July 4, 1939. H. MASON 2,164,879

PROCESS OF TREATING MATERIAL

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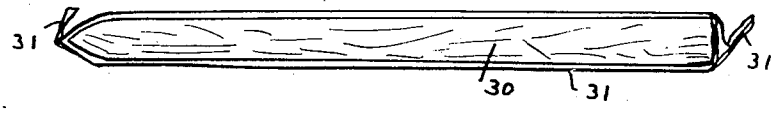


FIG. 3

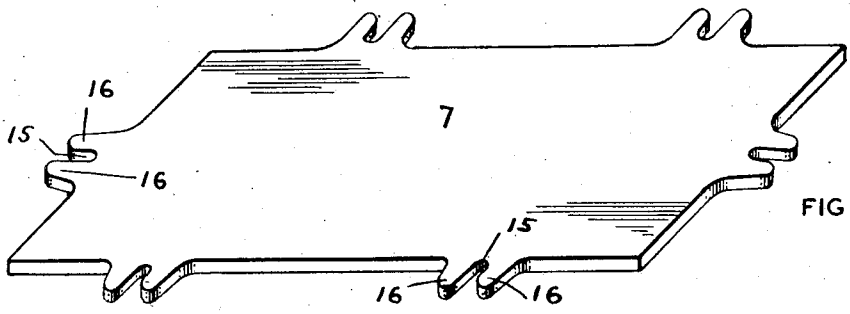
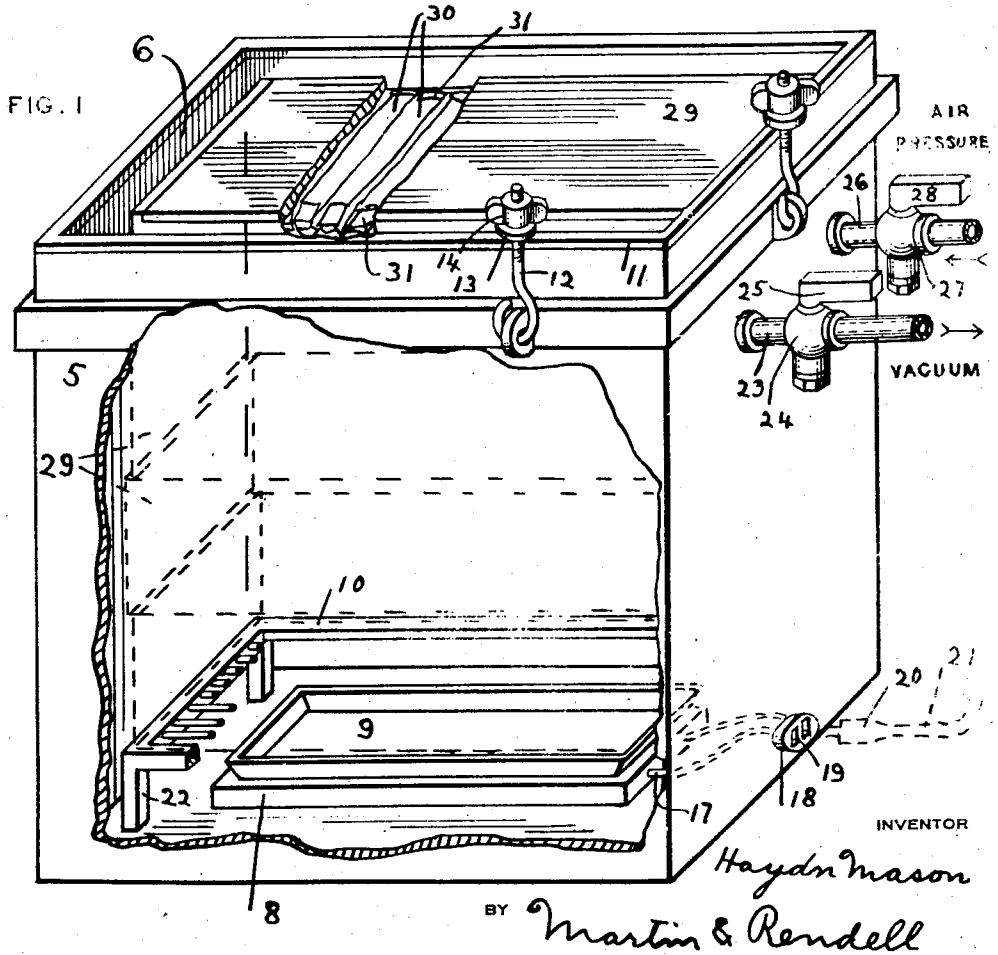


FIG. 2

FIG. 1



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PROCESS OF TREATING MATERIAL

Haydn Mason, New Hartford, N. Y.

