

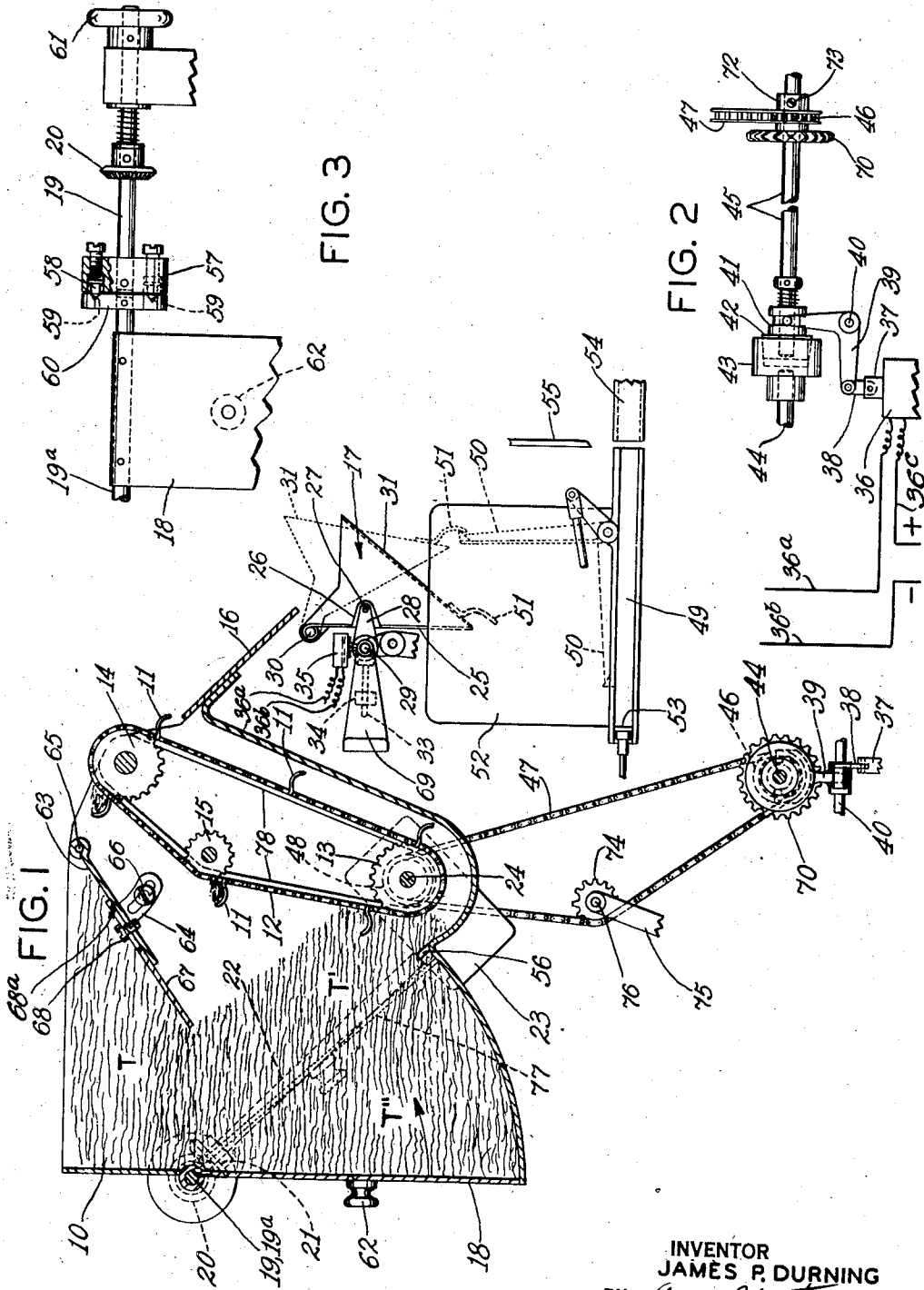
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J. P. DURNING

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HOPPER CONSTRUCTION

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INVENTOR
JAMES P. DURNING
BY *George S. Hastings*
ATTORNEY

UNITED STATES PATENT OFFICE

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HOPPER CONSTRUCTION

James P. Durning, St. Albans, N. Y., assignor to
International Cigar Machinery Company, a corporation of New Jersey

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This invention relates to cigar machinery, and more particularly to improvements in the feeding of scrap tobacco.

