April 5, 1932. J. M. VAUGHAN 1,852,947

METHOD AND APPARATUS FOR CLEANING TOBACCO

Filed March 27, 1931 3 Sheets-Sheet 1

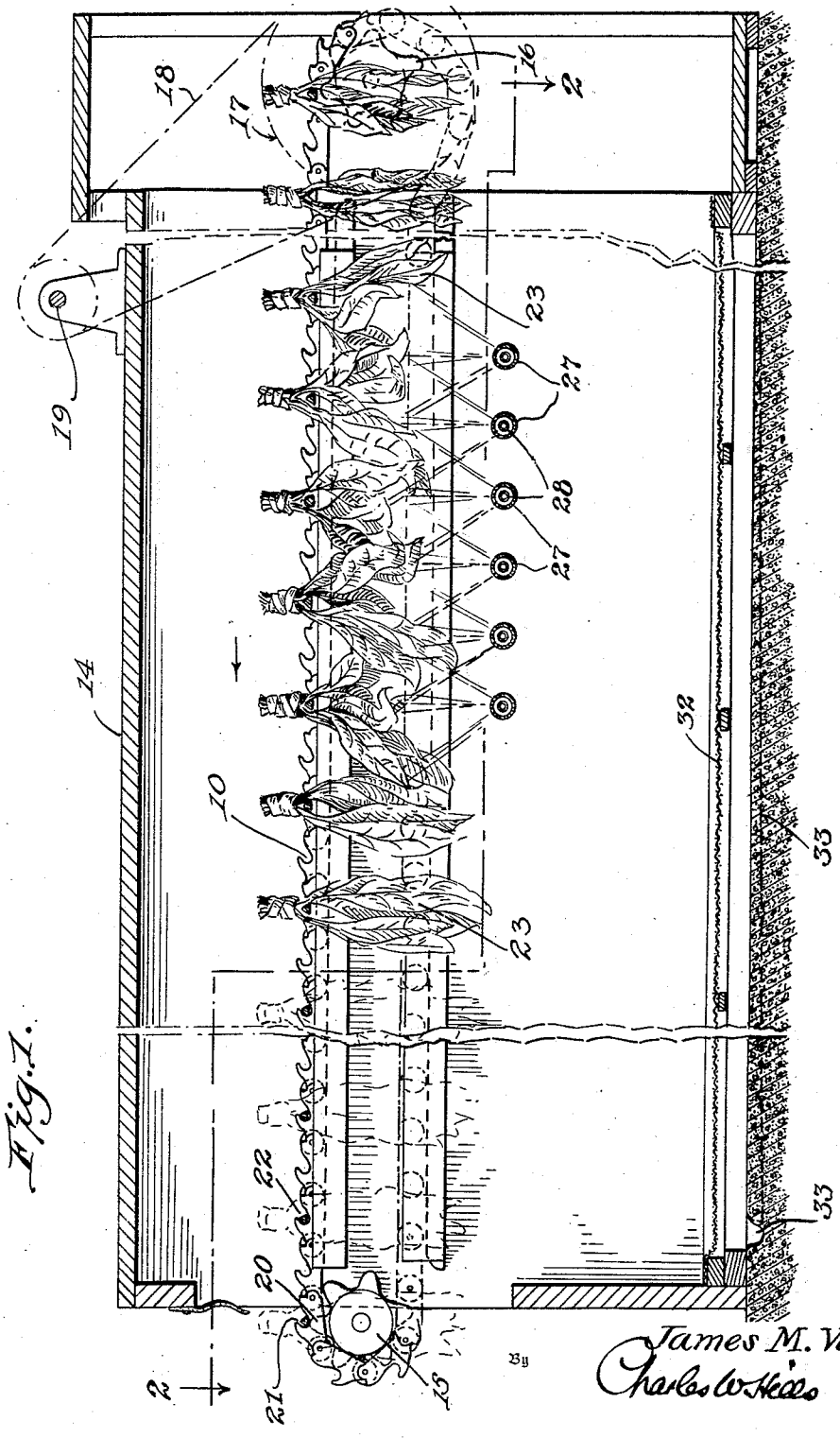

Fig. 1.

