Jan. 11, 1927. 1,614,378

F. MICKA

COMPRESSION FEEDING DEVICE

Filed July 17, 1926 2 Sheets-Sheet 1

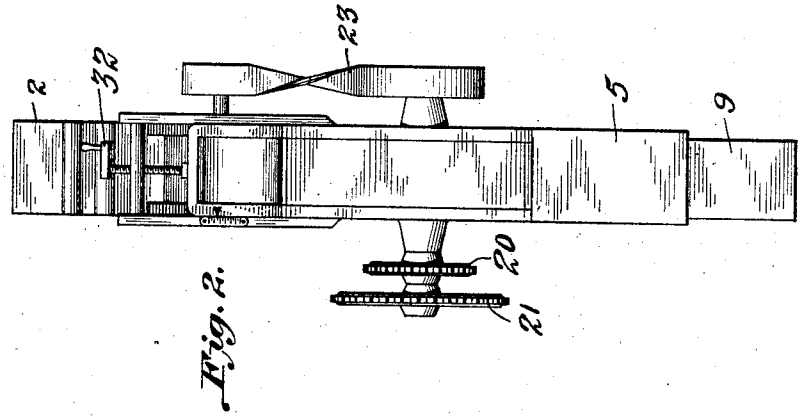


Fig. 2.

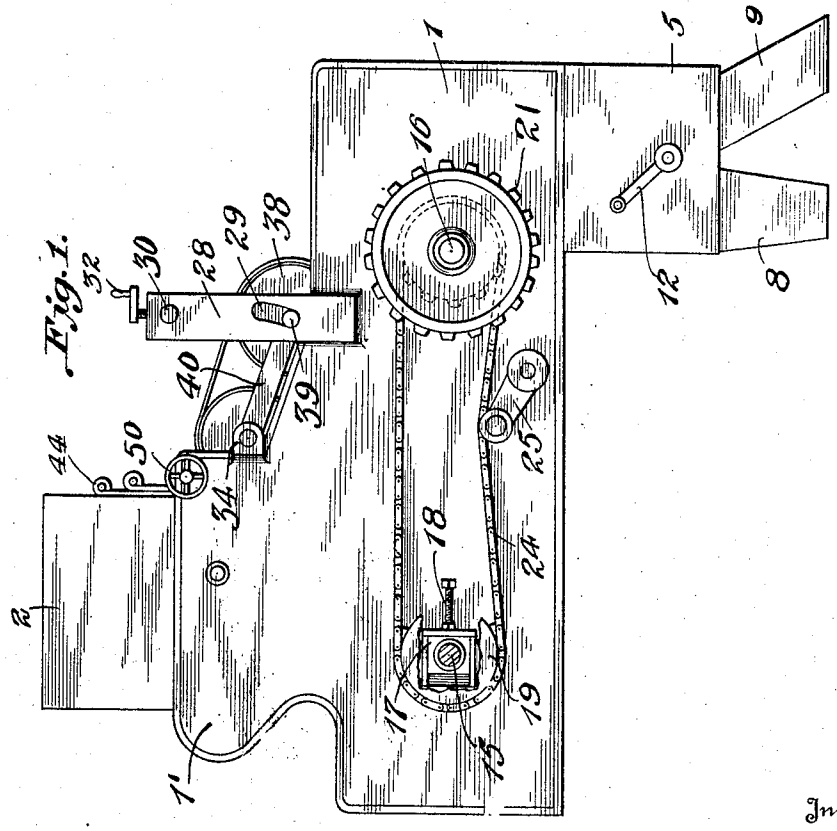


Fig. 1.

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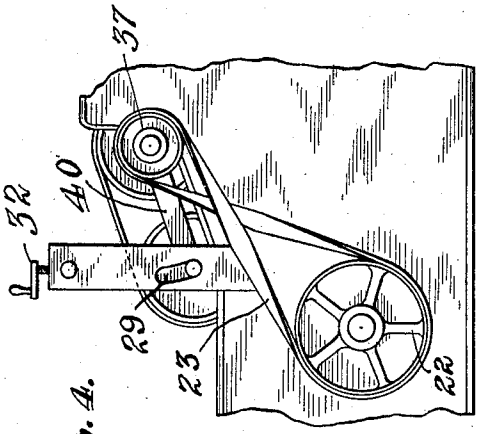


Fig. 4.

