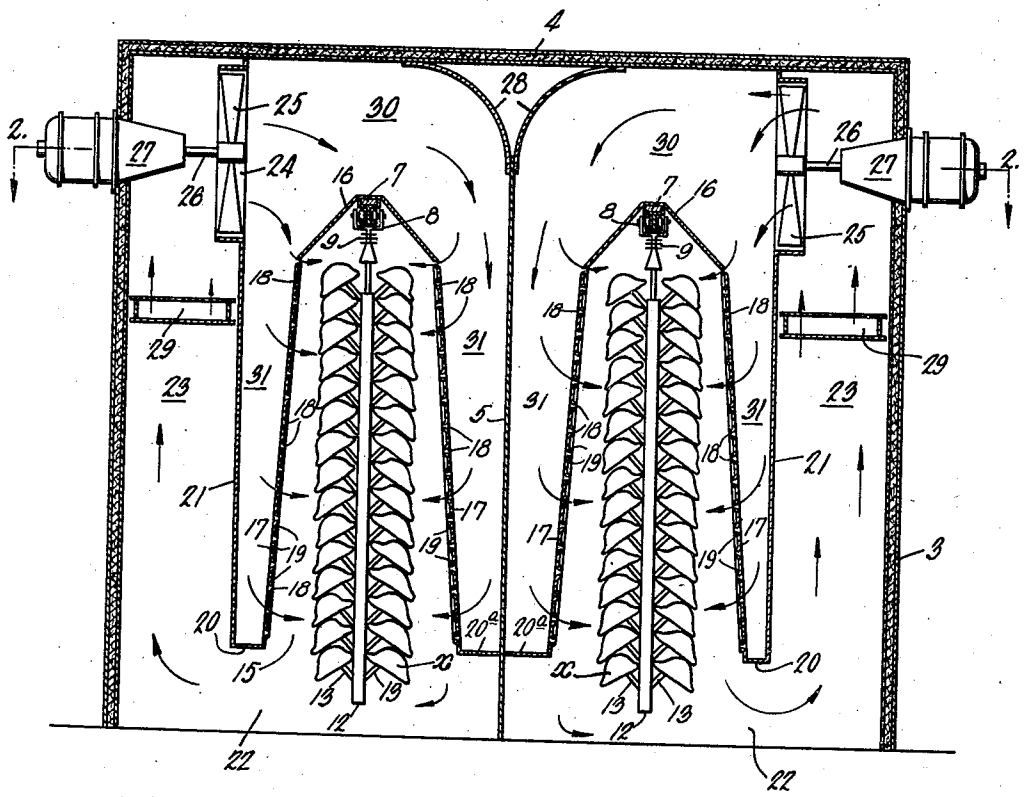
Sept. 8, 1942. A. O. HURXTHAL 2,295,475

HAT DRIER

Filed Aug. 4, 1939 2 Sheets-Sheet 1

Fig. 1.



