

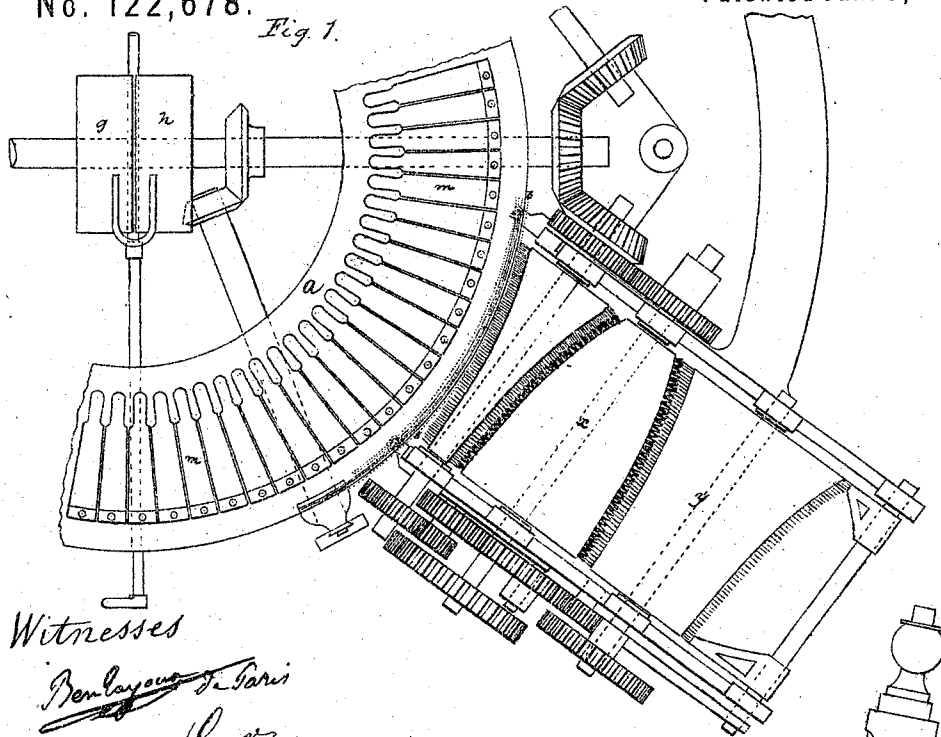
E. TAVERNIER.

5 Sheets--Sheet 1.

Improvement in Combing Machines.

No. 122,678.

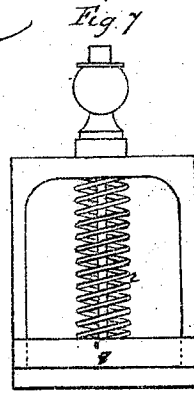
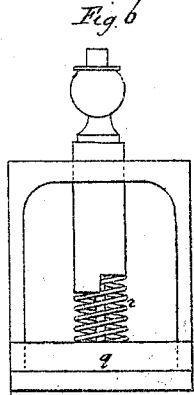
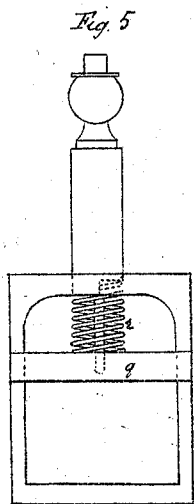
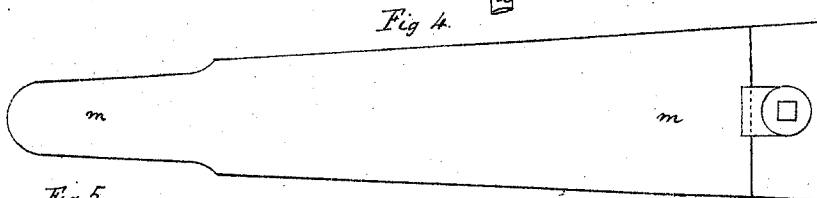
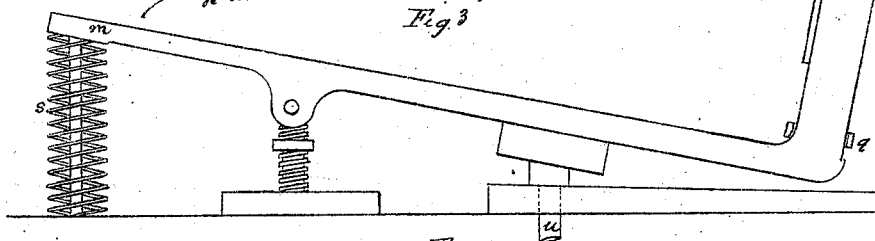
Patented Jan. 9, 1872.



