Jan. 29, 1929. 1,700,439

J. JUDELSON

CLOTHES DRIER

Original Filed March 18, 1926

Fig. 1

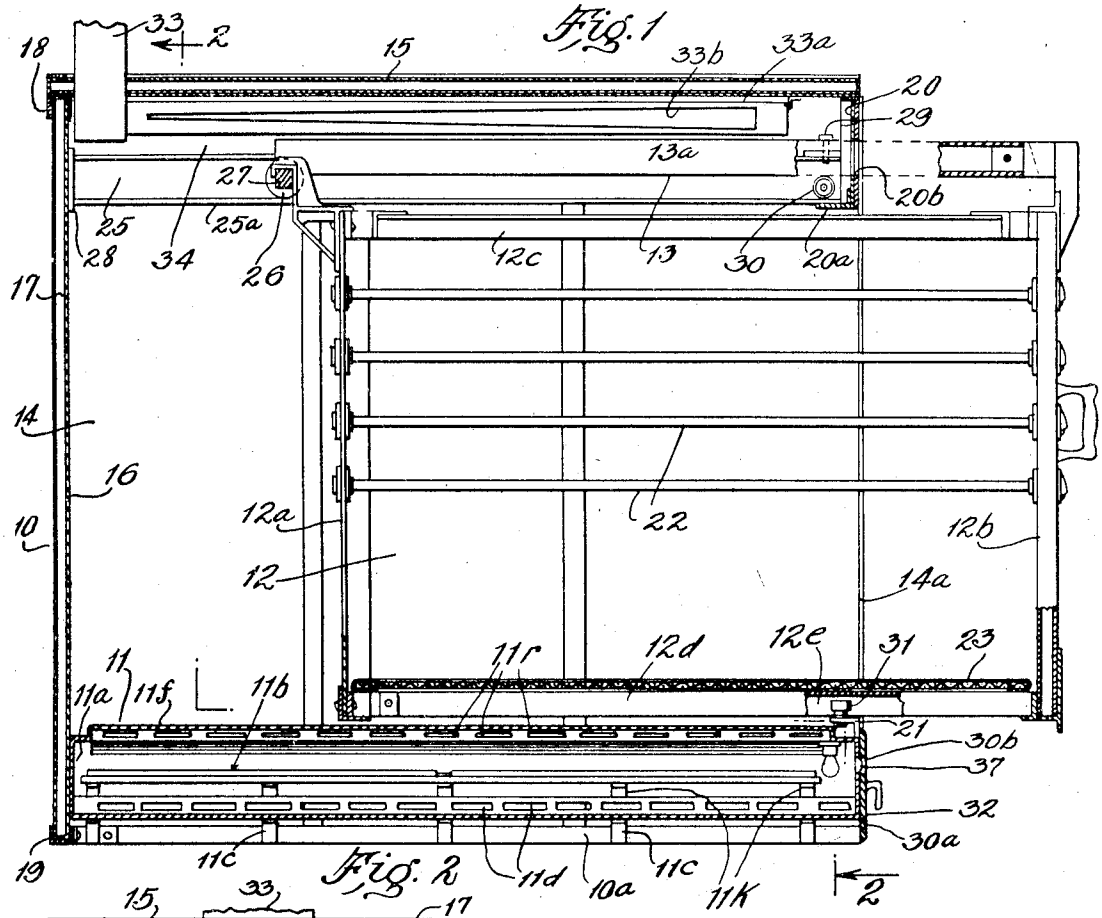


Fig. 2

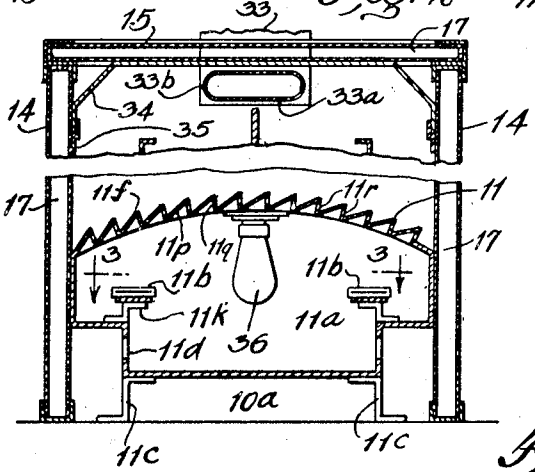


Fig. 4

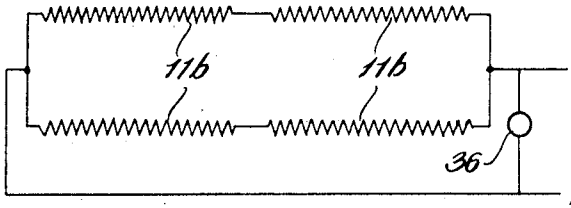
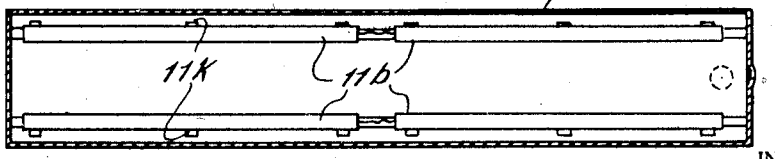


Fig. 3



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UNITED STATES PATENT OFFICE.

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CLOTHES DRIER.

Original application filed March 18, 1926, Serial No. 95,548. Divided and this application filed March 10, 1927. Serial No. 174,167.

This invention relates to driers, and is directed to the provision in a drier for clothes or other materials of an improved electrically heated drying system.

One object of the invention is to provide in a drier of the character described practical and efficient electrical means for heating and circulating a drying medium whereby moist clothes or other material in the drier may be quickly and effectively dried.

Another object of the invention is to provide in a drier a heating means of improved construction which shall efficiently and economically heat and circulate a drying medium.

A further object of the invention is to provide in a drier of the character referred to, an improved electrically heated drying apparatus comprising few and simple parts, which shall be relatively cheap to manufacture, economical in operation, and practical and efficient to a high degree for the purposes described.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

Certain features herein shown and described are shown, described and claimed in my co-pending application Serial No. 95,548 filed March 18th, 1926, the present application being a division of said co-pending application.

With the above exception, the invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts which will be exemplified in the construction hereinafter described, and of which the scope of application will be indicated in the following claims.

