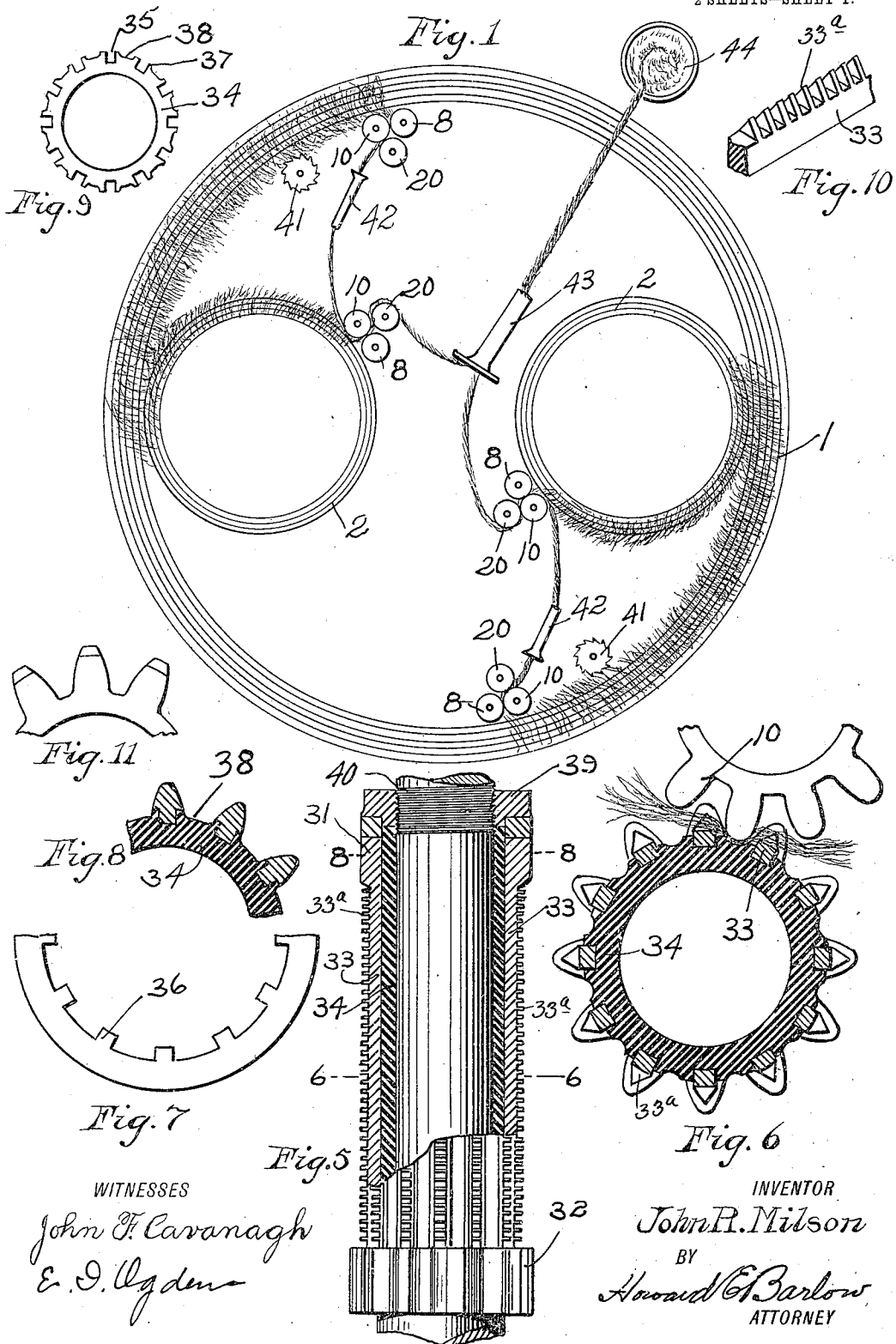


J. R. MILSON.
DRAWING-OFF ROLLS.
APPLICATION FILED MAY 11, 1908.

953,345.

Patented Mar. 29, 1910.

