

Jan. 12, 1943.

P. J. HERRMANN

2,308,227

DISTRIBUTOR FOR TOBACCO ROD FORMING MACHINES

Filed March 13, 1939

4 Sheets-Sheet 1

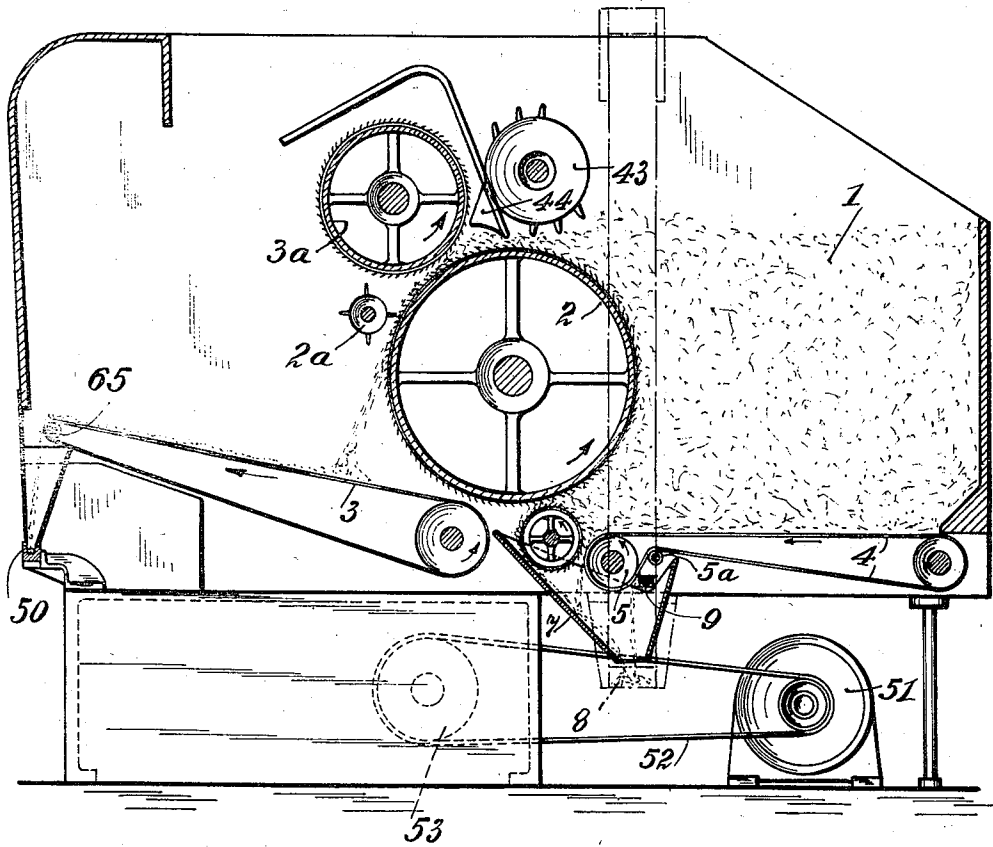
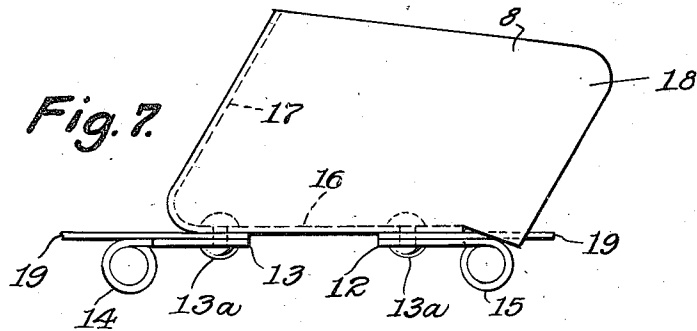


Fig. 1.

INVENTOR

Paul Johannes Herrmann

By *C. P. Goepel*

his ATTORNEY

Jan. 12, 1943.