In the accompanying drawing, in which is shown one of the various possible illustrative embodiments of this invention,

Fig. 1 is a side elevational view in cross-section of a clothes drier having a heating means embodying the invention, showing the interior construction.

Fig. 2 is a fragmentary cross-sectional view taken on line 2—2 in Fig. 1.

Fig. 3 is a cross-sectional view taken on lines 3—3 in Fig. 2.

Fig. 4 is a diagrammatic view showing the electrical connections and circuits.

Referring in detail to the drawing, the invention is here shown as applied to a clothes drier which may consist of one or more units each comprising a drying chamber or cabinet 10 provided with the electrically operated air-heater unit 11 for supplying heated air for drying clothes hung in the chamber 10. The clothes are carried on one or more rack-frames 12 suspended on a carrier 13 which is adapted to reciprocate in and out of said cabinet.

The cabinet 10 may be of any suitable construction, and is here seen to comprise side walls 14 and a top wall or roof 15 and is closed on the rear side by a wall 16, said walls being joined together in any suitable manner, and being preferably made in sections.

The side walls, roof and rear wall may be made of single or double sheet metal construction, and are here shown to comprise a pair of parallelly disposed sheets suitably reinforced in any well understood manner and spaced from each other to provide a heat insulating air space 17 for the drying chamber 10. The rear and top wall sections forming the chamber 10 may be secured together by top and bottom corner rails 18 and 19, respectively, said chamber being braced on the front side by the upper and lower cross-pieces 20 and 21, respectively, which interconnect the upstanding edges of the front side wall-section 14^a, as shown in Fig. 1.

