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F. H. B. STELZER ET AL

2,248,725

TOBACCO FEED REGULATING DEVICE

Filed Aug. 20, 1938

2 Sheets-Sheet 1

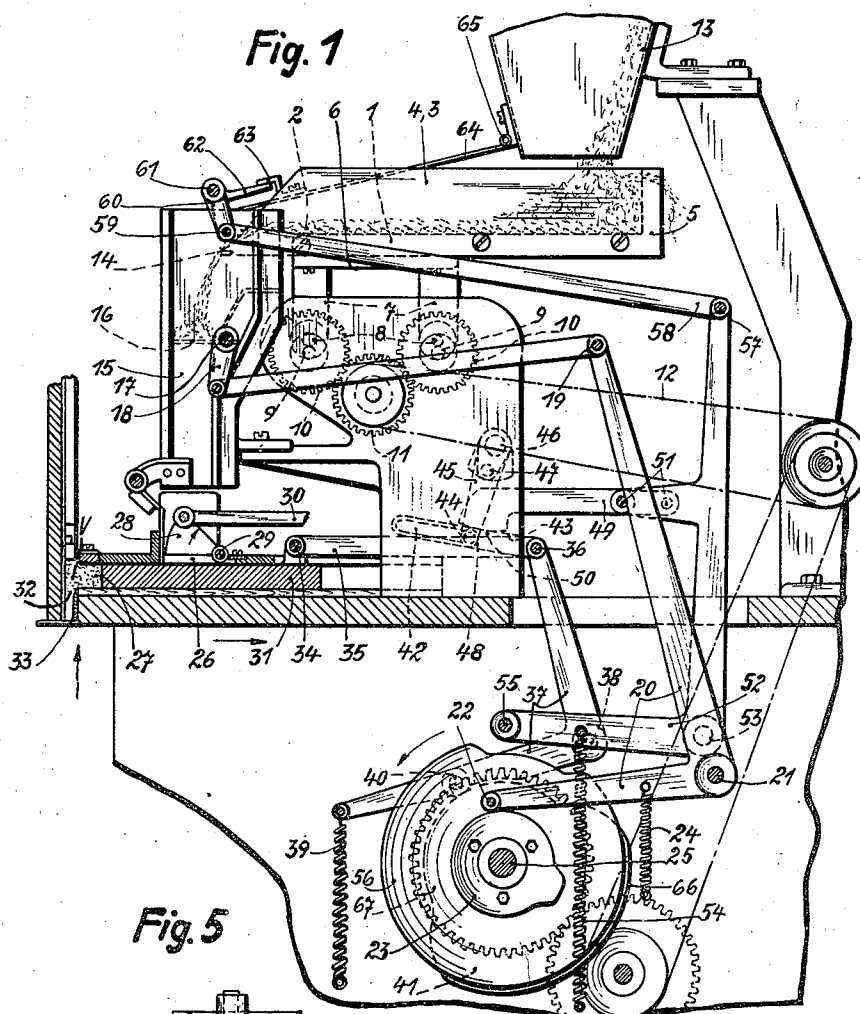
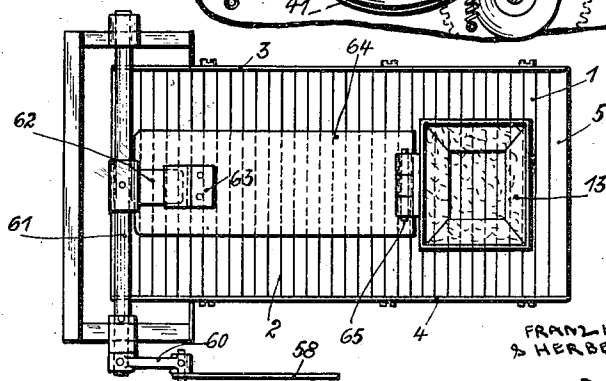