P. J. HERRMANN

2,308,227

DISTRIBUTOR FOR TOBACCO ROD FORMING MACHINES

Filed March 13, 1939

4 Sheets-Sheet 3

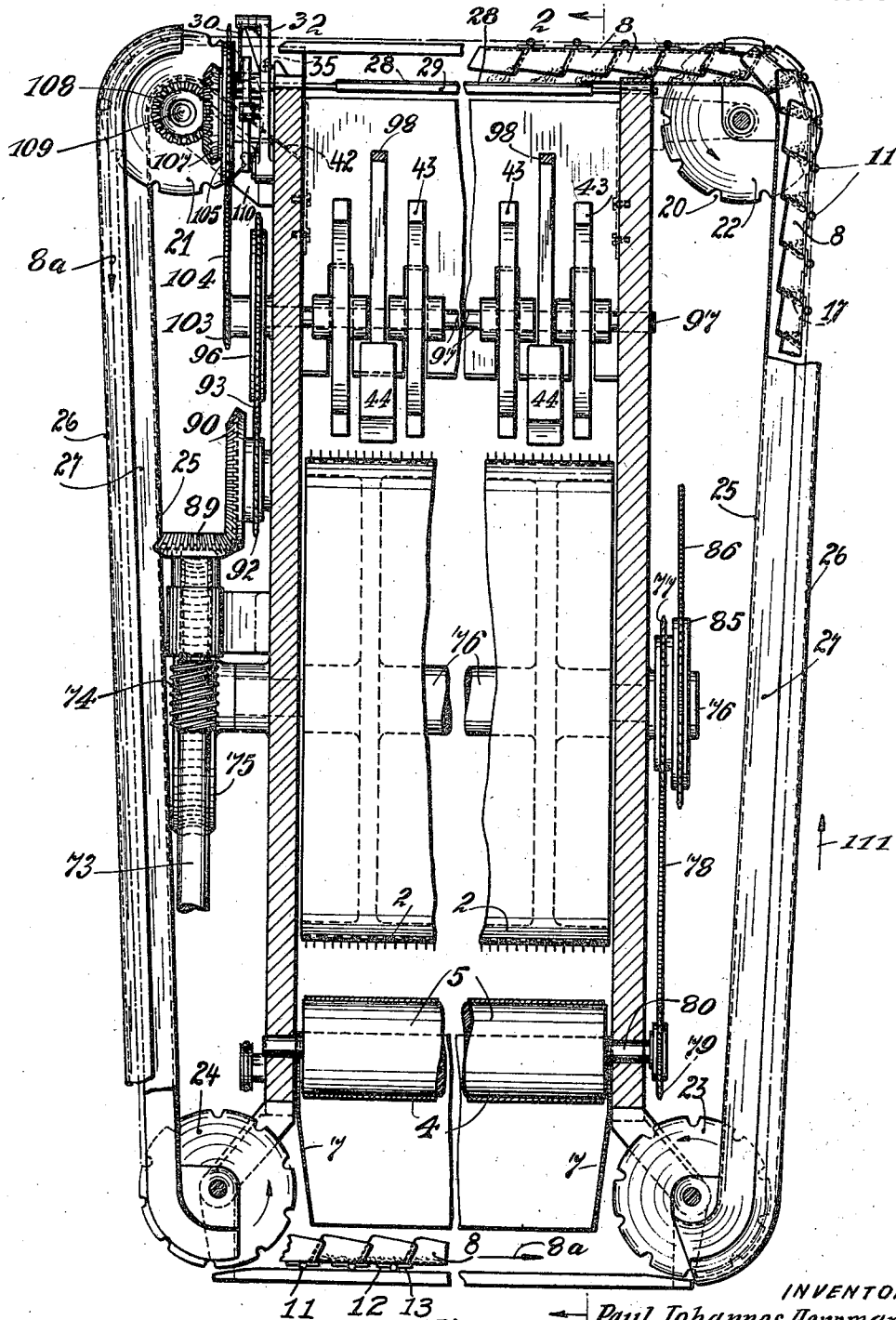


Fig. 3. ² INVENTOR Paul Johannes Herrmann
By C. P. Joepel
his ATTORNEY

Jan. 12, 1943.

