

T. SUZUKI.
 DRYING APPARATUS.
 APPLICATION FILED JAN. 17, 1912.

1,039,841.

Patented Oct. 1, 1912.

4 SHEETS—SHEET 1.

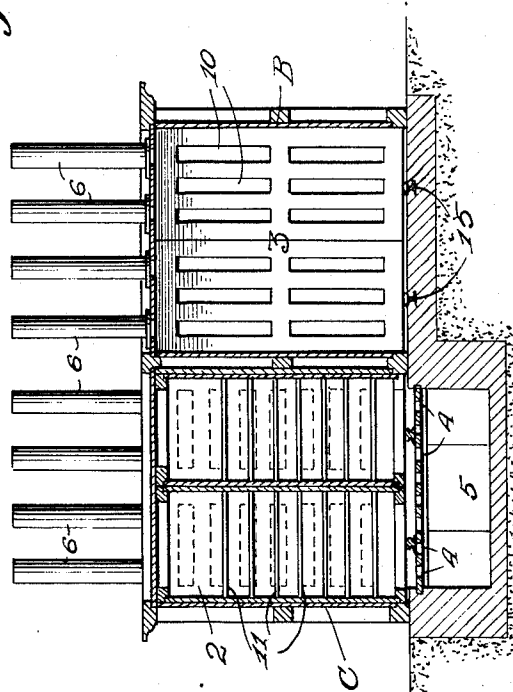
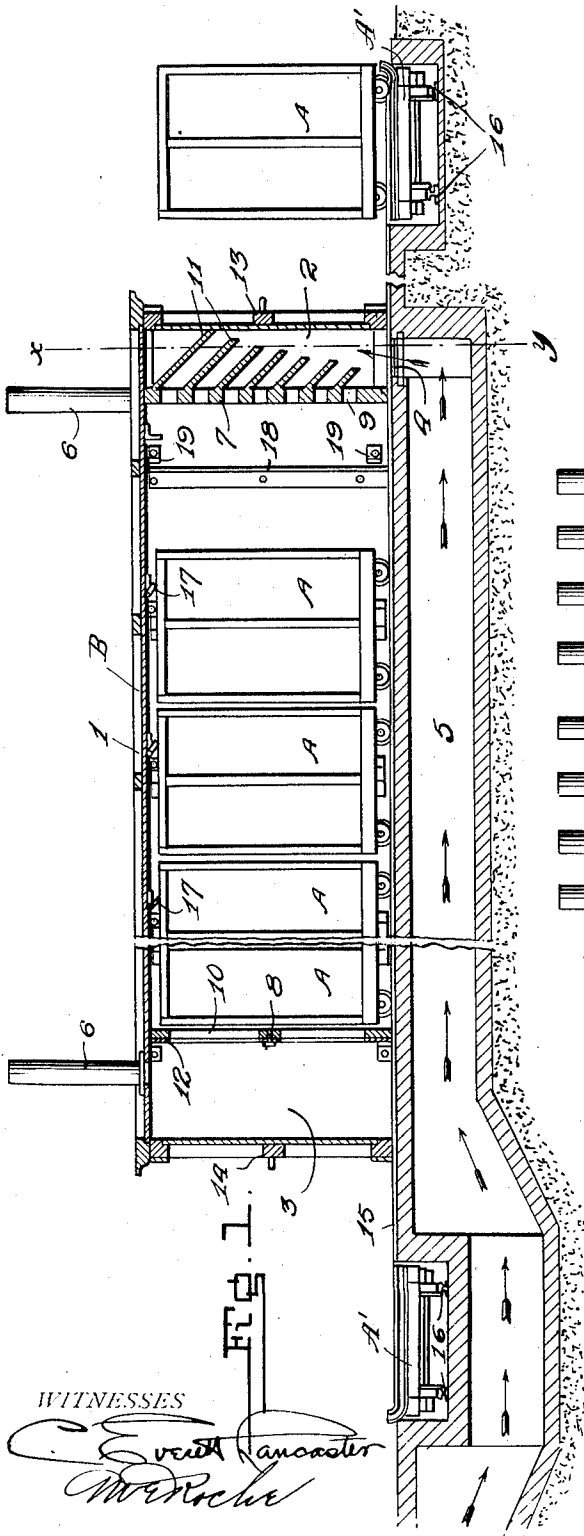


FIG. 2.

