United States Patent [19]

Lord

[11] **3,858,331**

[45] **Jan. 7, 1975**

[54] **GARMENT HEATING APPARATUS**

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[73] Assignee: **Catton, Incorporated,** New York, N.Y.

[22] Filed: **June 22, 1973**

[21] Appl. No.: **372,685**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 263,061, June 15, 1972, abandoned.

[52] **U.S. Cl.** **34/151,** 34/163, 34/239

[51] **Int. Cl.** **F26b 13/00**

[58] **Field of Search** 34/75, 76, 77, 151, 162, 34/163, 218, 219, 224, 225, 232–234, 239; 223/51; 68/6

[56] **References Cited**

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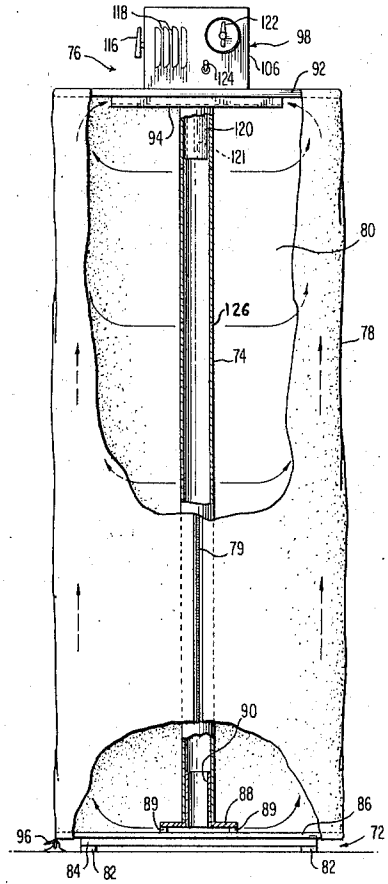
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Primary Examiner—Kenneth W. Sprague
Assistant Examiner—James C. Yeung
Attorney, Agent, or Firm—Burns, Doane, Swecker & Mathis

[57] **ABSTRACT**

A garment-treatment apparatus includes a base, an upstanding conduit, a frame supported at the upper end of the conduit, and an enclosure for defining a garment-treatment chamber. An air blower communicates with a heater and with the conduit to blow hot air into the conduit, through discharge openings located therealong, and into the chamber. The conduit is preferably arranged to support hanger apparatus such that a garment may be hung from the hanger in substantially encircling relationship to the conduit in the region of discharge openings. In this fashion, heated air ejected through the discharge openings is directed outwardly, through the garment to facilitate curing and/or heating thereof. The air blower preferably communicates with the upper end of the conduit so as to circulate heated air downwardly therethrough. The conduit includes a final outlet at its lower end to eject, into the lower portion of the chamber, air which has by-passed air discharge openings above the final outlet. Such an arrangement enables a substantially uniform temperature profile to be maintained within the chamber.

9 Claims, 9 Drawing Figures



2 Sheets-Sheet 1

FIG. 1

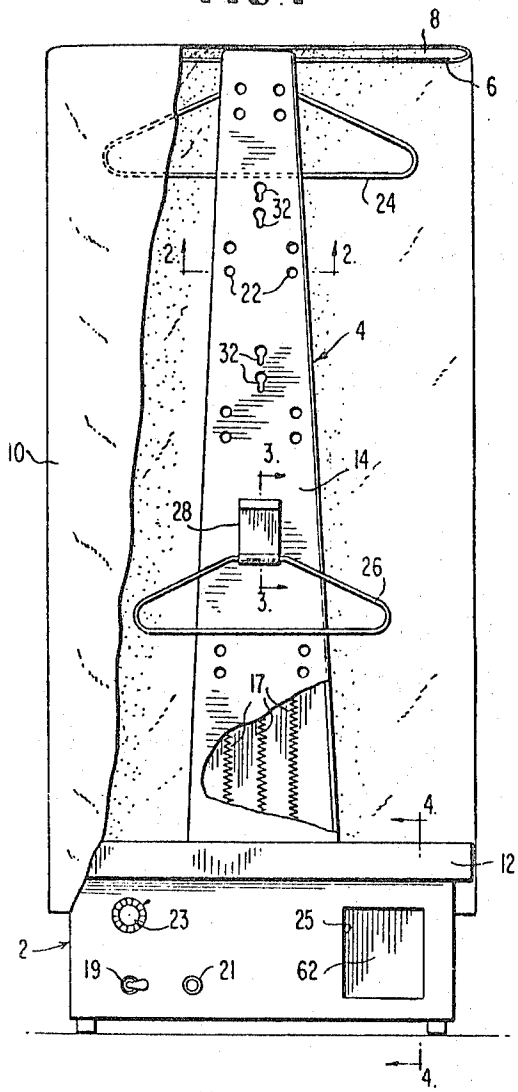
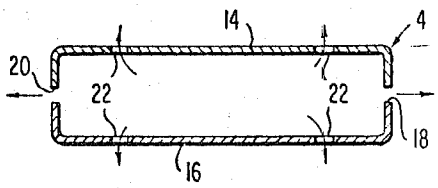


