No. 812,311. PATENTED FEB. 13, 1906.

E. TYDEN.

FIBER MIXER.

APPLICATION FILED MAR. 18, 1905.

2 SHEETS—SHEET 1.

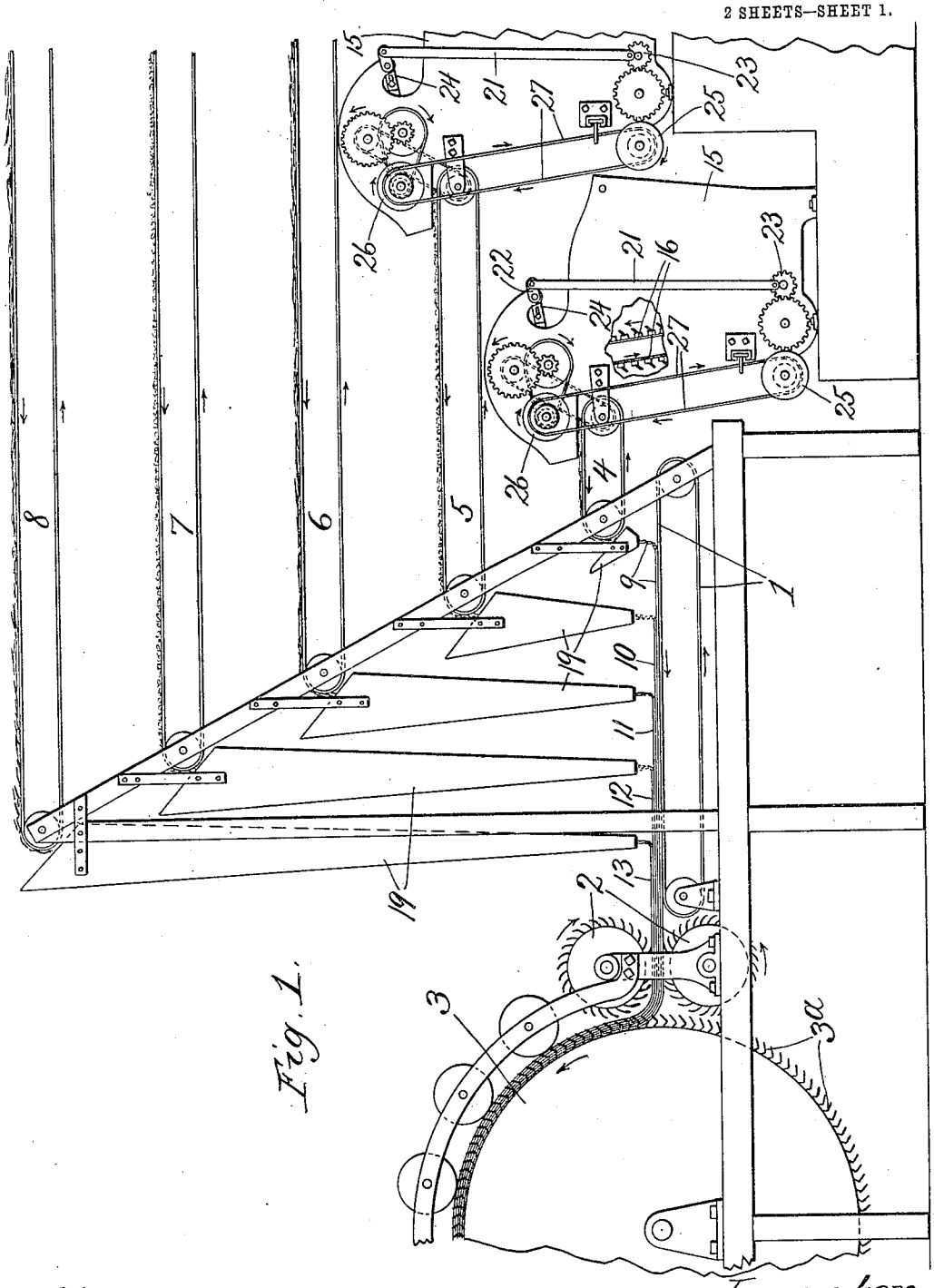

Fig. 1.