Witnesses

Benjamin De Paris

Usary & Co.



Inventor.
E. Tavernier

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Improvement in Combing Machines.

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Fig. 9.

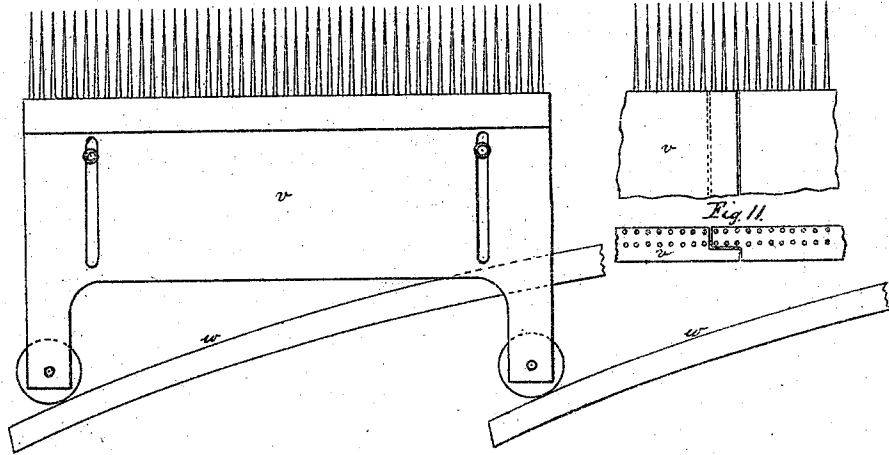


Fig. 10.

Fig. 11.

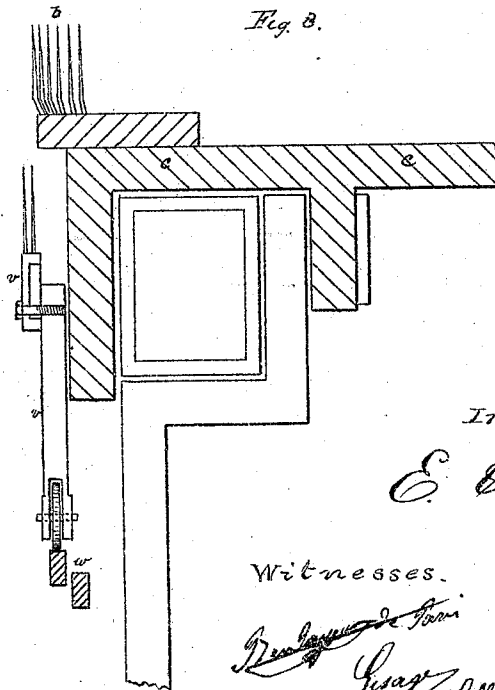


Fig. 8.

Inventor.

E. Tavernier

Witnesses.

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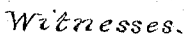
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Fig. 15.

