

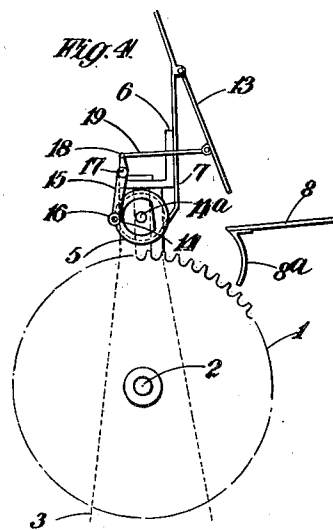
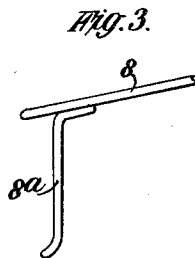
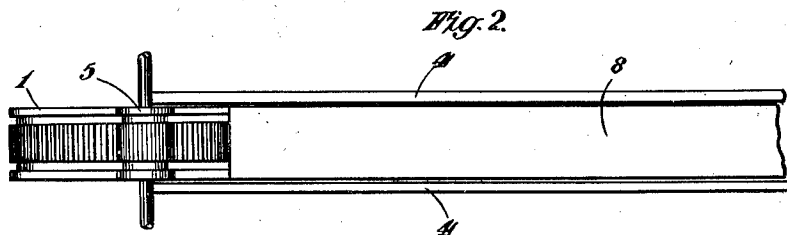
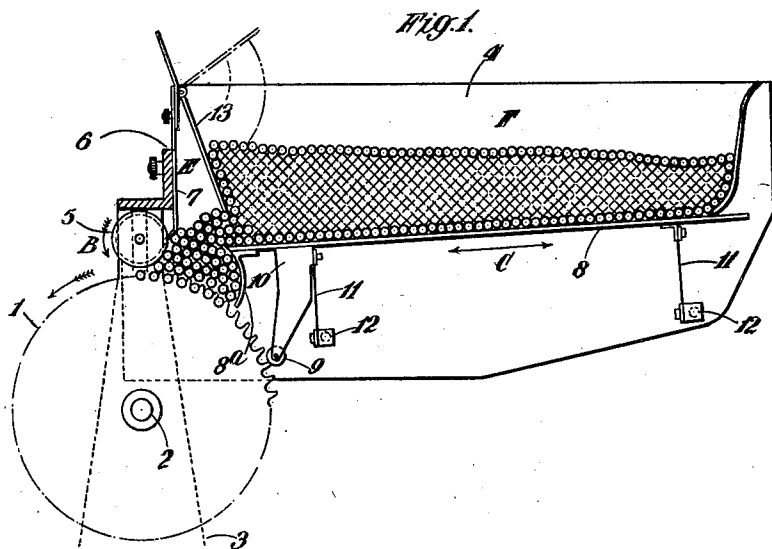
June 10, 1924.

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1,497,576

APPARATUS FOR FEEDING CIGARETTES AND OTHER SMALL ARTICLES

Filed Aug. 20, 1923



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR FEEDING CIGARETTES AND OTHER SMALL ARTICLES.

Application filed August 20, 1923. Serial No. 658,471.

To all whom it may concern:

Be it known that I, WALTER EVERETT MOLINS, a citizen of the United States of America, residing in London, England, have invented certain new and useful Improvements in Apparatus for Feeding Cigarettes and Other Small Articles, of which the following is a specification.

This invention relates to improvements in apparatus for feeding cigarettes or like articles from a hopper in which a fluted drum or the like is employed.

In apparatus of this class more particularly designed for feeding cigarettes, it is usual to employ a fluted drum for removing the cigarettes from the hopper and also to provide a retarding roller at the discharge opening of the hopper to prevent the cigarettes which are not being carried in the drum flutes from passing through the exit. This roller rotates in an opposite direction to the drum, so that the loose cigarettes are brushed or rolled clear of the exit through which the cigarettes actually in the drum flutes pass.

The object of the present invention is to reduce the weight and pressure of the cigarettes against the drum flutes, both for the purpose of avoiding damage to the cigarettes and also to allow greater freedom to enable the cigarettes to drop more readily into the flutes.

According to the present invention, the bottom of the cigarette hopper is elevated so that the main portion is preferably above the height of the top of the fluted drum, and the end of the bottom of the hopper nearest to the drum is bent down almost vertically to the drum and made slightly concave in relation to the drum. A small chamber is thus formed having the fluted drum for its bottom wall, the retarding roller for its front wall, and the bend of the bottom of the hopper just referred to for its back wall, the top of the chamber being open.

