Feb. 16, 1926. 1,573,709

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SUPPLY CONTROLLING MEANS FOR TEXTILE PREPARING MACHINERY

Filed Sept. 6, 1923 2 Sheets-Sheet 1

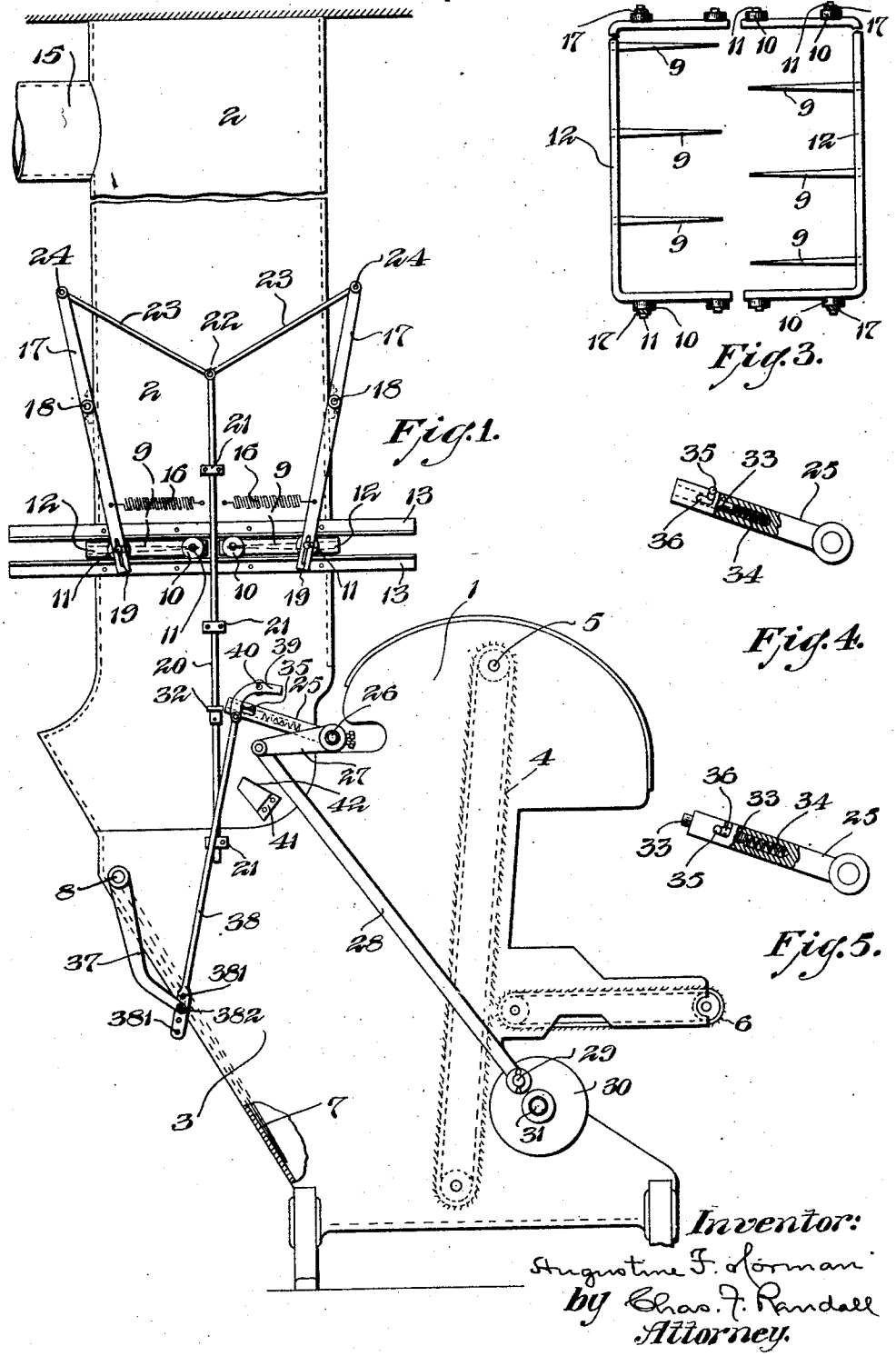


Fig. 1.

Fig. 3.

Fig. 4.

Fig. 5.

