(No Model.) 2 Sheets—Sheet 1.

A. MÜLLERS.

NAPPING MACHINE.

No. 458,185. Patented Aug. 25, 1891.

Fig. 1.

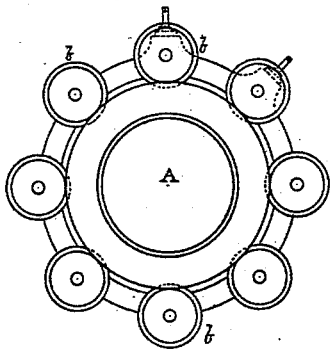


Fig. 2.

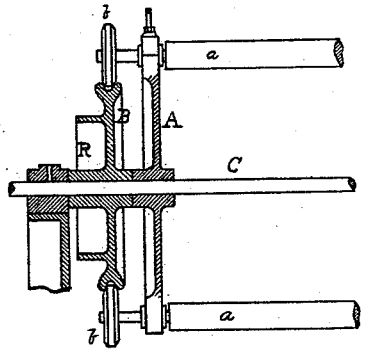


Fig. 4.

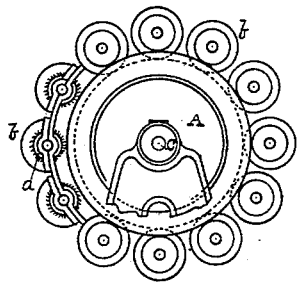


Fig. 5.

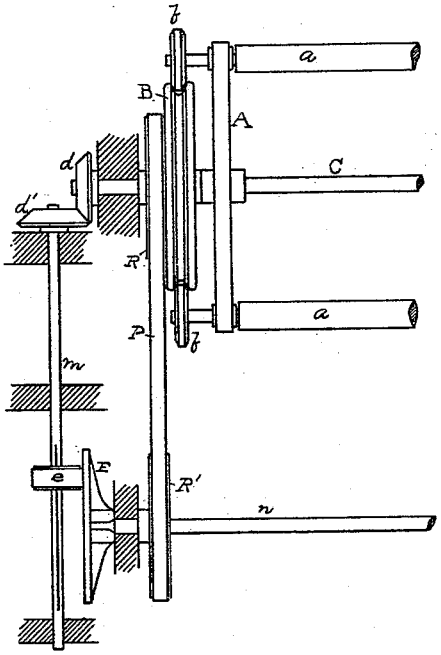
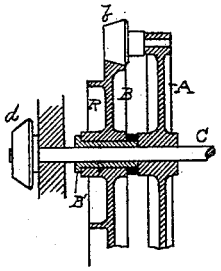


Fig. 7.



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Fred Kemper.

Inventor:
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(No Model.) 2 Sheets—Sheet 2.

A. MÜLLERS.

NAPPING MACHINE.

No. 458,185. Patented Aug. 25, 1891.

Fig. 5.

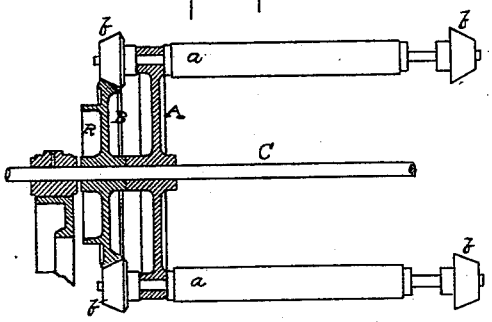


Fig. 8.

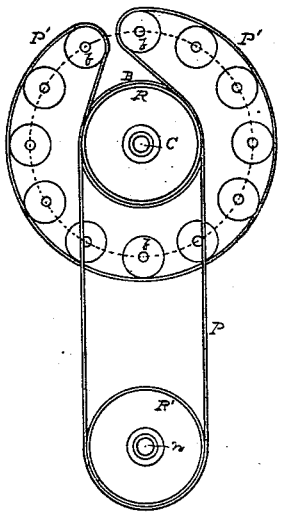


Fig. 6.

