

(No Model.)

2 Sheets—Sheet 1.

N. H. GROSSELIN.
CLOTH NAPPING MACHINE.

No. 558,804.

Patented Apr. 21, 1896.

Fig. 1.

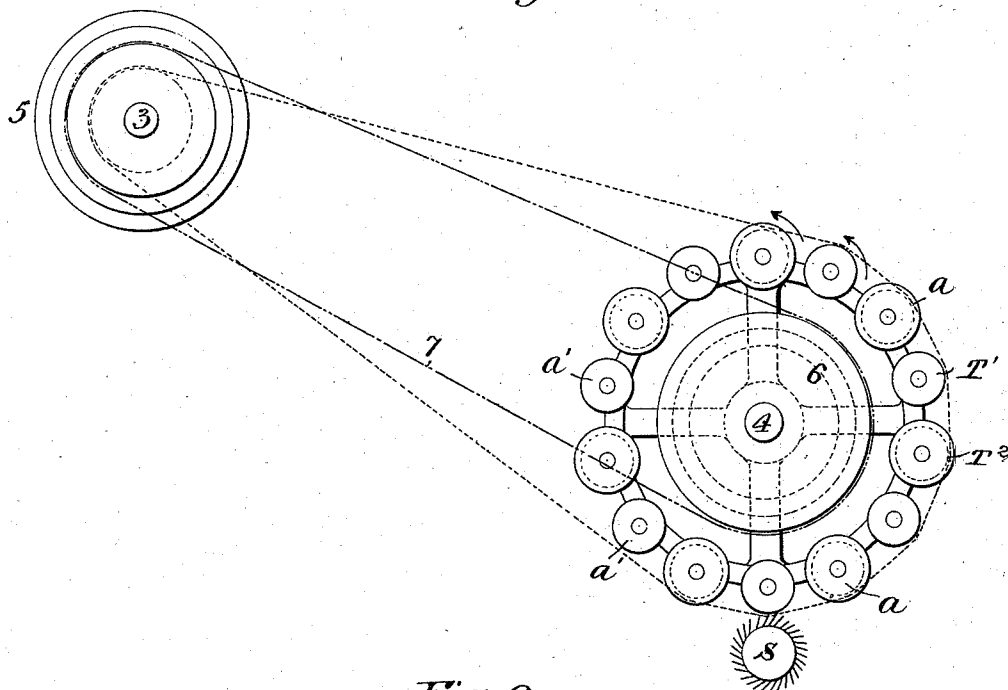
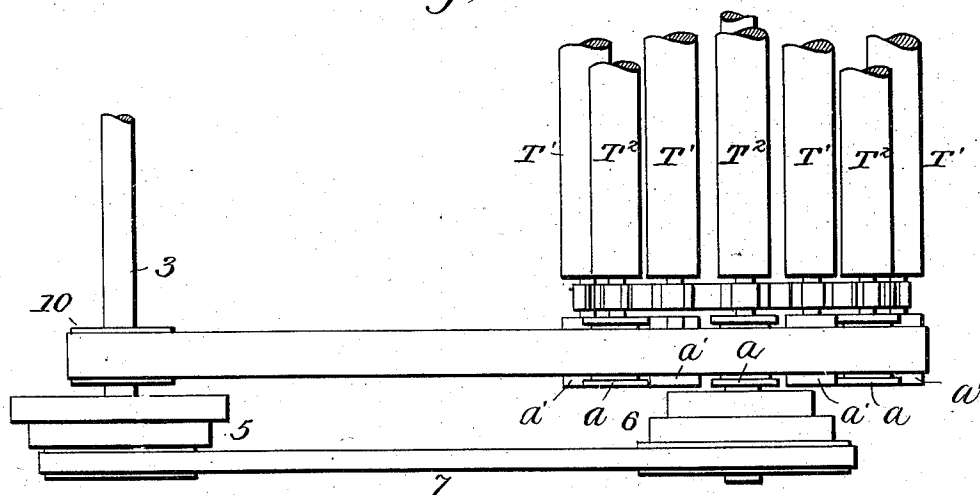


Fig. 2.



