March 25, 1930. S. CHASE, 4TH., ET AL 1,751,681

CLEANING DRIER

Filed March 2, 1925

Fig. 1.

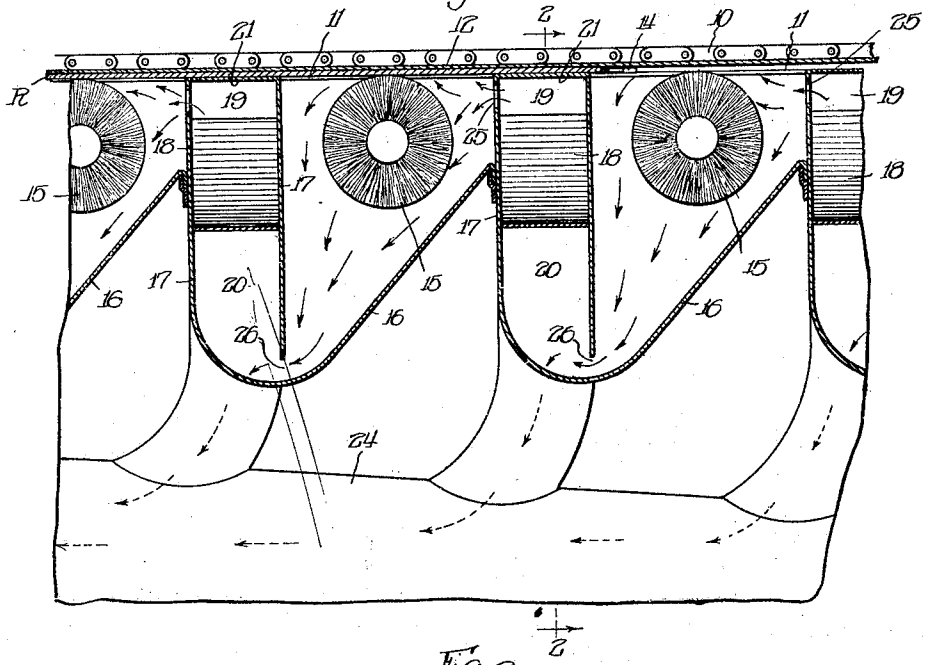
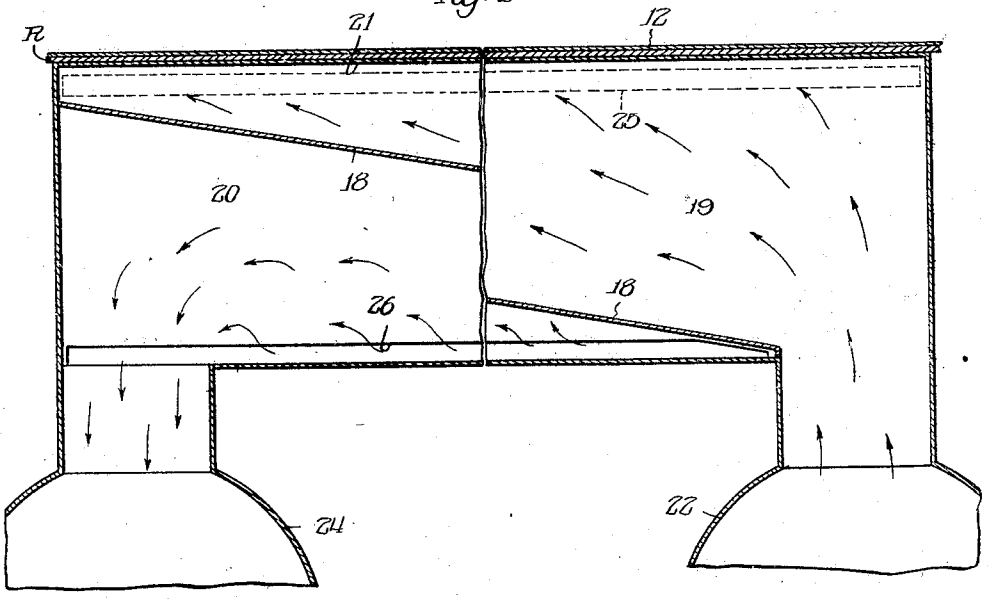


Fig. 2.



Witness:
R. Burkhardt.

Inventors:
Benjamin S. Pfeiffer;
Stephen Chase IV,
By Cromwell Bait & Warren
Attys

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UNITED STATES PATENT OFFICE

STEPHEN CHASE, 4th, OF CHICAGO, AND BENJAMIN S. PFEIFFER, OF WINNETKA, ILLINOIS, ASSIGNORS, BY DIRECT AND MESNE ASSIGNMENTS, TO CHASE MACHINE COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

CLEANING DRIER

Application filed March 2, 1925. Serial No. 12,517.

