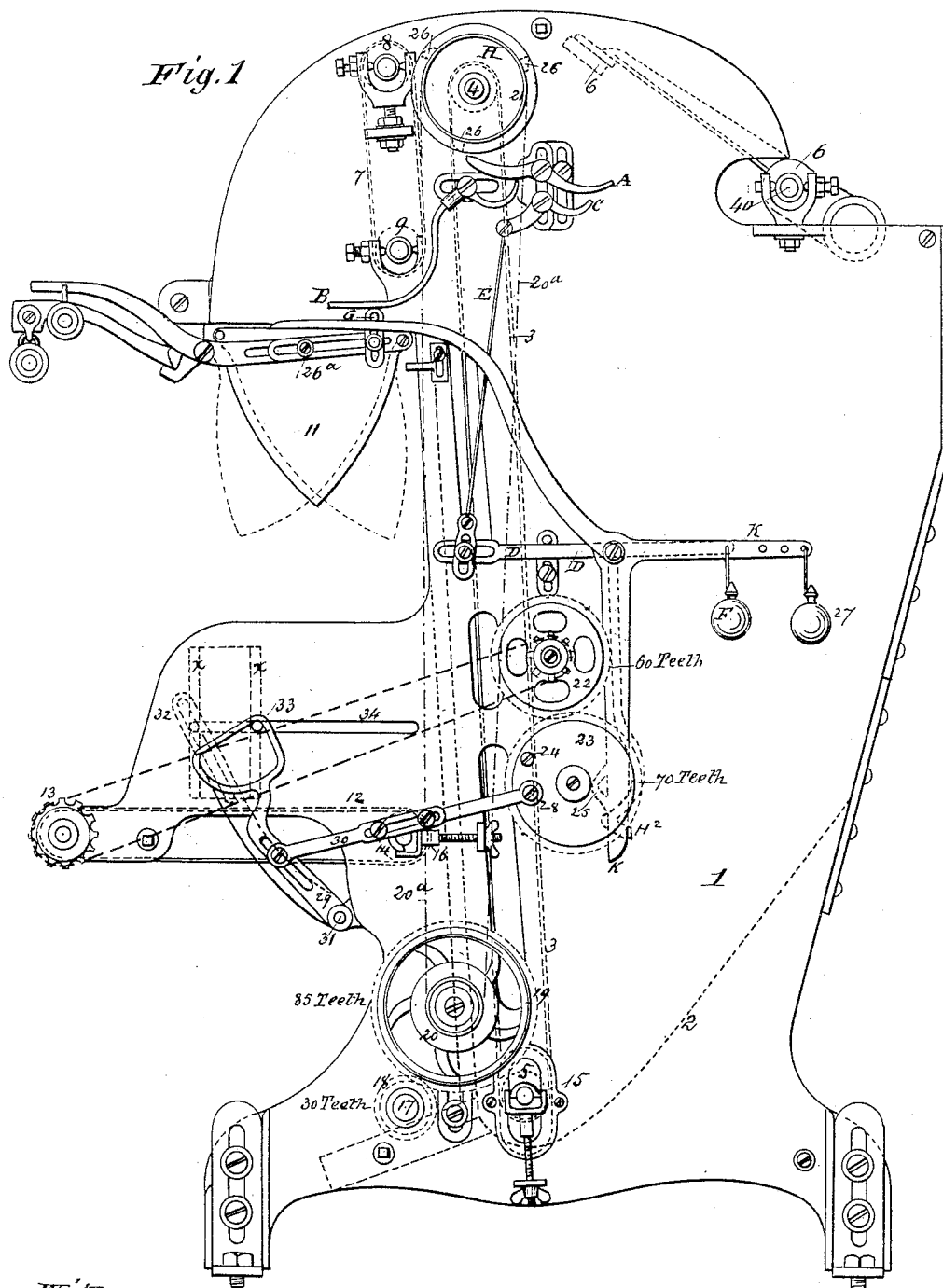


W. C. BRAMWELL.
 Mechanism for Feeding Carding Engines, &c.
 No. 216,373. Patented June 10, 1879.



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Fig. 2.