P. J. HERRMANN

2,308,227

DISTRIBUTOR FOR TOBACCO ROD FORMING MACHINES

Filed March 13, 1939

4 Sheets-Sheet 4

Fig. 4.

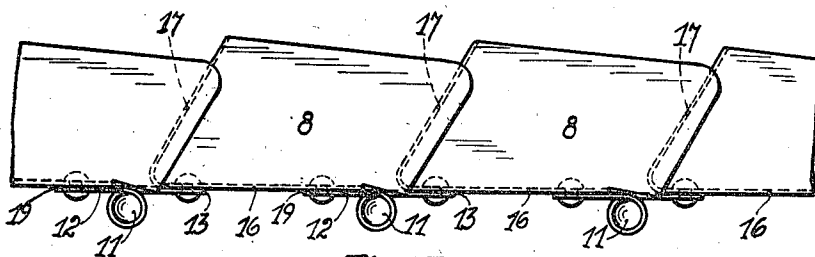


Fig. 5.

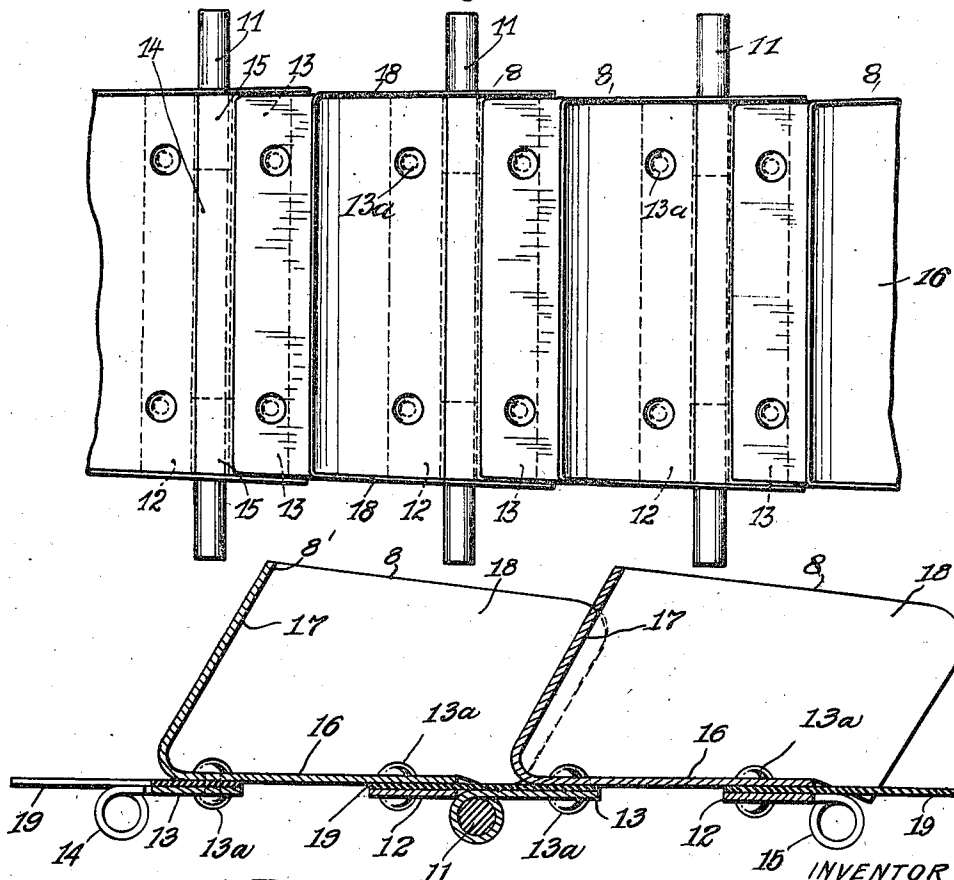


Fig. 6.