Witnesses.
Edward T. Wray.
Fred' G. Fischer

Inventor.
Emil Tyden.
by Burton & Burton
his Atty's.

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2 SHEETS—SHEET 2.

Fig. 2.

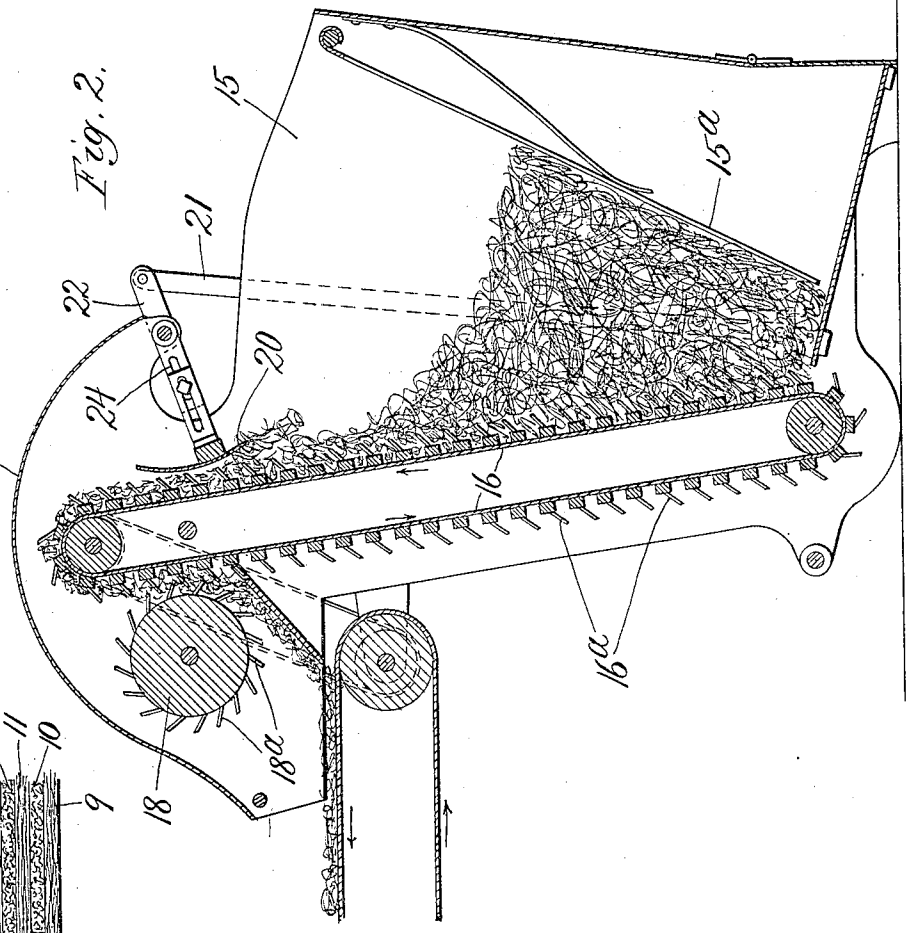
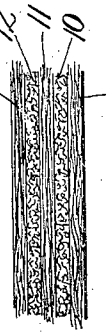


Fig. 4.



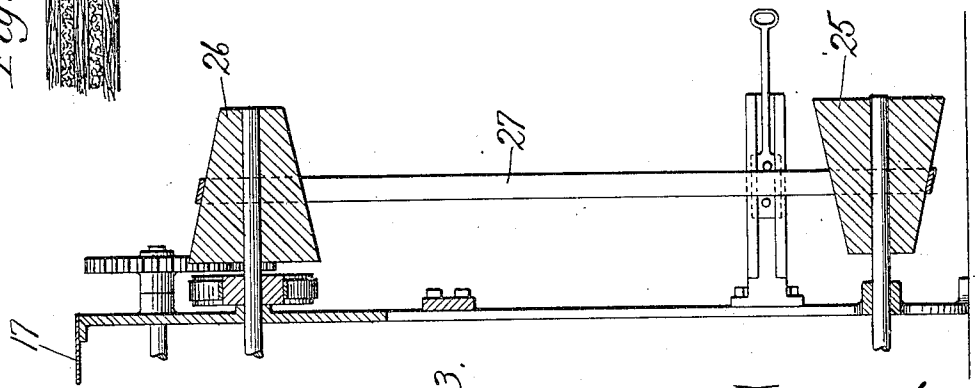


Fig. 3.