Application May 4, 1936, Serial No. 77,666

13 Claims. (Cl. 131—55)

This invention relates to a method for treating and particularly humidifying material especially cigars and other tobacco products.

The purpose of my present invention is to provide a new and improved method for treating material and particularly for humidifying material and the invention has particular reference and usefulness in the humidifying of packages of cigars and other tobacco products contained within wrappers or packages which are more or less air-tight.

Recently it has become a common practice to wrap each separate cigar in a sheet of substantially air-tight and moisture-proof material such as Cellophane, which sheets of such material are overlapped at the longitudinal joints and are folded over upon itself or twisted at the ends of the cigars. The overlapping and the end joints of this Cellophane or like material are not sealed by any adhesive or cement or if originally so sealed do not remain moistureproof partly for the reason that so far no practical adhesive has been found that is safe, practical and efficient under the circumstances here present. While these individual wrappers or envelopes of Cellophane or the like retain the desired original moisture contained within the cigars or other tobacco product longer than if no wrapper were used, the cigars or tobacco product within such wrappers very often lose their moisture before they are sold or used. The ordinary simple humidifying devices heretofore commonly used by cigar stores to rehumidify cigars when they have become too dry fails to be effective to restore the moisture content to such Cellophane-wrapped cigars after they have once become dried out. While the individual Cellophane wrappers are not sufficiently moisture-proof to retain the moisture within the separate packages, such wrappers are sufficiently moisture-proof to keep the heretofore commonly used humidifying devices from imparting the necessary moisture to the tobacco within the Cellophane wrappers.

It is the particular purpose of this invention to provide a method which is simple, economical and practical in the humidifying of the goods within such Cellophane wrappers and particularly the individually wrapped cigars and further to provide a method which is effective to humidify a normally closed cigar box containing closely packed cigars individually wrapped in Cellophane.

While I have illustrated and will explain this invention in particular reference to cigars individually wrapped in Cellophane, it will be understood that the showing in the drawing and the description herein is simply for illustratve purposes and that my invention is not limited to the treatment or humidifying of tobacco goods, but may be utilized broadly in the treatment of many other materials and particularly materials which resist the ordinary processes or apparatus provided for humidifying simply by providing a moist atmosphere.

Further purposes and advantages of this invention will appear from the specification and claims herein.

Fig. 1 is an oblique projection of the receptacle of an apparatus that may be used in the practice of my method, the near side of said receptacle being broken away to show the heating unit, water container and rack at the bottom of the receptacle and showing several cigar boxes within the receptacle, said boxes being shown in dotted lines through the open side of the receptacle but in full lines at the open top of the receptacle.

Fig. 2 is an oblique projection of the closure used with the receptacle shown in Fig. 1.

Fig. 3 is a side elevation of a Cellophane-wrapped cigar as it appears when outside of a box.

Referring to the drawing in a more particular description the apparatus will be first described as consisting of a receptacle 5 having a suitable large working opening 6 preferably at its top for the admission and removal of the materials commonly in packages, a closure or cover 7, means for hermetically sealing the cover upon the receptacle, a heating unit 8, a water container 9 and conveniently a rack or other means 10 for supporting the material to be treated above the water container and heating unit.

The receptacle 5 here shown is of a size to conveniently hold, say, four boxes of cigars as this size is sufficient for the ordinary cigar dealer. The receptacle 5 preferably has its working opening 6 at its top and such opening is preferably of substantially the cross-sectional area of the receptacle so that the cigar boxes may be readily placed therein or taken therefrom and also so that the receptacle may be readily and economically made of proper moisture-resisting and cleanable, presentable material such as cast aluminum. A gasket 11 of suitable material is placed about the top edge of the receptacle and the bottom surface of the cover near its four edges fits closely and flat down upon said gasket and can be fastened thereto with a hermetically sealed joint as by means of a set of swingingly mounted bolts 12 permanently but loosely fastened at their lower ends to the receptacle a

little below its top edge. The upper end of each bolt is threaded and has mounted thereupon a washer 13 and a wing nut 14. When the cover 7 is in place the bolts 12 are raised and severally slipped into the socket 15 provided between a pair of outstanding ears 16 upon the cover with the washer 13 and wing nut above the top of the cover. By screwing down the several wing nuts the cover is hermetically sealed but may be removed in an obvious manner by reversing the steps here described.

