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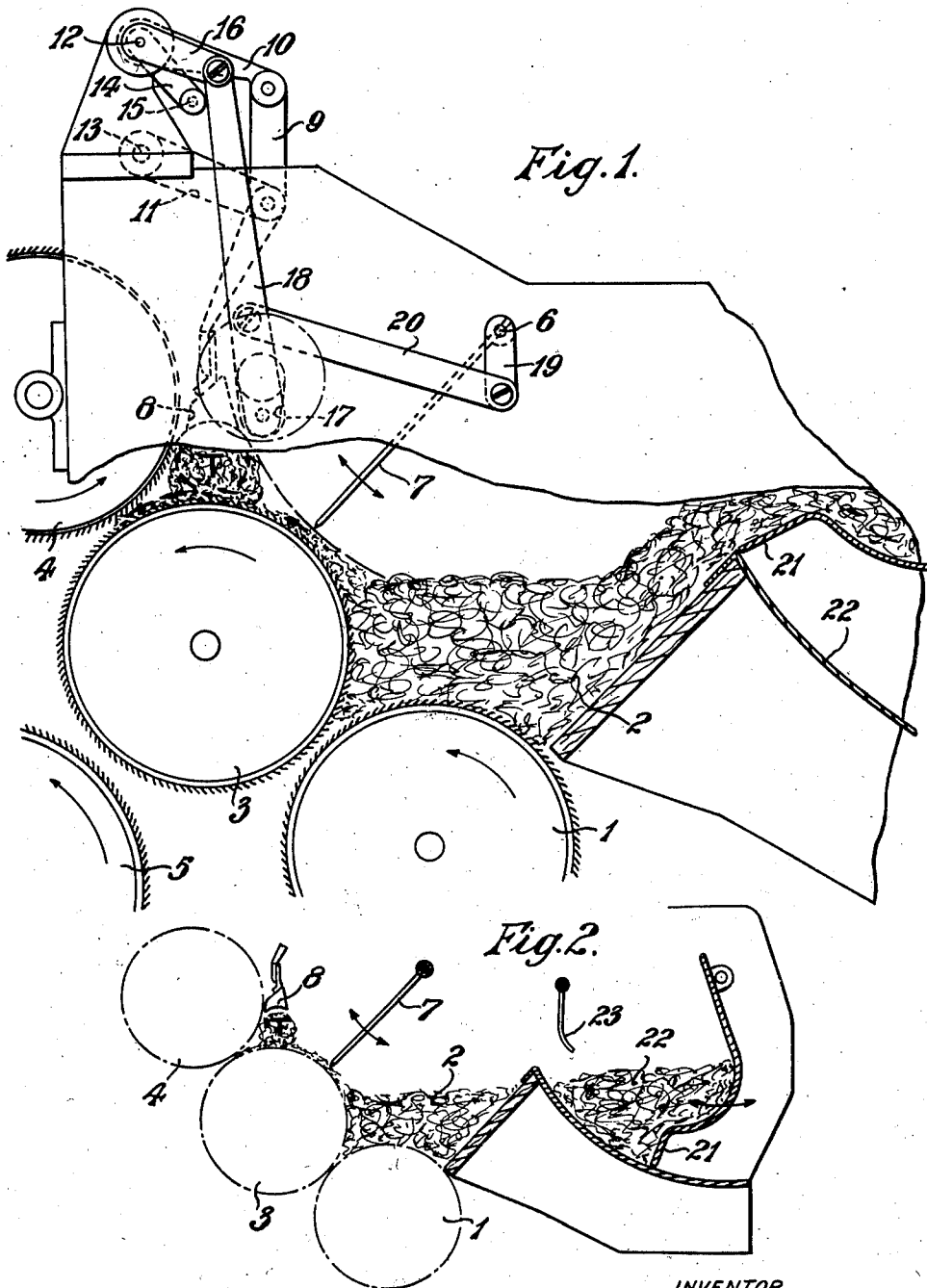
F. F. RUAU