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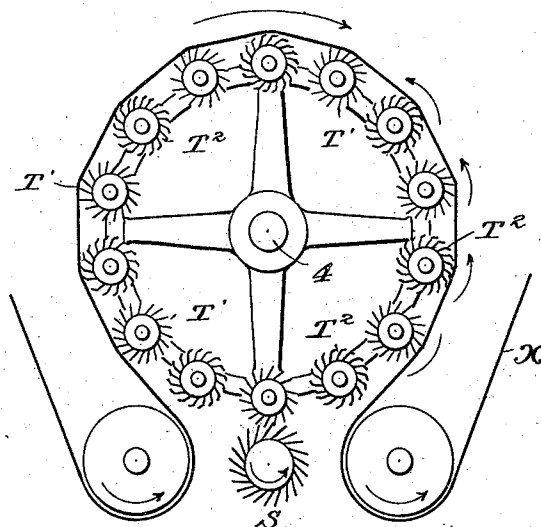
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Fig. 3



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UNITED STATES PATENT OFFICE.

NICOLAS HENRY GROSSELIN, OF SEDAN, FRANCE, ASSIGNOR TO CHARLES HEAP, OF ROCHDALE, ENGLAND.

CLOTH-NAPPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 558,804, dated April 21, 1896.

Application filed April 17, 1895. Serial No. 546,073. (No model.)

To all whom it may concern:

Be it known that I, NICOLAS HENRY GROSSELIN, a citizen of the French Republic, residing at Sedan, in France, have invented certain new and useful Improvements in Cloth-Napping Machines, of which the following is a specification.

My invention relates to that class of napping-machines in which there is a rotating head carrying a series of napping-rolls; and my invention consists in certain improvements in means for driving and cleaning said rolls, as fully set forth hereinafter, and as illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation showing the rotating head, the counter-shaft, the pulleys, and driving-belts of a napping-machine. Fig. 2 is a plan view showing one end of the head and the pulleys, driving-belts, and rollers, with the counter-shaft. Fig. 3 is a sectional elevation illustrating the arrangement of the teeth upon the rolls and the cloth passing through the machine.

In that class of napping-machines in which there is a rotating head carrying series of napping-rolls, some of which work with and others against the nap, although both turn in the same direction, it has been common to impart different degrees of movement to the different sets or series of rolls by driving the two sets of rolls by two separate sets of driving devices—as, for instance, by two driving-belts, one passing to pulleys on the ends of the shafts of one set of rolls and the other to pulleys on the ends of the shafts of the other set of rolls. This, while it permits a very great degree of variation of energy, especially when means for driving the driving devices at different speeds is provided, is attended with certain objections—as, for instance, the increased weight, complexity, and expense of the machine, which it is desirable to avoid in a cheaper class of machines and where so many degrees of variation are not necessary. In order, therefore, to overcome this objection, I provide the different series of roll-shafts with pulleys of different sizes and drive all of the pulleys from the same driving device—as, for instance, by means of a driving-belt passing around all of the pulleys, as in-

dicated in Fig. 1—and I provide the two series of rolls each with forwardly-projecting teeth inclined at different angles. By this means all of the working rolls of the two series T^1 T^2 , the former acting against and the latter with the nap, will be turned in the direction of the arrows, Fig. 1, but at different circumferential speeds.

The circumferential speed of the rollers T^1 , working against the nap, should be greater than the circumferential speed of the drum, while the circumferential speed of the rollers T^2 , working with the nap, should be less than the circumferential speed of the drum. This may be obtained by proportioning the pulleys a of the two groups in different ways. Thus, supposing the pulleys of the rollers T^2 , working with the nap, have the same diameter as the rollers themselves, the diameters of the pulleys of the rollers T^1 , working against the nap, may be smaller, while if the pulleys of the working rolls T^2 have a diameter greater than the diameter of the working rolls the pulleys of the working rollers T^1 may be of about the same diameter as the working rollers.

If desired, the pulleys a , secured to the end of the shaft of the napping-rolls, may be detachable therefrom, each machine being provided with sets of pulleys of different diameters, so that by substituting one set for the other variations in the degree of energy of the working parts may be obtained. With, however, the rolls of different sizes and a single belt many different degrees of energy may be obtained by varying the speed or the movement of the belt. Thus the speed may be varied by driving a counter-shaft 3 from the drum-shaft 4 through the medium of cone-pulleys 5 6 and a belt 7, and a different direction of movement may be secured by using a cross-belt instead of the open belt 7, as has heretofore been done in machines of this class.

