

(No Model.)

5 Sheets—Sheet 1.

J. A. MURPHY.

MACHINE FOR PREPARING HAIR FOR COMBING.

No. 467,043.

Patented Jan. 12, 1892.

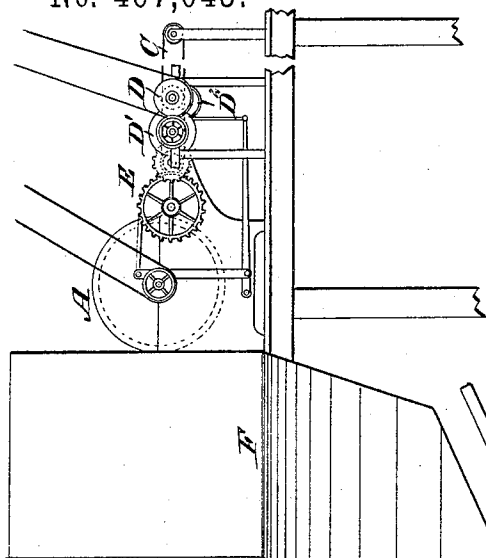
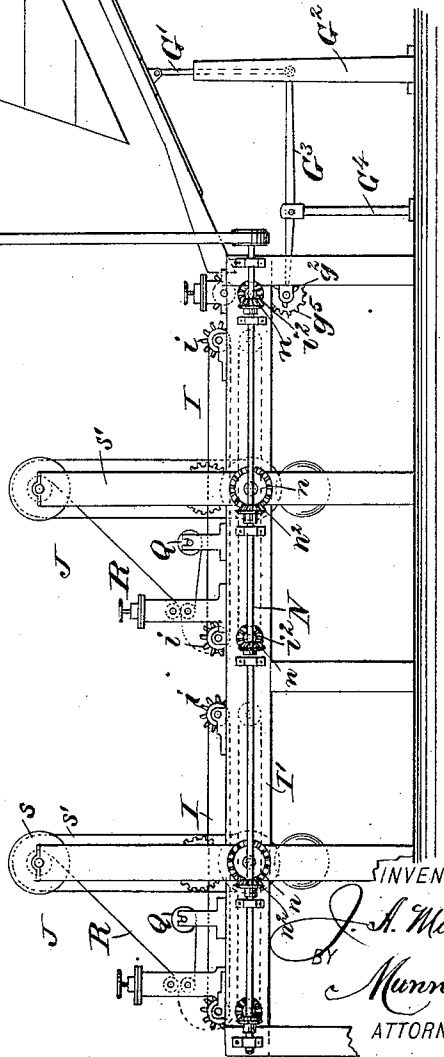
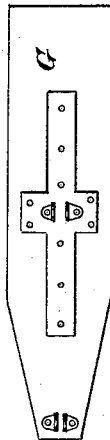


Fig. 1.

Fig. 10.



Fig. 11.



WITNESSES:

Chas. Nida.
C. Sedgwick

INVENTOR:

J. A. Murphy
BY
Munn & Co.
ATTORNEYS

(No Model.)