In Fig. 1 only two of these bolts 12 show. The one on the left hand part of the near side of the receptacle is eliminated by the cutting away of the front of the receptacle. The bolts at the left hand end and at the farther side of the receptacle are not shown because they are understood to be in down-hanging position which is their natural position when the cover is removed. It will be understood that the two bolts shown have been purposely balanced in upright position in order to show their operative position and as to the bolt at the right hand end of the receptacle in order to show the construction of other adjacent parts more clearly.

There is provided and suitably placed in the bottom of the receptacle 5 a suitable heating unit 8 of a sort such as to be controlled from without the receptacle. For this purpose in practice an electrically-operated heating unit is used with the wires 17 therefrom conveniently leading from the heating unit to an electric fixture 18 mounted in air-tight and liquid-tight manner in one side or end of the receptacle and having its socket or plug-in slots 19 upon the outside of the receptacle so that the co-operating plug 20 of an electric cord 21 may be attached to and detached from the apparatus as required. Preferably the heating unit 8 is of considerable cross-sectional area but thin so as to occupy very little height at the bottom of the receptacle but to provide a considerable heating area upon its top surface for quickly heating the water container 9. This may conveniently be a shallow pan of suitable material to resist action of heat and moisture. The rack 10 is of any convenient form adapted to be readily placed over the pan and heater when the pan has been supplied with its measure of water. Preferably the rack will have an open work or perforated top surface and will have legs 22 at its corners to hold the rack a short distance above the top of the water container or pan 9.

In one side or end of the receptacle 5 there is suitably mounted a pipe 23 the bore of which opens into the chamber of the receptacle and which pipe at a convenient short distance outside of the receptacle is provided with a valve 24 conveniently of the stop-cock type having a handle 25 whereby the passage through the pipe 23 may be readily and tightly closed or opened. Beyond the said valve 24 the fixture is adapted to be connected in any convenient way with a hose or pipe leading to a suction device whereby suction may be applied to the chamber of said receptacle and the air therewithin exhausted to the desired degree. Another suitable pipe 26 is similarly mounted in one wall of the receptacle with its bore in connection with the chamber of said receptacle and with such pipe likewise equipped with a valve 27 conveniently having a handle 28 whereby connection may be made through said pipe and valve to a source of air under pressure such as an air tank not shown or an air compressor or pump.

I will now describe the way in which this apparatus may be used and the course of operations so pointed out will in a practical manner also point out the steps of the process of my invention. It will be borne in mind that again I am describing the use of this apparatus and the particular steps of the process in connection with the humidifying of cigars contained in boxes with the individual cigars wrapped in Cellophane or the like but such description and explanation is only illustrative of my invention, and my process is not to be limited to the particular use of this apparatus nor to the humidifying of cigars, but the apparatus and the process may be used in many other ways as intended to be defined by certain of the claims herein.

Assuming that the device here illustrated is to be used to humidify several boxes 29 of cigars 30 individually wrapped in Cellophane wrappers 31, the proper amount of water will be placed in the open container 9. The amount of this water can be reckoned quite closely by computing the number and size of the cigars within the boxes, bearing in mind the weight of the desired moisture content of the cigars and making an allowance for a slight loss of moisture at one step in the process that will be hereafter mentioned and also making allowance for a slight loss of the moisture that will condense upon the inner surfaces of the receptacle and the pan and tray due to condensation of the moisture in the air towards the end of the process. After the water has been placed in the pan or container 9 the heating unit is placed into operation as by connecting the plug to the fixture 18 or turning the switch of the electric circuit and the heating unit is kept in operation until the water approaches the boiling point. A slight amount of water will have evaporated by this time due to the receptacle still being opened, but the amount of water so lost is very slight. As soon as the water approaches the boiling point the rack 10 is placed in position at the bottom of the receptacle and the desired number of boxes 29 piled thereupon and the cover quickly placed upon the receptacle and sealed thereto. Next the valve 24 of the vacuum line is opened and kept open until about twenty inches more or less of vacuum is obtained, whereupon the vacuum line is closed by operation of the valve 24. This step of producing the desired extent of vacuum will in practice take about a minute and a half. It will be understood that during this time the heating unit has been in operation and it will be left in operation for sufficient time to evaporate all of the water in the container or pan 9. Ordinarily the complete evaporation is accomplished by allowing five minutes of time from the beginning of the boiling operation. It is to be noted here that during the first part of the operation of boiling the water the vacuum line is open and a slight amount of moisture will be lost by going out with the air taken out from the receptacle by the suction line. This is the preferred operation, however, in that the overlapping of the suction operation and the boiling operation removes the first of any considerable amount of evaporated water when the vapor would be wet. The deposit of any wet vapor as appreciable drops, even upon the boxes or the inside of the receptacle, is to be avoided. After the suction has been continued long enough to get the required degree of vacuum, the vapor produced by the heating unit is sufficiently dry to be unobjectionable.

