L. SMITH.

WOOL-COMBING MACHINE.

No. 192,352. Patented June 26, 1877.

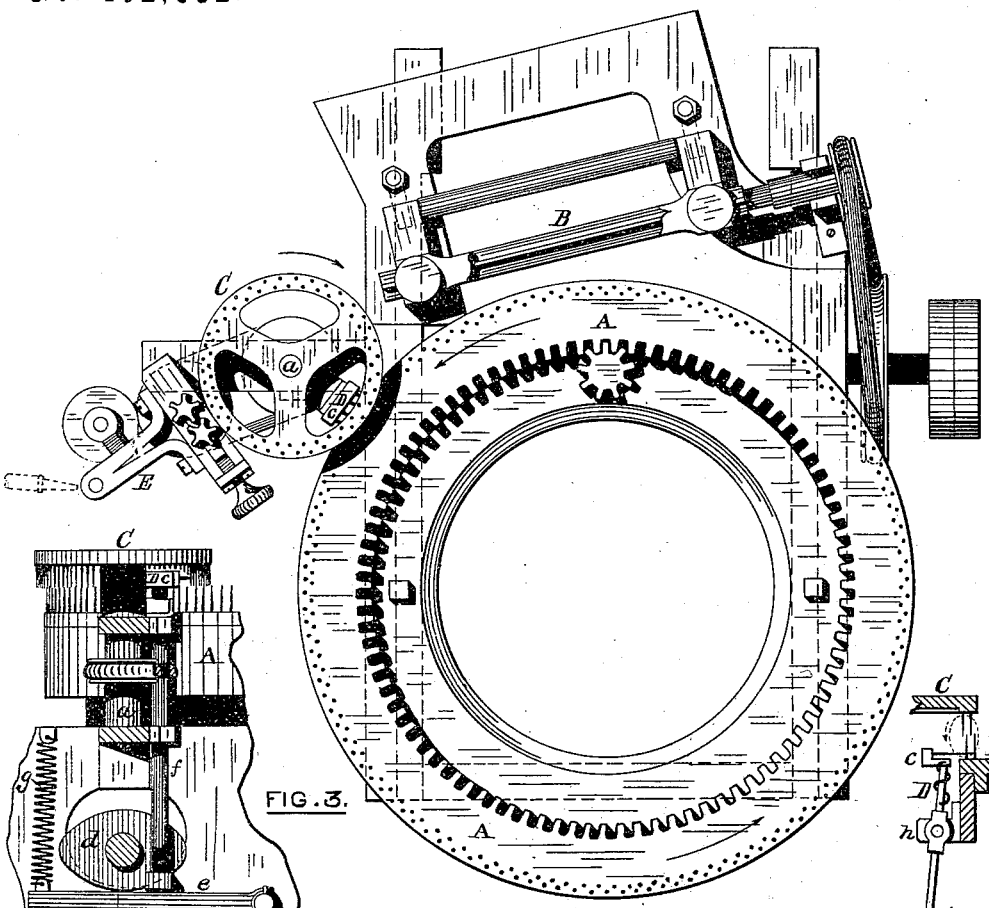

FIG. 1.

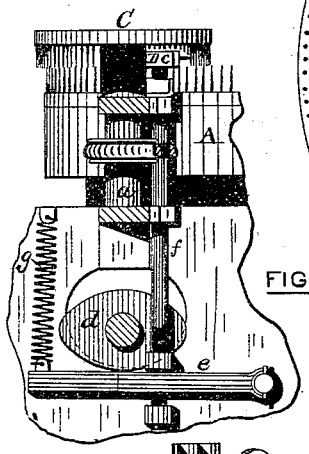

FIG. 3.

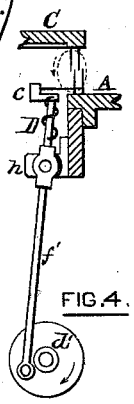

FIG. 4.