Fig. 5



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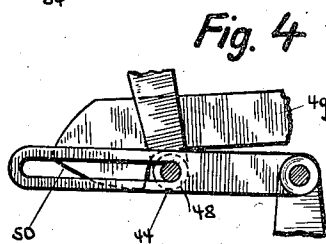
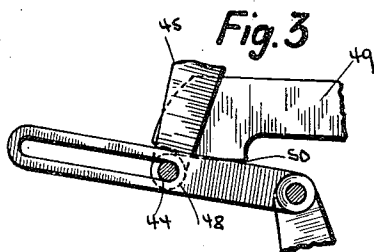
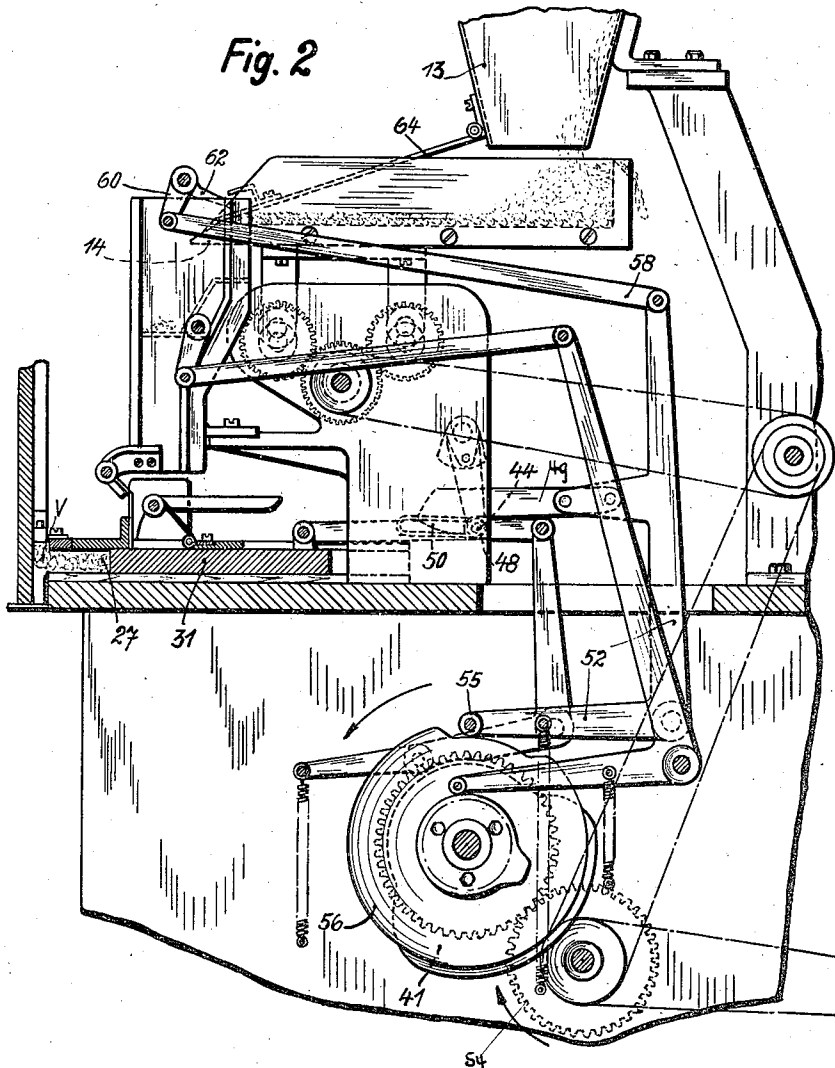
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TOBACCO FEED REGULATING DEVICE

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5 Claims. (Cl. 131—21)

The present invention relates to a tobacco feed regulating device more particularly of the type used for forming loose tobacco into cigar bunches.

An object of the present invention is to control the amount of tobacco being delivered into the filler forming press.

A further object is to provide feeding means with a regulator which follows the vibratory feeding motion thereof.

A further object is to coordinate the feed regulating device with the filler pressing device.

A still further object is to control the feeding of tobacco into the filler pressing device by means of the resistance of the tobacco to the pressing member.

In order to turn out bunches for cigars from loose tobacco it is necessary that these bunches be made uniform as to density and weight. This in turn necessitates a regulation of the feed of the tobacco so that the rate of feed will be carefully adapted to the requirements of the filler forming device. Numerous devices have already had this as their object. The present device relates to machines in which the filler tobacco is fed by means of a shaking chute. In these devices the regulation is particularly difficult because of the vibratory motion imparted to the chute. Any regulating device heretofore known has been unreliable for this type of machine.

In the invention regulation of the feed of tobacco is accomplished by pivoting a flap plate to a stationary part such as the feed hopper and allowing the free end of the plate to rest in the vibratory chute. The hinged arrangement permits the plate to follow the chute through all of its phases of motion and the weight of the plate can be adjusted so that it will rest upon the surface of tobacco with any desired degree of firmness. If desired, this pressure on the tobacco may be increased by the use of springs attached to the plate.

Preferably, the hinged plate does not extend completely across the vibratory chute so that only the bulk of the feed is prevented but there is always a small trickle of filler tobacco passing through the chute. This partial stoppage of the feed prevents feeding in large intermittent quantities.

