

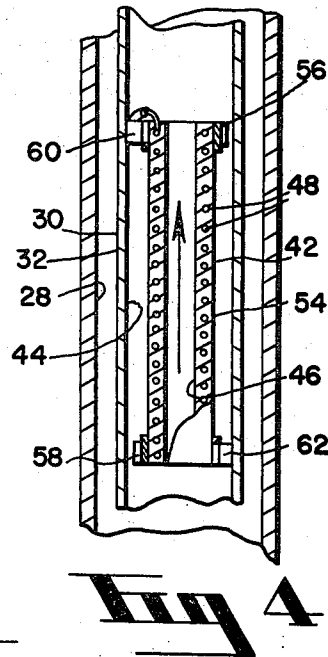
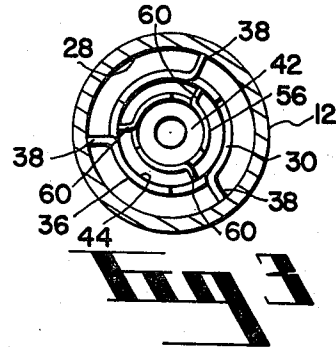
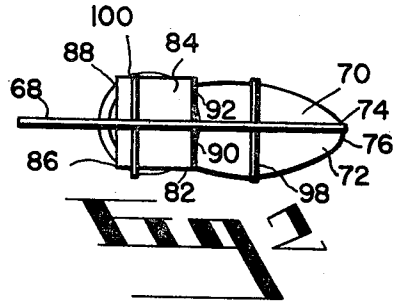
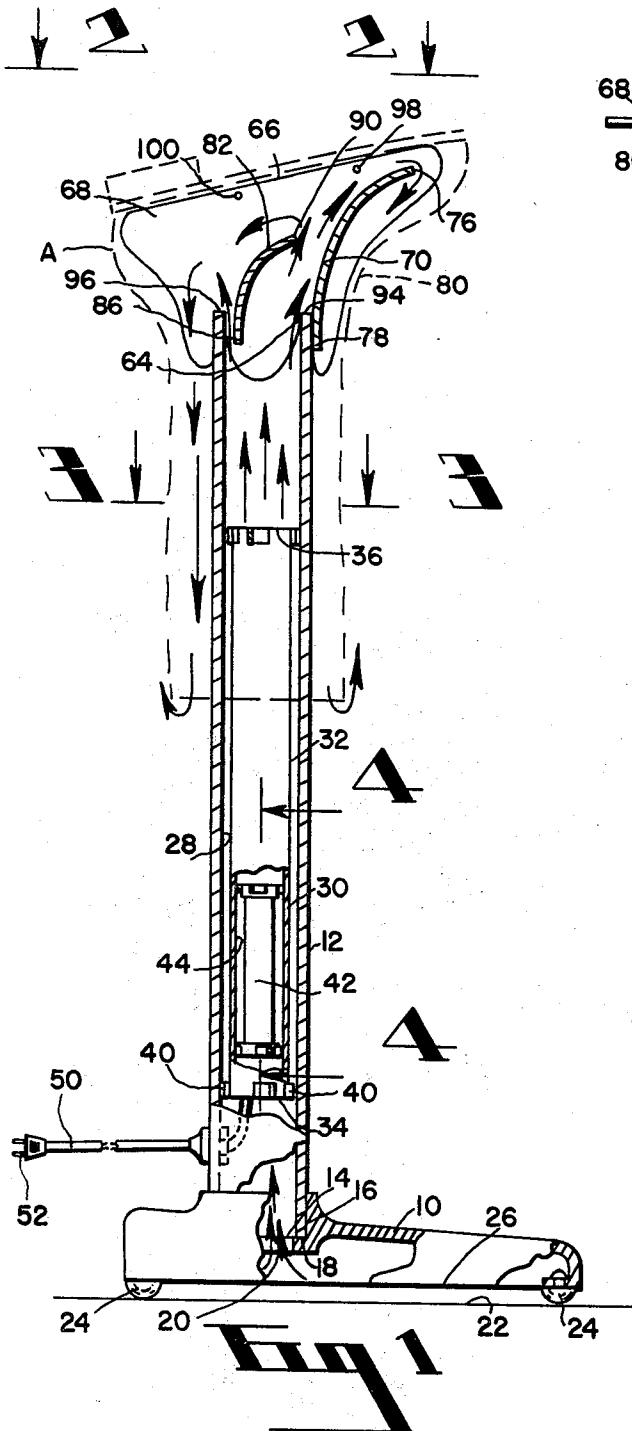
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BOOT AND SHOE DRYER