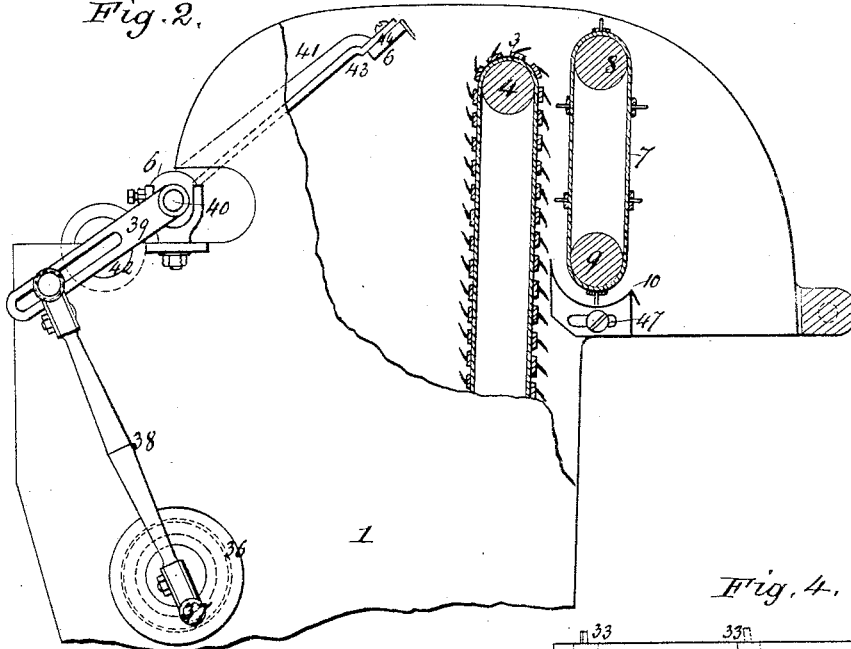


Fig. 3.

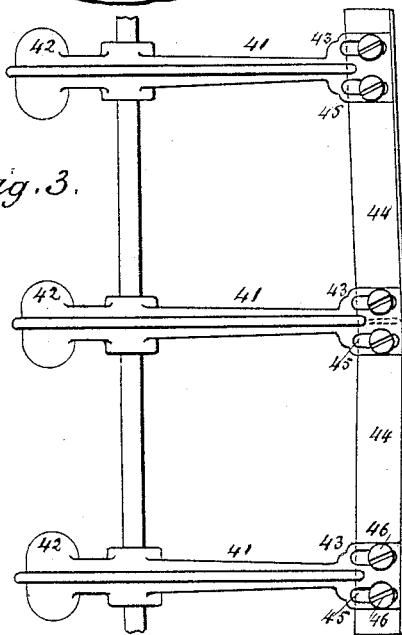


Fig. 4.

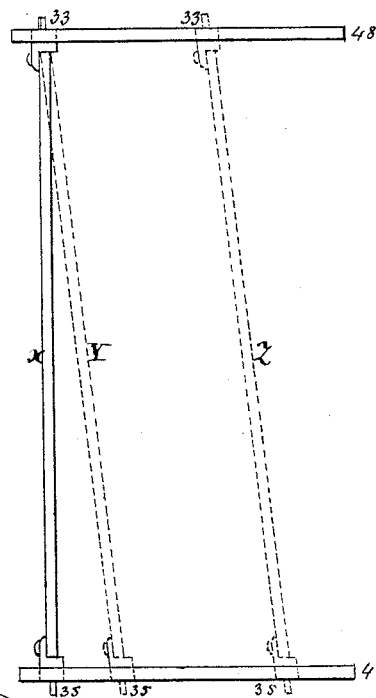
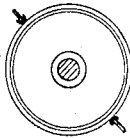


Fig. 5.



Fig. 6.



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN MECHANISMS FOR FEEDING CARDING-ENGINES, &c.

Specification forming part of Letters Patent No. **216,373**, dated June 10, 1879; application filed
December 23, 1878.

