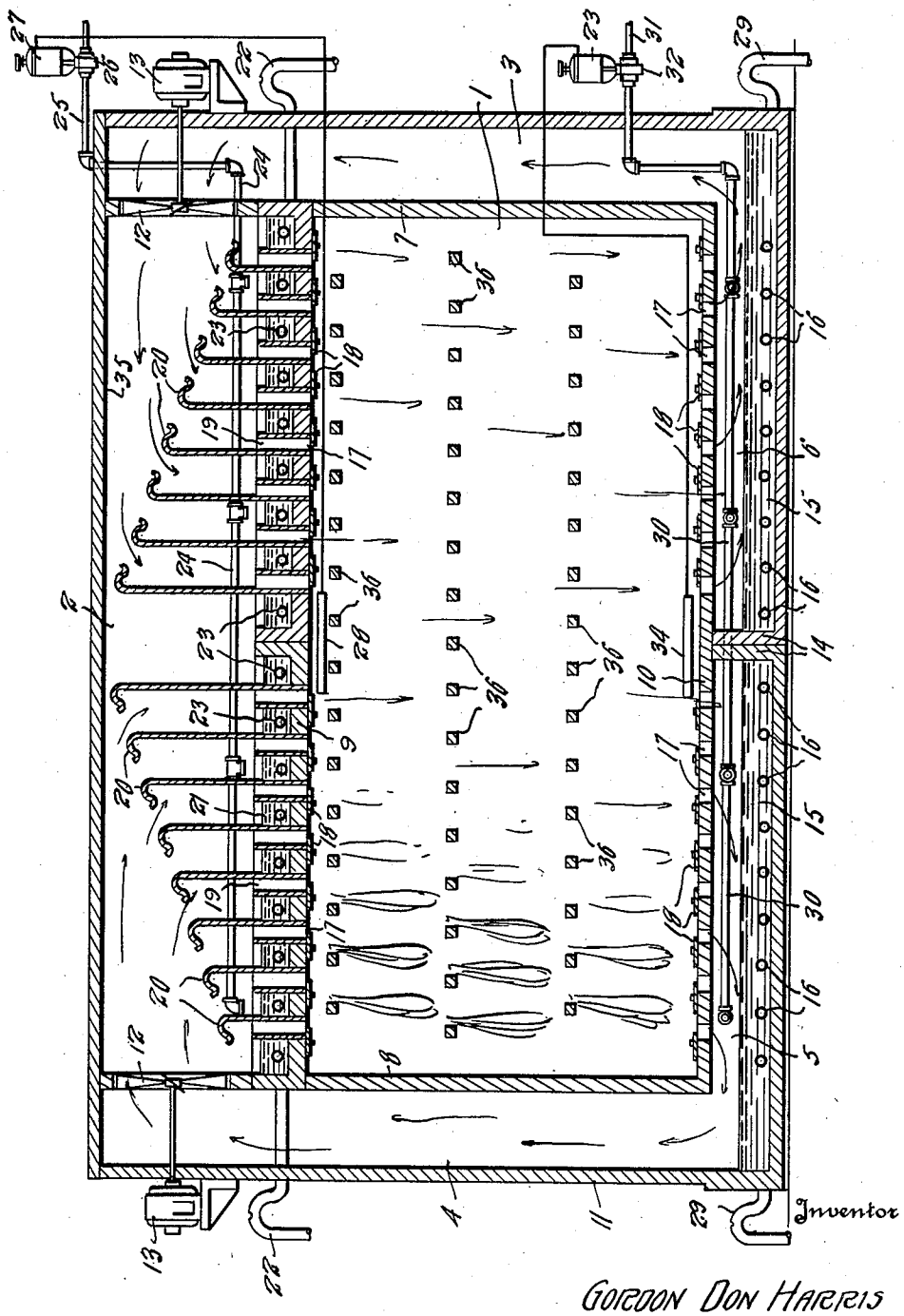
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CONDITIONING AIR FOR USE IN TREATING MATERIALS

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Inventor

GORDON DON HARRIS

By Semmes & Semmes

Attorney

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CONDITIONING AIR FOR USE IN TREATING MATERIALS

Gordon Don Harris, Sound Beach, Conn., assignor to The Industrial Dryer Corporation, Stamford, Conn., a corporation of Connecticut

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1 Claim. (Cl. 261—15)

This application is a division of my copending application Serial Number 379,966, filed July 22, 1929, now abandoned.

This invention relates in general to the conditioning of materials and more particularly has reference to a process and apparatus for conditioning air or other gases, which are circulated over tobacco or other materials to be treated.

