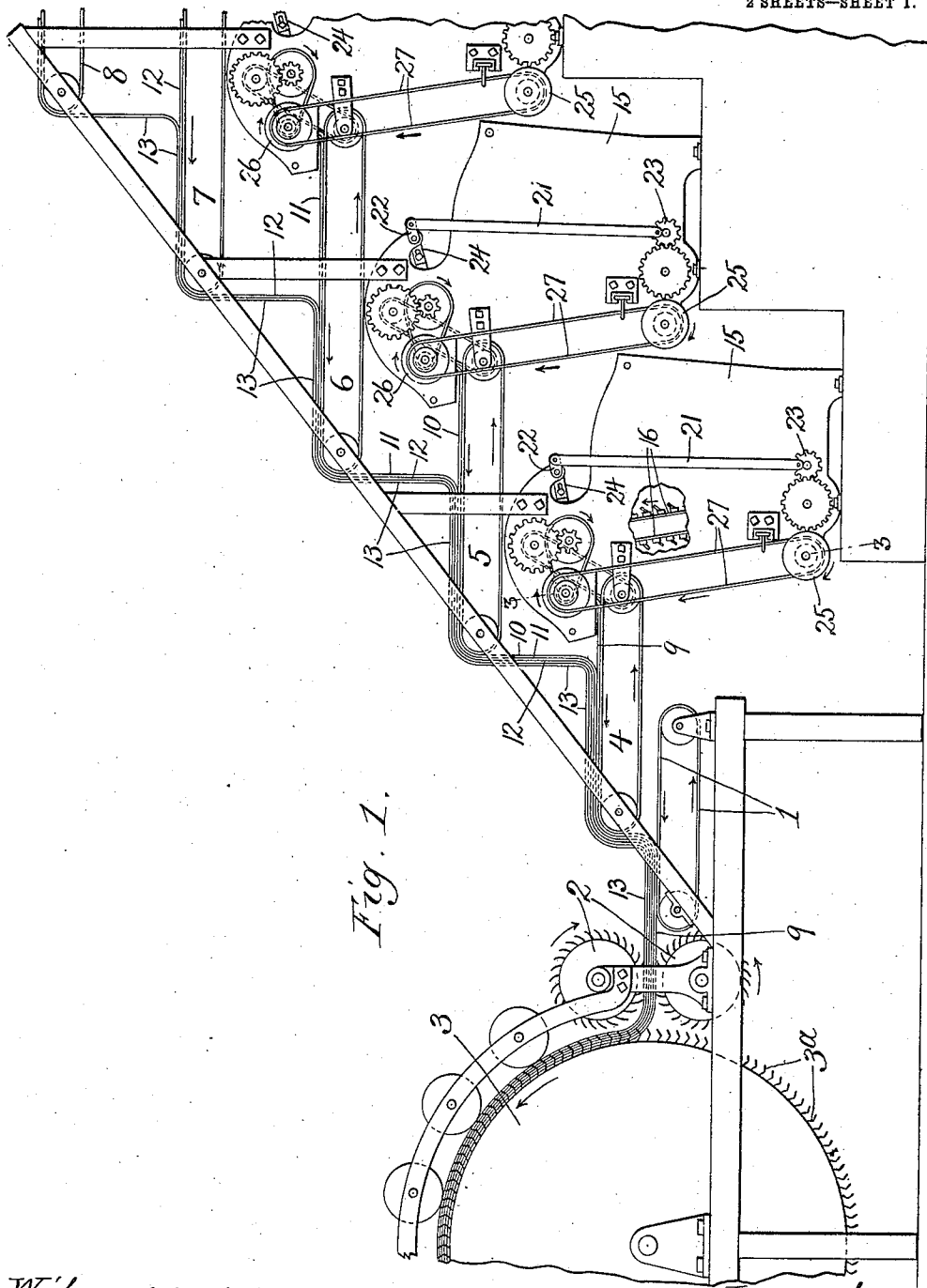


No. 852,474.

PATENTED MAY 7, 1907.