This invention relates to improvements in drying apparatus of the type disclosed in our co-pending application Serial No. 699,815, filed March 14, 1924, of which this application is a continuation in part. It is intended for the rapid drying of fabrics, such as carpets and rugs, which have been subjected to the cleaning or scrubbing operation and is designed to accomplish the drying, and incidentally the finishing of the surface of the fabric, rapidly and uniformly while the fabric is passing through the apparatus, incidental to the cleaning operation. An important feature of the apparatus is the entirely automatic, continuous and complete performance of the renovating treatment, which permits the dirty rug being introduced at one end of the machine and, after being subjected to the operation thereof, being discharged at the tail end of the machine completely cleaned and dried and ready for immediate rolling or use.

It will be understood that in a machine of the type disclosed in said application, the rug is transmitted in an out-spread condition with its pile surface, or the surface to be subjected to the scrubbing operation, presented downwardly, and incident to the progressive movement of the fabric said surface is thoroughly cleaned by the application of cleaning material and appropriate scrubbing operations. This necessarily leaves a considerable amount of moisture in the fabric which it is desired to remove thoroughly and quickly and without subjecting the fabric to an extremely high temperature. Consequently as the portions of the fabric leave the scrubbing mechanism they proceed immediately over a drying apparatus whereby heated air is impinged on the under surface while the latter is subjected to a brushing or wiping operation which agitates the pile of the material, fans the heated air through it and in intimate contact with the moisture-bearing portions, and also serves to wipe the moisture out of the fabric, remove lint, and finally lay all the nap one way.

An object of the present invention is to effect further improvements in this apparatus in the direction of condensing it into a smaller space, providing for a better confinement of the heated air in contact with the fabric, providing for a more effective drying of the brushes or wiping devices and particularly making provision for the rapid withdrawal of the moisture laden air and any lint which may be brushed from the fabric. The accomplishment of these objects makes for a more efficient and rapid operation of the machine, a more thorough drying at a lower temperature, removes circumstances which might sometimes cause a soiling of the fabric incident to the drying operation, decreases wear on the fabric and makes for a higher output because of the opportunity which it affords for transmission of the fabric through the machine at an increased rate.

Other and further objects and advantages of the present invention will be pointed out hereinafter, indicated in the appended claims or obvious to one skilled in the art upon an understanding of the present disclosure.

In the accompanying drawing, forming a part of this specification, we have illustrated an embodiment of the invention in a diagrammatic fashion. It will be understood, however, that the invention as specified in the claims is not to be construed as limited to this particular structural form.

In the drawing:

Fig. 1 is a diagrammatic longitudinal sectional elevation through a part of the apparatus; and

Fig. 2 is a fragmentary transverse sectional elevation such as might be taken on approximately line 2—2 of Fig. 1.

An understanding of the nature of the invention will be attained most quickly by reference immediately to the illustrative embodiment. It will be understood that the machine includes suitable frame members for supporting the various operating parts, including suitable transmission mechanism for transmitting endless chains, which run longitudinally at the side of the machine, and which are illustrated in the present instance by the chain portion 10. A support for the fabric incident to its passage through the machine is afforded by a series of laterally

spaced wires 11 extending longitudinally of the machine in various staggered relationships. Above this support and between the chains is arranged a smooth retaining plate 12, designed to hold the fabric flat on the supporting wires. The chains transmit a clamp 14, which extends transversely of the machine and engages the forward edge of the fabric, so that the latter is moved progressively toward the right in Fig. 1 between the support wires and the retaining member.

Below the support is arranged one or more drier units. A unit includes a brush 15 suitably supported on the machine frame and extending transversely below the support in such relationship that its bristles will lightly contact the under surface of a fabric on the support. Appropriate actuating mechanism is provided for operating the brush. The brush is housed between the super-jacent portion of the retaining plate 12, a bottom drying compartment wall 16 and transversely extending air chests 17 disposed ahead of and behind the brush. The air chest is subdivided by a diagonal partition 18 extending transversely of the machine, into a supply compartment 19 and a withdrawal compartment 20, the former arranged above the latter. The bottom drying compartment wall slopes downwardly between the supply compartment wall of one chest and the withdrawal compartment wall of the adjacent chest. The air chests are closed at the top by flat top walls 21 which lie approximately on the level of the supporting wires 11. The supply chest is connected at one side of the machine to a supply conduit 22, while the withdrawal compartment is connected at the opposite side of the machine with an exhaust conduit 24. The supply conduit is provided near its top with an outlet slot 25 discharging into the drying compartment, and the withdrawal compartment 20 has an inlet slot 26 provided in its side wall for communication with the drying compartment along the terminus of the bottom wall 16. The supply conduit 22 is supplied with dry heated air, as by means of a fan, and the exhaust conduit 24 is connected with an exhaust fan.