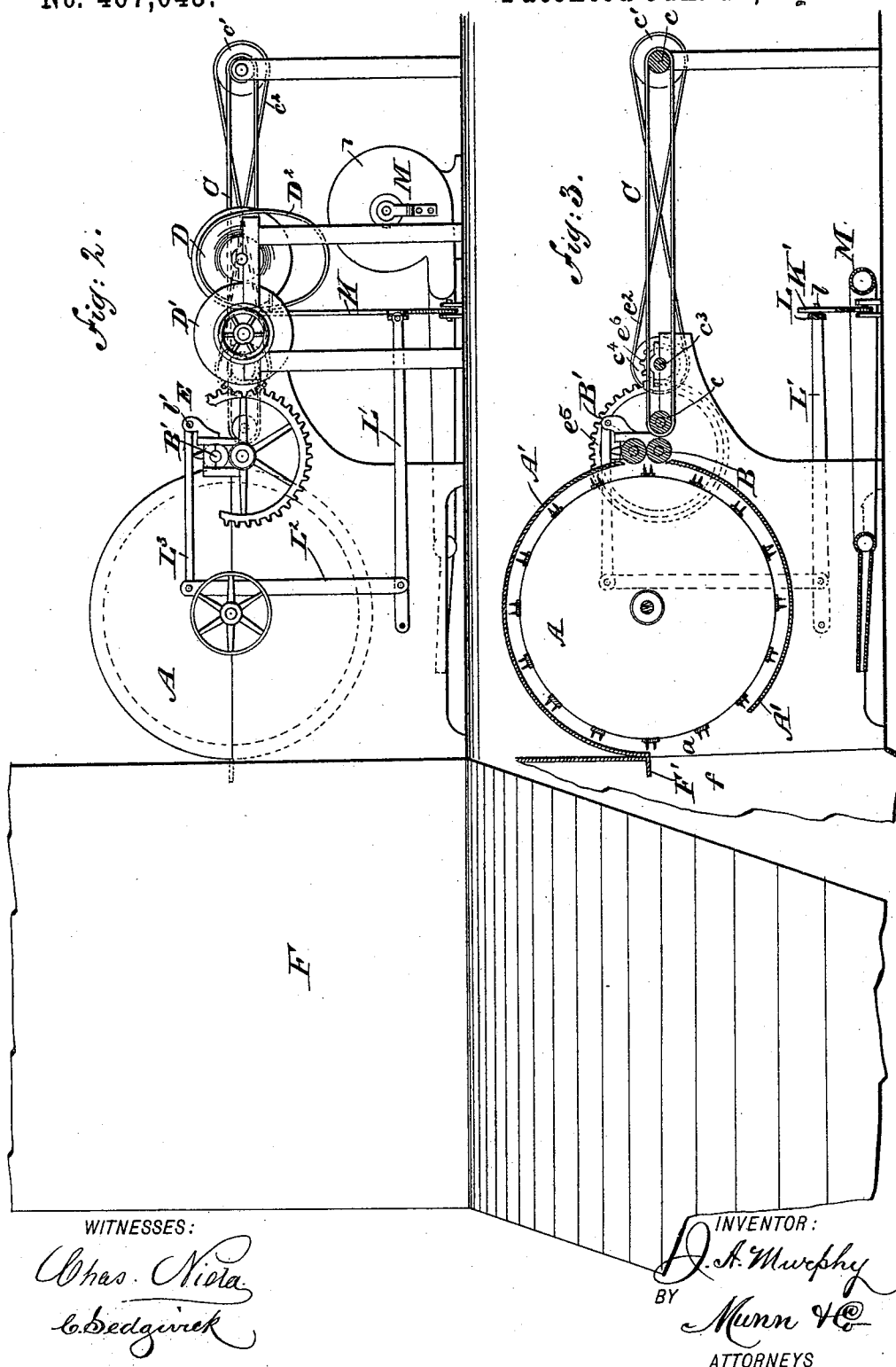
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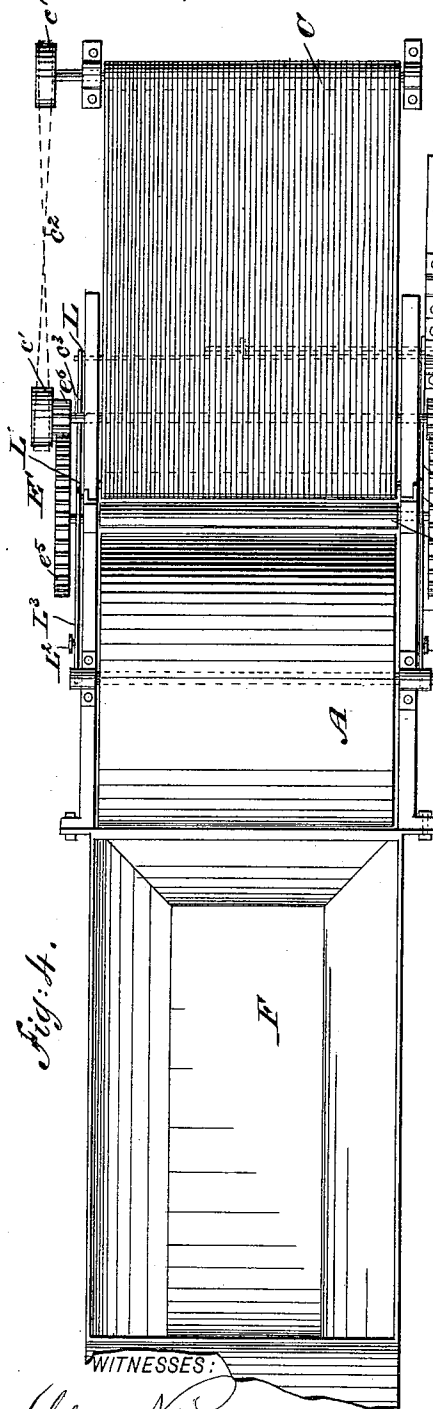


