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METHOD FOR CONDITIONING TOBACCO

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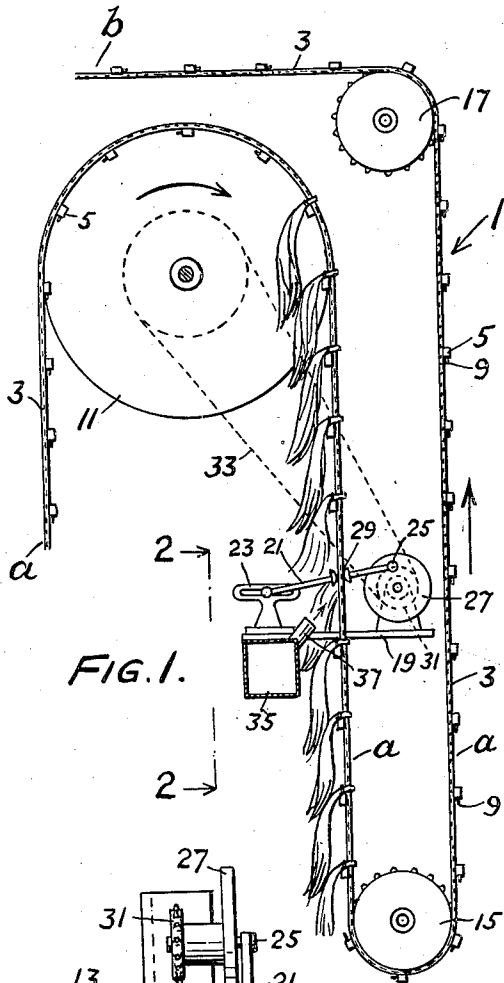


FIG. 1.

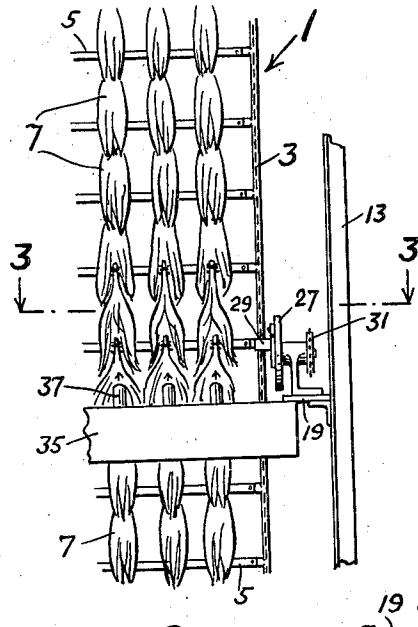


FIG. 2.

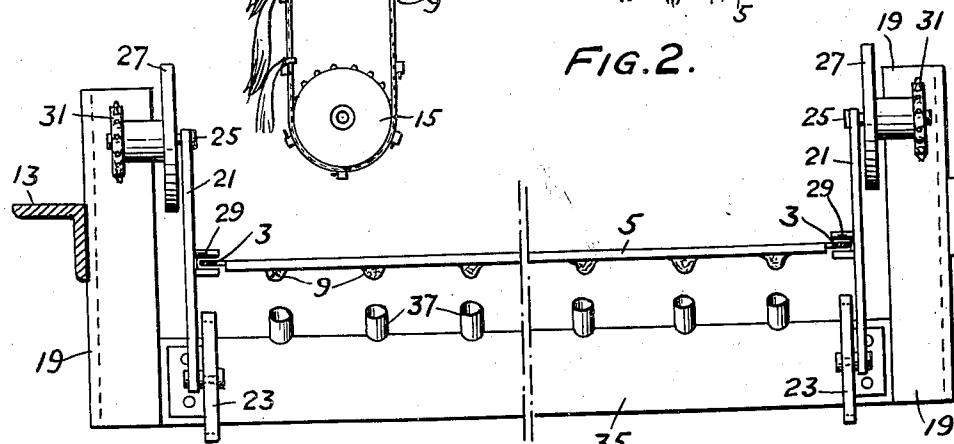


FIG. 3.

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METHOD FOR CONDITIONING TOBACCO

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2 Claims. (Cl. 131-140)

This invention relates to a method for conditioning tobacco.

More particularly, in accordance with this invention a method is provided whereby tobacco will be conditioned for any desired purpose. Thus, for example, tobacco may be conditioned by moistening or drying to adjust its moisture content for fermentation, by moistening to prepare it for sorting, packing, for use in the manufacture of cigars, etc.