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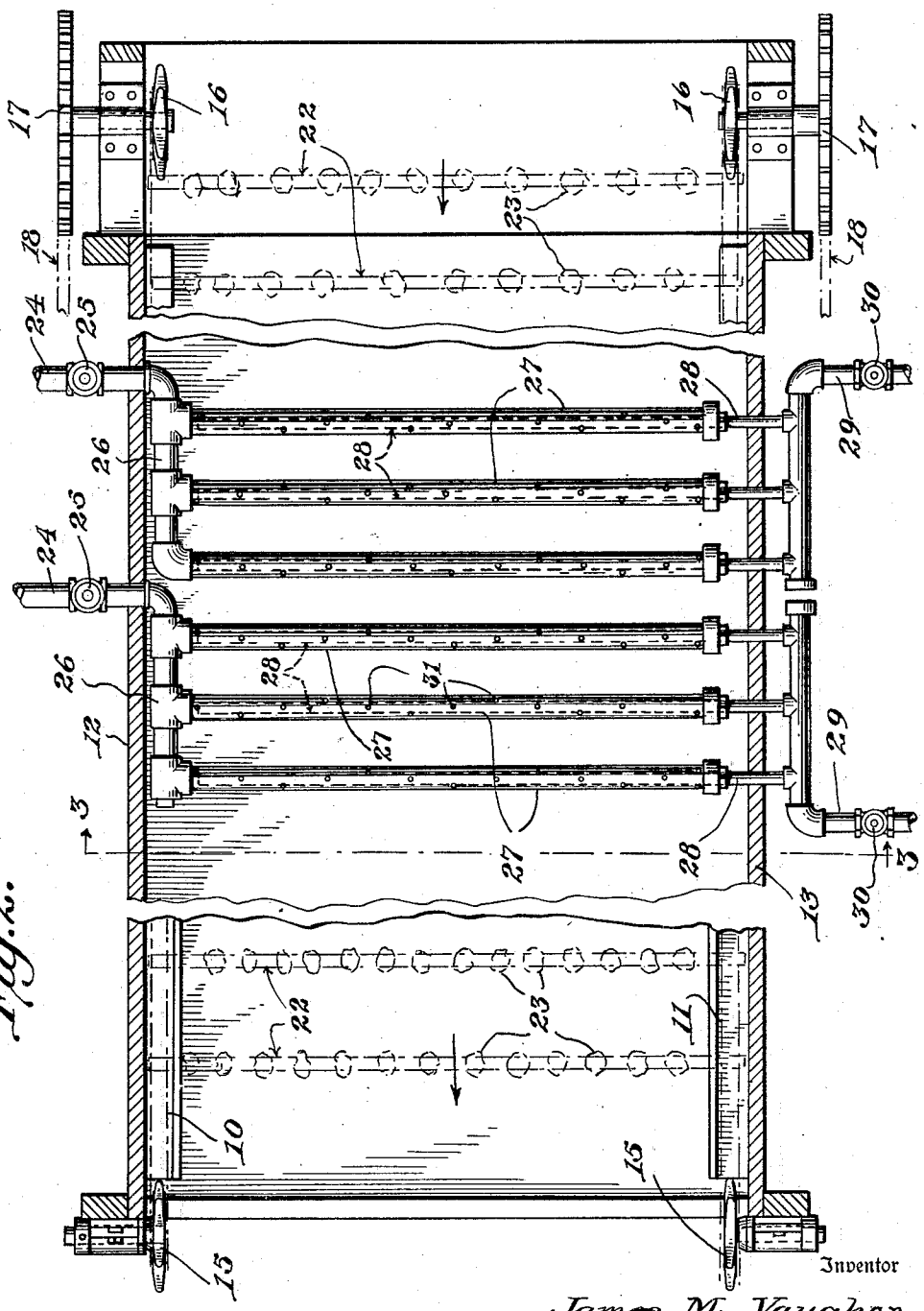

Fig. 2.

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Fig. 3.