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CIGARETTE MAKING MACHINE

Filed Aug. 29, 1932

2 Sheets-Sheet 1



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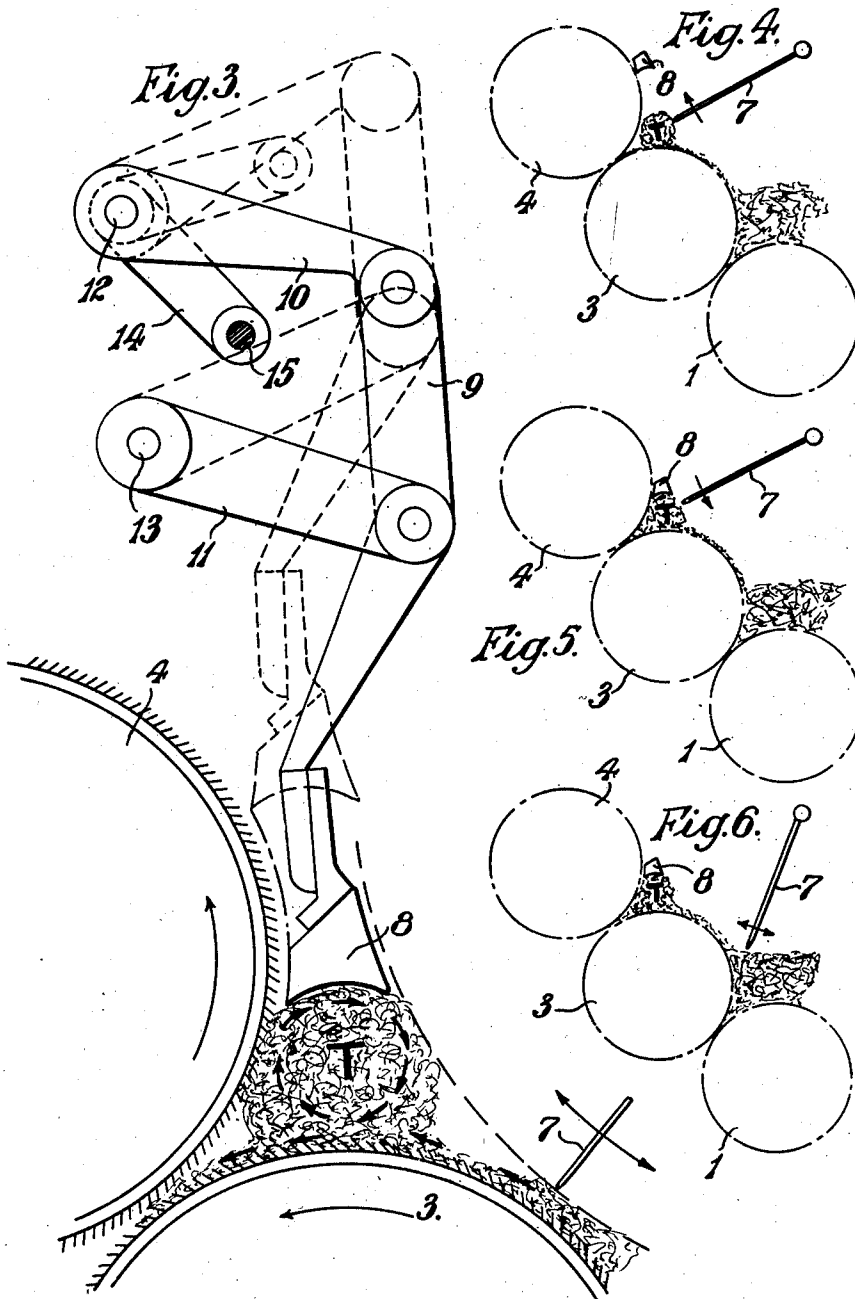
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## UNITED STATES PATENT OFFICE

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## CIGARETTE MAKING MACHINE

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13 Claims. (Cl. 131—39)

This invention relates to cigarette making machines, and refers more particularly to the tobacco feeding apparatus of such machines, and has for its object to overcome the apparently inexplicable variations occurring in the filling of the carded feed rollers of such apparatuses as are at present in use.

