No. 787,095. PATENTED APR. 11, 1905.

H. S. GREENE.

NAPPING MACHINE.

APPLICATION FILED AUG. 26, 1904.

Fig. 1.

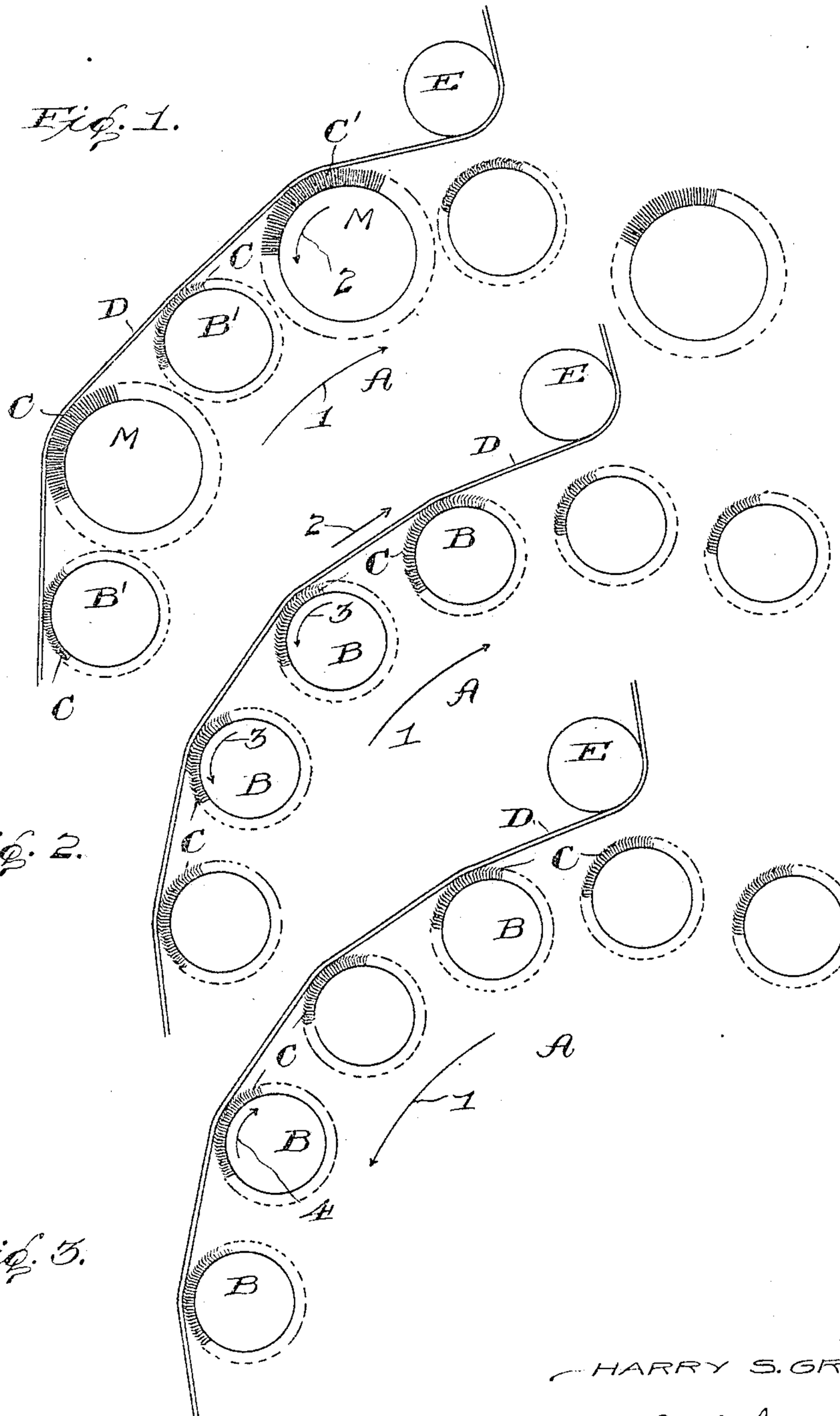

Fig. 2.

