No. 633,819. Patented Sept. 26, 1899.

W. J. M. DOBSON.

DRYING APPARATUS.

(Application filed Feb. 20, 1899.)

(No Model.)

Fig. 1.

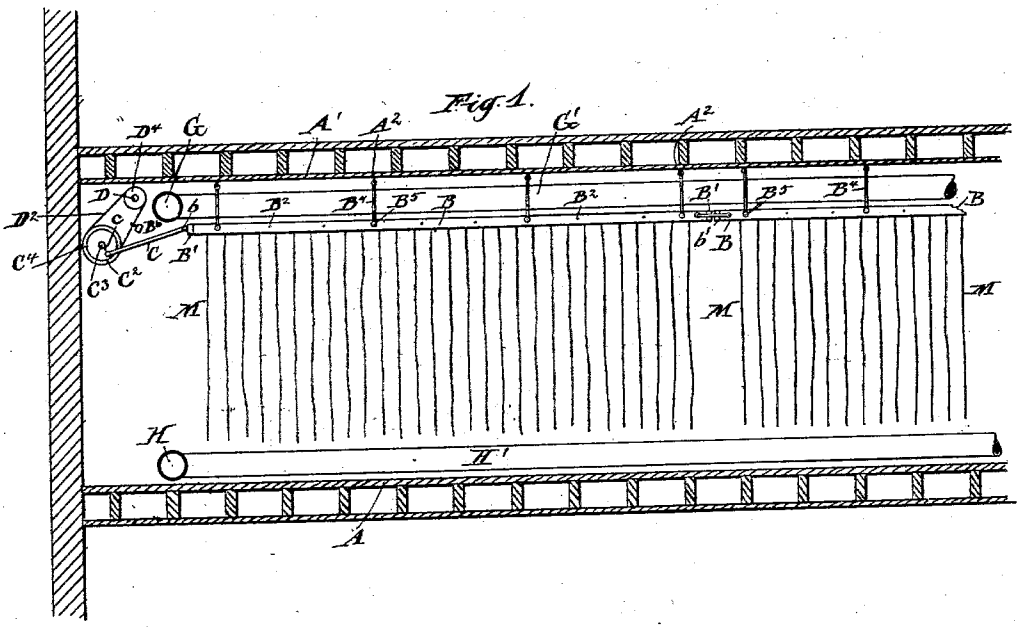


Fig. 2.