Witnesses.
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UNITED STATES PATENT OFFICE.

EMIL TYDEN, OF HASTINGS, MICHIGAN.

FIBER-MIXER.

No. 812,311. Specification of Letters Patent. Patented Feb. 13, 1906.

Application filed March 18, 1905. Serial No. 250,751.

To all whom it may concern:

Be it known that I, EMIL TYDEN, a citizen of the United States, residing at Hastings, in the county of Barry and State of Michigan, have invented new and useful Improvements in Fiber-Mixers, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this invention is to provide an improved apparatus for mixing the various grades and qualities of stocks for different materials to be mixed and blended for manufacture of felt or other fiber products.

It consists in the organization, combination, and construction of the elements set out in the claims.

A serious difficulty encountered in mixing different fibrous materials for the manufacture of felt or for carding in order to produce the desired grades and qualities of resulting product arises from the fact that by reason of the different lengths and qualities of fiber in the different elements to be thus mixed, the customary mixing devices by which the different elements when assembled in the desired proportions are, so to speak, stirred, combed, or raked together, tend often to separate the longer fibered stock from that of the shorter fiber instead of mixing it with it, because the short fiber or the smooth fiber, as hair, is easily left behind by the combing or raking device, while the long fiber or that which tends more than the other to tangle or cling together is engaged and moved forward by the rake, so that when the proper proportions of the various elements have been assembled together for mixing the action upon the materials of the mixing devices takes out and blends a larger percentage of the longer and more engageable fiber and leaves behind a larger proportion of the shorter fiber or else causes the short fiber to be finally carried out in quantities, where it becomes engaged between masses of longer fiber without being blended therewith. This causes the resulting felt stock or card to be uneven in quality and especially to contain occasional spots, which are made up so largely of the short fiber as to constitute flaws and cause the resulting articles of felt in which these spots appear to be classed as low grade or rejected and the thread spun from these parts of the card to be inferior, causing waste of all the labor expended in manufacture. It is to overcome this difficulty that the present invention is devised. It consists of means by which the several elements of the stock to be blended are delivered upon a horizontal carrier in layers one upon the other, the thickness of the layers being according to the proportions of the several elements desired in the mixture and such relative thicknesses being maintained continuously by regulating the speed of the devices which deliver the elements respectively, so that the resulting proportions are obtained, such speed being ascertained by experiment with each particular sort of material, and thereby being adapted to the character of the material or the facility with which it is actually engaged by the devices provided for taking it up and conveying it, thus making it possible with each lot of stock to obtain throughout the entire feeding of it a uniform result as to quantity delivered to the layer.

In the drawings, Figure 1 is a vertical longitudinal section through the conveyer and initial mixing-wheels of a mixer or blending-machine and the devices for feeding the several elements thereto. Fig. 2 is a section of one of the feeders. Fig. 3 is a detail section at the line 3 3 on Fig. 1, but made on the scale of Fig. 2, showing means for regulating the rate of feeding action of the feeder. Fig. 4 is a magnified section through the stratified layer deposited on the blending-machine feeding-carrier by the apparatus shown.

The blending-machine is of a familiar type, represented conventionally by the receiving-apron 1, which is an endless carrier from which at its delivery side the material carried by it is delivered between two feed-rollers 2 2, and at the side of said rollers remote from the end of the apron conveyer it is taken by the main cylinder 3 of the blending-machine, by which it is carried through the machine in the well-understood manner of such machines.