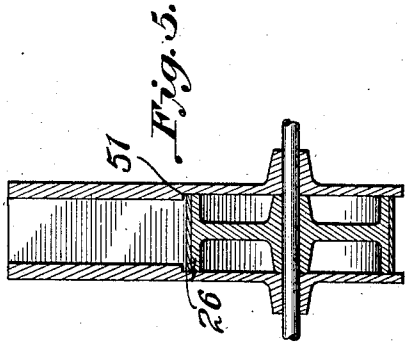


Fig. 5.

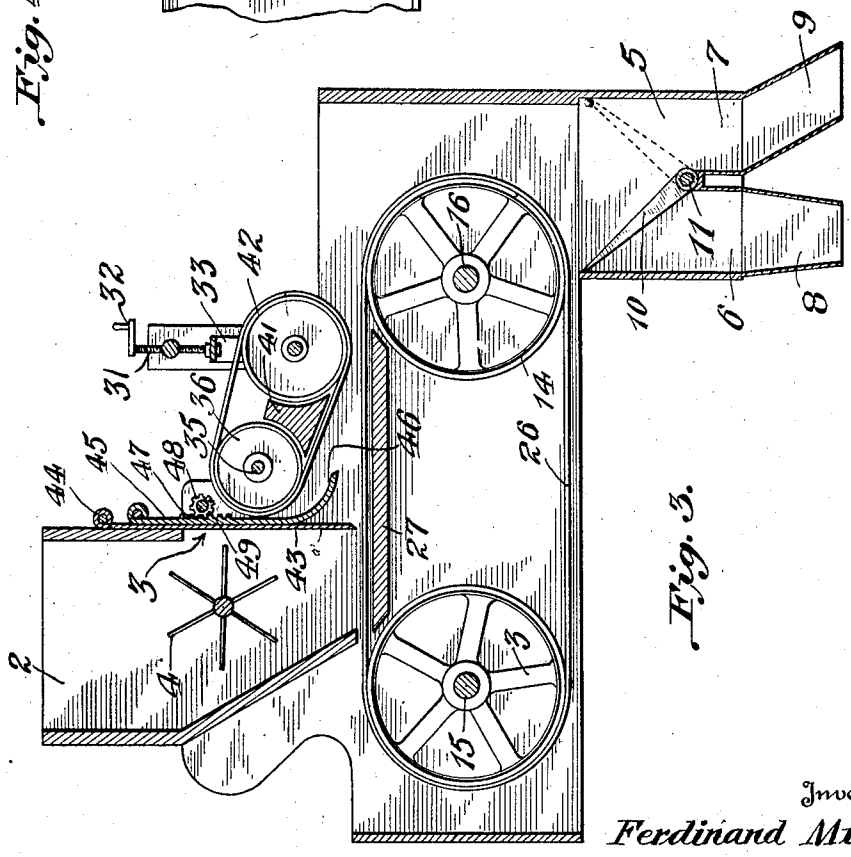


Fig. 3.

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Patented Jan. 11, 1927. 1,614,378

UNITED STATES PATENT OFFICE.

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COMPRESSION FEEDING DEVICE.

Application filed July 17, 1926. Serial No. 123,156.

This invention relates to improvements in compression feeding devices for use in the manufacture of formula feeds for animal consumption, the invention having for an object to provide a device of this character by means of which the matter passing through the same will be subjected to compression of a degree sufficient to maintain a uniform ribbon-like stream of material of even density from the device.

It is also an equally important object of the invention to provide a compression feeding device wherein means are utilized for conveying the material from the storage bin to the feeder hopper and into the path of an adjustable compressing means functioning to so compress said material and to regulate its flow from the discharge passage in a manner to produce an even and uniform ribbon-like outflow of the required density.

