

April 1, 1952

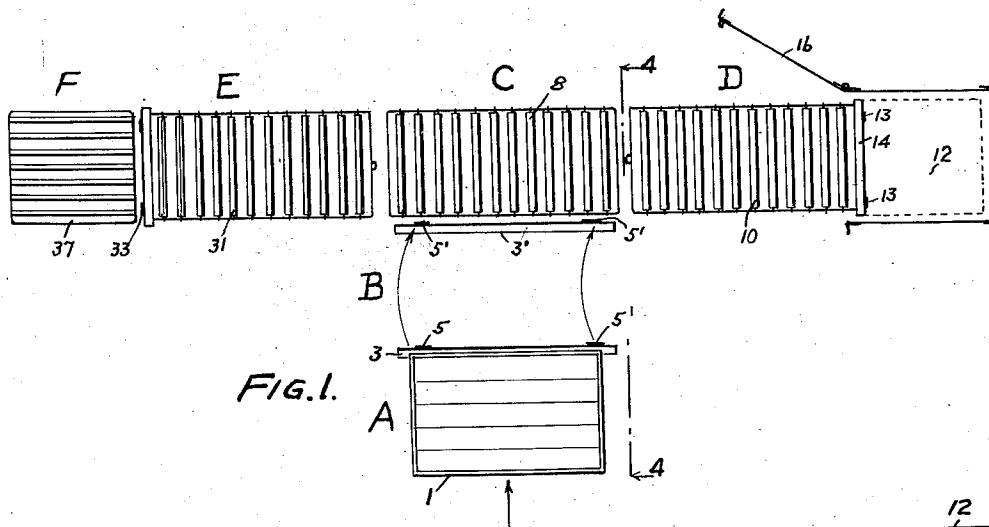
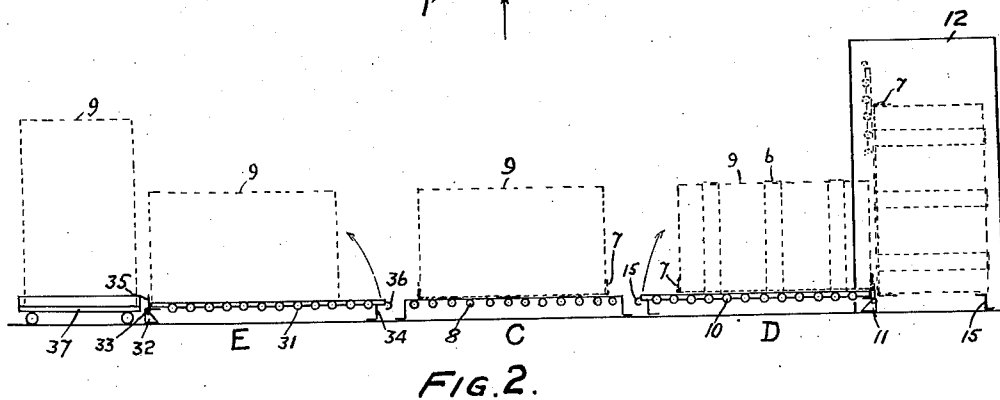
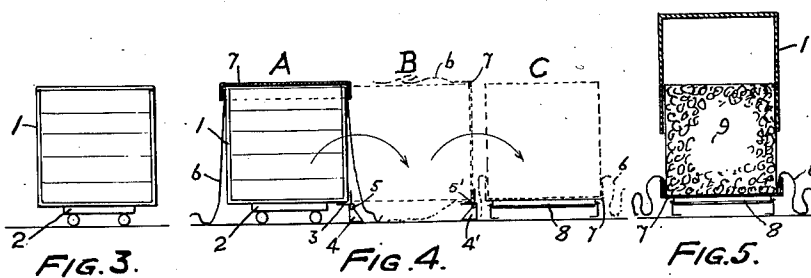
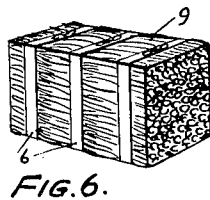
R. D. TOUTON

2,591,026

METHOD AND APPARATUS FOR WETTING BALED TOBACCO

Filed Dec. 30, 1944

3 Sheets-Sheet 1



WITNESS:

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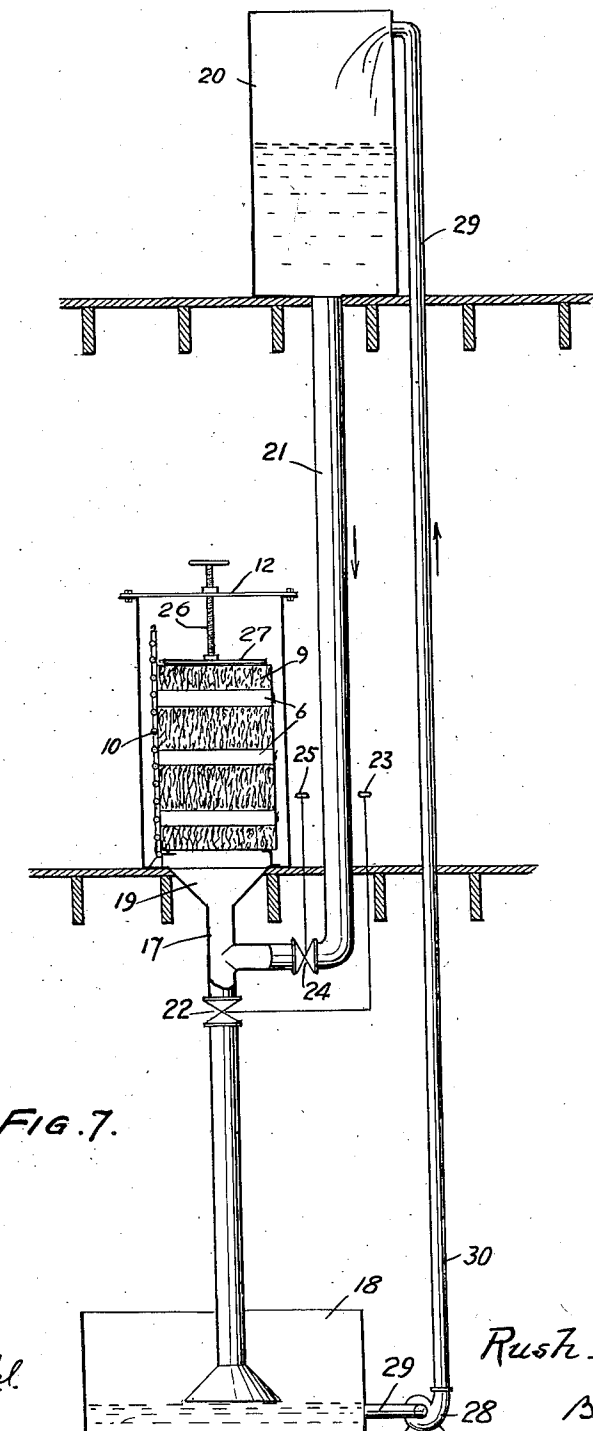
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2,591,026

METHOD AND APPARATUS FOR WETTING BALED TOBACCO

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3 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,591,026

METHOD AND APPARATUS FOR WETTING
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Application December 30, 1944, Serial No. 570,667

6 Claims. (Cl. 131--136)

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This invention relates to method and apparatus for wetting baled tobacco.

More particularly the method and apparatus according to this invention is adapted to the initial wetting of tobacco in hands as packed in the case without separation of the hands.

As is well known, tobacco, more particularly of the type used in the manufacture of cigars, in hands, after curing, is packed into cases for storage and shipment. The hands are customarily packed into the case in layers to extend oppositely lengthwise, the end portions of the leaves forming the hands overlapped and with the butts at the ends of the case. By way of example, the dimension of a standard case, which is made of wood, are 30" x 30" x 48" and the hands of tobacco are laid into it to extend lengthwise with the butts at ends and an overlap of the leaf portions of usually about six inches.

The tobacco packed in the case becomes dry and the leaves in such state are brittle and easily broken in handling, so that initial moistening of the tobacco to prepare it for treatment leading to its ultimate manufacture into, for example, cigars, has always heretofore presented a difficult problem.

For the initial moistening of tobacco heretofore, it has been customary to remove the case, separate the several closely packed hands, using all care to avoid breakage of the leaves, dip the hands individually in water and then pack them away for a period to permit equalization of the moisture content.

