

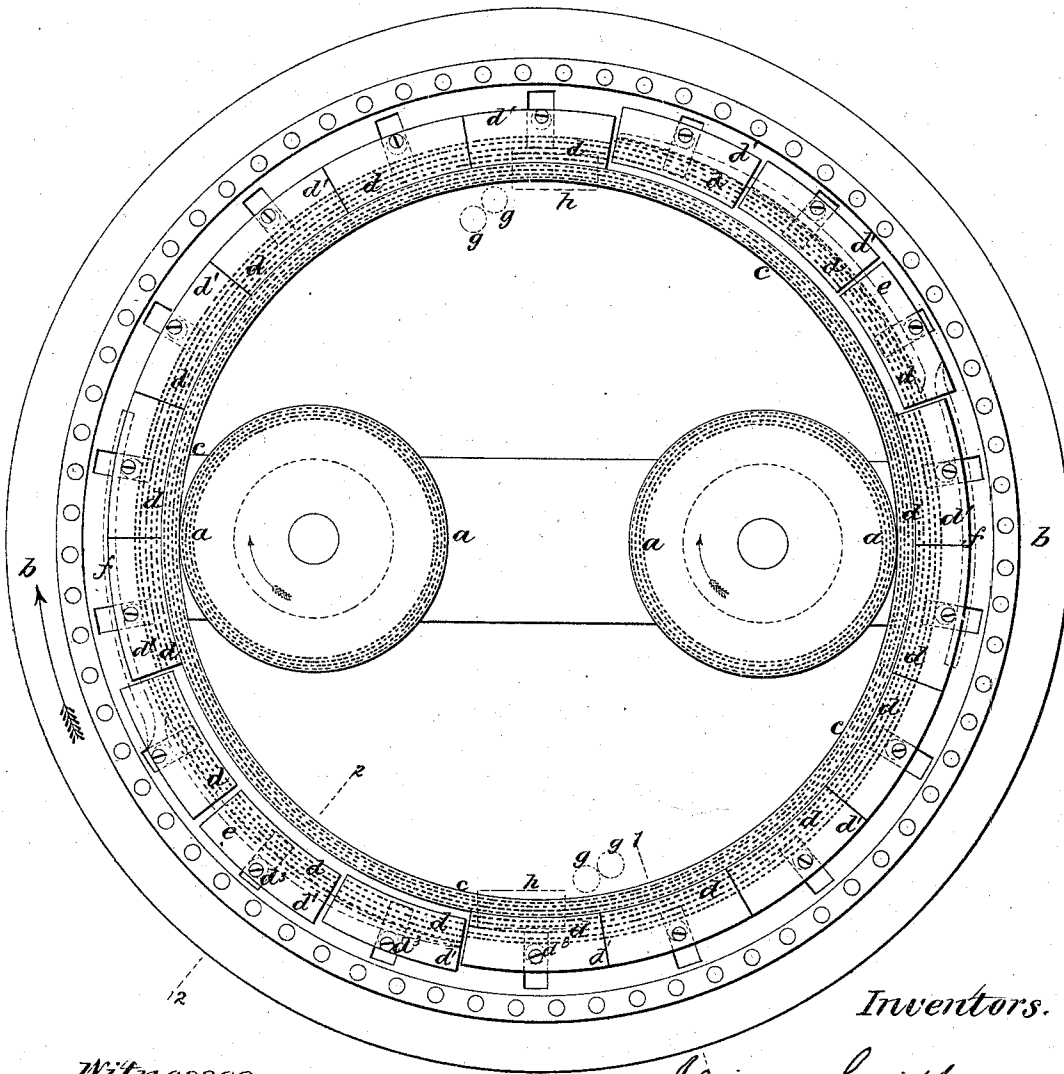
I. B. & H. SMITH & C. BRADLEY.

Combing-Machines.

No. 137,326.

Patented April 1, 1873.

Fig. 1.



Inventors.

Witnesses.

*Alfred Baker Moorhouse.
James Louett.*

*Isaac Smith.
Benjamin Smith.
Henry Smith.
Christopher Bradley.*

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Fig. 2.