2 SHEETS—SHEET 1.



WITNESSES
John F. Cavanagh
E. D. Uydens

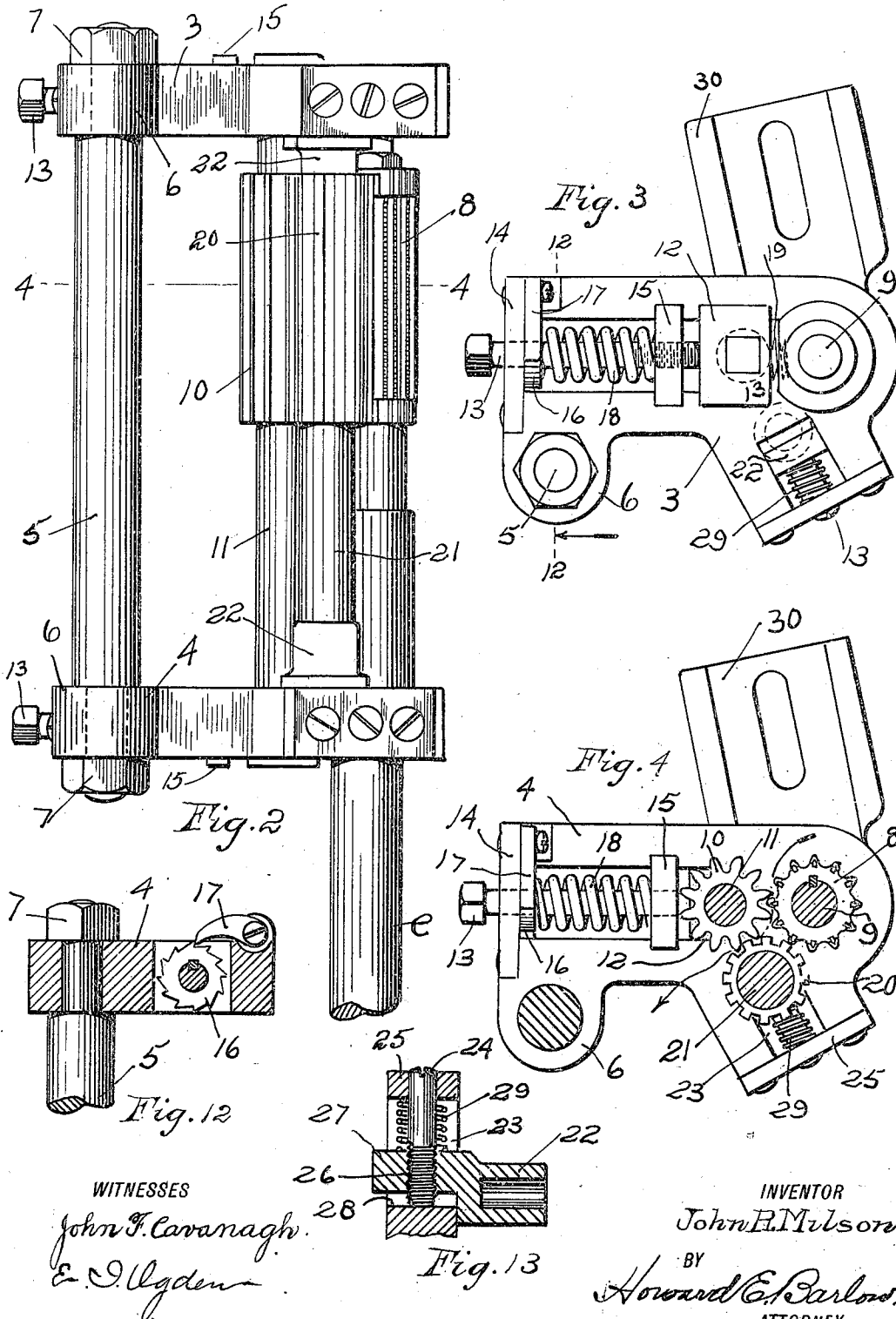
INVENTOR
John R. Milson
BY
Howard E. Barlow
ATTORNEY

J. R. MILSON.
DRAWING-OFF ROLLS.
APPLICATION FILED MAY 11, 1908.

953,345.