Promptly after the last of the water has been

evaporated the heating unit is turned off and the chamber of the receptacle is connected to the supply of air under pressure as by opening the valve 27 in the air line 26. Air under pressure is supplied until the pressure within the chamber of the receptacle is well above atmospheric pressure. I have found that about twenty pounds pressure above atmospheric pressure gives satisfactory results but a considerable variation from this amount may be had as long as sufficient pressure above atmospheric pressure, is obtained to aid in forcing the vapor into the cigars 30 within the individual packages and to have sufficient initial pressure so that some working pressure is left during the vapor absorbing period even after the pressure has been reduced through the vapor being absorbed largely by the materials and to some extent by the mass of air brought into the chamber to produce the air pressure required.

This proper air pressure is obtained ordinarily in a very short time, say a few seconds if the receptacle is connected to a line from a compressed air tank or a minute or two if a small air compressor is used.

After the desired air pressure has been obtained connection to the source of compressed air is cut off as by turning off valve 27. The receptacle is then left closed and sealed and the materials being treated are subjected to the action of the moisture and pressure for a considerable period, say several hours or over night. Then the receptacle is opened and it is found that the materials to be treated, even cigars 30 in individual wrappers 31 of Cellophane contained in closed filled cigar boxes 29, have absorbed the desired amount of moisture, in fact substantially all the moisture except a small part absorbed by the cigar boxes or condensed upon the water container or the inner side walls of the receptacle.

The above described process achieves the result of driving the moisture into the goods within the wrappers of moisture-proof materials apparently by the different steps or operations, first withdrawing the air from the goods or packages so as to have a substantial vacuum, then providing the desired or required measure of moisture in the way of "dry" vapor in the vacuum so provided and then subjecting the goods and vapor to the forcing action of compressed air for a long enough time for the vapor moisture to be thoroughly absorbed by the goods without their becoming wet.

A further result obtained by the course of operations or treatment above outlined and covered by certain of the claims herein, is that the goods or materials so treated are not only thoroughly humidified to the original or proper extent—even cigars within individual wrappers of Cellophane—but the goods so treated retain their proper degree of humidity or moisture over a longer and in many cases over a very much longer period of time than when the goods properly humidified were originally packed.

The full course of operations to which the Cellophane-wrapped packages have been subjected including the evacuation of most of the air, the providing of moisture in the form of vapor with an appreciable degree of heat followed by a relatively long continued period of high air pressure not only causes the vapor to pass into the materials within the separate Cellophane wrappers 31 but thereafter makes the overlapping surfaces of the Cellophane slightly cohesive and tacky and this causes the joints of the overlapping and twisted Cellophane to become sealed or cemented together so that these sealed joints prevent the escape of moisture therethrough to a much better extent than has been accomplished before.

The evacuation of the air from within the receptacle not only draws out the air surrounding the Cellophane-wrapped articles such as cigars but also causes the air within the wrappers to come out. As the vacuum is being created the original atmospheric air pressure within the wrappers becomes too great to be held by the very indifferent joints made in the Cellophane wrapper when the cigar is wrapped therein and the original atmospheric air pressure within the wrappers forces an escape of that air through more or less of the joints in the wrapper. In many cases no attempt is made to seal the joints in the sheet Cellophane when the cigar is wrapped therein but the Cellophane is simply wrapped around the cigar and the two surfaces of Cellophane at the lengthwise joint simply laid flat upon each other and the part of the Cellophane that projects beyond each end of the cigar is either twisted or pressed together and then folded over upon itself or against the adjacent end of the cigar. It will be obvious that the original atmospheric pressure of air within the cigar wrapper will easily escape through such joints when the suction is being applied to the chamber of the receptacle.

