No. 671,457. Patented Apr. 9, 1901.

J. H. STONE.

NAPPING MACHINE.

(Application filed Feb. 13, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

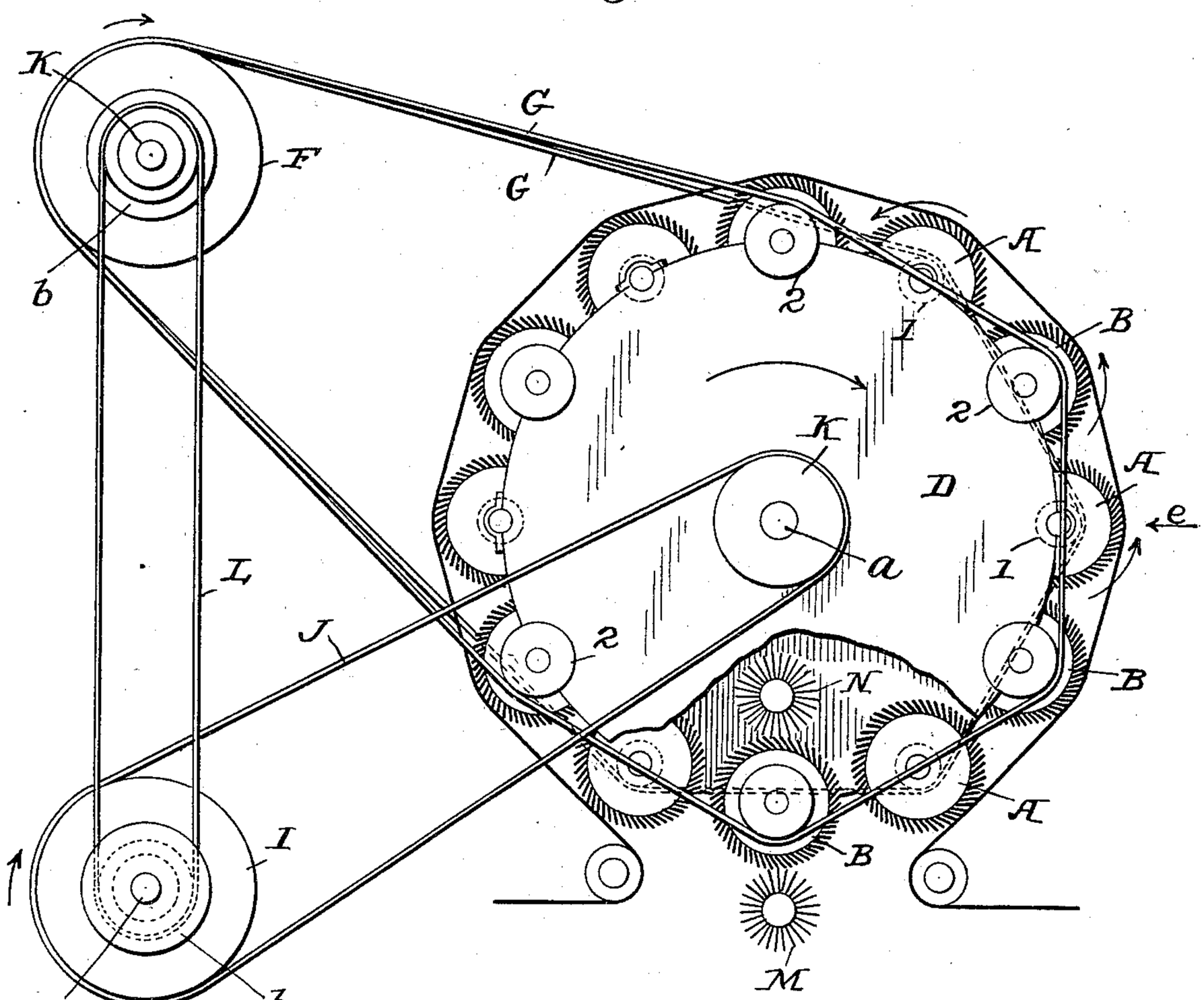

Fig. 3.