Many attempts have been made to overcome these irregularities, but at present none are very successful. It has, for instance, been proposed to exert pressure upon the tobacco at the point where the main carded drum carries the tobacco beneath a finer carded drum which operates above the main carded drum to brush back any surplus tobacco. In one instance, a number of resilient bands are used to effect this pressure, such bands being disposed so as to accommodate themselves to varying volumes of tobacco which may be contained between the two carded drums aforementioned.

In other cases various tamping devices have been used, but here also it has been endeavoured to make the tampers in a form such that they will accommodate themselves to varying volumes of tobacco at the point mentioned above.

Further, in some cases it has been endeavoured to correct any errors in the said pressure by providing a second brushing drum holding a reserve of tobacco over the "spread" of the carrying carded drum, the second drum serving to remove excesses and supplement deficiencies occurring in the filling of the carding of the main drum. Such an arrangement is illustrated in specification No. 313,633.

According to the present invention, a method of feeding tobacco to the cigarette making machine in a continuous shower of substantially uniform density is provided, wherein a roll of tobacco is formed and maintained in the junction between the combing and brushing rollers of the tobacco feeding apparatus, said roll being of substantially uniform density and volume, and having a substantially cylindrical shape.

Further, the invention consists of a method of maintaining the cylindrical surface of the tobacco roll parallel to the longitudinal axes of the combing and brushing rollers, and a method of loosening and trimming the roll and regulating the supply of tobacco to the roll.

Again, the invention consists of a method of periodically ensuring the regular filling of the carding of the combing roller with tobacco taken from the tobacco roll.

A further object of the invention is the pro-

vision of means for carrying out the methods set out above.

The invention will be more particularly described with reference to the accompanying drawings, in which:—

Fig. 1 is an elevation of a portion of a tobacco feeding apparatus, partly in section, showing the invention applied thereto.

Fig. 2 is a similar view to a smaller scale and showing the back of the hopper.

Fig. 3 is an enlarged view of a portion of Fig. 1.

Figs. 4, 5 and 6 are diagrammatic views illustrating the working of the apparatus.

Referring to the drawings, a roller 1 at the base of the hopper 2 picks up tobacco from the mass in the hopper and delivers it to a combing roller 3 which carries it to a brushing roller 4 rotating in the opposite direction to the roller 3 so that the tobacco forms into a roll T in the gap formed by the rollers 3 and 4. By the continued movement of the roller 3 a quantity of tobacco is removed from the roll and is showered on to a distributor 5 from which it is again removed and showered in a shower of substantially uniform density into the filling trough of the cigarette machine.

In order to keep the tobacco forming the roll T in a uniform condition, a raking device consisting of a bar 6 provided with a number of prongs 7 is arranged to oscillate in an arcuate path as shown in chain lines in Fig. 3 so as to loosen and trim the roll of tobacco T during its upstroke and to again trim and remove any excess of tobacco from the roll during a part of its downstroke. During the remainder of its downstroke it regulates the quantity of fresh tobacco being fed to the roll by sweeping back any excess of tobacco being fed by the roller 3, into the mass supported by the feed roller 1.

To ensure the regular filling of the carded roller 3 from the roll T a pressing device consisting of a bar 8 extending the whole length of the combing roller, is arranged above the said roll T near to the point at which the brushing roller operates with the combing roller. The bar 8 which is in one length is actuated by a suitable mechanism which causes it to move towards and away from the surface of the roller 3 in any desired manner. For example, it may reciprocate either vertically or in any desired direction with respect to the centre of the combing roller, but preferably it is caused to move as shown in Fig. 3 in a path substantially parallel to the surface of the brushing roller 4. This movement is effected by attaching the pressing or tamping bar

8 to arms 9 which are carried on levers 10 and 11, the other ends of which are pivoted at 12 and 13 to the machine frame.