It is an object of the present invention to provide a relatively simple and inexpensive feed which will diminish the rubbing and churning of the tobacco as portions of the same are removed from a hopper, and will provide also for the removal of the entire amount of tobacco in the hopper.

Another object is to provide a scrap tobacco feed which will not only avoid disintegrating the tobacco but will also avoid separating the large pieces of tobacco from the small, or the collection of small scrap in the bottom of the hopper.

A further object is to provide a feed which will handle a large quantity of tobacco and will continuously deliver tobacco to the extracting means in such a way as to avoid tearing the filler tobacco when portions of it are extracted.

A further object is to provide an improved feed which will allow a large quantity of tobacco to be inserted into a hopper and permit only a small portion thereof to come into contact with extracting members so that the tobacco will not be torn by the extracting members and will also avoid the tendency to form bridges.

A further object is to provide an improved scrap bunch feed which will produce a more uniform cigar filler by preventing the separation of the large from the small pieces of tobacco.

It is an object of the invention to provide a short filler or scrap tobacco feeding mechanism which will feed scrap tobacco with a minimum of tearing and breakage and wherein there is provided control apparatus operative in response to accumulations of predetermined weights of such tobacco fed to a scale pan to control the operation of the feeding mechanism.

Other objects and features of the invention will appear as the description of the particular physical embodiment selected to illustrate the invention progresses.

In the accompanying drawing, which forms a part of this specification, like characters of reference have been applied to corresponding parts throughout the several views which make up the drawing, in which:

Fig. 1 is a sectional side elevation of a portion of the machine;

Fig. 2 is a detail view of the intermittent driving means; and

Fig. 3 is a detail view of the hopper wall actuating means.

Referring to the drawing, the tobacco T, T', T'' is placed in a hopper 10 and is picked up by means of a series of buckets 11 connected to spaced opposed sprocket chains, one of which chains 12 can be seen in Fig. 1, driven by a sprocket 13 and running over sprockets 14 and 15. The scrap tobacco from the buckets 11 is deposited on a chute 16 whence it slides into a scale pan 17 of the type disclosed in my application Serial No. 193,244, filed March 1, 1938, now Patent No. 2,306,381, granted December 29, 1942. Suitable means such as the retaining plates 78 are provided between the spaced opposed sprocket chains for keeping the tobacco filler away from the revolving sprocket mechanism, thereby avoiding undesirable tearing of the filler before it is removed from the hopper. Since the opposed sprocket chains are located close to the outside walls of the hopper, no tobacco can get past said chains and additional retaining plates at this part of the hopper are not necessary.

The hopper 10 is equipped with an end wall 18 fastened to a shaft 19, the latter carrying a bevel gear 20 in mesh with a bevel gear 21 mounted on a shaft 22 extending from a casing enclosing a variable speed drive 23 which is driven from a shaft 24. Any suitable variable speed drive may be employed and for an example of one type of variable speed drive, reference may be had to U. S. Patent No. 1,287,707. In this manner the wall 18 is slowly moved forward and delivers the tobacco within the range of the buckets 11. The variable speed drive permits the rate of speed at which wall 18 is moved forward to be regulated as desired.

An adjustable plate 63 movably secured at one end to hopper 10 by means of a shaft 65 is provided for holding back surplus tobacco T. A slotted slidable bracket 64 connected to the plate 63 and secured to hopper 10 by means of a clamp screw 66 is provided to permit plate 63 to be lowered or raised.

A second plate 67 is slidably mounted on plate 63 and secured there to by means of clamp screws 68, which pass through suitable slotted openings 68a formed in plate 67, for regulating the amount of tobacco passing downward past plate 63.

Plates 63 and 67 are so adjusted that the quantity of tobacco delivered to chain 12 only contacts the bottom portion thereof so that no more than one or two buckets 11 of chain 12 are in

the tobacco at any one time, in order to eliminate grinding of the tobacco.

