Feb. 12, 1952 D. W. MOLINS ET AL 2,585,572

TOBACCO FEEDING DEVICE WITH SUCTION DEVICES

Filed Aug. 20, 1946 3 Sheets-Sheet 1

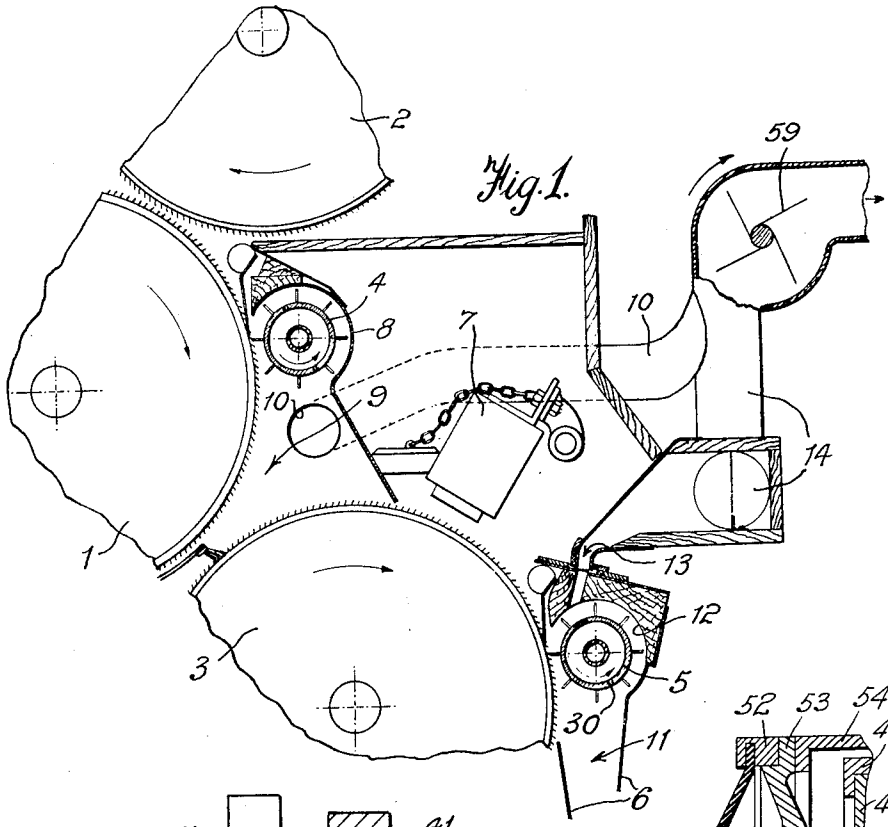


Fig. 1.

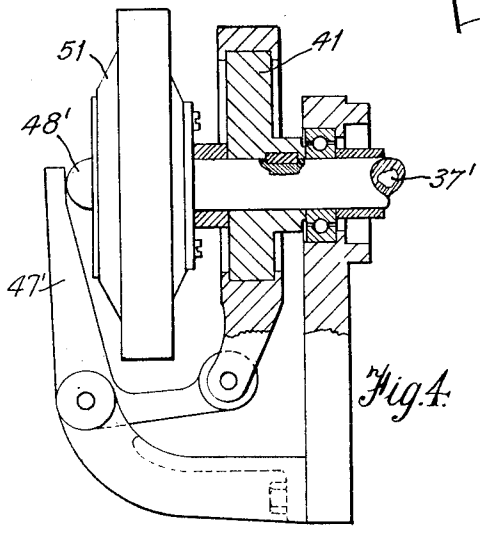


Fig. 4.

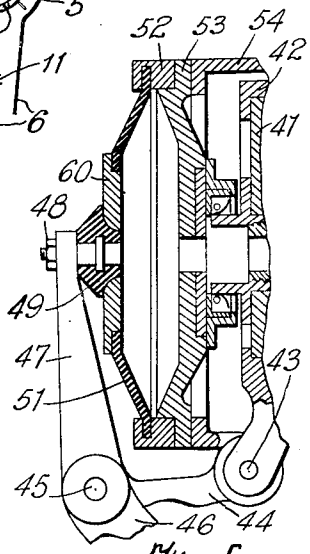


Fig. 5.