The front wall of the main cigarette hopper is arranged substantially vertical and tangent to the face of the retarding roller which is exposed to the cigarettes and the said retarding roller may have two or more peripheral channels into which protrude forks attached to the front wall of the hopper in order to clear any cigarettes at the

point where the retarding roller rotates against the said wall.

The main chamber of the cigarette hopper is separated from the small chamber just referred to by a wall of metal or other suitable material, the lower end of such wall terminating at a point substantially in a vertical line from and above the vertical bend in the bottom of the hopper, leaving an opening through which the cigarettes from the main hopper are admitted to the smaller chamber.

It will be understood that the opening between the main chamber and the smaller chamber substantially faces the front wall of the hopper previously described and the retarding roller, so that the weight of cigarettes in the main hopper bears on the bottom of the said hopper and the only vertical weight bearing on the cigarettes in the smaller chamber is the weight of the cigarettes admitted to this smaller chamber through the opening just referred to.

The level of the cigarettes in the small chamber controls the admission of cigarettes from the main chamber and the separating wall between the main and small chambers may be made adjustable, both as to height and incline, so as to increase or decrease the opening. Means may also be provided for reciprocating the separating wall and if desired a vibratory action may be imparted to the bottom of the hopper.

To enable the invention to be fully understood it will now be described by reference to the accompanying drawings in which a hopper constructed according to the invention is illustrated together with means for vibrating the bottom thereof according to the specification mentioned above.

In the drawings:—

Fig. 1 is a sectional elevation of the hopper.

Fig. 2 is a plan view thereof with certain parts removed.

Fig. 3 is a view of a detail.

Fig. 4 is a view shewing a method of reciprocating the separating wall.

As shewn, the apparatus comprises a fluted wheel or drum 1 mounted on a shaft 2 rotating in bearings in a pair of frames 3, only one of which is shewn.

The sides 4 of the hopper embrace the drum 1 leaving only a working clearance be-

tween the surfaces. Above the drum 1 and mounted in a similar manner but in adjustable bearings is a retarding roller 5, which rotates in the direction of the arrow B and is formed with small grooves or knurling on its surface. At the top of frame 3 an angle piece 6 is mounted carrying a depending plate 7. The lower end of the plate 7 is bent towards the roller 6 and has small prongs formed thereon which enter the grooves on the roller 5. The plate 7 is adjustable vertically.

The bottom of the hopper is formed by a plate 8 which is inclined and above the level of the top of the drum, said plate being supported on springs 11 screwed to pillars 12 and provided at its forward end with a bracket 10 carrying a roller 9 of fibre or the like. The roller 9 is so placed that the tips of the flutes in drum 1 come into contact with it when the drum rotates and cause the plate 8 to be rapidly vibrated as indicated by arrows C as fully described in the aforesaid specification. The end of the plate 8 nearest to the drum may be bent down to form a slightly concave wall, substantially vertical, or as shown in Figs. 1 and 3 a separate shaped portion 8^a may be attached thereto.

On the plate 7 is hinged a flap 13, the hinge being adjustable for height and when this flap is in the position shewn in full lines, it forms a dividing partition or wall between the two chambers E, F, of the hopper.

It will be seen that only a small number of cigarettes are subject to movement, the bulk being comparatively still in the main chamber F. This in no way interferes with the capacity of the hopper as the cigarettes readily pass through the gap between the chambers while the secondary chamber E is being emptied by the drum.

The cigarettes in the chamber E are able to move about easily as there is little weight on them and since they drop almost vertically on to the drum they enter the flutes with more certainty than in the usual apparatus in which they approach the drum from the side. This arrangement permits of a smaller portion of the drum being in contact with the cigarettes and consequently saves the latter from too much movement.

The plate 13 may be swung up as shewn for access to the drum for filling the hopper at the commencement of a run and it can be adjusted vertically and also about its hinge to alter the opening between the chambers F and E.

Under certain conditions it is desirable to move the plate 13 backwards and forwards to assist the flow of the cigarettes through the opening.

This may be accomplished by the arrangement illustrated in Fig. 4 wherein a cam 14

on the shaft 14^a of roller 5 operates a link 19 attached to the plate 13, through roller 16, and levers 15, 18, carried on a shaft 17 mounted in bearings on the angle piece 6 as will be readily understood.