A scale pan 17 is provided beneath the chute 16 for weighing and delivering tobacco to a magazine 49. A lever balance having two arms 33 and 28 is fixedly mounted on scale shaft 29. The scale pan 17 consists of a vertical plate 25 having lugs 26 formed on each side thereof, and a scale receptacle 31 which is pivotally mounted at its upper end to the upper portion of wall plate 25 by means of studs 30. Said scale pan is pivotally mounted on arm 28 by means of studs 27 which are carried by lugs 26. The other arm 33 supports an adjustably mounted weight 34 which counterbalances the weight of the loaded scale pan 17. The shaft 29 fixedly connected to the middle portion of the lever balance is pivotally mounted on a stationary bracket 69.

When the desired amount of tobacco collects in the scale pan, the latter trips and in so doing causes a Mercoid switch 35, also fixedly connected to shaft 29, to tilt in the direction of the scale pan 17, thereby completing an electric circuit leading to a solenoid 36, thus stopping the driving means imparted to shaft 24 in a manner to be presently described.

The wire 36b is connected at one end to a suitable source of electric current and at the other end to one of the contacts of a normally open mercury switch 35. Wire 36a is connected to the other contact of switch 35 at one end and to the solenoid 36 at the other end. Wire 36c connects a second contact of the solenoid 36 to the positive side of said suitable source of electric current. In this way, when the switch 35 is closed, electric current may be said to travel from the plus side of the source of current through wire 36c, through solenoid 36 (thereby energizing the same), through wire 36a, through closed mercury switch 35, through wire 36b, back to the minus side of the source of current.

The solenoid 36 is energized and de-energized through the circuit opened and closed by the Mercoid switch 35, thereby causing an armature 37 to enter or move away from said solenoid. Armature 37 supports one end of a link 38 connecting to a bell crank lever 39 pivoted on a shaft 40, the vertical arm of lever 39 being shaped to form a yoke engaging a collar 41 forming a part of a male clutch member 42 working in conjunction with a female clutch member 43. Clutch member 43 is attached to a continuous running shaft 44 of the machine and by means of the clutch drives a shaft 45.

Slidably connected to shaft 45 are two different size sprocket wheels 46 and 70 having a hub 72. The hub 72 is fixedly connected to shaft 45 by means of a set screw 73.

A free sprocket wheel 74 secured to the end of an adjustable bracket 75 by means of a stud 76 is provided for taking up excess slack in the sprocket chain 47.

By loosening bracket 75 and hub 72, the chain 47 can be inserted upon the larger sprocket wheel 70 which will increase the rate of speed of chain 47. The bracket 75 and the hub 72 when properly adjusted will of course be reset by means of clamp screws securing these members in position. The sprocket chain 47, which is driven by sprocket 46, drives the sprocket 48. Sprocket 48 is fixed to shaft 24 and is fixedly connected to the sprocket wheel 13 so as to impart feeding movement to chain 12 and driving motion to shaft 24.

The operation of the machine may be briefly described as follows:

Tobacco T is put into the top of hopper 10 by the operator. A sufficient amount of said tobacco (T', T'') is allowed to pass by plates 67 and 63 into the lower portion of the hopper so as to come into contact with the lower portion of revolving chain 12 carrying buckets 11. The excess tobacco is held back by plates 67 and 63 so that there will be no rubbing or grinding action upon the remaining tobacco by the feed chain which would disintegrate the tobacco.

A small amount of said tobacco is picked up by each bucket 11 and deposited upon the chute 16 which drops it into the scale pan 17. When an amount of tobacco in excess of the weight of member 34 has accumulated in the scale pan 17, it causes the balance lever (33, 28) to pivot on shaft 29 and tilt in the direction of scale pan 17. This balance lever (33, 28) causes the Mercoid switch 35 also to tilt in the same direction which closes the circuit operating the solenoid coil. The energizing of the solenoid coil causes the armature 37 to ascend and operate the bell crank lever 39 so as to disengage the clutch 42, 43 by compressing the clutch spring which holds the clutch in engagement. This in turn stops the motion of shaft 45 and consequently stops the bucket conveyor 12 and the movement of wall 18.

