Jan. 28, 1941. R. D. TOUTON 2,229,942

METHOD FOR CONDITIONING TOBACCO

Filed April 20, 1936 2 Sheets-Sheet 1

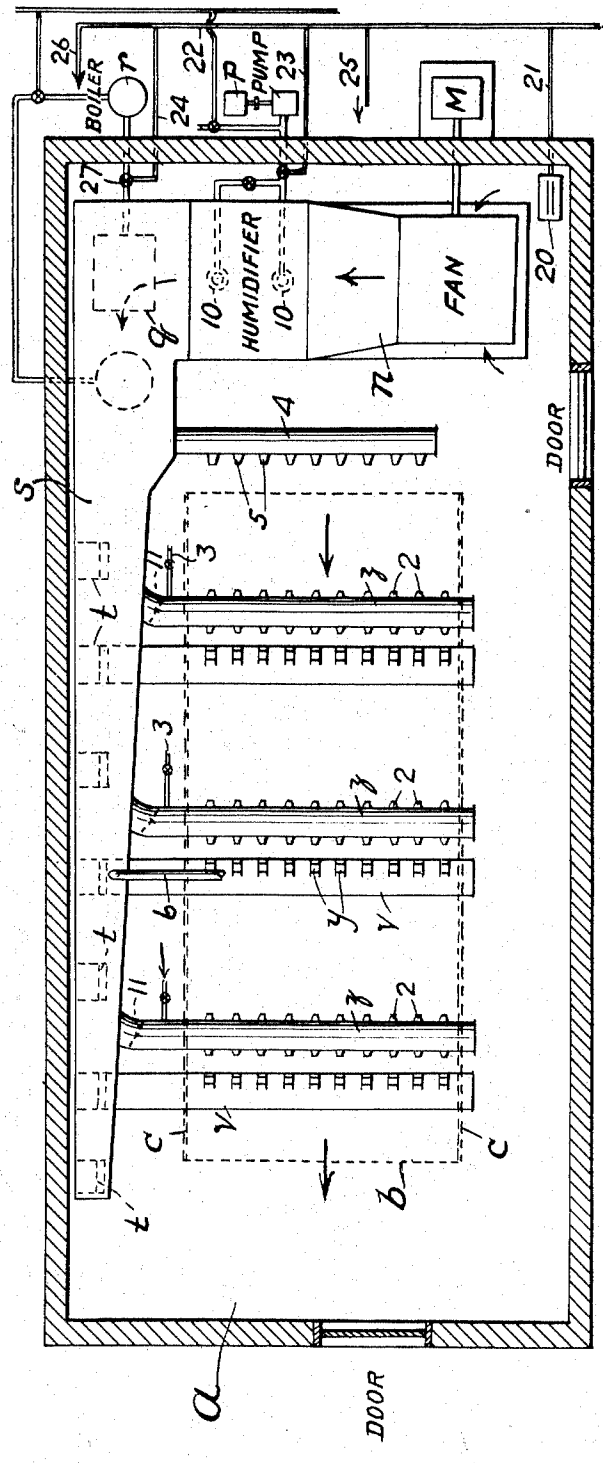


FIG. 1.