Even where an effort is made to seal the joints such joints are very imperfect, partly because the adhesives practical to use are very ineffective upon Cellophane and partly because often one or both of the surfaces of the Cellophane to come opposite each other is or are simply moistened and finally because ordinarily the necessary step of pressing such an attempted sealed joint is not done at all or can be done only to a moderate extent because the cigar within the package would be damaged if such sealed joints were pressed as firmly together against the cigar as would be required to make an effective sealing. Even where a solvent of Cellophane is used to make a sealing of the joint the necessary application of pressing the overlapping layers of Cellophane can rarely be used and in practice is not used due to the high speed of machine or even hand manipulation and the short time that can be given to the sealing of such joints. Accordingly none of the attempted sealed joints are effective against the original atmospheric pressure of the air tending to escape from within the Cellophane-wrapped cigars when the vacuum is being created about the Cellophane-wrapped articles. Accordingly in any event after the air has been evacuated from within the receptacle there is sufficient opportunity for the moisture or vapor or other treating agent being used to pass inwardly through the Cellophane wrapper joints, especially when the following steps of supplying air under pressure considerably exceeding that of atmospheric air takes place.

Furthermore I have found that under the conditions of this process, that is where the air is exhausted from within the Cellophane-wrapped packages as well as from the surrounding space within the receptacle and then the treating agent in the form of vapor is provided followed with a relatively high degree of heat long continued, the Cellophane or similar cellulosic wrapper becomes tacky or cohesive, both at the opposing surfaces of the joints of Cellophane where some adhesive was originally applied and also at such overlapping or joined surfaces of the Cellophane where no adhesive was originally applied. I have

found also that where the period of providing heat and moisture which causes these opposing surfaces of Cellophane to become tacky, is followed by an appreciable period of relatively high pressure of air within the receptacle, the overlapping faces of Cellophane are forced together and caused to make a fairly efficient sealed joint. I have found furthermore that if the steps which cause the Cellophane to become tacky or adhesive are not followed by the step of air under considerable pressure, the joints of the Cellophane wrapped about the cigar or other article would not become sealed or resealed and that even adjacent Cellophane-wrapped cigars would have some tendency to stick together. However when the step of relatively high air pressure is supplied after the steps incidentally producing the tackiness of the Cellophane, then the air pressure seems to press the opposing surfaces of the Cellophane together at the joints and make a more or less effective sealed joint and by such air pressure incidentally but strongly filling up with air under pressure the interstices that are between the Cellophane-wrapped cigars operates to separate the adjoining Cellophane-wrapped cigars and in any event reduces to a negligible amount any sticking of one Cellophane-wrapped cigar to an adjoining one.

What I claim as new and desire to secure by Letters Patent is:

1. The process of humidifying cigars and the like which consists in placing the materials in a tight receptacle, subjecting them therein to the action of a suction device until most of the air is removed, supplying the required amount of moisture in the form of vapor to said chamber, then continuously supplying air to said chamber until about twenty pounds pressure above atmospheric pressure is obtained and then shutting off further air and leaving the materials in the receptacle subject to the pressure and moisture therein for several hours whereby most of the moisture is absorbed by the materials.

2. The process of humidifying cigars and the like in Cellophane wrapped packages which consists in placing the packages of materials in a tight receptacle, subjecting them therein to the action of a suction device until most of the air is removed, supplying heat and the required amount of moisture in the form of vapor to said chamber, supplying air to said chamber until about twenty pounds pressure above atmospheric pressure is obtained and then shutting off further air and leaving the packages of materials in the receptacle subject to the pressure and moisture therein for several hours whereby most of the moisture is absorbed by the materials within the wrappers and a sealing of the joints of said Cellophane is obtained.

3. The process of humidifying cigars and the like which consists in placing the materials to be treated in a tight receptacle, providing and evaporating water within the receptacle, evacuating most of the air from the receptacle chamber, completing the evaporation of said water, then supplying air to the chamber until appreciably more than atmospheric pressure has been obtained, cutting off further air pressure and retaining the materials in the chamber subject to the pressure and moisture already supplied for several hours whereby most of the moisture is driven into and absorbed by the materials in the receptacle.