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BOOT AND SHOE DRYER

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Apr. 8, 1963. This application Aug. 22, 1966, Ser.
No. 574,186

5 Claims. (Cl. 34—104)

ABSTRACT OF THE DISCLOSURE

A boot and shoe dryer having concentric tubular thermal convection tubes, wherein a low wattage electrical heater is disposed concentrically of the inner tube, and means on the upper ends of the tubes for supporting a shoe, whereby convection currents induced by the heater flow upwardly through the tubes and into the shoe and downwardly around the outside of the shoe dryer, all in accordance with the thermal input of the heater internally of the concentric tubes.

This application is a continuation-in-part relative to my abandoned application, Ser. No. 271,090, filed Apr. 8, 1963.

This invention relates to a boot and shoe dryer and more particularly to a boot and shoe dryer which comprises novel means for very quickly and efficiently drying boots or shoes.

Various prior art devices have been utilized for drying boots or shoes and while many of these devices are capable of accomplishing such drying operations they lack efficiency of such drying operations within short periods of time, additionally, the uniform drying of all portions of boots or shoes has presented problems with prior art devices.

In various prior art boot drying structures it has been a problem to obtain high velocity conductive currents internally of shoes and uniformly throughout the interiors thereof for quickly and efficiently drying the same. Furthermore, it has been a problem to apply sufficient heat and at the same time uniformly distribute such heat so that the boot may be quickly dried without being damaged.

Another problem encountered in the prior art has been the incorporation of a heater directly in the boot drying device without heating the device to such an extent that it may cause radiation or conduction to portions of the dryer engaging the boot and thus, damaging the boot.

Accordingly, it is an object of the present invention to provide a boot and shoe dryer wherein a vertically disposed hollow tubular stand contains a hollow tubular radiation shield spaced internally of said hollow tubular stand so that two separate annulus passages surround the heater to conductively exchange heat therefrom which creates thermoconvection upwardly inside said first mentioned hollow tubular member thereby carrying all of the heat upwardly and creating a high velocity flow of hot dry air which is distributed internally of a boot supported on the upper end of the first mentioned hollow tubular member.

Another object of the invention is to provide a novel boot and shoe dryer having a hollow tubular substantially vertically disposed member serving as a hot air passage and being open at its upper end and whereon a novel flow distributor is supported and adapted to direct hot dry air uniformly throughout the entire toe, heel, and upper areas of a shoe or boot.

Another object of the invention is to provide a novel shoe and boot dryer having a hollow tubular warm air conducting member open at its upper end and on which a shoe or boot supporting baffle structure is readily re-

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movably mounted so that the baffle structure may be placed internally of a shoe or boot preliminary to its mounting on the upper open end of the hollow tubular member thus, permitting the baffle structure to be almost coextensive with the interior areas of the shoe or boot and yet readily placeable therein so that efficient and uniform distribution of warm air from the hollow tubular member to all of the areas internally of the boot may be efficiently obtained.