WITNESSES
Everett Lancaster
W. H. Roche

INVENTOR
 Tozaburo Suzuki,
 By *B. Singer* Attorney

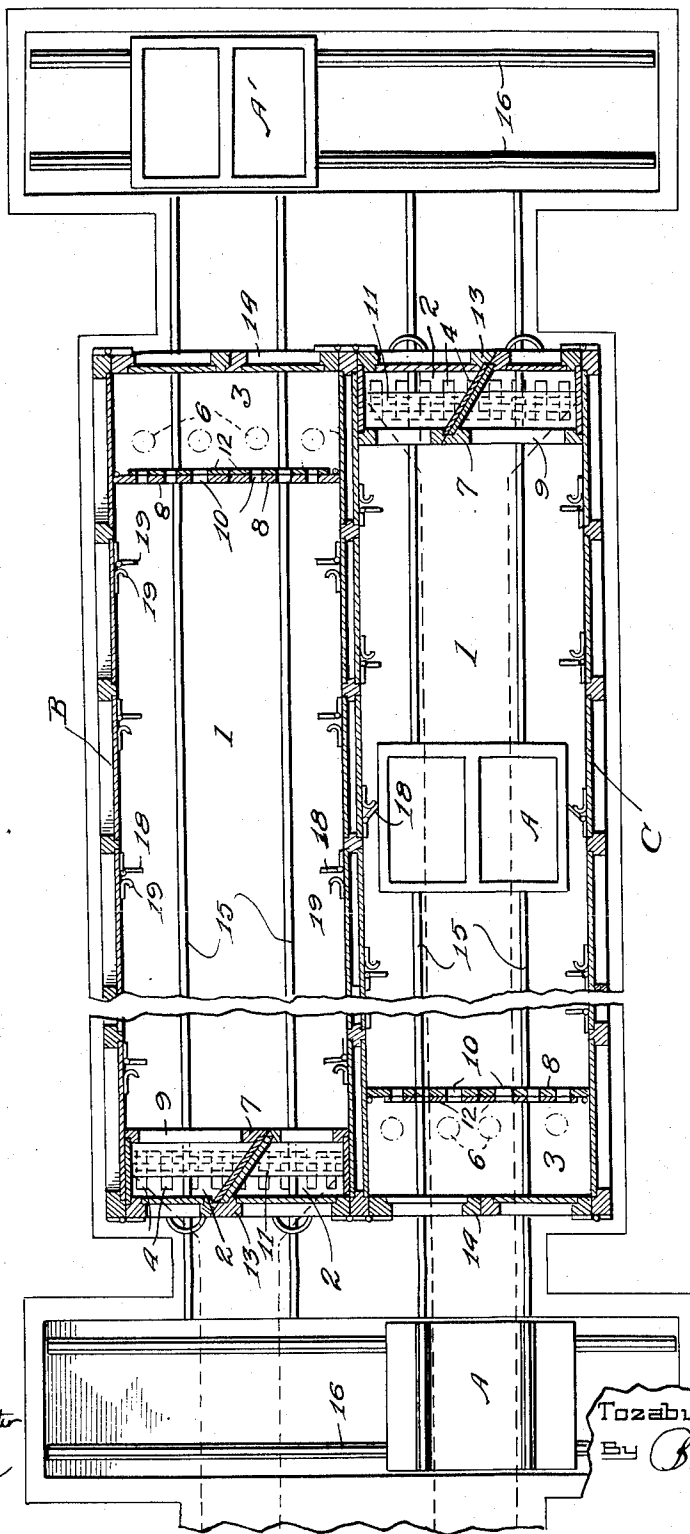
T. SUZUKI.
 DRYING APPARATUS.
 APPLICATION FILED JAN. 17, 1912.

1,039,841.

Patented Oct. 1, 1912.

4 SHEETS—SHEET 2.

Fig. 2.