FIG. 2



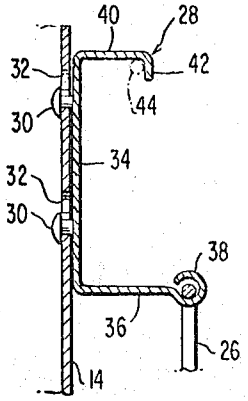


FIG. 3

FIG. 4

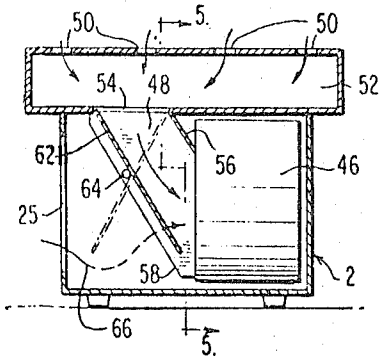


FIG. 5

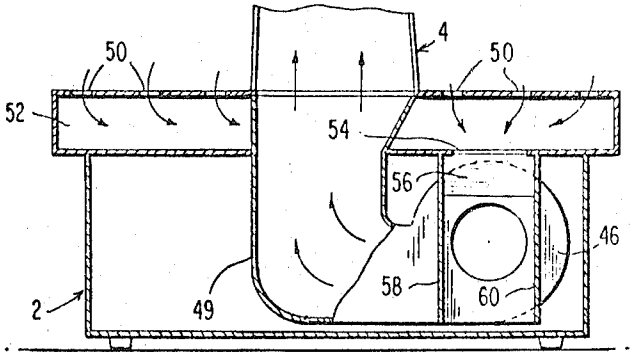


FIG. 6

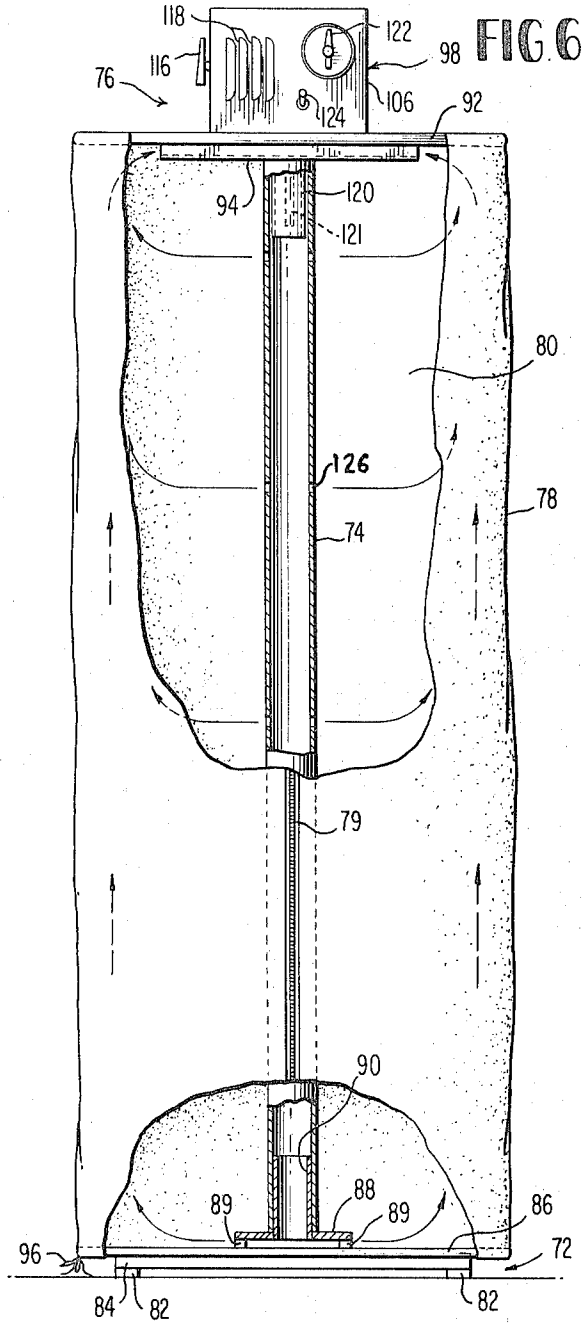


FIG. 7

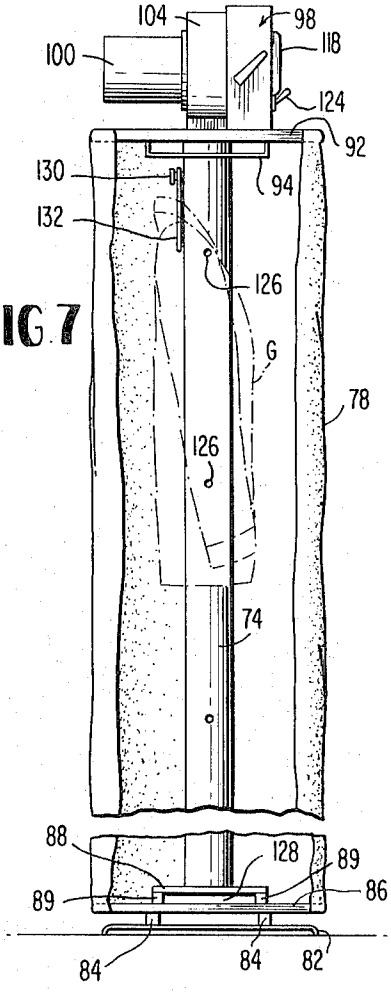


FIG. 8

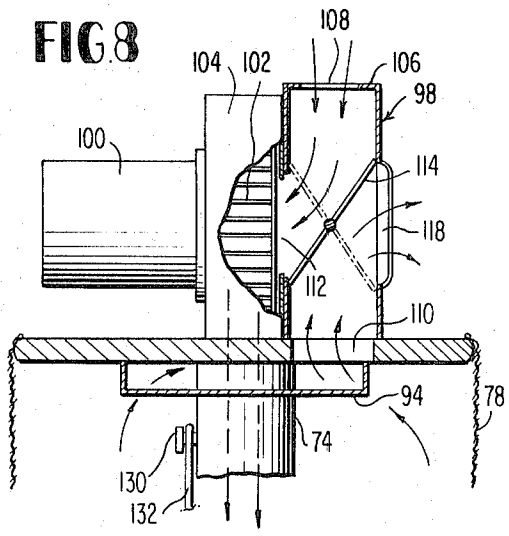
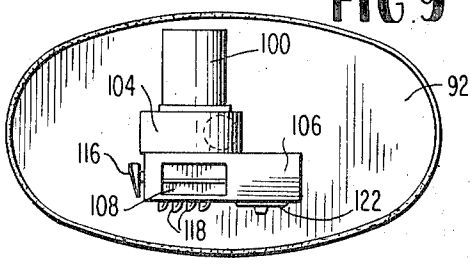


FIG. 9



GARMENT HEATING APPARATUS

CROSS REFERENCE TO RELATED APPLICATION

This is a Continuation-In-Part of my copending U.S. Application Ser. No. 263,061, filed on June 5, 1972 now abandoned.

BACKGROUND AND OBJECTS OF THE INVENTION

This invention relates to apparatus for heating garments. This apparatus is particularly suited for drying garments or for conducting the curing stage of durable press processes such as described in my U.S. Pat. No. 3,656,246, issued on Apr. 18, 1972.

Heretofore, there has been no apparatus which is suitable for use in the home which has the ability to heat garments for the purpose of curing durable press resins in the garment fabric. Prior U.S. Pat. 3,264,755 issued Aug. 6, 1966, U.S. Pat. No. 3,432,939 issued Mar. 18, 1969, and U.S. Pat. No. 3,601,292 issued Aug. 24, 1971, all disclose drying apparatus wherein a blower forces air into the interior of a flexible bag, with the air being released to the atmosphere after making a single pass through the bag. In instances where the air has been heated, it is released to the atmosphere and therefore the maintenance of a sustained high temperature is either not possible or not economical. These prior devices introduced the heated air only at the lower portion of the enclosure. External support means are required to support the uppermost portion of the enclosure, thereby limiting somewhat the locational versatility of the apparatus.