E. TYDEN.  
FIBER MIXER.  
APPLICATION FILED JULY 26, 1906.

2 SHEETS—SHEET 1.



Witnesses,  
Edward T. Wray.  
J S Abbott

Inventor.  
Emil Tyden  
by Burton and Burton  
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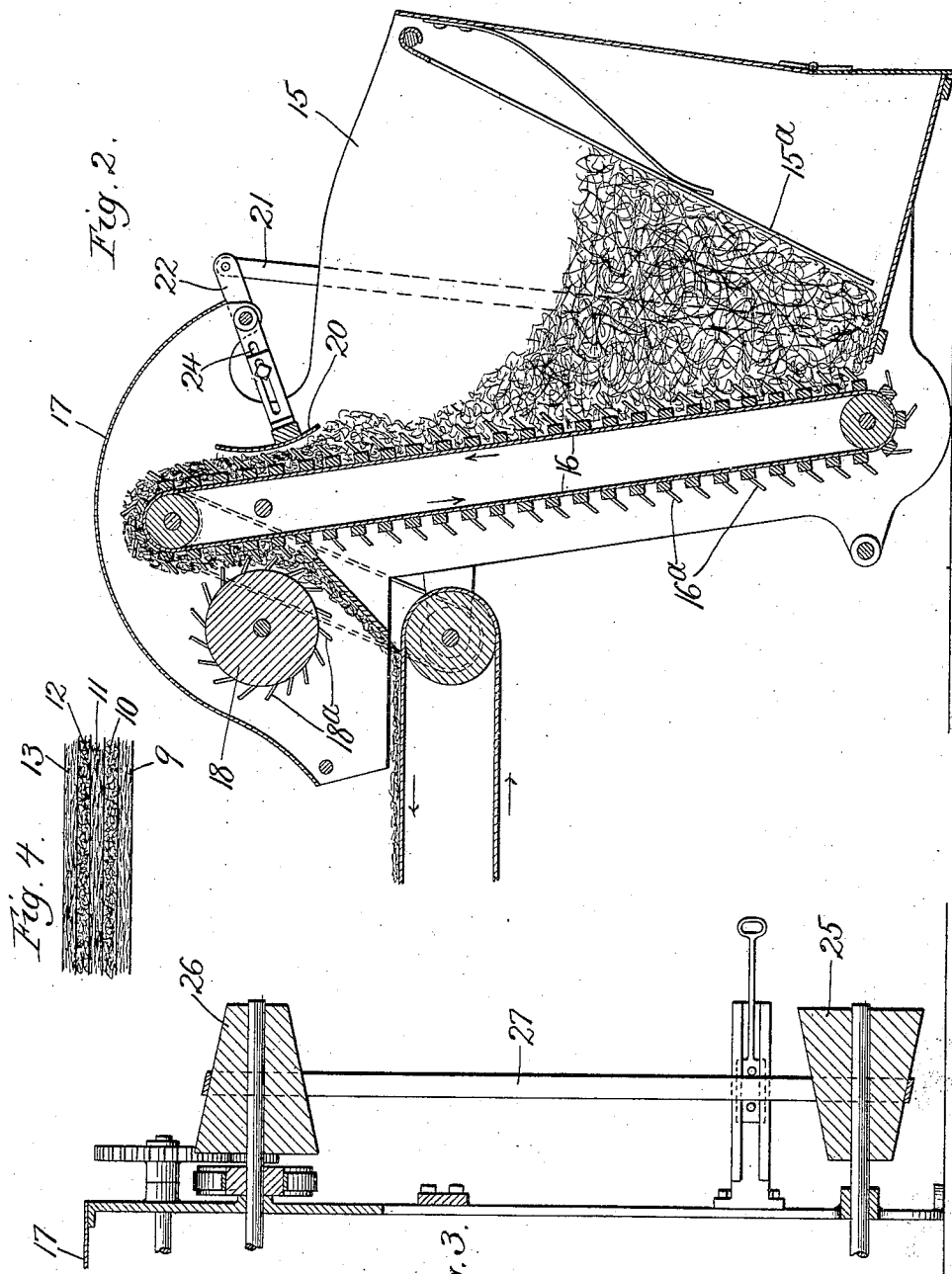
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# UNITED STATES PATENT OFFICE.

EMIL TYDEN, OF HASTINGS, MICHIGAN.

## FIBER-MIXER.

No. 852,474.

Specification of Letters Patent.

Patented May 7, 1907.

Application filed July 26, 1906. Serial No. 327,820.

*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 of different materials to be mixed and blended for the manufacture of felt or other fiber products.

It consists in the combination of the elements shown and described in the drawings and specification and set out in the claims.

Specifically, the invention is an improvement upon a construction shown in my Patent No. 812,311, dated February 13, 1906. It is designed to meet the same difficulty to which the invention shown in that patent is directed. This difficulty is one which is encountered in mixing different fibrous materials for the manufacture of felt or for carding in order to produce desired grades and qualities of the resulting product, and the difficulty arises from the fact that by reason of the different lengths and qualities of fiber, the customary means and devices by which the different parts of the stock when assembled in the desired proportions are 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, such as shoddy, or the smooth fiber, such 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 of the mixing devices is liable to take out and blend a larger percentage of the longer and more engageable fiber and to leave behind a larger proportion of the shorter or smoother fiber, or else to cause the short fiber to be finally carried out in accumulated quantities which become engaged between masses of longer fiber without being blended therewith. This results in an uneven quality of stock or card containing the spots made up so largely of short fiber as to constitute flaws, and making the resulting articles manufactured from the felt to be

classed as low grade, or the thread spun from the card to be correspondingly inferior.

The difficulty is overcome by means shown in the drawings hereinafter described, 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 to the facility with which it is actually engaged by the devices provided for that purpose.

