Feb. 20, 1951 H. L. WHITLEY 2,542,607

DEHYDRATION APPARATUS

Filed Nov. 9, 1946 3 Sheets-Sheet 1

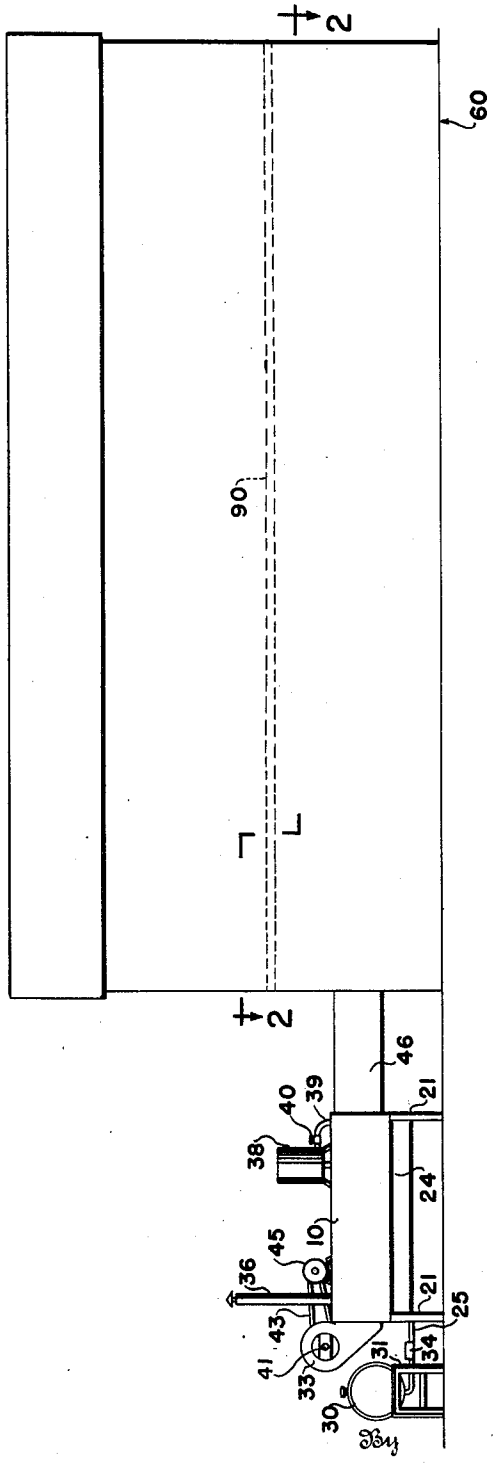


FIG-1

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DEHYDRATION APPARATUS