WITNESSES
Robert Lancaster
W. W. Roehr

INVENTOR
 Tozaburo Suzuki
 By *B. Singer*
 Attorney

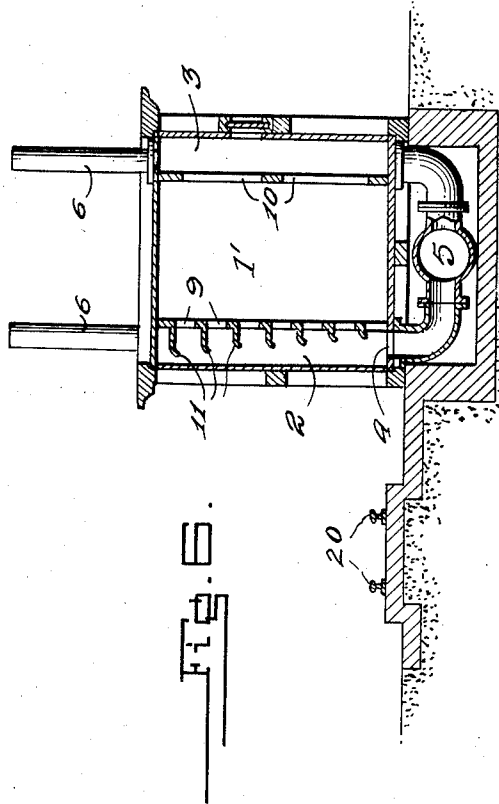
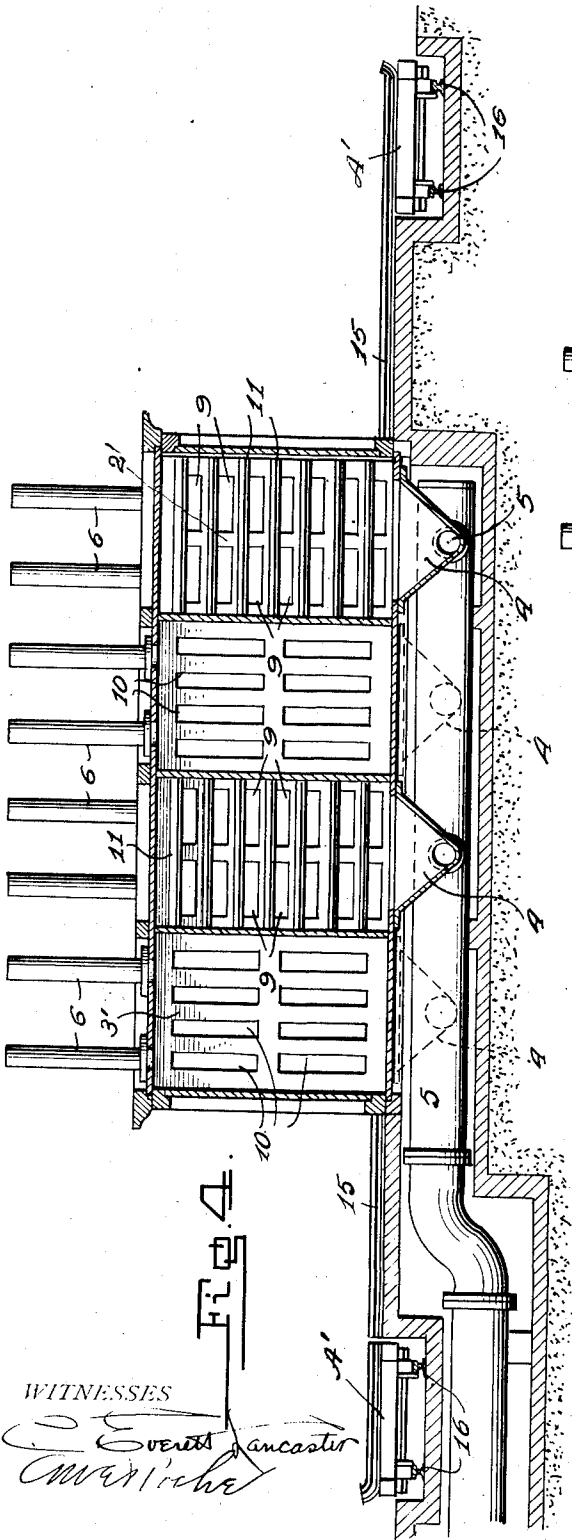
T. SUZUKI.
 DRYING APPARATUS.

APPLICATION FILED JAN. 17, 1912.

1,039,841.

Patented Oct. 1, 1912.