Fig. 4.

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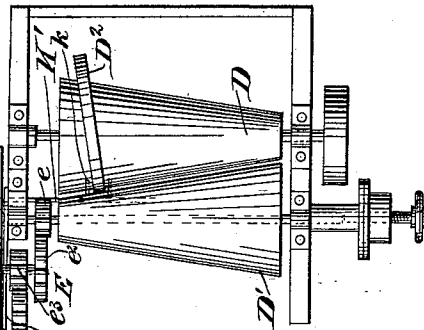
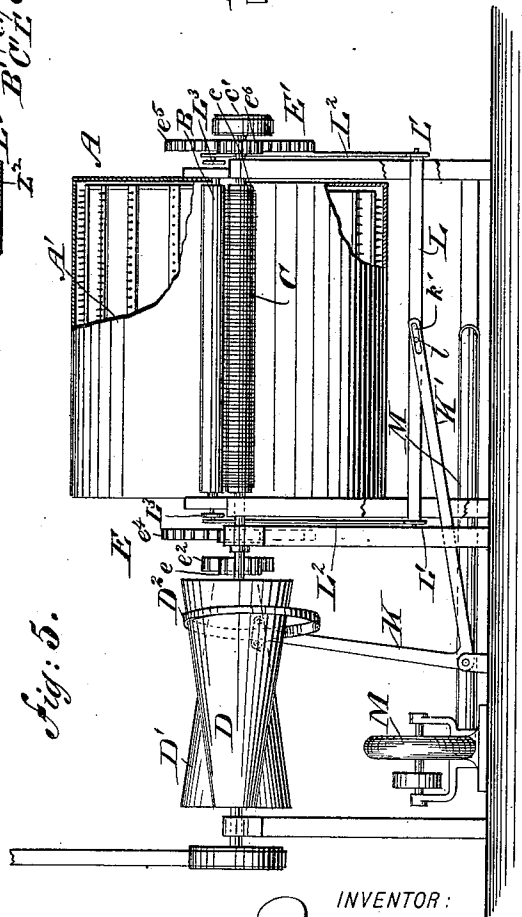


Fig. 5.



