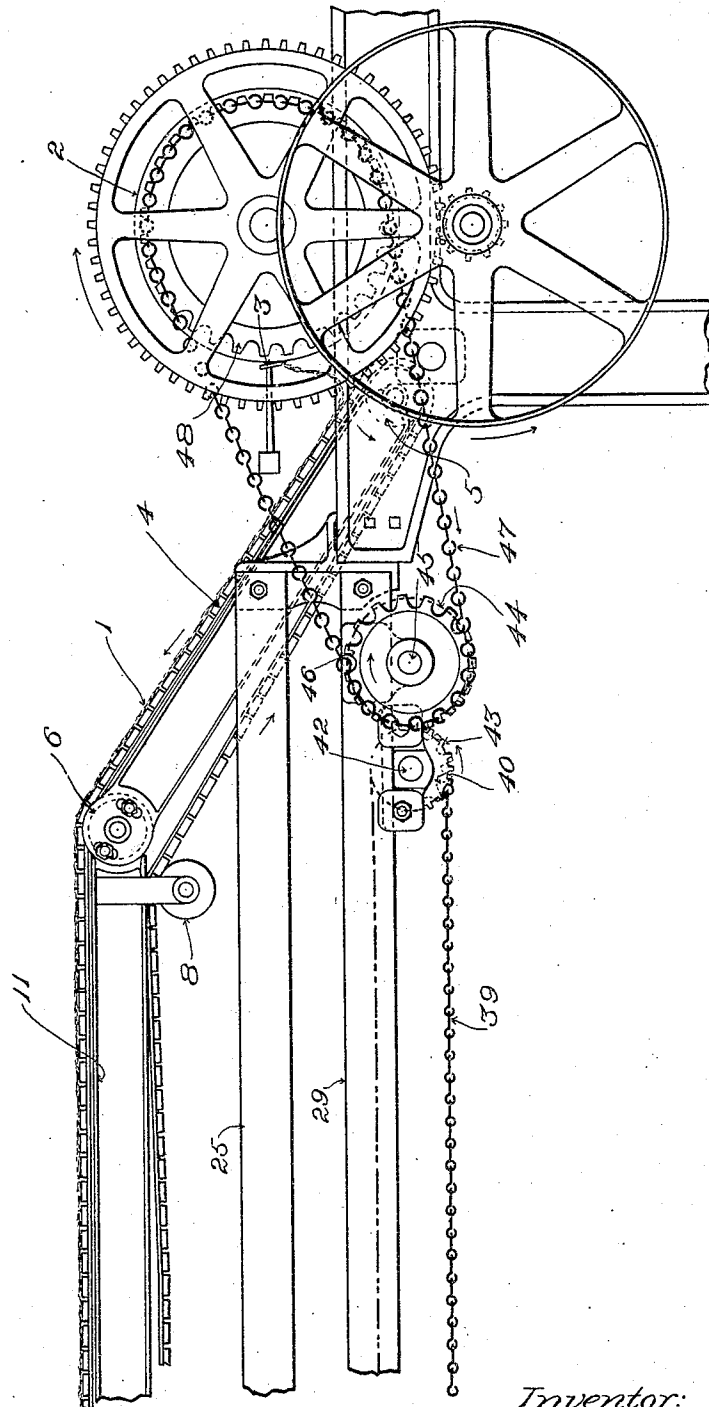


C. E. T. SCRIBNER.
LAP FORMING MECHANISM.
APPLICATION FILED NOV. 7, 1908.

938,437.

Patented Oct. 26, 1909.
3 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

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Edith J. Anderson.

Inventor:

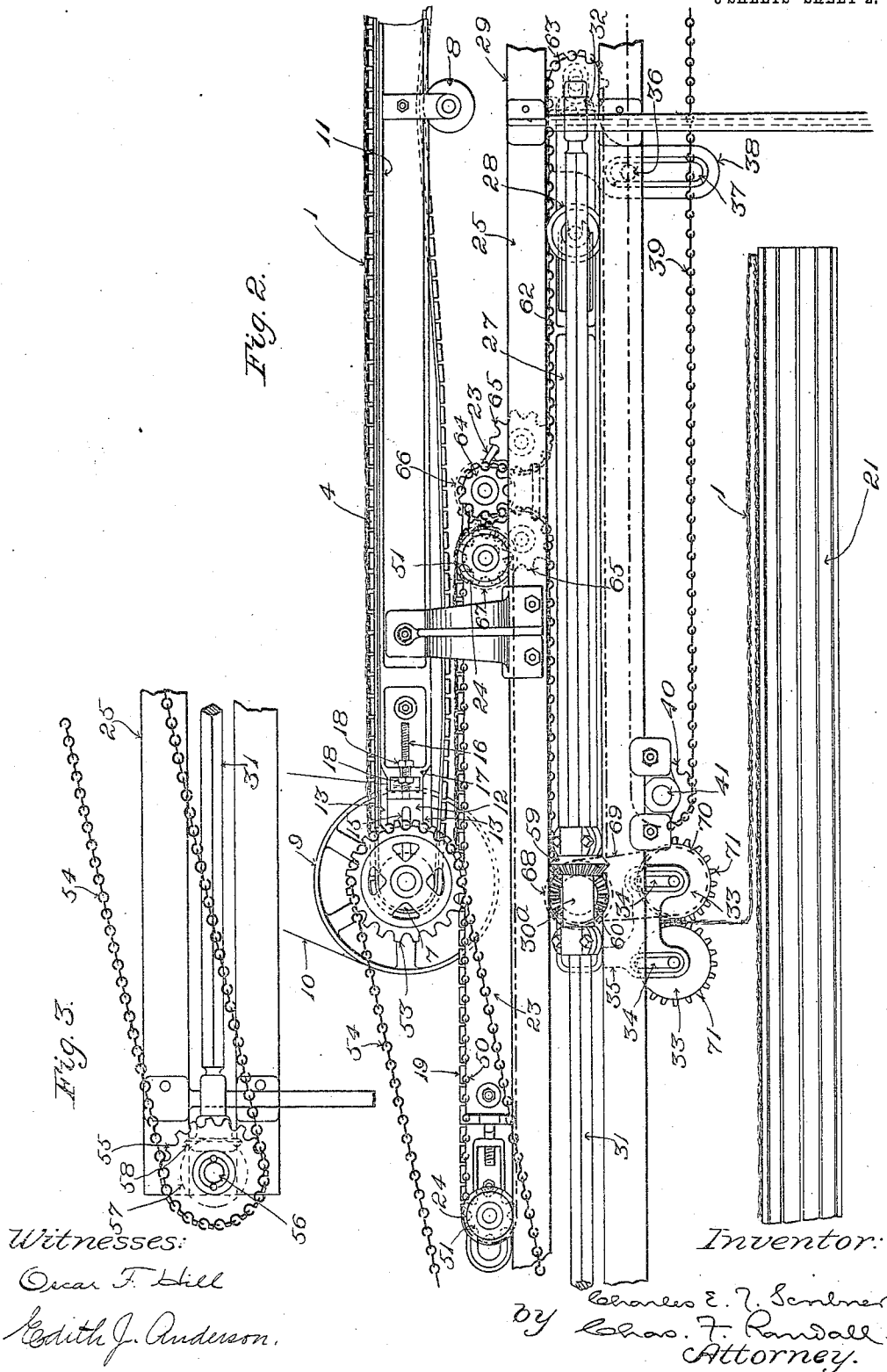
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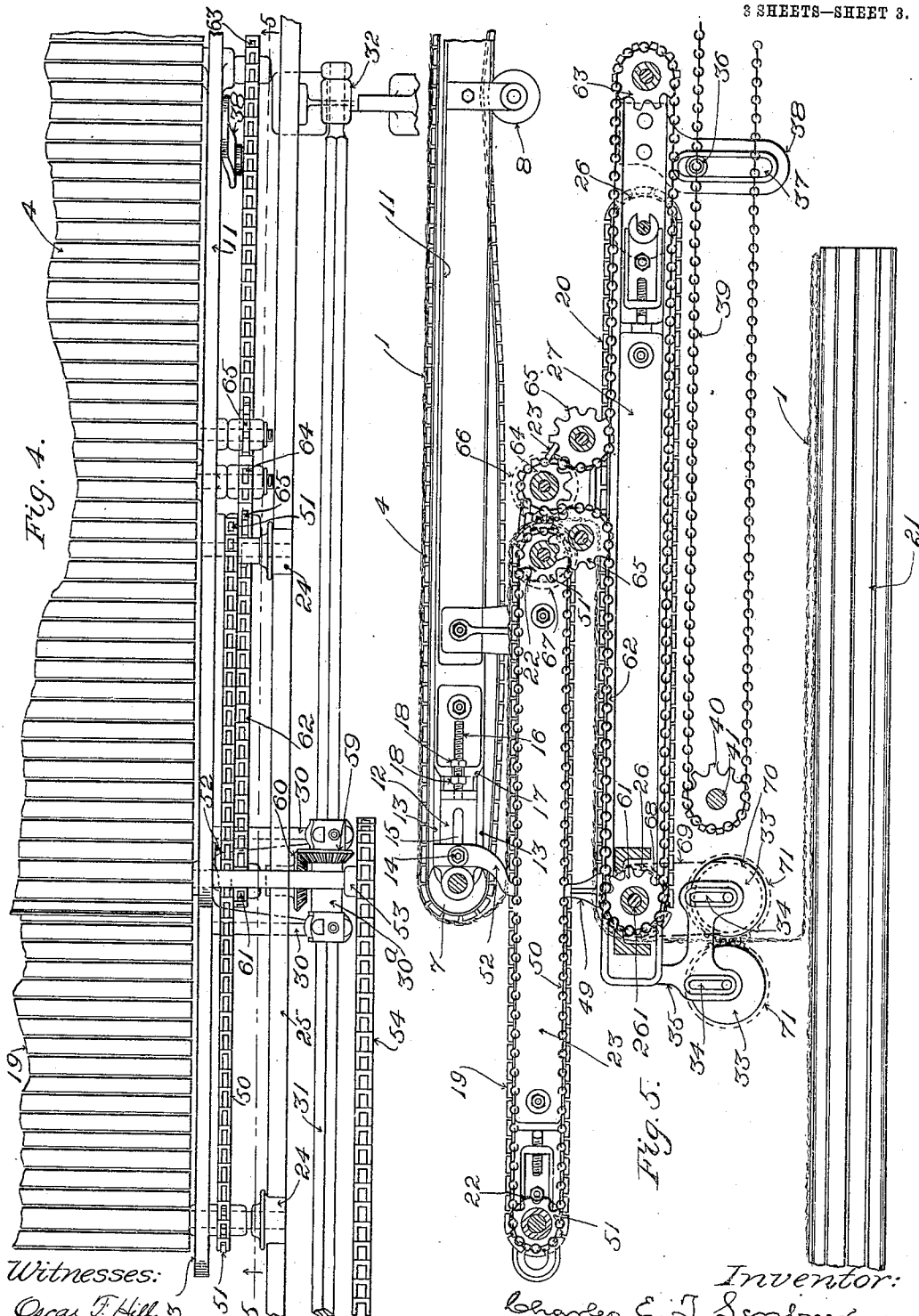