4. The process of treating Cellophane-wrapped packages of material which consists in placing the said wrapped packages of material in a tight receptacle, subjecting them therein to the action of a suction device until most of the air is evacuated, supplying the required amount of heat and of moisture in the form of vapor to the chamber of said receptacle, supplying air under pressure to said chamber until appreciably more than atmospheric pressure is obtained, and retaining the packages in the chamber for several hours subject to the air and moisture there present whereby most of the moisture is driven into and absorbed by the materials within the packages and the joints of the Cellophane wrappers are sealed and adapted to retain the moisture within the packages.

5. The process of treating Cellophane-wrapped packages of material which consists in placing the said wrapped packages of material in a tight receptacle, subjecting them therein to the action of a suction device until most of the air is evacuated, supplying the required amount of heat and of moisture in the form of vapor to the chamber of said receptacle, supplying air under pressure to said chamber until about twenty pounds more than atmospheric pressure is obtained, and retaining the packages in the chamber for several hours subject to the air and moisture there present whereby most of the moisture is driven into and absorbed by the materials within the packages and the joints of the Cellophane wrappers are sealed and adapted to retain the moisture within the packages.

6. The process of treating material which consists in placing the material together with a vaporizable treating agent within a sealable receptacle and sealing the receptacle, subjecting the material therein to the action of a suction device until most of the air is removed, vaporizing said treating agent, then placing the receptacle into communication with a sufficient source of compressed air until a pressure considerably above atmospheric pressure is quickly obtained, and leaving the material subject to the action of said treating agent and said pressure for the desired time.

7. The process of treating material which consists in placing the material together with a vaporizable treating agent within a sealable receptacle and sealing the receptacle, subjecting the material therein to the action of a suction device until most of the air is removed, vaporizing said treating agent by heat, then placing the receptacle into communication with a source of compressed air until a pressure considerably above atmospheric pressure is obtained, and leaving the material subject to the action of said treating agent and said pressure for the desired time.

8. The process of treating material which consists in placing the material together with a vaporizable treating agent within a sealable receptacle and sealing the receptacle, subjecting the material therein to the action of a suction device until most of the air is removed, vaporizing said treating agent by heat controlled from without the receptacle, placing the receptacle into communication with a sufficient source of compressed air until the partial vacuum is rapidly changed to a pressure considerably above atmospheric pressure, and leaving the material subject to the action of said treating agent and said pressure for the desired time.

9. The process of treating material which consists in placing the material together with a vaporizable treating agent within a sealable receptacle and sealing the receptacle, evacuating

the air from said receptacle, vaporizing said treating agent, placing the receptacle into communication with a sufficient source of compressed air until a partial vacuum is rapidly changed to a pressure considerably above atmospheric pressure, and leaving the material subject to the action of said treating agent and said pressure for the desired time.

10. The process of treating material which consists in placing the material together with a vaporizable treating agent within a sealable receptacle and sealing the receptacle, evacuating the air from said receptacle, heating said treating agent until it vaporizes, placing the receptacle into communication with a sufficient source of compressed air until a pressure considerably above atmospheric pressure is rapidly obtained, and leaving the material subject to the action of said treating agent and said pressure for the desired time.

11. The process of treating material which consists in placing the material together with a vaporizable treating agent within a sealable receptacle and sealing the receptacle, evacuating the air from said receptacle, heating said treating agent until it vaporizes, then placing the receptacle into communication with a sufficient source of compressed air until a pressure considerably above atmospheric pressure is promptly obtained, shutting off further air to said receptacle and leaving the material subject to the action of said treating agent and said pressure for the desired time.

12. The process of treating material which consists in placing the material in a tight receptacle, evacuating most of the air from the receptacle, providing a supply of a suitable treating agent within the receptacle and applying heat thereto to cause vapor to come therefrom, immediately and rapidly supplying air under pressure to said receptacle until appreciably more than atmospheric pressure has been obtained and retaining the materials in the receptacle subject to the pressure and vapor therein for the desired period.

13. The process of treating material which consists in placing the material in the chamber of a tight receptacle, subjecting it therein to the action of a suction device until most of the air is removed, supplying the required amount of treating agent in the form of vapor thereof to said chamber, then quickly supplying air to said chamber until about twenty pounds pressure above atmospheric pressure is obtained and then leaving the material in the receptacle subject to the pressure and said vapor therein for several hours whereby most of the said vapor is absorbed by the material.

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