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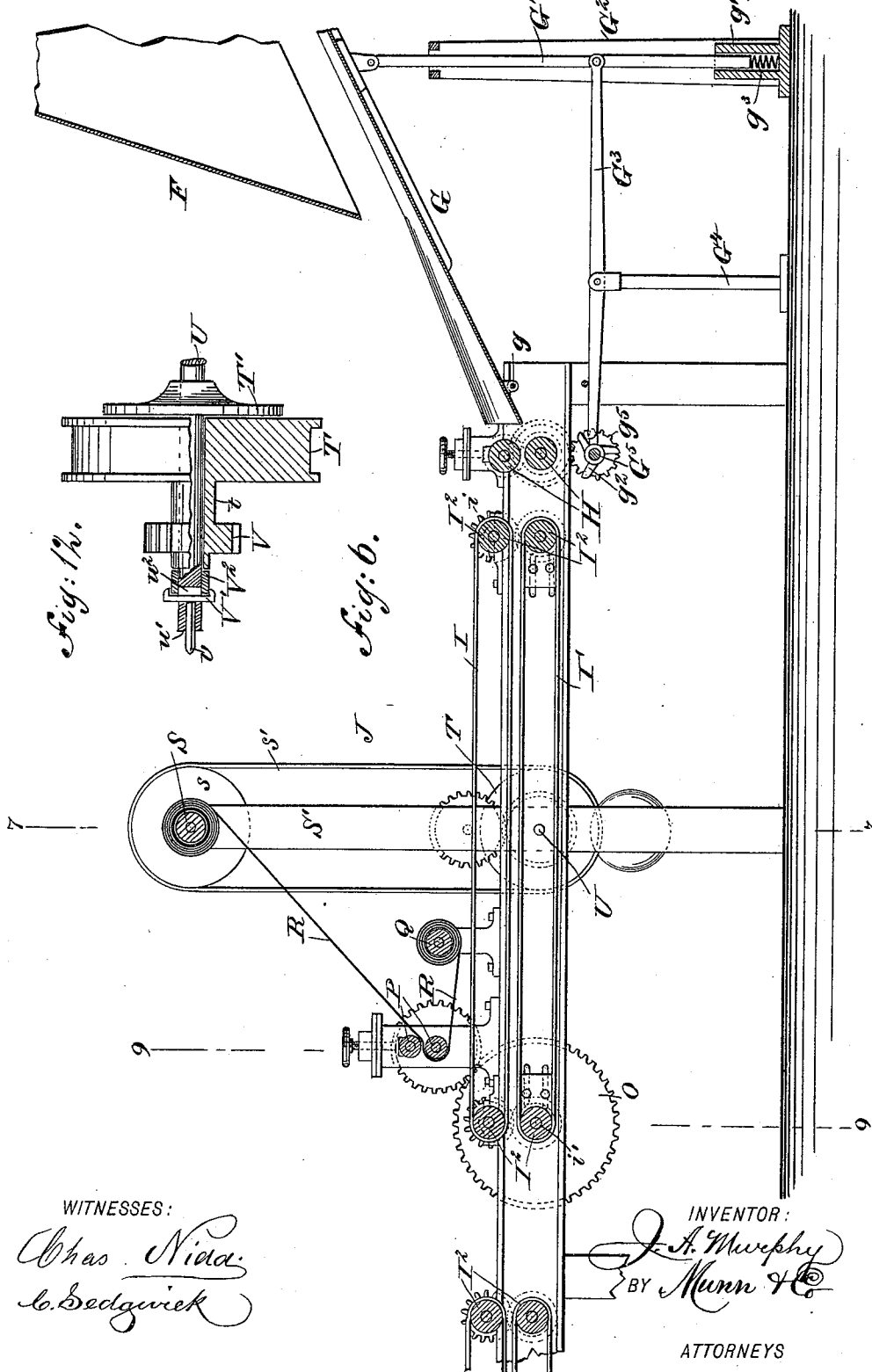
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UNITED STATES PATENT OFFICE.

JUNIUS A. MURPHY, OF NEW ORLEANS, LOUISIANA.

MACHINE FOR PREPARING HAIR FOR COMBING.

SPECIFICATION forming part of Letters Patent No. 467,043, dated January 12, 1892.

Application filed June 4, 1891. Serial No. 395,024. (No model.)

To all whom it may concern:

Be it known that I, JUNIUS A. MURPHY, of New Orleans, in the parish of Orleans and State of Louisiana, have invented a new and
5 Improved Machine for Preparing Hair for Combing, of which the following is a full, clear, and exact description.

The invention relates to machinery for treating horse-hair and similar fibers, and has
10 for its object the production of a machine for picking and forming the hair into a lap with the desired uniformity and economy, and whereby the lap will be in proper form to enable the combing-frames, to which the hair is
15 subsequently subjected, to effectively tease and comb the same.

The invention is distinguished by a novel feed mechanism and feed-regulator for the picker, a novel arrangement of the picker-cylinder, the hopper to which the picker delivers and their appurtenances, and it is further distinguished by a novel improvement
20 in the forming of the lap and in the reeling of the same.