Another object of the invention is to provide a shoe and boot dryer having a novel warm air distributing baffle system for disposition in the foot containing area of a shoe or boot, said structure comprising a central divider baffle disposed normally longitudinally through the middle portion of the interior of the shoe or boot and side baffles extending into the proximity of the toe area in the boot at opposite side of the central baffle; said structure also including baffle means for directing warm air into opposite sides and to the rear interior of a boot around the heel portion thereof; said baffle structure disposed in the middle portion of the boot so arranged that it holds the upper of the boot in spaced relation around a hollow tubular warm air conducting member on the upper end of which the baffle structure is positioned whereby warm air circulated into the boot may readily escape downwardly and outwardly from the upper structure of the boot when the boot is placed in inverted position on the baffle structure.

Another object of the invention is to provide a novel heater radiation shield and concentric tubular conduit and stand for a boot dryer which creates a high velocity air flow which is warm and dry and which effectively prevents radiation from the heater from heating the outer structure of the hollow tubular conduit which supports a boot on the structure of the invention.

Another object of the invention is to provide a novel means for concentrically spacing a radiation and convection shield concentrically in a hollow tubular conduit structure of the invention and also for concentrically positioning and spacing a hollow cylindrical heater internally of the radiation shield structure whereby thermoconvection is induced to occur in two separate annulus passages for efficiently conveying all of the heat generated by the heater and for creating high velocity flow upwardly to the interior of a boot or shoe supported on the dryer of the invention.

Another object of the invention is to provide a boot and shoe dryer which is capable of very efficiently uniformly and quickly drying boots or shoes in proportion to the overall bulk of the invention and in proportion to the energy supplied thereto.

Further objects and advantages of the invention may be apparent from the following specification, appended claims and accompanying drawings in which:

FIGURE 1 is a side elevational view of a boot and shoe dryer in accordance with the present invention showing portions thereof broken away and in section to amplify the illustration and showing by broken lines a boot supported thereon and illustrating convective flow of air through the dryer and through the boot for drying the boot while supported on the dryer;

FIGURE 2 is a top or plan view of the shoe or boot supporting baffle structure taken from the line 2—2 of FIGURE 1;

FIGURE 3 is a plan sectional view taken from the line 3—3 of FIGURE 1;

FIGURE 4 is an enlarged fragmentary sectional view taken from the line 4—4 of FIGURE 1.

As shown in FIGURE 1 of the drawings the boot and shoe dryer of the invention is provided with a base 10 on which is supported a hollow tubular conduit and

frame structure 12. A lower open end 14 of the hollow tubular conduit is supported in a socket 16 in the base 10 wherein a ledge 18 supports the lower end 14 of the conduit 12. The base 10, concentrically of the ledge 18, is provided with a central opening 20 conforming with the open end 14 of the conduit 12 so that air is permitted to flow upwardly through the base 10 and into the conduit 12 in response to convective currents as will be hereinafter described.

The base 10 is elevated from a surface 22 of a floor or other structure by means of feet 24 which supports a lower edge 26 of the base sufficiently above the surface 22 so that unrestricted flow of air may enter the conduit 12 at its open end 14 through the opening 20 in the base 10.

It will be appreciated that the hollow tubular conduit 12 is removably supported in the socket 16 in the base 10 so that the conduit 12 and base 10 may be separated for convenience of storage or packing.

The hollow tubular conduit 12 is provided with the bore 28 in which a radiation and convection shield member 30 is concentrically mounted. This member 30 is a hollow tubular member having an outside surface 32 which is smaller in diameter than the bore 28 thereby leaving an annulus between the member 30 and the bore 28 for a flow of air vertically through the conduit 12 as will be hereinafter described in detail.

The hollow tubular member 30 is provided with lower and upper open ends 34 and 36, respectively, to provide for free flow of air therethrough as indicated by arrows in the drawings.

As shown in FIGURE 3, the upper end 36 of the tubular member 30 is provided with a plurality of substantially radially disposed tabs 38 which extend outwardly and engage the bore portion 28 of the conduit 12. These tabs 38 are cut from the side wall of the tube 30 and bent outwardly and are of a sufficient length to provide substantial frictional engagement with the bore 28.