Patented Mar. 29, 1910.

2 SHEETS—SHEET 2.



WITNESSES

John F. Cavanagh.
E. J. Ogden.

INVENTOR

John R. Milson

BY

Howard E. Parsons,
ATTORNEY

UNITED STATES PATENT OFFICE.

JOHN R. MILSON, OF BOSTON, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS,
TO LISTER-NOBLE ROLLER COMPANY, A CORPORATION OF MASSACHUSETTS.

DRAWING-OFF ROLLS.

953,345.

Specification of Letters Patent.

Patented Mar. 29, 1910.

Application filed May 11, 1908. Serial No. 432,078.

To all whom it may concern:

Be it known that I, JOHN R. MILSON, a citizen of the United States, residing at the city of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Drawing-Off Rolls, of which the following is a specification, reference being had therein to the accompanying drawing.

10 This invention relates to drawing-off rolls for wool combs, gill boxes, and the like, and the object of the invention is to provide a set of rolls that can be used without a leather apron to engage and draw off the wool fringe from the comb teeth without injuring the fiber, and pass the same in the form of a sliver through the trumpet to the coiler to balling head.

15 It has been found that ordinary fluted rolls when used for drawing off the wool from the comb have a tendency to jam, cut and injure or destroy the fibers unless said rolls are provided with leather, or other suitable yielding material, to serve as a cushion against which the wool is nipped. These leathers have heretofore been made in the form of endless aprons which, owing to the severe bending strains to which they are subjected in passing through the corrugated rollers, are soon worn out and destroyed. Then again, the wear caused by the action of drawing the fibers from the comb through the pins also assists in destroying the apron, usually by wearing away the middle portion of the same. These aprons are usually of the very best quality of leather and are consequently very expensive, and as several of said aprons are employed in each of the combing machines the expense of constantly replacing them to maintain the efficiency of the machine, is considerable.

My invention consists broadly of a set of especially constructed rolls which engage and draw off the wool and effectually do away with the use of the leather apron. A set of these rolls comprise a nip roll, a pin or toothed roll meshing therewith, for drawing off the fiber, and a clearer roll meshing with said nip roll for clearing or drawing the fibers from the teeth of the pin roll.

The invention further consists in providing any of said rolls with a cushioning or yielding material at the points where the

fiber is nipped between them so as to effectually prevent the cutting or injuring of said fibers when acted upon by said rolls.

Heretofore where the aprons were used the fluted rolls were obliged to be made of considerable size so as to prevent a too rapid cutting of said aprons, but by my improved construction the rolls may be made much smaller, allowing the nipping line of the rolls to be brought much closer to the comb circles thereby drawing out more of the fibers, or saving more of the long stock and leaving less waste or noils in the small circle.

Another feature of my improved rolls is that the same are equally well adapted to be used as the front rollers in a gill-box, where they are of great advantage, first, by doing away with the leather apron ordinarily used there, and second, by being so much smaller the shorter fibers can reach the nip before the pins of the fallers are withdrawn from the sliver, and when used in this capacity the third or clearer roll may be dispensed with if desired.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings: Figure 1— is a diagrammatic view illustrating both the large and the small comb circles and the relative positions of the drawing-off rolls thereto. Fig. 2— is a side elevation of the rolls and the frame in which the same are supported. Fig. 3— is a top or end view of said frame showing the flexible adjustment of the roll bearings at one end of said frame. Fig. 4— is a sectional end view on line 4—4 of Fig. 2 showing the relative position of the three rolls and the flexible bearings by which the nipping tension of the same are adjusted. Fig. 5— is an enlarged side elevation of the pin roll partly in section. Fig. 6— is an enlarged sectional end view of said pin roll on line 6—6 of Fig. 5, also showing a portion of the nip roll meshing with said pin roll. Fig. 7— is a partial end view of the cage with the cushion bushing removed. Fig. 8— is an enlarged partial sectional end view of said pin roll on line 8—8 of Fig. 5. Fig. 9— is an end view of the cushion bushing. Fig. 10— is an enlarged detail of one