It has heretofore been attempted to moisten tobacco, after removal of the case, without separation of the hands, by dipping the mass in water and then separating the hands and subjecting them to a conditioned atmosphere for equalization of the moisture. However, it has been found that in so proceeding such non-uniformity of moistening is effected as to negative any apparent advantage in handling the tobacco in the mass over separating the individual hands and then moistening them by dipping them individually.

Now in accordance with this invention, it has been found that tobacco in bale form, after removal of the case, may be efficiently moistened to a uniform moisture content if the bale be subjected to flooding with water under pressure with the bale so positioned that the hands extend vertically, the bale permitted to drain and then, with the bale in a position such that the hands extend vertically, subjected to a conditioned atmosphere to equalize the moisture content of the tobacco in the bale.

With such treatment it has been found that without separating the packed hands, the tobacco leaves throughout the mass will be uniformly moistened and the hands may then be readily

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separated for further treatment of the tobacco without injury to the leaves.

Having now indicated the nature and purpose of this invention, the method and apparatus according thereto will be made apparent, from the broad and specific standpoints, by the following description of a preferred form of apparatus and procedure for the moistening of tobacco with use thereof, all with reference to the accompanying drawings, in which:

Figure 1 is a plan view of a part of the apparatus embodying this invention and adapted for the carrying out of a stage of the method thereof.

Figure 2 is a side view, partly diagrammatic, of a part of the apparatus shown in Figure 1.

Figure 3 is an end view of a case of tobacco on a dolly for introduction to the apparatus shown in Figure 1.

Figure 4 is a view, partly diagrammatic, on line 4, 4, Figure 1, taken in the direction of the arrows.

Figure 5 is an end view illustrating the removal of the wooden case from the tobacco.

Figure 6 is a perspective view of a bale of tobacco prepared for treatment.

Figure 7 is an elevation, partly in section, showing a detail of construction of the apparatus shown in Figure 1.

Figure 8 is a plan view of a part of the apparatus according to this invention adapted for carrying out another stage of the method thereof.

Figure 9 is a view, partly in section and partly diagrammatic, to show details of the showing of Figure 8.

Referring now to the several figures, 1 indicates a case of tobacco as received by the manufacturer and containing dry, tightly packed hands of tobacco laid in the case oppositely with the end portions of the hands overlapped and with the butts at the opposite ends of the case. The case, for transfer from storage to treatment for moistening of the tobacco, will be placed on its side on a dolly 2, the platform of which will be of less area than the side of the case, as shown in Figure 3.

The case 1 will be moved on the dolly 2 to the position A, Figures 1 and 4, with its edge resting on an angle 3 extending longitudinally of the case and turnably supported from brackets 4 by hinges 5. The brackets 4 will extend from, for example, the floor of a building housing the apparatus so as to position the angle 3 at a height to receive the case as supported on the dolly 2.

The case 1 being in position A, the top of the case is removed and a plurality of straps or belts 6 are laid in spaced relation over the open top of the case. The straps 6 may be of any suitable material, as webbing, and will be of a length such as to enable them to be passed around the mass of tobacco in the case, and their ends secured.

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The mass of tobacco in the case, it may be noted, will be about two inches less all around than the case, where, as is usual, the case is constructed of one inch lumber. The straps 6 may be conveniently of a width of about four inches and the provision of three straps, one placed centrally of and one adjacent each end of the case, will usually suffice.

After the straps 6 are placed, a pan 7 is placed over the top of the case, as shown in Figure 4.

The case 1 is now turned 90° off the dolly 2 into position B, Figures 1 and 4, into edge engagement with the angle 3', supported from brackets 4' by hinges 5'; and then the case is turned through a further 90° into position C, Figures 1 and 4. The case is thus rotated through 180° from position A to position C.

In position C the pan 7 rests upon a roller conveyor 8, the pan acting to support the mass of tobacco in the case.

In position C the case 1 is lifted off of the mass of tobacco, as shown in Figure 5, and the straps 6 are brought around the mass of tobacco and their ends secured in any convenient manner, as by the provision of buckles, to secure the hands forming the mass, as shown in Figure 6.