Heretofore when two sets of rolls have been employed, working with and against the nap, it has been considered necessary to make use of two roller-cleaning devices arranged, generally, one inside and the other outside of the drum, the napping-rolls being set so that their surfaces are upon different circular planes. In order to avoid the expense and

complexity of this arrangement, I make use of drums all of the same size, set upon the same circular plane, and a single cleaner-wheel S. This I am enabled to do by making use of two different kinds of cards with the teeth pointing essentially in the same direction. Thus the teeth of the rolls T², working with the nap, are bent forward in the direction of the rotation of the drum, as usual, while the teeth of the cards upon the rolls T¹, working against the nap, are straight teeth tangential to the general surface of the rollers and set in the direction of the rotation of the drum, but at a different angle from that of the working ends of the teeth of the rolls T², both sets of rolls being rotated in a reverse direction to that of the drum; and, as stated before, those working against the nap are operated at a speed greater than the circumferential speed of the drum, so that they turn backward more rapidly than the other rollers, which, while they rotate backward, have a forward drag upon the cloth. As a consequence of this arrangement a single exterior cleaning-brush S may be set so as to meet the surfaces of all the rollers and so as to clean the flock from the teeth all pointed in the same direction. The cleaning-roller S is driven in any suitable manner.

As a greater speed of revolution is imparted to the rollers working against the nap they tend to overcome the drag upon the rollers working with the nap, so that it is possible to nearly envelop the drum by the cloth *x*, as shown in Fig. 2, the drag or draft of one set of rolls very nearly overcoming the drag or draft of the other.

It is best to make use of cards for the rollers working against the nap, consisting of teeth which are set in a pretty stiff backing, so that they will not lie down too readily under their action, and in order to drive these rollers at their proper speed they may be driven from an independent source.

Without limiting myself to the precise construction and arrangements of parts shown, I claim as my invention—

1. The combination with the rotating drum of a napping-machine, of two series of napping-rolls, each provided with teeth inclined in the direction of the rotation of the drum, but the teeth of one series inclined to a greater angle than those of the other, substantially as described.

2. The combination in the rotating head of a napping-machine, of two series of napping-rolls, one having teeth with bent ends projecting

in the direction of the rotation of the head, and the other having teeth inclined in the direction of the rotation of the head, but at a different angle than the teeth of the other rolls, substantially as set forth.

3. The combination with the rotating drum of a napping-machine, of two series of napping-rolls, each provided with teeth inclined in the direction of the rotation of the drum, but the teeth of one series inclined to a greater angle than those of the other, and means for imparting backward rotation to the two sets of rolls, one at a greater speed than the other substantially as described.

4. The combination with the rotating drum of a napping-machine, of two series of napping-rolls, each provided with teeth inclined in the direction of the rotation of the drum, but the teeth of one series inclined to a greater angle than those of the other, means for imparting backward rotation to the two sets of rolls, one at a greater speed than the other, and means for varying the speed of rotation of said rolls to that of the drum, substantially as set forth.

5. The combination with the rotating drum of a napping-machine, of two series of napping-rolls, each provided with teeth inclined in the direction of the rotation of the drum, but the teeth of one series inclined to a greater angle than those of the other, pulleys of different diameters upon the shafts of the two sets of rolls, and a driving-belt passing around all of said pulleys, substantially as set forth.

6. The combination of a napping-head having two series of napping-rolls with teeth arranged to act with and against the nap, the teeth of the rolls of each series inclined in the same direction as the rotation of the head, and a cleaning device arranged to engage the teeth of all the rolls, substantially as set forth.

7. The combination with the rotating head of a napping-machine having two series of napping-rolls, each with forwardly-projecting teeth, of pulleys of different sizes connected with said rolls, a driving device engaging all of the pulleys, and means for varying the action of the said device, substantially as described.

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

NICOLAS HENRY GROSSELIN.

Witnesses:

F. MENNONS,

CLYDE SHROPSHIRE.