Paul Johannes Herrmann

By C. P. Goppel

his ATTORNEY

UNITED STATES PATENT OFFICE

2,308,227

DISTRIBUTOR FOR TOBACCO ROD
FORMING MACHINESPaul Johannes Herrmann, Dresden, Germany;
vested in the Alien Property CustodianApplication March 13, 1939, Serial No. 261,525
In Germany April 25, 1938

2 Claims. (Cl. 131-109)

This invention relates to distributors for tobacco rod forming machines, and more particularly to a device to be used therewith for returning to the distributor any short tobacco which has separated from the tobacco supply of the distributor.

The object of the invention is to utilize short tobacco in the manufacture of tobacco cigarette rods.

For this purpose, the invention consists in the provision of means attached to or built as part of a cigarette tobacco supply and distributor, to receive the short tobacco and convey it to the proper place to be guided with the tobacco to a cigarette rod forming machine.

More particularly, the invention also consists in the novel means for conducting the short tobacco so that it may receive the same, and hold it without loss in the conducting thereof, until it is discharged at the proper place. These novel means are in the form of interlocking and intermeshing cups forming a continuous band, and the invention also consists in the control of the discharge of the tobacco from these cups.

The invention will be more fully described hereinafter, embodiments thereof shown in the drawings, and the invention will be finally pointed out in the claims.

In the accompanying drawings:

Figure 1 is a vertical longitudinal section showing generally a known distributor with the improvement forming the present invention indicated in dotted lines, which cooperate with certain novel parts in full lines;

Figure 2 is a similar section but partial and enlarged, showing the details of the improved parts forming this invention, the section being taken on line 2-2 of Figure 3;

Figure 3 is a vertical transverse section taken on line 3-3 of Figure 2, seen in the direction of the arrows;

Figure 4 is a partial side view of the improved conveying means for the short tobacco;

Figure 5 is a plan view of Figure 4;

Figure 6 is an enlarged longitudinal sectional detail of the cups forming the endless conveyor, and

Figure 7 is an enlarged detail view in side elevation of one of the cups.

Similar characters of reference indicate corresponding parts throughout the various views.

Referring to the drawings, and more particularly to Figure 1, the tobacco supply 1 is engaged by rotating cylinder 2 which has projections adapted to pick up and carry the tobacco supply 1, and

to conduct it to the cylinder 3a also provided with projections, and rotating in the opposite direction, between which the tobacco drops with the aid of spiked wheel 2a to the apron 3 and is conducted thereby to the U-shaped cup 50 forming the first formation of a cigarette rod. A stamper 44 is disposed in the bight of the cylinders 2 and 3a. A toothed wheel or cylinder 43 cooperates with the stamper 44. These parts and their means for actuation are known and form no part of this invention per se.

At the bottom of the tobacco supply 1, an apron 4 passing over the pulley 5 and idler 5a is provided, which moves the loose or short tobacco at the bottom of the supply 1 to funnel 7 having inclined walls. Opposite to the pulley 5 a cylinder 6 having projections is placed which rotates in same direction to the movement of pulley 5, and cooperating with the cylinder 2, serves to catch up longer tobacco passing over the pulley 5, and deliver it to the cylinder 2 to be carried by cylinder 2 to cylinder 3a. Any short or loose tobacco not carried away by the cylinder 2, and carried along by cylinder 6, drops into the funnel 7. A rotary brush 9 is provided below the belt or apron 4 to brush off any adhering tobacco and deliver it to the hopper 7. From the hopper 7 short tobacco drops into the cups 8.