After the removal of the case and the securing of the straps 6 about the mass of tobacco, the mass will constitute, in effect, a bale 9 tied by the straps 6 and lying on its side in the pan 7 on the conveyor 8. It will be noted that the hands of tobacco in the bale in position C will lie horizontally.

The bale 9, resting in pan 7, is moved longitudinally off of the conveyor 8 to position D, in which it will rest on a roller conveyor 10, one end of which lies adjacent to conveyor 8 and the other end of which is mounted on brackets 11 at the bottom of a vertically extending chamber 12 through hinges 13. The hinged end of the conveyor 10 is provided with an angle bracket 14 against which the bale is pushed. The end of conveyor 10, remote from the chamber 12, is provided with a hook 15. The conveyor and a bale 9 of hands of tobacco carried thereby are raised on the hinges 13 into the chamber 12. The bale 9 is then supported on angle 14 and a support 15 in the chamber.

When the bale 9 is positioned in chamber 12, by the raising thereof of the conveyor 10, the hands of tobacco will stand vertically with the butts of the hands at the top and bottom, as shown in Figure 7.

The chamber 12, as shown in Figure 7, will be of a size to receive the bale 9 with clearance all around and will extend vertically above the bale, but will not be of substantially larger cross-sectional area than the cross-sectional area of the bale with the hands in vertical extension. A door 16, provided with a gasket and dogs enabling it to be made water-tight when closed, will be provided for admission of the bale 9. Adjustable on a screw 26, which extends through the top of chamber 12, is a hold down plate 27, adapted to be adjusted to the top of the bale 9 when it is entered in the chamber 12.

Opening into the bottom of chamber 12 is a pipe 17 leading vertically downward to a tank 18 positioned below chamber 12, to give say, for example, about a 15 foot suction leg. The pipe 17 will desirably open into the chamber 12 in a flared or funnel-like form, as shown at 19.

A tank 20, at an elevation above the chamber 12, to give, say, for example, a 15 foot pressure

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head, is connected to chamber 12 by a pipe 21 connected to pipe 17.

Flow through pipe 17 from chamber 12 to the tank 18 is controlled by a valve 22 in pipe 17 connected for manual operation, to a handle 23 positioned at a convenient point; and flow from tank 20 to chamber 12 is controlled by a valve 24 in pipe 21, connected, for manual control, to a handle 25 positioned adjacent to handle 23 for the control of valve 22.

A pump 28, positioned adjacent to tank 18 and the suction side of which is connected to tank 18 through a pipe 29, is adapted to discharge water from tank 18 to tank 20 through pipe 30.

Assuming at this point that a bale 9 has been positioned in chamber 12, the door 16 dogged shut, as described, and that the valve 22 is closed, the valve 24 is opened, which results in the admission of water to the bottom of chamber 12 under the pressure head of tank 20.

The water admitted to the bottom of chamber 12 will be distributed over the lower end of the bale 9 in a stream of definite form and direction by, for example, the flared or jet-like form of the discharge end of pipe 17, and the valve 24 will be so manipulated for the admission of water to chamber 12 at a pressure flow such as to flood the chamber sufficiently and desirably in most cases to a depth of, for example, 0.5-4.0 inches over the bale 9 in a period of say, for example, 5-60 seconds. Flooding of the bale will be prevented by the hold-down plate 27.

When the bale has been flooded the valve 24 is closed and the valve 22 opened. The water in chamber 12 then passes down pipe 17 into tank 18 and a degree of suction is put upon the chamber by virtue of the pipe 17 acting as a suction leg. The pump 28 is operated to return the water from tank 18 to tank 20 for the treatment of the next bale entered into chamber 12.

After the bale has drained in chamber 12, say, for example, for a period of 2-20 minutes, the door 16 is opened and the bale tipped out of chamber 12 by swinging the conveyor 10 down to its original position, as shown in Figure 2.

The bale 9, on removal from the chamber 12, is immediately moved across the conveyor 8 into position E on a roller conveyor 31, adjacent to and extending from conveyor 8 in the opposite direction from conveyor 10.

The conveyor 31, which lies in the plane of conveyor 8, is mounted at its end remote from conveyor 8 on brackets 32 through hinges 33 and is supported at its end adjacent to conveyor 8 by an angle member 34. The conveyor 31 is provided at its end remote from conveyor 8 with an angle bracket 35 against which the end of bale 9 bears when it is in position E and a hook 36 is provided for connection with a hoist to lift the conveyor on its hinges 33.