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TOBACCO FEEDING DEVICE WITH SUCTION DEVICES

Filed Aug. 20, 1946 3 Sheets-Sheet 2

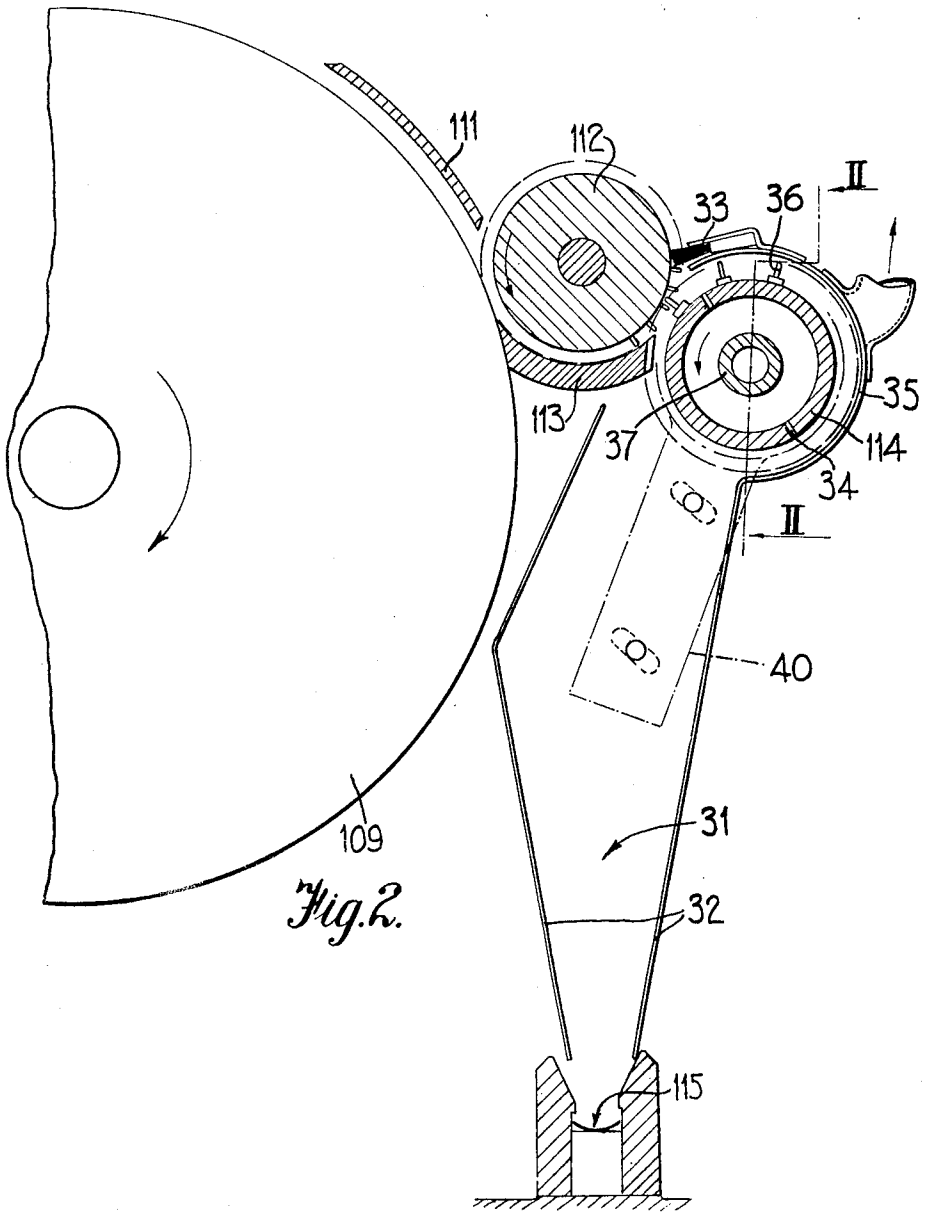


Fig. 2.

