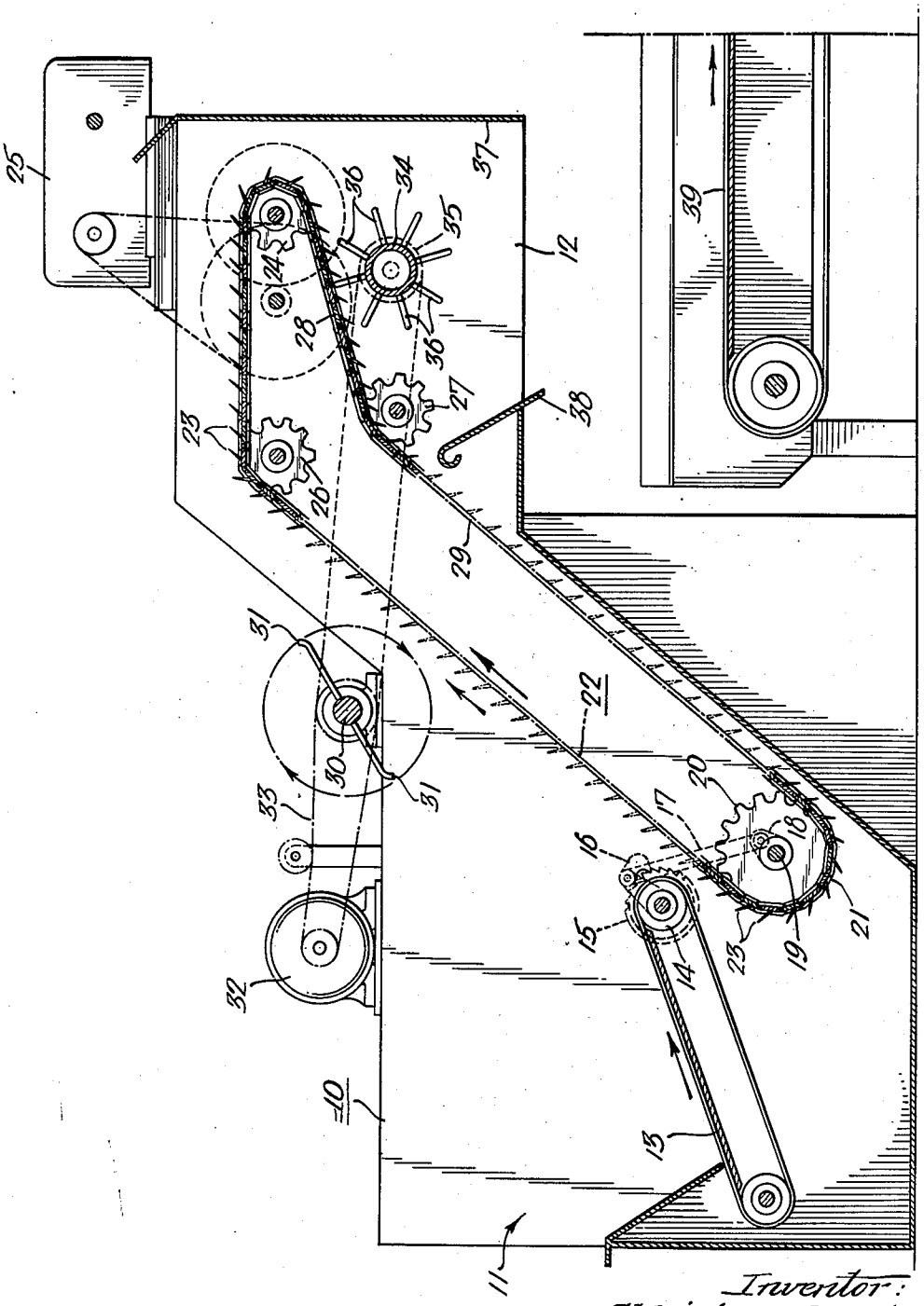
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FEEDING MECHANISM AND PROCESS FOR FIBROUS MATERIALS

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FEEDING MECHANISM AND PROCESS FOR FIBROUS MATERIALS

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1 Claim. (Cl. 198—229)

This invention relates to the feeding of fibrous materials incident to the performance of manufacturing processes and is concerned especially with the art of conveyors and means associated with such conveyors for controlling the feeding of material thereon and its discharge therefrom. It was conceived and developed especially with reference to problems encountered in automatically controlling the feed of leaf tobacco uniformly to a dryer conveyor and will accordingly be described specifically with reference to such problems.

In feeding apparatus designed for this purpose, it has been customary to pass the tobacco upwardly on an inclined forward flight of an endless conveyor in the form of a belt provided with blunt-ended pins which form bucket-like spaces between which the tobacco leaves are carried. As the tobacco moves upwardly, it is subjected to the levelling action of kicker blades which rotate counter to the movement of the tobacco, to kick back tobacco which may have been carried forward beyond the desired depth, and to maintain the depth of the bed of tobacco substantially uniform. After passing around the sprocket or pulley at the end of its forward flight, the successive conveyor portions make their return flight. Most of the tobacco drops off at this point, but some of it sticks on the under side of the conveyor as it starts this return flight. This part is removed from the conveyor and discharged by the action of a rapidly rotating doffer having blades which rotate in paths including arcs between the pins, the movement of the doffer blades being in the same directions as that of the endless conveyor flight across which they operate to perform the discharging function. The doffer blades thus force the tobacco forwardly and downwardly, where it is deflected by a back panel lying in its path, and dropped on the advancing endless conveyor by which it is fed through the dryer.