of the ribs or toothed bars connecting the gears at either edge of the cage or pin roll. Fig. 11— is a modification showing a portion of one of the corrugated rolls having
 5 cushions on the outer edge of its ribs. Fig. 12— is a section through one of the frames on line 12—12 of Fig. 3 looking in the direction of the arrow, to illustrate the position and action of the ratchet and pawl. Fig.
 10 13— is a sectional view on line 13—13 of Fig. 3 showing one of the clearer roll bearings and the means for adjusting the same.

My improved drawing-off rolls are more particularly adapted to be used on that style
 15 of combing machine known as the "Noble" comb, but the same may be used on any machine of this character, and in the drawings only such parts of the machine are represented as is necessary to illustrate the operation of my invention and its working relation
 20 to the comb.

At 1 is represented the large comb circle and 2—2 the small comb circles located within and on either side of said large circle.

25 My invention consists broadly in the construction and arrangement of a set of drawing-off rolls, which rolls are supported in the two end frames 3 and 4, said frames being located some distance apart and retained
 30 firmly in position by means of the tie rod 5 which passes through the ears 6—6 in said frames, the latter being firmly held in their required position by means of the binding nuts 7—7.

35 The pin roll 8, hereinafter described in detail, is keyed or otherwise secured to the driving shaft 9, which shaft extends down below the lower frame 4 and may receive its motion from a set of driving gears, not
 40 shown, or any other means for rotating the same at the proper speed.

The nip roll 10 is a plain fluted roll with long teeth or ribs adapted to mesh with those of the pin roll. This nip roll is mounted
 45 on the shaft 11, which is provided with bearings at either end in the floating boxes 12—12. The pressure of this roll against the pin roll may be regulated by the adjusting screws 13—13 in either frame. Each
 50 screw passes loosely through its cap 14 and is threaded through the loose head 15, its threaded end resting against said bearing 12. A ratchet wheel 16 is loosely keyed to slide on said bolt, the teeth of which are engaged
 55 by a pawl 17, whereby said bolts are prevented from turning back after having been set in position. A tension spring 18 engages the loose head 15 by which more or less tension may be exerted on said bearings
 60 12 by adjusting said bolts. An auxiliary tension spring 19, see Fig. 3, is located on the underside of each of said boxes 12 for the purpose of providing further flexibility to said nip roll, causing the same to more
 65 readily yield and relieve the force of the nip

or grip on the stock as the same is being passed between said rolls to prevent cutting or injury to the fibers.

The clearer roll 20 is fluted or provided with grooves throughout its length to receive the teeth of the nip roll and thus be
 70 driven to run in time therewith, said clearer roll being for the purpose of engaging the fibers and lifting the same from the pins on the pin roll so as to prevent said fibers
 75 from winding around and clogging up the pin roll and insure its effective action. This clearer roll 20 is mounted on the shaft 21 which shaft is provided with bearings
 80 22—22 at either end, said bearings being adapted to slide toward and from the nip roll 10 in the slotted portion 23 of the side frames, see Fig. 13, its position being regulated by means of the adjusting screw 24,
 85 the upper end of which is adapted to work loosely through the cap 25, the inner end 26 being threaded through the portion 27 of the bearing and rests against the bottom
 90 28 of the slot. The tension spring 29 presses against the portion 27 of the bearing and provides means whereby said roll may yield as the sliver passes between it and the nip
 95 roll so as to prevent injury to the fibers.

A plate 30 is attached to the lower frame whereby the whole device is supported from
 95 the main frame of the comb, or other convenient place, in the desired position to properly engage the wool fringe projecting from the comb circles.