It is also among the aims and objects of the invention to provide the discharge way of the feeder hopper with a novel means for permitting of accurate regulation of the amount of material fed or delivered onto the conveying means for delivery to the compression means.

Other objects of the invention will be in part obvious and in part pointed out hereinafter.

In order that the invention and its mode of operation may be readily understood by those skilled in the art, I have in the accompanying illustrative drawings and in the detailed following description based thereupon, set out one possible embodiment of the invention.

In these drawings:

Figure 1 is a side elevation of the improved compression feeding device,

Figure 2 is an end elevation of the same,

Figure 3 is a vertical longitudinal section therethrough,

Figure 4 is a fragmentary detail in side elevation showing the manner in which motion is transmitted to the compression means from the conveyor means, and

Figure 5 is a vertical transverse fragmentary section through one end portion of the device.

Having more particular reference to the drawings, in connection with which like characters of reference will designate corresponding parts throughout, the improved device may be stated to comprise a supporting means or body portion generally designated at this time by the numeral 1, said body portion being of substantially rectangular configuration and affording a casing or housing for receiving the working parts of the device; the upper portion of one end of the body 1 being provided with extensions 1′ fixedly receiving therebetween a feeder hopper 2, the lower end of which is open while an opening is formed in the lower portion of one side wall thereof as is indicated by the numeral 3; a suitable form of agitator 4 being rotatably mounted within the lower portion of the feeder hopper 2 for obvious purposes. The opposite end and lower portion of the body portion 1 is provided with a discharge way or chute 5 having branch discharge portions or legs 6 and 7 communicating therewith from which discharge spouts 8 and 9 are extended. To permit of the selective direction of compressed material through either of the discharge spouts 8 or 9, a flap valve 10 is horizontally pivoted as at 11 within a portion of the way 5 and is of such size as to close the inner end of either of the said spouts 8 or 9 with swinging of the same to it's several adjusted positions as is shown in full and in dotted lines in the Figure 3. To facilitate this pivotal movement of the valve 10 whereby to control communication between the way 5 and either of the discharge spouts 8 or 9, the pivot pin 11 mounting the valve 10 is extended and has a suitable crank handle 12 fixedly mounted thereupon and exteriorly of the way 5.

Relatively spaced endless conveyor belt wheels 13 and 14 are mounted in the opposite ends of the body portion 1 upon shafts 15 and 16; the shaft 15 having its opposite ends journaled in bearings 17 slidably mounted in slots or ways provided therefor in adjacent portions of the opposite side walls of said body 1 and being adapted to have adjusting motion imparted thereto through the medium of adjusting screws

18 turned into engagement with fixed portions receiving the adjustable bearings 17 and adapted to have engagement with parts of said bearings 17 whereby with rotation of such screws, adjusting movement will be imparted to the respective bearings, thus effecting longitudinal adjustment of the belt wheel 13 with respect to the body portion 1. Also, one end of the shaft 15 is extended beyond one side of the body 1 and has a sprocket wheel 19 fixedly mounted thereon, the purpose of which will be hereinafter more fully described.

The belt wheel 14 carried upon the shaft 16 is, as hereinbefore stated, mounted in the opposite end of the body portion 1 and its shaft 16 is journaled in fixed bearings provided therefore in the opposite side walls of said body 1; the opposite ends of said shaft 16 being extended to points beyond the outer faces of the opposite side walls of the body 1, one end having a driven sprocket wheel 20 and a driving sprocket wheel 21 fixedly mounted thereupon, the latter sprocket wheel being of a diameter greater than the former, while the opposite end of this shaft 16 has a pulley wheel 22 fixedly mounted thereon and adapted to receive an endless belt 23 thereabout, the purpose of which will be presently described.