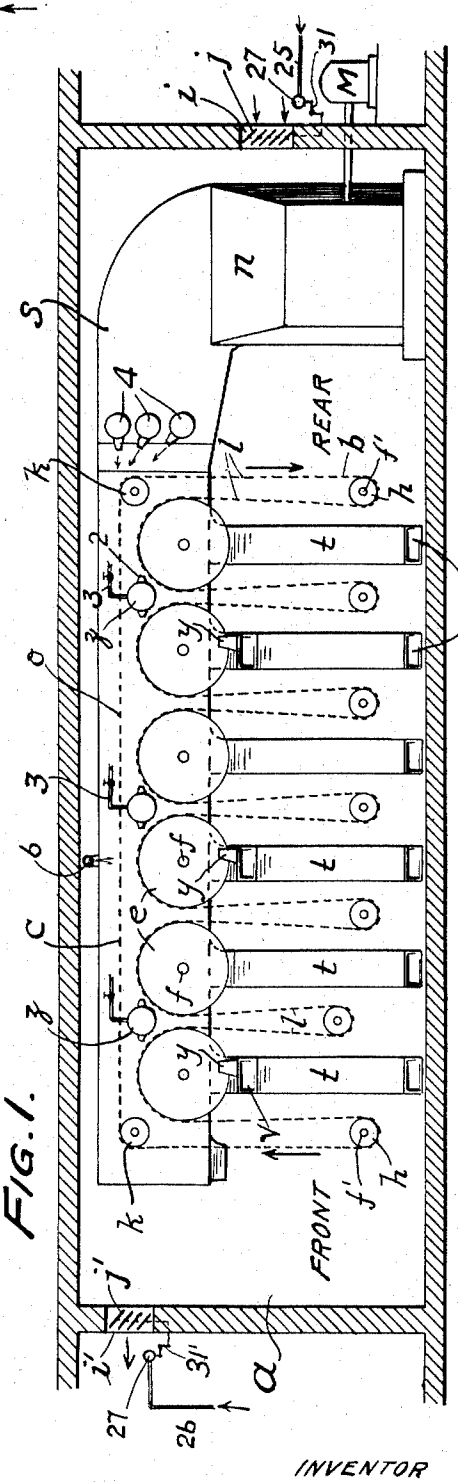


FIG. 2.

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WITNESS:

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METHOD FOR CONDITIONING TOBACCO

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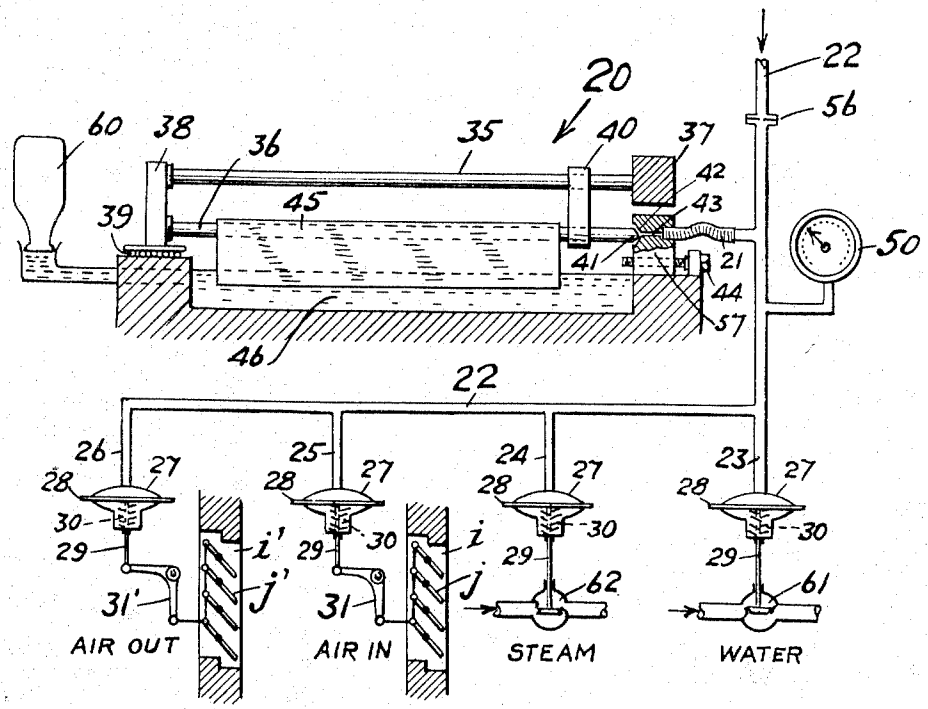


FIG. 3.