The rack frame 12 may comprise a rear panel 12^a and a front vertical panel 12^b adapted to provide a closure or door on the upper front portion of the cabinet 10. Extending between the panels 12^a and 12^b are horizontally and parallelly spaced rack rods 22 from which the clothes or other material are suspended. Close to the bottom of the frame 12 the usual wire mesh shelf or tray 23 is provided.

The carrier 13 is adapted to reciprocate the rack frame 12 in and out of the chamber 10 and to support the same in an extended and overhanging position outside the cabinet. Said carrier 13 comprises a main longitudinal tubular member or bar 13^a, the rear end of which is supported to travel between the flange portions 25^a of parallelly spaced channel rails 25 on a pair of rollers 26, the latter being mounted on an axle 27 secured to the carrier bar 13^a by any suitable well known means. The channel rails 25 have the rear ends thereof rigidly sup-

ported by a bar 28 secured to the rear wall 16, the front ends of said rails being supported on an extended portion 20^a of the cross-piece 20. The rails 25 may be secured to the cross-piece extension 20^a by pins 29, as shown in Fig. 1.

The front end of the carrier 13 rides on a roller 30 mounted for rotation on the cross-piece 20, an opening 20^b being provided in said cross-piece to permit the passage of the carrier bar 13^a therethrough.

The drier frame 12 may be provided with rigid bracing means comprising bars 12^c connecting the upper ends of said rear panel 12^a and front panel 12^b and a bar 12^d joining the lower ends of said panels. The lower brace bar 12^d is preferably provided with a longitudinal extending channel 12^e for engaging over a roller 31 mounted on the lower cross-piece 21 to serve as a guiding means for the drier frame 12 during the reciprocating movement in and out of the cabinet. For closing the lower front opening under the front panel 12^b a suitable hinged door 32 may be provided, as shown in Fig. 1.

The improved electrically heated drying system embodying the invention for supplying the necessary heat to a drying medium such as air and for circulating the heated medium through the cabinet to dry the clothes or materials placed therein, will now be described.

Located preferably so as to occupy substantially the entire bottom of the cabinet 10 is the heater unit 11 which is seen to comprise a box-like casing 11^a in which is enclosed suitable electric heater elements 11^b. As shown in the drawing, the casing is preferably supported above the floor level on suitable legs 11^c, said casing being preferably constructed to form a passage 10^a of substantially U-shaped cross-section between the bottom and side walls thereof, and the bottom of the chamber 10. The vertical walls of said passage formed by the casing 11 may be provided with a plurality of suitable perforations 11^d to permit air passing from said passage 10^a into the casing, said passage 10^a communicating with the outside of the cabinet through openings 30^a provided in the front door, 32.

In order to permit the uniform distribution of the air heated from unit 11 into the chamber 10, the top 11^f of the casing is made of corrugated or saw-tooth construction having alternate sloping and substantially vertically extending surface portions 11^p and 11^q respectively. The vertically extending portions may be provided with openings 11^r to permit the passage of heated air from the interior of the casing into the chamber. This form of casing top construction provides a relatively large heat radiating and reflecting surface on both the interior and exterior sides thereof. Said top also serves as a drain for guarding and shielding the elements against injury from drippings of the wet clothes or other material hung from the rack frame 12 in the chamber 10.

For removing the moisture laden air from the chamber 10, a flue 33 connecting the top portion of said chamber with a suitable exhaust system (not shown) is provided. Said flue is preferably formed with a branch portion 33^a which extends substantially the entire top of the chamber over the carrier 13. Said branch portion may be of any suitable construction, and as here shown comprises a pipe which communicates with the chamber in any suitable manner, as through elongated triangular shaped slits 33^b. The latter extend substantially the entire length of the branch portion 33^a so that the rising moisture-laden air readily passes to the exhaust flue. The effective openings of the slits 33^b are preferably made greatest adjacent the free end of the branch portion 33^a so as to reduce to a minimum the resistance to the passage of the air through said branch portion.

