

E. DELETTE.
COMBING MACHINE.
APPLICATION FILED AUG. 3, 1907.

1,058,160.

Patented Apr. 8, 1913.
4 SHEETS—SHEET 1.

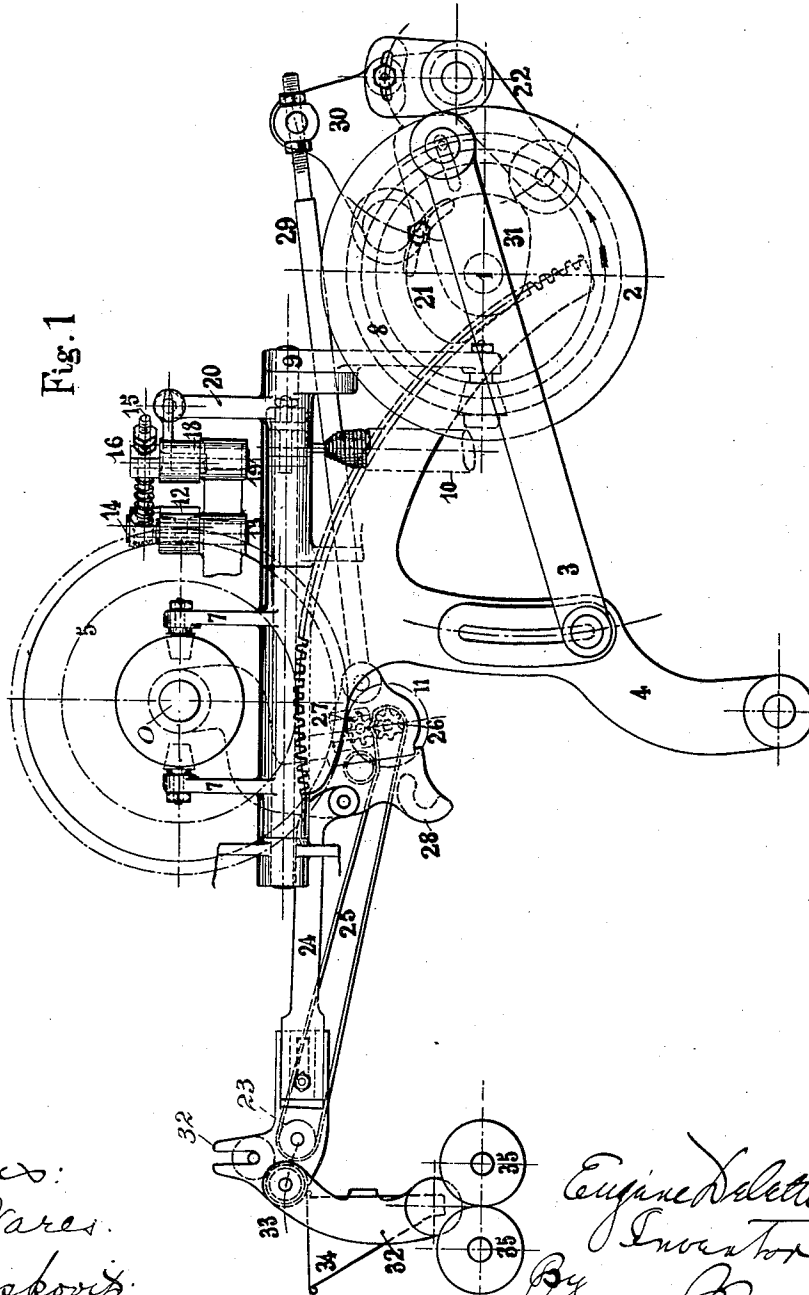


Fig. 1

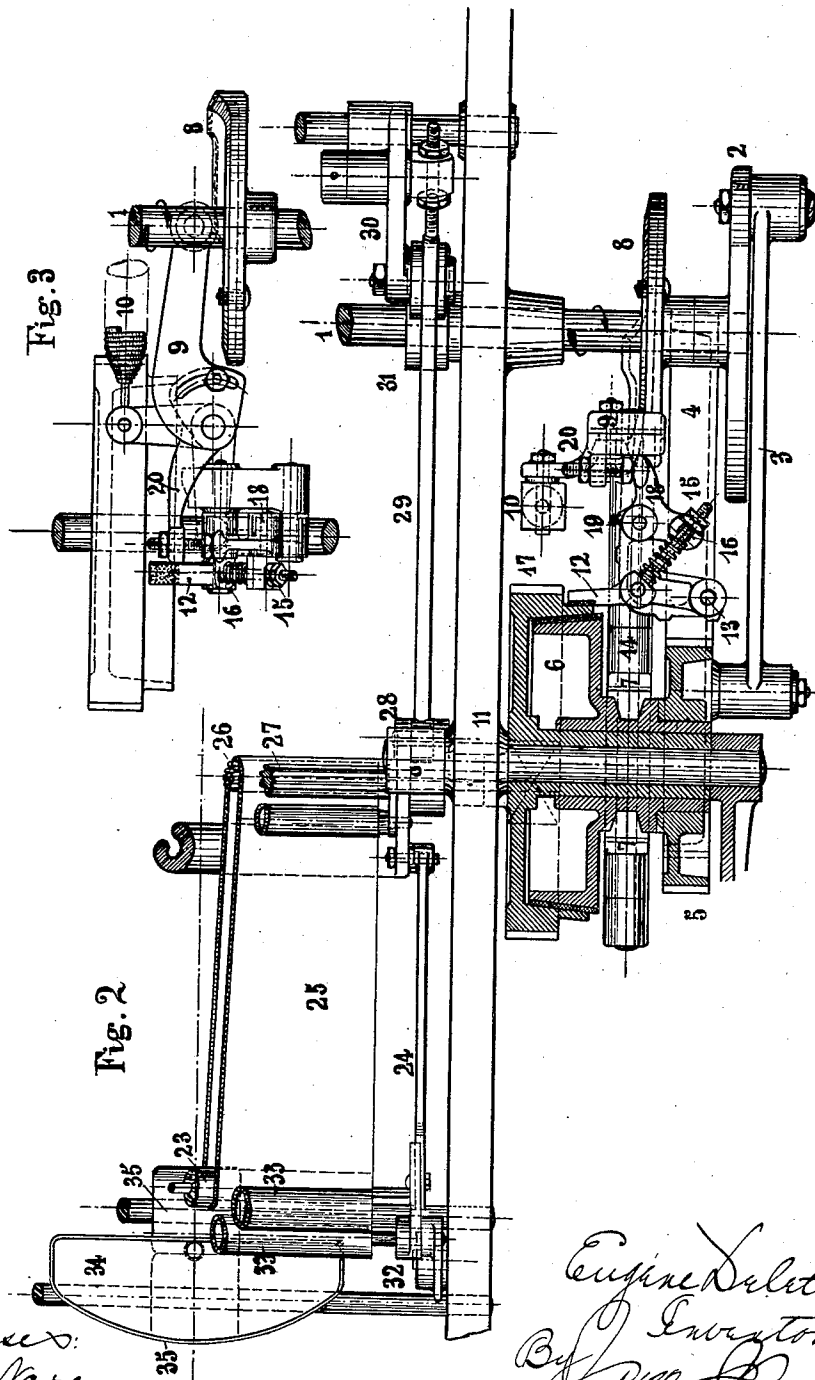
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Fig. 4

