E. B. AYRES.

LEATHER DRIER.

APPLICATION FILED DEC. 29, 1913.

1,106,272.

Patented Aug. 4, 1914.

2 SHEETS—SHEET 1.

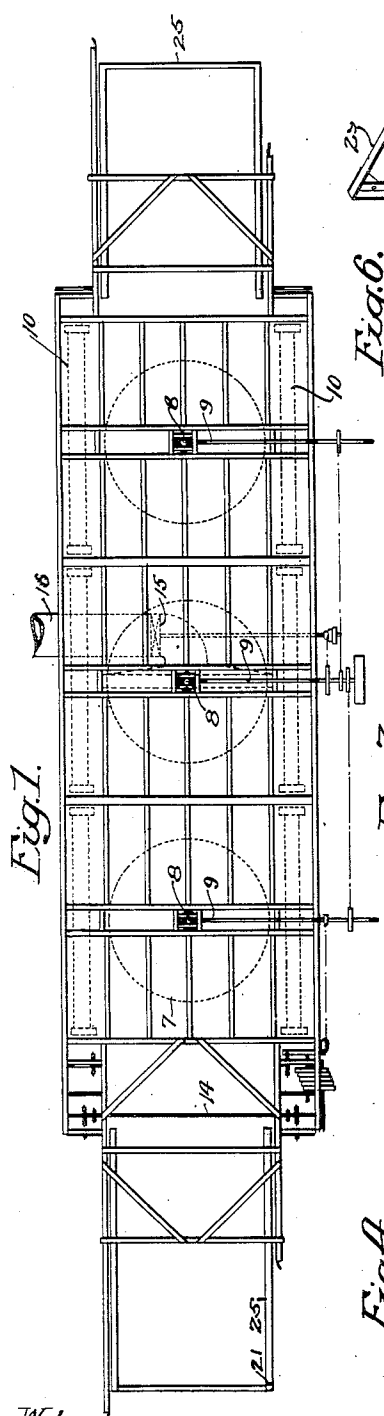


Fig. 1.

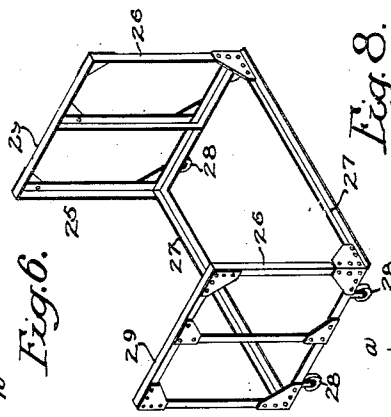


Fig. 6.

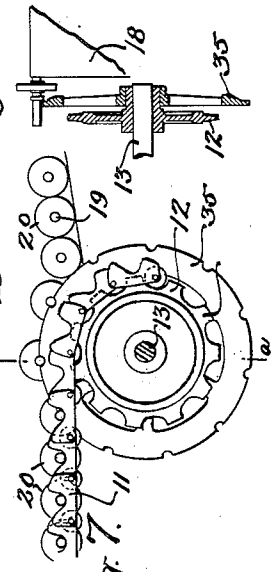


Fig. 8.



Fig. 7.

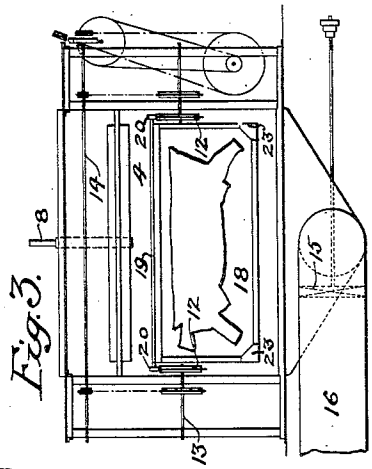


Fig. 3.

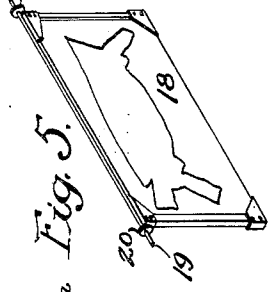


Fig. 5.

