FEED MECHANISM FOR CARDING MACHINES.

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Witnesses

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FEED MECHANISM FOR CARDING-MACHINES.

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To all whom it may concern:

Be it known that I, JAMES B. PLATT, a subject of the Queen of Great Britain, residing at Ashland, in the county of Grafton and State of New Hampshire, have invented a new and useful Feed Mechanism for Carding-Machines, of which the following is a specification.

My invention relates to improvements in feed mechanisms for carding-machines, and more particularly to structures of the character known to those skilled in the art as the "Bramwell" feeder.

The object of the present invention is to provide simple and effective means for feeding the stock charges in a path oblique to the axes of the feed-rolls for the purpose of having a series of not less than three charges operated on by the feed-rolls at one and the same time, whereby irregularities in the quantity of the charges and in the joinings or overlapping of the charges are compensated for by having the feed-rolls operate simultaneously on three or more charges and insure uniform and regular drawing.

The invention consists in the novel combination of elements and in the construction and arrangement of parts, which will be hereinafter fully described and claimed.

To enable others to understand the invention, I have illustrated one embodiment thereof in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a side elevation of a carding-machine feeder of the Bramwell type with my improvements applied thereto. Fig. 2 is an elevation from the opposite side of the machine shown by Fig. 1 and representing certain devices invented by me for moving the pusher in a path oblique to the longitudinal axis of the feed-rolls. Fig. 3 is a detail plan view omitting the weighing mechanism and showing the pusher and the feed-rolls in their active relations to the conveyor-apron. Fig. 4 is a diagrammatic view showing the manner of supplying the wool charges in an oblique angle to the feed-rolls to secure the operation of said rolls on a series of three or more charges.

The same numerals of reference are used to indicate like and corresponding parts in each of the several figures of the drawings.

10 designates a part of the framework of an ordinary carding-machine feeder of the Bramwell type, which includes suitable lifting aprons for elevating the wool from a receptacle to the hopper 11 of a weighing mechanism, the latter embodying valves 12, which are adapted to be opened and closed periodically for depositing charges of wool-stock of predetermined weight at regular intervals upon an endless slatted conveyor 13. This slatted conveyor is disposed in a horizontal plane and below the discharge of the hopper, forming one element of the weighing mechanism, and said conveyor operates to carry the charges of wool-stock from the vertical plane of the hopper 11 to the feed-rolls 15 of the carding-machine.

I have not considered it necessary to fully show and describe all of the parts or mechanisms which enter into a feed mechanism of the class to which this invention relates; but to a full disclosure of the present improvement it is thought advisable to refer to the foregoing parts with which my improvements are more directly associated.

The endless slatted conveyor 13 travels around and is partly supported by a shaft 14, which serves to propel the conveyor, and which is connected by suitable gear connections with other parts of the feed mechanism. The sides 17 of the feeder-frame are provided with horizontal slots 18 on a plane above the slatted conveyor, and between said sides 17 is arranged a pusher 19, having the studs 20 21 at its respective ends, said studs being fitted in the slots 18 of the feeder-frame to travel freely therein and to guide or direct the pusher in a path parallel to the surface of the endless conveyor. According to my invention the pusher is not advanced over the conveyor by devices which give equal movement or travel to the opposite ends of said pusher, as is common in the operation of prior feed mechanisms, and which results in advancing the charges of wool-stock to assume positions on the endless conveyor parallel to the longitudinal axis of the feed-rolls; but, on the contrary, my improvements con...
template the employment of two sets of devices which give unequal or variable travel to the opposite ends of the pusher. One set of actuating devices associated with one end of the pusher consists of a vibrating arm 22, which is hung at 23 on one side of the feeder-frame, and this vibrating arm has a longitudinal slot 24, which receives the stud 20 on one end of the pusher 19, said stud being prolonged or extended through one slotted side 17 of the feeder-frame in order that it may properly fit in the slot of the vibrating arm 22. To this vibrating arm 22 is pivoted one end of a pitman 24, which has its opposite end connected to a wrist-pin 25 on the gear 26, which is driven from a moving part of the feed mechanism, as clearly represented by Fig. 1 of the drawings. The means just described is adapted to give a short range or play to one end of the pusher; but in connection with the opposite end of the pusher I employ devices which give thereto a greatly increased range of movement, so as to make one end of the pusher travel a considerably greater distance than the opposite end of the pusher in order that the pusher as it completes the limit of its forward movement in advancing the charge of wool-stock will assume a position oblique or diagonally across the slatted conveyor and to the longitudinal axis of the feed-rolls, thereby leaving the charge of wool-stock in a position approximately at an angle of twenty-five degrees, more or less, to the axes of the feed-rolls. I also contemplate the construction of devices for giving increased range of movement to one end of the pusher adapted for application to feeders, which may lie at different heights from the floor, and I will now proceed to describe the preferred embodiment of devices for the attainment of these objects. The shaft 14, which propels the endless slatted conveyor, is provided at one end with a gear 27, which meshes with one member 28 of a compound gear. The other member 29 of this compound gear meshes directly with a gear 30, and the two members 28 29 of the compound gear are of different diameters and may be fast or integral with one of the other.