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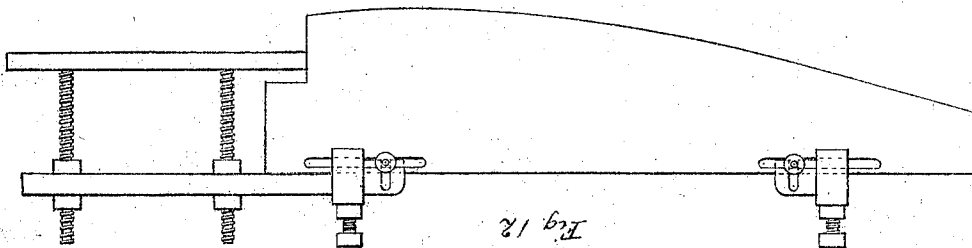
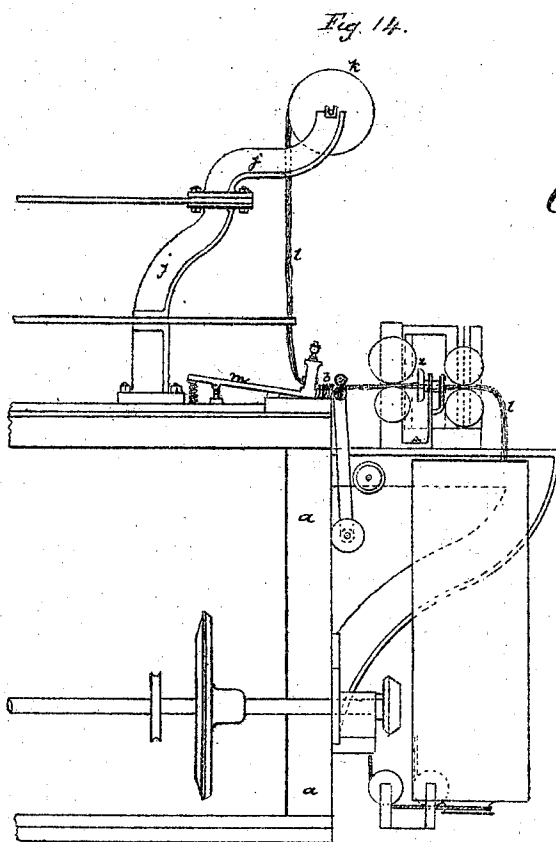
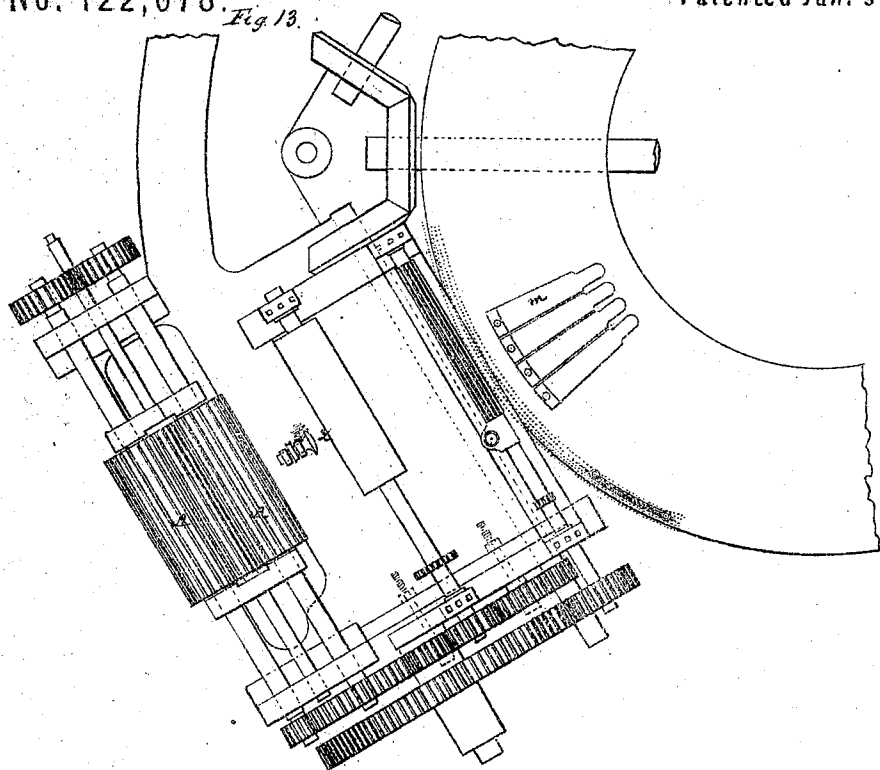