U.S. Pat. No. 3,626,602 issued Dec. 14, 1971 discloses a self-supporting garment dryer which has a central rigid conduit that carries a flexible skirt open at its bottom end. The conduit is provided with arms on which garments may be hung. The blower is located at the bottom of the conduit and blows air upwardly through the circuit. Discharge openings are formed in the conduit to direct air from the conduit toward garments which are hung or draped on the arms. Such an apparatus, while being capable of circulating air around garments in drying operations, is basically unsuited for effectively maintaining a substantially uniform temperature distribution around the garment, as may be desired for special garment-treating processes such as curing durable press resins in the garment, as explained, for example in my aforementioned patent.

U.S. Pat. No. 2,587,745 issued Mar. 4, 1952, discloses a garment finisher which forces heated air or steam upwardly into an open-neck garment which is supported by a vertical post of the apparatus. It will be apparent, however, that much of the air entering the bottom of the garment will merely continue flowing upwardly and exit through the neck without making significant contact with the garment. Also, this prior apparatus does not have an enclosure for the garment and does not provide for the return of heated air back into the blower inlet.

It is, therefore, a general object of the invention to obviate or minimize problems of the previously-described sort.

It is another object of the invention to provide a novel apparatus for drying and/or curing garments.

It is still another object of the invention to provide such a novel apparatus which is suitable for home use.

It is yet another object of the invention to provide a novel and effective garment-treating apparatus which is adapted to accommodate garments of varying size and shape.

It is still a further object of the invention to provide a novel garment treating apparatus which establishes a substantially uniform temperature profile within a garment-treating chamber portion of the apparatus. which has a base and an upstanding rigid conduit which serves several functions. The conduit contains heated air and introduces it into the garment-treating chamber. The conduit also provides the support both for the garment hangers and for portions of the enclosure which forms the treating chamber. This enclosure preferably includes a flexible vertical curtain which has its upper end supported by the upstanding conduit and its lower end conforming to the base of the apparatus. With respect to the roles of the hot air conduit, the present invention is applicable to a garment heating apparatus which operates only in a single pass, non-recirculating manner.

Preferably, the circulating blower for the apparatus normally has its inlet conduit communicable with the interior of the garment-treating chamber, and its outlet communicable with the interior of the rigid hot air conduit. Thus, air may be continuously recirculated and heated within the apparatus for maximum heat retention and efficiency. However, movable damper means may also be provided for bringing the blower inlet opening into communication with the outside air for a single-pass operation which is useful when drying garments since the moisture -laden air leaves the treating chamber without being recirculated.

Desirably the conduit serves to support garments which are arranged in encircling relation to the conduit. Air discharge openings are provided along the conduit and are arranged to direct air outwardly from the conduit through the garment. In this fashion, the air bently billows the garment to separate the layers of fabric to more effectively dry or cure the garment.

The blower may be arranged so as to introduce air into the lower end of the conduit. In this manner, the air is forced upwardly through the conduit and is ejected outwardly through the air discharge openings as it progresses upwardly.

It has also been discovered that by arranging the blower in communication with the upper end of the conduit to blow air downwardly therethrough, a surprisingly uniform temperature profile may be established within the chamber. This is especially significant during durable-press curing stages in that it diminishes the chances that incomplete or non-uniform curing of the garment might occur.

Therefore, in accordance with another embodiment of the present invention, the blower is arranged to introduce air into the top of the conduit. Preferably, the blower is supported at the top of the conduit and forces air downwardly through the conduit. The air is heated by a heating element disposed in the path of the circulated air and the heated air is ejected outwardly through the spaced discharge openings along the conduit. Air which is not ejected through the discharge openings is emitted through the bottom of the conduit into the lower portion of the chamber. The blower may be detachable from the conduit to enable the top of the conduit to be exposed so that certain garments, unable

to be wrapped around the conduit, may be slipped thereover.