Tobacco, after being cut, is generally arranged in hands before being dried. After drying, it is baled or placed in hogsheads to be shipped. In baling or packing the leaves become entangled, and, being dry, are subject to fracture. As it is essential that the leaves be pliable, so that they may be handled and manufactured into cigars without breakage, it is necessary that moisture be assimilated in the leaves.

Other materials, such as leather, require similar treatments before they are in condition for manipulation to convert them into articles of manufacture.

The most successful processes for changing the physical characteristics of tobacco from a dry condition, wherein the leaves may be easily broken, to a pliable and flexible condition, in which it is susceptible of handling without risk of fracture, are those in which the hands of dry tobacco are subjected to conditioned air. The condition of the air is modified during the treatment to insure the permeation of moisture throughout all parts of the leaves, including the stem, the blade or lamina, and the petiole connecting the blade with the stem. Tobacco treated in accordance with this process is of high commercial value.

The present invention relates to improvements in the processes in which conditioned air is passed over the tobacco or similar materials.

A major object of this invention is to devise a method and apparatus for conditioning tobacco and other materials.

Another object of this invention is to devise a method and apparatus for controlling the temperature of conditioning gas by regulating the supply of cold water brought in contact with the gas.

Yet another object of this invention is to provide a gas conditioning apparatus in which gas flows over a body of water, the temperature of which is controlled by regulating the amount of water supplied thereto.

Still another object of this invention is to devise an apparatus for treating tobacco and similar materials comprising a products chamber and a gas conditioning chamber in which the temperature of saturated gas supplied to the products chamber is controlled by the admission of cool water to a body of water for humidifying the gas.

A still further object of this invention is to provide an apparatus for treating tobacco and similar materials in which gas is subjected to a body of water constantly heated and in which the temperature of the gas is controlled by the regulation of the amount of cold water admitted to the body of water.

With these and other objects in view, which may be incident to my improvements, the invention consists in the method steps and parts and combinations of apparatus to be hereinafter set forth and claimed, with the understanding that the several necessary features of my invention may be varied to meet operating conditions without departing from the spirit and scope of the appended claim.

The present invention contemplates regulating the temperature of conditioned gas by regulating the supply of cold water to a tank for supplying moisture to the gas. A treating apparatus is provided, which is divided into a products chamber surrounded by a gas-conditioning chamber. The partitions forming the upper and lower walls of the products chamber are provided with a plurality of slots, through which gas is passed in circulating from the conditioning chamber into the products chamber. Tank structures are provided in the upper and lower conditioning chambers and are provided with means for heating water contained therein. Suitable fans are provided for circulating air or other gas over the water in the tanks and through the products chamber. In order to control the temperature of the gas, the temperature of the heated bodies of water is regulated by varying the supply of cold water in accordance with the temperature variations in the apparatus.

In order to make my invention more clearly understood, I have shown, in the accompanying drawing, means for carrying the same into practical effect without limiting the improvements in their useful applications to the particular constructions which for the purpose of explanation, have been made the subject of illustration.

In the drawing:

The single figure is a somewhat diagrammatic view of a treating apparatus constructed in accordance with the present invention.

There is shown in the drawing, apparatus 11 for treating tobacco or materials requiring similar treatment, which is divided by walls or parti-

tions into a treating or products chamber 1 and gas conditioning chambers 2, 3, 4, 5, and 6. Two partitions or walls 7 and 8 separate chamber 1 from the side conditioning chambers 3 and 4, respectively, and horizontal partitions 9 and 10 separate chamber 1 from the upper and lower conditioning chambers. Chamber 5 is in open communication with chamber or duct 4, and the latter communicates with chamber or duct 2 through openings in wall 8, in which are interposed circulating fans 12 driven by suitable motors or other power sources 13 which may if desired be reversed to reverse the direction of gas flow. Duct 3 is in open communication with chamber 6 and communicates with chamber 2 through openings in wall 7, in which are interposed fans 12 similar to those in wall 8.

Walls or partition members 9 and 10 are provided with a plurality of slots 17 through which air or other gas passes in circulating through the products and conditioning chambers. In order to secure an even distribution of gas through the products chamber 1 the slots are provided with closures 18, which are adjustable to vary the size of the slot opening. It has been found that the size of the slots can be so regulated that the gas will flow uniformly through the products chamber.

Slots 17 in the upper partition 10 are fitted with tube-like members 19, with which are associated drip guard deflectors 20 extending varying distances above the partition 9. These deflectors prevent any condensed moisture collecting on the roof 35 from dripping through the slots 17 onto the material suspended from the supports 36 in chamber 1. The tube-like members 19 and the partition 9 cooperate to form a tank structure in which is contained a body of water 21. Suitable overflow conduits 22 serve to maintain a substantially constant level of water in the tank.