Inventor:-
Alpheus O. Hurxthal
by his Attorneys
Howson & Howson

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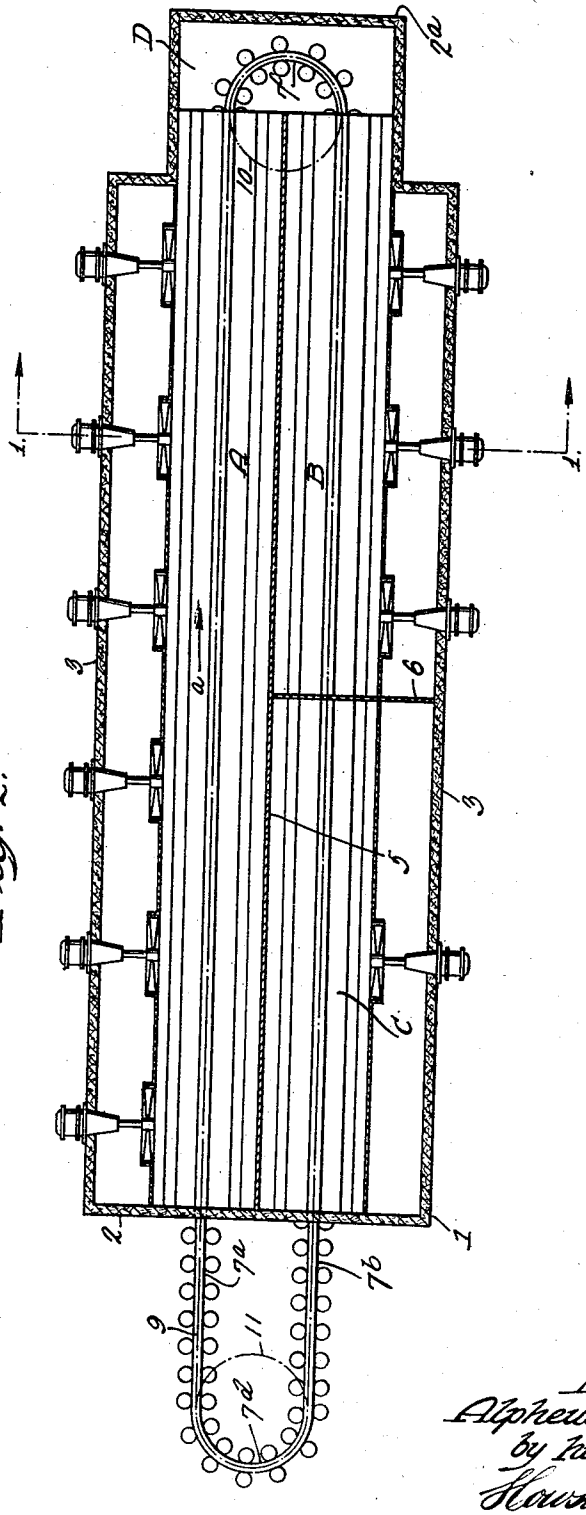


Fig. 2.

Inventor:-
Alpheus O. Hurxthal
by his Attorneys
Howson & Howson

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HAT DRIER

Alpheus O. Hurxthal, Wyncote, Pa., assignor to Proctor & Schwartz, Incorporated, Philadelphia, Pa., a corporation of Pennsylvania

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9 Claims. (Cl. 34—213)

This invention relates to an apparatus for drying hats of the felt type, or any of the various types and kinds of woven straws, etc., with the hats in a finished state, or while still in a completely or partly formed blank stage or stages during the course of manufacture thereof.

Prior to the present invention, hats in the various stages of manufacture have been dried in the presence of circulating air while hung on suitable conveyers moving through a drying chamber. In some instances, the air has been circulated around the hats in a more or less indiscriminate manner, with the result that some of the hats have been blown off their supporting pegs and damaged. In most instances, however, the air has been blown downwardly on the hats, with a view to holding the hats on the pegs. This method has certain disadvantages, particularly when the hats are arranged in superposed relation to each other on the conveyer. In such instances, the uppermost hats shield the lower ones and deflect the circulating air therefrom, with the result that the upper hats become overly dried, while those in the lower elevations remain in a non-uniform partially dried state.

The object of the present invention is to produce a hat drier in which the hats may be arranged discreetly in superposed relation in vertical laterally spaced tiers, for the sake of space economy, and carried through a drying chamber by a suitable conveyer.

In some instances, according to the principles of the present invention, the drier may also include a cooling chamber. In other instances a conditioning chamber may follow the cooling chamber. In other cases the drier may include merely a drying chamber and a conditioning chamber without a cooling chamber.

Another object of the invention is to provide means for directing a drying medium against the tiers of hats at vertically spaced intervals, in a generally horizontal but slightly declining direction, whereby the hats from top to bottom of each tier will be dried uniformly and at the same time be retained securely on the pegs by which the hats are individually supported.