Fig. 3.

Witnesses

J. L. Mockabee

J. J. Sheehy jr.

Inventor

HARRY S. GREENE.

By James J. Sheehy

Attorney

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UNITED STATES PATENT OFFICE.

HARRY S. GREENE, OF WOONSOCKET, RHODE ISLAND.

NAPPING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 787,095, dated April 11, 1905.

Application filed August 26, 1904. Serial No. 222,293.

To all whom it may concern:

Be it known that I, HARRY S. GREENE, a citizen of the United States, residing at Woonsocket, in the county of Providence and State of Rhode Island, have invented new and useful Improvements in Napping-Machines, of which the following is a specification.

My invention has relation to the napping of cloth; and it contemplates the provision of a planetary napping-machine in which the napping-rollers are so arranged relative to other rollers as to assure a gentle and mild action against the cloth and the production of the desirable short, curly, and thick nap thereon.

The invention will be fully understood from the following description and claims when taken in connection with the accompanying drawings, forming part of this specification, in which—

Figure 1 is a view of so much of the drum of a planetary napping-machine as is necessary to illustrate the arrangement of the napping-rollers relative to other rollers in accordance with my invention. Fig. 2 is a view similar to Fig. 1, illustrating an ordinary and well-known arrangement of napping-rollers on the drum of a planetary napping-machine; and Fig. 3 is a similar view illustrating another and well-known arrangement of napping-rollers on the drum of a planetary napping-machine.

For the sake of clearness I will first describe the construction shown in Figs. 2 and 3 and the different modes of operating the same and then point out wherein lies the novelty and utility of the construction shown in Fig. 1. Referring, therefore, by letter to Figs. 2 and 3, A is the drum of a napping-machine. B B are napping-rollers carried by the drum and provided on their perimeters with the usual teeth C. D is the cloth to be napped, and E the usual roller for guiding the cloth.

In Fig. 2 the drum A is assumed to rotate in the direction indicated by the arrow No. 1, for if it rotated in the direction opposite to that indicated by the said arrow no result would be obtained on the material D, which is moved in the direction indicated by the arrow No. 2, this because the energy of the drum would be exerted on the heels of the teeth C. If, however, the drum A were rotated in the direction indicated by the arrow No. 1 and the rollers B were fixed against rotation in the drum, the drum would act after the manner of a large rotary brush covered with hooked wire—*i. e.*, the teeth C would catch in the cloth and tear and spoil the same. For this reason the rollers B have been rotated on their axes in the direction indicated by the arrows No. 3 incident to the rotation of the drum in the direction indicated by the arrow No. 1, this speeding of the rollers on their axes contrary to the general motion of the drum having for its purpose to minimize the forward brush of the cylinder and to conduce to the production of a mild action upon the material. While this result is obtained, it will be apparent that the napping is effected by the action of the drum and that because of the long sweep of the drum a long, hairy, and shaggy nap is formed on the material and not the preferable short, curly, and thick nap.

In Fig. 3 the drum A is assumed to rotate in the direction indicated by the arrow No. 1, and hence it follows that if any action is to be obtained on the cloth by the teeth of the napping-rollers B it must be effected not through the sweep or brush of the drum, as in Fig. 2, but by rotating the rollers B in the direction indicated by the arrows No. 4—*i. e.*, in the direction opposite to the general motion of the drum—and sufficiently to overcome the brush motion of the heels of the wires or teeth C. When the rollers B are thus rotated on their axes in the drum A, the teeth C make sharp quick turns in the cloth and exert downward pulls from the same, thereby producing a short, thick, and curly nap. It will be noted, however, that while the mode of operation just ascribed to Fig. 3 effects the production of a short, thick, and curly nap it lacks the mild action of the mode of operation ascribed to Fig. 2 and is objectionable because the quick and energetic downward pull of the teeth C, due to the rotation of the drum A and rollers B in the directions indicated in Fig. 3, tends to disintegrate or fracture and injure the cloth being napped.