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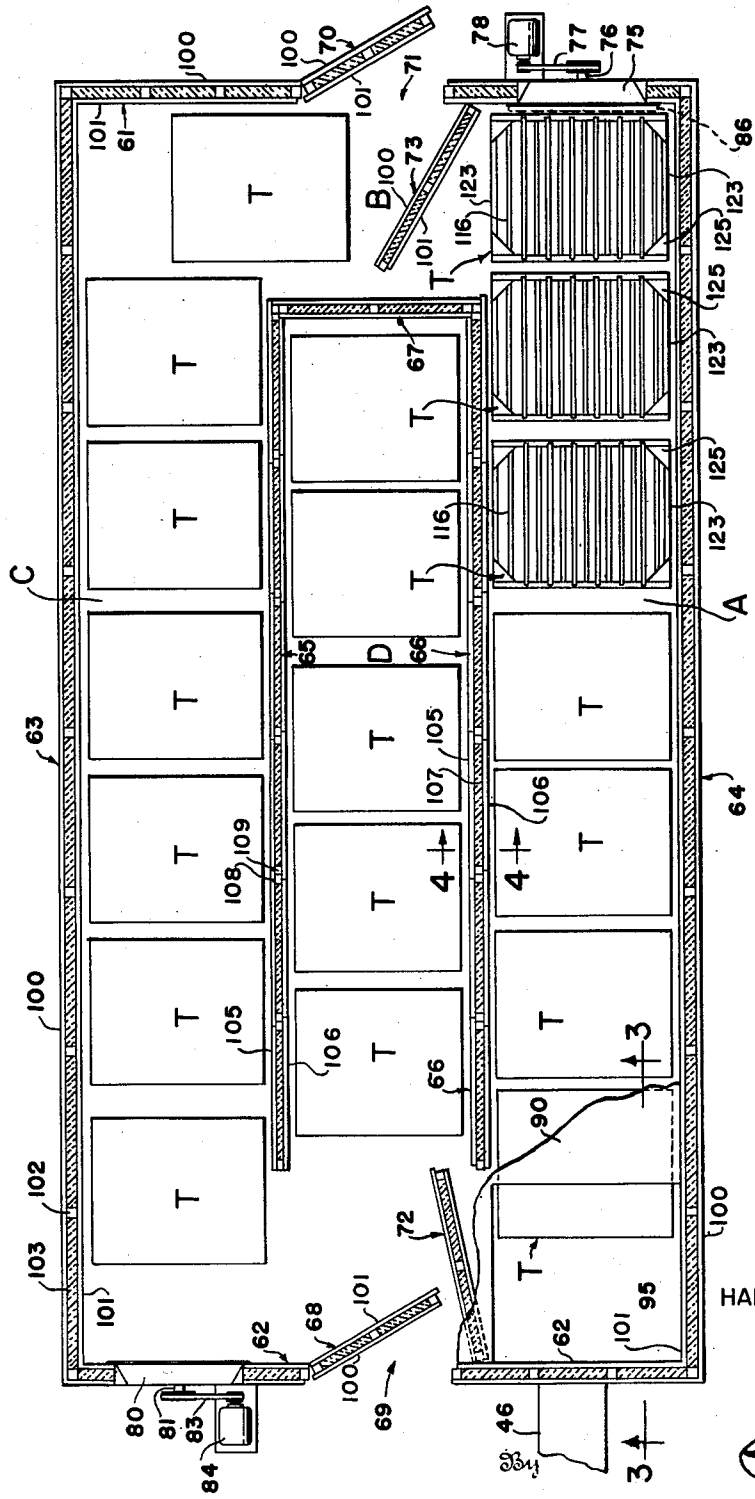


FIG -2

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DEHYDRATION APPARATUS

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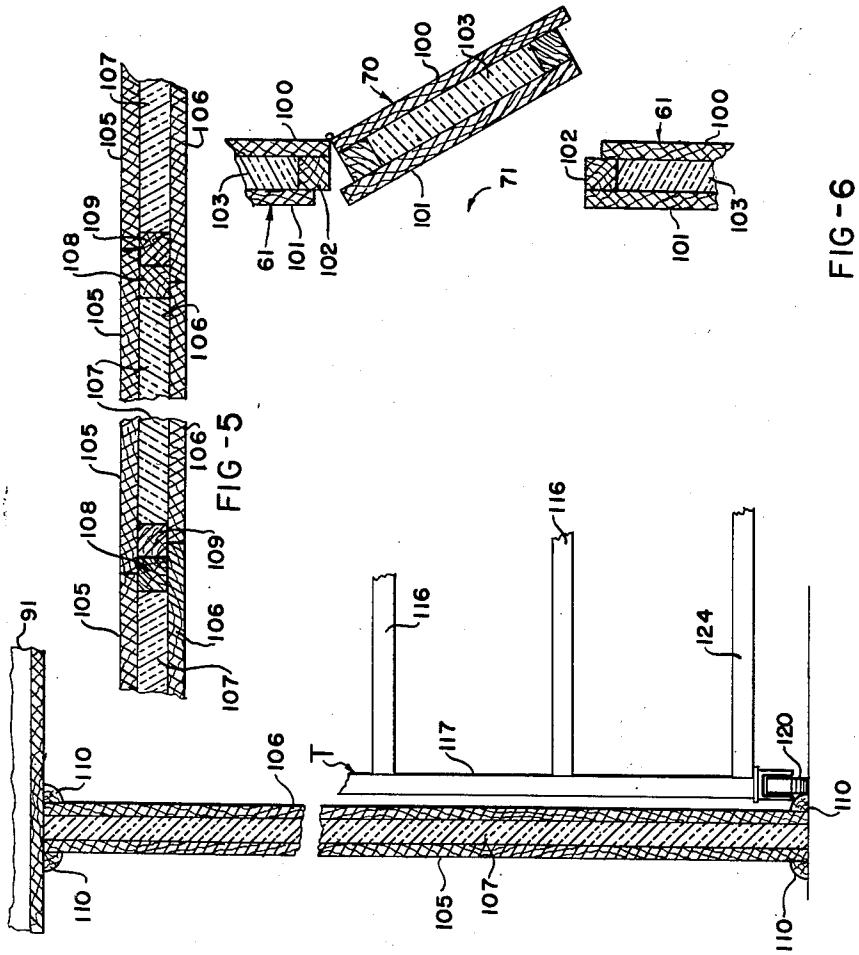