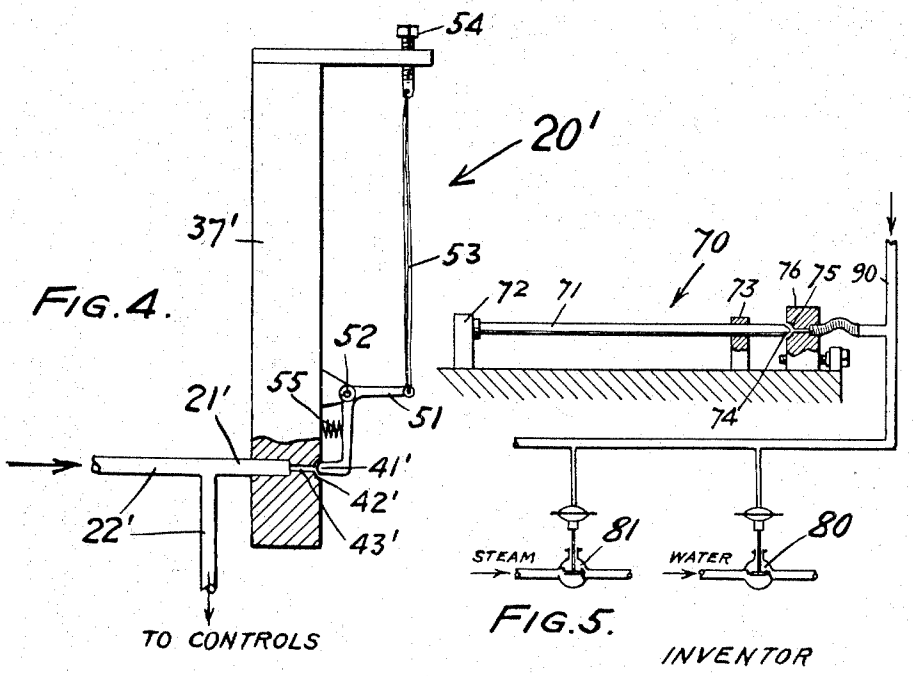


FIG. 4.

FIG. 5.

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UNITED STATES PATENT OFFICE

2,229,942

METHOD FOR CONDITIONING TOBACCO

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Application April 20, 1936, Serial No. 75,352

3 Claims. (Cl. 131—140)

This invention relates to a method for conditioning tobacco.

More particularly, this invention relates to a method for the treatment of tobacco, more particularly by the addition or extraction of moisture; i. e. moistening or drying.

Generally speaking, the method in accordance with this invention will be adaptable for use in the preparation, more particularly by regulation of the moisture content, of uncured tobacco for curing as, for example, by fermentation, in the preparation, by regulation of the moisture content, of tobacco for packing, in the preparation, by regulation of the moisture content, of tobacco for fabrication as, for example, the production of cigars, and in the treatment or preparation of tobacco for such other purposes where regulation of the moisture content, by mositening or drying, is desirable.

Heretofore it has, of course, been well known to condition tobacco by moistening or drying and, to accomplish the conditioning, it has been well known to subject the tobacco to an atmosphere conditioned with respect to temperature and moisture content of humidity.

In the conditioning of tobacco by procedures heretofore known, results have not been entirely satisfactory, in that desired uniform conditioning has not been obtained, the color of the tobacco has been deleteriously affected and variously tobacco in a lot subjected to conditioning has been damaged by spotting, or the tobacco has been made tender or deprived of elasticity.

Now in accordance with this invention a method is provided by which tobacco will be readily uniformly conditioned and brought to a desired moisture content by the addition or subtraction of moisture without injury to the tobacco and, indeed, in many cases and in connection with certain subsequent treatments, as fermentation, with positive improvement in the tobacco, more especially from the standpoint of color, aroma, tensile strength and general quality.

Generally speaking, the method in accordance with this invention involves subjecting tobacco, desirably in hands comprising leaves in laminated relation, to a large volume of a circulating gas, as air, conditioned as to temperature and moisture content and maintained with respect to its condition during the conditioning operation within a narrow range of difference between the dry bulb temperature and the wet bulb temperature. From a more detailed standpoint, the temperature of the conditioned gas when moisture is being added, may be slightly lower than the temperature of the tobacco and, again, the tobacco may be intermittently subjected to the action of a gas differently conditioned from that in general circulation.

More particularly, the method in accordance with this invention involves circulating a conditioned gas within and through a chamber in which the tobacco will be contained, preferably secured to a conveyor, or carried on trucks, by which it will be moved within and about the chamber. A conditioned gas, its precise condition from the standpoint of wet and dry bulb temperatures depending upon whether moisture is to be added to or taken from the tobacco, will be prepared in a suitable conditioning apparatus and caused to circulate in large volume about the tobacco therein, as through a suitably directed system of ducts. The conditioned gas will be recirculated or withdrawn or discharged from the chamber before the change in the spread or difference between its wet bulb temperature and its dry bulb temperature, or change in depression of the wet bulb temperature, exceeds about 1.5° F., or more particularly with change in spread or difference within about the range 0.1–2.0° F. The gas withdrawn from the chamber is then, for economy, in whole or in part brought back to its original condition, by the addition or extraction of moisture and/or heat, by passage through a suitable conditioning apparatus and/or the addition of fresh gas, as air, from the atmosphere, and recirculated about the tobacco in the chamber, from which it is again withdrawn in a condition within the defined limits of change in spread between the wet and dry bulb temperatures.