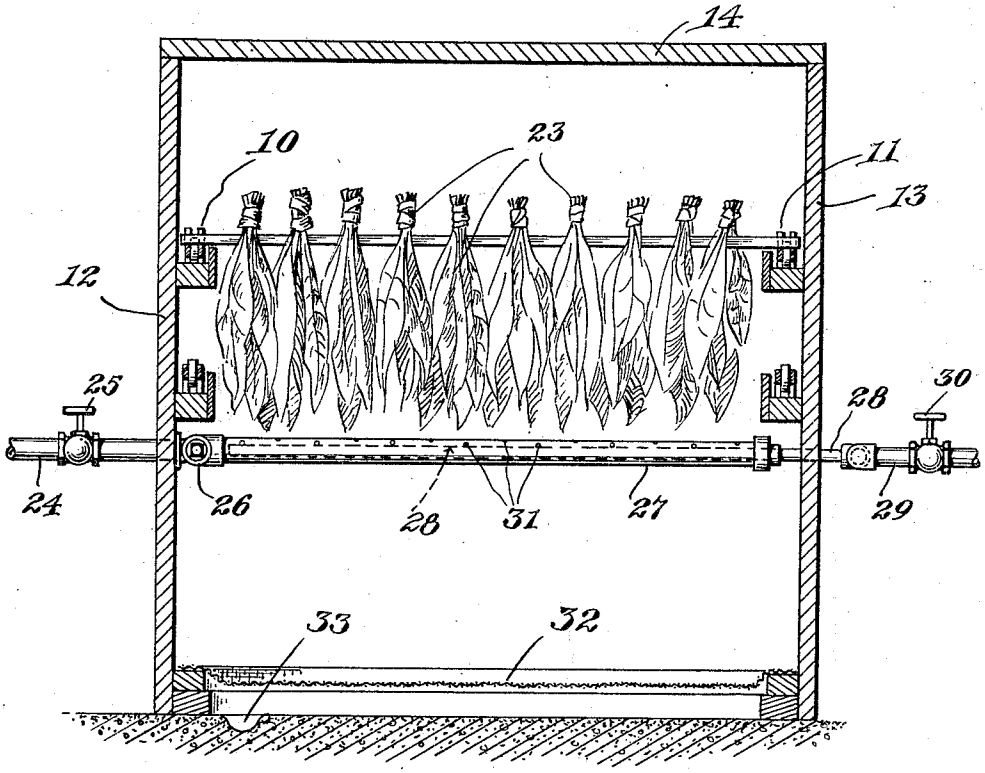


Fig. 4.

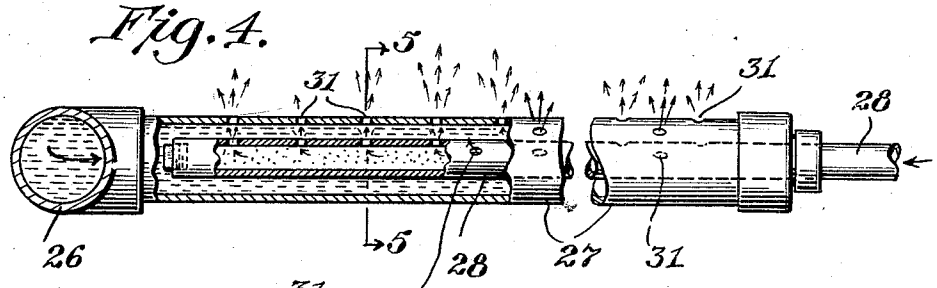
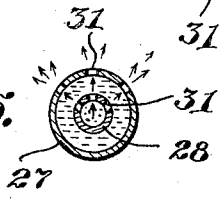


Fig. 5.



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UNITED STATES PATENT OFFICE

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METHOD AND APPARATUS FOR CLEANING TOBACCO

Application filed March 27, 1931. Serial No. 525,724.

My invention relates generally to the treatment of leaf tobacco, and more particularly to the cleaning of leaf tobacco after it has been cut, bundled and dried, and is in that stage, where, under normal circumstances the major portion of the crop is soiled by the gradual accumulation of dust and dirt throughout the usual hot dry growing season. Even when copious rains prevail immediately before the crop is cut, the lower leaves of the plants will be dirty and spattered from the ground.

The above conditions material lessen the market value of the crop, and while it has long been appreciated that the tobacco might be benefited in this respect by cleaning and re-drying, these operations are known to be attended with considerable difficulty, since the leaves when dried are in a fragile state, may be easily broken and injured and are subject to discoloration if re-wetted. So far cleaning has been attempted with but indifferent success, and up to the present time no effective economical method or apparatus has been advanced.

