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PROCESS OF DRYING TOBACCO

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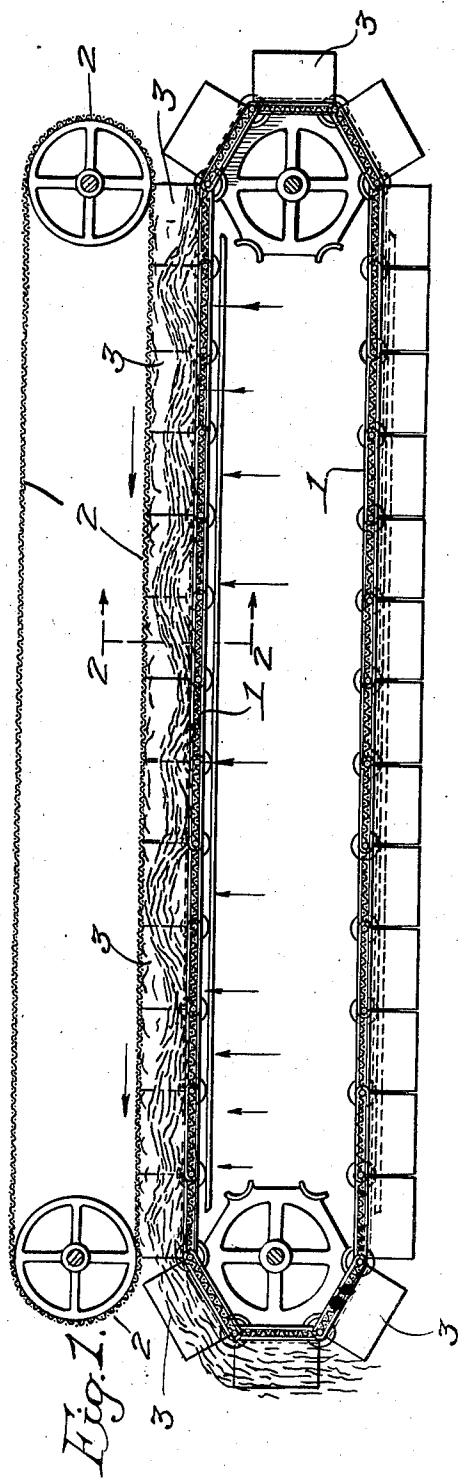
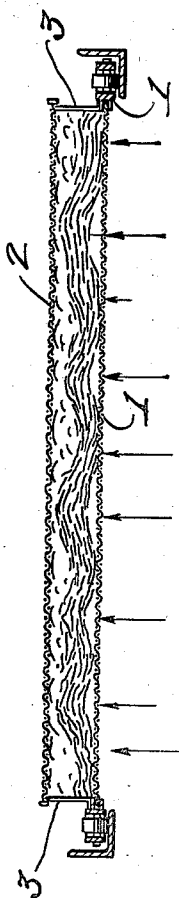


Fig. 2.



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PROCESS OF DRYING TOBACCO

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4 Claims. (Cl. 34—24)

This invention relates to a process for drying tobacco. Heretofore, it has been customary to lay tobacco leaves in flat overlapping relation to each other on a foraminous conveyer in a layer of several leaf thicknesses in depth. The conveyer passes through a drier casing and while in the casing air is blown downwardly from the top onto the layer of tobacco leaves, with the intention of the air passing through crevices formed in the layer and thence through the underlying foraminous conveyer, escaping from the under portion thereof and from which the air is drawn and recirculated around the conveyer to the top side of the layer.

Under the above noted process the drying has been more or less superficial, the packing of the leaves by the downward air pressure restricting and retarding the passage of the air through the layer. Hence, the leaves on the upper side of the layer and those adjacent the edges of the conveyer are dried while the leaves in the center and at the bottom of the layer are dried to a considerably lesser extent. This method also has the disadvantage of effecting a matting of the leaves which make the subsequent cooling and ordering of the tobacco difficult, and also resulted in the tobacco being discharged from the drier in a matted and hot condition. This method also is uneconomical in that the resistance presented to the air reacts against the fan by which the air is circulated, causing a low volume of air for a fan of given horse-power revolving at a predetermined number of revolutions per minute, the whole resulting in an extremely slow and unsatisfactory drying of the tobacco.