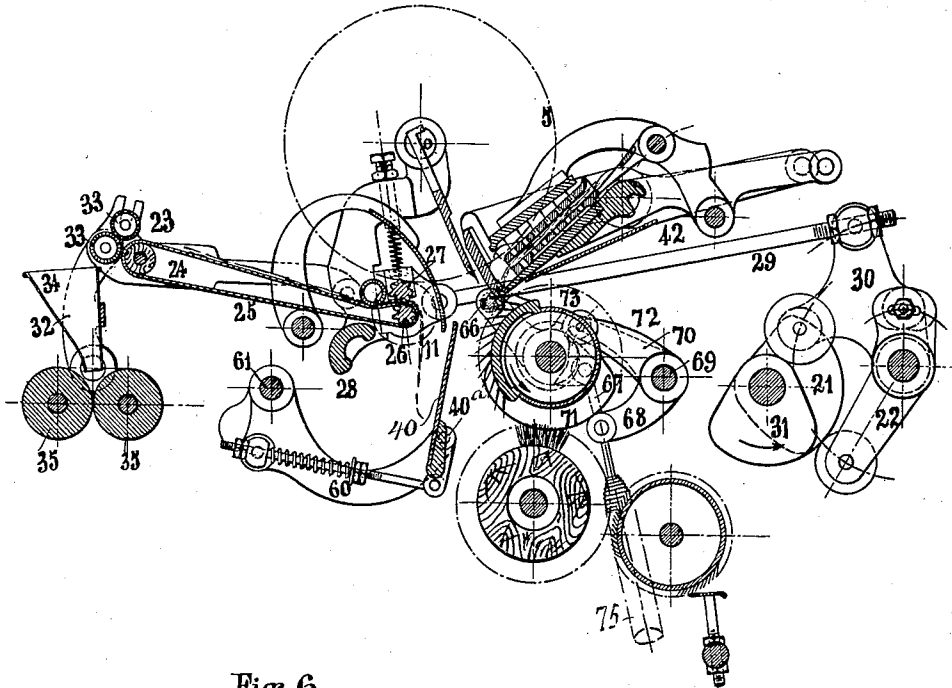
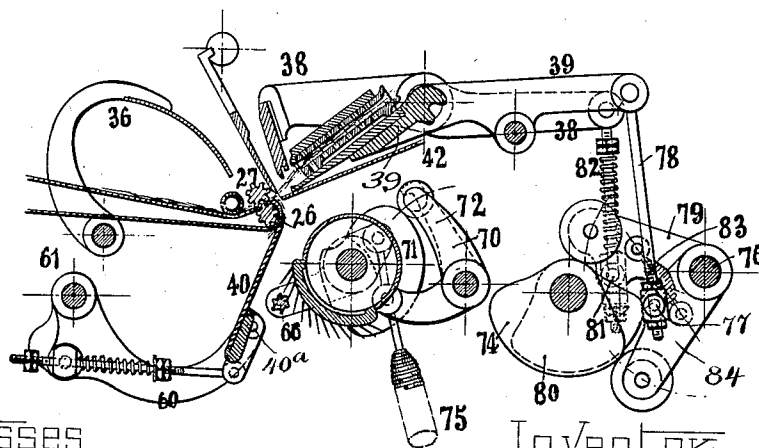


Fig. 6



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4 SHEETS—SHEET 4.

Fig. 5

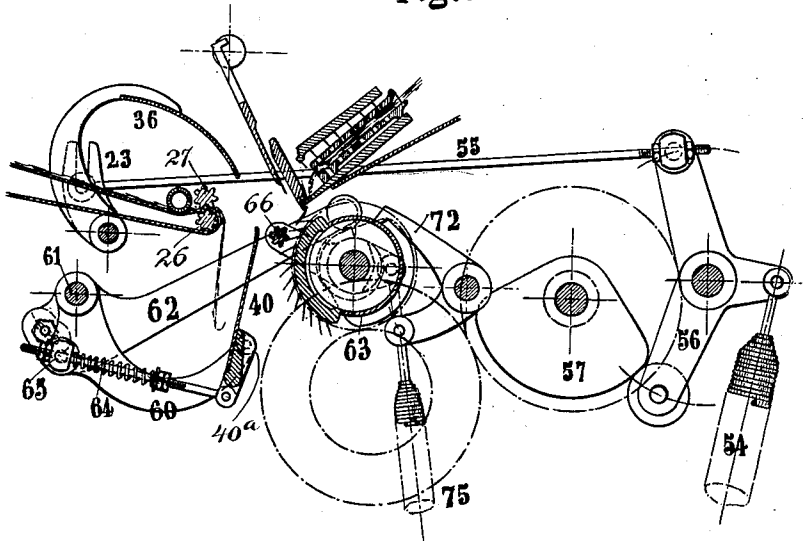
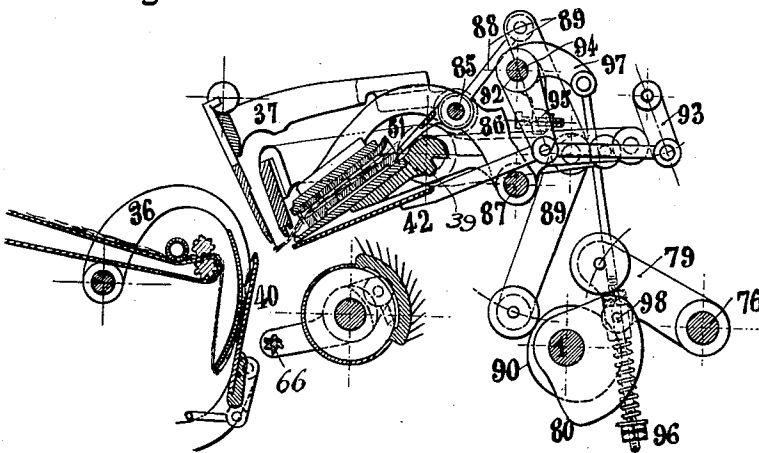