A lever 14 having a pin 15 attached thereto is periodically raised by means of another lever 16 which is driven from a crank 17 by a connecting rod 18, and the movement of the pin 15 causes the links 10 and 11 to oscillate, thus moving the pressing or tamping bar 8 through the path shown in chain lines in Fig. 3.

The raking device is driven by a crank 19 operated from the connecting rod 18 by a link 20.

The parts are so timed and arranged that when the pressing bar is approaching its upper position as shown in Fig. 4, the prongs of the rake are moving towards it and loosening and trimming the tobacco roll in the neighbourhood of the junction between the brushing and combing rollers. The presser then moves down and compresses any tobacco between it and the combing roller and thus ensures that the carding is completely filled, and during this motion the prongs of the rake commence their downward movement and thus take hold of any excess of tobacco protruding from the tobacco roll T and sweep it towards the rear and lower portion of the hopper, this movement being shown in Fig. 5.

The prongs continue their downward movement to the position shown in Fig. 6 and remove any excess of tobacco being fed to the roller T by the roller 3, and before they reverse their direction they act as a barrier to the tobacco which is constantly being advanced by the feeding roller 1, and therefore regulate the amount of tobacco offered to the combing roller. The lower position of the presser bar is determined by the diameter of the tobacco roll T between it and the combing roller, as it is merely lowered on to the roll T and the pin 15 can continue its downward movement and leave the presser bar in any position it may take up.

In addition to the apparatus above described, the hopper is preferably provided with an automatic feeding device in which a mechanically operated flap 21 sweeps a mass of tobacco from a container 22 towards the hopper of the machine and recedes to permit surplus tobacco to pass back into the container, and a bar 23 having prongs is arranged in the path of the moving tobacco to regulate the amount fed into the hopper.

By using this device in conjunction with the tamping and raking apparatus previously described, the level of the tobacco in the hopper is kept comparatively uniform, and consequently, the tamping and raking devices are able to work with the maximum efficiency as they are not hampered by the presence of large masses of unwanted tobacco in their neighbourhood.

Having now described the mechanical means for forming and maintaining a uniform roll of tobacco it is deemed desirable in order that the invention may be fully appreciated, to describe the practical effect of the apparatus, and this is set out below, references being made to the drawings.

By disposing the raking device and imparting to it the motion described and shown in the drawings, the following effects are produced:—

(a) Its action in sweeping close to the surface of the roller 3 retains the bulk of the tobacco on the roller 1 and the limited amount of tobacco permitted to pass up to the junction formed between the rollers 3 and 4 is formed by the rotary movement of said rollers into a roll T of tobacco.

(b) The raking device upon the upward and downward action at the high part of its stroke trims the roll T parallel along its length and upon the downward movement of the lower part of the stroke of the raking device, any surplus tobacco from the roll T is swept backwards and simultaneously the mass of tobacco contained between the rollers 1 and 3 is kept back, only such tobacco being allowed to pass as can pass between the points of the rake and the surface of the roller, also a certain quantity between the prongs of the rake and according to the distance to which such prongs are placed.

(c) It is found that if the raking device is not adapted to operate as described in order to maintain the cylindrical surface of the roll of tobacco substantially parallel, the roll assumes a form having varying diameters along its whole length, and when this occurs the rolling action of the carded drums causes the portions of the roll having the smaller diameters to rotate at a faster speed than the portions of greater diameter, this action causing the core of the tobacco roll to twist and thereby form a tight, tangled rope of tobacco which prevents the regular uniform filling of the carding of the drum 3.

The raking action of the present device in itself maintains a roll of tobacco of substantially uniform density and parallel throughout its length, and the pressing device will therefore press this roll with an equal parallel pressure likewise throughout the length of the roll without the necessity of sub-dividing the tamper into accommodating sections.

(d) The roller 3 removes tobacco from the roll T at substantially the same rate at which it presents fresh tobacco to the roll, and by this action the roll is maintained substantially constant with regard to its density and volume. To prevent the roll becoming over compressed either by the action of the pressing device or any other means, the rakes loosen and trim the roll at regular intervals.