In carrying out the method in accordance with this invention the maintenance of a substantially uniform condition of the gas to which the tobacco is subjected, or maintenance of the narrow change in spread between the wet and dry bulb temperatures of the gas introduced into the chamber containing the tobacco and that withdrawn from the chamber will be accomplished by the circulation through the chamber of a sufficiently large volume of air, or air at a sufficient rate so that the total heat released or absorbed by the tobacco in the absorption or release of moisture taken with the heat input or loss to the conditioned gas from various sources, such as lights, a circulating fan, the conveyor, persons in the chamber, input or loss through the walls of the chamber, or otherwise, will be absorbed and carried out of the chamber, and, at the same time, the moisture loss to the tobacco or gain therefrom will be such that the air leaving the chamber will retain wet and dry bulb temperatures such that their change in spread will be within the range indicated.

The conditioning, when moisture is added to the tobacco, will desirably be carried out with the conditioning gas at a slightly lower temperature than that of the tobacco and the tobacco may be subjected to forceful jets of gas at slightly higher temperature and/or moisture content than

that in general circulation about the tobacco. Generally, the condition of the gas will always be such with respect to the temperature of the tobacco that condensation of moisture on the tobacco will not occur.

Having now indicated in a general way the nature and purpose of my invention, I will proceed to a detailed description of a form of apparatus adapted for use in carrying out the method, preferred procedure in accordance therewith being described in detail in connection with description of the apparatus, all with reference to the accompanying drawings in which:

Figure 1 is a plan view, partly in section and partly diagrammatic, of a preferred form of apparatus for carrying out this invention.

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

Figure 3 is a detailed view, partly diagrammatic, showing control means for controlling and maintaining the temperature and relative humidity of the conditioning gases used.

Figure 4 is a similar detailed view of a modified control means.

Figure 5 is a detailed view, partly in section, of means for controlling wet or dry bulb temperature.

The conditioning chamber

Referring to the Figures 1 and 2, *a* indicates a chamber, which may be of any suitable dimensions, depending upon the amount of tobacco to be treated, and which is desirably insulated. The chamber is provided with suitably placed doors for the introduction and removal of tobacco. The chamber is also provided with openings *i* and *i'*, controlled by dampers *j* and *j'*, for the admission and discharge, respectively, of air from the chamber.

Within the chamber *a* is positioned an endless conveyor *b* of any desired type and which may comprise a pair of endless chains *c* from which are supported at spaced intervals cross members or bars to which the hands of tobacco may be attached.

The chains *c* pass over a series of relatively large sprockets *e*, *e* secured to shafts *f*, *f* journaled in a suitable frame and arranged in line in the upper portion of the chamber; and also over a series of relatively small sprockets *h*, *h* secured to shafts *f'*, *f'* journaled in the frame and arranged in line in the lower portion of the chamber and in staggered relation with the sprockets *e*, *e*; and finally over sprockets *k*, *k* secured to shafts journaled in the frame and positioned above and beyond the ends of the series of sprockets *e*, *e*.

The conveyor will be driven through a sprocket on one of the shaft *f'* by any suitable connection with any suitable prime mover, as through a chain or belt from an electric motor, the prime mover being desirably positioned without the chamber.

By virtue of the arrangement of the several sprockets *e*, *h* and *k*, the conveyor will have a number of pairs of substantially vertical reaches *l* in its travel from one end to the other of the series of sprockets *e* and *h*, which in pairs will be relatively close together, the pairs being relatively widely separated; and a horizontal overhead return reach *o*. The conveyor may be reversed over the arrangement shown in the drawings, i. e. the horizontal reach may run below the vertical reaches instead of above, with reversal of the relative positions of the large and small sprockets, the tobacco passing over the small sprockets instead of beneath them.

Within the chamber *a* adjacent one end thereof is positioned a gas, as, for example, air, conditioning apparatus comprising a casing *n* provided with inlet openings and containing a fan positioned adjacent the inlet openings and driven by a motor M positioned outside of the chamber. The fan will be arranged to deliver gas or air, drawn from the chamber, through a humidifier, which may comprise a water spray or sprays **10** supplied by a pump *p* positioned outside the chamber, and over a heating element *q*, which may be an electrical unit or a steam coil supplied with steam from a boiler *r* positioned outside of the chamber. The conditioned gas or air is discharged from the conditioning apparatus under the influence of the fan, into a main duct *s*, which extends longitudinally in the upper part of the chamber along one side thereof.

The humidifier may, for various uses of the apparatus, as in the moistening of tobacco, operate in effect as a cooler, dehumidifier and humidifier and for such operation will be supplied with cold water at a temperature such as to effect desired cooling, dehumidification and humidification for the provision of gas or air having desired wet and dry bulb temperatures for delivery to the duct *s*. Cooling may also be effected by admission of cold air to the humidifier, or by the provision of a cooling surface suitably positioned within the chamber *a*.