DRAWINGS

Other objects and advantages of the invention will become apparent from the subsequent detailed description thereof in connection with the accompanying drawings in which like numerals designate like elements, and in which:

FIG. 1 is an elevational view of one preferred form of heating apparatus in accordance with the present invention, with portions of its enclosure element being broken away to expose the internal structure of the garment treating chamber;

FIG. 2 is a sectional view taken along line 2—2 in FIG. 1, illustrating the cross-sectional configuration of the hot air conduit;

FIG. 3 is a sectional view seen along line 3—3 in FIG. 1, showing a preferred hanger construction and means for attaching it to the hot air conduit;

FIG. 4 is a sectional view of the apparatus taken along line 4—4 in FIG. 1, showing a movable baffle which may be shifted to change the apparatus from a recirculating mode of operation to a single-pass mode of operation;

FIG. 5 is a sectional view taken along line 5—5 in FIG. 4, showing the path of air leading to and from the circulating blower;

FIG. 6 is an elevational view of another preferred form of the heating apparatus, with portions of the enclosure and conduit being broken away;

FIG. 7 is a side elevational view of the apparatus shown in FIG. 6 and depicts a garment in encircling relation to the conduit;

FIG. 8 is a cross-sectional view of the upper portion of the apparatus of FIGS. 6 and 7; and

FIG. 9 is a plan view of the apparatus of FIG. 6.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIG. 1, it will be seen that the apparatus includes a base assembly 2 which supports the upstanding rigid hot air conduit 4. A frame 6 is attached to and supported by the uppermost end of the hot air conduit 4.

A bag-like member of relatively air-impervious fabric has an upper panel 8 resting on and conforming to the frame 6 and a curtain portion 10 which hangs vertically and has its lower portion conforming to the peripheral sidewall 12 of the base assembly 2. The curtain portion 10, which may comprise a quilted cotton exterior and a nylon interior is provided with a vertically extending zipper or other slide fastener which facilitates placement of a garment in the treating chamber.

The hot air conduit 4 is preferably formed of two channels 14 and 16 which are attached together by spacer means at given intervals so as to form elongated air discharge openings 18 and 20 which are illustrated in FIG. 2. Also, circular air discharge openings 22 are located along the length of the conduit 4 in order to promote uniform air and temperature distribution in the apparatus.

The size and spacing of the openings 22 may be selected to produce the desired temperature uniformity. The air passing through the conduit 4 and emerging through the openings is heated by helical electrical resistance heaters 17 which are within the hot air conduit as shown in FIG. 1.

The controls for the apparatus are located on the front panel of the base assembly 2. In the disclosed embodiment, there is a toggle switch 19 for energizing the blower and heating elements, an indicator light 21 for indicating when the apparatus is operating, and a timer dial 23 which automatically turns the apparatus off after a preselected period of time. An opening 25 in the front panel exposes the baffle 62 which may be moved to its various positions by an operator when it is desired to change between single-pass and recirculating modes of operation. It is expected that further development of the apparatus will lead to the use of thermostatic control devices, possibly having a sensing element located at the upper end of the hot air conduit 4 where higher temperatures have been found to exist.

An upper garment hanger 24 is located at the upper end of the hot air conduit 4, with the rods which form it being located between the two channels 14 and 16, so that a garment on the hanger 24 will encircle the hot air conduit 4. For smaller garments and those which cannot be supported on the upper hanger 24, one or more auxiliary hangers 26 may be provided. As best seen in FIG. 3, each of these auxiliary hangers is supported on a bracket 28 which is attached to the hot air conduit by studs 30 which have elongated heads receivable in the keyhole openings 32 of the hot air conduit. These studs are attached to a vertical panel 34 of the bracket 28. A horizontal flange 36 is rolled at 38 to encompass and pivotally support the rod which constitutes the hanger 26.

It will be evident that the hanger assembly may be removed from the apparatus by sliding it upwardly and permitting the heads of the studs 30 to pass outwardly through the enlarged upper ends of the keyhole slots 32. If it is desired to hang the hanger assembly from a clothesline or other support, this is possible by the upper flange 40 which has a downturned end portion 42 which may be placed over a clothesline, the position of which is shown in broken lines at 44.

The hot air circulating blower 46 is located within the housing of the base assembly 2. As shown in FIG. 2, the blower has an axial inlet which receives air from an opening in communication with the air inlet conduit 48. FIG. 5 shows the outlet of the blower 46 leading to the air discharge conduit 49 which is in communication with the interior of the rigid hot air conduit 4.