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TOBACCO FEEDING DEVICE WITH SUCTION DEVICES

Filed Aug. 20, 1946 3 Sheets-Sheet 3

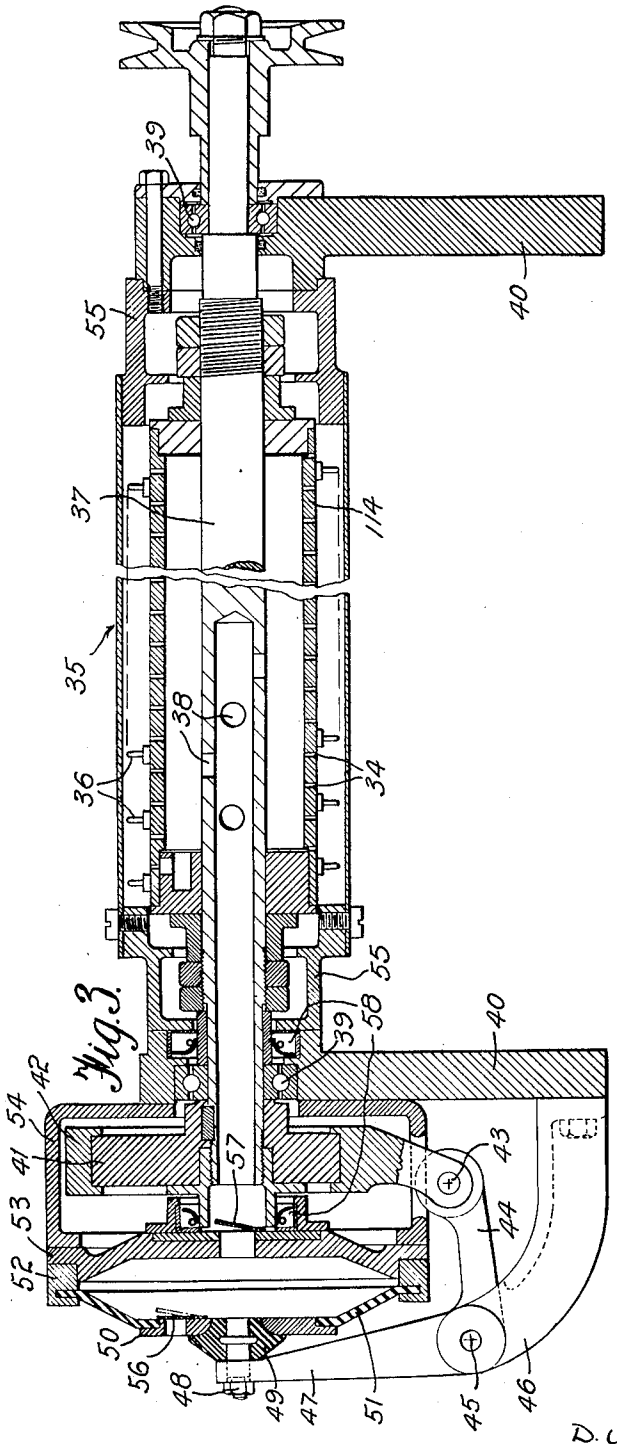


Fig. 3.

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Patented Feb. 12, 1952 2,585,572

UNITED STATES PATENT OFFICE

2,585,572

TOBACCO FEEDING DEVICE WITH SUCTION DEVICES

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Application August 20, 1946, Serial No. 691,718
In Great Britain August 28, 1945

4 Claims. (Cl. 131—110)

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This invention concerns tobacco manipulating machines, and is particularly concerned with dealing with tobacco dust raised in the handling of the tobacco in the machine.

It has heretofore been suggested in connection with the construction of tobacco feeding apparatus that suction devices be arranged with the apparatus for removing dust raised by the picker-rollers. It is found, however, that with this arrangement dust tends to accumulate on the stationary surfaces such as the shroud 12 and in particular at the top of the front wall of the chute 6. The latter accumulation is dislodged by periodically knocking the chute wall with automatically operated knockers. However, even such an arrangement is unsatisfactory since relatively large quantities of dust sometimes accumulate so that when they fall there will be an excess of dust in that part of the tobacco rod. Although the tobacco rod itself passes a suction device intended to remove dust, the arrangement requiring knockers is nevertheless not desirable. It is also noted that in the earlier machine, where the tobacco itself showered by the picker strikes and rubs the wall 6, the wall remains bright and clean, but that above this area, dust accumulates.

According to the present invention there is provided a tobacco feeding apparatus comprising a tobacco conveying element, a picker-roller to remove tobacco from said tobacco conveying element, a shroud partly encircling the picker-roller, blower means to cause air to impinge on the inner surface of said shroud to blow dust off said surface, and a suction device to remove the dust blown by the said blower-means.

The picker-roller may be hollow and the blower-means may comprise a pump communicating with the hollow interior of the picker-roller and apertures in the surface of the picker-roller communicating with the hollow interior whereby jets of air are blown outwardly from the picker-roller.

The pump may comprise a pulsating pump such as a diaphragm pump arranged to cause short blasts with or without alternate periods of reversal of pressure.

The shroud may be caused to encircle the picker-roller on the throw side to a point up to or near the position where the tobacco is thrown off the picker-roller, and the chute wall is arranged to continue from said shroud (e. g. by slight rounding off of shroud and chute wall). It will be seen that by this means substantially the whole of the chute wall is kept clean by the rubbing of the tobacco shreds and the shroud itself is scrubbed by the air jets.

