

(No Model.)

H. N. GROSSELIN.
GIG MILL.

No. 536,516.

Patented Mar. 26, 1895.

Fig. 1.

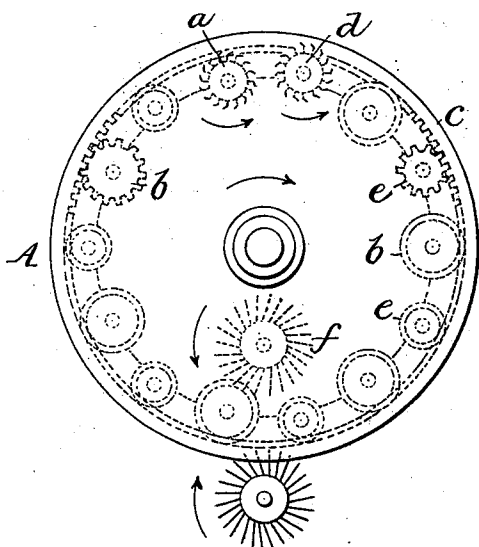


Fig. 3.

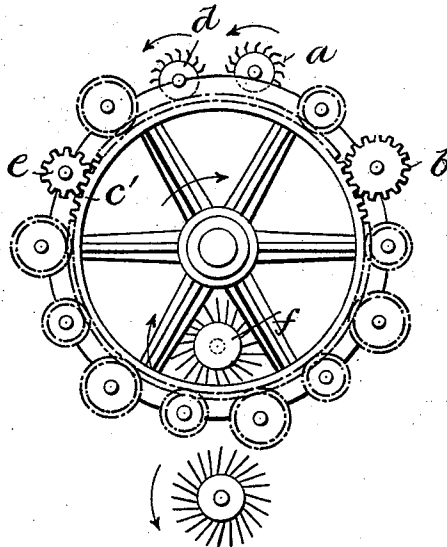


Fig. 2.

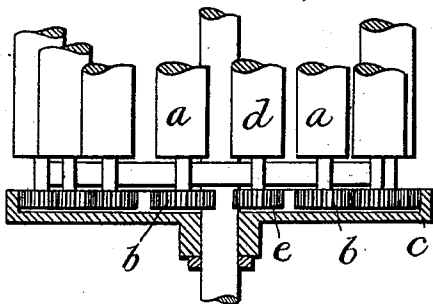
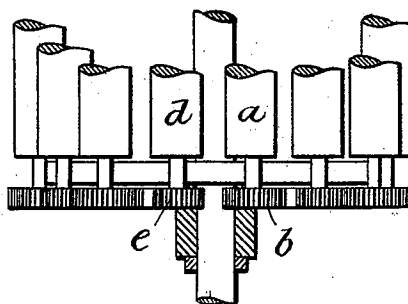


Fig. 4.



Witnesses
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UNITED STATES PATENT OFFICE.

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

GIG-MILL.

SPECIFICATION forming part of Letters Patent No. 536,516, dated March 26, 1895.

Application filed January 8, 1891. Serial No. 377,190. (No model.) Patented in France May 30, 1890, No. 206,004; in Germany June 10, 1890, No. 65,078, and in England December 6, 1890, No. 19,929.

To all whom it may concern:

Be it known that I, HENRY NICOLAS GROSSELIN, of Sedan, Ardennes, France, have invented certain new and useful Improvements in Gig-Mills, of which the following is a specification.

This invention which was patented in France May 30, 1890, No. 206,004, and in Germany June 10, 1890, No. 65,078, and in the British Patent No. 19,929, of December 6, 1890, has reference to gig mills in which a series of working or teaseling rollers of variable energy are arranged around a single drum with teeth pointed some in the reverse direction to the others so as to produce a simultaneous teaseling or dressing of the cloth in both directions, that is to say in the direction of the nap and against the nap, the said rollers all turning in the same direction but at different speeds, these speeds being capable of being varied at will according to the degree of working energy which it is desired to obtain.

In the accompanying drawings—Figure 1, is an end elevation illustrating sufficient of the drum, rollers and adjacent parts of a napping machine to exemplify my invention. Fig. 2, is a plan in part section of the parts shown in Fig. 1. Figs. 3 and 4 are an end elevation and plan view showing the drum, rollers and adjacent parts illustrating a different arrangement of gear.

The novel construction of the description of gig mills which forms the subject of the present invention enables me to effect a simultaneous teaseling or dressing in the direction of the nap and against the nap with one drum A turning in one direction and carrying a series of napping rollers revolving round the common center, the axis of the drum and of varying the degree of working energy of the cards *a*, *d*, as required by mechanism which differs from and is better than that which has hitherto been employed. In the new construction I utilize the power of adhesion which the cards of the rollers which work the cloth in one way possess in order to regulate the movement or rather the speed of rotation of the rollers which work the

cloth in the opposite direction by connecting the two sets of rollers by an arrangement of toothed wheels of different diameters or by other equivalent mechanical means. In this manner the first set of rollers, *a*, that with the card teeth turned forward, that is to say in the direction of the drum's rotation, will communicate the movement to the second set of rollers, *d*, that with the card teeth turned backward, that is to say in the direction opposite to the rotation of the drum. All these rollers turn in the same direction that is to say in the direction opposite to the rotation of the drum. In order to produce a useful effect it is necessary that the speed of rotation of the rollers which act with the nap should be less than that of the rollers which act against the nap. The energy or useful effect will increase in proportion to the difference between the speeds of the two sets of rollers. The rollers *a*, acting with the nap and driven by the cloth will therefore communicate a more or less accelerated movement to the rollers *d* which act against the nap. This is effected by the teeth of the rollers *a*, engaging the cloth as the drum revolves so that said rollers *a*, are thereby turned as they travel on the cloth and being geared with the rollers *d*, the said rollers *a*, turn or drive the rollers *d*.