The heating elements 11^b may be of any suitable construction and are adapted to be connected to a suitable electric supply source (not shown) in any well understood manner. As seen from Figs. 3 and 4, said elements are suitably mounted on brackets 11^k supported from the walls of the casing 11^a. Said heater elements may be connected in parallel, series or series parallel circuit depending on the available power source. As here shown, said elements are connected in series parallel relation with an electric light 36 connected in parallel circuit with said elements mounted on the front end of the heater unit 11 within the casing to serve as a signal to show when said elements are connected to the power source.

The operation of the improved electrical heated drying system will now be clear On connecting the heater elements 11^b to an electric supply source, the air surrounding said elements in the casing 11^a is heated and rises through the openings 11^r in the casing top 11^f into the chamber 10. Fresh air is drawn from the outside of the cabinet through the door opening 30^a into the passage 10^a and through the perforations 11^d in the sides of the casing into the unit 11. The heated air rising from the unit 11^b is uniformly distributed to flow upwardly into contact with the clothes or other material supported by the rack frame 12 and extracts moisture from said clothes or other material. The moisture-laden air on reaching the top of the cabinet is exhausted through the branch portion 33^a and flue 33.

A colored window in the form of a bull's-eye 37 may be fitted into the front side of

the casing through which the light 36 may be observed through an opening 30[b] in the door 32.

From the drawing it is apparent that the casing top 11[f] serves as means for retarding the flow of the air in the casing so that it may be longer in contact with the heating elements. Said casing is preferably made of a sheet material having the surfaces thereof finished to provide relatively high heat conducting and reflecting properties. The heat reflecting properties of the surfaces of the casing thus provide an efficient means for transmitting heat to the air.

To further increase the heat reflection, suitable means may be provided to extend along the entire top of the chamber over the carrier 13. Said means may comprise a sheet 34 finished to have a relatively high heat reflecting surface, and may be removably mounted on brackets 35 secured to the inner walls of the chamber as shown in Fig. 2.

With the improved electrically heated drying system above described, it is obvious that the heat is not only transmitted and caused to circulate by conduction, radiation and reflection in a practical and efficient manner, but said transmission and circulation also is greatly increased due to the convection effects in the system.

It will thus be seen that there is provided a device in which the several objects of this invention are achieved, and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiment above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawing is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:—

1. In a drier of the character described, electric heating means for supplying a heated drying medium in said drier, said means including a casing having a top wall, said casing top wall being corrugated to present a relatively large radiating surface, and a slot in a substantially vertical extending portion of said wall to permit the drying medium to circulate into said drier.

2. In a drier of the character described, a cabinet having a chamber, heating means for supplying a heated drying medium to said chamber, said means including a casing having a top wall, an electric heating element in said casing, said top casing wall forming a saw-tooth structure having slots in substantially vertical extending portions thereof to permit the heated drying medium to uniformly circulate from said means into said chamber.

3. In a drier of the character described, a cabinet having a chamber, heating means for supplying a heated drying medium to said chamber, said means including a casing having an extended top wall, an electric heating element in said casing, said casing top wall being corrugated to increase the radiating surfaces thereof, said wall having spaced openings therein arranged to permit the heated drying medium to uniformly circulate from said means into said chamber.

4. In a drier of the character described, a cabinet having a chamber, heating means for supplying a heated drying medium in said chamber, said means including a casing having a horizontally extending top wall, an electric heating element in said casing, said casing top wall forming a saw-tooth structure to increase the radiating surfaces thereof, said top wall having spaced openings in substantially vertical portions thereof arranged to permit the heated drying medium to uniformly circulate from said means into said chamber, said surfaces being finished to provide a heat reflecting means, as and for the purpose described and specified.

5. In a drier of the character described the combination of a cabinet having a horizontal wall positioned in said cabinet, the portion of the cabinet above said wall forming a drying chamber, said wall comprising V shaped portions having openings above the lower apices of said portions, said apices forming a drain for drippings from said drying chamber.

6. In a drier of the character described the combination of a cabinet having a drying chamber and a casing positioned at the bottom of said chamber, said casing including a substantially horizontal top wall, said top wall having vertical portions, heating means within said casing, said vertical portions having openings therein thru which air heated by said means may pass from the casing to the chamber.

In testimony whereof I affix my signature.

JULIUS JUDELSON.