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3 SHEETS—SHEET 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

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LAP-FORMING MECHANISM.

938,437.

Specification of Letters Patent.

Patented Oct. 26, 1909.

Application filed November 7, 1908. Serial No. 461,482.

To all whom it may concern:

Be it known that I, CHARLES E. T. SCRIBNER, a citizen of the United States, residing at North Adams, in the county of Berkshire, State of Massachusetts, have invented a certain new and useful Improvement in Lap-Forming Mechanisms, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention has relation to mechanisms of the class employed for depositing a fleece of fibers from a fiber-preparing machine in layers upon a suitable receiver, in practice usually a moving collecting apron, to form a lap of required thickness.

The invention consists in the combination with a delivery-device on which the fleece is formed into a lap supplied by a fiber-preparing machine, and a receiver for the fleece, of improved devices for controlling the said fleece and distributing it upon the receiver.

It also consists in various novel combinations of parts comprised in the said devices.

In the preferred embodiment of the invention the said devices consist, essentially, of two horizontally-extending endless aprons or lattices, the first of which receives the fleece from the said delivery-device and delivers it to the second, which delivers it to the receiver. The latter apron is traversed so as to distribute the fleece upon the receiver. The apron first mentioned, it being intermediate the delivery-device aforesaid and the distributing apron, is what I term a compensating apron. Its functions are to support the portion of fleece between the delivery-device and the distributing-apron, act as a take-up to prevent the occurrence of slack during the distributing movement in one direction, and pay out the fleece to prevent strain from coming thereupon during the distributing movement in the other direction.