Fig. 7



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UNITED STATES PATENT OFFICE.

EUGÈNE DELETTE, OF LURE, FRANCE.

COMBING-MACHINE.

1,058,160.

Specification of Letters Patent.

Patented Apr. 8, 1913.

Application filed August 3, 1907. Serial No. 386,888.

To all whom it may concern:

Be it known that I, EUGÈNE DELETTE, a citizen of the Republic of France, residing in Lure, Haute-Saône, in the Republic of France, engineer, have invented certain new and useful Improvements in Combing-Machines, for which application has been made in Great Britain, No. 14,536, dated June 24, 1907.

The present invention relates to combing machines in which the drawing off cylinders are actuated through a toothed sector, the extent of the drawing off being varied by means of a clutch drive and consists in the different parts being combined in the following manner and capable of being applied to other combing machines of the Heilmann type. This same application may be made in Heilmann machines in which the drawing off cylinders are fixed and the nipper and feed device are movable.

1. The drawing off of materials of medium and great length is effected by means of two oscillatory cylinders having grooves or flutings on their peripheries and an endless leather band passing between them. These cylinders are operated by a crank, rod and toothed sector which actuate the cylinders by means of a friction clutch, the travel of the cylinders being varied at will by adjusting the parts, and a brake acting on the friction clutch being provided to overcome the momentum of the parts on the reversal of the cylinders. The discharge of the material takes place through a funnel and rollers which latter may be either continuously or only intermittently driven. The drawing off is terminated by a cutter and a counter-cutter.

2. A double operating mechanism is provided for a pressing in cylinder having several unequal grooves pressing the material into the teeth of the circular comb and operated (1) by a roller lever actuated by a cam giving a movement of great amplitude, (2) by a lever having a square end being in contact with a second cam giving a sudden drop to a second lever at the end of the course of the pressing in cylinder away from the nipper, with the object of causing the return of the pressing-in cylinder toward the nipper to be as sudden as possible, in order to better cut away the broken fibers contained in the head of the sliver to be combed, at the moment when the last of the

teeth of the circular comb passes into the head of the sliver.

3. The upper and lower jaws of the nipper are each driven by a cam.

4. The operation of the feed, fixed comb, and gill-frame, is effected by a roller arm actuated by a cam placed on the end of the cam shaft and easily removable. By changing the cam the desired feed is obtained without disturbing the other parts of the machine, the arrangement of the gill frame mounted on a parallelogram receiving its movement sometimes from the feed cam and sometimes from the cam of the nipper.

In the accompanying drawings:—Figure 1 is a side view showing the driving mechanism for the rotation of the drawing off cylinders; Fig. 2 is a plan view of this mechanism with parts in section; Fig. 3 is a rear view of a part of this driving mechanism; Figs. 4, 5, 6 and 7 are longitudinal sections showing the various positions of the cutter and the counter-cutter during one revolution of the machine.

The first part will now be described:—The drawing off cylinders 26 and 27 are mounted on a carriage 28 oscillating from the center *o* (Figs. 1 and 2). This oscillation is imparted by the adjustable rod 29 connected to the roller arm 30 operated by the cam 31 on the cam shaft 1, thereby producing the rearward movement of the carriage toward the nipper, the forward movement being imparted by a counter cam 21 (Fig. 1) actuating the roller arm 22 connected to the roller arm 30. An endless leather band 25 passes between the two cylinders 26 and 27 and is kept taut by the roller 23 mounted on two extensible levers 24, which latter are pivoted to the carriage 28 and the levers 32, the levers 24 being formed in two parts with slots connected by bolts, as shown in the drawings, which allows of their length being altered.