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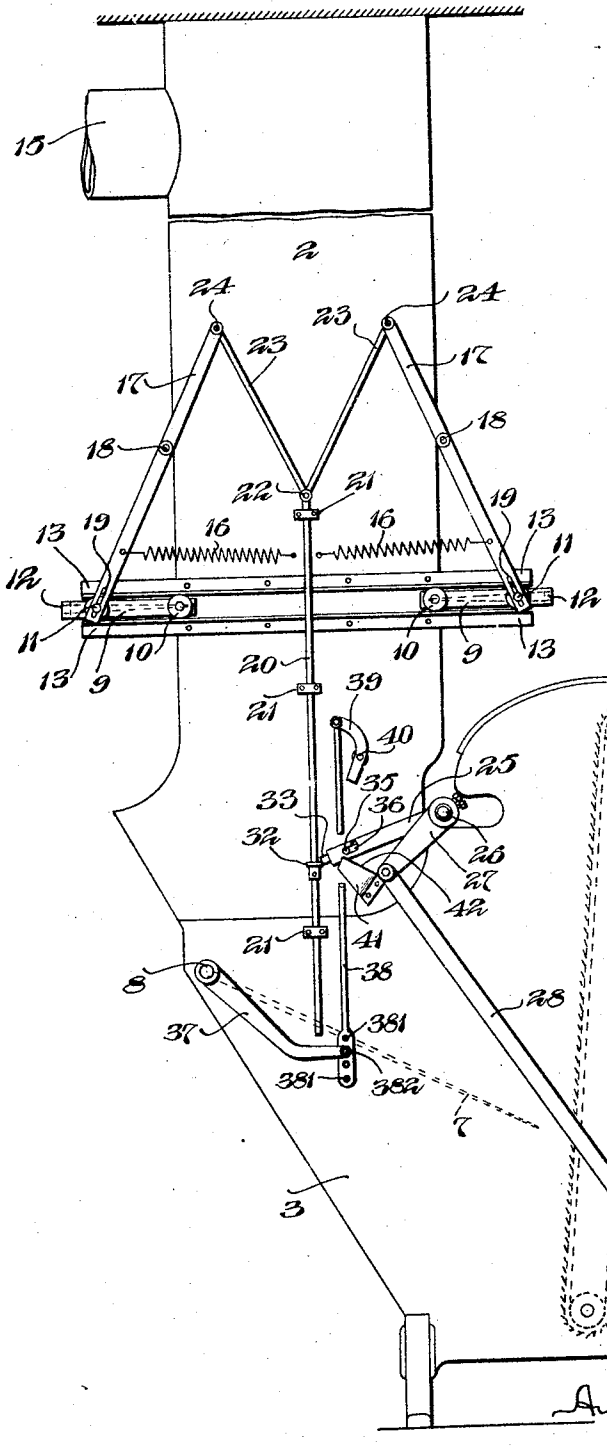


Fig. 2.

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UNITED STATES PATENT OFFICE.

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SUPPLY-CONTROLLING MEANS FOR TEXTILE-PREPARING MACHINERY.

Application filed September 6, 1923. Serial No. 661,179.

To all whom it may concern:

Be it known that I, AUGUSTINE F. HORMAN, a citizen of the United States, residing at Andover, in the county of Essex, State of Massachusetts, have invented a certain new and useful Improvement in Supply-Controlling Means for Textile-Preparing Machinery, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention has relation to supply-controlling means for textile preparing machinery in general, and in particular for employment in conjunction with the feeders used to supply the proper amount of fibrous material continuously to carding engines and other preparing machines.

My invention consists in supply-controlling means for preparing machinery, comprising, in combination with a hopper and a trunk for supplying fibrous material to the said hopper, a cut-off by which the discharge of such material from said trunk into said hopper may be arrested, a moving actuating member, and means governed by the quantity of fibrous material within the hopper for engaging said actuating member with the cut-off connections to actuate the cut-off so as to permit such discharge to occur.

An illustrative embodiment of my invention is shown in the accompanying drawings combined with a feeder of familiar type.

In the drawings,—

Fig. 1 is a side elevation of the said feeder and its connected supply trunk, showing the invention applied thereto, the cut-off and the parts more immediately associated therewith being in the positions they assume when the cut-off is shut to prevent fibrous material from entering the feeder-hopper.