The lower end 34 of the tubular member 30 is provided with radially disposed tabs 40 which are similar to the tabs 38 hereinbefore described and which engage the bore 28 in a similar manner. Thus, both the lower and upper ends 34 and 36, respectively, of the tubular member 30 are frictionally supported in the conduit 12 in concentric relation therewith.

Concentrically mounted internally of the hollow tubular member 30 is a heater 42. This heater 42 is a hollow cylindrical structure having a bore 46 disposed concentrically therein. The sidewall structures of the heater 42 are preferably composed of a ceramic material in which an electrical resistance heating element 48 is embedded. This element 48 may be in the form of a coil and opposite ends thereof coupled to a conventional extension cord 50 having a conventional plug 52 adapted to be inserted into a female electrical outlet socket.

The electrical capacity of the heating element ranges between 15 to 35 watts and it has been found that this range is somewhat critical to proper drying of shoes and boots.

The peripheral wall portion 54 of the heater 42 is spaced from the bore 44 of the hollow tubular member 30 to provide an air flow annulus therebetween and the central bore in the heating element 42 also provides an air flow passage.

Band members 56 and 58 surround upper and lower ends respectively on the heater 42. These bands are substantially identical in construction and are disposed to support the heater 42 internally of the bore 44 as will be hereinafter described.

As shown in FIGURE 3 of the drawings it will be seen that the heater 42 is surrounded by band 56 and that outwardly extending tabs 60 integral with the band 56 are disposed in frictional engaged relationship with the bore 44 of the tube 30 thus the tabs 60 support the heater 42 in the tube 30 in a manner similar to the

support of the tube 30 by its tabs 38 in the bore 28 of the conduit 12.

It will be understood that the band 58 is provided with tabs 62 which are similar to tabs 60 on the band 56 hereinbefore described.

As shown in FIGURE 1 of the drawings the hollow tubular member 30 and the heater 42 are concentrically mounted internally of the hollow tubular conduit 12 and are all in substantially vertical alignment and in concentric relationship with each other in order to provide for the creation of a vertically disposed thermal draft when the heating element 48 of the heater 42 is energized.

The conduit 12 is provided with an upper open end 64 which carries a shoe or boot supporting baffle structure 66. This structure 66 is provided with a centrally disposed divider baffle 68 which is substantially a flat piece of sheet metal or the like having a vertical planer disposition and this member 68 is disposed to be located internally of a shoe or boot substantially at the middle portion thereof.

On opposite sides of this baffle 68 are flow directing baffles 70 and 72. These baffles 70 and 72 extend at their edge portions 74 and 76 into an area of a toe portion of a boot as indicated by broken line A in FIGURE 1 of the drawings. These baffle structures 70 and 72 are directed from one side 78 of the conduit 12 and are disposed to be spaced from said instep portion 80 of a boot so that air may flow downwardly between the baffles 70 and 72 and the instep of the boot as indicated by arrows in FIGURE 1 of the drawings.

Secondary baffles 82 and 84 are located on opposite sides of the baffle 68 and lower edge portions 86 and 88 of the baffles 82 and 84 extend downwardly into communication with the bore 28 of the conduit 12 to split the flow of air and to direct some of it toward the toe portion of the boot and some of it toward the heel portion of the boot or shoe. The upper edge portions 90 and 92 of the baffles 82 and 84 are directed toward the toe portion of the boot as shown in FIGURE 1 of the drawings.

The middle baffle 68 is provided with notch portions 94 and 96 which receive opposite upper edge portions of the conduit 12 these notch portions 94 and 96 are flared as to readily receive said upper edges of the conduit 12 when the baffle structure is in a boot or shoe and when the conduit 12 is inserted therein. Thus, it will be obvious that the entire baffle structure is removable from the conduit 12 and may be inserted in a shoe independently of the conduit 12 in order that the structure may intimately fit the interior of the boot and provide an efficient flow separator and baffle structure to direct warm air throughout the entire area of the interior of a boot or shoe for efficient drying thereof. Thus, the notches 94 and 96 provide for the simple and ready removal of the entire baffle structure 66 from the conduit 12 either for transportation storage, packaging, or for the facility of separately installing the baffle structure in a shoe or boot before the baffle structure 66 is placed on the conduit 12 for subsequent operation of the heater 42 and the drying of the boot thereby.