An embodiment of the invention is illustrated in the drawings, in which latter,—

Figure 1 shows in side elevation the doffer-cylinder of a fiber-preparing machine, and certain of the adjacent parts. Fig. 2 shows in side elevation the main portions of the lap-forming mechanism, the portions at the opposite ends thereof being broken away. Fig. 3 shows in side elevation the left-hand portion of the lap-forming mechanism. Fig. 4 shown in plan the main por-

tions of the said mechanism. Fig. 5 is a view in vertical section in the plane indicated by dotted line 5, 5, in Fig. 4.

In the drawings,—the fleece 1 which is represented as operated upon is shown as supplied by a fiber-preparing machine which in this instance may be assumed to be a Garnett machine, the doffer-cylinder of the said machine being shown at 2, and at 3 being indicated the doffer-knife or stripping-comb by which the fleece is stripped from the surface of the said cylinder. In practice, the invention may be employed in connection with any suitable fleece-producing machine.

At 4 is an endless apron or lattice, upon the upper surface of which the fleece is received from the doffer-cylinder. This apron or lattice is supported and guided by rolls 5, 6, 7, 8, 8, and is intended to have continuous traveling movement communicated thereto, at the same surface speed as the doffer, by means of a band-pulley 9 which is fast upon the shaft of the supporting-roll 7, and a driving-band 10 passing around the said band-pulley, the said driving-band also passing around a band-pulley (not shown) on an overhead line-shaft (not shown). By the said traveling movement the fleece is conveyed to a suitable point for delivery to the lap-forming mechanism. Apron or lattice 4 is termed ordinarily a running-out apron. The rolls 6, 7, 8, 8, aforesaid, are mounted upon a horizontally arranged framework 11 that extends over the lap-forming mechanism, and, for convenience in setting the roll 7, such roll is mounted in stands, one of which is shown at 12, which are adjustable horizontally upon the said framework, in the direction of the length of the latter. Each stand 12 fits between upper and lower guides 13, 13, with which the framework is provided, and is held in place by means of a screw 14, the stem of which passes through a longitudinal slot 15 in the stand. An adjusting screw 16 fixed to the stand projects through a slot in a laterally projecting portion 17 of the corresponding side-piece of framework 11, and receives thereon the adjusting nuts 18, 18, one at each side of the said projecting portion. By turning these nuts the stand 12 and roll 7 may be adjusted in either direction lengthwise of the framework.

The intermediate or compensating apron to which the fleece is delivered by the delivery-device here constituted by the apron 4, as the latter apron makes its turn around the roll 7, is shown at 19, it being located below the delivery-portion of apron 4. The distributing apron to which the fleece is delivered by the said intermediate or compensating apron is shown at 20, it being located below the said compensating apron 19.

At 21 is shown a receiver to which the fleece is delivered by the distributing apron, and upon which by the traversing movements of such apron the fleece is distributed in layers, building up the thickness of the required lap, the said receiver being located below the distributing apron. Aprons 19 and 20, respectively, extend in the same direction as the delivery-apron 4. The receiver 21 is constituted, in this instance, of an endless traveling apron or lattice which extends transversely beneath the distributing apron, and by the movement whereof the thickness of fleece laid and accumulated thereon in the form of a lap is carried transversely for delivery to a winding mechanism, or other mechanism for disposing thereof, or in certain cases to mechanism for feeding the same to another preparing machine to be further operated upon therein.

The compensating apron 19 is supported by rolls 22, 22, which are mounted upon a carriage 23. The said carriage is furnished at its opposite sides with trucks or rolls 24, 24, resting upon fixed supporting-rails, one of which is shown at 25, along which rails the said carriage is capable of reciprocating lengthwise of the mechanism. The distributing apron 20 is mounted upon rolls 26, 26, on a carriage 27. The latter is supported at one end thereof by a truck or roll 28 at each side, carried by such end and resting upon fixed supporting-rails, one of which is shown at 29. At the other end thereof the carriage 27 is supported at each side thereof by arms 30, 30, extending outward from the carriage and having at their outer extremities split bearings receiving the opposite rounded sleeve-like portions of a quill 30^a having a square hole there-through, the said quill fitting, and being adapted to slide upon, a squared shaft extending longitudinally of the mechanism. Each squared shaft 31 is supported at its ends in fixed bearings 32, 32.