Fig. 2 is a side elevation of the same with the cut-off open to permit fibrous material to pass into the hopper.

Fig. 3 is a plan view of the two halves composing the cut-off of Figs. 1 and 2.

Figs. 4 and 5 are detail views, partly sectional, of the oscillating arm which in Figs. 1 and 2 serves to actuate the connections to open the cut-off.

Having reference to the drawings,—

The invention is shown combined with a carding-engine feeder 1 of well-known construction and operation, and with an associated pneumatic supply-trunk 2 through which fibrous material is conducted from an outside source to supply the feeder 1.

The said feeder 1, as usual, comprises a hopper 3 into which the fibrous material descends from supply-trunk 2, and from which such material is fed by a spiked vertically extending apron 4, which lifts it up and over the roll 5, the fibrous material being discharged from apron 4 upon a horizontal apron 6 which feeds it to the carding-engine or other machine. In practice, a rack or presser 7, yieldingly actuated by a spring or weight (not shown) is employed to insure the proper presentation to the spiked apron of fibrous material occupying the hopper. This rack 7 is fixed on a transverse shaft 8, which is mounted in bearings in connection with the hopper so as to allow the rack to be pushed back against the inclined surface of the outer wall of the hopper, as shown in Fig. 1, when said hopper is full of fibrous material, and to enable it to swing toward the apron 4, as shown in Fig. 2, under the action of its spring or weight (not shown), to press the contents of the hopper against the upwardly traveling run of the spiked apron 4, as the quantity of fibrous material within the hopper decreases.

The cut-off may vary in specific construction and mode of operation, but advantageously may be of comb-form, as in the drawings, with teeth 9, 9, arranged to work in holes in the shell of the trunk 2 and extending diametrically of the trunk. Preferably, I employ, in the case of a trunk of large dimensions in cross-section two combs facing each other, point to point, as indicated in the drawings, and respectively movable transversely of the trunk in opposite directions toward and from each other, with the teeth of each comb extending only part way across the interior of the trunk. Thereby the extent of movement of each comb of the pair is less than would be necessary if only a single comb should be employed. A single comb may be employed, however, where such employment is convenient. In this instance the comb-teeth 9, 9, are affixed to the backings 12, 12, which respectively are bent to a shape which conforms to the exterior shape of the supply-trunk 2, the side-arm of the said backings being provided with rollers 10, 10, that work between upper and lower tracks 13, 13, which are secured in pairs on opposite sides of the trunk 2. When the combs have been closed together by being

moved inwardly toward each other into the position shown in Fig. 1, the teeth 14 constitute an effective barrier or cut-off to prevent movement downwardly of the mass of fibrous material which has been deposited in the supply-trunk 2 through the conductor 15. When the combs are opened apart by being moved outwardly away from each other, the accumulated mass detained by their teeth is permitted to drop into the hopper.

The cut-off is closed by the action of contracting springs 16, 16, each anchored by one of its ends to a side of the supply-trunk 2, the said springs pulling inwardly toward the middle line of the supply-trunk upon the lower arms of levers 17, 17, which are fixed upon rockshafts 18, 18, mounted upon the supply-trunk 2, the said levers being connected at their lower ends respectively with the two halves of the cut-off. In the present embodiment four of such levers 17 are employed, comprising two pairs, a pair at each side of the rectangular supply-trunk; they are engaged operatively with the halves of the cut-off by means of slots 19, 19, in the lower arms of the levers, receiving the projecting pintles 11, 11, of certain of the rollers 10, 10.

The cut-off is opened to permit the descent of fibrous material from the supply-trunk 2 into the hopper 3, by means of downward movement imparted, as will be described, to an actuating rod 20 mounted for vertical sliding movement in guides 21, 21, 21, secured to one side of the supply-trunk 2 and the corresponding side of the hopper 3. The upper end of such actuating rod 20 is connected at 22 with links 23, 23, which are joined at 24, 24, with the upper arms of the levers 17, 17. Downward movement of the actuating rod 20 serves to draw the upper ends 24, 24, of the levers 17 toward each other and thus to spread the lower ends apart, separating the two halves 9, 9, of the cut-off and allowing the fibrous material to descend into the hopper 3. As soon as the springs 16, 16, are permitted to act reversely they operate to close the cut-off again, and in doing so raise the rod to its normal elevated position.