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Tobacco feeding apparatus made in accordance with the present invention will now be described by way of example with reference to the accompanying drawings in which:

Figure 1 is a sectional elevation of part of a tobacco feeding apparatus for a continuous rod cigarette making machine constructed according to the invention.

Figure 2 is a sectional elevation of part of another form of tobacco feeding apparatus for a continuous rod cigarette making machine constructed according to the invention.

Figure 3 is a section of Figure 2 on the lines II—II and also shows a pump and its operating mechanism.

Figure 4 shows a modified form of pump.

Figure 5 shows an additional modified form of pump.

Referring to Figure 1, tobacco is fed in any desired manner to a combing roller 1 and the surface of said roller is brushed by a brushing roller 2. The tobacco on the roller 1 is picked by a picker-roller 4 and showered on to a distributing roller 3. A shroud 8 surrounds the picker-roller 4 and extends down nearly to the distributing roller 3 so that there is formed a compartment 9 in which the roller 4 operates. Magnets 7 are provided as is usual in such apparatus.

The tobacco on the distributing roller 3 is removed therefrom by another picker-roller 5 provided with a nearly semi-circular shroud 12 and showered down a compartment 11, which is formed by a chute 6 to the rod forming channel of the cigarette making machine.

A duct 13 leads from the compartment 11 to an exhaust system through a pipe 14 and a similar duct 10 leads to the exhaust system comprising a fan such as that shown diagrammatically at 59 from the compartment 9.

The picker-roller 5 is hollow and its hollow interior is in communication with a diaphragm pump, such as the one described later with reference to Figure 3, arranged to blow air into the hollow interior of the picker-roller. The surface of the picker-roller is provided with a suitable number of apertures 30 of for example $\frac{1}{16}$ inch diameter communicating with the hollow interior. These holes are arranged in two diametrally opposite rows, the holes in each row being half inch apart and the holes of the two rows are staggered so as to give an effective separation of a quarter inch. The arrangement will be better understood when Figure 3 is described.

A part of the chute 6 forms a continuation of the shroud 12 and is carried round to the underside of the picker-roller 5 to a position where no

tobacco is thrown off the picker, that is, as shown, about 30° to the right of the vertical diametral line on that roller. The chute wall 6 is made continuous with the shroud and suitably shaped to avoid any sharp angles at the junction of the chute wall and shroud.

The air pump is arranged to cause a succession of short sharp blasts of air to emerge from the apertures in the picker-roller and thus to blow on the inner surface of the shroud and the top part of the chute wall where it merges into the shroud. In this way dust is prevented from building up on these parts and the dust in motion is taken away by the exhaust device.

The picker-roller 4 can also be made hollow and connected to a pump of similar kind to the one described. The shroud 8 of this roller also conforms to the shape of the picker-roller to a point substantially 30° to the right of the vertical diametral line of the roller, and thereafter extends down to the roller 3 as shown. The pump may be so arranged that the blasts alternate with suction strokes.

In Figure 2 the invention is shown applied to a tobacco feeding apparatus of a different kind, this apparatus being substantially as described and shown in United States Patent No. 2,149,925, dated March 7, 1939, to which reference should be made for a fuller description. For convenience parts shown in the prior Patent No. 2,149,925, and repeated here have their reference numbers increased by 100. The apparatus comprises a smooth roller 109 which forms the distributor and has a shroud 111 which surrounds part of its circumference and keeps the tobacco thereon in the form of a carpet. The tobacco is removed from the roller 109 by a carded or pin roller 112 which picks the tobacco and conveys it over the surface of a concave 113. A picker-roller 114 picks the tobacco from the edge of the concave and showers it down a compartment 31 which is formed by the walls of a chute 32, and into the trough 115 along which the cigarette paper runs. A brush 33 is provided for removing any tobacco from the pins of the roller 112 which has escaped the picking action.

In this case the picker-roller 114 is made hollow and provided with apertures 34 through which jets of air are emitted to remove dust from the semi-circular shroud 35 into which the upper part of the right-hand wall 32 is formed.