The lower cylinder 26 receives its forward or backward rotation from the wheel 11 operated by the wheel 17 connected with the wheel 5 by the friction clutch 6, wheel 5 receiving its motion from the quadrant 4 actuated by the rod 3 and the crank disk 2, forward to draw off the fibers and backward to make the sliver tail longer in order to obtain a better superposition of the slivers to be connected together and obtain a good ribbon. The duration of the forward rotation

can be varied according to the position of the rod 3 in the slot of the sector 4 (Fig. 1), also the other attachment in the slot of the crank disk 2 can be varied.

5 2. The backward rotation while sharing the same speed variation as given on the forward rotation, is provided with another adjustment for varying the duration of such backward rotation, and this adjustment is
10 effected by means of a cam 8 formed of two parts, Figs. 2 and 3, which cam allows the rotation of the cylinders to be reversed for a longer or shorter period by maintaining the clutch 6 and 17 in engagement for a
15 longer or shorter period. This is operated in the following way:—The engagement only takes place as long as the cam 8 is out of engagement with the roller of the lever 9. The frictional contact between the two parts
20 6 and 17 is effected by the spring 10. The cam effects the disconnection and consequently the stoppage of the cylinders 26 and 27. The cam 8 is made in two parts, one part keyed on the shaft 1, and the other part
25 bolted to it, and carries a slide or slot whereby the position of the second part of the cam on the first is varied, the result being that at will the disengagement can be more or less quickly effected, and consequently the
30 duration of the reversal of the drawing off cylinders also varied by regulating the position of the two parts of the cam. In short this arrangement of driving mechanism enables the extent of drawing off to be varied
35 at will by the rotation of the drawing off cylinders acting at the desired moment, and also the reversal of the cylinders to render the sliver tail sufficient to obtain a good superposition of the slivers progressively
40 drawn off.

The mechanism for rotating the cylinders Figs. 1 and 2, comprises a cam shaft 1 carrying the crank disk 2 actuating the rod 3 attached to the toothed sector 4 actuating the
45 wheel 5 keyed to the friction coupling 6 carrying a leather or other frictional covering. The coupling 6 is displaced laterally by means of two conical rollers on the fork 7 actuated through the cam 8 by means of an
50 adjustable roller arm 9 for the disengagement, and for the engagement by the spring 10, which latter always tends to bring back the roller of the lever 9 against the cam, but at a given moment when the friction clutch
55 6 engages the part 17 (thus producing the rotation of the cylinders), the roller of the arm 9 leaves the cam 8, which latter is provided with the desired recess to insure the necessary contact. This movement effects
60 the engagement and the disengagement of the friction clutch 6 with or from the part 17 which is formed in one piece with a wheel which actuates the wheel 11 of the drawing cylinder 26.

65 The material drawn off by the rotation of

the cylinders 26 and 27 rests on the endless leather band 25 and is maintained in place by the pressure of the cylinder 27 on the cylinder 26 through springs, Fig. 4, the material then passing between two rollers 33
70 and into the funnel 34 to emerge as a sliver from the rollers 35.

When the sector 4 moves to the left, Fig. 1, the friction clutch being engaged, the rotation of the cylinders 26 and 27 will cause
75 the endless leather band 25 to move forward, and on the sector moving to the right, the leather band will travel backward but only to such an extent as is required owing to the connection of the two parts of the cam 8
80 being suitably regulated. The rollers 35 will take up the difference existing between the advance and the reversal of the cylinders 26 and 27.