From the duct *s*, a series of vertical ducts *t*, *t* lead downwardly at one side of the chamber to the bottom thereof on lines between the pairs of vertical reaches *l* of the conveyor and terminate in lateral outlet openings *u*, *u* from which conditioned gas is discharged transversely of the chamber between the pairs of vertical reaches *l* of the conveyor for the provision of general circulation of air in the chamber. The air issuing from outlet openings *u*, *u* will travel toward the opposite wall of the chamber and deflected thereby will assume a rotary motion in the chamber or travel in a circulatory path so that tobacco carried by the conveyor will be surrounded by a sheath of conditioned gas in rotary circulation.

From the series of ducts *t*, *t* a series of horizontal ducts *v*, *v* extend transversely of the chamber beneath the sprockets *e*, *e* on lines between the pairs of vertical reaches *l*. Upwardly extending nozzles *y*, *y* are adapted to direct forceful jets of conditioned gas into hands of tobacco carried by the conveyor as the conveyor passes over the sprockets *e*, *e*.

A second series of horizontal ducts *z*, *z* leading from the main ducts extend transversely of the chamber between pairs of the sprockets *e*, *e*, and adjacent the top thereof. The ducts *z*, *z* are provided with lateral nozzles **2**, **2** adapted to direct conditioned gas at an angle with respect to the butts of hands of tobacco carried by the carrier and to promote local circulation in the upper portion of the chamber. Suitably valved pipes **3**, **3**, terminating in spray nozzles and connected to a suitable source of water are let into the ducts *z*, *z* for the supply of additional moisture or a changed temperature to air passing therethrough.

A series of horizontal ducts **4**, **4** arranged in vertical alignment and leading from the main duct *s*, extend transversely of the chamber and adjacent to the sprockets *k* at the rear of the chamber over which the conveyor passes into the

horizontal return reach *o*. The ducts **4**, **4** are provided with nozzles **5**, **5** spaced at angles to the vertical such as to direct forceful jets of air into hands of tobacco carried by the conveyor as it passes over the sprockets *k*.

A horizontal duct **6** leading from the main duct *s* extends transversely over the return reach *o* of the conveyor. The duct **6** is provided with downwardly extending nozzles adapted for the direction of forceful jets of air into hands of tobacco carried on the horizontal reach *c* of the conveyor. A suitably valved pipe **6** provided with a spray nozzle at its end and connected with a supply of water may be let into the duct *s* and similar valved pipes **3** provided with spray nozzles connected with a supply of water may be let into ducts *z* for the supply of moisture to the conditioned gas passing therethrough.

The various ducts may be provided with dampers, as dampers **11**, whereby the amount of air passing from the various ducts may be controlled or entirely shut off.

Those portions of the apparatus described above and the method of conditioning tobacco therein are substantially those described and claimed in my copending application Serial No. 27,174, filed June 18, 1935 and are accordingly not specifically claimed in this application.

In Figure 3 there is shown a preferred type of temperature and humidity control device **20**. This form of control device comprises a rigid frame **37**, in one side of which is mounted a metal tube or rod **35** preferably formed of some metal having a high co-efficient of expansion and adapted to be responsive to the dry bulb temperature in the chamber *a*. The opposite end of the tube or rod **35** is rigidly connected by a cross-bar **38** to a second metal tube or rod **36**, substantially identical in form with **35**. The cross-bar **38** and the outer ends of the rods **35** and **36** are supported by means of roller bearings **39** on the frame **37** and hence are free to move longitudinally with respect to the frame. The end of the rod or tube **36** opposite the cross-bar **38** is supported and guided by the hanger **40** depending from the rod **35**, and is formed into a valve member **41**. This valve member **41** cooperates with a valve seat **42** in the adjustable block **57** to close a restricted passage **43** in this block. The block **57** is adjustable with reference to the frame **37** by means of the screw **44**. A cloth or wick **45** covers substantially all of the metal tube or rod **36** and extends into a pan **46** formed in the frame **37**. The wick **45** is kept wet by water in pan **46** and hence the metal tube or rod **36** is responsive to the wet bulb temperature chamber *a*. The pan **46** is kept constantly full of water from the reservoir **60**.