It is well known that after cutting, the tobacco leaves are bundled and are hung and dried in such bundles. In order that the necessary handling of the tobacco for the purposes of cleaning and re-drying may be reduced to a minimum, my invention proposes a method and apparatus according to which the tobacco is treated in the bundles just as it has previously dried, and my invention has for its primary object, the provision of a method and apparatus whereby the tobacco may be effectively and economically treated with a cleansing liquid, without injury or discoloration, so that when re-dried its value will be increased in a very substantial degree over and above the cost of cleaning and re-drying operations. For the above purposes my invention proposes the disposition of the bundles of tobacco just as they have previously dried upon hanger rods capable of utilization in connection with an endless conveyer arrangement to which the rods are attached at one point and from which the rods are removed at another point after the tobacco has been cleaned.

Each of the above hanger rods receives a row of bundles and before association with the conveyer each rod with its row of bundles is shaken before being placed in the conveyer, in order to loosen the hanging leaves of tobacco and free the same from any adherence to one another. The rods are then placed in the conveyer and while in course of movement therewith, the leaf tobacco is thoroughly cleaned by directing sprays of steam and water upwardly against the bundles so that the sprays will readily find their way between the leaves and against all portions of the surfaces thereof.

The sprays are preferably directed upwardly against the bundles of tobacco at various angles and, being stationary with respect to the moving conveyer, the angles of the various sprays necessarily constantly change by virtue of the continuous movement of the tobacco bundle past the spraying station.

My invention proposes such a conveyer for the purposes thereof as will permit the hanger rods on which the bundles are disposed to be lifted bodily with the hanging bundles, after the cleaning operation and removed for re-drying without danger of pressure and the discoloration of the tobacco resulting from such pressure.

I preferably carry out my improved method by means of the apparatus illustrated in the accompanying drawings, which form a part of this specification and in which:

Figure 1 is a vertical longitudinal section taken through a cleaning apparatus forming a part of my invention.

Figure 2 is a horizontal sectional view taken therethrough substantially on the line 2—2 of Figure 1.

Figure 3 is a transverse vertical sectional view taken on line 3—3 of Figure 2.

Figure 4 is a detail view on an enlarged section, partly in elevation and partly in section, of one of the spraying pipes.

Figure 5 is a detail transverse section, taken on line 5—5 of Figure 4.

Referring now to these figures, the conveyer, as utilized with my invention, consists of a pair of endless chains 10 and 11, which, as best seen in Figures 2 and 3, are mounted

in horizontal opposed relation at the inner surfaces of the opposite side walls 12 and 13 of a conveyer housing 14.

Each of the chains 10 and 11 travels at its forward and rear ends respectively around sprocket wheels 15 and 16, and as seen in Figures 1 and 2, the rear sprocket wheels 16 may be mounted upon short shafts at whose outer ends sprocket wheels 17 are mounted for connection by sprocket chains 18 with an upper transverse shaft 19, which may be belt-connected in turn to any suitable source of power.

Each of the chains 10 and 11 is, moreover, composed of a series of hinged or pivoted links 20 and each link has an undercut shoulder at 21 to form a seat for one end of one of the cross road 22 upon each of which rods a number of bundles of tobacco 23 are disposed in a row.

Intermediate the ends of the conveyer housing and extending through the side wall 12, as best shown in Figure 2, are water supply pipes 24, each having a cut off valve 25, and each communicating at the inner side of the wall 12 with a header 26 from which a series of water spray pipes 27 project transversely across the interior of the housing in a horizontal plane below the level of the conveyer chains 10 and 11 and below the level of the bundles of tobacco conveyed through the housing in connection with these chains and the supporting rods 22 just above mentioned.

Through the opposite wall 13 of the housing a series of steam supply pipes 28 project, in number, equal to the number of water spray pipes 27, each of the steam spray pipes 28 being axially alined with its respective water spray pipe 27 and projecting into the same for approximately its full length. At their outer ends the steam spray pipe 28, outwardly beyond the housing side wall 13, communicate with steam supply pipes 29, and these latter pipes have therein shut-off valves 30.

It will be noted that those portions of the steam and water spray pipes 28 and 27 within the housing and, as best seen in Figure 4, have spray perforations 31, the extremities of the steam spray pipes 28 being closed as are the ends of the water spray pipes where the steam spray pipes enter the same. Preferably these spray pipes have their perforations to discharge sprays upwardly at various angles as will be plainly seen by reference to Figure 5, and it is thus obvious that water supplied through the connections stated to the water spray pipes 27 will be forcibly ejected through the spray apertures or perforations when steam is supplied to the steam spray pipes 28, the steam itself creating with the water a fine spray and joining with the same in its upward movement at various angles towards the bundles of tobacco passing along the conveyer, as plainly seen by reference to Figure 1.