To impart the necessary downward movement to actuating rod 20, a moving actuator is employed. In the present instance such actuator is an arm 25, fixed upon a rockshaft 26 mounted in bearings at the top of hopper 3, the said rockshaft being combined by means of a crank-arm 27 fixed thereon and a link 28, with a crank-pin 29 on a wheel 30 which is fixed to a rotating shaft 31. The continuous rotation of the shaft 31 thus serves to oscillate the arm 25 constantly up and down. Suitable provision is made for operative engagement between the free end of said arm 25, which moves up and down close to the actuating rod 20, and the said rod. Herein the arm is provided with means of making engagement with a collar 32 fixed upon said rod 20, when occasion arises for opening the cut-off to admit more fibrous material to the hopper 3. This means comprises a bolt 33 occupying an axial bore in the end of arm 25, such bolt being acted upon by a spring 34 confined behind it in the bore, such spring tending to project the bolt so as to cause it to extend beyond the end of the arm, the bolt being primarily held in retracted position inside the bore as shown in Fig. 4 by means of a detent in the form of a pin 35 radially extending from the bolt, working in a slot 36 in the wall of the tubular portion of the arm, and normally occupying a transversely offset part of the said slot, as in Fig. 4, the slot being L-shaped like the slot in the guide of a door-bolt. When projected, as in Fig. 5, the end of this bolt 33 engages with the collar 32 on the actuating rod 20 in the downward movement of the continuously oscillating arm 25 whereupon the rod 20 is pulled downward to open the cut-off.

To call the bolt 33 on oscillating arm 25 into engagement with the collar 32 on rod 20 when the hopper 3 has been emptied to the predetermined extent, I utilize the rack 7 within the hopper 3. To the outer end of the shaft 8 upon which is fixed the rack 7, an arm 37 is fixed and connected by link 38 with a trip 39 pivoted at 40 on the side of the supply-trunk 2. The connections, arrangement, etc., are such that so long as the rack is pressed back to the proper extent by fibrous material occupying the hopper, the engaging portion of the trip is kept out of the path in which the pin 35 of bolt 33 moves as the actuating arm 25 swings up and down. Also, so that when the rack 7 is permitted to rise into the position shown in Fig. 2, by reason of the exhaustion of the contents of the hopper by the action of spiked apron 4, the trip 39 will be turned over into the position shown in Fig. 2, with its engaging end in the path of the pin 35 so that as the oscillating arm 25 rises the pin will engage the said end and bolt 33 will in consequence be rotated the amount necessary to carry the pin 35 out of the transverse portion or notch of the slot 36. This will free the bolt to the action of spring 34 and the latter will slide the bolt lengthwise so as to project the end of said bolt far enough to engage with the collar 32, as the arm 25 descends. The rod 20 thereby will be drawn downward and the cut-off will be opened.

For the purpose of restoring the bolt to its retracted position within arm 25 I provide a fixed dog 41 upon the side of the trunk. In the final portion of its downward swing, the arm 25 passes between the side of the supply-trunk 2 and the said dog

41, as shown in Fig. 2, where said arm is just entering beneath the dog. The inclined upper edge 42 of said dog engages the pin 35 of the bolt 33, and as the arm 25 continues downward said edge acts as a cam, first to move said pin lengthwise of arm 25 to retract the bolt, and then to secure it in retracted position by turning it so as to move the pin 35 up into the transverse detent-portion of L-shaped slot 36. As soon as released, the actuating rod rises under the influence of springs 16, 16, and the cut-off closes.

In case the amount of fibrous material thus descending into the hopper 3 upon the momentary opening of the cut-off is sufficient to depress the rack 7 to the required extent, which ordinarily will be the case, the trip 39 is turned up out of the way of pin 35, as shown in Fig. 1, so that the arm 25 will oscillate idly and the cut-off remain closed, while the feeder proceeds to dispose of the charge just placed in its hopper 3. If an insufficient quantity or weight of fibrous material has been admitted to the hopper, the rack remains in its inward or lifted position and the trip 39 releases the bolt 33 each time the oscillating arm rises, to cause the arm to open the cut-off repeatedly until enough material has been deposited upon the rack.