The temperature and humidity control device **20** automatically operates the water valves, steam valves and louvres or shutters, referred to above, by control of the air pressure in line **22** and its various branch connections leading to pressure responsive operating means for these various valves and shutters. All the pressure responsive operating means may be substantially identical in structure and are indicated generally by the reference character **27**. Their general structure is well known and is no part of the present invention. Each comprises a casing within which is positioned a diaphragm **28** to which is connected a plunger **29** extending outside the casing. The space on one side of the diaphragm is provided with an opening for the admission of air under pressure, and forms a pressure chamber, while the space on the other side of the diaphragm is open to the atmosphere. A spring **30** urges the diaphragm against air pressure in the pressure chamber. The diaphragm of one of the pressure responsive control elements **27** is connected by a plunger **29** with a valve **61** in the water line supplying the sprays **10** and by means of the branch air line **23** with the main air supply line **22**. The diaphragm of another element **27** is similarly connected with a valve **62** in the steam line leading to the heating element *q*, by a branch air line **24** to the air line **22**. Similarly, the diaphragms of the other control elements are connected by means of the linkages **31** and **31'** with the louvres *j* and *j'*, respectively, in the openings *i* and *i'*, and by means of the branch air lines **25** and **26**, respectively, with the main air line **22**.

The main air pressure line **22** is supplied from any suitable source of air pressure (not shown) and this pressure, after passing through restricted orifice **56**, is registered on the air pressure gauge **50** and passes by means of the branch connections **23**, **24**, **25** and **26** to the pressure chambers of the several pressure responsive control elements **27**. A branch air line **21** connects the main air pressure line **22** with the temperature and humidity control device **20** at the restricted passage **43**.

The operation of the conditioning control apparatus described above will, it is believed, be obvious, it being noted that the tubes or rods **35** and **36** will respond respectively to variation in the dry and wet bulb temperatures in the chamber *a* and the result of this response, by expansion or contraction, will effect a variation in the position of valve member **41** with respect to valve seat **42** and more or less air from the line **22** will be led through passage **21**, resulting in variation of the pressure on the diaphragm of the control elements **27** and consequently variation in the setting of the steam and water valves **62** and **61** and of the louvres *j* and *j'*. The springs **30** of the several elements **27** will be of a strength with respect to the limits of variation of pressure in the line **22** under control of the element **20** so that with variation of wet and dry bulb temperatures in the air entering the conditioning apparatus the valves controlling the admission of water and steam to the conditioning apparatus and the louvres *j* and *j'* will be automatically adjusted to recondition the air for return to chamber *a* to the precise amount required to maintain in the chamber *a* the conditions required for the particular treatment.

Referring to Figure 5, **70** indicates a dry bulb temperature control device, comprising a metal tube or rod **71**, having a high coefficient of expansion, fixedly mounted at one end in a support **72** and slidably mounted adjacent its other end in a support **73**. The free end of rod **71** is forced into a valved member **74**, adapted to cooperate with a valve seat **75** in an adjustable block **76**. The device **70** actuates the water and steam valves **80** and **81** by control of the pressure in air line **90** in the same manner as does the control device **20** more fully described above. As will be obvious, if it is desired that the control device **70** control wet bulb temperature, it is only necessary to surround the rod **71** with a wick extending into a supply of water, as in the case of device **20**.

Referring to Figure 4, a modified form of conditioning control means **20'** is shown. This control means is responsive only to changes in relative humidity and comprises strands of humidity-

responsive material 53, such as, for example, human hair, adjustably connected at one end by means of a screw 54 to the frame 37' of the control means. The opposite end of the strands of hair is connected to the link 51 pivotally connected to the frame 37'. The link 51 is formed at one end into a valve member 41' cooperating with a valve seat 42' to close the passageway 43' in the frame 37'. A spring 55 urges the valve 41' against its seat. The control device may be connected with the air pressure line 22' by means of a branch line 21' in the same manner as the control device shown in Figure 3.

A decrease in the moisture content of the conditioning gases as they pass over the control element will cause the strands of hair 53 to contract, thus moving the valve element 41' away from its seat 42' against the action of the spring 55 and thereby opening the passageway 43'. This will cause a reduction in the air pressure obtaining in the line 22' which will be transmitted in the manner described above to the various pressure responsive control elements used to actuate the water and steam valves and shutters.

It will be appreciated that the entire humidifying apparatus shown largely within the chamber *a* may be placed without the chamber, a suitable duct being provided to lead air from the chamber to the inlet side of the fan and the duct system within the chamber being connected by a suitable conduit with the discharge from the humidifier.

In the operation of the apparatus embodying my invention as above described for the carrying out of the method in accordance with this invention, for example, for the addition of moisture to tobacco, tobacco in the form of hands comprising bunches of leaves bound at their butts are secured to the cross bars extending between the conveyor chains *c*. The tobacco, for the addition of moisture, may be in an extremely dry condition, such as is received by, for example, manufacturers of cigars, or it may be in such a state of dryness as to require the addition of but a small amount of moisture to condition it, for example, for fermentation.