4 SHEETS—SHEET 3.



WITNESSES

Overton Lancaster
W. H. H. H.

INVENTOR

Tozaburo Suzuki

By *B. Singer* Attorney

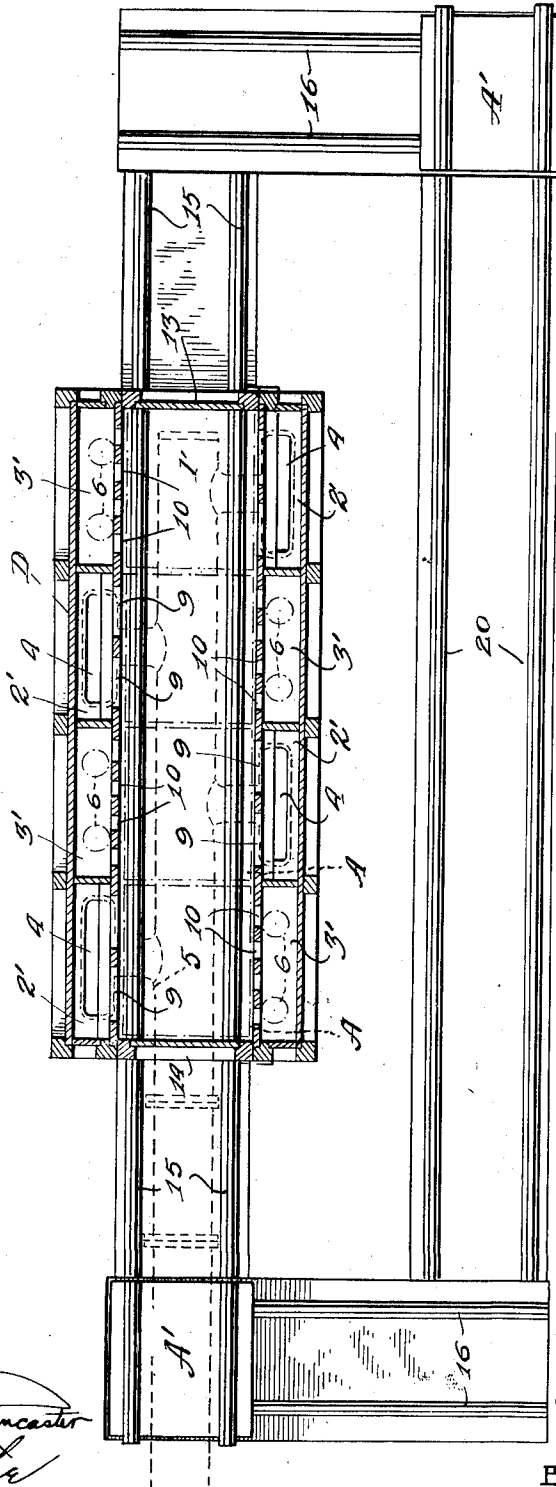
T. SUZUKI.
 DRYING APPARATUS.
 APPLICATION FILED JAN. 17, 1912.

1,039,841.

Patented Oct. 1, 1912.

4 SHEETS—SHEET 4.

Fig. 5.



WITNESSES

Everett Lancaster
Wm. E. Roche

INVENTOR

Tozaburo Suzuki

By

B. Singer
 Attorney

UNITED STATES PATENT OFFICE.

TOZABURO SUZUKI, OF TOKYO, JAPAN.

DRYING APPARATUS.

1,039,841.

Specification of Letters Patent.

Patented Oct. 1, 1912.

Application filed January 17, 1912. Serial No. 671,638.

To all whom it may concern:

Be it known that I, TOZABURO SUZUKI, a subject of the Emperor of Japan, residing at No. 401 Jiheishinden, Suna-mura, county of Minami Katsushika, Prefecture of Tokyo, Japan, have invented certain new and useful Improvements in Drying Apparatus, of which the following is a specification.

My present invention relates to drying apparatus for plants or tufty fibrous materials, wherein it is passed through the apparatus on suitable conveying means after having previously been distributed thereupon, and subjected to currents of air adapted to expel moisture therefrom.