A pair of guide and presser-rolls 33, 33, is provided in connection with carriage 27, such rolls being located at front and rear, respectively, of the path of the fleece as it is delivered from the distributing apron. The journals of the said rolls work in vertical slots 34, 34, in brackets 35 attached to the carriage, only one of such brackets being shown.

Traversing movements in the direction of

the length of the distributing apron are communicated to the carriage 27 of such apron by means of a rod 36 extending cross-wise of the machine and working in vertical slots 37 formed in brackets, one of which is shown at 38, fixed to the opposite sides of such carriage, the said rod being attached at each end thereof to a carrying sprocket-chain 39 passing around sprocket-wheels 40, 40, on cross-shafts 41, 42, mounted in bearings provided in connection with the lower guide-rails 29. Movement of rotation is communicated to shaft 42, for the purpose of actuating the said chains, by gearing 43, 44, connecting such shaft with a cross-shaft 45 that is driven by means of a sprocket-wheel 46 thereon, a sprocket-chain 47, and a sprocket-wheel 48 rotating in unison with the doffer-cylinder 2.

For the purpose of causing the compensating-apron to transverse simultaneously with the distributing-apron, the carriage 27 of the distributing-apron has attached thereto a chain-anchor 49, and an endless sprocket-chain 50, mounted upon sprocket-wheels 51, 51, that are carried by the carriage 23 of the compensating-apron, has the said chain-anchor made fast thereto at one point, a second chain-anchor, designated 52, carried by the stand 12 on framework 11, being made fast to the sprocket-chain at another point. In this instance, the sprocket-wheels 51, 51, are supported by the journals of the supporting-rolls 22, 22, of the compensating-apron, and are capable of turning loosely thereon. It will be perceived that the chain-anchor 49 partakes of the movement of the carriage 27 of the distributing-apron, but chain-anchor 52 is stationary. With this arrangement, which is duplicated at the side of the mechanism opposite that shown in the drawings, when the carriage 27 of the distributing-apron is moved in either direction, the chain-anchor 49 acts through the sprocket-chain 50 to drag the carriage 23 of the compensating-apron in the same direction, through one-half the distance traveled by the carriage 27, and one-half as fast.

For the purpose of causing the distributing-apron and compensating-apron to travel around their respective pairs of rolls, a sprocket-wheel 53 is fixed upon the shaft of the supporting-roll 7 of the delivery-apron 4. A sprocket-chain 54 passes around such sprocket-wheel and another sprocket-wheel, 55, fixed upon a cross-shaft 56 located beyond the receiver 21. Thereby rotary motion is transmitted to the said cross-shaft. The latter has fixed thereon, at each end thereof, a bevel-gear 57 meshing with a bevel-gear 58 fixed upon the corresponding squared shaft 31, by which means the latter is rotated. Upon the quill 30^a, confined between the bearing-portions of the arms 30,