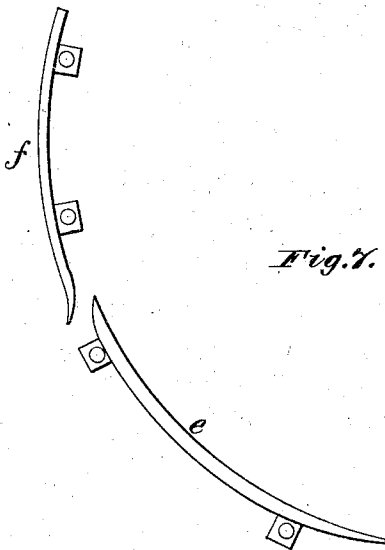
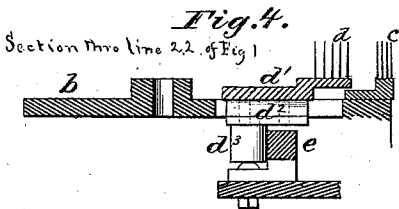
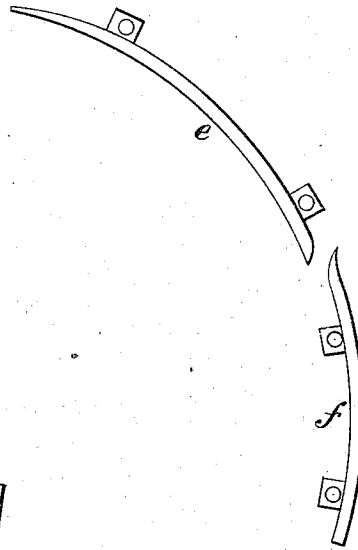
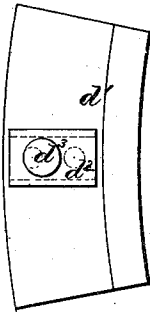


Fig. 7.



Section thro line 11 of Fig 1

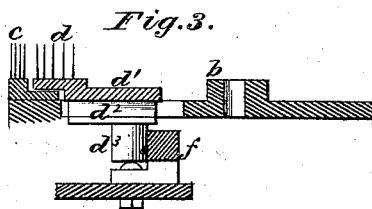


Fig. 6.

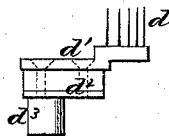
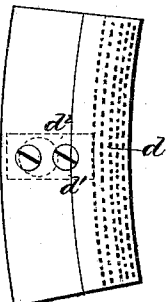


Fig. 5.



Witnesses.

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Inventors.

Isaac Smith.
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UNITED STATES PATENT OFFICE.

ISAAC SMITH, BENJAMIN SMITH, HENRY SMITH, AND CHRISTOPHER
BRADLEY, OF BRADFORD, ENGLAND.

IMPROVEMENT IN COMBING-MACHINES.

Specification forming part of Letters Patent No. **137,326**, dated April 1, 1873; application filed
May 21, 1872.

To all whom it may concern:

Be it known that we, ISAAC SMITH, BENJAMIN SMITH, and HENRY SMITH, of Bradford, county of York, England, worsted-spinners, and CHRISTOPHER BRADLEY, of Bradford aforesaid, comb-maker, have invented Improvements in Apparatus for Combing Wool and other Fibers; and we do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon.

This invention relates to that class of combing machinery commonly known as "Noble's," wherein one, or more than one, circular comb rotates within another circular comb, and the wool to be combed is fed or supplied to the teeth or pins of these circular combs in slivers at or about the point of nearest contact of the two combs, and the receding of the teeth of one comb from those of the other as they both rotate effects the combing or cleansing operation, as is well known.

Heretofore, in the use of this class of machinery, however, it is found that in feeding or supplying the wool or other fiber under operation to the combs, as above stated, some portion of the noil or the knots, bits of dirt, or other matters that should be taken out of the fiber by the process of combing, by being placed in the space betwixt the two combs or the two circles of teeth, are not combed out by the action of the combs, but remain in the fiber when it is drawn off into the sliver. Now, to remedy this evil, we make the ring of teeth of the outer or larger comb in divisions, or in two rings concentrically, the inner ring being permanently fixed to its carrying-plate, as at present; but the outer ring being made in segments or sections, and each section being capable of sliding outward from the fixed ring to a suitable distance as they arrive at a certain position in the circuit of the comb in its revolution, when the fiber laid thereon will be combed or cleansed at that part, and the action of the machine is such that, in feeding, this cleansed part will fall on the space between the two combs.

The sliding movement in and out of the segment-combs is effected by means of a cam,

groove, or other suitable machinery, formed on the frame of the machine, and on each segment is a pin, which enters and moves in this groove, and consequently the segments are guided in their actions by the cam, groove, or other suitable means.

But that the invention may be fully understood, we will, by the aid of the accompanying drawing, proceed to describe means pursued by us in carrying the same into effect.