The cups 8 themselves form in effect an endless chain which extends around the distributor, as seen in Figure 3, and passes over the pairs of notched wheels 21, 22, 23 and 24. Each cup 8 forms an integral part of the conveyor, and the cups are connected in the form of a chain, as described below by means of the hinge plates 12 and 13 and the pin 11. Preferably, to prevent any air currents prevalent in the factory from blowing the loose or short tobacco out of the cups, guard members 25, 26 and 27 are provided which cover the cup-chain, laterally of the distributor. Lateral walls 24, seen in Figure 2, serve the same purpose. The cups 8 when at the bottom of the distributor, as seen in Figure 3, are open on top to receive the tobacco and moving in the direction of arrow 8a ascend to hold it, and discharge it at the top, coming down empty at the other side, as seen in Figure 3.

The cups 8 which are made of metal are preferably integral. Each cup 8 is provided with two vertically upstanding side walls 13, and between the walls extends the bottom portion 16. The forward ends of the cups 8 are open, as also are the tops which provide means for receiving and discharging the tobacco from the cups. The rear ends of the cups 8 are provided with a slanting

rear wall 17 extending between the vertical side walls 18, and the cups are so disposed with respect to one another that the side walls of two adjacent cups overlap. Thus, the side walls 18 together with the rear wall 17 of one cup will project into the forward portion through the open front of the cup positioned directly behind the given one. Such a construction insures the prevention of any leakage of tobacco from between the cups.

To the bottom portion 16 of each cup 8 is riveted by means of rivets 13^a in the front thereof the hinge plate 12 provided with the eye portion or socket 15, and at the rear of the bottom portion 16 of each cup 8 is riveted a second hinge plate 13 provided with the socket 14, so that the sockets 14 and 15 of successive cups are adapted to intermesh and to receive the pin 11 to thereby connect adjacent cups 8 hingedly.

The top edges on the sides 18 of the cups 8 may be seen to be downwardly inclined in the direction of movement of the cup chain, or in other words toward the fronts of the cups 8. This, in effect, causes the inclined rear walls of the cups 17 and the rear portions of the side walls 18 to extend at a greater distance from the bottom portion 16 of the cups 8, and to thereby form a pocket in the rear portion of the cup 8 and also to form an up-standing edge at the rear of each cup.

The pins 11 which carry the portions 14 and 15 of the hinge plates 12 and 13 extend outwardly beyond the sides 18 of the cups 8 and so are adapted to engage the notches 20 of the pairs of discs 21, 22, 23 and 24. The disc 21 is driven by means described below and thus motion is imparted to the entire chain.

When the cups 8, filled or partially filled with tobacco, arrive at the top of the distributor, they may either discharge their contents upon a plate 28 hinged at 29, or if that plate is in the dotted line position shown in Figure 2, then directly into the path of the tobacco coming from cylinder 2 and moving in the direction of cylinder 3a, being guided in its downward flow by an inclined wall 38. This wall 38 has an angular plate 39 provided with slots 40, through which thumb screws 41 pass, whereby the wall 39 may be adjusted in position.

The plate 28 is operated by a link connection moving it periodically. To the plate, at its hinge 29, is connected a curved link 30, in turn pivoted to a link bar 31, in turn pivoted to a link 32, pivoted to the frame of the machine at 33. The link 32 has a follower 34. A spring 35, having one end secured to the link 32, and the other to a bracket secured to the frame of the machine, causes the follower 34 to press against a cam 36 having a projection 37. Whenever the projection 37 strikes the follower 34, the link connection is operated and the plate 28 is moved from horizontal full line position to inclined dotted line position as shown in the upper part of Figure 2. The loose or short tobacco descending as indicated along the wall 38, drops upon the wheel or cylinder 2, and being intermingled with the long tobacco, drops upon the apron 3.