The invention also includes various details and combinations of parts, all as hereinafter fully described, and defined in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate
30 corresponding parts in all the figures.

Figure 1 is a side elevation of the complete machine. Fig. 2 is a side elevation, on a larger scale, of the picker-cylinder, the feed mechanism therefor and its appurtenances, and the hopper to which the picker-cylinder delivers. Fig. 3 is a longitudinal vertical section through the picker-cylinder and its feed mechanism. Fig. 4 is a plan view of the parts
40 shown in Fig. 2. Fig. 5 is a front elevation thereof, parts of the casing or guard of the picker-cylinder being removed. Fig. 6 is a longitudinal vertical section through the jigging-apron, the reeling mechanism, and the delivery mechanism arranged in connection therewith. Fig. 7 is a transverse vertical section on line 7 7 in Fig. 6, parts being omitted. Fig. 8 is a detail side elevation of a portion of the reeling mechanism. Fig. 9 is a transverse vertical section on line 9 9, Fig. 6. Fig.
50 10 is a plan view of the jigging-apron. Fig. 11 is an inverted plan view of said apron, and

Fig. 12 is a detail sectional view of the friction-clutch of the reeling mechanism.

In constructing an apparatus embodying
55 my invention a suitable picker-cylinder A is provided, to which the hair is fed by feed mechanism comprising a fixed and a yielding feed-roll B B', Fig. 3, and means for delivering the hair to said rolls. I prefer to employ
60 an endless conveyer-belt C for delivering the material to the feed-rolls, and, in connection with said conveyer-belt and feed, a driving mechanism is employed comprising in the main, cone-pulleys D D', an interposed friction-belt D², and trains of gear-wheels E E'.
65 The picker-cylinder delivers the picked hair, in the manner hereinafter described, to a hopper F, from which the said hair gravitates to a vibrating or jigging apron G, and
70 from the latter it passes to compression-rolls H, Fig. 6. Endless belts I I', arranged in duplicate sets, serve to deliver the hair from the compression-rolls H to duplicate sets of reeling mechanism J J.
75

The apparatus thus generalized is constructed and arranged in its details as follows: The endless conveyer-belt C travels in the direction of the rolls B B' over rollers c c, one of which carries a pulley c', which is connected by a belt c² with a pulley c⁴ on a transverse shaft c³, the pulley c⁴ and the feed-rolls being driven through the medium of the gear-wheels E E'. One of the reversely-placed cone-pulleys D D' is driven from any suitable power and serves to drive its companion pulley through the medium of the interposed friction-belt D², and on the shaft of the driven pulley D' a pinion e is secured, which meshes with a gear-wheel e² on the shaft c³, which shaft carries a pinion e³, which meshes with a gear-wheel e⁴ on the feed-roll B. At the opposite side of the machine the roll B carries a second gear-wheel e⁵, which meshes with a pinion e⁶ on the shaft c³. Thus motion
80 is imparted to the conveyer-belt and feed-rolls from the cone-pulleys D D'; and in order to regulate the feed mechanism a regulator is provided which is automatically governed from the yielding feed-roll B'. Thus
85 a belt-shifter K in the form of an elbow-lever is provided at the end of its vertical arm with guide projections or ears k, through which the drive-belt D² passes, and the other
90
95
100

arm K' of the belt-shaft is formed with an elongated slot k' , Fig. 5, into which projects the pin l , formed on or secured to the cross-bar L. The bar L is connected by its ends with levers L', which range longitudinally at each side of the feed mechanism; and said levers L' are connected by vertical links L² with levers L³, which are fulcrumed at their opposite ends, as at l' , adjacent to and above the yielding roll B', so as to rest on said rolls or the journals thereof. With feed-regulating devices thus constructed it will readily be understood that when an abnormal quantity of hair is delivered to the rolls B B' its increased thickness will cause the yielding roll B' to rise, which will throw the levers L³ upward, and through the medium of the connections shown throw the belt-shifter K, and so shift the drive-belt D² as to immediately cause a decrease in the speed of the driven pulley D' and the feed-rolls and conveyer-belt.