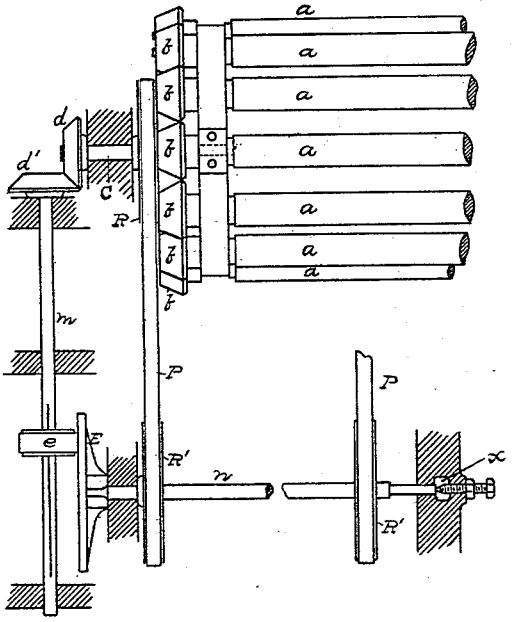
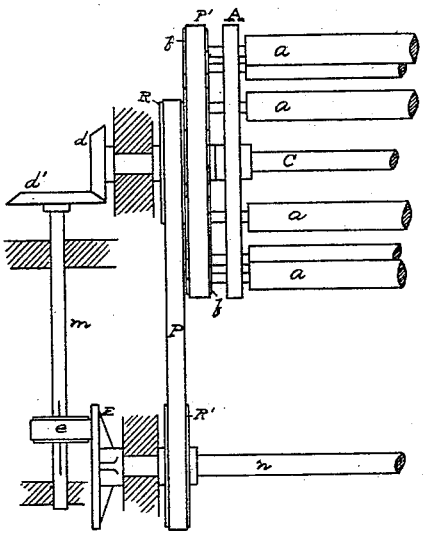


Fig. 9.



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UNITED STATES PATENT OFFICE.

AUGUST MÜLLERS, OF MÜNCHEN-GLADBACH, GERMANY, ASSIGNOR TO JAMES T. LAW, OF NEW YORK, N. Y.

NAPPING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 458,185, dated August 25, 1891.

Application filed January 29, 1891. Serial No. 379,502. (No model.) Patented in Germany May 25, 1886, No. 39,098, and in Austria-Hungary December 22, 1887, No. 31,790 and No. 58,225.

To all whom it may concern:

Be it known that I, AUGUST MÜLLERS, of München-Gladbach, Germany, have invented a new and useful Improvement in Napping-Machines, (said invention having been patented in Germany by Letters Patent No. 39,098, dated May 25, 1886, and in Austria-Hungary by Letters Patent No. 31,790 and No. 58,225, dated December 22, 1887,) of which the following is a specification.

In the accompanying drawings, Figure 1 is an end view of the parts of my machine mounted on the main shaft. Fig. 2 is a longitudinal section of the same at one end of the shaft. Fig. 3 is an elevation of sufficient of the parts to show clearly the train of mechanism by which the motion is transmitted from the main shaft to the napping-rollers at one end of the machine. Fig. 4 is an end view of the parts mounted on the main shaft with three of the pulleys *b* removed. Fig. 5 is a view showing a modification of Fig. 2. Fig. 6 is a view showing a modification of Fig. 3. Fig. 7 is a section to show a means of adjustment. Fig. 8 is an end view of a modified form of my machine. Fig. 9 is an elevation of the same.

My invention relates to a frictional motion for driving the little card-wire rollers of the napping drum or cylinder of napping-machines, in which the napping rollers are mounted revolubly upon wheels or spiders which are fastened to the main cylinder-shaft, whereby the napping-rollers are caused to move in an orbit. The object of this friction motion is to do away with the stationary friction-strap used heretofore in machines of that kind, which were open to many objections and subject to a great many repairs.

Referring to Figs. 2 and 3 of the drawings, C is the main shaft of the napping-drum, upon which are keyed the spiders A, which carry upon their periphery radially-adjustable bearings, in which are mounted the wire-covered napping-rollers *a*. Upon each journal end of each napping-roller *a* is fastened a friction-pulley *b*, which is in touch with the large friction-pulley B, which is loosely mounted on the drum-shaft C. By adjusting the bearings of the napping-rollers *a* upon the spiders A nearer to or farther away from the center the friction-pulleys upon the journals of the napping-rollers can be brought into closer or lighter contact with the large friction-pulley B of the main shaft, thus regulating the friction between these pulleys at will, or removing it altogether, if desired.

The shaft C carries outside the frame a bevel-wheel *d*, which meshes into a bevel-wheel *d'* upon an upright shaft *m*. Upon this upright shaft *m* is splined an adjustable friction-roller *e*, which transfers its motion to the friction-disk E and the counter-shaft *n*, to which the disk is fastened. Thus the disk E and shaft *n* can be caused to revolve faster or slower, according to the position of the roller *e* against the disk E, whether it be farther away from or nearer to its center. Upon the shaft *n* is fastened the pulley R', which transmits its motion through belt P upon the pulley R, which is fastened to the friction-pulley B. Thus by raising or lowering the friction-roller *e* upon the upright shaft *m* the friction-pulley B and through it the pulleys *b*, and with them the napping-rollers *a* can be revolved about their respective axes faster or slower, and they may be caused to revolve either in the same direction as the main drum or in the opposite direction. To move the napping-rollers in the opposite direction to the main drum, the roller *e* is merely caused to cross the center of the disk E to the opposite side, which will then cause the pulleys R and R' and friction-pulley B to turn in the opposite direction to that in which they moved before.