Immediately that the bale 9 is placed in position E, the conveyor 31 is lifted on its hinges and the bale placed on a dolly 37 having a perforated or slat bottom.

It will be observed that the bale 9 as positioned on the dolly 37 stands on end with the hands extending vertically and is inverted or turned end for end with respect to its position in the chamber 12. In other words, the end of the bale which was down in the chamber 12 is up on the dolly 37.

When the bale 9 has been positioned on the dolly 37, which, as has been noted, has a slatted bottom promoting drainage in the position F, the bale and dolly are moved to position G, Figure 8.

Position G, Figure 8 is opposite swinging doors 39, giving entry to a room or chamber 38, in

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which a conditioned atmosphere, say, for example, an atmosphere of 130° F. and having a relative humidity of about 70% is maintained.

Opposite to the swinging doors 39 which give access to the chamber are swinging doors 39', and between the two sets of doors extend rails 40, which may be formed of channel section material.

From the position G the bale 9 on the dolly 37 is entered just within the room 38 through the swinging doors 39, the wheels of the dolly being tracked with the tracks 40. As subsequent bales 9 of tobacco are treated by flooding with water in the chamber 12 and inverted on a dolly 37, as described above with reference to Figure 1, they are moved to position G and entered in chamber 38. As each successive bale and dolly are entered into chamber 38, the bale and dolly previously entered are advanced toward the doors 39', through which, one by one, they are discharged from the chamber as bales and dollies are entered into the chamber from position G.

The chamber will be of a length such that, with respect to the condition of the air within the chamber, the excess moisture in the upper part of the bales 9, which were down in the chamber 12, will drain down into the lower part of the bales, which were up in chamber 12, and time will be afforded for uniform distribution to, and absorption of, moisture by the leaves of the hands forming the bales; and the upper portion of the bale, especially the butt portion of the hand, down in the chamber 12 and hence carrying excess moisture, will be exposed for drying.

The bales and dollies as discharged from chamber 38 will be moved into position G', Figure 8, from which position they will be tipped through 90° into position H, in which position the straps 6 will be removed. At position H the hands 50 forming the bale will lie horizontally and may be readily picked up and charged on to a conveyor 41, which travels in chamber 38, with its ends extending beyond the end walls of the chamber, for treatment of the hands, as by jets of conditioned air, for exfoliation of the leaves and adjustment of the moisture content.

The conveyor 41 may be of any desired or well known type for conveying the tobacco with respect to jets of air, or other means for its treatment. By way of example, the conveyor shown in Figure 8 diagrammatically may be of the structure fully illustrated and described in United States Letters Patent No. 2,334,362 to R. D. Touton which issued November 16, 1943.

It will now be observed that the apparatus in accordance with this invention involves means for the handling of tobacco hands in the bale to its flooding with water in a particular position, i. e., with the hands in vertical extension, for then effecting rapid end for end inversion of the flooded bale to effect a uniform distribution of the water therein, and means for subsequent treatment to adjust the moisture content of the tobacco leaves.

The method in accordance with this invention, it will be noted, involves the manipulation of tobacco hands in the case for removal of the case without disturbing the hands of tobacco, and with the formation of a bale, and the wetting of the bale with water with the hands in vertical extension, followed by manipulation of the bale for its rapid inversion end for end, followed by a period of drainage from and drying of the wetter end. More specifically, the method involves such procedure plus manipulation of the

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bale to enable ready removal of the hands of tobacco to conveying means, on which they are subjected to further treatment for adjustment of the moisture content of the tobacco leaves.

In carrying out the method in accordance with this invention, the setting up of certain conditions will be substantially critical to the desirable and efficient wetting of the tobacco.

Thus, the flooding time of the bale in chamber 12 will be only such as is necessary to effect removal from the bale of substantially all the air, as will be indicated by the existence of only small bubbles above the bale. However, variously air will be entrapped within the bale or within pockets which may exist between leaves and which will be compressed by the entering water. Such air compressed within the bale will, when the bale is inverted, act to facilitate distribution of water. The pressure of the water admitted at the bottom of chamber 19 from tank 20 will be within the range of 2-25 pounds per square inch and for control of the time required for wetting and the extent thereof, the water will desirably be at a temperature of 60° F.-110° F., and the water will be admitted to the chamber at a rate such as to desirably flood over the bale to a depth of 0.5-4.0 inches in from 10 to 30 seconds.