30, of carriage 27, is a bevel-gear 59 meshing with a bevel-gear 60 upon the shaft 261 of one of the supporting-rolls 26 of the distributing-apron. Thereby the said roll is rotated and the required traveling movement of the said apron is secured. As the carriage 27 reciprocates, the bevel-gear 59 is caused to slide along the squared shaft. It therefore remains in engagement with the bevel-gear 60, and hence the said shaft 261 and corresponding supporting-roll 26 are continuously rotated at a constant rate of speed in all positions of the said carriage. The traveling movement of the compensating-apron is transmitted thereto by means of a sprocket-wheel 61 fixed upon shaft 261, just mentioned, and a sprocket-chain 62 passing around the said sprocket-wheel 61 and also around another sprocket-wheel, designated 63, mounted upon the opposite end of carriage 27. The driving-connections of the sprocket-chain communicate a constant speed thereto, corresponding with that of the distributing-apron, and the direction of travel is the same as in the case of such apron. The upper run of the sprocket-chain 62 passes over a sprocket-wheel 64 mounted upon the carriage 23 of the compensating-apron, and under guide-sprockets 65, 65, which also are mounted upon the carriage 23 at front and rear, respectively, of sprocket-wheel 64. The sprocket-wheel 64 is connected by spur-gears 66, 67, with the adjacent supporting-roll 22 of the compensating-apron 19, so that movement of rotation communicated to such sprocket-wheel will be transmitted through the gearing 66, 67, to the said roll and the compensating-apron, causing the latter to travel around its supporting-rolls 22, 22, in the direction to deliver the fleece to the distributing-apron. When the aprons are traversing away from the Garnett machine the greater and more rapid traverse of the carriage 27 of the distributing-apron will increase the rate at which the sprocket-chain 62 will be caused to travel around the sprocket-wheel 64. Consequently, the traveling movement of the compensating-apron around its supporting-rolls will be equal to the normal speed of sprocket-chain 62, plus the difference in the speed of traverse of the carriages 23 and 27. When the aprons are traversing from the left in the drawings toward the Garnett machine, the higher rate of traverse of carriage 27 in such direction will correspondingly diminish the rate at which sprocket-chain 62 will pass around sprocket-wheel 64. Consequently the traveling movement of the compensating-apron around its supporting-rolls will be equal to the normal speed of sprocket-chain 62, minus the difference in the speeds of traverse of the two carriages. Briefly, the rate of travel of the compensating-apron 19 upon its supporting-rolls will be accelerated during the trav-

ersing-movement which causes the delivery-portion of such apron to approach the point at which the fleece is delivered by the delivery-device, and will be retarded during the traversing movement which causes the said delivery-portion to recede from such point.

The guide and presser-rolls 33, 33, are rotated positively by means of a sprocket-wheel 68 fixed on shaft 261, a sprocket-chain 69, and a sprocket-wheel 70 fixed on the shaft together by spur-gears 71, 71, to turn in unison.

It will be perceived that the illustrated embodiment of the invention is characterized by the employment, in connection with a delivery-device for the fleece from a fiber-preparing machine, of two endless aprons or lattices which extend horizontally, and the first of which receives the fleece from the said delivery-device and delivers it to the second, which delivers it to the receiver. The first apron, previously termed herein the compensating-apron, supports and takes care of the portion of fleece intermediate the delivery-device and the second apron, (which last has previously been termed herein the distributing apron). A bodily traversing movement communicated to the second apron or lattice distributes the fleece upon the receiver. The fleece is supported by the top surface of the first (*i. e.* compensating) apron from the point at which it is received upon such surface to the point at which it leaves such apron, and it is supported by the horizontal top surface of the second (*i. e.* distributing) apron from the point at which it is received thereupon to the point at which it leaves such apron in being delivered to the receiver. The length of fleece supported by the two aprons is sufficient to permit movement of the second (or distributing) apron to the respective extremes of its traverse without injury to the fleece. The first (or compensating) apron is traversed simultaneously with the second (or distributing) apron, and in the same direction with the latter, the traversing movement of the first (or compensating) apron in unison with the second (or distributing) apron in one direction being proportioned to give out length of fleece sufficient to accommodate the required movement of the second apron in that direction in distributing the fleece, and the movement of the first apron in the opposite direction in unison with the returning traversing movement of the second apron being properly proportioned to take up the slack in the fleece which would result from such returning movement. As the traversing movement of the two aprons carries the delivery-point of the first apron toward the point at which the fleece leaves the delivery-device the speed of the said apron in traveling around its supporting-rolls is increased

so as to prevent the fleece from piling up upon itself on the apron, and also so as to deliver the fleece more rapidly to the second apron, which at this time is traversing in a direction tending to draw forward the fleece faster. As the aprons traverse in the reverse direction, so that the delivery point of the first apron is carried away from the point at which the fleece is supplied by the delivery-device, the speed of the first apron is decreased so as not to draw the fleece forward faster than it is supplied thereto, and also because the more rapid traversing movement of the second apron in the same direction occasions a tendency of the fleece to pile up upon the second apron.

As other constructions and arrangements of delivery-devices may be employed for supplying the fleece to the compensating and distributing aprons, and as other means for actuating the said aprons may in some cases be employed, and other changes may be made in the construction without necessarily involving a departure from the main principles involved in the invention, I do not hereby limit myself to the specific construction herein shown except in the case of the claims wherein specific reference is made thereto. Nor do I limit myself to an exactly horizontal disposition of the compensating and distributing aprons.