Submerged in the body of water 21 are suitable heating elements 23, which may be coils through which hot fluids are circulated, or electrical heating elements. Water is supplied to the tank above slotted partition 9 by means of a distributing conduit 24 connected to a supply conduit 25, in which is mounted a valve 26 adapted to be actuated by a valve-operating mechanism 27 controlled by a thermostat 28 shown by way of example located in the products chamber 1.

It is within the concept of this invention to locate the controlling thermostat either in the products chamber as shown, within the gas conditioning chambers or in the water bodies depending upon the particular arrangement desired. With this construction, water will be supplied to the tanks in accordance with the temperature variation in a particular part of the apparatus.

Chambers or ducts 5 and 6 beneath partition 10 are separated by partition 14. Each of these chambers is provided with a tank which contains a body of water 15. The bodies of water are heated by elements 16, which may be coils, through which is circulated hot fluids, or electrical heating coils. Suitable overflow conduits 29 serve to maintain a constant water level in the tanks.

A conduit 30, having outlets, extends over the tanks in the chambers 5 and 6 and is connected to a water supply conduit 31. Valve 32, operated by an actuating device 33, is positioned in conduit 31 to regulate the quantity of water supplied to the tanks. Thermostat 34 controls the operation of valve 32 so that water is supplied to the tanks in accordance with the temperature variation in chamber 1.

It, of course, is obviously within the scope of the present invention to locate the thermostat 34 where desired. The thermostats 28 and 34 may be positioned in the same chamber or portion of the apparatus or one may be located in one part of the apparatus and the other in an entirely different part. This flexibility of arrangement permits of many desirable operating combinations.

It, of course, is obvious that condiuts 25 and 31 may be connected to the same main. Although there is no showing in the drawing, I wish it to be clearly understood that water may be supplied to all of the tanks by means other than conduits 25 and 31. For instance, conduits may be provided in which are valves actuated by floats to insure that the water level in the tanks will not drop below a predetermined level.

In operation, material to be treated is placed in the products chamber 1, and the fans 12 are set into operation so that gas will flow over the material in the desired direction. For instance, gas from chamber 1 will be drawn down through slots 17 over the bodies of water 15. These bodies of water are constantly heated by elements 16 so that vapors are generated. The generated vapors rise from the water bodies and diffuse in the air as it flows through the ducts 5 and 6. Mixtures of gas and vapors flow up through ducts 3 and 4 and are forced by fans 12 into the chamber 2. As the mixture enters chamber 2, more vapors generated by the heaters 23 and arising from the bodies of water 21, diffuse into the mixture, which insures substantial saturation of the gas.

Gas which is substantially saturated with water vapor then flows through slots 17 in partition 9 down over the material. If the temperature of the saturated gas is too high, the thermostats 28 and 34 will affect mechanisms 27 and 33, which in turn will actuate valves 26 and 32 to admit cold water to the several tanks to reduce the temperature of the water and, consequently, reduce the temperature of the gas.

The conditioning gas employed may be any suitable gas or mixture of gases found suitable for the purpose. Air, of course, may be used in many instances. Also gases or mixtures of gases having inherent characteristic properties for modifying the tobacco or other material may be employed.

As hereinbefore pointed out, the fans 12 are adapted to be operated in either direction of rotation to effect a flow of conditioning gas in the desired direction through the apparatus that is either up or down through the products chamber. This is an advantageous feature in that treatment of materials may be facilitated.

It will be appreciated that the construction herein set forth by way of example is very simple, in that relatively few parts are required which are easily operated to produce very effective results. By placing humidifying tanks in the upper compartment 2, which have as their bottom the partition 9, and by maintaining the water therein warm, there is practically no condensation of moisture on the upper wall 9 of chamber 1. Thus there will be no spotting of the material due to dripping of water thereon It is obvious that the construction herein described may be employed in apparatus of either the continuous or intermittent type.

While I have shown and described the pre-

ferred embodiment of my invention, I wish it to be understood that I do not confine myself to the precise details of construction herein set forth, by way of illustration, as it is apparent that many changes and variations may be made therein, by those skilled in the art, without departing from the spirit of the invention or exceeding the scope of the appended claim.

I claim:

A method of conditioning air for use in treating materials comprising passing air over a body of heated water, passing the air over a second body of heated water, passing the air together with vapor taken from above the bodies of heated water toward a zone wherein the material is to be treated and regulating the temperature of the air flowing over the bodies of water by controlling the amount of cold water supplied to the bodies of water.

GORDON DON HARRIS.