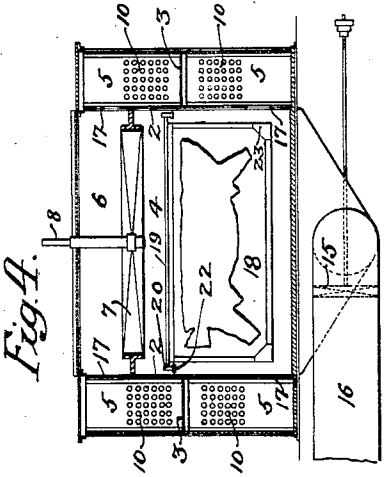


Fig. 4.

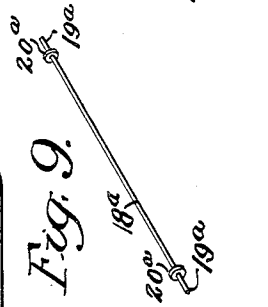


Fig. 9.

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2 SHEETS—SHEET 2.

Fig. 2a.

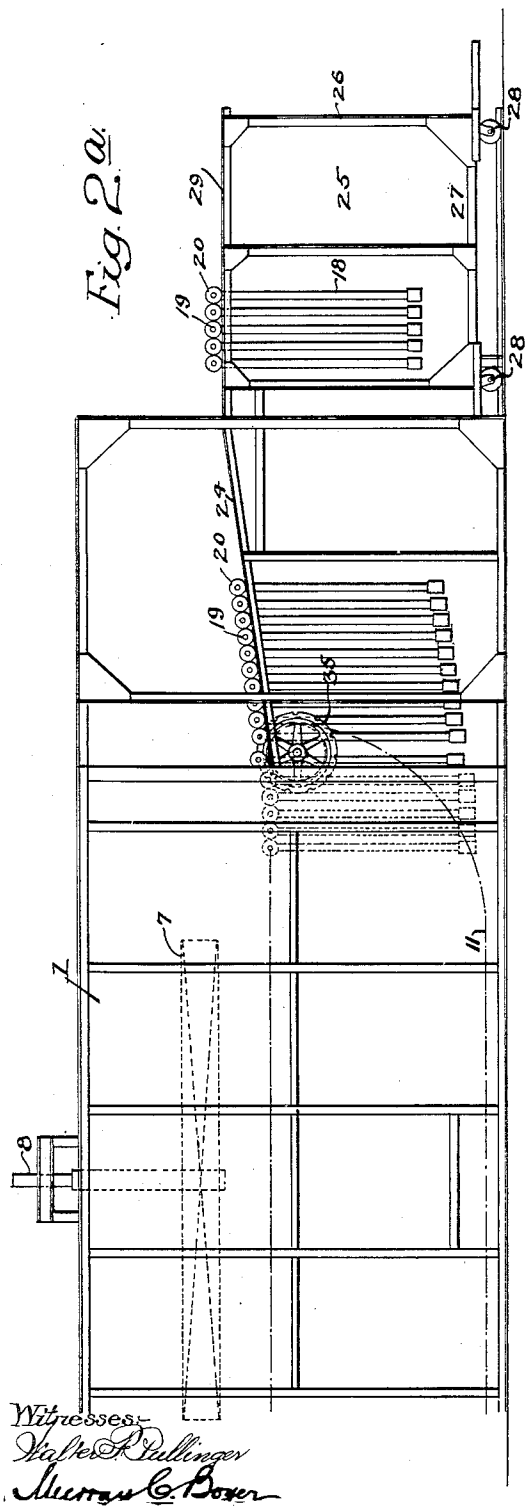
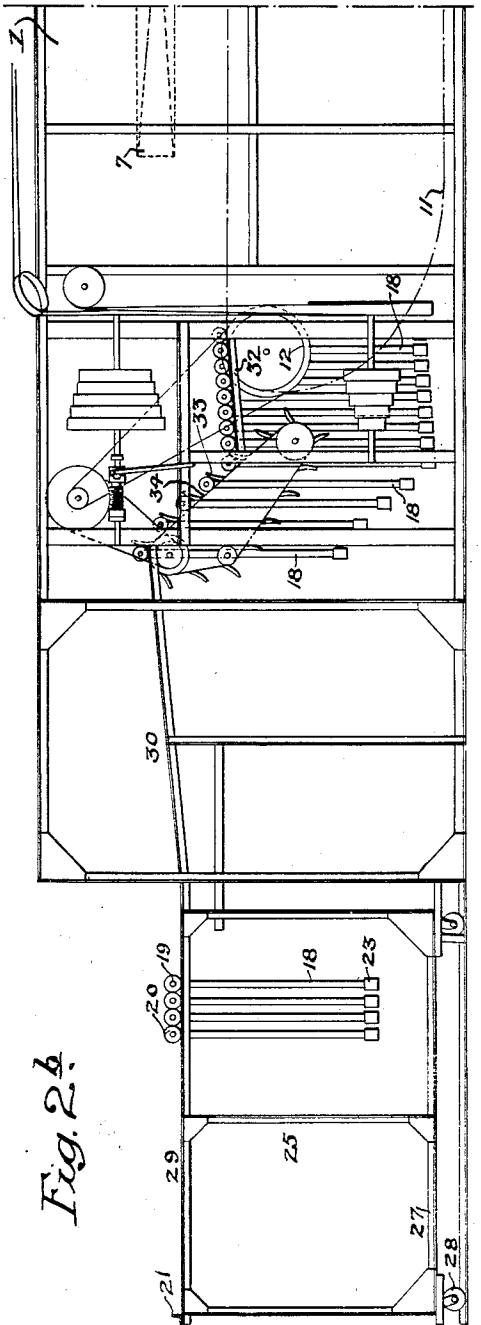