In accordance with my invention which is shown in Fig. 1 napping-rollers B′ are mount-

ed in the drum A, between other rollers M, and are covered with the conventional napping wire or teeth C or are provided with other means compatible with the purposes of my invention for napping cloth. The rollers M may be plain rollers or may be provided with card-wire C′, as shown, or with sandpaper, perforated sheet metal, or any other suitable material that will enable them to frictionally engage the cloth.

The drum A, Fig. 1, is assumed to rotate in the direction indicated by the arrow No. 1, and the rollers B′ M are assumed to rotate in the direction indicated by the arrow No. 2. With this understanding it will be observed that the rollers M, which are larger in diameter than the rollers B′, in about the proportion shown, and have their axes disposed in the same circle as the axes of said rollers B′, cause the cloth D to form tangents with respect to the rollers B′; also, that the said rollers M tend to lift the cloth from the rollers B′, or, in other words, tend to hold the cloth away from the perimeters of the said rollers B′. From this it follows that while the rollers B′ rotating in one direction engage with the cloth, because of the motion of the drum in the opposite direction (indicated by arrow No. 1) the rollers M lift the cloth from the teeth of said rollers B′ immediately after said teeth pick into the cloth. In this way the mildness of action ascribed to the construction and mode of operation indicated in Fig. 2 is attained, and yet a short, curly, and thick nap is produced on the cloth without the objections heretofore stated to be possessed by the construction and mode of operation indicated in Fig. 3.

The rollers M and B′ may be, and preferably are, so relatively positioned as to cause the cloth to be napped to extend in straight lines past the rollers B′ after the manner shown at the extreme left of Fig. 1, though they might be so positioned that the cloth is slightly deflected outwardly when engaged by the rollers B′, as also shown in Fig. 1, without involving a departure from the scope of my invention.

The important feature in my invention is the comparatively large diameter of the rollers M, for it will be apparent that said rollers, because of their comparatively large diameter, will tend to retard the passage of the cloth and in that way assure the cloth being lifted from the teeth of the rollers B′ for the purpose stated.

In the constructions shown in Figs. 1 to 3 the rollers carried by the drum may be, and preferably are, rotated by power transmitted and regulated from without the drum. I desire it understood, however, that in my novel construction shown in Fig. 1 the rollers B′ and M may be rotated by any suitable means without involving a departure from the scope of my invention.

It will be readily appreciated from the foregoing that my novel and advantageous construction, Fig. 1, is quite as simple and inexpensive as the ordinary construction, Figs. 2 and 3, and is quite as durable and easy to keep in repair.

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

1. In a napping-machine, a drum arranged to turn in one direction and equipped with napping-rollers and also with rollers of comparatively large diameter arranged to turn in the opposite direction; all the rollers being arranged with their axes in a common circle, and the comparatively large rollers alternating with the napping-rollers and having perimeters adapted to frictionally engage cloth.

2. In a napping-machine, the combination of a drum arranged to turn in one direction, napping-rollers mounted in the drum and arranged to turn in the opposite direction and having hooked teeth on their perimeters, the outer ends of which are disposed in the opposite direction, with reference to the direction of rotation of the rollers, and rollers of comparatively large diameter also mounted in the drum; all of the rollers being arranged with their axes in a common circle, and the comparatively large rollers alternating with the napping-rollers.

3. In a napping-machine, the combination of a drum arranged to turn in one direction, napping-rollers mounted in the drum and arranged to turn in the opposite direction and having hooked teeth on their perimeters, the outer ends of which are disposed in the opposite direction, with reference to the direction of rotation of the rollers, and rollers of comparatively large diameter also mounted in the drum and having card-wire on their perimeters; all of the rollers being arranged with their axes in a common circle, and the comparatively large rollers alternating with the napping-rollers.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HARRY S. GREENE.

Witnesses:
EDGAR L. SPAULDING,
GEO. W. SPAULDING.