An apparatus constructed and operated in accordance with the principles of the present invention will be fully disclosed hereinafter, reference being had to the accompanying drawings, of which:

Figure 1 is a transverse sectional elevation of the drier taken on the line 1—1, Fig. 2; and

Fig. 2 is a sectional plan view taken on the line 2—2, Fig. 1.

As shown in the drawings, the drier comprises a casing 1 composed of suitably insulated end and side walls 2, 2a and 3, 3 respectively, and a similarly insulated roof 4. The interior of the casing 1 is divided longitudinally by a vertical partition 5 extending from the end wall 2 to a point adjacent but spaced from the end wall 2a, producing within the casing a primary compartment A, extending substantially along the full length of the drier at one side of said partition; a secondary compartment B, extending part way along the length of the casing at the opposite side of the partition 5; and a final compartment C, extending the remainder of the way along the second side of the partition 5, the final compartment C being divided from the secondary compartment B by a transverse partition 6.

Extending the full length of the casing, through and beyond the end wall 2 thereof, is an overhead track 7, which consists of two parallel sections 7a and 7b with the sections 7a extending through the compartment A and the section 7b extending through the compartments B and C. The parallel track sections 7a and 7b are joined, within the casing 1 in a transverse compartment D formed between the end of the partition 5 and the end wall 2a of the casing, by a semi-circular section 7c. The opposite ends of the parallel sections 7a and 7b are joined together, outside the opposite end wall 2 of the casing 1, by a semi-circular section 7d.

Mounted on the track 7, for movement along the same, is a series of carriages or trolleys 8, 8, which may be conveyed along said track in any suitable manner, or by any suitable means such as a link-belt or chain 9 of the endless type passing around sprockets 10 and 11 having their respective axes of rotation arranged in alignment with the centers of the arcs of the curved sections 7c and 7d respectively of the track 7. The chain 9 may be connected to the series of carriages 8 in any suitable manner to retain the carriages in spaced relation to each other longitudinally of the track 7.

Depending from each of the carriages 8 is a pole 12; and extending laterally from opposite sides respectively of each pole 12, in opposite directions transverse to the track 7, is a double series of vertically spaced angularly disposed pegs 13, 13 upon which the hats x, x are hung in vertical spaced superposed relation to each other and in substantially vertical alignment one with the other, whereby the hats are arranged economically in vertical tiers, with the tiers spaced

laterally one to another along the full length of the rail 7.

The vertical tiers of hats are conveyed through tunnels 15, 15 formed in the compartments A, B and C, between the central partition 5 and the side walls 3, 3 of the drier casing. Each tunnel includes an inverted V-shaped imperforate roof section 16 and a pair of perforated side walls 17, 17. The side walls 17, 17 are disposed, in downward outwardly flaring relation to each other, at opposite sides respectively of and with respect to the vertical median plane of each tunnel 15 in which the poles 12, 12 travel through said compartments.

Each side wall 17 is provided with a multiplicity of horizontally and vertically spaced rows of perforations 18. Preferably the perforations 18 are pressed out of the sheet metal of which the side walls 17 are composed, in such a manner that the displaced metal surrounding each perforation 18 forms an inwardly protruding nozzle 19.

The side walls 17, 17 lying adjacent to but spaced from each of the opposite sides of the central partition 5 are connected to said partition by horizontal walls 20*a*, 20*a*. The perforated side walls 17, 17, lying toward the walls 3, 3 of the casing 1 are connected, by horizontal walls 20, 20, to vertical partitions 21, 21 spaced from and lying intermediate the walls 3 and 17 in each instance.

The partitions 21, 21 terminate above the base plane of the drier casing 1 and thereby provide horizontal transverse air channels 22, 22 which communicate with vertical longitudinal air channels 23, 23 formed between the vertical partitions 21, 21 and the side walls 3, 3 of the casing 1.