Fig. 2b.




Witnesses—

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# UNITED STATES PATENT OFFICE.

ELWOOD B. AYRES, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE PHILADELPHIA TEXTILE MACHINERY COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

## LEATHER-DRIER.

1,106,272. Specification of Letters Patent. Patented Aug. 4, 1914.

Application filed December 29, 1913. Serial No. 809,344.

*To all whom it may concern:*

Be it known that I, ELWOOD B. AYRES, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Leather-Driers, of which the following is a specification.

One object of my invention is to construct a machine for drying skins in the manufacture of leather so that the skins can be arranged transversely to the direction of movement of the conveyer in order that a greater number of skins can be carried by the conveyer than heretofore, and a greater number of skins can be dried in a given length of apparatus.

A further object of the invention is to construct means for feeding the skins to the machine and means for removing the skins from the machine.

These objects I attain in the following manner, reference being had to the accompanying drawings, in which:

Figure 1 is a plan view of my improved machine for drying skins; Fig. 2ª is a side view of the feed end of the machine showing a truck arranged in front thereof delivering the boards with skins thereon to the machine; Fig. 2ᵇ is a side view showing a truck located at the discharge end of the machine, receiving the boards with the skins thereon; Fig. 3 is an end view; Fig. 4 is a transverse sectional view through the center of the machine; Fig. 5 is a perspective view of one of the carrier boards; Fig. 6 is a perspective view of one of the trucks; Fig. 7 is a side view illustrating the rails and placing wheel; Fig. 8 is a sectional view on the line *a*—*a*, Fig. 7; and Fig. 9 is a view of a bar which may be used to support the skins.

Referring to the drawings, 1 is the casing of the machine made of any length desired. This casing has two vertically arranged partitions 2 at each side and a horizontal partition 3 extending from one side partition to the other and forming four chambers. The chamber 4 is the drying chamber through which the skins to be dried are conveyed and the chambers 5, 5 at each side are the chambers containing the heating pipes 10 and the chamber 6, above the chamber 4, communicates with the side chambers and the said chamber 4. The vertical partitions have openings at the top and bottom to allow the air to circulate through the chambers 5 and through the chambers 4 and 6. In the partition 3 is a series of openings in which are fans 7 mounted on vertical shafts 8 driven from transverse shafts 9 by gearing. The central transverse shaft 9, in the present instance, is the driving shaft of the machine. The heating pipes 10 in the chambers 5, in the present instance, extend through the entire length of the machine and are arranged in as many sections as the particular construction of the machine will allow.