In order to form a lap of uniform density or thickness I so deliver the hair to the hopper as to cause it to fall in a shower, and to this end the guard A' is continued upward above the lowermost point of the cylinder A, whereby an upward direction will be given the picked hair when thrown off the picker-cylinder. This upward direction is changed by means of a deflector F', which is arranged at the upper end of the opening f of the hopper and projects into the hopper a short distance. This deflector retards the upward movement of the picked hair and deflects it in a more or less horizontal direction across the hopper, but not so violently as to cause it to be thrown against the opposite side. The upward air-current induced in the hopper by the picker-cylinder causes an eddy below the cylinder adjacent to the hopper, and this I counteract by an opposed current from a blower M, which is operated from any convenient power and arranged to direct the current of air into the hopper with a force just sufficient to counteract the action of the eddy. The result of this arrangement is that the hair will be spread out in the hopper and will gravitate in the form of a shower onto the apron G and without being concentrated at any one point in the hopper. The main cause of the thorough spreading and uniformity in the falling of the hair is due to the deflector and the upwardly-turned guard A'.

The apron G is inclined and is pivoted at its lower end at g , and intermediate of its length there is pivoted to its under side the upper end of a post G', which is capable of being reciprocated vertically in the guide G², the lower end of the post resting on a spring g^3 in a socket g' . Motion is imparted to the post G' by a rocking-lever G³, which is fulcrumed intermediate of its length to a standard G⁴ or other support, and the free end of said lever extends into the path of strikers g^2 , secured or formed radially on a transverse shaft G⁵, which is driven by gear-wheels g^5

from one of the compression-rolls H, the arrangement being such that as the shaft G⁵ is rotated its strikers g^2 will successively strike the free end of the rocking-lever G³ and through the medium of the post G' give a downward movement to the apron G. The spring g^3 returns the apron after each movement by the rocking-lever, and thus a jigging motion is given to the apron for causing the hair lap formed thereon to gravitate in the direction of the compression-rolls H. The lower end of the apron G has its sides g^6 turned upward and gradually inward to overhang, whereby as the lap approaches the said end the sides of the lap will be turned over to give body to the lap, the overturned sides being compressed by the compression-rolls to prevent them from rising.

The reeling mechanism J and the endless aprons delivering thereto are in duplicate and arranged in tandem for a purpose presently to be described; but as both sets are alike it will suffice to refer to the parts in the singular number. The superposed endless belts or aprons I I' travel around rollers I², and said rollers and the compression-rolls H are given motion from a main drive-shaft N. Each pair of rollers I² are permanently geared together at one end by pinions i , secured to said rollers, and the shaft i' of each of the lower rollers is provided at the opposite end with a bevel-pinion i^2 , which meshes with a similar pinion n on shaft N. At the delivery end of the aprons the shaft i' of the lower roller I² is provided with a loose gear-wheel O, the hub of which is formed with a clutch-section o , and adjacent to such clutch is a companion clutch-section o' , the latter being held to the shaft i' by a feather-and-groove connection, so as to turn with the shaft, but be capable of a longitudinal movement, in response to an ordinary shifting-lever o^2 , operated by hand or otherwise, so as to engage the clutch-section o of gear-wheel O for giving motion to said gear-wheel.

Meshing with the gear-wheel O is a gear-wheel p , which is carried by the shaft of one of the two companion rolls P P. In the rear of the rolls P is a roll Q, on which cloth or other suitable web R is wound, the web in practice being unwound from the roll Q and passing therefrom to and between the rolls P, from whence it passes to and is wound on a reel S, mounted in the upper ends of standards S' or other suitable frame. The reel S is driven by a pulley s and belt s' from a drive-pulley T, which is mounted loosely on a transverse shaft U, the said shaft being provided with a bevel-pinion u , which meshes with a similar pinion n^2 on the main shaft N. On the shaft U, adjacent to the pulley T, a friction-disk T' is keyed for driving the said pulley when the latter is moved into frictional contact therewith.