FIG-6

FIG-5

FIG-4

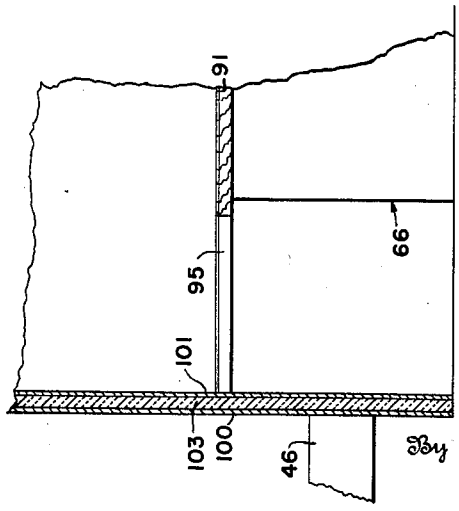


FIG-3

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Patented Feb. 20, 1951

2,542,607

UNITED STATES PATENT OFFICE

2,542,607

DEHYDRATION APPARATUS

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Application November 9, 1946, Serial No. 708,997

2 Claims. (Cl. 34—211)

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This invention relates to apparatus for curing tobacco and relates more especially to a drying and storage house having corridors through which heated air is passed and said corridors being adapted to have placed therein suitable wheeled trucks on which the sticks of tobacco leaves are placed whereby a current of heated air may be passed through said corridors and through the tobacco leaves to dry the same with means for storing additional trucks loaded with tobacco for a yellowing operation which trucks can be fed into the line of other trucks for passing progressively through the heated corridor, or corridors, for curing the same and said building having an upstairs storage compartment so that when the tobacco is cured the trucks can be elevated and placed in storage on the second story of the building.

It is an object of this invention to provide a tobacco curing system wherein a curing compartment is provided and if desired, there could be provided above the curing compartment a storage compartment and the curing compartment is divided into corridors which are adapted to receive a plurality of wheeled trucks, and said wheeled trucks being adapted to receive a plurality of sticks having bunches of tobacco leaves thereon to undergo a curing process, with means for heating and forcing air through one or more of the corridors and with a ventilating fan provided for inducing the air through the corridors. Means are also provided whereby humidification may be imparted during the curing process or after the curing process is completed, whereby the humidified air may be forced through the tobacco leaves for bringing them in order for handling purposes. Means are also provided for storing an additional quantity of trucks having green tobacco leaves thereon which can be fed into the stream of trucks to replace the cured trucks which are removed from the curing department.

It is another object of this invention to provide apparatus for handling tobacco, such as curing the same and bringing the same into order for handling purposes after the same is cured, in which means are provided for heating and forcing air through definite corridors within the building, the said corridors being provided with suitable doors whereby one or more corridors at a time can be used for curing the tobacco, depending upon the quantity of tobacco desired to be cured at one time, with means for storing additional tobacco to be cured and progressing the tobacco, loaded onto trucks, through said corridors and replenishing the cured tobacco with the other tobacco stored outside of the corridors through which heated air is forced, so that when the tobacco is cured, it can be transferred to a storage compartment disposed in the upper story of the building, if desired. If desired, the tobacco can be left in the corridors and when it is desired to bring it into order by creating the proper amount of humidity within the tobacco leaves to avoid crumbling or shattering, the same heating means can be employed for forcing humidified air through the corridor in which the tobacco leaves are stored for imparting the proper amount of humidification to the tobacco leaves so that they will stand handling without damage thereto.