The two sets of rollers *a* and *d* being connected together by wheels and pinions it will be understood that it suffices to modify the relation between the diameters of the wheels which drive one set of rollers and the diameters of the wheels which drive the other set of rollers in order to produce differences of speed between the two sets, differences which are translated by a greater resistance to the turning of the rollers and consequently by an increase of their working energy. Various mechanical means may be adopted for attaining the desired result, these means differing only in the arrangement of their parts.

Supposing, (see Figs. 1 and 2) that each of the rollers *a*, acting with the nap carries at its end a pinion *b*, of a diameter equal to the diameter of the roller reckoned at the exterior of the card, all the pinions of the seven rollers acting with the nap (supposing the drum to

have fourteen rollers) will gear with an internally toothed wheel *c*. Each of these seven other rollers *d*, those acting against the nap carries at its end at the same side of the drum, a toothed wheel *e* of a diameter differing from the preceding that is to say smaller, and gearing with the same internally toothed wheel. The result is that as all the rollers will develop within the toothed wheel an equal circumferential speed those which have smaller pinions will revolve more quickly than the others. As the two sets are connected together there will be a slipping or friction on the cloth to be teaseled or dressed which will be equally exerted in the two sets of rollers and which will be the more considerable as the difference between the pinions is the greater. Supposing all the rollers *a*, acting with the nap have pinions *b*, of twenty-five teeth and all the rollers *d*, acting against the nap have pinions *e*, of twenty teeth, there will be a difference of one-fifth between the speeds of the two sets of rollers. As the effect or slip of the cards on the cloth is equally distributed between the two sets, each of them will have a useful effect of one-tenth, that is to say ten per cent. of the distance traveled by the circumference of the drum. This first arrangement is very simple. It allows of constructing at a small cost a practical gig mill of great useful effect and very suitable for manufacturers who have always cloth of the same nature to teasele or dress, as is often the case in woolen factories.

As it is often necessary to change the energy of the rollers so as to be able to utilize the same machine for dressing cloths of different strength and resistance it is useful to be able to modify at will the relation between the speeds of the two sets of rollers. While preserving the first arrangement above described it is sufficient to substitute for the pinions *a*, of twenty-five teeth of the rollers acting with the nap other pinions of twenty-six or twenty-seven teeth which may be done without changing the other parts or altering the positions of the shafts in order to obtain a corresponding accelerated speed in the set of rollers acting against the nap. If in this same set the pinions of twenty teeth are changed for others of nineteen or eighteen teeth the difference will increase progressively and the working energy will be more and more considerable. Experience shows that without changing the internally toothed wheel the pinions of twenty-five teeth of the rollers acting with the nap can without inconvenience be replaced by others of twenty-six, twenty-seven or even twenty-eight teeth. Similarly the pinions of the rollers acting against the nap can be replaced by others of nineteen, eighteen or seventeen teeth. There can thus be obtained six different degrees of energy, and in practice this amount of variation is, broadly speaking, sufficient

to allow of dressing the large majority of cloths.

In some gig mills working both with and against the nap on the same drum as hitherto constructed the axes of the two sets of rollers are at an unequal distance from the center so as to allow of cleaning or stripping the cards. The application of the mechanism above described is therefore the more easy as the rollers acting against the nap which are the further from the axis of the drum, have to receive the pinions of smaller diameter.

The mechanism which I have above described and which relates to the use of an internally toothed wheel is equally applicable if externally toothed wheels are employed. In this latter case, see Figs. 3 and 4, some modifications have to be made in the construction if it is wished to use a single externally toothed wheel *c'* with which gear all the pinions of the two sets of rollers. It will be necessary to invert the position of the two sets, that is to say to place in the bearings which are farther from the center the rollers *a* acting with the nap, that is to say those which have the card points forward, and place the rollers *d* acting against the nap in the bearings which are nearer the center of the drum. At the same time the direction of rotation of the internal stripper *f*, should be changed.

What I claim, and desire to secure by Letters Patent, is—

1. The combination of a drum, two sets of napping rolls carried thereby provided with gears of different diameters, and a gear engaging those of all the rolls, substantially as described.

2. The combination of a drum, two series of napping rollers carried thereby, one series with teeth arranged to act with the nap and the others with teeth to act against the nap, and gearing between the two series of rollers, the said gearing being proportioned and arranged, substantially as described, to rotate one series of rolls at a different speed from the other, for the purpose set forth.

3. In a gig mill a drum carrying two sets of rollers *a*, *b*, with reversed teeth, those of the rollers *a*, turning in the direction of the drum's rotation and each roller shaft provided with a pinion, the pinions of the rollers *a*, being larger in diameter than those of the rollers *d*, and intermediate gears or connections between the two series of pinions whereby the movements of the rollers *a*, are transmitted at a different speed to the rollers *d*, substantially as set forth.

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

HENRY NICOLAS GROSSELIN.

Witnesses:

ROBT. M. HOOPER,
ALPHONSE GRÜNFELDER.