On the hub t of the pulley T a pinion V is formed or secured, and meshing therewith is a pinion w , which is keyed to a screw-rod W,

the latter having a ball-and-socket bearing in an arm w' or other suitable part of the framework, so that the said screw-rod may be capable of vertical movement. The screw-rod W rests in a threaded semicircular seat x , formed on the upper end of the stem X' , which projects upward from a weight X, said stem X' being fitted to slide on a lever Y, which is fulcrumed on the frame of the machine for vertical movement. The lever Y is formed with a toe or shoulder y , which bears against the outer end of a pin v , the said pin being fitted for longitudinal movement in the axially-bored end u' of the shaft U. At its inner end the key v bears against a pin V' , which passes through a slot u^2 , the said slot ranging diametrically through the shaft U and intersecting the axial bore u' . The ends of the key V' extend in the direction of the length of the shaft U and overlie a loose collar V^2 , which is fitted on the shaft U between said key and the end of the hub t of the pulley T beyond its pinion V. The devices thus described are for the purpose of giving drawing action to the reel S, and consequently increased tension to the web, as the reeling of the web progresses and its diameter consequently increases, and the operation of such devices will be presently described.

In practice the lap is delivered by the belts I I', and its end is turned up between the rolls P P' or over the same to the web R, and it is thus caused to travel with said web to the reel S, whereby the two will be wound on said reel together, the web forming a backing and separating film between the successive layers of the hair lap. In this manner the lap may be delivered in the best possible condition to the combing-frames for subsequent combing in the process of curling the hair. As the shaft U is rotated, and likewise the rolls P, through which the web passes, the web will be wound by the reel S through the medium of the driving-pulley T and friction-disk T'. During the initial winding the weighted lever Y will press the pulley T into frictional contact with the friction-disk T' with no great pressure; but as the winding progresses the revolution of the screw-rod W, through the pinions V w , will move the weight X outward on the lever Y and cause the pin v to press the pulley T into closer contact with the friction-disk T', and as the feeding action of the rolls P remains unchanged the drawing action of the reel T will be increased sufficiently to wind the combined web and hair with the desired tightness. When the reel S of the first set of reeling mechanism is wound to its fullest extent, the lap being delivered by the first pair of aprons I I², is broken and passed to the similar aprons of the second set of reeling mechanism, and the reeling thus continued without interrupting the operation of the picking-cylinder, &c. When the reel of the second set is wound, the lap is again directed to the first set, a new reel having been in the meantime placed in the latter.

It will be seen that with the above-described apparatus the lap is formed without being undesirably matted, the complete automatic regulation of the feed is provided for, and provision is made for a proper reeling of the lap without interrupting the operation of the lap-forming mechanism.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In machinery for treating horse-hair and other fibers, the combination of a picker, a hopper to which said picker delivers, a jigging-apron arranged beneath the hopper, reeling mechanism, and delivery devices between said apron and reeling mechanism, substantially as described.

2. The combination, with a picker and a hopper to which said picker delivers, of a jigging-apron beneath said hopper; compression-rolls beyond said apron, and a reeling mechanism beyond said compression-rolls, substantially as described.

3. The combination, with a picker mechanism, a hopper to which said picker delivers, and a blower arranged in connection therewith, of a jigging-apron beneath the hopper, conveyer-belts beyond said apron, and reeling mechanism to which said belts deliver, substantially as described.

4. The combination, with a picker mechanism, a hopper to which the picker delivers, and a jigging-apron beneath said hoppers, of duplicate sets of reeling mechanism for the lap formed by said picker and apron, substantially as described.

5. The combination, with a picker-cylinder, of feed mechanism therefor, including a fixed and a yielding roll and a feed-regulator for said feed mechanism, the said regulator being controlled from the yielding feed-roll, a hopper to which the picker delivers, reeling mechanism, and means for delivering the picked fiber from the hopper to the reeling mechanism, substantially as described.

6. The combination, with a picker-cylinder and a hopper, the guard or casing of the picker-cylinder and the hopper having communicating openings, the said guard being continued upward at the opening to direct the picked hair in an upward direction, of a vibrating apron below said hopper and a reeling mechanism, substantially as described.