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It is another object of this invention to provide a means for dehydrating vegetable matter of any kind, such a tobacco leaves, cut grass for converting the same into hay, for dehydrating fruit, and in fact processing any vegetable or other growth for removing the moisture therefrom and providing wheeled trucks for supporting the matter to be dehydrated and providing corridors in a suitable building, and providing means on the exterior of the building, preferably, for forcing heated air through the objects being dehydrated, and, if desired, humidifying the objects after they have been dried.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds when taken in connection with the accompanying drawings, in which

Figure 1 is an elevation of a curing barn or curing house and showing means for creating and forcing heated air through the curing house;

Figure 2 is a sectional plan view taken along the line 2—2 in Figure 1 and showing a portion of the second floor in plan;

Figure 3 is a vertical sectional view taken substantially along the line 3—3 in Figure 2;

Figure 4 is a vertical sectional view taken along the line 4—4 in Figure 2;

Figure 5 is a horizontal sectional view showing a typical inner-wall section of the building;

Figure 6 is a horizontal sectional view showing a typical wall structure of a door and its mounting.

Referring more specifically to the drawings, the numeral 10 indicates an outer casing of a suitable heat generating apparatus which is supported by a plurality of upright posts 21. Mounted below the casing 10 is a rectangular casing 24 which is open at its top and bottom with its top fitting closely against the bottom portion of outer casing 10, and in which is mounted a plurality of

burners, not shown. Extending from casing 24 is a fuel supply pipe 25 which leads to a storage tank 30, mounted on a suitable support 31, and a liquid or gaseous fuel is supplied to the burners, not shown, from the tank 30. In the supply pipe 25 may be installed a conventional constant flow mechanism 34, if desired.

An exhaust pipe 36 for the burners, not shown, passes out through the top of the casing 10.

Mounted on top of the outer casing 10, by any suitable means, is a water tank 38 having a pipe 39 leading therefrom with a valve 40 therein for controlling the flow of water therefrom so that the air being heated by the burners may be humidified, if desired.

Covering the left-hand end of the casing 10 as shown in Figure 1 is a housing 33 having a blower fan 41 in its upper portion, said blower fan being driven by a belt 43, mounted on a V-pulley of a suitable electric motor 45.

The end of the casing 10 remote from the fan casing 33 has a duct 46 covering the same, which duct leads into the dehydrating building to be presently described.

In the form of heating unit thus far described, a liquid or gaseous fuel is adapted to be used; however, it is obvious that a coal or wood furnace would work equally as well.

The dehydrating house, building, or barn is indicated broadly by the reference character 60. This tobacco barn, or other dehydrating building, comprises end walls 61 and 62 and side walls 63 and 64 with partitions 65, 66 and 67. End wall 62 is provided with a swinging door 68 for closing an opening 69, whereas end wall 61 has a swinging door 70 for closing an access opening 71. There is provided a swinging door 72, hinged to the interior surface of end wall 62 for closing an opening in the partition 66. Partition 66 stops short of the end of wall 61 and a swinging door 73 is provided for closing the opening between the end of partition 66 and end wall 61.

This arrangement of partitions and doors provides a plurality of corridors designated as A, B, C and D. The duct 46 leading from the heating unit penetrates end wall 62 and communicates with corridor A. At the other end of corridor A in end wall 62 may be provided a suction fan casing 75 having a suction fan therein mounted on a shaft 76 which is driven by a V-belt 77, driven by an electric motor 78. There can also be provided at the end of corridor C in end wall 62 a similar suction fan casing 80, in which is mounted a suction fan 81 driven by a belt 83, driven in turn by an electric motor 84. When it is desired to use the last-named suction fan, then, of course, the suction fan 76 would not be employed but a board covering 86, indicated in dotted lines in Figure 2, would be placed over the suction fan casing 75 to close this opening, while suction fan 76 would remain inoperative and the suction fan 81 would be made operative. This would cause the heated air to be passed through corridors A, B, and C, and exhausted by suction fan 81, whereas if corridors B and C were not desired to be used, then door 73 could be closed and suction fan 76, with its cover 86 removed, would be rendered operative to pass the heated air only through corridor A.