At spaced intervals along each of the intermediate partitions 21 are circular openings 24, in which are rotatably mounted air-circulating fans 25. Each fan 25 is mounted on a shaft 26 of an individual driving motor 27. Each motor 27 is mounted outside of and projects into the casing 1 through the side wall 3 thereof. Adjacent the roof 4, the partition 5 is connected to said roof by oppositely curving fillet plates 28, 28.

Within the air channels 23, 23, between the lower edges of the intermediate partitions 21, 21 and the fan openings 24 therein, suitable conditioning units 29 are disposed, such units constituting either heating, cooling or humidifying means for the air moving through the passages 23, 23, the character of the unit depending upon the compartment A, B, or C with which the particular air passage 23 in which the unit is installed communicates.

Power may be applied from any suitable source to either or both of the sprockets 10 and 11, for driving the chain 9, whereby the carriages 8 and the poles 12 with the hats *x* thereon are carried in the direction of the arrow *a*, through the compartment A; thence through the transitional compartment D at the one end of the casing 1 which connects the compartment A with the compartment B; thence through the compartments B and C in succession; and finally out into the open at the opposite end of the casing 1, where the dried hats are removed from the pegs 13, and wet, damp or moist hats to be dried are substituted therefor.

As the hats are conveyed through the tunnels 15, 15 in the compartments A, B and C, in succession, air is circulated by the fans 25 upwardly through the channels 23 and the conditioning units 29 therein, then laterally inward in opposite directions toward the partition 5, through the openings 24 in the intermediate partitions 21, 21, into air compartments 30 formed above the roofs 16, 16 of the tunnels 15, 15. From the upper air compartments 30, 30, the air moves downwardly, in channels 31, 31 formed between the side walls 17, 17 of the tunnels 15, 15 and the partitions 5 and 21, 21. From the channels 31, the air moves through the nozzles 19 in the side walls 17, 17, in a substantially horizontal direction toward the central vertical median plane of each tunnel, the air moving at a slightly declining angle as a result of the angular flaring relationship of the walls 17, 17 of each of the tunnels 15, whereby the air from the nozzles 19 impinges against the hats *x* along the full vertical length of each tier and holds the hats on the pegs 13, as the impinging air effects drying of the hats.

In one form of the invention, drying alone takes place in both the compartments A and B, for which purpose a large volume of air, heated by the units 29, 29 in the channels 23, 23 communicating with the compartments A and B, is directed by the nozzles 19, 19 against the hats traveling successively through the tunnels 15 located in said compartments A and B.

In the compartment C, as shown in Fig. 2, a single fan 25 is provided to circulate a lesser volume of air through the tunnel 15 located in said compartment, the temperature of the air being lower than that circulating in the compartments A and B, and effecting a general conditioning of the hats prior to their exit from the casing 1.

In other instances, the whole or a predetermined portion of the length of the compartment B may function as a cooling compartment, in which case the conditioning units 29 in the passage 23 communicating with the compartment B, would produce a relatively low temperature in the circulating air, and whereby the hats, after leaving the drying compartment A, would be subjected to a precooling prior to entrance into the conditioning compartment C.

I claim:

1. A drier for hats, comprising horizontally movable means including laterally extending upwardly inclined elements supporting said hats in laterally spaced tiers each consisting of a plurality of hats disposed in vertically spaced superposed relation, and means for directing streams of drying medium in a substantially horizontal direction against said tiers from outer hat-supporting ends of said elements toward the opposite ends of said elements solely throughout a predetermined horizontal course traveled by said tiers.

2. A drier for hats, comprising horizontally movable means including laterally extending upwardly inclined elements supporting said hats in laterally spaced tiers each consisting of a plurality of hats disposed in vertically spaced superposed relation, and means for directing streams of drying medium in a substantially horizontal direction against said tiers at vertically spaced intervals respectively from outer hat-supporting ends of said elements toward the opposite ends of said elements solely throughout a predetermined horizontal course traveled by said tiers.