To all whom it may concern:

Be it known that I, WILLIAM CALVERT BRAMWELL, of Hyde Park, in the county of Norfolk and State of Massachusetts, have invented new and useful Improvements in Mechanism for Feeding Carding-Engines, &c., which improvements are fully set forth in the following specification.

This invention relates to the feeding and delivering to carding-engines, pickers, and other preparing machinery, of wool, cotton, jute, and fibrous materials in general, having special reference, however, to the feeding of long wool.

The oldest method, and the one heretofore most generally employed, has been to deposit the wool upon the apron of the first breaker of a carding-engine or upon the feeding-apron of other preparing-machines by hand, the operatives first weighing a given quantity and then spreading it upon the apron, over a certain area. The hands employed are apt to become careless, and, by neglecting to properly weigh and distribute the wool, cause the work to be uneven. Without regard, however, to the lack of dependence to be placed upon the hands, the expense of their labor, even when boys are employed, becomes a serious item of account.

Endeavor has been made to produce a machine to automatically deliver the wool to be fed to the carding or other engines. An inventor named Bolette devised a machine which will serve as a type for others of the same class. In it were combined a box to receive the wool, a lifting-apron operating in vertical planes, a rotating beater or beaters above the upper roller, over which this apron passed, a second endless apron revolving horizontally back of the lifting-roller, and arranged to receive the wool therefrom, and, finally, an adjustable plate located above the horizontal apron, so that only a certain amount of wool, in accordance with the adjustment, was allowed to pass under it to be fed to the carding-machine.

The objections to this machine were various. It delivered the wool, not by weight, but by bulk, so that, owing to the different density of the wool, some portions being more matted

and heavier by the absorption and retention of moisture, the resulting sliver was of unequal weight in parts. It was also an objection that the first portion of the wool as fed from the box of the feeder was heavier than the rest, because the other portions contained particles thrown back by the beaters, which, being opened and loosened by their action, were consequently lighter than the matted portion first carried over. Moreover, the cylindrical beaters employed were liable to lap or wind, and cause stoppages in consequence, especially with long wool, which the tendency is now to use. The wool has also been found to lap or wind about the journals of the rotating mechanism and stop the machine.

Owing to the stationary character of the adjustable top plate above the horizontal apron, the apron would sometimes blow away or slip from the wool which clogged and was held back by friction with said top or throat plate.

These objections I have partly overcome by my own prior inventions, for which Letters Patent No. 180,533, August 1, 1876, and No. 196,424, October 23, 1877, were granted to me, but not entirely nor as perfectly as could be desired.

It should be here remembered that the great object of all these machines for feeding or delivering wool and other fibrous material to carding or other engines is the production, ultimately, of a yarn which shall have for each unit of measure a certain weight, so that the tissue made therefrom may also be uniform in weight throughout.

Any measurement of the wool simply by bulk or volume must produce great inequalities in the weight of the yarn. To secure a perfect result equal weights of wool must be deposited on equal areas of the feeding-apron.

The object of this invention is, therefore, to feed to the carding-engine the wool in such a way that equal weights on equal areas shall be presented uniformly.

The invention consists in reciprocating mechanism for evening and combing the wool as it is lifted by an endless apron; in devices to prevent lapping and winding on the rotating mechanism; in a stripping-apron and co-operating devices to separate the wool there-

from; in certain devices for use in connection with the weighing operation; in mechanism for delivering the raw wool diagonally to the first breaker of carding-engines, and in the construction and combination of parts, as hereinafter more fully set forth.

The following description will enable those skilled in the art to which it appertains to make and use my invention, reference being had to the accompanying drawings.

The general construction and arrangement of the machine is similar to that described in my aforesaid Letters Patent.

An endless apron operates to lift the wool from a box, and to deliver it to the weighing mechanism, from which it is dropped, when a suitable quantity has been delivered to the horizontal feeding-apron of a carding-engine, whereon it is pushed up compactly by suitable mechanism.

The particulars in which this invention differs from those covered by my said patents need not be here specified, as they, as also the advantages due to this improvement, will readily appear from the description as hereinafter set forth and a comparison of it with said patents.