The partitions 65, 66 and 67 would extend upwardly and be joined to a ceiling or second floor 90, supported by suitable ceiling joists 91 which would provide a storage compartment of the entire second floor of the building, and an opening 95 would be provided which would be closed by a suitable door, not shown, when a curing or dehydration process was being carried out, and after the dehydration process is carried out, if it is desired to store the dehydrated objects present in any one or all of the corridors A, B, and C, then this door would be removed from over opening 95 and a suitable hoisting mechanism would be employed for hoisting the trucks holding the dehydrated objects onto the second floor for storage purposes. This second floor compartment could very easily be employed in the processing of tobacco by bringing the tobacco in order while in the corridors and then elevating it to the second floor and using the second floor as a packing room for grading and packaging these tobacco leaves into hands.

The outer walls and the doors are all of similar construction and comprise an outer covering sheet 100 and an inner covering sheet 101, secured to suitable uprights 102 and said uprights having disposed therebetween suitable boards 103, which preferably are of insulating material such as fibre board and the like. These partitions 65, 66 and 67 are of similar construction having outer sheet members 105 and 106 with a suitable insulating material 107 therebetween, but they are joined slightly differently in that two uprights 108 and 109 are used at the joints and this provides a staggered joint as shown in Figure 5 which permits the length of the partition to be arranged as desired as any number of these sections can be joined together by suitable means, not shown, to provide a partition of the requisite length.

On each side of the partitions at the top and bottom, as well as at the top and bottom of the inside of the outer walls, suitable quarter rounds 110 can be provided so that they can be removed easily and the partition walls removed or installed very quickly. Also, the quarter rounds serve to prevent the trucks, to be presently described, from rubbing against the walls and partitions of the building.

It is to be understood that this building and heating unit therefor can be employed for dehydration of any desired article, but in the drawings I have shown, it is especially equipped for the curing of tobacco. The tobacco leaves are picked from the field and suitably secured to tobacco sticks 116 in a conventional manner. I provide a plurality of wheeled trucks comprising four upright corner angle iron members 117, joined together by top angles 118 and bottom angles 119 mounted on four wheels 120. There is also provided a plurality of longitudinal angles which are identical to the top angles previously described. These top angles are adapted to support the ends of the tobacco sticks 116 which are filled with bunches of tobacco leaves. The upper portion of the uprights 117 are secured together by means of suitable angle braces 123, while the lower portion thereof is secured together by suitable angles 124. Suitable corner plates 125 are provided at the upper and lower portions of the truck to brace the same against losing its shape and making it much stronger for handling purposes.

When it is desired to begin the curing of a barn of tobacco, the tobacco sticks with the tobacco leaves thereon are usually prepared outside of the barn, are loaded onto the trucks and after being placed on the sticks are placed in the wheeled trucks as shown in the drawings and corridor A is filled. It is understood that these trucks are of such height as to fill the corridors almost to

the ceiling to conserve space. If it is a small batch of tobacco or other material which is to be cured and dehydrated, then door 73 can be closed and the heated air forced through corridor A and forced out through the opening in which suction fan 76 is mounted. However, if there should be a larger curing to be taken care of, then corridor B can be completely filled by closing door 70 and moving door 73 back against it or in a clockwise manner in Figure 2, and corridor C can also be filled and the cover 86 can be placed over suction fan 76 and suction fan 76 rendered inoperative, and then suction fan 84 can be energized and the heated air will be passed through corridors A, B, and C successively to dehydrate the material disposed therein. If there is a surplus of material to be dehydrated, then a plurality of trucks with the tobacco leaves or other dehydratable material may be stored in corridor D where they will undergo a yellowing process and as the curing is about completed, and as the trucks are removed from the left-hand end of corridor A, and the other trucks moved clockwise in corridors A and B and C, then additional trucks can be taken from corridor D and the doors 68 and 72 being closed, and door 73 being open, these additional trucks can be fed into the left-hand end of corridor C to continue the curing process.