The means for operating the various parts are the following:

The motor 51 drives a belt 52 passing over the pulley 53, as shown in Figure 1. This pulley 53 is on a shaft 54 to which a gear 55 is secured, which gear 55 meshes with the gear 56 on a shaft 57 to which another gear 58 is secured. This gear 58 meshes with the gear 59 on a shaft 60. The gear 59 meshes with the gear 61 on a shaft 62 to which a pulley 63 is also secured, and over this pulley passes the belt 3 in the direction of the

arrow 64, which belt 3 also passes over a pulley 65 (Figure 1), which pulley 65 is directly over the rod-forming device 50. To the shaft 62 a second pulley 66 is secured, over which a belt 67 passes, this belt 67 also passing over a pulley 68 to the shaft of which the cleaner 9 is also secured. Immediately above the cleaner 9 is an idler shaft 69 having an idler 70 thereon, which idler acts to bend the lower part of the conveyor 4 into a suitable position so as to enable the cleaner to work thereon and remove from the belt surface any adhering tobacco.

Referring again to the shaft 54, this also has secured thereto a beveled gear 71 engaging a beveled gear 72 on a vertical shaft 73 to which a worm 74 is secured. This worm 74 meshes with a gear 75 on a shaft 76, to which shaft a sprocket 77 is secured, over which sprocket 77 a chain drive 78 passes, which chain then passes over a sprocket 79 on a shaft 80, moving the shaft 80 in the direction of the arrow 81, and the chain 78 also passes over a sprocket 82 on a shaft 83. By the action of the chain 78 the shaft 80 is rotated, as stated, in the direction of the arrow 81, and the shaft 83 is rotated in the direction of the arrow 84. Upon the shaft 76 there is also secured another sprocket 85, over which a chain 86 passes and extends upwardly to pass over a sprocket 87 on a shaft 88, and to this shaft 88 the cylinder 3a is secured and is moved thereby.

Returning to the vertical shaft 73, at its uppermost end a beveled gear 89 is secured which meshes with the beveled gear 90 which is secured in turn to a shaft 91 to which a sprocket 92 is secured. A chain 93 passes over this sprocket 92 and over another sprocket 94 secured to shaft 95, and thereafter over a sprocket 96 which is secured to the shaft 97 to which the wheel or cylinder 43 is secured. By the action of the chain 93, the tamping mechanism 44 is operated by having the tamping feet 44 supported by an elbow lever 98 pivoted at 99 and forming part of a lever 100 to which a follower 101 is supported. To the shaft 95 a cam 102 is secured, whereby upon the rotation of the shaft 95 the cam 102 on its rotation moves the idler 101 from the full line position shown in Figure 2 to the dotted line position shown in Figure 2, and by such movement raises the tamping feet 44 upwardly. The chain 93 at the same time rotates the shaft 97, as stated, and this shaft has secured thereto a sprocket 103 engaged by a chain 104 which passes over a sprocket 105 secured to the shaft 106. To the shaft 106 is secured a bevel gear 107 engaging a bevel gear 108 on a shaft 109 which is supported by brackets 110 as shown in Figure 3, which brackets 110 are suitably secured to the frame members of the machine. Thus, by the rotation of the shaft 97, the shaft 109 is rotated through the instrumentality of the parts described, and the shaft 109 has secured thereto the notched discs 21 in a pair to have the notches engage the rods 11 of the cup-shaped links adapted to receive the loose tobacco. Thus, by the rotation of the shaft 109, as shown in Figure 3, a chain which is made up of these cup-shaped links 8 is driven in the direction of the arrow 8a empty when moving in downward direction, and adapted to be filled when moving horizontally in the direction of the arrow 8a there shown, and in their filled or partially filled condition adapted to move upwardly in the direction of the arrow 111 until they again move horizontally, having passed over the discs 22 so as to discharge the contents upon the guide wall 25. The tobacco thus discharged from the inverted cups 8

onto the guide wall 25 is scraped from the guide wall 25 and deposited onto the plate 28. This action occurs after it has accumulated on the guide wall 25 to a sufficient depth to cause the extending rear edges 8' of the cups 8 formed by the inclined side walls 18 and rear wall 17, as above described, to contact the tobacco thus deposited and to urge it toward the plate 28 as a result of the continuous movement of the conveyor chain. By the rotation of the shaft 97, the shaft 106 is rotated, which shaft, as before stated, has placed thereon a cam 37 which cooperates with a follower 34, whereby the linkage connections are moved, which in turn move the plate 28.