Fig. 12

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Inventor.

E. Tavernier

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5 Sheets--Sheet 5.

Improvement in Combing Machines.

No. 122,678.

Patented Jan. 9, 1872.

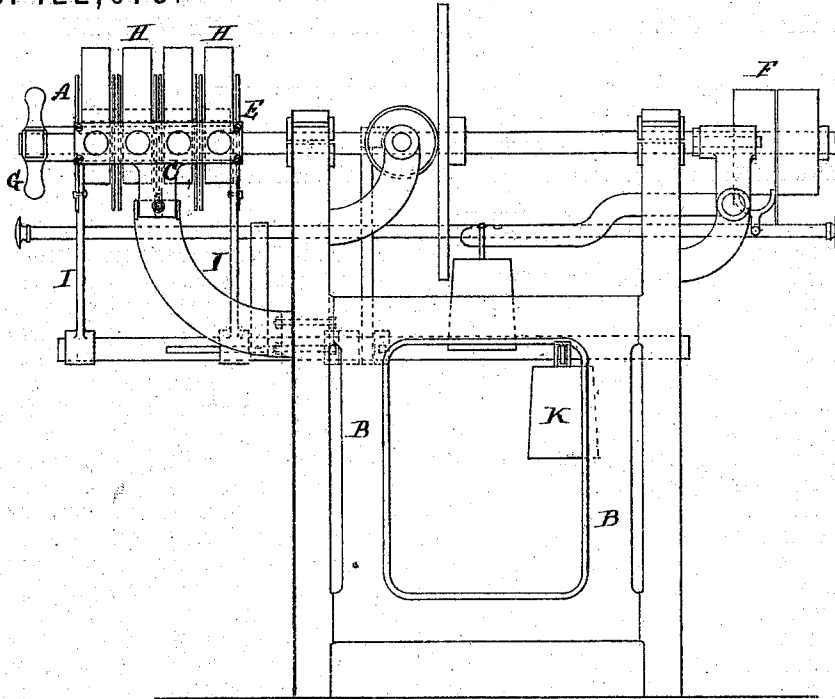
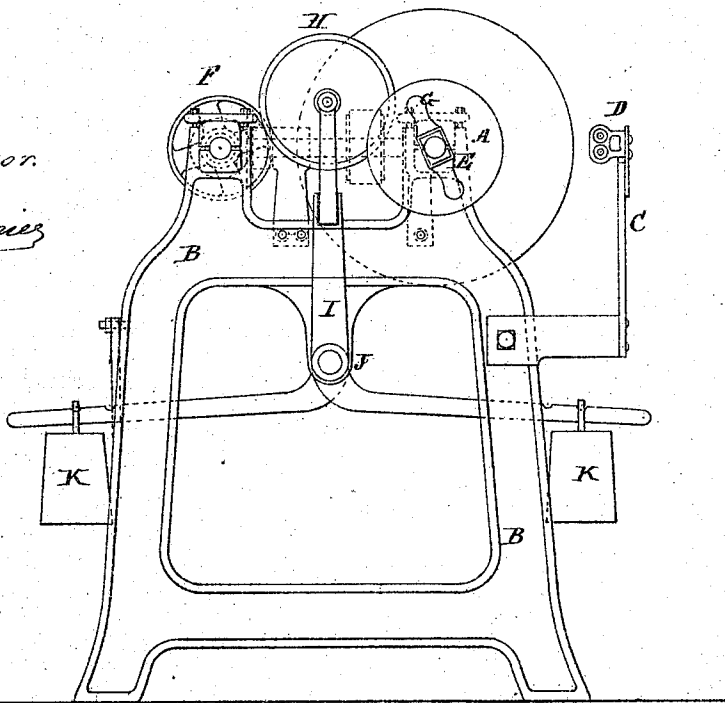


Fig. 16.