The tobacco contained in scale pan 17 is then delivered to a magazine 49 by means of a gate 50 which, in swinging from its closed position to its open position (as shown in dotted lines) engages a prong 51 of the scale receptacle 31, causing the same to swing away from plate 25, permitting the tobacco to be emptied into said magazine via a guide chute 52 of the usual construction. The tobacco charge in magazine 49 is acted upon by a reciprocating plunger 53 which presses the charge and advances the same into a transfer 54. The charge is separated by means of a knife 55 from the remaining tobacco column in the magazine, and the cut charge is then delivered to the rolling apron (not shown) of the machine.

The plunger 53 and gate 50 is operated in the same manner as disclosed in my application previously mentioned, and therefore a description of the same is deemed unnecessary.

As the tobacco supply diminishes, the upper part of the supply T is gradually removed from the upper chamber or primary hopper, and the remainder slides down along the wall 18 (indicated by dotted lines 71) into the secondary hopper.

The variable speed drive 23 is adjusted to advance wall 18 slowly so that by the time it reaches the stops 56 which limit the extent of its forward movement, the tobacco chamber is almost empty. While the tobacco supply in the hopper is being removed by the buckets, the wall 18 slowly advances so that by the time the tobacco supply has been almost used up, the wall 18 will have been advanced to the position 71 indicated by dotted lines. This slow movement of wall 18 assures the delivery of a constant supply of tobacco to the lower portion of the bucket carrying chain 12.

When the hopper is almost empty, the remaining tobacco will be found resting against the wall 18 in its advanced position more or less similar to that occupied by T'. In this manner the small amount of tobacco remaining in the hopper 75 would be held in the scope of operation of the

conveyor buckets 12 by the wall 18. When the hopper is full, tobacco will be found at T, T' and T''.

It will be noted that although a constant supply of tobacco is being fed to the conveyor chain 12, at no time is there more than a very small portion of the conveyor chain 12 in contact with the tobacco. There will therefore be no rubbing or grinding on the tobacco which would cause the same to disintegrate.

Shaft 19 (Fig. 3) is provided with a slip connection consisting of a disk 57 carrying spring tensioned plungers 58 adapted normally to engage depressions 59 provided in a disk 60 carried by the continued portion 19a of shaft 19. With the wall 18 in position against members 56, its shaft 19a will remain stationary while shaft 19 continues to rotate.

When the hopper is empty, wall 18 is returned to its starting position by pulling a knob 61 attached to the end of shaft 19, thereby disengaging the gearing 20—21 and also the members 57 and 60. The wall 18 fixed to shaft 19a can then be returned to its starting position by pulling knob 62 which is fixed to said wall. The knob 61 is then released so that the gearing 20—21 and the members 57—60 can be re-engaged. The hopper is then ready to receive an additional batch of tobacco, which tobacco will be fed in the same manner as described above.

The invention above described may be varied in construction within the scope of the claims, for the particular device selected to illustrate the invention is but one of many possible concrete embodiments of the same. It is not, therefore, to be restricted to the precise details of the structure shown and described.

What is claimed is:

1. A scrap tobacco feed comprising a hopper, means projecting partly into said hopper for removing tobacco therefrom, driving mechanism for said tobacco removing means, a tobacco flow adjusting plate secured within said hopper for governing the amount of tobacco passing from the upper portion to the lower portion of the hopper, a plate pivoted at its upper end to the rear part of the hopper, and means connected with said mechanism for slowly swinging said last named plate in the direction of the tobacco removing means during the operation of said removing means to guide the remaining part of the tobacco in said hopper into contact with a comparatively short operating portion of the tobacco removing means.

2. A scrap tobacco feed comprising a hopper, means for removing tobacco from said hopper, a tobacco flow adjusting plate mounted in said hopper for governing the amount of tobacco fed from the upper portion to the lower portion of the hopper, a tobacco pusher plate hinged to the rear of said hopper for guiding tobacco to a limited portion of the tobacco removing means, positively actuated interconnected mechanism for driving said tobacco removing means and for swinging said hinged pusher plate gradually toward said means to lift said tobacco of said supply and deliver the same into the range of operation of said moving means, and means operative in response to the quantity of tobacco removed from said hopper for controlling the movement of said plate.