Operation of the present invention is substantially as follows:

When the plug 52 is coupled to a supply of electrical energy the heating element 48 in the heater 42 is energized and it heats the surfaces of the heater 42 at the bore 46 and at the outer side wall 54 thereof causing a thermal draft in the annulus between the heater 42 and the tubular member 30. Radiation to the inner wall or bore 44 of the tubular member 30 tends to heat this member and it acts as a shield to prevent radiation from contacting the bore surface 28 of the hollow tubular conduit 12. Concurrently, as the shield tube 30 is heated it heats air on its hotter surface and this creates thermal flow upwardly in the annulus between the tube 30 and the conduit 12 internally of the bore 28, thus, air flows through the center of the heater 42 upwardly through the annulus between the

heater 42 and the tube 30 and upwardly through the annulus between the tube 30 and the bore 28 of the conduit 12. In this manner, air is induced to flow at a high velocity and in considerable volume. The shield tube 30 prevents radiation to the bore 28 and consequently the flow there in the annulus between the tube 30 and the bore 28 thus maintains the conduit 12 cool so that the portions of a boot or shoe which may tend to contact the outer surface of the conduit 12 may not be burned or damaged.

As the warm air flows upwardly through the tube 30 and bore 28 it is divided by the plate 68 and is directed as hereinbefore described by the baffles 76 and 82 so that the air flows upwardly and around inwardly and throughout the entire area of the interior of the boot or shoe.

During this flow the sole of the boot or shoe is held in substantially horizontal position by horizontally disposed bars 98 and 100 which are held in fixed position in connection with the baffle 68. In this manner the shoe or boot is maintained in juxtaposition so that the air flow on opposite sides of the baffle 68 and around the baffles 70 and 82 is evenly distributed and so that the top or upper of the shoe is somewhat concentrically held around the conduit 12 permitting an even downward flow of warm air after it has passed through the shoe.

Attention is called to the fact that invention includes the tube 12 being open at its upper and lower ends, the second tube spaced concentrically within the outer tube and the heater, being within the second tube with an air space between the heater and the second tube and an air space between the second tube and the outer tube. This combination of elements provides a boot or shoe dryer, which may be controlled very critically with respect to wattage input, to avoid overheating and damaging shoes or boots, while at the same time, efficiently drying them. The amount of heat input is very critical. It has been found that a margin as narrow as five watts of power may represent a critical factor for successful heating and drying, without damaging shoes of same sizes. This, of course, being related to one model of the invention and the foregoing wattage range of 15 to 35 watts may not represent an exact range of allowable variations in heat input, but is indicative of the importance of controlling precisely and carefully the amount of heat delivered to the device, so that shoes may be properly dried without overheating and damaging the leather of the shoes. In considering this critical input factor, attention is called to FIG. 1 of the drawings, in which the heater 42 is a resistant heater, of the type which is small enough to be located internally of the innermost tube and having the ability to provide concentric heating, which is insulated by thermal air drafts moving upwardly in such a manner as to heat the air, but to avoid undue heating of the outer tube 12. The base 10 of the device is not heated and the only heat applied is by way of the small heater 42, being capable of fine control to maintain the heat input tolerance within the desired range to be effective, yet safe. Applicant's heater 42, being located concentrically of the inner tube and the outer tube, with air spaces between the heater and the inner tube and between the inner tube and the outer tube, provides a means for effectively creating thermal drafts in the annulus spaces between both tubes and the heater and to prevent undue heating of the tube 12 on which the shoe or boot is supported by the upper baffle structure.