Inventor.

E. Tavernier

Witnesses.

Benjamin J. Davis
George H. Allen

UNITED STATES PATENT OFFICE.

EDOUARD TAVERNIER, OF LILLE, FRANCE, ASSIGNOR OF ONE-HALF HIS RIGHT TO AUGUSTUS MORAND, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN COMBING-MACHINES.

Specification forming part of Letters Patent No. 122,678, dated January 9, 1872.

To all whom it may concern:

Be it known that I, EDOUARD TAVERNIER, of Lille, in the Republic of France, have invented or discovered certain new and useful "Improvements in Combing and Preparing Cotton, Wool, and other Fibrous Substances, and in Engines or Machines in connection therewith," which improvements I do hereby declare to be fully and truly described in and by the following description thereof—that is to say:

This invention relates to certain improvements in machines for combing and preparing cotton, wool, and other fibrous substances, as will be hereinafter more fully set forth.

In feeding the sliver or material into and between the comb of the machine from the inside to the outside the frames through which the end of each fed sliver protrudes are acted upon and made to rise and fall by inclined plates or grooves, and as the comb rotates a compact fringe or "bat" of perfect form is produced. The needles of both the rotating and the working combs are of a curved or bent form, somewhat resembling a bayonet, and owing to that form the working organs are kept in close contact with the needle-points. Sometimes a series of gills combs are employed as working combing organs outside the main receiving rotary comb, and then these gills combs are made of a curved form to embrace more or less the circular horizontal receiving-comb—that is to say, the curve increases by insensible degrees in such a way as to avoid an acute angle at the point where the straight line melts into a curve. The feeding-frames are of skeleton form, and the fore ends are arranged with spring-plates to press upon the sliver as it passes through into the needles or points. The plates can be kept off the sliver by a catch, as desired. In order to clean the gills I cause them to rise up between two or more fixed flat brushes, or their equivalents, pressing on both sides of the needles, thereby causing the noils to be pushed off at the extremity of the gills combs, where a revolving brush takes the noils, this brush being cleaned by a card-drum or a doffing-knife. I use the same mode of cleaning when a porcupine is employed. Sometimes I use a fixed longitudinal keeping-plate instead of a traveling one, which plate may, however, be pressed down by a spring or springs.

By the combination and arrangement of some of the parts of existing circular engines or machines with the new parts, as before referred to, I can prevent the divergency of the sliver, for the purpose before described. The circular guard or cleaning-comb is made up of segments which rise and fall by riding upon inclined plates and grooves. The comb enters into the fringe between the receiving-comb and the drawing-off rollers, and no spaces are left at their meeting ends, so that the usual continuous circle of comb-teeth is preserved. The fringe is pushed down to the bottom of the points by a dabbing-brush or equivalent. A revolving brush lifts the fiber to the top and another brush or equivalent turns the points of the fiber toward the drawing-off rollers. The porcupine is preferably of roller-form and has one end of smaller diameter than the other, the barrel being hollowed to follow the circle of the receiving-comb. The needles or points are of varying lengths and of different degrees of fineness. The coarse needles are secured at the small end of the roller, and thereafter the needles are gradually made finer and set closer together as they approach the larger diameter.