The filler forming device with which the invention is intended to be operated employs a former which consists of a hollow block with an opening to receive tobacco and a reciprocating plunger which performs the actual compression of the tobacco. The compressed tobacco is cut off at suitable intervals by a reciprocating or other

knife. According to the invention the quantity of tobacco fed into the former is used to control the rate of feeding from the vibratory chute. The coordination is accomplished by using the amplitude of movement of the presser as a measure. The tobacco fed from the vibratory chute falls through the opening in the hollow block and lies before the presser so that the quantity of tobacco delivered determines the extent of movement possible for the presser. Where a great quantity of tobacco has been delivered it is desirable to limit the subsequent rate of delivery until this quantity has been disposed of.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended hereto.

In the drawings, wherein like symbols refer to like or corresponding parts throughout the several views,

Figure 1 is a longitudinal vertical section of the device with parts broken away.

Figure 2 is a similar longitudinal vertical section showing the operating parts in a different position.

Figure 3 is an enlarged fragmentary view of a portion of Figure 1.

Figure 4 is an enlarged fragmentary view of a portion of the device corresponding to that shown in Figure 3 when the operating parts are in the position of Figure 2, and

Figure 5 is a top plan view of the tobacco feeder of Figure 1.

Referring now to Figures 1 and 2, a tobacco supply hopper 13 is mounted with its delivery end over a portion of a vibratory chute or tray 1. The floor of the chute is provided with teeth or ribs 2 which extend transversely of the chute and serve to transmit the vibratory motion of the chute to the tobacco resting thereupon. The chute is vibrated by mounting it upon a bracket 6 which has a pair of arms 7 mounted on crank pins 8. The crank pins are carried by shafts 9 to which spur gears 10 are secured. The spur gears are driven by means of a third gear 11 which is rotated by a belt drive 12 or the like. It will be seen that the crank arrangement causes the chute 1 to move both vertically and horizontally. This motion causes tobacco delivered at the rear of the chute 1 to advance between the side walls 3 and 4 of the chute and to be delivered from the end 14 thereof. The rear wall 5 of the chute is cut down at its upper portion to limit the amount of tobacco retained at that end of the chute. This arrangement of

the back wall 5 permits feeding an excessive quantity of tobacco at all times so that sufficient will be delivered for any contingency.

A guide chute 15 is located below the delivery end 14 of the chute. A shut-off flap 16 is mounted upon an axle 17 for movement across the delivery chute 15 to prevent flow of tobacco. The axle 17 carrying the flap 16 is connected to a lever 18 which in turn is connected through a link 19 with an angle lever 20 pivoted on the machine frame at 21. The free end of the angle lever 20 is provided with a roller 22 which rides upon the face of cam 23 under the traction of a spring 24. The cam 23 is mounted on a shaft 25 suitably journaled in the machine frame.

The tobacco delivery chute 15 terminates above an aperture 26 of the pressing device. This device consists of a hollow block for the channel 27 therein. Traveling in this channel 27 is a pusher 31. Tobacco falling through the aperture 26 when the pusher or presser 31 is withdrawn receives the pressing force of the presser when it is returned to its forward position. The aperture 26 is provided with a gate or cover 28 which is pivoted at 29 and controlled by a connecting rod 30 actuated by a cam or other means (not shown). In the presser at the forward end 32 of the compression chamber a knife 33 is mounted for vertical reciprocation. This knife moves intermittently in the direction of the arrow in Figure 1 to cut off suitable portions of pressed tobacco for cigar fillers. The operation of this cutter is well understood and forms no part of the present invention and it is therefore not shown here in great detail.

The presser 31 is connected by a pivot 34 with a rod 35 which in turn is connected to the angle lever 37 through a pivot 36. The angle lever 37 is pivoted on the machine frame at 38 and carries a roller 40 which rides on the surface of the cam 41 under the traction of a spring 39. The cam 41 is mounted on the same shaft 25 with the cam 23 and it will be appreciated that the cam 41 produces the pressing of the filler by swinging the lever 37 about the pivot 38 and reciprocating the presser 31. The motion of the presser 31 is regulated by the following means: a slotted arm 43 is pivoted to the rod 35 and the lever 37 at the pivot 36. Through the slot 42 of the arm 43 a pin 44 mounted on the end of the lever 45 extends. The lever 45 is pivoted to the machine frame at 46 and has a braking device which may consist of a spring or other frictionally urged pin 47 which rubs against the frame and impedes swinging of the lever 45. The pin 44 has a protection carrying a roller 48 which extends laterally from the arm and projects into the plane of motion of a cam carried upon the arm 49. The arm 49 is itself fastened by means of screws 51 or the like to an angle lever 52 pivoted to the machine frame at 53. The lower arm of the angle lever 52 carries a roller 55 which rides upon the cam 56 under the traction of the spring 54. The upper end of the angle lever 52 connects to a rod 58 by means of the pivot 57 for the purpose of operating the tobacco regulating plate.