As distinguished from my former patent, this invention consists in an improved arrangement of the carrying devices for delivering the several layers of the material onto the feeding carrier of the blending machine, such improved arrangement being more compact and less bulky of construction, the reduction in bulk being accomplished by arranging each of the film-delivering carriers so that it delivers its film onto the carrier which has the film to be laid next below it on the final carrier: thus, the top carrier delivering to the second, the second one delivers its own film and that of the top carrier together to the third; and the third delivers its own film with that of the second and first, all three together, to the fourth, and so on to the last carrier, which delivers all films to the feeding carrier of the blending machine.

In the drawings:—Figure 1 is a vertical longitudinal section through the conveyer and initial mixing wheels of a mixer of 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. 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 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, as hereinafter more particularly mentioned, but which need not be fully described, being the same as shown in my said former patent No. 812,311. The highest of the aprons, 8, overhangs the apron, 7, and delivers the film which it carries, directly on top of the film carrier by said apron, 7. Apron 7 overhangs apron 6 and delivers its film and the film which is received from apron 8 onto the film carrier by said apron 6; and apron 6, overhanging said apron, 5, delivers onto the film carrier by said apron 5, the films of aprons 6, 7 and 8, successively superposed, as indicated. Apron 5, overhanging apron 4, delivers onto said apron 4 the film carried by apron 5 from its own feeder, together with the films from aprons 6, 7 and 8, superposed as described. And apron 4, in turn, delivers onto receiving apron, 1, of the blending machine, all the films from aprons 4, 5, 6, 7 and 8, successively superposed as described, producing on said apron, 1, a stratified deposit, each stratum consisting of one element of the stock to be blended into the felt in the proportion in which such element is required for producing the quality of felt desired. This stratified deposit, when delivered from the conveyer, 1, to the feed rollers, 2, 2, is 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<sup>a</sup>, across the exposed edge of the stratified mass, taking therefore the several elements in the exact proportions measured by the thickness of the several 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, except as to the relative positions of their delivering aprons. Each of these feeders consists of a hopper or bin, 15, which is kept supplied with the material or element of the stock to be fed, as, in one case, hair, in another case, short fiber or shoddy, 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 plate, 15<sup>a</sup>. The elevator is armed with teeth or fingers, 16<sup>a</sup>, 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<sup>a</sup>, 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 feeders comprising each the bin or hopper, the elevator, the clearing paddle wheel and the delivery apron, are mounted upon platforms successively higher and higher, so that each delivery apron of each of the devices back of the first may extend forward overhanging the one in advance of it. As above stated, the lowest delivery apron, 4, extends forward overhanging the receiving apron, 1, of the blending machine, and the apron of each next higher feeder terminates back of the delivery side of the next lower for delivering its film upon the apron of the next lower. If all the feeders are constructed alike and merely mounted each rearward of and higher than the preceding, each delivery apron will thus overhang the next lower apron as described, and this is a preferred construction because it permits all the feeders to be identical in construction and different only in position.

The quantity of material delivered from any one of the feeders by the delivery apron thereof is determined by the rate at which said feeder is operated or by the rate at which the elevator of that feeder takes 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. Each feeder has a comb, 20, operating at the upper end of the elevator, and connections,—as by means of a pitman, 21, crank, 22, and continuously revolved gear, 23,—for combing off any excess of material which may be engaged by the fingers of the elevator and carried up in clots or lumps, so that the elevator is enabled to deliver a substantially uniform layer to the delivery apron at the farther side. This comb, by means of a 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; and this adjustment permits the elevator to carry up and deliver a load or layer of greater or less thickness. With a given character of stock, the elevator running at a given speed and 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 particular feed devices will deposit on the receiving apron, 1, of the blending machine, may be increased or diminished with any given character of stock by increasing or diminishing the speed of the elevator, or, in lieu thereof, by increasing or diminishing the distance of the comb from the elevator (up to the maximum thickness of the load or layer which the elevator will carry of the particular stock in question).

For varying the speed of the elevators of the different feeders so as to cause their respective delivery aprons to deposit strata of the desired thickness upon the apron, 1, any familiar speed-varying devices may be employed. In the drawings, the means for this purpose illustrated consist of tapering rollers or cone pulleys, 25, 26, with means for shifting the connecting belt, 27, with respect to the pulleys. Many other well-known expedients for varying speed may be substituted.

I claim:—

In a machine for the purpose stated, in combination with a blending machine comprising a horizontal carrier for feeding material thereto, a plurality of feeders for supplying to such carrier the material to be blended, each comprising an endless carrier for delivering the material from the feeder, such carriers being located one above another, a higher carrier terminating at its delivery side back of the delivery side of a lower carrier for delivering its film onto such lower carrier, the lowest of said carriers being in a position overhanging the receiving carrier of the blending machine.

In testimony whereof, I have hereunto set my hand, in the presence of two witnesses, at Chicago, Illinois, this 20th day of July, 1906.

EMIL TYDEN.

In the presence of—

CHAS. S. BURTON,  
J. S. ABBOTT.