From the foregoing, it has been seen that after the loose or short tobacco has been deposited into the cup-shaped link members 8, it is not subjected to any further breaking down, and substantially remains in this condition and is then brought into the run of the regular tobacco.

The cup-shaped devices 8 may be prismatic or semicylindrical in shape, but the important part is that the inclination of the walls 17 is such that a pocket is formed in the lower or rear end portions of the cups 8, as these members 8 ascend on the vertical leg or flight of the conveyor, which pocket is covered by the adjacent overlapping walls of the adjacent members, so that the tobacco is contained therein. The walls 16, 17 and 18 of the cup members 8 are preferably entirely integral with each other, and are so connected as to be substantially an integral member so as to have no slots or slits through which loose tobacco may pass. A tight fitting joint is made between the overlapping forward portions of the side walls of one cup and the rear portions of the side walls 18 of the adjacent cup due to the bearing pressure of the resilient metal of which the cups 8 are made. So, for instance, the walls seen in Figure 4 overlap along the dotted line 17, and a scale-like formation is brought about having a hugging action so as to prevent any small particles from passing between the walls. In case the tobacco does not fall out of the containers 8 at the proper time, the inclined surface 42 shown in Figure 3 is provided upon which the tobacco can slide downwardly and be conducted towards the spiked roller 2.

The forwardly inclined rear walls 17 of the containers 8 form at 8' levelling means in the top row for spreading a uniform layer of the conveyed short tobacco when on the plate 28.

From the foregoing it is seen that the conveyor consists of the link pins 11 which carry the hinge parts 12 and 13, that is the hinge parts 12 encircle the pins 11 with the sockets 15 and the hinge parts 13 with the sockets 14, with which sockets the hinge parts are preferably made from one piece. At the parts 12 and 13 which belong to different successive hinges, the bottom parts 16 of the cups are firmly attached by means of riveting, screws or the like. In addition, the transverse walls 17, arranged successively in the conveyor, and outer walls 18, are firmly connected with these bottom walls 16. The cup space of each cup is therefore formed by its walls 16, 17 and 18, and wall 17 of the subsequent cup. The walls 17 are formed at a slant so that by vertical position of the bottom wall 16, the tobacco flows on the walls 17 in the direction of the bottom wall 16. The walls 16, 17, and 18 of each cup are connected with each other so that there are no slits. The side walls 18 of the cups arranged in series, lie scale-like above each other, whereby the outer parts adjust themselves against the inner parts

flexibly. Between the parts 12 and 13 and the floor parts 16, elastic intermediate layers 19 are provided, which layers completely cover up the hinge slits within the domain of the pins 11. The pins 11 extend on the sides of both sides of the cups 8. With these extending ends they come to lie in the space 20 of the conveyor wheels 21, 22, 23, 24 which rotate in the direction of the arrow. The driving may take place by either one or several of these chain wheels. In the embodiment, it starts by wheel 21.

In the conveyor drum between the wheels 23, 24, the cups 8 point their openings to the top so that the short tobacco arriving on the inclined walls of the chute 7, which extends the length and breadth of the tobacco supply container, may slide into them. By constantly rotating the wheels 21 to 24, the cups 8 are first led over the wheel 23. Between this wheel and the conveyor wheel 22, the cups are approximately rotated at an angle of 90°. The inclination of the rear walls 17 of the cups 8 provide a pocket in each cup which serves to retain the tobacco in the cups during the vertical movement of the latter. Also, as may be seen in Figure 3, the ascending and descending flights of the conveyor formed by the cups are inclined outwardly from the bottom toward the top of the distributor, and such construction further serves to prevent accidental discharge of tobacco during the upward movement of the cups 8.