In the drawings, Figure 1 is an end elevation. Fig. 2 is a sectional view, showing the upper part of the lifting-apron, the reciprocating comb, stripping-apron, and dish or shell to assist the operation of the stripping-apron. Fig. 3 is a plan of comb. Fig. 4 shows the operation of the pusher upon the feed-apron. Figs. 5 and 6 are detached sectional views of the shield to protect the journals of the rotating mechanism.

Like parts are indicated by the same letter or number on all the figures.

1 is the case or receptacle into which the wool is thrown, in the bottom of which is a grating of parallel rods. (Shown by dotted lines 2.) In the rear of case 1 is the lifting-apron, (shown by dotted lines 3 3,) carried by rolls 4 and 5, and provided with teeth. (More clearly shown in Fig. 2.) To prevent this apron from carrying forward the wool in lumps or bunches I use a reciprocating or vibrating comb, 6. (More clearly shown in Fig. 2.) To clear the teeth of apron 3 a stripping-apron, 7, operated by rolls 8 and 9, is used, and in connection therewith a shell or dish, 10, (clearly shown in Fig. 2,) is employed. At 11 in Fig. 1 is the scale into which the wool is deposited by stripping-apron 7. The scale in its general arrangement is described in my Letters Patent No. 196,424, dated October 23, 1877. At certain intervals this scale is caused to discharge its contents upon the feed-apron, shown by dotted lines 12, and operated by rolls 13 and 14.

Immediately after such discharge I push this wool forward by a board or pusher, X, (shown clearly in Fig. 4,) one end of said pusher being caused to travel in advance of the other, pushing the wool before it diagonally across said apron 12. 15 and 16 represent adjusta-

ble boxes carrying rolls 5 and 14, provided with means for keeping the aprons tight. The various motions in this machine are obtained from driving-shaft 17. Changeable gears 18 connect with gear-pulley 19, which operates apron-roll 4 by belt 20^a. By changing gears 18 and 19 the speed of the lifting-apron 3 is altered at will, or this may be done by changing pulleys 20 21, or in any ordinary way.

The rollers 8 and 9 are operated by suitable band-pulleys or other gearing (not shown) from the shaft 4 or 5 of the rollers of the lifting-apron, so that the stripping-apron has a motion slightly faster than the lifting-apron. Other disposition may, however, be made for imparting motion to these rolls.

When a sufficient weight of wool has been deposited on the scale the delivery of wool thereto is stopped by the following mechanism until the wool is discharged from the scale and the wings are again closed.

A is a lever, operated by lever B, whose longer end rests on a pin, G, attached to the weighing-scale. When the scale turns its balance and carries down with it the pin G, it causes the longer end of lever B to follow it, that end being the heavier. In so doing the stop-lever A becomes tilted, and catches in one of the teeth of a clutch, H, or other mechanism, for arresting further delivery of wool or other fibrous material.

22 is a change-gear, which regulates the discharging of the scale through the gear 23, provided with a pin, 24, which latter at each revolution comes in contact with the projecting part 25 of lever K. This lever, pressing on pin 26^a, causes the wings of scale to open, as shown by dotted lines, and to discharge the wool. When the pin 24 has passed the projection 25 of lever K, it then comes in contact with projecting end H² of lever D, and thus pulling on wire E tilts lever C, which in turn forces the stop-lever A out of contact with one of the teeth 26 of clutch H. A fuller explanation of this clutch is given in Patents Nos. 180,533 and 196,424; but any clutch mechanism may be used which will allow the pulley to run free on its shaft when it is engaged. The balance-weight 27 returns the lever K to its original position after it has been operated upon by pin 24, and in like manner the weight F returns the levers C D to position.

The levers A, B, C, and D and the connection of the rod or wire E are made adjustable by slots and pins, as clearly shown on the drawings.

28 is a pin or stud attached to the gear-wheel 23, and operating the pusher-lever 39 by connection 30, which is adjustable by set-screws and slots or equivalent mechanism.