It will be understood that various other means could be used to form and maintain the roll of tobacco without departing from the spirit of the invention; for instance, the raking device may be arranged to move through a path of any given shape instead of merely oscillating in an arcuate path as described, provided it maintains the tobacco roll as described.

What I claim as my invention and desire to secure by Letters Patent is:—

1. In a tobacco feeding apparatus for a cigarette making machine, the combination with a hopper, of means for feeding tobacco from said hopper, combing means for receiving tobacco from said feeding means and conveying the same upwardly, brushing means cooperating with said combing means and movable so that the adjacent surfaces of said combing and brushing means travel in opposite directions to form the tobacco fed into the junction formed by the said combing and brushing means into an unconfined roll of substantially uniform density and volume, and substantially uniform diameter, and means for continuously loosening and trimming the tobacco roll to maintain the same in its substantially uniform cylindrical condition.

2. In a tobacco feeding apparatus for a cigarette making machine, the combination with a hopper, of means for feeding tobacco from said hopper, combing means for receiving tobacco from said feeding means and conveying the same upwardly, brushing means cooperating with said

combing means and movable so that the adjacent surfaces of said combing and brushing means travel in opposite directions to form the tobacco fed into the junction formed by the said combing and brushing means into an unconfined roll of substantially uniform density and volume, and substantially uniform diameter, means for continuously loosening and trimming the tobacco roll to maintain the same in its substantially uniform cylindrical condition, and means for intermittently pressing the tobacco roll against the combing roller.

3. In a tobacco feeding apparatus for a cigarette making machine, the combination with a hopper, of means for feeding tobacco from said hopper, combing means for receiving tobacco from said feeding means and conveying the same upwardly, brushing means cooperating with said combing means and movable so that the adjacent surfaces of said combing and brushing means travel in opposite directions to form the tobacco fed into the junction formed by the said combing and brushing means into an unconfined roll of substantially uniform density and volume, and substantially uniform diameter, means for continuously loosening and trimming the tobacco roll to maintain the same in its substantially uniform cylindrical condition, and means for intermittently pressing the tobacco roll against the combing roller, said last named means comprising a reciprocatory device movable as a unit toward and away from the combing roller for exerting pressure upon the cylindrical tobacco roll along the entire length of the latter.

4. In a tobacco feeding apparatus, the combination with a combing means, of a cooperating brushing means, a tobacco feeding device for delivering tobacco to said combing means, means for limiting the quantity of tobacco thus fed to a relatively thin layer, said combing and brushing means moving in opposite directions in converging paths, whereby the tobacco carried by said combing means tends to form a substantially cylindrical roll adjacent the point of close proximity of said paths, and means for loosening and trimming the roll to maintain the same in an unconfined substantially cylindrical and uniformly dense condition.

5. In a tobacco feeding apparatus, the combination with a combing means, of a cooperating brushing means, a tobacco feeding device for delivering tobacco to said combing means, means for limiting the quantity of tobacco thus fed to a relatively thin layer, said combing and brushing means moving in opposite directions in converging paths, whereby the tobacco carried by said combing means tends to form a substantially cylindrical roll adjacent the point of close proximity of said paths, and means for loosening the roll to maintain the same in an unconfined substantially cylindrical and uniformly dense condition, said last named means comprising a toothed element supported for reciprocatory movement past said roll and into engagement with the layer of tobacco on said combing means to regulate the feed of tobacco toward said roll.

6. In a tobacco feeding apparatus, the combination with a combing means, of a cooperating brushing means, a tobacco feeding device for delivering tobacco to said combing means, means for limiting the quantity of tobacco thus fed to a relatively thin layer, said combing and brushing means moving in opposite directions in converging paths, whereby the tobacco carried

by said combing means tends to form a substantially cylindrical roll adjacent the point of close proximity of said paths, means for loosening the roll to maintain the same in an unconfined substantially cylindrical and uniformly dense condition, said last named means comprising a toothed element supported for reciprocatory movement past said roll and into engagement with the layer of tobacco on said combing means to regulate the feed of tobacco toward said roll, and means for intermittently pressing said tobacco roll against said combing means.