The invention will be well understood by referring to the accompanying drawing, in which Figure 1 represents a section or portion of a machine or circular combing-frame in which these improvements are shown, and in which a sliver can be produced with perfect continuity throughout its length. Fig. 2 is an elevation of the same frame, representing the mode by which the necessary motion is imparted to the circular comb.

a is the frame of the machine, supporting the circular rotating comb *b* on its outer edge. The inside of the comb-ring *c* is provided with teeth, geared into by the pinion *d*, operated by the bevel-wheels *e* and the main shaft *f*, on which the fast and loose pulleys *g h* are mounted, the throwing in and out of action of which is governed by the fork *i* in the usual manner. The machine carries at its upper part a series of reel-carriers, *j*, for supporting the reels *k*, from which the slivers *l* to be operated upon by the pins or points are drawn. The sliver is led down from the inside of the frame through an eye in the plate *n* to the outer end of the pressing-frame *o*, and thence to the needle-points or pins

before it passes to the porcupine or doffing-roller *p*. The frame or box *o* somewhat resembles that known as "Noble's," but its mode of action is different, inasmuch as the fiber is held or gripped by a spring-plate, *q*, termed a pressing-plate, to prevent the fiber being taken from it at too great a speed, and to admit of the sliver being drawn or lengthened by the rotation of the comb.

The box is shown detached in Figs. 3, 4, 5, 6, and 7, Fig. 3 being a side view, and Fig. 4 a top view, while Figs. 5, 6, and 7 are end views, with the pressing-plate in the three positions it occupies for the proper action when in work. The plate is surmounted by a spiral spring, *r*, which bears against a shoulder or top bar, which is perforated to allow the central pin to work through. The pin has a button or spherical head, to which a thin plate with a notch in it is attached. This plate prevents the pin turning, and its notch, when lifted, as shown in Fig. 5, rests upon the top bar and holds the plate *q* off the sliver. This is essential, as a large opening is left for permitting the sliver to be passed through when the reel is first placed upon the support *j*. The tail of plate *m* rests upon a spring, *s*, and its pressure is regulated to suit the necessary height of the outer end and to return the fore end when it is lifted by the pin *u*, which rides upon usual inclined plates in their rotation.

The needles or points of the circle and other combs, as well as working combs and guard-combs, are of bayonet-shape, or are bent outward to admit of other needles or points rising up between them, as will be seen on reference to Fig. 8. These needles are carried by plates *v*, provided with rollers to run up the inclined bars *w*, shown in Fig. 9. A bar is shown for each roller, and they are so arranged that the needle-plates are raised horizontally so as to bring all the points up level at one time. The inclined plates travel round with the circular comb and permit of the needle-plates *v* falling off the inclines when traveled a sufficient distance.

The working or ring-guard combs, with their plates, form a continuous circle outside the circle-comb, their ends overlapping one another, as shown in the views, Figs. 10 and 11, and they are adjustable and can be secured to their plates by the screws which work in the slots, as seen in Fig. 9.

The sliver, as it passes through the needles or points of the circular comb and the guard-comb, is acted upon and cleaned by a porcupine of the form shown in Fig. 1. This porcupine is a hollow cone, on the smaller diameter of which the teeth are of greater distance apart than those at the larger diameter at the opposite end, the distances decreasing gradually from one end to the other, the hollow shape being only formed to coincide with the circle of combs against which it works to clean the sliver. The porcupine is set at an angle to the circle of combs, and receives the sliver at one end only, namely, the smaller end, which is fur-

ther from the circles of comb than the larger end, and by this means the sliver is acted upon gradually—that is to say, the extremity of the fringe is first cleaned, and as the points enter more and more into the fringe the body of it becomes thoroughly cleaned. The porcupine is itself cleaned by the brush *x*, the loose fiber being afterward removed from the brush by the card-drum *y*. The sliver, after being cleaned by means of the porcupine, passes round to the drawing-off rollers in the usual manner, these being placed in a frame outside the machine, so that the sliver, after leaving them, falls into a "can" or a balling-head.