7. The combination, with a picker-cylinder and a hopper arranged in connection therewith, of a feed mechanism including a fixed and a yielding roll, means for driving the feed mechanism, including a belt and pulleys, of a belt-shifter for said belt, the shifter being operated from the yielding roll, substantially as described.

8. The combination, with feed-rolls, one of which is a yielding roll, a conveyer-belt delivering thereto, and means including a driving belt and pulleys for giving motion to said conveyer-belt and feed-rolls, of levers at each end of the yielding roll and adapted to be

thrown by the latter, a belt-shifter, a transverse bar to which said shifter is connected at about the center of said bar, and connections between said bar and the above-named
5 levers, substantially as described.

9. The combination, with a picker-cylinder, of a hopper to which said picker delivers in an upward direction, the hopper having a deflector extending inwardly therein in the path
10 of the material thrown by the picker, substantially as described.

10. In combination, a hopper having an opening, a picker-cylinder the guard or casing of which has an opening leading to that
15 of the hopper, said guard being curved upward at the lower end of the hopper-opening and a deflector extending into the hopper at the upper end of the opening therein, substantially as described.

20 11. In combination, a hopper having an opening, a picker-cylinder the guard or casing of which has an opening leading to that of the hopper, said guard being curved upward at the lower end of the hopper-opening,
25 a deflector extending into the hopper at the upper end of the opening therein, and a blower arranged to deliver a current of air near the upwardly-extending end of the picker-guard, substantially as described.

30 12. The combination, with a picker-cylinder, of a hopper to which said picker delivers and a jiggings-apron beneath said hopper, substantially as described.

35 13. The combination, with a picker-cylinder, of a hopper to which said picker delivers the picked material in an upward direction, a blower arranged to deliver a current of air below the point of delivery of the picker, and
40 a jiggings-apron beneath said hopper, substantially as described.

45 14. In machinery for treating hair or other fiber, an inclined jiggings-apron having its one end formed with overhanging sides, in combination with compression-rolls beyond said
apron, substantially as described.

50 15. The combination, with the compressing-rollers and the parallel endless feed-belts between which the material passes from the rollers, of rollers P P, one above the other
across the delivery end of the upper belt, the upper and lower rolls S Q, the web R, secured at its ends to the rolls Q S, and passed between the rolls P P, and mechanism for operating the said belts and rollers, substantially
55 as set forth.

16. In a machine for treating hair or other fiber, duplicate sets of reeling mechanism, in combination with two longitudinally-aligned sets of conveyer-belts for delivering the fiber, one of such sets of belts being adapted to deliver to the first set of reeling devices, or to the conveyer-belts of the second set of reeling devices, the said sets each comprising an upper and lower endless belt, between which the material is fed in combination, substantially
60 as described.

17. The combination, with the shaft having a loose pulley and the friction-disk thereon, of a screw-shaft parallel with the first-named shaft and geared at its inner end to the loose pulley, a lever pivoted at its inner end below the screw-shaft independent thereof and having a traveling weight operated by the said screw-shaft, and shifting devices operated by the said lever to firmly engage the loose pulley and friction-disk as the weight is moved outward, substantially as set forth.
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18. The combination, with the reel and the drive-shaft provided with a friction-disk and a loose pulley belted to the reel and provided with a gear V, of a screw-shaft W, having a universal bearing at its inner end, and a gear w, meshing with gear V, the lever Y, pivoted at its inner end below the screw-shaft and having a foot y on its lower side near its pivoted end, a weight traveling on the lever and having a connection with one screw-shaft, and a pin sliding axially in the main shaft, connected at its inner end with the sliding pulley and engaged at its outer end by the foot y,
85 substantially as set forth.

19. In a machine for treating fibers, the combination, with a web and a reel therefor, of a pair of rolls through which the web passes to the reel, conveying mechanism for delivering the fiber to said web, a drive-shaft, and means for actuating the reel therefrom, including a friction-disk and a drive-pulley, the said pulley being loose on the shaft, a screw-rod actuated from said pulley, a lever fulcrumed adjacent to said screw-rod, a weight on said lever movable by said screw-rod, and shifting devices for the pulley intermediate the said pulley and the weighted lever, substantially as described.
95 100

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Witnesses:

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