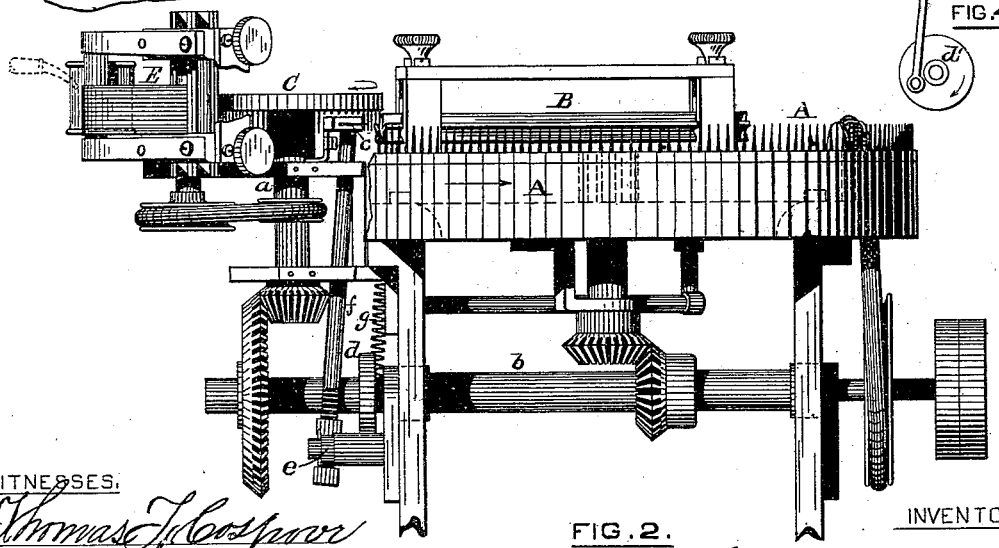

FIG. 2.

WITNESSES.

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LEONARD SMITH, OF BRADFORD, ENGLAND.

IMPROVEMENT IN WOOL-COMBING MACHINES.

Specification forming part of Letters Patent No. **192,352**, dated June 26, 1877; application filed March 15, 1877.

To all whom it may concern:

Be it known that I, LEONARD SMITH, of the city of Bradford, England, have invented certain new and useful Improvements in Wool-Combing Machines; and I do hereby declare that the following specification, taken in connection with the drawings forming a part of the same, is a clear, true, and complete description thereof.

My invention consists, in part, of the combination, with suitable combing and "drawing-off" mechanism, of an auxiliary comb and a transferring-comb or "lifter," whereby the "noil" remaining on the main comb is transferred to the auxiliary comb, and the long wool remaining in the noil presented in a position convenient for its removal.

My invention further consists in the combination, with the main combing mechanism and the main drawing-off mechanism, of an auxiliary comb, a transferring-comb, and an auxiliary drawing-off mechanism, whereby the noil is transferred from the main comb to the auxiliary comb, and the long wool withdrawn therefrom.

To more particularly describe my invention I will refer to the accompanying drawings, in which—

Figure 1 represents, in top view, so much of a well-known type of combing-machine with my improvements attached as is desirable for illustrating my invention. Fig. 2 represents the same in end view, with a portion of the main comb cut away. Fig. 3 represents, in elevation, a portion of the transferring mechanism in detail. Fig. 4 represents similar transferring mechanism involving a modification of the operative details.

The machine shown in the drawings has a circular comb, as at A, which is rotated in the usual manner. The drawing-off mechanism, as at B, contains no novel features. No specific description of these portions of the machine is required for the purpose of this specification, because my improvements result in the withdrawal of the long wool remaining in the noil on the main comb after the usual combing operations, and the drawing off of the main portion of the long wool, and therefore any practicable combing and drawing-off mechanism may be profitably employed in combination with the additional mechanism, hereinafter described, in accordance with my invention.

It will be understood that the main comb A revolves in the direction indicated by the arrow thereon, and that the teeth thereof, as they approach the drawing-off mechanism at B, are laden with wool, and that, after the teeth have passed that point, they carry only the noils and such extraneous matter as remain in the wool, together with the long wool which the drawing-off mechanism has failed to control and withdraw.

The frame of the machine adjacent to the side on which the partially-stripped teeth are traveling is so constructed that it supports the novel mechanism which, in combination, embodies the main feature of my invention, and power for operating it may be derived from any of the adjacent shafting of the machine, as may be deemed most convenient. C denotes an auxiliary comb. In this instance it is circular in form, and, when employed with a circular main comb of about four feet in diameter, it is preferably about sixteen inches in diameter. This auxiliary comb overhangs the main comb at one portion of its periphery. It revolves in a plane parallel with that of the main comb. At the point of overhanging its teeth move in the same direction as the teeth of the main comb, and at the same speed. The teeth of the auxiliary and main combs are parallel with each other, and their points, although closely adjacent, do not engage with each other, so that the noil remaining on the teeth of the main comb may be lifted and transferred directly to the teeth of the auxiliary comb while both combs are revolving. The teeth of the auxiliary comb are similar to those on the main comb, and may be arranged in one or two rows with but little variation in results, although I prefer, generally, flat strong teeth set in a single row, with about thirteen teeth to the inch. Although good results are attainable without heating the auxiliary comb, it is desirable so to do in some cases, and steam or burning gas may be employed for that purpose.

As shown in the drawings, the auxiliary

comb C is mounted on the vertical shaft *a*, which is in this instance driven by gearing, properly speeded, from the main driving-shaft of the machine, as at *b*. (Shown in Fig. 2.)