It will be appreciated by those skilled in the art that radiation by the heater 42 is effectively prevented from overheating any portion of the dryer and that the tube 30 in accomplishing this function also helps to induce a volume of high velocity warm air to flow upwardly through the shoe during the drying thereof.

It will be obvious to those skilled in the art that various modification of the present invention may be resorted to in a manner limited only by a just interpretation of the following claims.

I claim:

1. In a boot and shoe dryer the combination of: a base; an upstanding hollow tubular conduit supported on said

base and having open upper and lower ends adapted to conduct a flow of air therethrough; a second hollow tubular member of smaller external diameter than the internal diameter of said hollow tubular conduit; said second hollow tubular member disposed concentrically within said hollow tubular conduit thereby providing an annulus between said second tubular member and the interior of said hollow tubular conduit; and a heater disposed concentrically in said second hollow tubular member and being of an external diameter smaller than that of the internal diameter of said second hollow tubular conduit, thereby forming an annulus between said heater and the inside of said second hollow tubular conduit; and means for concentrically supporting said second hollow tubular member internally of said hollow tubular conduit and for concentrically supporting the said heater internally of said second hollow tubular member, whereby heat induced by said heater causes air to flow upwardly in the annulus spaces between said hollow tubular conduit and said second hollow tubular member and between said second hollow tubular member and said heater; and means for supporting a boot or shoe to receive warm air at the upper opening end of said hollow tubular conduit; said means for supporting a boot or shoe on the upper end of said conduit comprising baffle means spaced below the boot supporting means and directed laterally of said hollow tubular conduit and adapted to conduct hot air into the toe portion of a boot or shoe supported thereon.

2. In a boot and shoe dryer the combination of: a base; an upstanding hollow tubular conduit supported on said base and having open upper and lower ends adapted to conduct a flow of air therethrough; a second hollow tubular member of smaller external diameter than the internal diameter of said hollow tubular conduit; said second hollow tubular member disposed concentrically within said hollow tubular conduit thereby providing an annulus between said second tubular member and the interior of said hollow tubular conduit; and a heater disposed concentrically in said second hollow tubular member and being of an external diameter smaller than that of the internal diameter of said second hollow tubular conduit, thereby forming an annulus between said heater and the inside of said second hollow tubular conduit; and means for concentrically supporting said second hollow tubular member internally of said hollow tubular conduit and for concentrically supporting the said heater internally of said second hollow tubular member, whereby heat induced by said heater causes air to flow upwardly in the annulus spaces between said hollow tubular conduit and said second hollow tubular member and between said second hollow tubular member and said heater; and means for supporting a boot or shoe to receive warm air at the upper opening end of said hollow tubular conduit; said means for supporting a boot or shoe on the upper end of said conduit comprising baffle means spaced below the boot supporting means and directed laterally of said hollow tubular conduit and adapted to conduct hot air into the toe portion of a boot or shoe supported thereon; portions of said baffle means disposed to direct flow of warm air into a heel portion of a boot or shoe disposed thereover.

3. In a boot and shoe dryer the combination of: a base; an upstanding hollow tubular conduit supported on said base and having open upper and lower ends adapted to conduct a flow of air therethrough; a second hollow tubular member of smaller external diameter than the internal diameter of said hollow tubular conduit; said second hollow tubular member disposed concentrically within said hollow tubular conduit thereby providing an annulus between said second tubular member and the interior of said hollow tubular conduit; and a heater disposed concentrically in said second hollow tubular member and being of an external diameter smaller than that of the internal diameter of said second hollow tubular conduit, thereby forming an annulus between said heater and the inside of said second hollow tubular conduit; and means for concentrically supporting said second hollow tubular