3. A drier for hats, comprising horizontally movable means including laterally extending upwardly inclined elements supporting said hats in laterally spaced tiers each consisting of a plurality of hats disposed in vertically spaced super-

posed relation, and means for directing streams of drying medium in a substantially horizontal slightly declining direction against said tiers at vertically spaced intervals respectively from outer hat-supporting ends of said elements toward the opposite ends of said elements solely throughout a predetermined horizontal course traveled by said tiers.

4. A drier for hats, comprising horizontally movable means in the form of an overhead trolley and depending poles provided with laterally extending upwardly inclined pegs for supporting said hats in laterally spaced tiers each consisting of a plurality of hats disposed in vertically superposed relation on said pegs respectively, and means for directing streams of drying medium in a substantially horizontal slightly declining direction against said tiers at vertically spaced intervals respectively throughout a predetermined horizontal course traveled by said tiers.

5. A drier for hats, comprising horizontally movable means in the form of an overhead trolley and depending poles provided with laterally extending upwardly inclined pegs for supporting said hats in laterally spaced tiers each consisting of a plurality of hats disposed in vertically superposed relation on said pegs respectively, and means in the form of a horizontal tunnel comprising perforated side walls for directing streams of drying medium in a substantially horizontal slightly declining direction against said tiers at vertically spaced intervals respectively throughout a predetermined horizontal course traveled by said tiers through said tunnel between said perforated side walls thereof.

6. A drier for hats, comprising horizontally movable means in the form of an overhead trolley and depending poles provided with opposite laterally extending upwardly inclined pegs for supporting said hats in double laterally spaced tiers each consisting of a plurality of hats disposed in vertically superposed relation on said pegs respectively, and means in the form of a horizontal tunnel comprising perforated side walls for directing streams of drying medium in a substantially horizontal slightly declining direction simultaneously against opposite sides respectively of said tiers at vertically spaced intervals respectively throughout a predetermined horizontal course traveled by said tiers through said tunnel between said perforated side walls thereof.

7. A drier for hats, comprising horizontally movable means in the form of an overhead trolley and depending poles provided with opposite laterally extending upwardly inclined pegs for supporting said hats in double laterally spaced tiers each consisting of a plurality of hats disposed in vertically superposed relation on said pegs respectively, means in the form of a horizontal tunnel comprising perforated side walls for directing streams of drying medium in a substantially horizontal slightly declining direction simultaneously against opposite sides respectively of said tiers at vertically spaced intervals respectively throughout a predetermined horizontal course traveled by said tiers through said tunnel between said perforated side walls thereof, means for circulating said drying medium through the perforations of said side walls into said tunnel and around the outside thereof at different velocities in respectively different succeeding portions of said tunnel, and means for producing different predetermined temperatures in said circulating medium in different predetermined succeeding portions of said tunnel.

8. A drier comprising an open-bottomed tunnel including a pair of oppositely disposed downwardly divergent perforated side walls and an imperforate roof section, a casing enclosing said tunnel, and means in the casing for driving air around the outside of said roof and side walls of the tunnel and through said perforations in said side walls simultaneously in opposite generally horizontal slightly declining directions toward the vertical median plane of the tunnel, said air escaping from the interior of the tunnel through the open bottom thereof for recirculation around the outside of the tunnel.

9. A drier comprising an open-bottomed tunnel including a pair of oppositely disposed downwardly divergent perforated side walls and an imperforated roof section of an inverted V-shaped cross section, a casing enclosing said tunnel, means in the casing for driving air around the outside of said roof and side walls of the tunnel and through said perforations in said side walls simultaneously in opposite generally horizontal slightly declining directions toward the vertical median plane of the tunnel, said air escaping from the interior of the tunnel through the open bottom thereof for recirculation around the outside of the tunnel, a supporting rail located in the apex of the roof, carriages mounted on said rail for movement longitudinally thereof, poles depending from said carriages in said median plane of said tunnel, and laterally projecting pegs on said poles for supporting hats to be dried by said air.

ALPHEUS O. HURXTHAL.