The regulator consists of a plate 64 hingedly mounted at 65 upon the tobacco hopper 13. The weight of the plate is such that it rests firmly upon the tobacco when left free. The outer end of the plate 64 is provided with a hook 63 beneath which a finger 62 is adapted to lie. The

finger 62 is mounted upon a shaft 61 which is also secured to a lever 60. The lever 60 is pivoted at 59 to the arm 58 before mentioned. It will thus be seen that a high point on the cam 56 will cause the finger 62 to raise the hook 63 of the plate 64 to permit unimpeded feeding of tobacco from the chute.

As shown in Figure 5 the plate 64 is narrower than the chute 1 so that the plate lies only upon the bulk of the tobacco being fed and does not entirely stop the flow of tobacco.

It will be seen that the cams 23, 41 and 56 are all mounted upon the shaft 25 and are operated together by any suitable drive means.

The operation of the device is as follows: the vibratory chute 1 is, as described, adapted to supply a greater amount of tobacco than can be used in the compression device. In operation, the shaft 25 is rotated in the counter-clockwise direction as shown in the arrow in Figure 1. As this is done the cam 41 rotates and its high portion 66 strikes the roller 40 swinging the lever 37 in a clockwise direction so that the presser 31 is withdrawn in the direction of the arrow in Figure 1. As soon as the front face of the presser has passed the aperture 26 the closure gate 28 is swung out of the way by approximately 90° in the direction of the arrow to open the aperture. This gate 28 is swung in coordination with the presser by any suitable means (not shown).

Immediately after the presser 31 is withdrawn the projecting part of the cam 23 strikes the roller 22 of the lever 20. As a result of this, the closure flap 16 is swung downward to open the feed chute 15. Thereupon the tobacco accumulated upon the flap 16 drops through the aperture 26 into the presser channel 27. The cam 23 continues to rotate and the roller 22 drops from the high portion down to the normal face of the cam lifting the flap 16 to horizontal or closed position. The closure gate 28 for the aperture 26 is then closed and the cam 41 now arrives at the position in which the cut away or low part 67 comes beneath the roller 40. The traction spring 39 then swings the lever 37 in a counter-clockwise direction and returns the presser 31 to its upward position thereby pressing tobacco to the form of the channel 27. Accordingly, as the amount of tobacco in front of the presser 31 is greater or less the presser in its terminal position will lie more or less close to the knife 33. In Figure 1 a small quantity of tobacco lies before the presser 31. In that case, as shown particularly in Figure 3, the pin 44 lies in position to place its roller 48 upon the cam face 50 of the arm 49. As in this position of pin 44 the recess of the cam 56 lies below the roller 55, as shown in Figure 1, the lever 52 cannot swing to drop the roller onto the cam because the arm 49 connected to the lever 52 is supported against counter-clockwise swinging by the roller 48 of the pin 44.

When the parts are in the relation shown in Figure 1 feeding of the tobacco takes place uninterruptedly.

However, on the other hand, as shown in Figure 2, the tobacco supply V in front of the presser 31 becomes too great, then, when the cam disk 56 rotates to the position shown in Figure 1, the roller 55 will be free to fall into the low portion thereof. The result is that the feeding of tobacco from the chute 1 is substantially stopped. The presser 31 cannot advance far enough into the channel 27 to clear the end of the cam face 50 on the arm 49 and therefore the roller 48 lies in

the angle between the cam face 50 and the arm 49. In this phase of operation it will be seen that the arm 52 is free to swing in a counter-clockwise direction by an amount sufficient to enable the spring 54 to drop the finger 62 which is the only thing holding the valve flap 64 from the tobacco in the chute 1. When the finger 62 is depressed the flap 64 drops by its own weight and prevents feeding of the greater portion of the tobacco.

After a suitable dwell in the cam 56 a high portion again presents itself and the arm 52 is swung in a counter-clockwise direction, the flap 64 is raised and feeding is re-commenced. In this way feeding of tobacco to the filler pressing device is kept constant. If the feeding is normal as shown in Figure 1 the flap plate 64 is retained open. However, if on the other hand, an overabundance of tobacco drops through the aperture 26 when the flap 16 is opened, then the feeding of tobacco will be greatly cut down by permitting the plate 64 to close.