In order to offset the undesirable characteristics of the drying process above described, a reverse method has been tried and wherein the air is caused to travel upwardly, first through the foraminous conveyer and then through the layer of overlapping tobacco leaves thereon. This method effects a better opening up of the layer and permits a freer passage of the air through the layer and also produces a better and more uniform drying of the tobacco by reason of a greater percentage of the leaves coming in contact with the drying air.

One of the difficulties encountered with this method is that in some places the layer of leaves is not as heavy as in other places and a volume of air which will function effectively against the heavier portions of the layer and lift the same just a sufficient amount to loosen up the leaves sufficiently to permit the air to

pass through the layer will take the lighter portions of the layer and raise them into humps, similar to bubbles in the surface of the body of water, which eventually open up or burst, permitting a rush of air through the resultant openings and robbing the heavier parts of the layer of the air which normally would pass through these heavier parts, the air naturally taking the path of least resistance.

In order to overcome this objection the volume and velocity of the air necessarily has to be governed by the thinner and lighter portions of the layer. Another objection is that the smaller leaves or parts of leaves, being lighter than the full size and heavier leaves, will blow off the top of the layer and become broken, lost and ground to dust in the mechanism of the drier. Consequently, only low volume and low velocity air can be employed and the advantages attained by this method are, therefore, but little above the method wherein the air is blown down against the top of the layer. Another point about the blowing up method is that as the leaves become drier they naturally become lighter and have a tendency to float, frequently resulting in even the larger leaves being removed from the conveyer within the drier. To overcome this objection, it was found necessary during the last stages of the drying process to resort to the down flow method previously described and which caused the matting of the tobacco in the same manner as above noted.

The object of the present invention is to improve upon the up-flow method and by which the full advantages of such a method may be obtained without the objectionable points inherent in such method. A clear understanding of the method forming the subject matter of the present invention may be more readily attained by reference to the accompanying drawing, of which:

Fig. 1 is a diagrammatic longitudinal sectional view of an apparatus which may be employed for carrying out the improved method in accordance with the principles of the present invention; and

Fig. 2 is a transverse section taken on the line 2—2, Fig. 1.

As illustrated in the drawing, the apparatus comprises a foraminous conveyer which may be of any desired construction. The carrying run of the conveyer is preferably disposed in a horizontal plane.

Spaced above and running parallel with the

carrying run of the conveyer 1 is a second foraminous belt which travels with the carrying run of the conveyer 1, preferably at the same lineal speed therewith.

5 At the opposite sides respectively of the conveyer 1 and the upper belt 2, and closing the space between the two, are side walls 3, 3 which, while they may be stationary, are preferably movable with the belts 1 and 2 at the same lineal speed therewith.

10 The side walls 3, 3 may be of any form or construction desired and may constitute endless belts disposed in vertical planes or side plates carried by either one or the other or both of the belts 1 and 2, the construction being immaterial as long as the belts 1 and 2 and the side walls 3 together form a closed box-like structure in section transversely of the conveyer 1.

20 In carrying out the improved method in accordance with the principles of the present invention the tobacco leaves are spread on the carrying run of the conveyer 1 in overlapping relation to each other and to a depth less than the distance between the upper tobacco-confining surface of the carrying run of the foraminous conveyer 1 and the under tobacco-confining surface of the adjacent superposed run of the belt 2. Preferably the layer should not exceed 75% of this distance and be not less than 50% of this distance in thickness. However, these proportions are given merely as a matter of illustration and should not be considered as limiting the invention in any way.

35 The drying air or other gaseous drying medium is blown upwardly through the foraminous conveyer 1 and thence through the layer of tobacco leaves indicated at x, emerging from the top of the layer and passing upwardly through the foraminous belt 2.

40 The air is supplied in sufficient volume and at sufficient velocity to permeate through the heaviest portions of the layer, whereby all of the leaves are raised with respect to each other and separated by the air passing between the leaves and caused to more or less float along with the conveyers 1 and 2.