Referring to FIG. 4, it will be seen that air located within the garment treating chamber is drawn into the blower inlet through apertures 50 in the upper wall of the return air chamber 52. The air then passes through an opening 54 in the lower wall of the return air chamber 52, and passes to the blower through the air inlet conduit 48. The air inlet conduit 48 is formed by a stationary rear wall 56, parallel sidewalls 58 and 60 and a movable baffle 62 which forms the front wall thereof. The baffle 62 is mounted for pivotal movement about the rod 64 so that when moved to the broken line position shown in FIG. 2, air flown from the opening 54 is obstructed and ambient air will be introduced along the path shown by the arrow 66. Of course, the position of the baffle shown in solid line provides for a recirculating mode of operation, during which the air is continuously recirculated through the apparatus through a path which includes the interior of the conduit 4, the garment treating chamber, the air return openings 59,

the return air chamber **52**, and the air inlet conduit **48**. This recirculating mode of operation provides for maximum heat retention within the apparatus and is useful for imparting durable press properties to garments made of previously impregnated fabrics. However, when the apparatus is used simply to dry wet garments, the baffle is placed in the broken line position to provide a single-pass operation which permits the moisture-laden air to be released to the atmosphere for efficient drying.

Preferably, garments are placed in the apparatus in a position where they will surround the hot air conduit. Air released by the hot air conduit will billow the garment with a gentle motion to separate the layers of fabric and to remove any small wrinkles formed therein. This feature may be particularly advantageous in a durable press process which utilizes a heating step, not involving ironing, to effect curing of crease-producing compositions applied to a pre-ironed garment. In such a process it is critical that the garment be maintained in its pressed condition during curing (heating), so that wrinkles are not durably set in the garment along with the desired creases.

It will be appreciated that numerous modifications may be made to the base apparatus without departing from the spirit of the invention. The garment hangers may themselves be hollow perforated bodies having their interiors in communication with the interior of the hot air conduit, or the hangers may have an adjustable size which permits them to support garments of different sizes. The hot air conduit may be formed of separable or telescopically related sections to permit their collapse for ease of transportation.

In another preferred form of the invention the hot air blower and thermostatic sensors are located at the upper end of the apparatus, as depicted in FIGS. **6** through **9**.

More particularly, and as may be viewed in FIG. **6**, a garment-treating apparatus **70** includes a base portion **72**, an upstanding conduit **74**, a lid unit **76**, and a flexible enclosure **78** which, together with the base and lid defines a heating chamber **80** around the conduit.

The base **72** includes a pair of legs **82** which support a pair of cross-bars **84**. A floor plate **86**, preferably of eliptical configuration, is mounted on the cross-bars **84** in a generally horizontal posture. A pedestal **88** is mounted to the floor plate **86** in raised relation to the upper surface thereof by a plurality of connecting studs **89**. A hollow post **90** projects upwardly from this pedestal **88** with its lower end terminating above the floor plate.

The bottom portion of the conduit **74** is configured to fit around the post **90** and rest on the pedestal **88** such that the conduit communicates with the chamber **80** via the hollow post **90** and a passage defined between the pedestal **88** and the floor plate **86**.

The lid unit **76** is supported at the upper end of the conduit **74**. This lid unit **76** includes a generally elliptical lid plate **92** having a U-shaped channel member **94** attached to the underside thereof within the chamber **80**.

The flexible enclosure **78** which defines the chamber **80** preferably comprises a flexible curtain which is hung from the outer periphery of the lid plate. The curtain may be fabricated of quilted cotton with a nylon interior, for example. The bottom end of the curatin **78** is configured to generally conform to the floor plate **86** and may be arranged to be pulled into tight engagement therewith by a drawsting **96**. A zipper **79** is provided in the curtain for opening the chamber **80**.

Seated atop the lid plate **92** is a power-driven blower mechanism **98** which includes an electric motor **100** coupled to a rotary blower **102** (FIG. **8**). The blower is preferably of the squirrel-cage type. Surrounding the blower is a housing **104** which has an air-feed opening (not shown) aligned with an opening in the lid plate **92** and the conduit **74**. The conduit extends upwardly through the channel to the lid plate to isolate the blower feed opening from the top of the chamber **80**.

An air-transfer casing **106** is mounted on the lid plate **92** adjacent the housing **104**. This casing communicates with the surrounding atmosphere by means of an inlet opening **108**. A recess **110** is formed in the lid plate **92** and communicates the casing with the chamber **80** via the ends of the channel member **94**.

The casing **106** and the housing **104** have aligned apertures defining a passage **112** which communicates the casing with the blower inlet. A rotary baffle or damper **114** is located within the casing **106** and is manually rotatable by means of a handle **116** at the side of the casing. By selective positioning of the damper, the blower inlet may be supplied with air solely from the surrounding atmosphere via opening **108**, solely from the chamber **80** via channel **94** and recess **110** in the lid plate **92**, or a mixture of both. Air from the chamber which is not recirculated may be conducted through a plurality of vent openings **118** formed in a wall of the casing.