Description of the Drawing.

Figure 1 shows, by a plan view, parts of apparatus for combing wool, or other fiber of the character referred to, with our improvements applied to it. Figs. 2 and 3 show sections of parts of the same, taken, respectively, through the lines 1 1 and 2 2 of Fig. 1. Figs. 4, 5, 6, and 7 show details separately.

In each of the views the same letters are employed to indicate corresponding parts.

a a are two circles of comb-teeth, which, as is usual in such description of combing machinery, revolve within an outer and larger circle of comb-teeth, so that the fiber may be simultaneously laid into the teeth of both the inner and outer circles of teeth; but in carrying out our improvements, in place of the whole of the teeth of the outer or larger circle being permanently fixed to their carrying-ring or carrying-plate, so as simply to revolve with that ring or carrying-plate *b* in its rotation in the direction of the arrow, these teeth of this larger circle are divided into two rings, *c* and *d*. The teeth of the ring *c* are, as heretofore, permanently fixed to the revolving and carrying ring *b*; but the teeth of the ring *d* are set in segmental plates *d*¹, which, while they are controlled to rotate with the plate *b*, are also capable of being actuated to cause them to move radially, so that their comb-teeth *d* may move toward and from the combs *c* so as at one time to act as part of the combs *c*, as heretofore, and then to recede therefrom a short distance, to effect a partial combing or a cleansing of the part of the fiber held between these combs *c* and *d*. In order to effect this movement of the combs *d* each of the plates *d*¹ is affixed to a separate plate or "dog," *d*², and each of the plates or dogs *d*² is

formed to slide separately in slots formed radially for them in the ring *b*. This movement is, as shown, effected by each of the plates *d*² being formed with, or having applied to it, a stud; or it may be a bowl, *d*³, projecting downward, so that in the rotation of the ring *b* each stud or bowl *d*³ is first acted upon by a stationary curved bar or cam-course, *e*, affixed to the stationary part of the framing, to cause the plates *d*², with the combs *d* carried thereby, to move outward, and then, in the further progress of the ring *b*, the curved bar or cam-course *f* acts in succession on the opposite sides of these studs or bowls *d*³, to cause the plates affixed thereto, with their segments of combs *d*, to move inward again to the combs *c*, by which the combs *c* and *d* will again act, as heretofore, as one comb. The dotted circles *g g* indicate the position of the rollers for drawing fiber through the teeth of the combs *c d* in the usual way. After this drawing off from the comb *c d* has taken place by a pair of rollers, *g g*, a dabbing-brush, the position of which is indicated by the dotted lines *h*, or it may be a knife, acts to press the fiber fully into the teeth of the combs *c d*, and then, in their further movement, the bar *e* acts to cause a separation of those combs, and thereby a cleansing of the fiber held between them. When this partial combing and cleansing of fiber between the combs *c* and *d* has taken place, lifters then raise that fiber out of the teeth of both combs *c* and *d*. This lifting of the fiber out of the combs *c* and *d* is, as shown, effected at or about the point *i* by lifters or knives, as is well understood. The combs *d* then again move inward to the combs *c*, and the fiber is again laid into the combs *c* and *d*, and into the teeth of a circle, *a*, in the ordinary way when using such class of combing machinery, but with this difference, that in carrying out our improvements the portion of fiber which had

just been cleaned by the separation of the combs *c* and *d* is laid over the part between the teeth of the combs *c* and *d*, so that the noil, knots, bits of dirt, and other matters which would otherwise remain in the fiber by being left therein between the teeth of the inner or smaller circle and those of the outer or larger one, except by a second combing, have already been removed by the separation of the portions *c* and *d* of the larger circle, as explained.

We prefer that a few rows of teeth of the combs *d*, next those of the combs *c*, be of the same character and pitch as those of the combs *c*, and then that the outer rows be of a coarser pitch; but this may be varied to the quality or character of fiber under operation.

Having thus described our invention, and means which we adopt in carrying the same into effect, we would have it understood that we do not confine ourselves to the precise details shown and described, as these may be varied without departing from the peculiar character of our invention; but

What we claim is—

The improvements in apparatus for combing wool and other fibers of the character described, whereby the outer circle or ring of combs is divided into two rings, with one portion divided into segments capable of movement to and from the other, in manner and for the purposes substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

ISAAC SMITH.
BENJAMIN SMITH.
HENRY SMITH.
CHRISTOPHER BRADLEY.

Witnesses:

ALFRED BAKER MOORHOUSE,
JAMES SMITH.