One of the features of this invention is
 100 the construction of the pin roll which is preferably made in the form of a cage, the same being provided with gear teeth 31 and 32 at either end thereof, each tooth of these
 105 respective gears being connected by a long thin bar 33, the outer edge of each bar being slightly below the face of the tooth of the gear, each bar being serrated on its outer
 110 edge or formed with a plurality of fine outwardly projecting teeth 33^a the same being adapted to enter the wool and engage the
 115 fibers thereof to draw the same from the comb circles. An essential feature of this construction is the forming of these teeth below the outer edge of the gear teeth so as
 120 to provide sufficient room for the stock between the ribs of the nip roll and the points of the teeth on the pin roll to prevent the cutting of said stock.

It is found in practice necessary and desirable to provide a cushion against which
 120 the nip roll is to bite the stock. This cushion may be made in any desirable way but for convenience I have formed a bushing 34, which may be constructed of raw-hide,
 125 leather, fiber, or any other material suitable for this purpose, said bushing being provided with a series of grooves 35, see Fig. 9, throughout its length for the purpose of admitting inwardly projecting ribs 36 of
 130

the cage, see end view Fig. 7. The portions 37 between these grooves are nicely rounded out as at 38 against which rounded portion the stock is engaged and pressed by the teeth of the meshing nip roll 10, see Fig. 6. This bushing, as is shown in Fig. 5, is pressed into the pin roll caging and is secured in position therein by means of the nut 39 which is threaded onto the arbor or shaft 40 on which said roll is mounted.

The operation of my invention may be more fully described as follows: The prime object of my invention is to do away with the expensive leather belts, which have heretofore been used for the purpose of engaging and drawing off the fibers from the comb circles. In doing this I have provided a set of corrugated rolls and in order to cause the same to operate in the most effective and satisfactory manner I have provided a toothed wheel 41 which is caused to rotate in the proper direction and at the desired speed by gears, or other suitable means not shown, to act upon the fringe before reaching said rolls and to raise the fringe and cause the same to extend and stand in the right position to be more readily engaged and operated upon by said rolls. The fringe thus raised is engaged and drawn in between the nip roll and the pin roll, the teeth of the latter entering the fibers, while the ribs of the former firmly nip with a strong firm grip said fibers against the flexible or yieldable cushion between the rows of pins or teeth in the pin roll securely holding the same from slipping. The fiber is led from here between the nip roll and the clearer roll 20, which latter roll changes the direction or lead of the stock and raises the fibers from the pins or teeth in the pin roll, nicely clearing the same and preventing the stock from winding around and clogging up said roll. From here the stock is led in the form of a sliver through the trumpet 42 preferably to the second set of drawing-off rolls located in the small comb circles. Here the sliver is increased by the addition of the fringe gathered and drawn from the small circles in the same manner as drawn from the large comb circles, whence the whole is led through the trumpet 43 to the balling head or to the can 14.

This construction of rolls is equally well adapted to be used as the front rolls on gill-boxes to do away with the usual apron from which the sliver is led to the baller, or the same may be used in silk, flax, and jute machines, or any other fiber operating machinery in which the same may be adapted to operate in a practical manner.

I do not restrict myself to placing the cushions between the rows of teeth of the pin rolls, as cushion strips may be secured to either roll or held on the outer edges of the teeth of either roll, if desired, as shown in

Fig. 11. Neither do I wish to be restricted to the arrangement of the pins or teeth as these may be made of pins driven into the roll or formed and arranged in any suitable or convenient manner, and in fact in the operation of some fibers the pins or teeth may be done away with altogether depending entirely upon the flexible nip of the rolls for drawing off the fibers, and therefore any arrangement of rolls having a combination of both pins or teeth and cushions or cushions alone attached to the rolls to act upon the fiber would come within the spirit and scope of my invention.

My improved rolls are practical in their construction and effective in their operation and by their use combs and gill boxes and analogous machines to which these rolls may be applied may be operated at much less expense as the costly aprons are done away with and at the same time a greater percentage of the long fiber is saved.

What I do claim as my invention, and desire to secure by Letters Patent, is:

1. A drawing off roll comprising a toothed cage, and an internal body of cushioning material located within said cage, portions of said cage being cut away to expose said cushioning material.

2. A drawing off roll comprising a toothed cage, and an internal body of cushioning material located within said cage, said cage being provided with slots alternating with the teeth thereof.