The tobacco in hands may be secured to the cross bars of the conveyor by any suitable form of clip or fastening means, which will desirably engage the butts of the hands only, leaving the leaves free. The tobacco can be readily secured to the conveyor at one end, as, for example, the front end, the conveyor being gradually advanced until completely filled with the tobacco. Before or immediately after the conveyor is charged with tobacco the humidifying apparatus is placed in operation and circulation of humidified air through the chamber *a* is set up. The condition of the air will depend upon the tobacco subjected to treatment and upon the ultimate condition desired for the tobacco. Hence, it will be appreciated that when adding moisture to the tobacco, the exact condition of the air from the standpoint of temperature and humidity, or, in other words, the wet bulb and dry bulb temperature, are not of the essence of this invention, since they may be varied, depending upon the type or kind of tobacco subjected to treatment and the ultimate condition of the tobacco. It will be obvious that the time of treatment may be varied.

By way of illustration, where, for example, very dry tobacco, as, for example, wrapper tobacco, is to be conditioned for use, for example, in the fabrication of cigars, the air introduced will desirably have a temperature of 70° F., and a moisture content of 92%, more particularly, a dry bulb temperature of 70° F. and a wet bulb temperature of 68° F. and the air conditioning apparatus will be initially adjusted to discharge properly conditioned air into the chamber *a*. The air introduced into chamber *a* through the duct system as described, will generally have a rotary circulation about the tobacco within the chamber, while the air discharged through the several jets, as described, will pass directly into the hands of tobacco or angularly with respect to the butts, as described.

The volume or rate of circulation of conditioned air through the chamber *a* and the conditioning apparatus will be such that the loss of moisture to the tobacco and absorption of heat released by the tobacco and heat absorbed by the air from other sources of heat within the chamber will not produce a change in the difference between the dry bulb and wet bulb temperatures of the air in excess of 2.0° F. and preferably not in excess of about 1.0° F.

The air leaving the chamber, as has been indicated, is reconditioned by passage through the humidifying apparatus and is returned for recirculation in and through the chamber *a*. The temperature and humidity control device 20, responsive to the dry bulb and wet bulb temperatures of the air leaving the chamber *a*, is so adjusted as to cause variation in the conditioning elements included in the humidifying apparatus, with variation in the difference between the dry and wet bulb temperature of the air leaving the chamber. Thus, the device 20 controls, as has been described in detail, the water and heat supplied to the humidifying apparatus and hence varies the conditioning from the standpoint of temperature or moisture content of the conditioned air, to insure maintenance of the wet and dry bulb temperature difference for which the control is set. Likewise, the control device operates to maintain the condition of the air in chamber *a* through control of the louvres *j* and *j'*, through which air from outside the chamber *a* may be taken into the chamber and air from the chamber *a* may be discharged from the chamber, respectively.

It will now be noted that by virtue of the control devices 20 and 70 affected by the condition of air leaving the chamber and passing into the humidifying apparatus, the conditioning apparatus functions, with respect to the condition of the air drawn from the chamber to recondition the air for discharge into the chamber, from the standpoint of temperature and moisture content, to an extent such as to maintain the difference between wet and dry bulb temperatures within the limits prescribed for the air leaving the chamber, and to maintain the desired temperature. It will be observed that in proceeding in accordance with the method embodying this invention the air circulating about the tobacco in the chamber *a* is constantly at a substantially uniform condition throughout the period required to effect desired moistening of the tobacco, due to large volume of air used. As a result, all the tobacco within the chamber is subjected to a uniformly conditioned air. In other words, portions of the tobacco are not subjected to air having different conditions from the standpoint of humidity, such as has heretofore been customary. Consequently, all the tobacco in the chamber *a* receives moisture at a uniform rate and without the possibility of local heating or of local condensation, with the result that all the tobacco

is moistened to a uniform degree and the possibility of discoloration or spotting is eliminated.

Recirculation of the air will avoid excessive loss from the tobacco of valuable components in that the recirculated air will be as it were saturated with components of the tobacco capable of being lost to the air.