From the foregoing, it is also seen that the invention comprises a device for the return of short tobacco separated from the distributor, by which the separated short tobacco is transported by an endless and running conveyor to the supply of the tobacco of the distributor in which a chute which has the length and breadth of the supply container to receive the separated tobacco, delivers the short tobacco to containers each for a small amount of tobacco, which are conducted to a place where their contents discharge into the main tobacco supply, at which place the containers are upset or have their openings in the downward direction.

I have described but one embodiment of my invention, but it will be clear that changes may be made within the principle of the invention described, without departing from the scope of the subjoined claims:

I claim:

1. In apparatus for feeding a mixture of long and short tobacco to a cigarette rod forming machine and wherein short tobacco separates from the long tobacco during the feeding operation; the improvement which consists in means for returning the separated short tobacco to the tobacco being fed, comprising an endless chain of containers movable transversely to the direction of movement of the tobacco being fed and having four runs including a substantially horizontal bottom run below the tobacco being fed, a substantially horizontal top run above the tobacco being fed, and spaced vertical side runs connecting the top and bottom runs on opposite sides of the tobacco being fed, said containers being arranged in an upright position in the bottom run and being inverted in the top run of the endless chain, each of said containers having a bottom wall, two side walls, and a forwardly inclined rear wall, the front and top of each container being open to form a mouth adapted to receive the separated short tobacco in the bottom run of the endless chain and to discharge said short tobacco in the top run of the chain, the forwardly inclined rear wall of each container preventing the short

tobacco from falling out during the upward travel of the endless chain from the bottom run to the top run, a guard plate for one of the side runs of said endless chain partially extending below the top run, said guard plate extension adapted to receive short tobacco discharged from the inverted containers, a tiltable plate disposed beneath the top run of said endless chain contiguous with said guard plate extension, said forwardly inclined rear walls of the containers forming leveling means for the short tobacco discharged on said guard plate extension to spread the short tobacco onto said tiltable plate and thereby form a uniform layer of short tobacco on the latter, means for driving said endless chain substantially continuously, and means operatively connected to said driving means for periodically tilting said tiltable plate, whereby the uniform layer of short tobacco thereon is delivered to the fed tobacco.

2. In apparatus for feeding a mixture of long and short tobacco to a cigarette rod forming machine and wherein short tobacco separates from long tobacco during the feeding operation, the improvement which consists of means for returning the separated short tobacco to the tobacco being fed, comprising a plurality of containers each having a bottom, side walls, and an end wall, said end wall being formed by an upwardly and forwardly inclined bent portion of the rear extremity of said bottom, means on opposite ends of the bottoms of said containers hingedly connecting said containers together to form an endless conveyor movable transversely to the direction of movement of the tobacco being fed, the front and top of each container being open, the

forward edges of the side walls of each container being upwardly and forwardly inclined in parallel relation to the end wall of the container, the free ends of the side walls of one container overlapping the rear portions of the side walls of the adjacent container, whereby a pocket is formed by the bottom, side walls and rear wall of one container, and the rear wall of an adjacent container, said endless conveyor having four runs including a substantially horizontal bottom run below the tobacco being fed, a substantially horizontal top run above the tobacco being fed, and spaced vertical side runs connecting the top and bottom runs on opposite sides of the tobacco being fed, in the bottom run, said containers being arranged in upright open position to receive the separated short tobacco from the tobacco being fed, and in the top run, said containers being inverted to discharge the conveyed short tobacco therefrom, the upwardly inclined rear wall of each container preventing the short tobacco from falling out during the upward travel of the endless conveyor from the bottom run to the top run, a plate beneath the top run of said endless conveyor adapted to receive the conveyed short tobacco, said forwardly inclined rear walls of the containers forming leveling means in the top run for spreading a uniform layer of the conveyed short tobacco onto said plate, means for driving said conveyor substantially continuously, and means operatively connected to said driving means for intermittently moving said plate to deliver the said uniform layer of short tobacco to the tobacco being fed.

PAUL JOHANNES HERRMANN.