The length of the drain pipe to chamber 13 will be such as to rapidly drain the water off from the chamber and to draw a substantial vacuum. The bale will be permitted to stand in the chamber to drain after withdrawal of the water for from 5 to 10 minutes.

Removal of the bale from the chamber 12 and its inversion to position on dolly 37 will be accomplished rapidly so that rapid inversion of the bale from its position in chamber 12 will be accomplished.

The chamber 38 will be of sufficient length so that the bales will remain therein for a period of from 3 to 70 hours and the atmosphere in the chamber 38 will be conditioned to a temperature of about 100° F.-130° F. with a relative humidity of 55%-70%. The bales while in chamber 38 will be subjected to drainage from the wetter upper part of the bale, which was down in chamber 12, to the drier lower part of the bale, which was up in chamber 12 and, at the same time, the upper wetter part of the bale, and more especially the exposed butts of the hands, will be subjected to a drying action, all promoting uniformity in the moisture content of the bale when it leaves the chamber 38.

It will be appreciated that if desired flavors and/or curing reagents may be added to the water used for wetting the bale. Likewise, if desired, a wetting or moisture-retaining agent, as, for example, glycerine, may be added to the water.

It will be appreciated that various modification in detail may be made from the above particular description of preferred apparatus and procedure according to this invention without departing from the scope thereof or from the scope of the appended claims.

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

1. The method of wetting hands of tobacco which includes removing the top from a case of tobacco hands, placing ties over the exposed tobacco hands, placing a support over the exposed tobacco hands, rotating the case through 180°, removing the case from the tobacco hands and securing the ties to form a bale, tipping the bale

on end, flooding the bale with water, and inverting the bale to permit drainage.

2. The method of wetting hands of tobacco which includes removing the top from a case of tobacco hands, placing ties over the exposed tobacco hands, placing a support over the exposed tobacco hands, rotating the case through 180°, removing the case from the tobacco hands and securing the ties to form a bale, tipping the bale on end, flooding the bale with water, inverting the bale to permit drainage while subjecting the bale to an atmosphere above atmospheric temperature, tipping the bale through 90°, removing the ties and separating the hands of tobacco.

3. Apparatus which comprises means for the wetting of baled tobacco hands including a chamber, means for introducing water into the chamber under pressure through the bottom of the chamber, means for withdrawing water from the chamber through its bottom, a support for the baled tobacco hands pivoted at one end within the chamber and swingable from a horizontal position without the chamber into a vertical position within the chamber.

4. Apparatus for the wetting of baled tobacco hands which includes a pair of pivoted supports positioned in spaced parallel relationship, a conveyor adjacent to and parallel with one of said supports, a chamber, means for the introduction and withdrawal of water from said chamber, a second conveyor adjacent to and in line with said first conveyor having its end remote from said first conveyor pivoted within said chamber, said second conveyor being swingable into a vertical position within said chamber, a third conveyor adjacent to and in line with said first conveyor and pivotally mounted at its end remote from said first conveyor, said third conveyor being swingable into a vertical position.

5. Apparatus which comprises means for the wetting of baled tobacco hands including a chamber, water conduit means positioned above said chamber and connected to the bottom of the

chamber for introducing water therein under pressure, water conduit means positioned below said chamber and connected to the bottom of the chamber for the withdrawal of water therefrom with the creation of a degree of vacuum therein, and a support for the baled tobacco hands pivoted at one end within the chamber for swinging the bale from a horizontal position without said chamber into a vertical position within the chamber.

6. Apparatus which comprises means for the wetting of baled tobacco hands including a chamber having a pressure tight door, a support for the baled tobacco hands pivoted at one end within the chamber for swinging the bale from a horizontal position without said chamber into a vertical position within the chamber through the pressure tight door, and a second support for baled tobacco hands with the hands in horizontal extension in line with said first support, said second support being pivotally mounted at one end and swingable into a vertical position.

RUSH D. TOUTON.

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