Projecting downwardly from the lid plate **92** is a tube **120** in which is disposed a heater element **121**. The tube **120** is insertable into the top of the conduit **74**. Suitable structure between the conduit **74** and the tube **120**, such as a pin-and-slot arrangement for example, may be provided to assure that the lid unit **76** is properly oriented with respect to the base unit **72**.

The blower mechanism **98** includes an on-off switch **124**, a timer mechanism **122** and a thermostat (not shown). The latter is disposed within the channel **94** and may be connected to a suitable control (not shown) to provide automatic regulation of the heater in controlling the temperature of the chamber **80**.

The conduit is provided with a plurality of spaced, outwardly directed discharge openings **126** which communicate the interior of the conduit with the treating chamber **80**. Thus, heated air traveling downwardly through the conduit is ejected outwardly through the discharge openings and into the chamber. Heated air which is not ejected through the openings enters the bottom of the chamber from the bottom of the conduit **74**, via a vinal outlet between the pedestal **88** and the floor plate **86**. The air then flows upwardly within the chamber. As it rises, it combines with the air that is discharged through the openings **126**. Upon reaching the top of the chamber the air passes through the channel **94** to be totally or partially recirculated through the blower **102** or ejected through the vents **118**.

The conduit **74** is preferably provided with means, such as a lug **130** for example, for mounting a hanger **132**. The conduit is configured so as to permit aligned and oppositely directed portions of the hanger to extend beyond the conduit sides so that a garment G may be wrapped around the conduit in encircling relation thereto while being supported by the hanger **132** (FIG. **7**).

In order to dry or cure a garment G within the treating apparatus **70,** the zipper **79** is opened and, if possible, the garment is wrapped around the conduit **74** and hung upon the hanger **132** in its normally-worn posture. In this fashion the garment substantially encircles the conduit **74.**

Some garments are unable to be wrapped around the conduit in a normally-worn orientation, such as a closed sweater for example. By removing the lid unit **76** from the conduit **74,** however, the top of the conduit will be exposed and such garments may be slipped downwardly over the conduit and onto the hanger.

The curatin **78** is then zipped shut and the blower and heating element are actuated by flicking the switch **124** to the "on" position. The thermostat is then set to the desired temperature.

As air is forced downwardly by the blower, it is heated by the element **121** to a predetermined temperature. During subsequent downward flow through the conduit, heated air is discharged outwardly through the discharge openings **126.** Since the air loses heat by conduction through the conduit **74,** the air being discharged at the various levels along the conduit is of progressively diminishing temperture.

Air which exits through the bottom of the conduit is, by design, of a temperature which approximates that desired for the chamber. As this air rises, it gradually loses heat both to garments within the chamber and to the outside through the curtain **78.** At the same time, however, it mixes with progressively hotter air from the discharge openings **126** and the conduit surface such that air temperatures are maintained substantially uniform within the chamber. This condition assures that a uniform curing of the garments will occur.

It will be understood that any suitable distribution of the discharge openings **126** may be provided to maintain as uniform a temperature as possible within the chamber.

Of important significance in the curing and/or drying operation is the disposition of the garment on encircling relation to the conduit **74.** Heated air being discharged through openings **126** in the region of the garment will be directed outwardly, through the garment. In this fashion, the air will tend to billow the garment and separate the layers of fabric so as to heat the garment and remove wrinkles therefrom. This effect is especially significant in durable press processes since it assists in producing a wrinkle-free garment.

In summary, the arrangement of the blower **104** and the conduit **74** wherein heated air circulates downwardly through the conduit, through the air discharge openings **126,** and through the lower end of the conduit tends to establish a substantially uniform temperature profile within the chamber **80.**

By enabling garments to be hung in substantially encircling relation with the conduit **74,** air from the discharge openings **126** is ejected toward and through the garment to facilitate heating thereof. Gentle separation of the fabric layers by the air aids in removing wrinkles from the garment, an especially desirable occurrence in the production of durable-press garments.

Significantly, the arrangement provided by the present invention enables garments to be contacted by outwardly flowing air from the discharge openings **126** as well as by upwardly flowing air from the final discharge opening. This dual heat flow pattern maximizes the garment-heating effects of the circulated air.

Although the invention has been described in connection with preferred embodiment thereof, it will be appreciated by those skilled in the art that additions, modifications, substitutions and deletions not specifically described may be made without departing from the spirit and scope of the invention as defined in the appended claims.