While this system operates well to provide a steady flow of tobacco through the dryer, it has been subject to some difficulty in operation, particularly in connection with the discharge of the tobacco from the conveyor. In order to clear the pins, it has been necessary to mount the back panel in a position in which its upper edge is somewhat spaced from the underside of the conveyor. As a consequence, some of the tobacco has been caught on the top edge of the panel and later carried down to the floor by the conveyor. Tobacco accumulating on the back panel in this way also tends to form lumps, and these are deleterious to the product in cases when they later find their way into the finished product.

A principal object of the invention has been to obviate these difficulties, and to provide a combination which operates to discharge the tobacco cleanly, without the objectionable stickage discussed above.

Further objects and advantages of the invention, and the manner in which they have been attained, will be evident from reading of the following specification in the light of the attached drawing, in which, the single figure

is a longitudinal cross-section through the conveyor housing and mechanism of the invention.

The feeding mechanism of the invention may be contained in a housing **10** having an inlet **11** through which the tobacco or other fibrous material is to be received, and an outlet **12** through which it is to be discharged, after being spread out in a uniform layer in the feeding apparatus of the invention. Upon being received through the inlet **11**, the material (hereinafter referred to as tobacco for the sake of convenience) is passed forwardly in a step-by-step movement by an endless conveyor **13** on which it accumulates to a substantial depth. The conveyor **13** is driven by a roller **14** through a ratchet **15** and a pawl **16** which receives its step-by-step movement from a link **17** carried by a crank **18** rotating with a shaft **19** which receives its motion from a sprocket **20** through chains **21**. These chains carry between them an endless conveyor **22** which may be a belt provided with girts carrying spaced blunt-ended pins **23** between which the tobacco is carried forwardly and upwardly. The chain drive for this conveyor is obtained through a drive sprocket **24** deriving its power from a prime mover through a variable speed drive unit **25** and intermediate gearing, as illustrated.

The conveyor and driving chains are guided in their succession of upward and forward, horizontal forward, and downward and rearward flights by the sprockets **20** and **24**, and by intermediate guide sprockets **26** and **27**. The rearward flight of the conveyor **22** includes, in the portion just under and to the left of the drive sprocket **24**, a first flight portion **28** extending at only a slight angle to the horizontal, and a second flight portion **29** beyond the guide sprocket **27**, extending at a much more substantial angle. The kicker **30**, which may take the form well-known in the art and include a number of blades or arms **31**, is rotated by a motor **32** and chain or belt **33** in a direction opposed to that of movement of the tobacco upwardly along conveyor **23**, and through an arc which, at its nearest point of approach to the conveyor flight, determines the thickness of the bed of tobacco impelled forwardly beyond this point, by kicking tobacco in excess of this level rearwardly from this point on the conveyor. Both the kicker and the conveyor features discussed up to this point are fairly conventional and well understood by persons skilled in this art.

Most of the tobacco is discharged downwardly from conveyor **22** to receiving belt **39** as conveyor **32** starts its downward and rearward flight. However, some tobacco will be entrained or impaled by the conveyor, and this is removed by doffer **34**. This doffer **34** is rotated through a sprocket or pulley **35** by the chain or belt **33**, and is mounted in a position such that its radiating arms or blades **36** describe arcs which extend between the pins **23** as they move diagonally downward on the portion **28** of the return flight of conveyor **22**. This movement of the doffer arms **36** across and through the path of material entrained by the pins on the conveyor as these pins extend downwardly in the return flight knocks the tobacco loose from the pins and the conveyor against the forward end **37** of the housing **10**, and the sides and ends of the housing, together with a rear plate or panel **38**, constitute a receiving chute by which the tobacco falling from the conveyor together with that removed by the doffer is continuously fed to the receiving end of the endless conveyor **39** by which it may be continuously passed through the dryer, for example.

From the foregoing discussion, it will be evident that the tobacco is spread out in a uniform layer by its discharge on the conveyor **22**, and the action of the kicker **30**, and that residual tobacco is removed from this conveyor in clean-cut fashion by the arms or blades **36** of the doffer **34**, and thence deposited on belt **39** for move-

ment through the dryer with other tobacco which drops normally on belt 39. It will also be evident that the disadvantages of the prior art, in which the doffer operated in the reverse direction to that here involved, and in which substantial amounts of tobacco stuck to the upper edge of the back panel corresponding to 38, have been entirely eliminated.

While only a single embodiment of the invention has been described, it will be evident to those skilled in the art that it is susceptible to various modifications and refinements, and I therefore wish it to be understood that its interpretation is not to be limited except by the scope of the following claim.

I claim:

In a feed mechanism for fibrous material, the combination of an endless conveyor having spaced pins for entraining the material and carrying it to a delivery point, means including rotary guide and driving members for impelling and directing successive longitudinal portions of said conveyor forwardly and diagonally upwardly through a material-advancing flight in which said pins project upwardly from said portions, and rearwardly and diagonally downwardly through a material-discharging and return flight in which said pins project downwardly from said portions, a material-receiving hopper located below the rotary member about which said conveyor turns in changing from its material-advancing to its return flight, and having a forward wall located forwardly of the forward end of said rotary member, and a doffer mounted for rotation within said hopper and having arms movable across and between the locations of said pins below a portion of said return flight beyond said turn, and means for moving said doffer in a direction opposed to the movement of said conveyor as said material passes rearwardly in the return flight of said successive portions.

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