7. In a tobacco feeding apparatus, the combination with a combing roller, of a cooperating oppositely rotating brushing roller located in close proximity to the upper surface of said combing roller, means for feeding a relatively thin layer of tobacco to said combing roller in advance of said brushing roller, the quantity of tobacco thus fed to said combing roller being sufficient to form the tobacco into a substantially cylindrical roll adjacent the brushing roller, and means supported for movement adjacent the tobacco roll thus formed and sweeping across the same to maintain the tobacco roll in a relatively loose and substantially uniformly dense condition.

8. In a tobacco feeding apparatus, the combination with a combing roller, of a cooperating oppositely rotating brushing roller located in close proximity to the upper surface of said combing roller, means for feeding a relatively thin layer of tobacco to said combing roller in advance of said brushing roller, the quantity of tobacco thus fed to said combing roller being sufficient to form the tobacco into a substantially cylindrical roll adjacent the brushing roller, and means supported for movement adjacent the tobacco roll thus formed and sweeping across the same to maintain the tobacco roll in a relatively loose and substantially uniformly dense condition, said last named means comprising a toothed element movable through a path approaching the combing roller in advance of the said tobacco roll to regulate the thickness of the layer of tobacco carried by said combing roller.

9. In a tobacco feeding apparatus, the combination with a combing roller, of a cooperating oppositely rotating brushing roller located in close proximity to the upper surface of said combing roller, means for feeding a relatively thin layer of tobacco to said combing roller in advance of said brushing roller, the quantity of tobacco thus fed to said combing roller being sufficient to form the tobacco into a substantially cylindrical roll adjacent the brushing roller, means supported for movement adjacent the tobacco roll thus formed and sweeping across the same to maintain the tobacco roll in a relatively loose and substantially uniformly dense condition, said last named means comprising a toothed element movable through a path approaching the combing roller in advance of the said tobacco roll to regulate the thickness of the layer of tobacco carried by said combing roller, and means for pressing the tobacco roll against said combing roller.

10. In a tobacco feeding apparatus for a cigarette making machine, the combination with a hopper, of means for feeding tobacco from said hopper, combing means for receiving tobacco from said feeding means and conveying the same upwardly, brushing means cooperating with said

- combing means and movable so that the adjacent surfaces of said combing and brushing means travel in opposite directions to form the tobacco fed into the junction formed by the said combing and brushing means into an unconfined roll of substantially uniform density and volume, and substantially uniform diameter, and means for maintaining the tobacco roll in its substantially uniform cylindrical condition and for regulating the quantity of tobacco having access to the roll. 80
11. In a tobacco feeding apparatus for a cigarette making machine, the combination with a hopper, of means for feeding tobacco from said hopper, combing means for receiving tobacco from said feeding means and conveying the same upwardly, brushing means cooperating with said combing means and movable so that the adjacent surfaces of said combing and brushing means travel in opposite directions to form the tobacco fed into the junction formed by the said combing and brushing means into an unconfined roll of substantially uniform density and volume, and substantially uniform diameter, means for maintaining the tobacco roll in its substantially uniform cylindrical condition, and means for intermittently pressing the tobacco roll onto the combing means. 85
13. In a tobacco feeding apparatus for a cigarette making machine, the combination with a hopper, of means for feeding tobacco from said hopper, combing means for receiving tobacco from said feeding means and conveying the same upwardly, brushing means cooperating with said combing means, and movable so that the adjacent surfaces of said combing and brushing means travel in opposite directions to form the tobacco fed into the junction formed by the said combing and brushing means into an unconfined roll of substantially uniform density and volume, and substantially uniform diameter, means for loosening and trimming the tobacco roll and regulating the quantity of tobacco having access to the roll, and means for intermittently pressing the tobacco roll into the combing means with a uniform pressure along the entire length of the roll. 90
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