The gear 30 is adapted to drive one pusher lever, and the compound gear and the pusher lever gear are loosely journaled on stub-shafts 31, which are supported by a bracket 32, fixed to the opposite side of the frame from the vibrating arm 22 and its actuating devices. The lever-driving gear 30 is provided with a crank-arm 33, which is made fast to and adjustable on said gear for giving variable movement to the pusher-lever by concentricating said arm 33 with a longitudinal slot 34 and making the slotted arm fast with the gear 30 by a bolt 35. 36 designates a stand designed to be securely fastened to the floor adjacent to one side of the feeder-frame, and to this stand is adjustably fastened a slotted fulcrum-arm 37, which extends a suitable distance above the stand to provide for the attachment and free play of a driving-lever 38. This driving-lever is of angular construction, and it is fulcrummed at or near its angle on a bolt 43, attached to the adjustable arm of the stand. This angular driving-lever is provided with extensible arms 39 40, which are adjustably fastened to the respective end portions of said lever, each arm being provided with one or more longitudinal slots 41, through which pass the bolts 42, that serve to adjustably fasten the arm to the lever. The arm 40 on the substantially horizontal portion of the angular driving lever is pivoted to the lower end of the pitman 44, and the upper end of this pitman is connected to a wrist-pin 44* on the crank-arm 35 of the driven gear 36, whereby the crank-arm is adapted to travel with the gear in its rotation for reciprocating the pitman in order to vibrate the lever 38. This pitman 44 consists of two or more sections arranged to overlap each other and adjustably secured by bolts 45, which pass through slots 46 in one member of the pitman, and as the pitman and the driving-lever are made extensible the device for operating one end of the pusher may be lengthened or shortened in order to adapt said device to pushers 19, which lie at different heights from the floor of the room in which the carding-machine is located. It is evident that the arms of the driving-lever may be lengthened or shortened and that the pitman may be extended or contracted to compensate for variable positions in the elevation of the pusher and in the relative arrangement of the stand 36 to the driving-gears, and the fulcrum-arm 37 of the stand also enables this end to be attained with ease and facility. The arm 30, which is fastened to the inclined length of the driving-lever, is provided at its upper part with a longitudinal slot 47, adapted to receive the stud 21 of the pusher 19, and this driving-lever is thus adapted to move one end of the pusher back and forth between the weighing mechanism and feed-rolls and over the slatted conveyor.

From the foregoing description it will be noted that the vibrating arm 22 is hung on one side of the feeder-frame at a point considerably above the floor, while the driving lever 38 is disposed on the opposite side of the machine and is fulcrummed on a stand which is fixed to the floor, so that the fulcrum of the driving-lever 38 is considerably below the horizontal plane of the pivot of the driving-arm. This arrangement permits of the employment of a driving-lever which is considerably longer than the vibrating arm, and thus the radius and arc of the driving-lever are much greater than the arc of movement of the vibrating arm. In consequence of this relative arrangement of the vibrating arm and driving-lever which are connected loosely with the opposite ends of the pusher, the driving-lever is adapted to give a considerably greater range of movement to the end of the pusher to which it is connected than...
the movement imparted to the opposite end of the pusher by the vibrating arm, and hence in the forward movement of the pusher under the influence of the vibrating arm and the driving-lever said pusher is adapted to assume a diagonal position across the endless conveyer, and thereby occupy an inclined relation to the longitudinal axes of the feed-rolls on the completion of its forward movement. It follows from the inequality in the play of the opposite ends of the pusher and the oblique travel of the pusher across the endless conveyer that the charge of wool-stock subsequent to its deposit on the conveyer by the weighing mechanism will be forced by the pusher into an angular position across the conveyer and with relation to the axes of the feed-rolls, and as the charge is forced by the pusher into proper relation to the preceding charge the last-named charge which is acted on by the pusher will overlap and be crowded against the preceding charge. By reference to Fig. 4 the angular relation of the series of charges to the plane of the feed-rolls is clearly brought out, and as the series of overlapping charges all assume the inclined positions and as they are carried by the conveyer to the feed-rolls a series of charges not less than three in number will pass through the feed-rolls simultaneously, so that all of the series of charges varying in number from three to five will be operated upon by the feed-rolls at one and the same time.