In the operation of the apparatus, the fabric is transmitted progressively along the support 11 over the brush, and the brush is actuated to subject the under surface of the fabric to the action of its bristles. Heated dry air is forced through the supply conduit 22 and into the supply compartment 19 whence it is distributed across the width of the machine and emitted through the outlet slot 25 into the drying compartment adjacent the fabric. In the drying compartment the heated dry air comes in contact with the brush bristles and dries from them the moisture which they take up from the fabric. A quantity of the dry air is fanned into contact with the fabric and through its pile by the action of the brush. In such fashion the moisture is quickly and thoroughly extracted from the fabric. The air is held against escape at the top of the drying compartment by the contact of the fabric with the top walls 19 of the air chests. The air which has taken on moisture tends to seek the lower portion of the drying compartment and is drawn out through the slot 26 into the withdrawal compartment by the suction induced in the exhaust conduit 24 by the exhaust fan. Lint which may be brushed off of the fabric, detaches itself from the brush as the latter dries, and tends to form into light bunches which roll down the wall 16 and are carried away in the exhaust. When no fabric is being transmitted over the drying compartment, the heated air is held against escape therefrom by the proximity of the retaining plate 12.

A machine may be equipped with as many of these drying units as may be desired so that the fabric is submitted to their actions successively. In such fashion a very rapid and very thorough drying of the fabric is accomplished and the surface is flossed up and matting and streaking of the soft pile surfaces avoided. Material which might tend to soil the fabric is withdrawn and accumulation of débris in the machine is prevented. A particular advantage lies in the fact that in instances where a soap solution is used for cleaning the fabric, any of the solution remaining after the cleaning is not only dried from the fabric but the light powdery residue is completely brushed out of the fabric before the latter is delivered from the machine. This eliminates from the completed article the soap dust which is usually found remaining in rugs as now delivered from renovating treatments. A substantial saving in operating cost is attained by this apparatus due to the fact that it may be continuously operated to dry one portion of the rug while another portion is still undergoing the scrubbing operation, and due to its limited requirements of floor space for installation.

We claim:

1. In an apparatus for drying fabrics, in combination, means for feeding a fabric progressively, a housing arranged to confine air in contact with the lower surface of the fabric, a movable brush operating inside the housing to brush the fabric, the housing having a bottom wall sloping away from the brush, and means for circulating air through said housing and down its sloping wall.

2. In a drier, in combination, means for moving a fabric progressively, a wiper arranged to sweep the same and extending transversely its direction of movement, air chests extending alongside the wiper for cooperation with the fabric at opposite sides of the wiper, and means for moving heated air

from one to the other of said chests across the wiper and fabric.

3. In a drying machine, in combination, a wiper extending transversely of the machine, air chests extending on opposite sides of the wiper, means for circulating air between the chests and means for progressively advancing a sheet of fabric in contact with the chests and wiper.

4. In a drying machine, in combination, a frame, means for progressively advancing a fabric longitudinally thereof, a plurality of wipers extending transversely of the frame for cooperation with the fabric, air chests extending transversely of the frame at opposite sides of the wipers and means for circulating air from one air chest to another in contact with the fabric and wipers.

5. In a drying machine, in combination, a support for sustaining a fabric in flat position, a brush arranged to operate on the lower side of the fabric, a supply conduit for distributing heated air to the brush and fabric, an exhaust conduit arranged to receive débris from the brush, and a wall sloping from adjacent the brush to the mouth of the exhaust conduit.

6. In a drying machine, in combination, a drying housing having a top opening, a brush operating in the housing, means for progressively moving a fabric across said opening in contact with the brush, a retaining plate for holding the fabric in close relationship to said opening and means for circulating drying air through the housing in a direction opposite to the progressive movement of the fabric.

7. In a drying machine, in combination, a support for a sheet of fabric, a plurality of brushes arranged in operable association therewith, air chests arranged on opposite sides of said brushes, each of said chests comprising a supply compartment and an exhaust compartment, said compartments having outlet and inlet communication with the brushes, means for supplying air through the supply compartments and means for exhausting air through the exhaust compartments.

8. In a drying machine, in combination, means for moving a fabric progressively, a brush arranged for operation on the underside of the fabric, a compartment housing the brush below the fabric, said housing having a downwardly sloping wall, and being provided with an inlet at its upper portion and an outlet at the lower terminus of said wall, means for supplying air through the inlet and means for exhausting air through the outlet.

In testimony whereof we have hereunto subscribed our names.

STEPHEN CHASE, IV.
BENJAMIN S. PFEIFFER.