The bundles of tobacco having been transferred according to my invention from racks or other structure upon which they have been initially dried to the rods 22, upon which they are placed in substantially the same manner in which they previously rested in connection with the drying racks, are first shaken in order to loosen the leaves and break any adhesions. The rods are then placed with their ends in connection with the conveyer chains adjacent to the forward end of the conveyer housing and through the connections above described bringing about slow continuous movement of the conveyer chains, are fed through the housing, in hanging positions so that when the spray station is reached, the sprays of steam and water will act to further separate the leaves and find their way completely between the same and to all portions of the surfaces of the leaves. After the spray station has been passed, excess moisture drains from the leaves freely to the base of the housing as does the surplus cleansing water, and at the base of the housing for this purpose there is preferably arranged a screen bottom 32 and a suitable drain channel 33 below the screen, whereby the cleansing fluid may be passed off to a sewer or other point of ultimate disposal.

The cleansed bundles of tobacco are free of most of the surplus fluid by the time they reach the rear end of the conveyer where the rods are just as freely removable from the conveyer chains as they were placed in connection with the chains at the forward end of the conveyer, and upon removal from the conveyer chains, the rods with their rows of bundles are hung upon racks of any suitable nature and re-dried preferably upon the same hanger rods upon which they passed through the conveyer and through the cleaning apparatus so as to avoid re-handling and all danger of pressure which might cause discoloration.

The tobacco may be thoroughly cleaned in this way and with reasonably careful handling all danger of injury to the leaves is avoided and all danger of discoloration eliminated, with the result that the tobacco in a clean state will bring the maximum price of its class and will be enhanced in value to a degree substantially beyond the cost involved in its cleaning and re-drying.

What is claimed is:

1. The method of cleaning tobacco which consists in disposing tobacco in bundles in connection with a support so that the leaves depend freely below the support, and then directing sprays of cleansing liquid upwardly against the bundles with sufficient pressure to spread and separate the leaves and completely permeate the bundles.

2. The method of cleaning tobacco which consists in disposing tobacco in bundles in connection with a movable support so that the leaves thereof during movement depend

freely below the support and then directing sprays of cleansing liquid upwardly against the bundles while in course of movement and with sufficient pressure to separate the leaves and strike the surfaces thereof at constantly varying angles.

3. The method of cleaning dry tobacco in bundles which consists in spraying the same with steam and water and at the same time supporting the bundles so that the sprays will separate the leaves and strike all surfaces thereof.

4. The method of cleaning dry tobacco in bundles which consists in spraying the same with steam and water and at the same time supporting and moving the bundles with respect to the sprays so that the latter will separate the leaves and completely permeate the bundles at constantly varying angles.

5. An apparatus for cleaning tobacco in bundles consisting of a series of water and steam spray pipes arranged to eject upwardly directed sprays, and means for supporting and moving the tobacco past the spray pipes including movable carriers and hangers for supporting the bundles of tobacco whereby they depend with respect to the carriers, said hangers being freely engageable with and removable from the carriers.

6. An apparatus for cleaning tobacco in bundles consisting of a series of water and steam spray pipes arranged to eject upwardly directed sprays, a housing therefor, a conveyer including movable carriers extending through the housing along and above the spray pipes, and supporting members for the bundles of tobacco, which members are freely engageable with the carriers at one end of the housing and removable therefrom at the other end of the housing.

7. An apparatus for cleaning dry tobacco in bundles consisting of a series of spray pipes arranged to eject upwardly directed sprays, a housing therefor, and a conveyer for the tobacco extending through the housing above the spray pipes, each of said spray pipes including an inner steam pipe and an outer water pipe, and connections for supplying steam and water to the respective pipes.

8. An apparatus for cleaning tobacco in bundles including means for supporting and moving bundles of tobacco during the cleaning operation so that the open ends of the bundles depend, and means for spraying steam and water into the open end of the bundles at constantly varying angles during their movement.

In testimony whereof I hereunto affix my signature.

JAMES M. VAUGHAN.