3. A drawing off roll comprising a cage formed with longitudinally arranged serrated ribs, and an internal body of cushioning material, portions of said cushioning material being exposed between said ribs.

4. A drawing off roll comprising a cage provided with internal ribs, and a bushing of cushioning material provided with grooves to receive said ribs, said cage being slotted to expose portions of said bushing.

5. A drawing off roll comprising a cage provided with serrated ribs, and cushioning means forming a part of the body of said roll.

6. In a machine of the character described, a pair of corrugated drawing-off rolls, one of said rolls provided with teeth, cushioning means secured between the teeth of one of said rolls against which the fibers may be nipped without injuring the same, and means for clearing said toothed roll.

7. In a machine of the character described, a pair of corrugated drawing-off rolls, a plurality of rows of teeth on one of said rolls, cushioning means secured between said rows of teeth of said roll against which the fibers may be nipped by the ribs of the opposite roll without injuring the fiber.

8. In a machine of the character described, a pair of drawing off rolls one of which is provided with ribs and cushioning

means secured between said ribs, and means for clearing or removing the stock from said ribs.

5 9. In a machine of the character described, a pair of corrugated drawing-off rolls, one of said rolls provided with a plurality of rows of teeth, cushioning means secured to said roll between said rows of teeth, and a clearer roll for raising and clearing
10 the fibers from said toothed roll.

10 10. In a machine of the character described, a pair of corrugated drawing-off rolls, engaging teeth on one of said rolls, cushioning means secured between the teeth
15 of said rolls, a corrugated clearer roll meshing with one of said rolls, and means whereby said rolls may yield or draw apart as the stock passes between them.

20 11. In a machine of the character described, a toothed roll, cushioning means connected to said roll, a corrugated nip roll adapted to nip the fiber against the cushion on said toothed roll, and a clearer roll meshing with said nip roll and arranged to lift
25 the fiber from and clear the teeth of the first mentioned roll.

30 12. In a machine of the character described, a toothed roll, cushioning means connected to said roll, a corrugated nip roll adapted to nip the fiber against the cushion on said toothed roll, a clearer roll meshing with said nip roll and arranged to lift the fiber from and clear the teeth of the first mentioned roll, and means for flexibly adjusting the pressure of said rolls against
35 each other.

40 13. In a machine of the character described, a pair of corrugated drawing-off rolls, engaging teeth on one of said rolls, cushioning means secured between the teeth of said rolls, a corrugated clearer roll meshing with one of said rolls, and means for flexibly adjusting the pressure of said rolls against each other.

45 14. In a machine of the character described, a toothed roll, cushioning means

connected to said roll, a corrugated nip roll adapted to nip the fiber against the cushion on said toothed roll, a clearer roll meshing with said nip roll and arranged to lift the
50 fiber from and clear the teeth of the first mentioned roll, means for exerting a flexible pressure of the nip roll and the clearer, and means whereby said pressure may be adjusted.

55 15. In a machine of the character described, a roll provided with serrated longitudinal bars located at intervals around its circumference for the purpose of engaging and drawing in the fibers and material of a
60 softer material located between said bars.

16. In a machine of the character described, a toothed roll provided with serrated longitudinal bars located at intervals around its circumference, a corrugated nip
65 roll, and cushioning means between said longitudinal bars against which the ribs of said nip roll nips the fibers.

17. In a machine of the character described, a toothed roll provided with serrated longitudinal bars located at intervals around its circumference, a corrugated nip
70 roll, cushioning means between said longitudinal bars against which the ribs of said nip roll nips the fibers, and a driven gear on said toothed roll meshing with said nip roll to keep said rolls in time with each other.

18. In a machine of the character described, a toothed roll provided with serrated longitudinal bars located at intervals around its circumference, a corrugated nip
80 roll, a bushing or shell of cushioning material adapted to be forced into said toothed roll to form cushions between the row of teeth thereon against which the ribs of said
85 nip roll nip the fibers.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN R. MILSON.

Witnesses:

HOWARD E. BARLOW,

E. I. OGDEN.