From the foregoing description of an embodiment of the invention, it appears that the improvements consist in providing the shaking chute of a cigar machine with a shut off member which is associated with the delivery end of the shaking chute, and which in its operative position follows the movements of the shaking chute; the shut off member extending only over a portion of the width of the channel of the shaking chute. In the embodiment, the shut off member consists of a plate which is hinged above the shaking chute, and which in the position for impeding the tobacco feed, places itself sloping obliquely downward in the direction of the tobacco flow, with its free end upon the delivery end of the shaking chute in consequence of its own weight, and if necessary with the employment of additional loading by a weight or spring. Also, the tobacco passes through an aperture of the channel wall into a compression channel in which the tobacco, by means of a yielding forwardly-moved pusher or the like, is conveyed to a cut off contrivance associated with the end of the channel and the pusher by means of feelers or the like, and controls the tobacco feed in such a way that in case a certain quantity of tobacco supply in the channel is exceeded, the excess feeding of tobacco is impeded, this being arrived at by a cam controlled feeler member 50 which coacts with a projection 48 or the like, attached to the reciprocating pusher 31 or its rod system, 35, 43, 45, and at the same time is connected, by means of a rod system, 58—62, with the shut off member 64 associated with the shaking chute 1 in such a way that in case the tobacco supply is exceeded, the feeler rod system is shifted into a position in which the shut off means 64 can pass into the operating position.

Finally, a structure has been described in which the inflow aperture of the compression channel is closed by a closure piece during the compression stroke, characterized by the fact that in the tobacco feed shaft 15, terminating in the compression channel aperture 26, a flap 16 is built in, said flap 16 opening after the opening of closure 28 and closing before the closure 28 has been closed.

It is obvious that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes

and modifications being restricted only by the scope of the following claims.

What is claimed is:

1. A device of the character described comprising means for feeding tobacco, plate means for controlling the delivery of tobacco from said means, cam actuated means for opening and closing said plate means, a filler forming device comprising a forming channel and a reciprocable presser, said forming channel having an opening therein communicating with said tobacco feed, and means coordinating said cam actuated means with said presser whereby to permit said plate to close when an excessive quantity of tobacco accumulates in said filler channel and to retain said plate open when a smaller quantity of tobacco is present in said channel.

2. A device of the character described comprising a vibratory tobacco feeding chute, a flap plate disposed to limit the feeding of tobacco from said chute, cam operated means for controlling the opening and closing of said plate, filler forming means comprising a forming channel with an opening communicating with said tobacco feed and a presser for compressing tobacco in said channel, means including a cam for actuating said presser, an arm secured to the operating means for said plate, said arm extending into the zone of operation of said means for actuating said presser, and a stop on said means for actuating said presser whereby to limit the movement of said plate operating means to prevent closing of said plate when a normal quantity of tobacco is present in said filler forming channel and to permit closing of said plate when a greater quantity of tobacco is present in said channel.

3. A device of the character described comprising a vibratory tobacco feeding chute, a flap plate pivotally mounted in said chute, cam operated means for controlling the movement of said plate, filler forming means communicating with said tobacco feeding chute and including a presser for compressing tobacco, means for actuating said presser, an arm secured to said cam operated means for said plate, said arm extending into the zone of operation of said means for actuating said presser, and a stop on said means for actuating said presser whereby to limit the movement of said cam operated means to prevent closing of said plate when a normal quantity of tobacco is present in said filler forming means and to permit closing of said plate when a greater quantity of tobacco is present in said container.

4. A device of the character described comprising means for feeding tobacco, pivoted means for controlling the delivery of tobacco from said means, cam means for actuating said pivoted means, a filler forming device comprising a forming channel and a reciprocable presser, said channel communicating with said tobacco feed, and second cam means coordinating with said first mentioned cam means and said presser whereby to permit said pivoted means to close when an excessive quantity of tobacco accumulates in said filler channel and to retain said pivoted means open when a normal quantity of tobacco is present in said channel.

5. In a machine of the class described including a filler forming channel and a presser adapted to reciprocate in said channel; means for feeding tobacco to said channel, comprising a vibratory tobacco feeding chute, pivoted plate means in said chute for controlling the delivery of tobacco therefrom, mechanism for moving

said plate means to opened and closed positions to respectively increase and decrease the amount of tobacco delivered from said chute, and means cooperating with said presser for selectively actuating said mechanism according to the amount of tobacco present in said filler forming channel, whereby said plate means is opened when a

normal quantity of tobacco is present in said channel, and said plate means is closed when an excessive quantity of tobacco accumulates in said channel.

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