It is desirable to press the charges of wool-stock before they pass into or between the feed-rolls, and this end is attained by the action of the pusher on the stock charges and by a presser device which overhangs the conveyer 13 and is in advance of the feed-rolls. This presser is in the form of a bar 48, having a beveled or curved working edge 49. The presser is carried by arms 45, which are attached to a rocking-shaft 50, journaled in proper bearings on the sides of the feeder-frame, and the hangers 49 are of unequal length and firmly fastened to the rock-shaft and the bar 48, whereby the bar is disposed in a diagonal position across the conveyer, the angle of the presser to the axes of the feed-rolls being approximately twenty-five degrees. As the pusher is advanced to force the charge of wool-stock toward the feed-rolls, the presser should be elevated to permit the stock to freely pass below the same, and this end is attained by the employment of a slotted arm 51, which is fixed to the rock-shaft 50 and is engaged with a stud 53 on a driving-lever 52, said lever being actuated by a wrist-pin 53 on a crank-disk 54, as shown by Fig. 1.

The operation may be described as follows: The lifting-apron of the feed mechanism elevates the wool-stock and deposits the same in a hopper of the weighing mechanism. The valves of this hopper are opened at regular intervals to deposit charges of predetermined weight upon the slatted conveyer, and during the weighing of the charge the pusher is adapted to be moved in the manner described across the conveyer. Previous to opening the valves of the weighing-hopper the pusher occupies a position to one side and in rear of the hopper, and on the discharge of the wool-stock from the hopper the pusher is advanced to move the charge over and across the conveyer into the oblique position, so that the charge will lie at an angle of approximately twenty-five degrees to the axes of the feed-rolls. As the pusher approaches the limit of its forward travel the presser 48 is raised to permit the charge to pass freely under the same, and the last charge advanced by the pusher is adapted to overlap or crowd against the preceding charge. The slatted conveyer is adapted to contain a series of not less than five charges, and this conveyer advances or carries three or more of the charges into and through the feed-rolls. As will be seen by reference to Fig. 4, a series of three charges of wool-stock are passed through the feed-rolls and by the time that the first charge shall nearly have passed through the rolls the fourth or fifth charge is in position to enter the rolls.

One of the feed-rolls of the ordinary feed mechanism is driven by gear connections with the gear-wheel 26, as shown by Fig. 1, said gear connections being embodied as an inclined shaft 14, having intermeshing beveled gears 14 with the feed-roll, the other end of said inclined shaft being driven in a suitable way (not shown) from the gear 26, which intermeshes directly with the driving-gear 26.

The gear element 54 is driven by suitable connections with the upper elevator-shaft of an ordinary Bramwell feeder, and this gear element 54 is driven at the same speed as the gears 26 30 in the usual manner in order that the several elements of the machine may operate properly.

Changes in the form, proportion, size, and the minor details of construction within the scope of the appended claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus described the invention, what I claim is—

1. In a feeder for carding-machines, the combination with feed-rolls, of a pusher, an actuator for giving movement or play within certain limits to one end of said pusher, and an independent driving device connected with the opposite end of the pusher and moveable in an arc of greater radius than the actuating device to impart greater travel to the pusher than the play given thereto by the actuating device, substantially as described.

2. In a feeder for carding-machines, the combination with feed-rolls, and a conveyer, of a pusher, an actuating device associated with one end of the pusher to give movement
or play within certain limits thereto, and a driving-lever movable in an arc of greater radius than the actuating device and connected operatively with the opposite end of the pusher, substantially as described.

3. In a feeder for carding-machines, the combination with feed-rolls and a conveyor, of a pusher, an actuating device connected with one end of the pusher for moving the latter within certain limits, a driving-lever fulcrumed on a plane below the pivot of the actuating device for movement in an arc of greater radius and connected with the opposite end of the pusher, and a train of driving-gears for actuating the driving-lever, substantially as described.

4. In a feeder for carding-machines, the combination with feed-rolls and a conveyor, of a pusher, an actuating device connected with one end of the pusher to impart movement thereto within certain limits, an extensible driving-lever fulcrumed at a point below the pivot of the actuating device and having one arm thereof connected with the opposite end of said pusher, a train of driving-gears, and an extensible pitman between one member of the gear-train and the extensible lever, substantially as described.

5. In a feed mechanism for carding-machines, the combination with feed-rolls, and a conveyor, of a pusher, an actuating device connected with one end of said pusher, to impart movement thereto within certain limits, driving devices connected with the opposite end of said pusher for imparting increased range of movement thereto as compared with the actuating device, said driving devices having an extensible lever which is adjustable to compensate for the application of the pusher to machines of different height, and fulcrumed at a point below the pivot of said actuating device, and means for operating said driving devices, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JAMES B. PLATT.

Witnesses:
ORA A. BROWN,
J. M. CHENEY.