In the carrying out of the method in accordance with this invention for the moistening of tobacco, it will be desirable that the temperature of the air circulated about the tobacco in chamber *a* be lower than the temperature of the tobacco. The tobacco in absorbing moisture tends to heat. The conditioned air will desirably be cool relative to the temperature of the tobacco to the end that the tobacco as it absorbs moisture will be constantly and uniformly subjected to a cooling action by the air. Under certain conditions, the air discharged from the nozzles 2 and *y* leading from the conduits *v* and *z* will be cooler, or at a lower temperature than the air in general circulation in the chamber in order to insure against any local heating of the tobacco, more particularly, within the hands into which the nozzles discharge. The discharge of air through nozzles *y* and 2 at a lower temperature than that of the air in general circulation may be readily accomplished by the provision of cooling devices within the conduits *v* and *z*. The provision of brine coils within the conduits *v* and *z* will adequately provide for air at a lower temperature than that in general circulation. Again, it will be desirable in many cases that the air discharged angularly against the butts of the hands of tobacco through nozzles 2 have a higher moisture content than that of the air in general circulation in the chamber, or, in some cases, that it actually carry free moisture. The moisture content of air discharged through nozzles 2 may be increased over that in general circulation, as supplied by the humidifying apparatus, or free moisture added to the air by the introduction of a spray of water into the conduit *z* through the valved pipes 3.

In carrying out the method in accordance with this invention for the extraction of moisture from tobacco, for example, for the extraction of moisture from green tobacco to prepare it for fermentation or packing, the procedure described above in connection with the moistening of tobacco will be followed, with control of the humidifying apparatus, which will in such case act as a dehumidifying apparatus, so that the limitation on the difference between the wet and dry bulb temperatures of the air leaving the chamber, as indicated, will be maintained.

In the extraction of moisture from tobacco or drying, the conditioned air will be at a higher temperature or warmer than the tobacco and ordinarily heat generated by air movement of a big volume of air by the fans will supply all evaporation requirements. Usually because of working at low change in depression, heat must be extracted from the air leaving the chamber. Variously, it may be desirable that air at a temperature higher than that in general circulation in the chamber *a* be discharged through the several jets described above. The discharge from the jets of air at a higher temperature than that in general circulation in the chamber will be readily accomplished by the provision of any suitable form of heating device in the conduits *v* and/or *z*, from which the nozzles *y* and 2 discharge. The provision of an electric heating element, or of a steam coil in the conduits will adequately serve the purpose.

Generally speaking, in practice, the wet bulb depression of the air introduced into chamber *a* will not exceed about 10° F. For drying the wet bulb depression preferably will be within about the range 4.5–10° F., while for moistening the wet bulb depression will preferably be within about the range 0.1–4.0° F. and the air discharged from the chamber will not have a change in depression in excess of about 2.0° F., and preferably the change will be within the range 0.5–1.5° F. In either case the temperature change will desirably not exceed 2.5° F. and preferably the temperature change will not exceed 0.5–1.0° F.

The air discharged from the various jets described will desirably be under some pressure, as for example, a pressure of 0.2–1.5 inch water gauge.

It will be appreciated that various modifications may be made in the preferred embodiment of apparatus as illustrated and described and that various modifications in procedure according to the method of this invention as described may be made without departing from the scope of the invention, which depends upon limitation, as indicated, in the difference between the wet and dry bulb temperature of the air leaving the chamber *a* after circulation with respect to the tobacco in chamber *a*.

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

1. The method of conditioning tobacco by the addition of moisture thereto, which includes circulating a gas conditioned with respect to temperature and moisture content about tobacco in a chamber, withdrawing the gas from the chamber in a condition such that the change in depression of its wet bulb temperature does not exceed about 2.0° F., the conditioned gas being characterized by the fact that its temperature is lower than that of the tobacco as it absorbs moisture from the gas and periodically subjecting the tobacco to forceful jets of conditioned gas characterized by the fact that its temperature is lower than that of the conditioned gas in general circulation about the tobacco.

2. The method of conditioning tobacco which includes circulating a gas conditioned with respect to temperature and moisture content about the tobacco in a chamber, withdrawing the gas from the chamber in a condition such that the change in depression of its wet bulb temperature does not exceed about 2° F. and periodically subjecting the tobacco to forceful jets of conditioned gas characterized by the fact that its temperature is lower than that of the conditioned gas in general circulation about the tobacco.

3. The method of conditioning tobacco by the addition of moisture thereto which includes circulating a gas conditioned with respect to temperature and moisture content about the tobacco in a chamber, withdrawing the gas from the chamber in a condition such that the change in depression of its wet bulb temperature does not exceed about 2° F., the conditioned gas being characterized by the fact that the conditioned gas enters the chamber with a wet bulb depression not exceeding about 10° F., and periodically subjecting the tobacco to forceful jets of conditioned gas characterized by the fact that its temperature is lower than that of the conditioned gas in general circulation about the tobacco.

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