4, 5, 6, 7, and 8 are endless conveyer-aprons which bring the several elements of stock to be blended each from a separate feeder, hereinafter described. The lowest of the aprons 4 overhangs the outer or receiving end portion of the conveyer-apron 1 of the blending-machine and delivers a film or stream of the particular element which it carries onto said apron, forming the lowest layer thereon, (represented at 9.) The apron 5 is extended above the feeder to which the apron 4 pertains and beyond the point at which the apron 4 delivers its layer onto the apron 1, so that it delivers the material which it carries on said

apron 1 in advance of the point of delivery thereon of the layer 9 by the apron 4, so that the layer 10 delivered by said apron 5 is superimposed upon the film 9 as a second stratum or layer. Similarly, the aprons 6, 7, and 8 deliver material which they carry successively in advance of each other onto the apron 1, forming successively-superinterposed layers 11, 12, and 13, so that there is produced upon the apron 1 a stratified deposit, each stratum consisting of one element of the stock to be blended in the felt in the proportion in which such element is required for producing the quality of felt desired. This stratified deposit when delivered by the conveyer-apron 1' to the feed-rolls 2 2 is by them compressed and issues from between them in a sufficiently-coherent condition, so that the rapidly-revolving main cylinder 3 of the blending-machine detaches the material by the travel of its teeth or fingers 3^a across the exposed edge of the stratified mass, taking, therefore, the several elements in the exact proportions measured by the thickness of the several strata or layers 9, 10, 11, 12, and 13, and the material is thus carried through the blender and delivered therefrom thoroughly mixed in these proportions. The particular character of this blender or mixing-machine is well understood and requires no further or more particular description.

Each of the conveyer-aprons 4, 5, 6, 7, and 8 constitutes the delivering device from a feeder. The several feeders (two being shown in Fig. 1) are of familiar type, as shown in section in Fig. 2, and will be briefly described, the description of one answering for all, excepting as to their relative position and the length of the delivering-apron. Each of these feeding devices consists of a hopper or bin 15, which is kept supplied with the material or element of the stock to be fed, which may be in one case hair, in another case short fiber or shoddy, or in another case longer wool fiber, according to the particular mixture desired in the felt to be produced.

An endless elevator 16 travels from the bottom upward at the forward side of the bin or hopper 15 for carrying up the stock, which is kept pressed in toward the foot of the elevator by the spring-pressed follower 15^a. The elevator is armed with teeth or fingers 16^a for thus lifting the stock which it carries under the hood 17, where the material is cleared from the elevator by the revolving wheel 18, having paddles or vanes 18^a for dislodging the material from the carrying-fingers of the elevator and causing it to be lodged upon the receiving end of the apron 4, 5, 6, 7, or 8, as the case may be.

The several feeding devices, comprising each the bin or hopper, elevator, clearing paddle-wheel, and delivery-apron, are mounted upon platforms successively higher and higher, so that said delivery-apron of each of the devices back of the first may extend forward over the one in advance of it, and these delivery-aprons are successively longer and longer, so that the one farthest back may extend over the feeders in front of it and deliver at a point on the conveyer-apron 1 of the blender in front of all the preceding. This arrangement makes the delivery-aprons, from the foremost to the rearmost, successively higher and higher at the delivery-point, and the material which they respectively carry and deliver is guided in its direct fall from the delivery end of the feed-apron to the proper point on the apron 1 in throats or vertical guideways formed by approximately vertical but converging bars 19 19. These guiding-throats are only necessery to prevent the scattering of the material which may not be sufficiently coherent to constitute a continuous sheet or film.