The principal objects of my invention are to provide an apparatus which will thoroughly and uniformly dry the material; to so dispose the directing means of the current of air that the conveying means for the materials may be successively moved through the chambers of the apparatus thus facilitating the operation, and, to direct the currents of air within the chambers to follow a path closely adjacent the materials to be treated, and to break up the strata like currents adjacent the walls of the apparatus.

Further objects of my invention will be more particularly pointed out in the following detailed description.

In the drawings, forming a part of this specification: Figure 1 is a vertical longitudinal section through one of the housings of the apparatus embodying my invention. Fig. 2 is a sectional plan view through contacting housings of the type shown in Fig. 1, embodying my invention. Fig. 3 is a transverse vertical sectional view, through the housings, as disclosed in Fig. 2. Fig. 4 is a view similar to Fig. 1, showing the modifications of my invention. Fig. 5 is a view similar to Fig. 2, relating to the modification shown in Fig. 4. Fig. 6 is a view similar to Fig. 3, relating to the device as disclosed in Fig. 4.

Similar characters refer to similar parts throughout the several views.

The drying apparatus as disclosed in Figs. 1, 2 and 3 of the drawing, comprises two longitudinally through the housings B and C, each including a drying chamber 1, distributing chamber 2, and an exhaust chamber 3, all separated by doors or movable partitions as will be subsequently disclosed.

The materials to be treated are supported

upon suitable vehicles A which are preferably mounted upon rails 15 extending longitudinally through the housings B and C, through each of the compartments 1, 2 and 3 thereof, and at their ends, rails 16 are provided, at a lower level than rails 15, and a switching car A' may be provided to transfer the cars from the rails of housings B to the rails of housing C, or vice versa.

Referring more particularly to the housings B and C, which, are preferably identical but arranged in inverse order, access is gained to the housing by the doors 14 adjacent the exhaust chamber 3, which latter are separated from the drying chambers 1 by doors 8. These doors 8 are perforated as at 10, and said perforations are controlled by dampers 12, for a purpose to be subsequently described.

The distributing chamber 2 is separated from drying chamber 1 by partitions 7, which are preferably carried by doors 13 at the end of the housing, so that upon opening these doors the distributing chamber is separated into halves, and the vehicles A may be drawn out of the housing at the distributing chamber end thereof. The partitions 7 have perforations 9 which are provided, adjacent their upper margins, with downwardly projecting deflecting plate 11 disposed in superposed spaced apart relation to each other, with each succeeding plate projecting beyond the outer margin of the subjacent plate.

A conduit 5 is adapted to deliver air to a port 4, opening into the distributing chamber, so disposed below the deflecting plate 11 that the air rising therefrom impinges said plate and is guided through the openings 9 in stratalike currents of substantially uniform density, the air traversing the chamber 1, entering chamber 3, where it finds egress through suitable stacks 6 or their equivalent. By regulating the apertures 10 in the doors 8, the velocity of the flow of the air in chamber 1 may be adjusted to attain the most practical and efficient drying of the material therein.

In order to break up the strata like currents adjacent the walls of the chamber 1, and to direct such currents to circulate adjacent the material carried by the vehicle A, on the ceiling wall I provide movable deflecting plate 17, which normally assumes a pendent position due to the force of gravity, but which, when engaged by the vehicle A,

are directed toward the distributing chamber 2, and in this position deflect and diffuse the currents of air which follow closely this wall, toward the materials on the vehicle and intermix it with the currents below. Likewise, on the side walls of the chamber, I provide deflecting plates 18, which are acted upon by springs 19, so that they closely engage the vehicle A and are directed toward the distributing chamber 2 when the car, entering by doors 14, engages such plates.

The operation of the apparatus disclosed in Figs. 1 to 3, inclusive, is as follows: The materials to be treated are carried by vehicles A which are wheeled into the chamber 1, of housing B, passing through chamber 3, in succeeding relation, and the air current is distributed from chamber 2, traversing through chamber 1, deflected by plates 17 and 18, as described, and finding egress through chamber 3. The vehicle next adjacent the chamber 2 is the first to be taken from housing B and is wheeled upon switching car A' which transfers it to the tracks 15 of housing C, whereupon it is wheeled into chamber 1 of housing C, through chamber 3, and inasmuch as the current of air in chamber 1 of housing C flows in a counter direction to that flowing through chamber 1 of housing B, the materials are uniformly dried when they are again wheeled through doors 13 of housing C. The vehicles A are then unloaded and reloaded, when they are in convenient proximity to again enter chamber 1 of housing B.