In other words, when the corridors A, B and C are filled and the heat is turned on, the tobacco is processed in a conventional manner by advancing the heat gradually until the leaf is dried in the truck adjacent the door 72. It is of course evident that the state of curing as the trucks extend down the corridor A from left to right will be less advanced. When the tobacco held by the first truck in the left-hand end of corridor A has been completely cured and the stems have been killed, this truck is removed by opening door 72 and one of the trucks in the middle corridor B is inserted in the left-hand end of the corridor C and all of the other trucks having first been moved around in a clockwise manner in corridors C, B and A, respectively. In this way, the uncured or green tobacco is fed into the left-hand end of corridor C and the cured tobacco is taken out of the left-hand end of corridor A, this curing process continues until the entire crop of tobacco is completely cured as this can be a continued process with the cured tobacco being withdrawn from the hottest portion of the barn and the uncured or greenest tobacco being inserted to move all of the other trucks around to progressively shift them toward the source of heat. In this way a perfect cure of the tobacco can be obtained and this has been impossible by the old method, wherein the tobacco was stacked close together in a barn, tier above tier. It might be added that by this present method it is absolutely impossible to scald the tobacco on account of increasing the heat at too rapid a pace. Heretofore, in the old type of curing, after the yellowing process has been carried out, the heat is advanced from at a rate of from three to five degrees per hour, because by advancing it at a faster rate the tobacco will become scalded. The reason the tobacco becomes scalded in the old process is that there is not proper ventilation through the tobacco leaves. By the present invention there is a current of heated air passing around all of the tobacco leaves which absolutely prevents scalding or sponging and enables the tobacco to be cured in a continuous process by withdrawing the cured tobacco from the hottest part of the barn and progressing the tobacco around to take the place of the withdrawn tobacco, and feeding the green tobacco at the coolest part of the barn in the current of heated air, because although the temperature of the air entering the barn is around 175°, by the time it passes through all of the other tobacco which is greener and greener until the heated air reaches the exit portion, this heated air is robbed of its heat as it progresses through the tobacco so that when it strikes the newly inserted tobacco at the discharge end of the current of air this heat will not be above 100° or something in that neighborhood and therefore will not damage the green tobacco inserted in the line of flow of the stream of heated air.

In the drawings and specification there has been set forth a preferred embodiment of the invention, and although specific terms are employed, they are used in a generic and descriptive sense only, and not for the purposes of limitation, the scope of the invention being defined in the claims.

I claim:

1. Apparatus for curing tobacco, comprising a building having a corridor extending from one end of the building to the other and a cross corridor extending along said other end of the building, a third corridor extending longitudinally along the other side wall of the building from one end wall to the other, heat generating apparatus disposed adjacent the first end of the building and having a duct leading into the first main corridor, a suction fan located at the end of the first corridor for drawing heated air through the first corridor, a plurality of doors for connecting the corridors to the first-named corridor and a second suction fan located at the end of the third corridor for drawing heated air from the heat generating apparatus along the corridors and out of the building, said corridors being adapted to have placed therein wheeled trucks supporting a plurality of tobacco sticks with tobacco leaves thereon for curing the same, a fourth corridor disposed between the two corridors running parallel to the side walls and in which additional trucks loaded with tobacco leaves can be stored, the third corridor having a door communicating with the fourth corridor whereby the trucks stored in the fourth corridor can be fed into the third corridor as all of the trucks are advanced around the corridors.

2. A tobacco-curing barn comprising a building having an upper story and a lower story, and having two end walls and two side walls, a plurality of partitions disposed in the lower story and dividing the interior thereof into a plurality of corridors, movable doors in said partitions for establishing communication between the corridors, suction fans disposed in opposed end walls of the building for drawing air through the corridors, a heat-generating member disposed on the exterior of the building and having a duct leading through one of the walls of the building and communicating with one of the corridors, an impelling fan associated with the heat-generating means for forcing heated air into one end of the corridors, said suction fans serving to move the air through the corridors, means for closing some of the suction fans when said doors are opened for establishing communication between more than one of the corridors for creating a draft of heated air through the corridors, said corridors being adapted to receive wheeled trucks, filled with tobacco leaves to be cured, the first and second stories having an opening therebetween through which

the wheeled trucks with the tobacco leaves thereon, after being cured, may be transferred for storage and handling purposes.

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