It will be seen that the quantity of material delivered from any one of the feeding devices by the delivery-apron thereof may be determined by the rate at which the entire feed device is operated, or even by the rate at which the elevator operates to take up the material from the bin, provided the thickness of the layer or load which the elevator is adapted or permitted to carry under the hood is regulated so as to be uniform. These feeding devices have a comb 20, operating at the upper end of the elevator, vibrated by suitable connections, as a pitman 21, from a crank 22, and a continuously-revolved gear 23 for combing off any superfluous or excess of material which may be engaged by the fingers of the elevator and carried up in clots or lumps, so that the elevator delivers a substantially uniform layer to the delivery-apron at the farther side. This comb by means of the slotted construction of the lever-arm 24 (see Fig. 2) is adjustable to make the distance of its operating edge from the elevator greater or less to permit the elevator to carry up and deliver a load or layer of greater or less thickness and with a given character of stock, the elevator running at a given speed and with the comb adjusted at a given distance from the elevator, the quantity of material delivered to the delivery-apron will be uniform, and the resulting thickness of the stratum which the delivery apron of the feed device will deposit on the apron 1 may be increased or diminished with any given character of stock by increasing or diminishing the speed of the elevator or by increasing or diminishing the distance of the comb from the elevator.

For varying the speed of the elevators of the different feed devices so as to cause the delivery-apron of each one to deposit a stratum of the desired thickness of the apron 1 any familiar speed-varying driving devices may be employed. For that purpose I have illustrated tapering rollers or cone-pulleys 25

26 with means for shifting the connecting-belt 27 longitudinally with respect to the pulleys. I do not limit myself to this particular mechanical expedient, but other well-known expedients for varying speed may be substituted.

I claim—

1. In a machine for the purpose stated, in combination with a blending-machine comprising a carrier for feeding material thereto; a plurality of devices for feeding the material to be blended, each of said feeding devices comprising an endless carrier for delivering material therefrom, such carriers being terminated at their delivery side in position for delivering upon said endless feed-carrier of the blending-machine, one in front of another, along the path of movement of the carrying ply of said carrier, and means for regulating the rate of delivery of the several feeding devices independently of each other.

2. In a machine for the purpose indicated, in combination with a blending-machine comprising an endless carrier for feeding the same; a plurality of devices for feeding the several materials to be blended, each of said feeding devices comprising an endless carrier for delivering the material, said endless carriers of the several feeding devices being arranged successively one above another, each terminating at its delivery side beyond the one below it, above the endless feeding-carrier of the blending-machine, and means for regulating the rate of delivery of said delivering-carriers independently of each other.

3. In a machine for the purpose indicated, in combination with a blending-machine comprising an endless carrier for feeding the same, a plurality of feeding devices for delivering different materials to said carrier having their delivering means arranged for delivery successively, one in front of another, on said carrier, for producing superimposed layers of the different materials thereon, said feeding devices having variable-speed driving means and means for regulating the speed of each independently of the others.

4. In a mechanical organization for the purpose indicated, in combination with a blending-machine having an endless carrier for feeding it, a plurality of feeding devices, each comprising a receptacle for the material to be fed and means for engaging and carrying away the same, and having each an endless traveling delivery belt or apron, said feeding devices being arranged at successively more and more elevated positions, one behind another, back of the receiving end of the carrier of the blending-machine, the delivery-apron of each feeding device at the rear being extended above all the feeding devices in front of it, said several aprons terminating at their forward or delivery side successively farther and farther forward above the carrier of the blending-machine as they are located successively farther and farther rearward from the receiving side thereof.

5. In a machine for the purpose stated, in combination with a blending-machine comprising a horizontal carrier for feeding material thereto, a plurality of devices for supplying to such carrier the material to be blended, each comprising an endless carrier for delivering material therefrom, such carriers being located one above another, each terminating farther forward than the one below it along the path of movement of said horizontal carrier of the blending-machine.

6. In a machine for the purpose indicated, in combination with a blending-machine comprising a horizontal carrier for feeding the same, a plurality of devices for supplying to such carrier the several materials to be blended, each of said devices comprising an endless carrier for delivering the material, said endless carriers being arranged successively one above another, above the horizontal feeding-carrier of the blending-machine, and each terminating at its delivery side farther forward than the one below it along the path of feeding movement of said blending-machine carrier, and means for regulating the rate of delivery of said several delivering-carriers independently of each other.

In testimony whereof I have hereunto set my hand, in the presence of two witnesses, at Chicago, Illinois, this 11th day of March, A. D. 1905.

EMIL TYDEN.

In presence of—

CHAS. S. BURTON,

FRED. G. FISCHER.