The pusher-lever 29 is attached to one end of shaft 31, and on the other end of said shaft is a plain slotted lever. (Shown in dotted lines at 32.) 33 is a pin attached to the pusher, (shown by dotted lines,) and working through a slot, 34, in the frame of the machine. On the other side of the machine a corresponding slot,

but of greater length, carries the pin (shown at 35 in dotted lines) at the other end of the pusher.

The push-lever 29 has an opening, in which the pin 33 rests, of such a form that during a portion of its movement it does not operate the pusher.

The lever 32, at the other side of the machine, moves the pusher in advance of the lever 29 before the latter comes into contact with pin 33, thus imparting to the pusher the diagonal position. (More fully shown in Fig. 4.)

The motion of the feed-roll 13 is obtained from main driving-shaft 17 by a train of gearing (not shown) to avoid the appearance of unnecessary complication.

The vibrating comb 6 (more clearly shown in Figs. 2 and 3) is driven by pulley 36, carrying on its face a pin, 37, which operates a connecting-rod, 38, and slotted lever 39, attached to the comb shaft 40. The arms of the comb are shown at 41. They are provided at one end with balance-balls 42 and at the other end with slots 43, to which the adjustable comb-stock 44 is attached by screws 46.

Motion may be imparted to the pulley 36 directly from a pulley on the driving-shaft 17, or from a pulley on the roller 5, or on other rotating shaft of the machine.

10, Fig. 2, represents a dish used in connection with the stripping-apron 7 to assist the apron in removing the stock (wool) from the teeth of the lifting-apron. This dish is provided at each end with slots 47, by which it may be adjusted. Fig. 4 shows the various positions of the pusher.

48 are portions at each side of the frame of the machine with the slots through which pins 33 and 35 of the pusher work. X is the pusher before it commences its forward movement. Y shows its position when the lever 32 has moved in advance of lever 29, and before the latter (lever 29) has begun to move the pusher. From this point the pusher moves forward an equal distance at each end until it arrives at Z, which shows the limit of its forward movement. This limit, however, may be increased or reduced, as desired.

Figs. 5 and 6 show two forms of the shield used to protect the journals of the rotating mechanism from the lapping or winding of the stock or wool. Fig. 5 shows the shields as applied to small rolls, and Fig. 6 to cylinders.

49 is the shaft or journal of the roll or cylinder, and 50 the box or bearing of the same, with the shield attached thereto. The end of roll or cylinder is hollowed out to admit the shield, as shown in the figures. The shield may be attached to the frame of the machine instead of to the bearing, if desired.

The operation of the machine is as follows: The wool box or receptacle having been filled and the machine put in operation, the wool is raised by the lifting-apron 3, the teeth of which take hold of the wool. The quantity of stock

which is lifted by the apron is regulated by the reciprocating comb 6. This comb also prevents the carrying forward of the stock in lumps or bunches, and also aids to prepare it for the carding process. The stock or frame of this comb is constructed in two or more parts, 44, which are adjustable by means of the slots 43 and screws 46. These parts are connected together by the comb-plate, which is a serrated or toothed blade, sufficiently flexible to allow of the adjustment of the parts of the stock or frame.

In operation the friction of the sides of the case retards the stock, so that it is fed more heavily in the middle than at the sides.

By the adjustment of the comb-plate and stock the teeth on said plate can be set closer to or farther from the teeth of the delivery-apron at either side or in the middle, so that by its operation the wool shall be equally distributed along the entire width of the apron.

The comb is balanced by the balls 42, and is reciprocated or vibrated through suitable mechanism, before described.