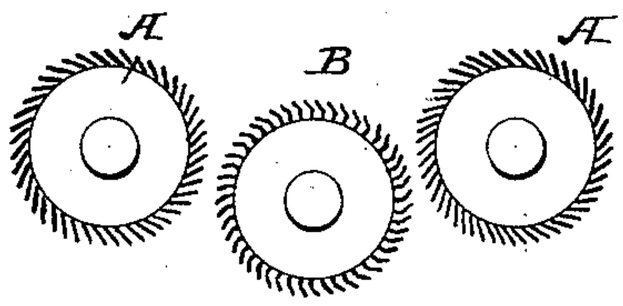

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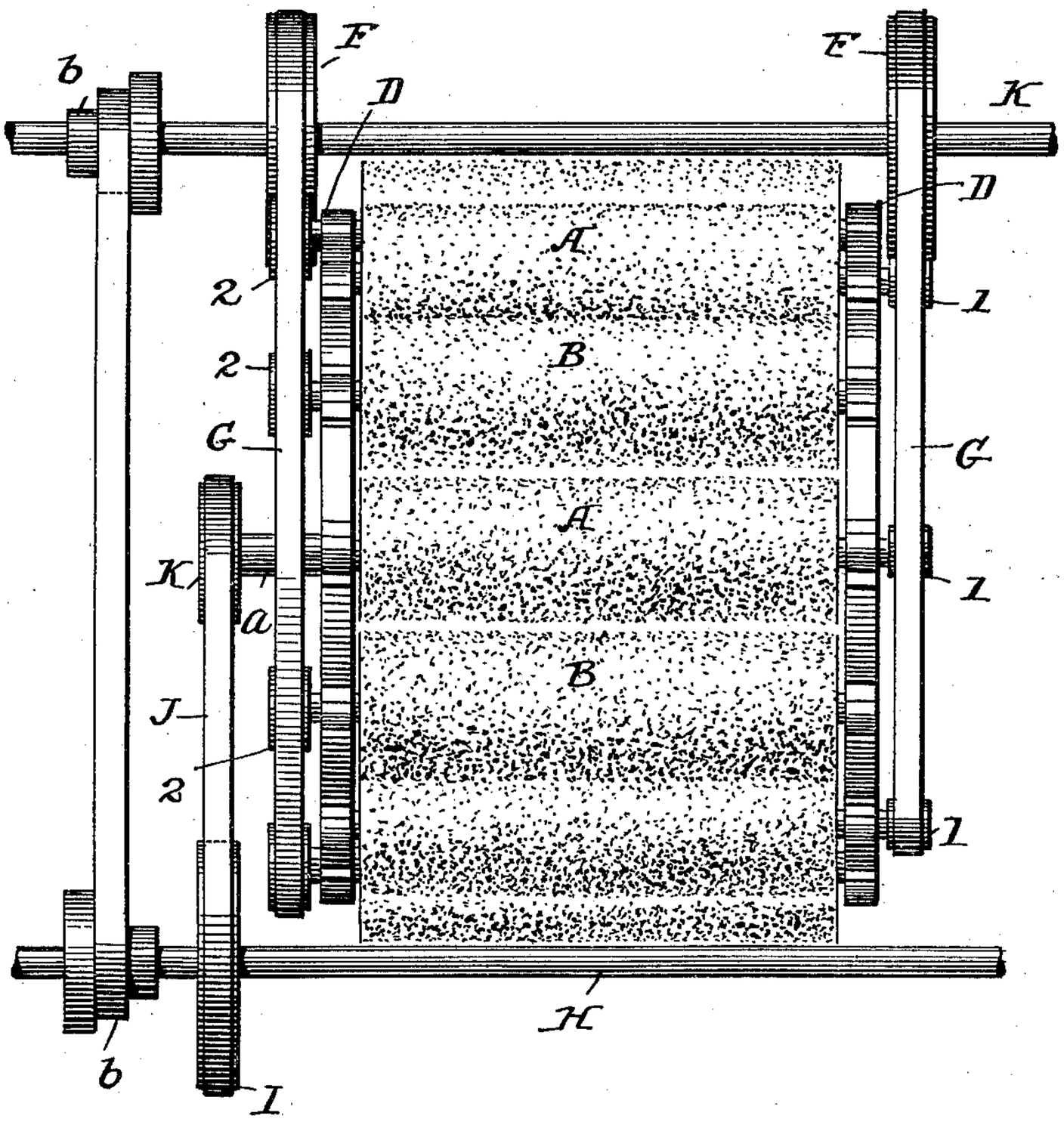
Fig. 2.



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UNITED STATES PATENT OFFICE.

JOSEPH HENRY STONE, OF NORTH ANDOVER, MASSACHUSETTS, ASSIGNOR TO AMERICAN NAPPING MACHINE COMPANY, OF WILLIAMSTOWN, MASSACHUSETTS.

NAPPING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 671,457, dated April 9, 1901.

Application filed February 13, 1901. Serial No. 47,141. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH HENRY STONE, a citizen of the United States, residing at North Andover, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Napping-Machines, of which the following is a specification.

My invention relates to napping-machines; and it consists in providing a rotating head with napping-rolls covered with cards or teazels, whose points are all in a backward direction with reference to the direction of movement of the rotating head, and with means for so relatively driving the rolls that one set will act with and the other against the nap, together with means for cleaning the rolls, as fully set forth hereinafter and as illustrated in the accompanying drawings, in which—

Figure 1 is a sectional elevation of sufficient of a napping-machine to illustrate my improvement. Fig. 2 is a view looking in the direction of the arrow *e*, Fig. 1, the cleaner-rolls omitted; Fig. 3, an end view of three rolls upon the head, illustrating a modification.