To enable the devices to bring the trip 39 into play at an earlier or later stage in the depletion of the contents of the hopper provision is made for adjustable connection between the rack 7 and the trip. In the present instance this provision consists in a series of holes 381, 381, in the lower end of the rod 38, such series enabling the pin 382 which engages the said rod with the arm 37 of the rack to be shifted from one hole to the other so as to swing the trip into acting position earlier or later in the movement of the rack from its position shown in Fig. 1 toward that shown in Fig. 2.

What I claim as my invention is,—

1. Supply-controlling means for feeders comprising, in combination with a hopper and a trunk for supplying fibrous material to the said hopper, a cut-off normally occupying a position in which such material is arrested within said trunk, an oscillating actuating member, and means governed by the quantity of fibrous material within the hopper for engaging said actuating member and the cut-off connections to actuate the cut-off so as to release the arrested material and permit a feeding discharge into the hopper to occur.

2. Supply-controlling means for textile preparing machinery comprising, in combination with a hopper in connection with said machinery and a trunk supplying fibrous material to the said hopper, a cut-off normally occupying a position in which such material is arrested within said trunk, an actuating rod operatively combined with the cut-off, an actuating member, and means governed by the quantity of fibrous material within the hopper to bring about engagement between said member and the actuating rod to actuate the latter so as to open the cut-off and thereby release the arrested material.

3. Supply-controlling means for textile preparing machinery comprising, in combination with a hopper in connection with said machinery and a trunk supplying fibrous material to the said hopper, a cut-off normally occupying a position in which such material is arrested within said trunk, having an actuating rod operatively combined therewith, an arm oscillating adjacent said actuating rod, and means governed by the quantity of fibrous material within the hopper to bring about engagement between the said arm and the actuating rod to open the cut-off and thereby release the arrested material.

4. Supply-controlling means for textile preparing machinery comprising, in combination with a container for fibrous material and a trunk delivering thereto, cut-off devices normally acting to arrest flow of fibrous material from said trunk, said devices including an actuating rod, a moving actuator, an engagement member, and means controlled by the quantity of material in said container and controlling the said engagement member to bring about the actuation of the said rod and thereby the opening of the cut-off by said actuator to release the arrested material.

5. Supply-controlling means for textile preparing machinery comprising, in combination with a hopper and a trunk delivering fibrous material to such hopper, a cut-off which controls discharge from the trunk to the hopper, means normally acting to close said cut-off to arrest the material within the trunk, cut-off operating connections comprising a lever-arrangement and an actuating rod, a moving actuator, a normally-disengaged engagement member for connecting the actuator with the rod, and means, controlled by the quantity of material in the hopper, by which said engagement member is made effective to establish connection between the actuator and rod when the supply of fibrous material in the hopper is depleted to the predetermined extent to actuate the cut-off to release the arrested material.

6. Supply-controlling means for textile preparing machinery comprising, in combination with a hopper and a trunk delivering fibrous material to such hopper, oppositely arranged cut-off members for controlling discharge from said trunk, actuat-

ing levers for said cut-off members, an actuating rod linked to said levers, a moving actuator, a normally-disengaged engagement member for connecting the actuator with the rod, and means, controlled by the quantity of material in the hopper, by which said engagement member is made effective to establish connection between the actuator and rod when the supply of fibrous material in the hopper is depleted to the predetermined extent.

7. Supply-controlling means for textile preparing machinery comprising, in combination with a hopper and a trunk delivering fibrous material to such hopper, a normally-closed cut-off which controls discharge from the trunk into the hopper, an actuating member for said cut-off, a moving actuator, an engagement member carried by said actuator and normally latched in inoperative relations with respect to said actuating member, means including a trip which is controlled by the quantity of material contained in the hopper for unlatching the engagement member to cause it to actuate the cut-off actuating member to open the cut-off, and means for restoring the engagement member to inoperative relations.

8. Supply-controlling means for textile preparing machines comprising, in combination with a hopper and a trunk delivering fibrous material to such hopper, opposite cut-off members which control discharge from the trunk to the hopper, levers respectively connected with the cut-off members, an actuating rod to which the levers are linked, means for yieldingly closing the cut-off members, a moving rod-actuator, an engagement-member carried by said actuator and normally latched in inoperative relations with respect to the rod, a trip controlled by the quantity of material occupying the hopper for unlatching said engagement-member when the said quantity is depleted to the predetermined extent, and means for re-latching the engagement-member in the said inoperative relations.

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