To have the drum act like an ordinary napping-cylinder—that is to say, so that the rollers *a* are not revolved about their axes at a positive desired speed—one only needs to slide up the bearings of the rollers *a* until the friction-pulleys upon their journals are out of contact with the friction-pulley B.

In Figs. 4, 5, and 6 is shown a modification of this arrangement, which is still simpler. The friction-pulleys at the journal ends of the napping-rollers *a* are here made cone-shaped, as is also the friction-surface of the friction-pulley B. The latter, which is mounted loosely upon the shaft C, can be slid

closely up against or as far away from the series of small pulleys upon the napping-rollers until all contact ceases. The adjustable arrangement of the bearings of the napping-rollers *a*, which are mounted in the peripheries of the spiders A, can thus be dispensed with, and instead of bringing each individual pulley *b* into or out of contact with the friction-pulley B the latter may come into or out of contact with all of the friction-pulleys *b* at once. The friction-pulley B may set for that purpose upon a sleeve B′ on the shaft C. The cessation of rotation of the friction-pulley B can also be caused by means of the screw *x* (see Fig. 6) by releasing the pressure or this screw *x* against the friction-roller *e*, which can be set up or off, so that the rotation of the roller *e* cannot be transferred to the disk E. Finally, to make a common napping-cylinder out of the drum, the spiders A can be loosened upon the shaft C, in which case the drum would remain stationary, while the napping-rollers *a* could be made to turn about their axes through the friction-pulley B.

Instead of being friction-pulleys, B and *b* can be plain pulleys and the motion of pulley B transmitted by a belt P′ to the small pulleys *b*, as shown in Figs. 8 and 9, the adjustable frictional motion between *e* and E governing their respective speeds.

In designating the device E as a disk, I am not to be understood as limiting myself to a disk of the form shown, in which the friction-surface appears at right angles to the axis of the shaft.

In designating the device *e* as a roller or wheel, I am not to be understood as limiting myself to the form of device shown, since it is essentially merely an endless traveling friction-surface adapted to co-operate with the friction-surface of the disk.

I claim—

1. In combination, the main shaft, the teaseling-rollers revolubly mounted on the same, the friction-disk, the friction-roller co-operating therewith and so mounted as to be movable toward and from the center, means whereby the motion transmitted through said friction disk and roller is communicated to said teaseling-rollers, and means whereby said motion is communicated from the main shaft, substantially as described.

2. In combination, the main shaft, a counter-shaft, a disk and friction-roller interposed between the same, whereby the relative speed of the two may be varied, teaseling-rollers revolubly mounted upon the main shaft, means whereby the motion of the said counter-shaft is transmitted to said teaseling-rollers, and means whereby the motion of said disk and roller is communicated from the main shaft, substantially as described.

3. In combination, the main shaft, a friction disk and roller whereby the speed taken from the main shaft may be varied, means for adjusting the pressure between said disk and said friction-roller, teaseling-rollers revolubly mounted on the main shaft, means whereby the motion transmitted through said friction disk and roller is communicated to said teaseling-rollers, and means whereby said motion is communicated from the shaft, substantially as described.

4. In combination, the main shaft, the teaseling-rollers revolubly mounted on the same, the friction-disk, the friction-roller co-operating therewith, means whereby the motion transmitted to said friction disk and roller is communicated to said teaseling-rollers, and means whereby said motion is transmitted from the main shaft, substantially as described.

5. In combination, the main shaft, the teaseling-rollers revolubly mounted on the same, the counter-shaft, means whereby said teaseling-rollers are driven from said counter-shaft, a vertical shaft, beveled wheels, a friction-disk, and a friction-roller through which motions from the main shaft are transmitted to the counter-shaft, substantially as described.

6. The rotating frame of a gig-mill, its main shaft, a series of raising-rollers carried by the said frame, a friction-disk, a co-operating friction-wheel, a shaft upon which it is adapted to be adjusted axially toward and from the center of said friction-disk, means whereby the disk and wheel are actuated from the main shaft, and means whereby the said raising-rollers are rotated independently of the rotation of the frame carrying said raising-rollers, substantially as described.

7. In combination, the main shaft, the teaseling-rollers revolubly mounted on the same, a pulley mounted on the main shaft, pulleys on the several teaseling-rollers, and an endless belt extending around the main-shaft pulley and thence outward and around the teaseling-roller pulleys, substantially as described.

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