Referring now to Figure 3, it will be seen that the picker pins 36 are spaced apart from one another by a distance which is in the particular apparatus being described one inch, and between a pair of pins the holes 34 are made through which the air jets pass, these holes being spaced apart about half an inch. As in the earlier description, rows of holes are made diametrally opposite and in order to distribute the action of the air over the inner surface of the shroud, the holes at the opposite ends of the diameter are staggered so that in effect there is an air jet at every quarter inch along the length of the roller. The roller is fixed to a spindle 37 which is hollow at one end to form an air pipe, and is perforated at 38 so that the air can pass into the interior of the picker-roller. The spindle 37 is supported in ball races 39 which are fixed in brackets 40, which are attached to the apparatus as described later. Beyond the left-hand bracket 40 an eccentric 41 is fixed on the spindle 37 and has an eccentric strap 42 mounted on it which is pivoted at 43 to an arm 44 of a bell crank lever which is pivoted at 45 to a bracket 46 fixed to the

left-hand bracket 40. The other arm 47 of the bell crank lever is fixed to a pin 48 which is embedded in a rubber bush 49 which is secured to a disc 50, the rubber being connected both to the plate and the pin by the process known as bonding. The disk 50 is bonded to a rubber diaphragm 51 the outer edges of which are bonded to a metal ring 52 which is fixed to a disc 53, the latter being in turn fixed to a cylindrical housing 54. The housing 54 is fixed to one bracket 40, and at the other side of said bracket the shroud 35 formed by the upper part of the wall 32 is fixed to said bracket by a bush 55. Thus the whole assembly of picker-roller and pump is carried on the brackets 40, and these brackets are fixed to the side walls of the tobacco feeding apparatus in the manner indicated in Figure 2 so that the picker-roller 114 can be adjusted towards or away from the edge of the concave 113 as this adjustment is a matter of considerable importance in the operation of feeding the tobacco.

The pump is provided with two valves 56 and 57 represented in Figure 3 by simple flaps, though more elaborate valves may be fitted if necessary. As the picker-roller 114 rotates, the eccentric 41 causes the rubber diaphragm 51 to be moved in and out, and thus air is pumped into the interior of the picker-roller in the form of short sharp jets which have the effect of removing dust from the shroud formed by the upper part of the wall 32 and causing it to move down into the trough 115 before any undue accumulation occurs which would spoil the consistency of the cigarettes.

Instead of having a pump such as the one just described which repeatedly forces air into the interior of the roller, the pump may be made without valves, as illustrated in Figure 5, in which case the inward movement of the pin 48 will operate disc 50 to cause jets of air to be forced out of the nozzles 34, while on the return movement of the pin 48 air will be sucked back through the nozzles and thus the air in the interior of the shroud will be subjected to continuous agitation which has the effect of preventing the settlement of dust. Figure 4 shows an external view of a further modified form of the pump, and in this case the pump is mounted for rotation on the spindle 37^1 which avoids the necessity of providing any sealing devices such as those marked 58 in Figure 3, which are necessary when the pump does not rotate to prevent air escaping between the pump and the hollow sprindle 37^1. The pump is operated by an arm 47^1 of a bell-crank lever similar to the lever 44, 47 shown in Figure 3, pressing against the domed head of a pin 48^1 which is connected to the diaphragm 51 in the same way as is pin 48 in Figure 3.

The arrangement whereby the air is blown in intermittent blasts or blasts alternating with reversal of pressure strokes is effective in keeping the dust in motion, and at the same time keeps low the quantity of air flowing through the machine, which is advantageous.

What we claim as our invention and desire to secure by Letters Patent is:

1. A tobacco-feeding apparatus comprising a tobacco-conveying element, a picker-roller to remove tobacco from said tobacco-conveying element, said picker-roller being hollow and having apertures in its periphery, a shroud partly encircling the picker-roller, the apertures being directed outwardly of the picker-roller so as periodically to face the inner surface of said shroud

on rotation of the picker-roller, blower-means to cause jets of air to be blown outwardly through said apertures so as to impinge against and sweep over the inner surface of said shroud to blow dust off said surface, and a suction device to remove dust blown by the said jets.

2. Apparatus as claimed in claim 1, wherein the blower-means comprises a pulsating pump arranged to cause short jets of air on to the surface of the shroud.

3. Apparatus as claimed in claim 2, wherein the pump comprises imperforate pressure means to reverse the air pressure after each said jet.

4. Apparatus as claimed in claim 1 wherein the shroud is arranged to encircle the picker-roller on the side of the latter remote from the tobacco-conveying element, to a point near the position where the tobacco is thrown off the roller, and wherein there is provided a chute to guide and contain tobacco picked by the picker-roller,

the said chute having a wall which merges into the shroud in the region of the said position, whereby there is provided a smooth unbroken surface against which the air jets impinge.

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FÉLIX FRÉDÉRIC RUAU.

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The following references are of record in the file of this patent:

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Number	Name	Date
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FOREIGN PATENTS

Number	Country	Date
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542,226	Germany	Jan. 21, 1932