The partitions of any number of hoppers may be operated from a single cam.

With the above described apparatus since the smaller chamber E only is in direct communication with the drum 1, a smaller number of cigarettes than usual are subjected to violent motion. Also the vertical feed to the hopper causes the cigarettes to fall more rapidly and readily into the flutes of the drum, so that with a small chamber E no loss of speed in the working of the machine is occasioned.

It will be understood that various modifications within the spirit of the invention may be made.

Further, it will be obvious that the invention may be applied to hoppers of the type in which, instead of a fluted drum, or wheel, a continuous band conveyor carrying fluted sections or blocks is employed.

Having thus described the nature of my said invention and the best means I know of carrying the same into practical effect, I claim:—

1. In apparatus for feeding cigarettes and like articles in combination, a hopper having a discharge opening, a partition dividing the hopper into two compartments of unequal size communicating through an opening, a rotary fluted drum mounted substantially vertically below the discharge opening of the smaller compartment, a hopper bottom raised above the level of the fluted drum and means for vibrating the hopper bottom in a direction parallel to the layers of articles thereon.

2. In apparatus for feeding cigarettes and like articles in combination, a hopper having a discharge opening, a partition dividing the hopper into two compartments of unequal size communicating through an opening, a rotary fluted drum mounted substantially vertically below the discharge opening of the smaller compartment, a hopper bottom raised above the level of the fluted drum, a depending end on said bottom adjacent to the drum, and means for vibrating the hopper bottom in a direction parallel to the layers of articles thereon.

3. In apparatus for feeding cigarettes and like articles in combination, a hopper having a discharge opening, a partition dividing the hopper into two compartments of unequal size communicating through an opening, a rotary fluted drum mounted substantially vertically below the discharge opening of the smaller compartment, a hopper bottom raised above the level of the fluted drum, a depending end on said bottom adjacent to the drum, means for vibrating

the hopper bottom in a direction parallel to the layers of articles thereon and means for vibrating the partition to assist the flow of the articles to the smaller compartment.

4. In apparatus for feeding cigarettes and like articles in combination, a hopper having a discharge opening, a partition dividing the hopper into two compartments of unequal size communicating through an opening, a rotary fluted drum mounted substantially vertically below the discharge opening of the smaller compartment, an inclined hopper bottom mounted on springs and raised above the level of the fluted drum, a depending end on said bottom, an arm on said bottom, and a roller mounted on said arm adapted to engage the fluted drum.

5. In apparatus for feeding cigarettes and like articles in combination, a hopper having a discharge opening, a partition dividing the hopper into two compartments of unequal size communicating through an opening, a rotary fluted drum mounted substantially vertically below the discharge opening of the smaller compartment, an inclined hopper bottom mounted on springs and raised above the level of the fluted drum, a depending end on said bottom, an arm on said bottom, a roller mounted on said arm adapted to engage the fluted drum and means for vibrating the partition.

6. In apparatus for feeding cigarettes and like articles in combination, a hopper having a discharge opening, a pivoted partition dividing the hopper into two compartments of unequal size communicating

through an opening, a rotary fluted drum mounted substantially vertically below the discharge opening of the smaller compartment, an inclined hopper bottom mounted on springs and raised above the level of the fluted drum, a depending end on said bottom, an arm on said bottom, a roller mounted on said arm adapted to engage the fluted drum, a retarding roller mounted above the fluted drum and in the discharge opening of the smaller compartment, a cam on the retarding roller and link connections between the pivoted partition and a roller engaging said cam for vibrating said partition.

7. In apparatus for feeding cigarettes and like articles in combination, a hopper divided by a partition into two communicating compartments of unequal size, a fluted drum mounted vertically beneath the discharge opening of the smaller compartment, an inclined hopper bottom above the level of the fluted drum, a depending end on said bottom bent concave adjacent to the drum, a retarding roller in the discharge opening above the drum, the arrangement being such that a small chamber is formed having the fluted drum for its bottom wall, the retarding roller for its front wall and the depending end of the hopper bottom for its back wall, the top of the chamber being open and in restricted communication with the larger compartment of the hopper so that only a small portion of the articles are subjected to the motion of the drum at one time.

In testimony whereof I have signed my name to this specification.

WALTER EVERETT MOLINS.