I claim as my invention:—

1. In lap-forming mechanism, the combination with a delivery-device for the fleece, and a receiver on which the fleece is laid into a lap, of a distributing apron, and a traversing compensating apron intermediate the delivery-device and distributing apron, which in each traverse of the distributing apron alternately takes up the slack and pays out the fleece.

2. In lap-forming mechanism, the combination with a delivery-device for the fleece, and a receiver on which the fleece is laid into a lap, or a horizontal, or substantially horizontal, traversing distributing-apron, and a similarly-disposed compensating-apron intermediate the said delivery device and said distributing-apron, which in each traverse of the distributing apron alternately takes up the slack and pays out the fleece.

3. In a lap-forming mechanism, the combination with a delivery-device for the fleece, and a receiver on which the fleece is laid into a lap, of a distributing apron, means for traversing said apron to distribute the fleece to form a lap, a compensating apron, and means for traversing the same simultaneously with the distributing apron and in the same direction but through a shorter distance and at less speed.

4. In lap-forming mechanism, the combination with a delivery-device for the fleece, and a receiver on which the fleece is laid into a lap, of a traversing horizontal distribut-

ing apron, and a similarly-disposed compensating apron operating differentially to control the fleece, and which in each traverse of the distributing apron alternately takes up the slack and pays out the fleece.

5. The combination with a fleece-delivery-device, of a carriage, a distributing apron supported thereby, a second carriage, a compensating apron supported thereby, and operating connections producing traversing movements of the respective carriages in the ratio of two and one.

6. The combination with a fleece-delivery-device, of a carriage, a distributing apron supported thereby, a second carriage, a compensating apron supported thereby, and connections between such carriages transmitting traversing movements from one to the other thereof in the ratio of two and one.

7. The combination with a fleece-delivery device, of a carriage, a distributing apron supported thereby, a second carriage, a compensating apron supported thereby, and means for transmitting differential movement from one carriage to the other comprising a flexible connector attached at one point to a fixed abutment and at an opposite point to the first carriage and passing intermediately in a bend or bight around a guide on the other carriage.

8. The combination with a fleece-delivery device, of a carriage, a compensating apron supported thereby, a second carriage, a distributing apron supported thereby, and means for transmitting differential movement from one carriage to the other comprising a flexible connector attached at one point to a suitable abutment, passing thence in opposite directions around guides on the carriage first mentioned, and then connected to the second carriage.

9. The combination with a fleece-delivery device, of a fleece-supporting and compensating carriage, a fleece-distributing carriage, the said carriages respectively having means for promoting the advance of the fleece and means for transmitting differential movement from one carriage to the other comprising a flexible connector having attachment to a suitable abutment and passing thence around a guide on the carriage first-mentioned and then connected to the second carriage.

10. The combination with a fleece-delivery device, of a fleece-supporting and compensating carriage, a fleece-distributing carriage, the said carriages respectively having means for promoting the advance of the fleece and means for transmitting differential movement from one carriage to the other comprising a flexible connector having attachment to a suitable abutment and passing thence in opposite directions around spaced-apart guides on the carriage first-mentioned and then connected to the second carriage.

11. In combination, a fleece-delivery device, an apron receiving the fleece therefrom, a carriage supporting the said apron, a second apron receiving the fleece from the first
5 apron, a carriage supporting the second apron, means for causing differential traverse of such carriages, means for causing the second apron to travel around its supports on the second carriage, and means to cause
10 the first apron to travel around its own supports at an increased speed during the traverse in one direction and at a decreased speed during the traverse in the other direction.

12. In combination, a fleece-delivery device, an apron receiving the fleece therefrom, a carriage supporting the said apron,

a second apron receiving the fleece from the first apron, a carriage supporting the second apron, means for causing differential traverse of such carriages, means for driving
20 the first apron, comprising an endless flexible driver passing around a wheel on the first carriage, said wheel being in operative connection with the said apron, guides on
25 the second carriage around which the endless driver passes, and means for driving the second apron and said endless driver.

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

CHARLES E. T. SCRIBNER.

Witnesses:

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MARGARET CHRYSTAL.