What is claimed is:

1. Garment heating apparatus comprising:
support means;
vertical conduit means carried by said support means and including a plurality of generally outwardly directed air discharge openings;
enclosure means defining a chamber around said conduit means;
blower means communicating with said conduit means for circulating air through said conduit means and said air discharge openings and into said chamber;
heater means for heating circulated air; and
means for mounting hanger means on said conduit means such that generally aligned and oppositely directed portions of said hanger means extend outwardly beyond said conduit means to support, in the region of said discharge openings, a garment in substantially encircling relation to said conduit means so that air ejected through said air discharge openings is directed generally outwardly, through said garment;
said blower means communicating with the upper end of said conduit means for circulating air downwardly through said conduit, and said conduit means including final outlet means at the lower end of said conduit for ejecting, into the lower portion of said chamber, heated air which has by-passed air discharge openings located above said final outlet means.

2. Garment heating apparatus comprising:
support means;
vertical conduit means carried by said support means and including:
a plurality of vertically spaced, outwardly directed air discharge openings, and
means for mounting garment-supporting apparatus;
enclosure means defining a garment treating chamber around said conduit means;
said enclosure means including means for providing access into said garment treating chamber;
air blower means communicating with the upper end of said conduit means for circulating air downwardly through said conduit means;
heating means disposed in the path of the circulated air to heat such air;
final outlet means at the lower end of said conduit means for ejecting, into the lower portion of said garment treating chamber, heated air which has by-passed said air discharge openings located above said final outlet means; and
exhaust passage means disposed at the upper end of said chamber for exhausting heated air that has risen within said garment treating chamber while being mixed with progressively warmer air from said air discharge openings in a manner tending to maintain a substantially uniform temperature within said chamber.

3. Apparatus according to claim 2 wherein said conduit means includes means for mounting hanger means on said conduit means such that generally aligned and oppositely directed portions of said hanger means extend outwardly beyond said conduit means to support, in the region of said discharge openings, a garment in substantially encircling relation to said conduit means so that air ejected through said air discharge openings is directed generally outwardly, through said garment.

4. Apparatus according to claim 2 and further including frame means mounted at the upper end of said conduit means; said blower means being mounted atop said frame means; said support means including base means; and said conduit means extending upwardly from said base means.

5. Apparatus according to claim 4 wherein said blower means is detachably supported by said conduit means such that said frame means and said blower means may be removed from said conduit means to enable garments to be slipped over the top of said conduit means.

6. Apparatus according to claim 5 wherein said heating means includes a tube carried by said frame means and being extendable into said conduit; and a heating element disposed within said tube.

7. The apparatus according to claim 5 wherein the bottom end of said conduit means is detachably inserted over an upstanding post portion of said base means.

8. Apparatus according to claim 6 including baffle means disposed adjacent the air inlet of said blower means for selectively communicating the inlet of said blower means with recirculated air from said chamber and with air surrounding said apparatus.

9. Garment heating apparatus according to claim 2 comprising:

base means including a floor plate;

upstanding conduit means projecting upwardly from said base means, said conduit means including:

a plurality of vertically spaced, outwardly directed air discharge openings, and

means for mounting garment-supporting apparatus such that garments may be hung in substantially encircling relation to said conduit means in the region of air discharge openings;

vertically extending flexible curtain means defining a chamber around said conduit means;

lid means situated at the upper end of said conduit, said lid means including:

a lid plate;

tube means carried by said lid plate and projecting downwardly therefrom into the upper end of said conduit means;

heating means situated in said tube; and

blower means carried atop said lid plate and communicating with said tube and said conduit to blow air downwardly through said conduit and around said heating means;

means for selectively communicating the inlet side of said blower means with said chamber for recirculating air within said chamber through said blower means; and baffle means for regulating the air fed to said blower;

said lid means being removable from said conduit means such that access to the top of said conduit means may be provided to enable garments to be slipped over the top of said conduit means; and

the terminal end of said conduit means being vertically spaced from said floor plate to define a final outlet opening for ejecting, from said conduit, heated air which has by-passed air discharged openings located above said final outlet opening.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,858,331 Dated January 7, 1975

Inventor(s) John G. Lord

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In the title page the name of the Assignee has been misspelled.

In corrected form, the name of the Assignee should read --Cotton, Incorporated, New York, N.Y.--.

Signed and sealed this 1st day of April 1975.

(SEAL)
Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents
and Trademarks

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