In connection with the device as disclosed in Figs. 4, 5 and 6, of the drawing, the same idea of directing the currents in counter direction to each other through the drying chambers is carried out, however, the housing D in combination with the vehicle A, provide, as it were, a plurality of heating chambers 1' and the cars are disposed so that they register substantially with the distributing chamber 2' and exhaust chamber 3' which are disposed laterally of the rails 15' traversing the chamber 1'. As clearly shown in Fig. 5 of the drawing, the chambers at one side of the rails 15 alternate and have disposed at the opposite side of the rails a coacting chamber, such as an exhaust chamber 3' for each distributing chamber 2' and the vehicles A are of such a length as to register substantially with the said coacting chambers. The vehicles find ingress to the chambers 1', as through doors 14' and egress therefrom as through doors 13' and the vehicles may be transferred back to the starting point by means of switching cars A', rails 16 and supplemental rails 20.

Air is admitted into chamber 2' by the conduit 5 and the walls of said chambers next adjacent the chamber 1' are provided with apertures 9 and the deflecting plates 11, as in the previous modification, and air find-

ing ingress to chamber 2' through port 4. Likewise the walls of chamber 3' next adjacent chamber 1' are provided with apertures 10 and stack 6 for the purpose set forth in connection with the form disclosed in Figs. 1 to 3, inclusive, of the drawing.

In the operation of the apparatus as disclosed in Figs. 4, 5 and 6, the materials are impinged by the air current from the deflecting chamber 2', first from one side, and then from the other side, as they are moved through the housing D.

I claim:—

1. In a drying apparatus, the combination with a chamber having ingress and egress means for air currents and means for conveying the materials treated therethrough, of deflecting means disposed transversely of the current flow, engaging said conveying means and the interior of the chambers, with its margin adjacent said conveying means foremost in the current flow, substantially as and for the purpose set forth.

2. In a drying apparatus the combination of a chamber having ingress and egress means for air currents, means for conveying the materials treated therethrough, of deflecting plates disposed transversely of the current flow, carried by said chamber at the interior thereof and adapted to engage said conveying means, and mechanism for holding said deflecting plates closely adjacent the said conveying means when the same is transported through said chamber, in the direction counter to that of the current flow.

3. In a drying apparatus, the combination with a drying chamber and a distributing chamber separated by a wall having a plurality of apertures, of conveying means for gaseous fluid opening into the lower portion of said distributing chamber, and a plurality of deflecting plates disposed closely adjacent the upper margins of the said apertures therein, directed downwardly and disposed in superposed spaced apart relation to each other over the said opening of said conveying means, each plate projecting beyond the next subjacent plate, substantially as and for the purpose set forth.

4. In a drying apparatus, the combination of two housings disposed in substantially parallel relation to each other, each housing including a distributing chamber at one end, an exhaust chamber at the other end, and a drying chamber intermediate said distributing and said exhaust chambers, the end chamber of one housing being disposed at the end of its respective housing opposite from the like chamber of the other housing, conveying vehicles for transporting the materials to be treated through said chambers, and means disposed exteriorly of and adjacent the ends of said housings for transporting the vehicles of either housing to the

other with the vehicles disposed to traverse said drying chambers in a direction counter to that of the current flow therethrough, substantially as and for the purpose set forth.

- 5 5. In a drying apparatus, the combination of two housings disposed in substantially parallel relation to each other, each housing including a distributing chamber at one end and an exhaust chamber at the other end
10 with a drying chamber intermediate said distributing and said exhaust chambers, the chamber of one housing disposed at the end of its respective housing opposite from the like chamber of the other housing, convey-
15 ing vehicles for transporting the materials

to be treated through said chambers, and means disposed exteriorly of and adjacent the ends of each of said housings for transferring the said vehicles from one housing to the other with the vehicles disposed to traverse said drying chambers in a counter direction to that of the current flow therethrough, substantially as and for the purpose set forth.

In testimony whereof I affix my signature 25 in presence of two witnesses.

TOZABURO SUZUKI.

Witnesses:

J. K. CALDWELL,
M. NAUSBER.