By means of the above improvements the sliver is operated upon and thoroughly cleaned without breaking its continuity or leaving some portions of it thicker or more full than others, a fault in most other constructions of combing-frames, which reduces the commercial value of the sliver in the market.

Fig. 12 is a detached view of one of the keeping-plates for pressing the sliver to the bottom of the pins as they travel from the porcupine to the drawing-off rollers, shown in Figs. 13 and 14, and by which the sliver is removed from the pins previous to passing through the rotating eye *z* to the balling-can, which is outside of the machine and under the outer drawing-off rollers *A*.

Fig. 15 represents one of the grooved plates for the segment-combs to ride in when they have to be lifted to bring their points up level with the circle of comb-points. These grooved plates may be used instead of or in combination with the inclined plates or bars before spoken of.

The mode of action of the drawing-off rollers and of the revolving brush will be understood by referring to Fig. 14, which shows the parts in the position they occupy according to this part of my invention.

I do not in all cases use the drawing-off rollers, as when short-staple sliver, or, for instance, cotton, is being acted upon, a nipping apparatus can be employed, and the working of this will be regulated so as not to break the continuity or divergence of the sliver. Any "top" being shown above the nippers can be removed by transferring-combs or rollers, or in any convenient manner.

Instead of using a porcupine in the manner and for the purpose before explained, I can use "gill"-combs arranged in a similar manner, having rows of needles of a gradual size, beginning by coarse needles and finishing by very fine needles outside the main circle of combs, these gill-combs having a curve embracing more or less the circular form of the main revolving comb. The points of the "gills" may be standing up from the top or pointing downward from the bottoms of their plates or holders, and they can be kept clean by brushes or other appliances in any suitable manner. In this case the noils would be removed from the brushes by a revolving one, against which a doffing-knife may be caused to act. If the slivers or ribbons

are intended to be passed onto a balling-head, I prefer to make the head of the shape shown in Figs. 14, 15, and 16, and operate upon four bobbins at one time, so that the ribbon is divided, and I keep the ribbons or slivers upon the bobbins in a compact manner as they are being wound on by pressing-rollers which adjust themselves to the increasing diameters by means of balance-weights or springs.

In the figures I have shown weights because they are capable of being slid along the levers to regulate the pressure. This balling-head is of novel character, and would form an important addition to an existing combing-frame, as by it the work is turned out more solid than by the ordinary method, and the sliver is also prevented uncoiling from the bobbins. The balling-head A is mounted upon a frame or support, B, and the frame has on the front of it a vertical plate or bar, C, carrying guide-eyes D for dividing the sliver. One end of each sliver is passed through its eye and laid upon the bobbin E intended to receive it. The bobbin-shaft is then rotated by the gearing or band-wheel F, and continues to do so until the bobbins are filled. The end of the bobbin-shaft has a handle, G, for turning it in order to unscrew the opposite end from the socket when the bobbins have to be removed. The pressure-rollers H H are held upon vertical swinging arms I I, which are free to vibrate

upon the axis J so as to keep the rollers in contact by means of the weights K K, as before explained.

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

1. The porcupines in which the teeth are at varying distances apart, when arranged and set, with relation to the circular comb, so that only one end is in contact with the circular comb, as described and shown.

2. The feeding-boxes, constructed as described, and arranged to act upon the sliver when passing from the inside to the outside of the circle of combs, as set forth.

3. The needles or points in circular combing-machines, when constructed as hereinbefore described and shown.

4. The fixed keeping-plates, as and for the purpose set forth.

5. The improved balling-head, shown and described, when constructed and operating as set forth.

In witness whereof I, the said EDOUARD TAVERNIER, have hereunto set my hand and seal the eleventh day of March, one thousand eight hundred and seventy-one.

EDOUARD TAVERNIER.

Witnesses:

BEN TAYOUR, *de Paris.*

LESAGE, *de Lille.*

(28)