At each side of the drying chamber 4 are rails 22 which support conveyer chains 11. The chains pass around sprocket wheels 12 on shafts 13 mounted in suitable bearings.

The shafts 13 are driven from a transverse shaft 14 through drive chains at each side, as the shafts 13 do not extend across the chamber 4. The shaft 14 is driven from a central driving shaft 9 through belting clearly illustrated in the drawings. This driving mechanism, however, may be modified without departing from the essential features of the invention. In some instances, the conveyer may be driven by mechanism independently of the fans.

15 is the exhaust fan communicating with the bottom of the chamber 4 near the center, in the present instance, and this fan draws the moist air out of the chamber and into the duct 16.

17, 17 are openings communicating with the chambers 5, 5 to admit air to these chambers.

18, 18 are the carrier boards to which the skins are secured. These boards have laterally projecting spindles 19 carrying rollers 20. The projecting portions of the spindles are engaged by the chains 11. The boards are spaced apart by the rollers 20 at the upper end and by the blocks 23 at their lower ends, so that a current of air can be forced down between the boards and over the skins.

There are two inclined rails 24 at the feed end of the casing on which the rollers 20 of the boards 18 travel. These rails are at such an inclination that the boards will be fed by gravity into the chamber 4. These boards can be fed to this inclined rail by hand, but I prefer to use a truck 25, as illustrated in Figs. 2ª, 2ᵇ, and 6. This truck consists of an open framework having vertical side mem-

bers 26 projecting from a quadrangular framework 27 at the bottom, and is mounted on rollers 28. There may be any number of these trucks and they can be loaded with the boards and arranged in front of the machine so that the top rails 29 of the truck will aline with the inclined rails 24, in order that the boards can be transferred from the truck to the rails one after another and fed by gravity to the end of the machine. After the boards have been discharged from one truck, this empty truck can be moved away and another full truck can be placed in position.

I preferably utilize placing wheels 35 to properly tranfer the boards from the inclined rails to the conveyer chains. The wheels 35 are notched to receive the spindles 19 as one after another moves into position. These wheels carry the boards so that their spindles will drop into the notches in the conveyer chains 11. The conveyer chains are so proportioned that the wheels on the carrying boards will contact one with another throughout the length of the casing, spacing the boards to allow air to circulate between them and allowing them to come close together so that a great number of skins can be dried in a comparatively short casing.

The rollers on the carrying board are idle in the casing and merely act to support the carrying boards while mounted on the trucks and while being fed to or removed from the casing.

The chain has rollers which travel on the rails within the casing and form the entire support of the board. By this means no care need be exercised in feeding the machine with the boards having the skins thereon.

At the rear of the machine are the rails 30 inclined away from the machine so that as the boards reach the discharge end of the machine they are automatically placed on these rails 30, rolling down and traveling by gravity onto one of the trucks 25, which receives the boards at the discharge end of the machine. The trucks have stops 21 at the end so as to limit the movement of the boards. When the truck 25 is filled, it is moved away from the machine and another empty truck is placed in position.

It will be noticed that the inner end of the rails 30 are above the line of the conveyer chain and that, consequently, the boards must be delivered onto the rails 32, as they emerge from the drying chamber. These rails are slightly inclined so as to feed the boards in front of the projections 33 on an inclined conveyer 34, which carries the boards up and discharges them onto rails 30 as hereinabove described. This inclined conveyer is driven in any suitable manner, preferably from the sprocket wheel 12 at the discharge end of the machine so that the conveyer 34 is driven at a speed corresponding to the travel of the boards through the machine in order that each projection 33 will engage and carry one of the boards.

In some instances, sticks 18ª, illustrated in Fig. 9, may be used instead of the boards and these sticks may be provided with rollers 20ª and may project to form spindles 19ª. In this event, the skins would either be hung over or suspended from the sticks.