After the wool has been carried over the upper roller, 4, it is removed from the lifting-apron by the stripping-apron 7, operating in connection with the dish 10. This endless apron is armed with strips of leather, rubber, or other flexible and elastic material, teeth, or other suitable appliances, and runs parallel or at a slight angle with the lifting-apron, but at a greater speed. It serves to remove the wool from the teeth of the lifting-apron, and the concave trough or dish 10, adjustable below it, serves more effectually to convey the stock from the delivery-apron to the weighing pan or scale, or to any desired receptacle. The wool is continuously delivered to the weighing pan or scale equally throughout the entire length of it. When the required weight of wool has been deposited on the scale the latter turns its balance and carries down the pin G. The lever B, by reason of the greater weight of its longer arm, turns on its pivot and tilts the lever A, which engages with the clutch H and stops the lifting-apron, and consequently the delivery of wool to the scale. By the continued operation of the machine the wool is automatically discharged by the movement of the lever K through the contact of the pin 24 on the gear 23 with the projection 25 on said lever, which opens the wings of the scale by means of intermediate levers. The wool being discharged from the scale is deposited evenly across the feeding-apron 12 of the carding-engine.

The first motion of the pusher X places the weighing of wool diagonally across the apron. It then pushes the wool over the apron, maintaining its diagonal position against previous weighings. By reason of the diagonal position of the wool one or more junctions between the separate weighings of raw wool are always entering the carding-engine at the same time. The movement given to the pusher is much more rapid than the progress of the feed-apron, so

that the wool is pressed forward solid and compact to close up all irregularities. The mechanism for reciprocating the pusher has already been described and need not be here repeated.

After the scale is emptied of the wool the wings are closed by the action of the counterweights, and the lifting-apron again set in motion by the contact of pin 24 with the projection on lever D, operating to remove the lever A from the clutch H through the medium of the connection E and lever C.

The stripping-apron is of such length as to prevent any wool from winding around it. To prevent the wool winding about the journals, shields 51, attached to the bearings and projecting into the hollow or recessed ends of the rollers or cylinders, are provided. They effectually protect the journals from any stock which might otherwise fall upon them and cause the stoppage of the machine.

Although it is preferred to construct the machine as above described, it is evident that modifications might be made in the details and in the arrangement of parts. For example, by arranging the weighing-scale diagonally with reference to the feed-apron, and by using a pusher parallel to the scale, and moving equally at both ends, the rows or layers of wool could still be fed diagonally.

Having thus fully described my said invention and the manner in which the same is or may be carried into effect, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with an automatic weighing-scale and the feed-apron of a carding-engine or similar machine, of a lifting or delivery apron and a stripping-apron, arranged relatively, as set forth, to said feed-apron and scale to allow the wool to drop thereon, substantially as described.

2. The combination, with a rotary stripping device, of a dish or trough located below said stripping device, and arranged to deliver the wool into a suitable receptacle, substantially as described.

3. The combination, with the endless stripping-apron, of an adjustable dish or trough located below the same, and arranged to deliver the wool or other fibrous material to a suitable receptacle, substantially as described.

4. The combination, in a machine to deliver wool or other fibrous material to a carding-engine or similar machine, of a lifting or delivery apron and reciprocating or vibrating mechanism located on the lifting side of said apron, and operating to even or comb the wool carried by said lifting-apron, substantially as described.

5. The combination, with the feed-apron of a carding or similar machine and a scale arranged to weigh the wool, of a delivery or lifting apron and a vibrating comb located on the side of said delivery-apron, upon which the wool is lifted, and operated by suitable mechanism to strip off and even the wool carried by said lifting-apron before it is delivered

to the scale, and to return the portion stripped off to the wool-box, substantially as described.

6. In a machine for delivering wool or other fibrous material to be fed to a carding-engine or other preparing-machine, the combination, with the lifting or delivery apron, of an evening device, and means for adjusting the same at different points upon its surface or length nearer to or farther from the delivery-apron, to act with more or less effect upon the wool carried by different parts of said apron, substantially as described.

7. The adjustable evening device, consisting of a suitable frame, a comb or serrated plate, and means for adjusting the same to bring the teeth from a straight line to a curve, substantially as and for the purposes set forth.

8. The evening device, consisting of a series of arms attached to a cross-shaft, a stock composed of two or more parts adjustably secured on said arm, and a comb or toothed plate attached to said adjustable stock, substantially as described.