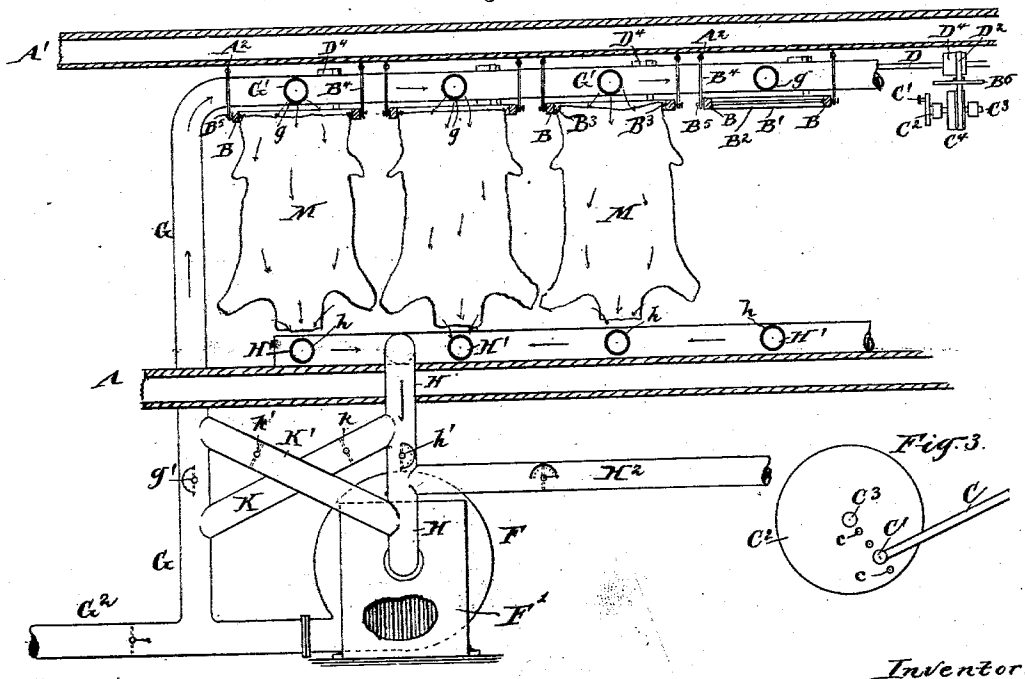


Fig. 3.

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

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DRYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 633,819, dated September 26, 1899.

Application filed February 20, 1899. Serial No. 706,088. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. M. DOBSON, a citizen of the United States, residing in New York, (Brooklyn,) in the county of Kings and State of New York, have invented a certain new and useful Improvement in Drying Apparatus, of which the following is a specification.

The invention is intended to serve more particularly in drying materials in the form of leaves or sheets, such as skins or light hides; and it consists in suspending the sheets by the upper corners from a reciprocating frame and pipes or conduits arranged above and below, through one of which hot dry air is supplied, to be later removed through the other when cooled and moisture-ladened. Provisions are made for quickly and easily attaching and removing the sheets and for imparting the required reciprocating motion to the frames, and thereby gently waving the entire series of suspended sheets and inducing a free circulation of the air-currents between and around them. The air-conduits are equipped with valves or dampers and by-passes, so that either may serve as a supply or exhaust pipe, and thus permit the hot dry air to be applied to that portion of the material containing the larger proportion of moisture or to be alternated, if desired.

By the use of my apparatus a great saving in floor-space is effected and a larger amount of work may be done with an increased uniformity in the product.

The accompanying drawings form a part of this specification and show the invention applied to the drying of light skins.

Figure 1 is a vertical section taken longitudinally of a room equipped with my improved system. Fig. 2 is a corresponding vertical transverse section, also showing the arrangement of air-conduits and blower. Fig. 3 is a face view showing a detail of the reciprocating mechanism.

Similar letters of reference indicate the same parts in all the figures.

A is the floor of a large room or loft, and A′ the ceiling.

B B are rails or light timbers extending longitudinally of the room and arranged parallel to each other, separated by a space about equaling the width of the skins to be dried. The rails are held apart at the ends by the transverse strips B′ B′ and rods B^2 B^2 set at suitable intervals. Each pair of rails constitutes a frame and are provided on the inner faces with a series of hooks B^3, equally spaced on each and serving to receive two corners of the skins M and support them in series with a narrow space between each and the next. The rails are hung by short links B^4 of equal lengths, engaged in eyes A^2 set in the ceiling and receiving at the lower ends pins B^5, preferably driven on the outer faces of the rails.

D is a line-shaft extending transversely of the room at one end, turned by power and equipped with pulleys C^4 of sufficient width, carrying belts D^2, running on tight and loose pulleys C^4, controlled by belt-shifters B^5 on independent counter-shafts C^3, one for each frame. The counter-shafts are mounted in suitable bearings and carry face-plates C^2, each provided with a radial series of holes *c*, in either of which a crank-pin C′ may be secured. From the crank-pins extend links or pitmen C, pivoted to the frames at the points *b*.

The revolutions of the shafts C^3 impart a reciprocating motion to the frames, which may be increased or diminished by correspondingly changing the positions of the pins C′, and by reason of the shortness of the links B^4 the motion of any point in the frames is in an arc of short radius, thus producing a waving or undulatory movement of the skins particularly favorable to the evaporation of the moisture.

Two or more frames may be placed end to end and secured by links *b*′, so that all may be reciprocated by one shaft C^3.