In my copending application, Serial No. 27,174, filed June 18, 1935, now Patent No. 2,151,947, issued March 28, 1939, there is described and claimed a method and apparatus for conditioning hands of tobacco for these purposes. The apparatus there described comprises, broadly, a chamber in which travels a conveyor arranged with substantially vertical reaches and adapted to support bunches or hands of tobacco. Within the chamber there is arranged a system of ducts provided with outlets arranged with respect to the conveyor for the delivery to the chamber of conditioned gas in a manner to promote general circulation with respect to the tobacco and for the direction of conditioned gas into the bunches or hands. Means for the conditioning of gas, as air, with respect to temperature and humidity or moisture content are provided and are so arranged as to effect recirculation of air from the chamber through the system of ducts.

The conditioning of the tobacco is carried out by subjecting tobacco in bunches or hands to a gas, as air, conditioned with respect to the nature of the treatment of the tobacco, as moistening or drying. The gas, as air, is generally circulated with respect to the tobacco and/or forcefully directed into the hands or bunches for the purpose of opening or spreading the leaves, and, at the same time, the hands or bunches are subjected to movement through a circuitous path.

The present invention relates to improvements in the method described in the above referred to application.

The present invention, from the method standpoint, involves subjecting the conveyor for the hands of tobacco to positive agitation at a point or plurality of points in its path, preferably located in the vertical reaches; and, in its preferred form, directing forceful jets of conditioned gas, as air, into the hands of tobacco, preferably at the points where the conveyor is agitated.

Apparatus adapted for carrying out this invention comprises, broadly, in addition to the chamber, conveyor and conditioned gas distribution system described above, means for imparting positive agitation to the conveyor, which means are desirably adapted to impart

localized agitation to the vertical reaches of the conveyor, and preferably are associated with nozzles from the conditioned gas distribution system, or other means for directing forceful jets of conditioned gas at the hands of tobacco on the conveyor.

The more specific details of the method according to this invention will become apparent from the following detailed description of a preferred mode of operation in carrying out the method with reference to the accompanying drawing in which:

Figure 1 is a fragmentary sectional view showing one end of a conveyor system provided with agitating means in accordance with this invention,

Figure 2 is a fragmentary sectional view taken along the line 2-2 of Figure 1, and

Figure 3 is a horizontal sectional view taken on the line 3-3 of Figure 2.

In the drawing 1 indicates an endless conveyor which, in the form illustrated, comprises a pair of endless chains 3,3 from which are supported at spaced intervals cross bars or members 5. Secured to the crossbars 5 at spaced intervals are means 9 for holding hands of tobacco 7. These means may comprise, for example, bands of rubber secured at their ends to the crossbars.

The chains 3,3 pass over a series of relatively large sprockets 11 secured on shafts journaled in the upper part of a frame 13, and also over a series of relatively small sprockets 15 secured on shafts journaled in the lower part of the frame 13. In Figure 1 only a single large sprocket 11 and a single small sprocket 15 at one end of the conveyor are shown, but it will be appreciated that the complete conveyor will comprise a plurality of sprockets 11 and 15, each type positioned in line in the upper and lower parts, respectively, of the frame 13 and staggered with respect to one another.

By reason of this arrangement of the series of sprockets the conveyor will have a number of vertical reaches *a* in its travel over the series of sprockets. The conveyor at the end of the series of sprockets 11, 15 will pass, as shown in Figure 1, over the sprocket 17, positioned in the upper part of the frame 13, and back in a horizontal return reach *b* to the other end of the conveyor system.

The conveyor may be driven through a driving sprocket on one of the shafts of the sprockets 11 or 15 by suitable connection with any suitable prime mover, as through a chain or belt from an electric motor.

It will be understood that the entire conveyor system is positioned within a substantially closed room or chamber, in which, by means of any suitable air-conditioning apparatus, conditioned

gas, as air, of desired temperature and moisture content for effecting the desired treatment of the tobacco, as moistening, drying, cooling, fermenting, etc., is generally circulated about the conveyor.

Secured to plates 19 supported from the frame 13 are means for imparting positive agitation to the conveyor chains 3. These means comprise a pair of shafts 21 adapted to be reciprocated. The shafts 21 are supported and guided through a pivoted connection at one end by the guide members 23 and are pivoted at the other end on eccentric studs 25 carried by the crank discs 27. A pair of beveled flange members 29 on each shaft 21 act as guides for the conveyor chains 3 which pass between them and serve to impart motion of the shafts 21 to the conveyor.