45 Any of the smaller and lighter leaves which may be lifted from the layer and which under the up-flow method previously described would be blown from the conveyer are trapped by the superposed belt 2 and carried along with the layer by the conveyer 2 to be returned to the layer at such time as the flow of air through the layer is cut off as the conveyer 1 approaches the discharge end of the drier or is about to enter into another stage of working of the tobacco forming the layer and wherein no further upward movement of the leaves will be effected.

60 The air may be projected upward through the tobacco by any suitable means such as relatively spaced nozzles, or the air may be driven into the drier casing (not shown) below the carrying run of the conveyer 1 and caused to rise through the tobacco by pressure built up in the lower part of the casing.

65 In those portions of the layer which are lighter and which under the up-flow method previously described would form into bubbles or blisters and eventually burst and cause the air to escape freely from the under side of the conveyer without passing through the leaves constituting the layer as a whole, will be arrested in the course of formation and before the leaves are raised to a sufficient height to be blown

about and leave a free air passage such as above noted and to this end the hold-down conveyer 2 should be spaced above the supporting conveyer 1 just a sufficient distance to permit a gentle rise and fall or floating action of the leaves as the air passes through the layer and not sufficiently above the top of the layer to permit the formation of the so-called blisters or bubbles.

From the above, it will be clear that a larger volume of air at a higher velocity than has been practical heretofore may be passed through the layer of tobacco with a result that the tobacco is discharged in a light fluffy and cool condition. The tobacco is dried more uniformly than has been possible heretofore and at a much higher rate, and the increased volume and velocity of the air can be produced by a fan of the same capacity and at the same horse-power as that described in connection with the above noted down-flow method of drying, this increased velocity and volume with the same capacity fan at the same power consumption being made possible by the loosening up of the leaves of the layer under the new method and a resultant reduction in the resistance to the passage of the air through the layer. The effect of the new method is to cause a rise and fall or wave-like action of the layer of tobacco leaves between the belts 1 and 2, and this action keeps the tobacco leaves in a constant state of agitation, resulting in a better and more uniform drying and increases the capacity of a drier of a given size to as much as 30% in the output or production of the drier.

I claim:

35 1. The method of drying tobacco which consists in arranging tobacco leaves in overlapping relation to each other in a layer between horizontal vertically spaced foraminous confining surfaces and vertically disposed laterally spaced confining surfaces with the layers of leaves of lesser thickness than the vertical spacing of said horizontal surfaces, passing a current of gaseous drying medium solely in an upward direction through and perpendicular to said foraminous surfaces and the layer of leaves confined therebetween, and effecting relative horizontal movement between said horizontal confining surfaces with the layer of leaves therebetween and the upwardly moving current of drying medium.

50 2. The method of drying tobacco which consists in arranging tobacco leaves in overlapping relation to each other in a layer between horizontally disposed foraminous confining surfaces spaced apart a distance greater than the thickness of the layer, and blowing a gaseous drying medium solely in an upward direction through and perpendicular to said foraminous surfaces and the layer of tobacco leaves confined for a limited amount of free relatively vertical movement between the leaves and relative to and between said surfaces.

65 3. The method of drying tobacco which consists in arranging tobacco leaves in overlapping relation to each other in a layer between horizontally disposed foraminous confining surfaces spaced apart a distance greater than the thickness of the layer, blowing a gaseous drying medium solely in an upward direction through and perpendicular to said foraminous surfaces and the layer of tobacco leaves confined for a limited amount of free relatively vertical movement between the leaves and relative to and between said surfaces, and moving said surfaces and the entrapped layer of tobacco leaves horizontally

and relative to and across the upwardly moving current of drying medium causing the layer of tobacco leaves to rise and fall in wave-like movements between said surfaces.

5 4. The method of drying tobacco which consists in arranging tobacco leaves in overlapping relation to each other in a layer between horizontally disposed foraminous confining surfaces spaced apart a distance greater than the thick-
10 ness of the layer, blowing a gaseous drying medium solely in an upward direction through and perpendicular to said foraminous surfaces and

the layer of tobacco leaves confined for a limited amount of free relatively vertical movement between the leaves and relative to and between said surfaces, and moving said surfaces and the entrapped layer of tobacco leaves horizontally and relative to and across the upwardly moving current of drying medium causing the layer of tobacco leaves to rise and fall in wave-like movements between said surfaces while confining said motion laterally within the longitudinal marginal edges of said surfaces.

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