3. A scrap tobacco feed comprising a hopper, means for measuring a portion of tobacco, means for removing tobacco from said hopper and depositing the same in said measuring means, a

tobacco pusher plate hinged to the rear of said hopper for guiding tobacco toward said removing means, and separate means actuated by said measuring means for stopping and starting the operation of said pusher plate and said tobacco removing means.

4. A scrap tobacco feed comprising a hopper, a device for measuring a portion of tobacco, means for removing tobacco from said hopper and depositing the same in said measuring device, a tobacco pusher plate hinged to the rear of said hopper for guiding tobacco toward a limited portion of said removing means, a tobacco flow adjusting plate mounted in said hopper for governing the amount of tobacco passing onto said pusher guide plate, and separate means actuated by said measuring device for stopping and starting the operation of said pusher guide plate and said tobacco removing means.

5. In a cigar machine, a tobacco feed comprising a hopper, a pusher plate connected to said hopper, mechanism for removing tobacco from said hopper, a device associated with said mechanism for accumulating portions of tobacco removed from said hopper by said mechanism, means for operating said pusher plate and said mechanism so as to deposit tobacco into said device, and separate means actuated by said device for stopping the operation of said pusher plate and said mechanism when said device is full and starting the operation thereof when said device is empty.

6. A short filler feed for use in a cigar machine comprising a hopper for holding a large supply of tobacco, an elongated member traveling in an endless path whose lower portion comes into contact with the tobacco supply, driving means for said member, elements mounted on said member for removing portions of tobacco from said hopper, means mounted in said hopper for holding the upper portion of the tobacco supply away from said elongated member, movable means connected to said hopper for guiding tobacco toward the lower portion of said elongated member, mechanism for driving said member, and means driven by said mechanism for gradually advancing the movable means in the direction of the elongated member as the tobacco supply in the hopper diminishes, and means interconnected with said driving mechanism for changing the rate of advance of said movable means.

7. In a scrap bunch feed, a hopper having an adjustable inclined plate for regulating the amount of tobacco sliding from the upper to the lower portion of the hopper, a member traveling in an endless path projecting into said hopper having elements mounted thereon for removing tobacco from said hopper and depositing the same into a measuring device, a hinged inclined member secured to the rear wall of the hopper and located below said regulating plate for receiving tobacco from the upper portion of the hopper and allowing the same to slide into contact with a limited portion of said traveling member, and automatic means for gradually swinging said hinged member in an arcuate path toward said traveling member as the supply is being depleted so as to deliver the entire contents of the hopper to the traveling member.

8. A short filler feed for a cigar machine comprising: an auxiliary hopper, having a substantially vertical back wall and an inclined front wall spaced from said back wall, for holding surplus tobacco placed in said auxiliary hopper; a primary hopper, having a movable back wall, po-

sitioned below said auxiliary hopper for receiving a predetermined quantity of tobacco from said auxiliary hopper; tobacco extracting means associated with said primary hopper; a pivotal mounting for supporting the upper portion of the movable back wall of the primary hopper; and means for actuating said movable back plate to bring it slowly forward as the supply of tobacco in said primary hopper becomes exhausted to permit the same to slide into contact with said tobacco extracting means.

9. A short filler tobacco feed comprising a hopper having an upper tobacco supporting portion and a lower tobacco feeding portion, an elevating device movable in an endless path within said lower feeding portion and without said upper supporting portion, mechanism for driving said device, members in said device for removing short

5 filler tobacco from said lower feeding portion while maintaining said tobacco fed substantially free from tearing and breakage, a retaining wall forming a part of said upper portion for holding surplus in said upper supporting portion away from said elevating device, a pusher plate forming one wall of said lower feeding portion, means mounting said plate at the rear of said lower feeding portion for pivotal movement upwardly 10 towards said device, said plate being constructed and arranged to support the major portion of tobacco in said lower portion as the quantity therein diminishes, and means coacting with said mechanism for moving said plate slowly upward to forward tobacco supported thereby to said device 15 concurrently with the movement of said device.

JAMES P. DURNING.