F is a fan-blower located in the basement of the building and driven by a motor (not shown) provided with a conduit G, leading from the delivery side to a line of pipes G′, arranged parallel with and between the pairs of rails, but sufficiently above to avoid the skins. There may be as many pipes G′ as there are frames side by side, and each is provided with perforations *g* on the under side, through which air is forced by the blower into the space between each skin and the next to bathe the surfaces and take up the moisture therefrom.

H is a conduit arranged to supply air to the

fan. It may receive fresh air from outside the building through a branch H^2, controlled by a valve or damper H^3, or through a series of pipes H', similar to the pipes G', but located below the line of skins and having openings *h*, through which the currents from G' are drawn downward past the moist surfaces and returned to the blower.

F' is a casing forming part of the blower, fitted with steam-coils or other radiating surfaces, within which the air may be heated before reaching the fan.

In order that the direction of the currents may be reversed, I introduce by-passes or cross-conduits K K', connecting the main conduits G and H near the blower, controlled by dampers *k k'*, which with the dampers *g' h'* allow the direction to be controlled, so that either sets of pipes G' H' may deliver or exhaust, and hot dry air may be blown upon the lower portions of the skins M when necessary or expedient to hurry or equalize the drying.

When the air has been repeatedly circulated and reheated until nearly saturated with moisture, it is discharged into the atmosphere through the branch pipe G^2 by properly setting the dampers and a fresh supply taken in.

Although I have shown the apparatus as adapted to drying light skins, it will be understood that other materials—as sheets of paper, pasteboard, fabrics, or freshly-dyed garments—may be hung upon the hooks B^3 in the loosely-distended condition and economically dried.

Other means may be employed for reciprocating the frames instead of the counter-shafts and face-plates shown, and it will be understood that there may be as many frames with a reciprocating mechanism for each as the space will allow.

Means, such as cone-pulleys or other devices, may be employed, if found necessary or desirable, for increasing the rate or number of reciprocations in any given period of time.

I claim—

1. In a drying apparatus, a swinging frame, means for suspending therefrom the materials to be dried, and means for reciprocating the frame, in combination with pipes arranged above and below said frame and materials, one adapted to deliver hot dry air and the other to remove it after circulating about said materials, all substantially as herein specified.

2. In a drying apparatus, a swinging frame, means for suspending therefrom the materials to be dried, and means for reciprocating the frame, in combination with pipes arranged above and below said frame and materials, one adapted to deliver hot dry air and the other to remove it, and means as the cross-conduits K, K' and dampers *k*, *k' g'* and *h'*, for reversing the direction of the flow when desired, all substantially as herein specified.

3. The frame B, B' and suspending-links B^4, hooks B^3 and pins B^5 on said frame, in combination with the counter-shaft C^3 and face-plate C^2 having the series of holes *c* at different distances from the center, crank-pin C' adapted to be received in either of said holes, and the connecting-rod C between said crank-pin and frame whereby the latter may be reciprocated, all substantially as herein specified.

4. The frame B, B' and suspending-links B^4, hooks B^3 and pins B^5 on said frame, in combination with the counter-shaft C^3 and face-plate C^2 having the series of holes *c* at different distances from the center, crank-pin C', adapted to be received in either of said holes, and the connecting-rod C between said crank-pin and frame whereby the latter may be reciprocated different distances, and with the blower F conduits G and H and perforated pipes G' H' above and below said frame, all substantially as herein specified.

5. The frame B, B' and suspending-links B^4, hooks B^3 and pins B^5 on said frame, in combination with the counter-shaft C^3 and face-plate C^2 having the series of holes *c* at different distances from the center, crank-pin C' adapted to be received in either of said holes, and the connecting-rod C between said crank-pin and frame whereby the latter may be reciprocated, and with the blower F conduits G and H and perforated pipes G' H' above and below said frame, and the cross-conduits K, K' and dampers *k*, *k' g'* and *h'* arranged to control and reverse the direction of the flow, all substantially as herein specified.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

WM. J. M. DOBSON.

Witnesses:
CHARLES R. SEARLE,
R. P. SCHULZER.