9. The combination of the following elements, arranged to deliver wool to the feeding-apron of a carding or similar engine, or to an intermediate scale: first, a lifting-apron; second, a reciprocating or vibrating comb, located on the side of said lifting-apron, upon which the wool is lifted for evening the stock carried thereby, and, third, a stripping-apron, located on the delivery side of aforesaid lifting-apron, for detaching the stock carried thereby, substantially as described.

10. The combination, with a revolving shaft being hollowed or recessed at the end and provided with a journal, of a stationary shield arranged to project into the hollow or recess of said shaft, the said shield flaring outward from its point of attachment as it enters said hollow or recess, substantially as shown and described.

11. In a machine for delivering wool or other fibrous material to be fed to a carding-engine or preparing-machine, the combination, with the weighing-scale and lifting or delivery apron, of a clutch arranged on one of the rollers upon which the said lifting-apron is mounted, a pivoted stop-lever arranged by its engagement or disengagement with said clutch to stop or permit the revolution of said apron, a lever or device operated by the balance to cause the aforesaid stop-lever to engage with said clutch, an independent lever or series of levers, and mechanism for operating the last-named lever or levers independently of the balance, to cause the disengagement of aforesaid stop-lever, the said devices being automatic in their action, substantially as described.

12. The combination, in a machine for automatically weighing and delivering wool to be fed to a carding or similar machine, of the following elements: first, a lifting-apron mounted on rollers; second, a weighing-scale; third, a clutch on the shaft of one of said rollers; fourth, a pivoted stop-lever arranged by its

engagement or disengagement with said clutch to stop or permit the revolution of said apron; fifth, automatic devices operated by the weighing-scale to cause the engagement of said lever with the clutch; sixth, a continuously-rotating wheel carrying a pin; seventh, a lever and intermediate mechanism operated by engagement with said pin to discharge said scale and return it for refilling; eighth, an independent lever and connections, arranged to be operated upon by aforesaid pin to cause the disengagement of other stop-lever from the clutch as the scale is returned for refilling, substantially as described.

13. The combination, with the feeding-apron of a carding-engine, of a pusher and mechanism for operating the same to move the wool diagonally across said apron for feeding to the carding-engine, substantially as described.

14. The combination, with the feeding-apron of a carding-machine and mechanism adapted to automatically deliver thereto wool or other fiber in a series of rows or layers, of a pusher and mechanism for operating the same to push the said rows or layers of wool diagonally over the feeding-apron, substantially as described.

15. The combination, with the feeding-apron of a carding-machine, of mechanism, substantially as described, arranged to automatically form on said apron a series of separate or unconnected diagonal rows of unprepared fiber, and to press said rows compactly together, substantially as described.

16. The combination, in a machine for feeding wool or other fibrous material to carding-engines or similar machines, with a feeding-apron, of a lifting or delivery apron, an evening device, and mechanism for weighing and forming on said feeding-apron diagonal rows or layers of equal weights, and for pushing each row as it is formed against previous weighings, substantially as described.

17. The combination, with the feeding-apron of a carding-machine, of a reciprocating pusher moving back and forth in substantially the same plane, parallel to said apron, substantially as described.

18. The combination, with a feeding-apron, of a pusher provided with pins resting in slots, slotted operating-levers, and mechanism for vibrating said levers, substantially as described.

19. A pusher, for use in connection with the feed-apron of a carding-machine, in combination with mechanism for imparting thereto a motion first at one end only and then a diagonal motion forward, substantially as described.

20. The combination, with a feeding-apron and reciprocating-pusher provided with pins resting in slots, of operating levers or connections arranged to act on said pins, one of said levers or connections having a suitably-shaped opening to allow a forward movement to be given to the other end before it commences to operate, substantially as described.

21. In a machine for delivering wool or other fibrous material to carding-engines or other preparing-machines, the combination of the lifting-apron, the adjustable vibrating comb or eveners, the stripping-apron and dish, the automatic weighing-scale, the feeding-apron, and the reciprocating-pusher having a diagonal movement across said apron, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

WM. CALVERT BRAMWELL.

Witnesses:

JOHN ALLYN,

WM. E. MARSTON.