It will be seen from the above description that I am enabled to arrange the boards carrying the skins close together and a large number of skins can be dried in a given space. The air, as it circulates down between the boards, or between the skins, dries the skins thoroughly, the moist air being carried off from the bottom of the chamber and the center thereof, the fresh air being admitted at any point desired.

I preferably so arrange the apparatus that very little air is introduced at the feed end of the machine, the major portion of the air being taken in near the discharge end, the moist air being drawn out at the floor, at or about the center of the machine. This produces the effect desired, namely, when the skins enter the machine the air is at a low temperature and moist, but when they leave the machine, it is at a high temperature and dry. Thus the skins are thoroughly heated and the moisture remains in the skins during a portion of their travel through the casing. During the latter portion of their travel the skins are dried and the moisture removed therefrom. When the skins are removed from the machine, they are dry and pliable.

I claim:

1. The combination in a machine for drying leather, of a casing having a drying chamber therein and heating chambers on each side of the drying chamber; means for circulating air through the drying and heating chambers; a conveyer arranged to travel longitudinally through the drying chamber; and transversely arranged carriers for skins suspended from the conveyer and spaced apart so as to form transverse channels to allow the air to circulate between the skins as they travel through the casing.

2. The combination in a machine for drying skins, of a casing having a drying chamber and a heating chamber; means for circulating air through the heating chamber and drying chamber; conveyer chains extending longitudinally through the casing; and boards mounted on the chain, said boards being arranged transversely to the line of travel so that the boards with the skins attached can be placed close together, allowing air to circulate between the boards carrying the skins.

3. The combination in a machine for drying skins, of a casing having a longitudinally arranged drying chamber and heating

chambers; a partition above the drying chamber and one on each side thereof separating the drying chamber from the circulating and heating chambers; the transverse partition having openings; fans mounted in the openings for circulating air between the skins; and an exhaust fan communicating with the lower portion of the drying chamber near the center so as to remove the moist air as it accumulates therein.

4. The combination in a drier, of a casing; a drying chamber therein; a conveyer arranged to receive skin carriers and to traverse them through the machine; an inclined rail at the forward end of the machine alining with the conveyer; and a truck having rails alining with the inclined rail and on which the skin carriers are mounted so that the skin carriers can be transferred from the truck onto the inclined rail and from the rail onto the conveyer.

5. The combination in a drier for skins, of a casing having a longitudinal drying chamber; a conveyer located therein; means for driving the conveyer; means for circulating air in the chamber; inclined rails at the discharge end of the machine; an elevator for transferring the skins from the conveyer to the inclined rails; and a truck having rails alining with said inclined rails and arranged to receive the skin carriers from the inclined rails.

6. The combination in a drier, of a casing having a longitudinal drying chamber; means for circulating air through the chamber; a conveyer chain at each side of the drying chamber; carrier boards having laterally projecting spindles engaged by the chains; rollers on the spindles spacing the boards apart to allow the air to circulate between the boards; inclined rails arranged to receive the boards and to feed them by gravity to the conveyer at the forward end of the machine; an inclined rail at the rear end of the machine; and an elevator located between the end of the conveyer within the chamber and the last mentioned inclined rails so as to carry the boards from the discharge end of the conveyer up to the said inclined rails.

7. The combination in a machine for drying skins, of a casing; conveyer chains within the casing, said chains having notches therein; inclined rails and placing wheels located between the inclined rails and the chains; and carrying boards having spindles arranged to travel on the inclined rails and to be engaged by the placing wheels and to rest in the notches of the chains.

8. The combination, in a machine for drying skins, of a casing; a conveyer for feeding the skins therethrough; a series of fans for circulating the air through the casing in a vertical direction; side chambers; and means for heating the air as it circulates through the side chambers; an exhaust pipe; a fan therein communicating with the chamber at the bottom near the center thereof; with means for admitting fresh air to the chamber, whereby the skins are thoroughly heated; the moisture remaining in the skins through a portion of their travel through the casing and during the latter portion of their travel the skins are dried and the moisture removed therefrom, thus producing a dry and pliable skin.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

ELWOOD B. AYRES.

Witnesses:
CLYDE T. MOYER,
WM. A. BARR.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."