The crank discs 27 are preferably driven through sprockets 31 by means of chains 33 from, for example, sprockets 11 of the conveyor system. Each crank disc 27 may be driven from separate sprockets 31, as shown in Figure 3, or each pair of crank discs may be secured on a single shaft and driven through a single sprocket 31.

A duct 35 leading conditioned gas from the conditioning apparatus is likewise secured to the plates 19 and is provided with a plurality of nozzles 37 spaced in alignment with the tobacco holding means 9 on the crossbars 5 of the conveyor and directed upward at an angle of about 45° into the hands of tobacco on the conveyor.

It will be understood that the conveyor agitating means described above may be operably connected to the conveyor at a point on each vertical reach *a* thereof, or only on some of the vertical reaches, or, without departing from this invention, on a horizontal reach thereof. Likewise the air ducts 35 and distributing nozzles 37 may be positioned at any desired point or points along the path of the conveyor, although preferably they will be associated with the conveyor agitating means.

In carrying out the method in accordance with this invention with the use of the apparatus described above, the conveyor will be put in motion, in the direction of the arrows, and charged with bundles or hands of tobacco 7 by inserting the butt ends thereof beneath the rubber bands 9, 9 on crossbars 5, 5. At the same time the air-conditioning apparatus is started and conditioned air is circulated through the chamber in which the conveyor travels and is also discharged in forceful jets from the nozzles 37.

In the travel of the conveyor through the vertical reaches *a* the leaves of the bunches or hands of tobacco will be, as it were, shingled with inversion of the hands by swinging through a 180° arc in the passage of the conveyor about the sprockets 11 and 15. In the vertical reaches the hands are suspended so that the major portion of the hands are substantially vertical.

As the conveyor moves downwardly in the vertical reaches *a* it will be subjected to a vigorous shaking or agitation as it passes between the guiding flanges 29 on the reciprocating shafts 21. The guiding flanges 29 are beveled so as to present no hindrance to the free motion of the conveyor chains 3. The shafts 21 may desirably have a travel of from about 4 to about 6 inches

and may, for example, be moved at a rate of 100-400 reciprocations per minute, thus imparting a vigorous shaking motion to the entire vertical reach of the conveyor. Under the influence of this agitation the hands of tobacco suspended on the conveyor are given a motion which tends to flex and separate the adhering leaves and so permit complete penetration of the hand by the conditioned atmosphere of the chamber.

At the same time the agitated hands are subjected to forceful jets of conditioned gas from the nozzles 37, directed upwardly into the hands at an acute angle relative to the direction of movement of the hands, which further serve to open up the hands and effect a thorough and uniform conditioning of the tobacco.

It will be noted that the oscillations of chains 3 are such as to position the hands momentarily coincident with the axis of the jets so that at that point substantially every part of the hands receives a portion of the gas from the jets.

If desired, the same treatment may likewise be carried out as the conveyor moves upwardly in the vertical reaches *a*, or the treatment may be carried out only during the upward motion of the conveyor. It is, however, preferred to agitate the conveyor and direct forceful jets of conditioned gas into the hands of tobacco as the conveyor moves downwardly.

As will be appreciated, numerous and various modifications in detail may be made in the apparatus and in the method of operation above described without departing from the scope of this invention.

What I claim and desire to protect by Letters Patent is:

1. The method of conditioning tobacco which includes moving hands of tobacco on a conveyor in a circuitous path including a vertical reach in which the hands move downwardly and are suspended so that the major portion of the hands are substantially vertical through an atmosphere of conditioned gas in a chamber, causing the conveyor to oscillate in a horizontal direction at a point in its travel in said vertical reach and simultaneously directing forceful jets of conditioned gas upwardly at an angle of about 45° to the direction of travel of said conveyor and into the hands at the point of oscillation of the conveyor, said oscillations being such as to position said hands momentarily so that they extend in a direction substantially coincident with the axis of the jets so that at that point substantially every part of the hands receives a portion of the gas from the jets.

2. The method of conditioning tobacco which includes moving hands of tobacco downwardly through an atmosphere of conditioned gas in a chamber while the hands are suspended so that the major portion of the hands is substantially vertical, directing forceful jets of conditioned gas upwardly towards the hands at an acute angle relative to the direction of movement of the hands, and in the region of the jets agitating the hands in a lateral direction thereby positioning said hands momentarily so that they extend in a direction substantially coincident with the jets so that at the region of the jets substantially every part of the hands receives a portion of the gas from the jets.

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