A sprocket chain 24 is engaged about the sprocket wheels 19 and 20 and as will be appreciated, serves to effect a driving connection as between the driven sprocket wheel 20 and the sprocket wheel 19, thus permitting of the transmission of rotary motion to the several shafts 15 and 16 fixedly carrying their respective belt wheels 13 and 14. To effect an automatic "take up" of slack in the sprocket chain 24, which is of the endless type, an idler take up device 25 is mounted upon the outer portion of the adjacent side wall of the body 1 and is adapted to have its free end engaged with an adjacent portion of said chain 24 in the manner clearly shown in the Figure 1. Furthermore, it will be understood in this direction that slack in the endless sprocket chain 24 may be further relieved by longitudinal adjustment of the adjustable bearings 17 receiving the shaft 15 of the belt wheel 13.

That the material delivered from the lower portion of the feeder hopper 2 into the body portion of the device may be conveyed to the compression means, hereinafter described, an endless belt conveyor 26 is engaged about the belt wheels 13 and 14 and is disposed longitudinally of the intermediate portion of the body 1, the upper side of said belt passing over a table or board 27 fixedly supported in the upper portion of said body 1 in the manner shown in the Figure 3.

Transversely spaced and aligned standards 28 are fixed to the opposite side walls of the body portion 1 and extend for distances above the same as is shown in the Figures 1 and 3; the intermediate portions of said standards having arcuate slots 29 formed therein while a bar or rod 30 is fixedly mounted between the upper ends of such standards and has a screw threaded opening formed in its intermediate portion receiving the screw threaded shaft or rod 31 therethrough, the upper end of which is provided with a fixedly mounted crank handle 32 while the lower end thereof is provided with a swivel head engaging the horizontal or basal portion of a substantially inverted U-shaped supporting frame 33, the opposite sides of which are arranged adjacent to and in parallelism with the inner faces of the several standards 28.

Bearing fingers 34 are fixedly mounted upon the inward vertical side portions of the extensions 1′ of the body portion 1 and have rotatably mounted therein a shaft 35 upon which a pulley wheel 36 is fixedly mounted, one end of said shaft being extended beyond the bearing and having a second pulley wheel 37 fixedly mounted thereon and receiving the remaining end of the crossed endless belt 23 thereabout in the manner shown in the Figures 2 and 4. Another pulley wheel 38, corresponding in diameter to that of the pulley wheel 36 is provided and as will be noted upon reference to the Figures 1 and 4, is fixedly mounted upon a shaft 39, the opposite ends of which are journaled in bearings formed in the free ends of supporting bars 40 disposed longitudinally of the body portion 1′ and arranged in substantially parallelism to the opposite side walls thereof; the opposite ends of said bars being pivotally mounted upon the shaft 35, aforesaid.

The extremities of the shaft 39 are extended and slidably received in the arcuate slots or ways 29 in the standards 28 and thus, it will be appreciated that when said extended ends of the shaft 39 are in their lowermost positions with respect to the slots 29, they will be supported in their lowermost positions with respect to the standards 28.

The extremities of the inverted U-shaped element 33 are loosely engaged with the adjacent portions of the shaft 39 and consequently upon this, it is to be understood that with rotation of the screw threaded adjusting shaft or rod 31, said pulley wheel 38 may be raised or lowered to the desired extent.

A form of partition 41 is preferably supported between the pulleys 36 and 38 while an endless conveyor belt 42 is disposed about the same and is adapted to be moved thereover with the transmission of rotary motion to the shaft 35 from the driven pulley wheel 37.

