess 10, in which is inserted the web-turning finger b^6 . By loosening the set-screw holding the sleeve b^2 on the rod b' and the set-screw holding the sleeve b^3 on the stud b^x and the set-screw holding the sleeve b^5 on the stud b^4 (best shown in Fig. 5) it will be obvious that the web-turning finger b^6 may be placed in any desired position of inclination with relation to the edge of the web after the same crosses the web feeding and supporting roller 13, the web on arriving at said roller having had one side thereof napped by any usual napping means. The action of the web-turning finger b^6 on the web is illustrated in Fig. 2, wherein one edge of the web is thrown down thereby and the opposite edge of the web acted upon by the second web-turning finger c^6 is turned upwardly, and thereafter by the fingers $d^6 e^6$ the web is completely turned over between the rollers 13 and 14, so that the napped side of the web which was outermost as the web reached the roller 13 is undermost in passing the roller 14. From the roller 14 the web is again conducted, as indicated by the dotted arrow, over the roller 2 and under and over the tension-rollers 15^x 16 17, mounted in the usual adjustable carrier 18, and thence is led again over a second pair of the stretching-rollers G toward the left-hand side of the machine (see Fig. 1) and thence about the cylinder to be again acted upon by the napping-rolls.

It will be understood that the cylinder and napping-rolls are sufficiently long to enable a web to be acted upon a plurality of times by the napping means while being fed through the machine in the same direction and that there are a sufficient number of pairs of stretching-rollers to properly handle the web.

The several sets of web-turning means (shown as the fingers $b^6 c^6 d^6 e^6$) and the means for connecting each finger with its supporting-rod are as described of the fingers b^6 and their connection with the rod b' , so that further de-

scription of the connecting means between the fingers and the rods is unnecessary.

It will be observed that the different web-turning fingers are each inclined differently one with relation to the other, as best represented in Figs. 1 and 2, so that said fingers may occupy correct positions with relation to the edge or edges of the web being napped to overturn the web between the rollers 13 and 14, and it will be understood by adjusting the sleeves corresponding with b^2 on the respective supporting-rods that each series of fingers or devices may be adapted to cooperate with any width of web.

Having illustrated one form of web-turning means, I desire to state that this invention is not limited to the particular form of web-turning means represented, and that instead of the fingers I may employ any suitable means to turn over the napped web that an unnapped portion of the web may be napped while being fed through the machine, as I believe that I am the first to connect with a napping-machine any means whatever for overturning the web after the same has been napped for a portion of its length on one side that the opposite side of the web as the latter is being fed through the machine may be napped, thus enabling a web with both sides napped to be delivered from the machine, the napping being done in a continuous operation and while the web is being fed through the machine.

I have not considered it necessary to illustrate the means for rotating the cylinder B and the napping-rollers D, nor the means for rotating the several web-feeding and supporting-rollers by the aid of which the web is fed through the machine to be napped, for the reason that such devices are well known and the particular means for actuating them is immaterial in the consideration of my invention.

I believe that I am the first to provide a napping-machine with pairs of stretching-rollers, the rollers of each pair being sustained with their longitudinal axes out of parallelism, and I have described means for adjusting these rollers at one operation; but it will be understood that this invention is not limited to the particular means shown for adjusting these rollers, nor is the invention limited to adjusting them simultaneously. The stretching-rollers may be used to advantage for stretching cloth in any machine through which the cloth may be run.

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

1. In a napping-machine, napping means to raise a nap on one side of a web, and means to thereafter turn over the web being napped that the opposite side thereof may be napped by the same napping means, whereby the web

running through the machine may be delivered with both sides napped.

2. In a napping-machine, means to raise a nap on one side of a web, and means to turn a part of the web between its ends after the napping of one side thereof, to present the other side of the web to the same napping means that it may be napped, the napping of both sides of the web being carried on simultaneously at different points in the length of the web, whereby both sides of the web may be delivered napped.

3. In a napping-machine, napping means, and means to turn the web over or upside down on an axis longitudinal of the web whereby both sides of the web may be subjected to the action of the napping means.

4. In a napping-machine, napping means, a plurality of pairs of stretching-rollers, and means for turning over the web while the same is being fed through the napping-machine, that different portions of the same napping means may act upon the web at different points of its length to thereby nap both sides of the web simultaneously.

5. In a napping-machine, a napping-cylinder, pairs of stretching-rollers located in front of and above said napping-cylinder, means to hold the longitudinal axes of said rollers out of parallelism, and means to turn the web over during its passage through the machine that both sides thereof may be napped.

6. In a napping-machine, napping means

presenting napping-surfaces of greater length than twice the width of the web to be napped, means to feed the web to be acted upon by the napping-surfaces, and means to effect the contact of both sides of the web with the napping-surfaces during a single passage of the web through the machine.

7. In a napping-machine, napping means presenting napping-surfaces of greater length than twice the width of the web to be napped, means to feed the web to be acted upon by the napping-surfaces, and means to effect the contact of both sides of the web for a plurality of times with the napping-surfaces during a single passage of the web through the machine, whereby both sides of the web may be napped simultaneously.

8. In a napping-machine, the combination of napping means, guides for directing one surface of the web to the action of the napping means, means for thereafter turning the web over about an axis longitudinal of the web, and means for then directing the web to the napping means that the other surface thereof may be napped.

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

MAXIM LA FOUNTAIN, JR.

Witnesses:

WALTER COULSON,
HELEN A. SMITH.