To overcome or avoid the momentum of
85 the parts on the reversal of the cylinders a brake is applied. This is shown in the three Figs. 1, 2 and 3, and consists of a lever 12 provided with leather or the like at the end, Fig. 2, so as to bear on the female part 17
90 of the friction clutch and pivoting on the pivot 13. A rod 15 Figs. 1, 2 and 3 passing into a fork 16 pivotally mounted on the lever 18 is arranged on the pivot 14, which lever 18 is mounted on the axis 19.
95 On the rod 15 is an extension spring preferably placed between the head of said rod and the fork 16 which tends to separate these two parts. This separation is limited by two nuts placed on the rod 15 and serving as a stop for the fork 16. When the
100 drawing off and the reversal of the cylinders 26—27 take place, the roller of the arm 9 is no longer in engagement with the cam 8, but the friction clutch 6 is engaged
105 in the part 17, thereby causing the cylinders 26 and 27 to rotate through the wheels 17 and 11. The backward movement of the cylinders ceases when the inclined plane, or acting surface Fig. 3, of the cam 8 raises
110 the roller of the arm 9 and thereby disengages the friction clutch. The roller is raised sufficiently high so that the screw of the arm 20 (Fig. 2) forming part of the lever 9 is caused to bear somewhat firmly on
115 the lever 18, which latter compresses by its fork 16 the spring of the rod 15, and the latter firmly presses the leather of the lever 12 on the friction clutch 17 and instantly arrests its rotation. This pressure is only of
120 short duration as the highest part of the acting surface of the cam 8 soon passes clear and the brake 12 ceases to act, the friction clutch remaining disconnected until the moment when the remainder of the acting sur-
125 face completely passes clear.

The cutter 36 (Fig. 5) is operated by a rod 55 adjustable by screws on the roller lever 56 which carries a spring 54 which in
conjunction with cam 57 actuates the cut- 130

ter. An open slot in the lever 23 allows the movement of the cutter 36 to be varied and the rod 55 to be easily disconnected from the lever 23 when required.

5 The counter-cutter 40 has a combined vibratory and bodily swinging movement by being pivoted at 40^a on the lever 60 keyed on the shaft 61, which receives an up and down movement from the roller arm 62
10 actuated by a cam 63 placed on the circular comb. The counter-cutter 40 is vibrated by being displaced forward and backward; backward as seen in Fig. 6, by engagement with the endless leather band which com-
15 presses the spring on the rod 64 against the abutment 65, and forward by the action of this spring. Its forward movement, Fig. 5, is limited by nuts on the threaded end of the rod coming against the abutment 65.
20 This mechanism gives to the counter-cutter a nipping action on the tail of the sliver for the purpose of holding the sliver under tension during the wind-up.

In Figs. 4, 5, 6, 7, the various positions
25 of the cutter and counter-cutter during a revolution of the machine are shown.

2. The pressing-in cylinder 66 with flutings of unequal height and pressing the material into the teeth of the circular comb,
30 Fig. 4, is mounted on two levers pivoting on the shaft of the circular comb. The levers carrying the pressing in cylinder 66 are actuated by two rods 67 connected to the arms 68 fixed on the shaft 69, which shaft
35 69 receives two movements from different parts placed on the circular comb, (1) from a roller-lever 70 actuated by the cam 71, (Fig. 6), which imparts a very slow movement, and (2) when the roller lever 70 arrives at the end of its course, (the position of the pressing cylinder being away from the nipper), it leaves the cam 71, and the arm 72 (Figs. 4 and 5) which is preferably
40 provided with a square end comes to rest on another cam 73 which latter has a rapid descent, thereby giving to the pressing-in cylinder a quick return toward the nipper in order to better cut away the broken fibers from the head of the sliver. The position
45 of these parts is seen at the moment the recoil is made. Immediately this return movement is completed the roller-arm 70 resumes contact with its cam in order to cause the pressing-in cylinder to descend. A spring
50 75 acts on the trunnion of the arm 68 whereby the roller-arm 70 is held against the cam 71. In the various Figs. 4, 5, 6, and 7 the different positions of the presser are seen during a revolution of the machine.

60 3. The nipper, Fig. 6, is actuated by two cams one of which 74 actuates the roller arm 84, which latter is loosely mounted on the shaft 76. This roller arm 84 carries a journal 77 for receiving the adjustable rod 78
65 pivoted to the lever-tail 39 of the lower jaw.

The other cam 80 (partly shown in dotted lines) actuates the roller-arm 79, which is keyed on the shaft 76 and the arm 79 actuates the upper jaw lever 38 by parts composed of a journal 81 mounted on the arm 70
79 and a rod 82 freely passing through the said journal at one end and pivoted to the lever 38 at the other end. The shaft 76 has keyed upon it a second arm not shown in the drawing similar to the arm 79 and
75 connected in the same way with the upper jaw, so that the said jaw is controlled from both sides. Said rod 82 carries a spring, which presses on the upper jaw at the desired moment, and screw stops for effecting the opening of the nipper. A spring 83 connects the two roller arms 84 and 79 in order to hold the rollers in contact with the cams. The lower jaw is arrested in its movement toward the circular comb by the rod 78 and
85 the roller arm 84, the pressure being exerted by the springs of the rods 82 on the upper jaw 38, which comes to rest on the closing of the nipper on the lower jaw 39, the nipper being suitably adjusted in relation to the
90 circular comb by the screws of the rod 78.