With a view toward providing means for

controlling and regulating or adjusting the discharge of material onto the endless conveyor belt 26, a slidable gate valve 43 is mounted adjacent the opening 3 in the feeder hopper 2 and when in its lower position, serves to reduce the discharge of material onto the said belt 26 to minimum; the upper portion of said gate valve being provided with a suitable operating device, indicated in a fashion herein and referred to by the numeral 44. Also, a regulating or adjusting gate valve 45 is provided the hopper 2 and as will be noted upon reference to the Figure 3, the lower portion of this particular gate valve is curved outwardly as indicated at 46 while the upper portion of the same is provided with a longitudinally disposed rack 47, the teeth of which are adapted to be engaged or to mesh with the teeth of a pinion 48 fixedly mounted upon a shaft 49 disposed transversely of the adjacent end of said hopper 2 and mounted in suitable bearings in adjacent portions of the extensions 1'; a hand wheel 50 being fixedly mounted upon an extended end of said shaft 49 and serving for an obvious purpose. Thus, it will be understood that by rotating the hand wheel 50, rotation of the pinion 48 will be effected and due to its meshing with the rack 47, the regulating gate valve 45 will be either raised or lowered with respect to the endless belt conveyor 26 whereby to regulate to the desired nicety, the depth and flow of the material from the open portion 3 of the hopper 2 onto said endless conveyor belt 26, it being understood in this connection that with functioning of the curved lower portion 46 of the regulating gate valve 45, that the control gate valve 43 has been previously moved to its open or raised position.

To prevent the falling of material from over the edges of the belt 26 into engagement with the bearing of the belt wheel 13, resulting in deterioration of the moving parts, I may and preferably do slightly reduce the interior cross sectional area of the hopper 2, after the fashion shown in the Figure 5, while the lower portion of the body 1 is enlarged and thus provides opposed shoulders 51 below which the peripheral portion of said pulley wheel 13 is adapted to be arranged, while the upper side of the endless conveyor belt 26 is arranged immediately below said shoulders and therefore, it will be understood that such shoulders have overlapping relation to the opposite side portions of the belt and consequently, that the falling of material over the edges of the belt and onto the bearings of said belt wheel will be avoided.

The operation of the improved compression feeding device may be stated to be as follows:

Material of the desired formula is discharged into the hopper 2 from storage bin. At this time, motion is being imparted to the endless belt conveyors 26 and 42 through the medium of their respective belt and pulley wheels; it being understood that power is transmitted to the device through the medium of the larger sprocket wheel 21. At this time, the screw threaded rod 31 is turned or adjusted whereby to effect proper vertical positioning or adjustment of the pulley wheel 38 about which one end of the endless belt conveyor 42 passes. With the securing of proper adjustment, the control gate valve 43 is raised to its full open position whereupon the hand wheel 50 is rotated to effect the desired vertical adjustment of the curved lower portion 46 of the regulating gate valve 45. At this time, the material will flow in an even and uniform stream from the hopper 2 onto the longitudinally moving endless conveyor belt 26, being carried by said belt forwardly and into engagement with the similarly moving endless conveyor belt 42 of the compression means of the device, whereat it is subjected to compression by the vertically adjusted pulley wheel 38, this resulting in the discharge of an even and uniform ribbon-like flow of material of even density into the discharge way 5 of the device. One of the spouts communicating with the discharge way 5 is adapted to communicate with a feed mixing device while the remaining spout (the spout 9) is adapted to serve as a means for permitting of the sampling or testing of the compressed material delivered into the discharge way 5. In this connection, it will be understood that by effecting shifting of the flap valve 10 from that position as shown in full lines to the position shown in dotted lines in the Figure 3, the discharge of material will be diverted to the discharge spout 9 whereas when the flap valve 10 is in that position as shown in full lines in the said Figure 3, the discharge of material will be then effected through the discharge spout 9 for testing or sampling purposes.

Manifestly, the construction shown is capable of considerable modification and such modification as is within the scope of my claim I consider within the spirit of my invention.

I claim:

A device of the character described comprising a supporting means, conveying means disposed longitudinally of the same and a portion of said conveying means being adjustable, a hopper upon the supporting means adjacent one end thereof having a discharge opening in one side thereof communicating with the conveying means, a control gate valve slidably mounted upon one side of the hopper adjacent the discharge opening therein and for vertical movement

with respect to the same, a regulating valve overlying said gate valve and mounted for vertical sliding movement with respect to the discharge opening in the hopper, the lower end of said regulating valve being curved outwardly and in a direction away from the hopper, and manually operable means connected to said regulating valve for effecting vertical sliding movement of the same independently of the control valve.

In witness whereof I have hereunto set my hand.

FERDINAND MICKA.