The napping-head D is suitably mounted upon a shaft *a*, having its bearings in a frame of any suitable character and carrying a pulley K, from which a driving-belt J passes from a pulley I on a main driving-shaft H, rotating in the direction of its arrow, and whereby rotation in the direction of its arrow is imparted to the head D.

Upon the head are carried the napping-rolls A B, provided with teazels or card-clothing having the teeth inclined in the same backward direction. The rolls may be driven part in one direction and part in the opposite direction, or all of the rolls may be driven in a backward direction with reference to direction of movement of the rotating head, but at different rates of speed, always, however, so that some of the napping-rolls act with the nap and some act against the nap, which is novel in connection with rolls all having teeth inclined in a direction the reverse of the head. The proportion of rolls working with and those working against the nap may be varied as desired, and they may be arranged alternately or otherwise, as may be most advisable. In Fig. 1, however, the rolls are all rotated in a direction the reverse of that in which the head D turns; but the napping-rolls A are driven at such a speed in the direction of their arrows in respect to the speed of rotation of the head and travel of the cloth as to effect a picking action upon the cloth—that is, these rolls travel with the nap, while the rolls B, while turning in the same direction, do not exceed the speed of travel of the head, so that they act against the nap—that is, they travel over the face of the cloth in such a manner as to effect a sort of brushing action, which it has been found tends to impart a better finish to the cloth than would be otherwise secured, and they further serve to keep the cloth taut.

The two series of rolls may have the proper movements imparted to them in any desired manner. For instance, the shaft of each roll may be provided with a pulley, the pulleys 1 on the rolls A being less in diameter than the pulleys 2 on the rolls B, and a belt G may pass around each series of pulleys from a belt-wheel F on a counter-shaft K, driven from the shaft H by a belt or otherwise. This arrangement, however, is only specified as one means whereby the desired movements may be secured, and the belt L between the two shafts H and K may be carried by reverse cone-pulleys *b b* and may be used open or crossed, so as to secure any desired given speeds and different directions of movement.

In order to effectively clean the rollers, I make use of any suitable cleaning device—as, for instance, rollers M N may be used, one outside and the other inside the drum, and which movement is imparted in any suitable manner, each cleaning-roll operating on all of the rollers, which is practicable, as the points of the teeth in all of the rollers extend in the same direction. However, in case part of the napping-rollers are journaled at a greater distance from the drum-shaft than the other part it is evident that either cleaning device will intersect with but a part of the napper-rollers unless there is a difference in their diameters. If desired, however, but a single cleaning-roll may be used.

While I have stated that the teeth of the two series of rolls point in the same direction,

they are not necessarily inclined at the same angle, (though they may be,) and one may be bent and the other straight, as indicated in Fig. 3. The pulleys on the rolls may be of the same size, but driven from pulleys of different sizes on the shaft F or from two separate counter-shafts, thus securing the desired different speed ratios of the rolls working with and against the nap.

The cloth may be conducted through the machine in any suitable manner and at any desired speed and in either direction, so as to properly coöperate with the napping-head.

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

1. A napping-machine provided with a rotating head, napping-rolls carried thereby and all having their teeth pointed in a direction the reverse of that in which the head rotates, and means for imparting different movements to different rolls to cause some to work against the nap and others with the nap, substantially as set forth.

2. The combination with a rotating head and with rolls carried thereby and all having teeth pointed in the direction opposite to the direction of rotation of the head, of means whereby all of the rolls are rotated in a direction the reverse of that of the head, but a part of the rolls at a greater speed than that of the other, substantially as set forth.

3. The combination of a rotating head, a series of rolls carried thereby and means for rotating them at a speed the reverse of and greater than that of the head, and another series of rolls and means for rotating them at a speed less than that of the head but in the same direction as the other rolls, the teeth of all the rolls pointing in a direction the reverse of the movement of the head, substantially as set forth.

4. The combination of the rotating head, rolls having their teeth pointed in a direction the reverse of that of the rotation of that of the head, means for driving a part of the rolls to act with and the other part against the nap but all in the same direction, and a cleaning device or cleaning devices for cleaning the teeth of all the napping-rolls, substantially as set forth.

5. The combination of the rotating head, rolls having their teeth pointed in a direction the reverse of that of the rotation of that of the head, means for driving a part of the rolls to act with the nap, the other part against the nap but all in the same direction and a cleaning device outside and a second cleaning device within the head, substantially as set forth.

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

JOSEPH HENRY STONE.

Witnesses:

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