4. The feeding device 51, Fig. 7, is actuated by the shaft 85 mounted on the supports 86 keyed on the shaft 87 which is mounted on the arms of the lower jaw 39.
95 The rod 88, Fig. 7, connects the shaft 85 to the roller arm 89 which is actuated by the cam 90 placed at the end of the shaft 1, thereby giving a forward and backward movement to the feeding device. To alter the feed it suffices to change the cam 90. The frame of the fixed comb 37 is also mounted on the shaft 85 and participates in the movement of the feed 51 forward and backward.
105 The gill-frame is connected by two pivots to the oscillating levers 93 and 95 forming a parallelogram and the centers of oscillation of which are fixed to the frame of the machine; also partly shares in the movement of the feed when the screw stop of the lever 95
110 mounted on the shaft 94 comes in contact with the support 86. This contact is insured by the pressure of the spring on the rod 96 during the duration of the drawing off, but immediately the nipper closes by the
115 action of the roller arm 79 which operates the closing of the upper jaw by the cam 80 as previously described, the bearing 98 mounted on the roller arm 79 in which the rod 96 slides abuts against the screwed stop
120 on this rod, raising the same and imparting a movement to the lever 97, Fig. 7, fixed on the shaft 94 whereby the gill-frame 42 is caused to recoil. The gill-frame thus becomes independent of the feeding device and
125 is then under the influence of the movement of the shaft 76 operating the upper jaw which causes it to recoil back to avoid the teeth of the circular comb when the nipper is closed.

I declare that what I claim is:—

1. In a combing machine, the combination of combing means, drawing-off cylinders, and mechanism for giving said cylinders semi-rotary movements in either direction comprising a crank-disk, a segmental-rack, a connection between the said rack and disk for actuating the former, including means for varying the movement of the rack, and connections from said rack to said cylinders including means for checking the impetus of said cylinders during one of their movements; whereby the cylinders may be varied in their movements consonantly with the variations in movement of the rack.

2. In a combing machine, the combination of a circularly moving comb, a pressing-in device for pressing the material into said comb comprising a corrugated cylinder, mechanism for actuating said pressing-in device including coöperating cams for periodically causing said pressing-in device to have a quick movement into engagement with the material, and drawing-off means coöperating with said pressing-in device.

3. In a combing machine, a circular comb, a pivotally supported cylinder which swings about the comb for pressing the material into the latter, two different cams acting on said cylinder to impart its functional movement, and means producing a sudden movement of one of said cams, said cylinder having flutings of unequal heights, substantially as described and shown.

4. In a combing machine, a circular comb, a pressing-in cylinder, double means for operating said cylinder, unequal grooves in said cylinder pressing the material into the teeth of the circular comb, a roller-lever op-

erating said pressing-in cylinder, a cam giving a slow motion operating said roller-lever, and a square-ended lever in contact with a second cam imparting a sudden drop to said lever at the moment when the pressing-in cylinder is farthest away from the nipper, substantially as described and shown.

5. In a combing machine, a nipper mechanism, means for operating the upper jaws of the nipper including a cam, a roller-arm actuated by said cam and keyed on a shaft, an arm mounted on the other end of said shaft, a rod and a spring actuated by said arms causing the upper jaw to move and press on the lower jaw of the nipper, another cam operating the lower jaw of the nipper and actuating a roller-arm connected therewith by a rod, a counter cutter, and means for limiting the descent and rise of said counter cutter, substantially as described and shown.

6. In a combing machine, the combination of combing means; means for feeding the material to the combing means, including a gill frame; drawing-off means; nippers and actuating mechanism therefor coöperating with the combing means; and a cam mechanism for giving to the gill-frame a slow forward movement and a rapid backward movement.

In witness whereof, I have hereunto signed my name this 6th day of July 1907, in the presence of two subscribing witnesses.

EUGÈNE DELETTE.

Witnesses:

FRANÇOIS DU BOITROUVRAY,
LOUIS M. TAILFER.