It will be readily seen that the comb C may be hollow, steam-tight, and provided with an axial steam-pipe connection at its upper side for the introduction of steam, and that the shaft on which it is mounted may be provided with a small axial opening for the discharge of water resulting from condensation, and thus secure any desired degree of heat for the comb.

D denotes an automatic transferring-comb or lifter, which transfers the noil from the teeth of the main comb to the auxiliary comb. The head of the lifter is shown at *c*. It is provided with teeth, which project horizontally toward the teeth of the comb C, which overhang the teeth of the main comb.

Various mechanical devices may be employed for imparting to the lifter the requisite movement, and the head of the lifter may also be variously constructed. It is only requisite that the lifter have the capacity to project its teeth sufficiently to properly engage with the noil in the main comb, and lift it therefrom into the auxiliary comb and leave it there, the main and auxiliary combs being meanwhile in motion.

In Fig. 3 the lifter is shown to be actuated be a cam at *d* on the main shaft *b*, a lever, *e*, to which the lifter-rod *f* is attached, and a spring, *g*, attached to the lever. In operation, the cam, by contact with the upper surface of the lever, induces a downward movement of the lifter, and the spring induces the return or upward movement.

In Fig. 4 the lifter is mounted on its rod, as in Fig. 3; but the lower end of its rod *f'* is connected with a crank-plate, *d'*, and this rod slides in a swiveled guide, as at *h*, so that as the crank-plate revolves the lifter-head is made to move in a circular line in a vertical plane, during which movement it advances with its teeth toward and among the teeth of the main comb, at their bases, into or below the noil, thence upward until the noil is fully engaged with the teeth of the auxiliary comb, thence backward, leaving the noil, thence downward and forward as before, and so on, repeating these movements in regular and continuous succession. The lifter-head, as its teeth mesh with those of the combs, should be capable of an axial movement on its rod, so that as the combs revolve the lifter may continue in its engagement with their teeth, and therefore said head is mounted so that it can partially revolve on its rod *f'* with either of the two combs, when its teeth are meshed therewith, and in order that it may resume its normal position, when freed from the combs, a small spiral or other spring is employed.

I have termed the transferring-comb D a "lifter," because it lifts the noil from one comb to another in that class of machines in which the noil is carried on a comb having teeth which project upward. It will be obvious, however, if the noil be carried on a main comb, having teeth which point downward, that the teeth of the auxiliary comb should project upward, in which case the lifter would have a series of movements reversed from the order described, so that it could transfer the noil from the main to the auxiliary comb by a downward movement.

E denotes an auxiliary drawing-off mechanism, which, by means of its rolls and apron, takes only the long wool from the noil, which is carried by the auxiliary comb, and delivers it in suitable condition for recarding or recombing, as may be desired. I prefer that the apron and rolls be set vertically, and the latter be so set with relation to the teeth of comb C that they will engage only with the long wool in the noil. A blow-pipe, with its nozzle pointing downward adjacent to the drawing-apron near the rear of the rolls, as indicated in dotted lines in Figs. 1 and 2, will blow the wool from the apron downward into a can placed to receive it.

It is to be understood that the noil is removed from the auxiliary comb by mechanism which is well known and commonly employed for removing the noil from the ordinary combs—as, for instance, in the Lister machine—but no such mechanism is shown in the drawings.

The operation of a machine provided with my improvements is as follows: The wool is fed to and the main portion of the long staple drawn from the main comb by any suitable mechanism. After the teeth of the main comb have passed the drawing-off mechanism most of the long wool projecting from the front side of the comb has been removed. On the opposite or rear side of the teeth, however, there is in the noil considerable long wool which projects inwardly, and it will be seen, when the noil is transferred to the auxiliary comb, that these long fibers of wool project outwardly therefrom, and are in a position which enables the rolls to engage with and draw them from the noil. The short wool in the noil is, of course, finer than the long wool, and the separation of the long from the short, not only results in a desirable uniformity of fineness in the noil, but also in a practical uniformity in the length of the wool composing it. The noil is therefore better fitted for the uses to which such wool is applied, and the long wool removed therefrom by reason of my invention is rendered available for those uses in which a long staple is a desirable feature.

I do not limit my invention to any precise construction of the mechanism shown and described; but

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

1. In a wool-combing machine, the combination, with the main combing mechanism and the main drawing-off mechanism, of an auxiliary comb and a transferring-comb or

lifter, substantially as described, whereby the noil remaining in the main comb is transferred to the auxiliary comb, with the long wool thereof in a position for its ready removal from the noil, as set forth.

2. The combination, with the main combing and the main drawing-off mechanism, of an auxiliary comb, a transferring-comb or lifter, and an auxiliary drawing-off mechanism, substantially as described, whereby the noil is transferred from the main comb to the auxiliary comb, and the long wool removed from the noil, as set forth.

LEONARD SMITH.

Witnesses:
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