member internally of said hollow tubular conduit and for concentrically supporting the said heater internally of said second hollow tubular member, whereby heat induced by said heater causes air to flow upwardly in the annulus spaces between said hollow tubular conduit and said second hollow tubular member and between said second hollow tubular member and said heater; and means for supporting a boot or shoe to receive warm air at the upper opening end of said hollow tubular conduit; said means for supporting a boot or shoe on the upper end of said conduit comprising baffle means spaced below the boot supporting means and directed laterally of said hollow tubular conduit and adapted to conduct hot air into the toe portion of a boot or shoe supported thereon; portions of said baffle means disposed to direct flow of warm air into a heel portion of a boot or shoe disposed thereover; a middle baffle plate extending in a position to be located at a middle portion of the interior of a boot or shoe to divide air flow to opposite sides of a shoe to thereby efficiently direct hot air throughout the entire interior area of the shoe.

4. In a boot and shoe dryer the combination of: a base; an upstanding hollow tubular conduit supported on said base and having open upper and lower ends adapted to conduct a flow of air therethrough; a second hollow tubular member of smaller external diameter than the internal diameter of said hollow tubular conduit; said second hollow tubular member disposed concentrically within said hollow tubular conduit thereby providing an annulus between said second tubular member and the interior of said hollow tubular conduit; and a heater disposed concentrically in said second hollow tubular member and being of an external diameter smaller than that of the internal diameter of said second hollow tubular conduit, thereby forming an annulus between said heater and the inside of said second hollow tubular conduit; and means for concentrically supporting said second hollow tubular member internally of said hollow tubular conduit and for concentrically supporting the said heater internally of said second hollow tubular means, whereby heat induced by said heater causes air to flow upwardly in the annulus spaces between said hollow tubular conduit and said second hollow tubular member and between said second hollow tubular member and said heater; and means for supporting a boot or shoe to receive warm air at the upper opening end of said hollow tubular conduit; said means for supporting a boot or shoe on the upper end of said conduit comprising baffle means directed laterally of said hollow tubular conduit and adapted to conduct hot air into the toe portion of a boot or shoe supported thereon; passage means of said baffle means disposed to direct flow of warm air into a heel portion of a boot or shoe disposed thereover; a middle baffle plate extending in a position to be located at a middle portion of the interior of a boot or shoe to divide air flow to opposite sides of a shoe to thereby efficiently direct hot air throughout the entire interior area of the shoe; said last mentioned plate having notched portions removably fitted over opposite edges of the upper open end of said hollow tubular conduit, whereby said baffle structure may be readily removed from said conduit and placed in a shoe preliminary to the mounting of the baffle structure and the shoe on the hollow tubular conduit to receive warm air from the open upper end thereof.

5. In a boot and shoe dryer the combination of: a base; an upstanding hollow tubular conduit supported on said base and having open upper and lower ends adapted to conduct a flow of air therethrough; a second hollow tubular member of smaller external diameter than the internal diameter of said hollow tubular conduit; said second hollow tubular member disposed concentrically within said hollow tubular conduit thereby providing an annulus between said second tubular member and the interior of said hollow tubular conduit; and a heater disposed concentrically in said second hollow tubular member and being of an external diameter smaller than that of the internal diameter of said second hollow tubular conduit, thereby forming an annulus between said heater and the inside of said second hollow tubular conduit; and means for concentrically supporting said second hollow tubular member internally of said hollow tubular conduit and for concentrically supporting the said heater internally of said second hollow tubular means, whereby heat induced by said heater causes air to flow upwardly in the annulus spaces between said hollow tubular conduit and said second hollow tubular member and between said second hollow tubular member and said heater; and means for supporting a boot or shoe to receive warm air at the upper opening end of said hollow tubular conduit; said means for supporting a boot or shoe on the upper end of said conduit comprising baffle means directed laterally of said hollow tubular conduit and adapted to conduct hot air into the toe portion of a boot or shoe supported thereon; passage means of said baffle means disposed to direct flow of warm air into a heel portion of a boot or shoe disposed thereover; a middle baffle plate extending in a position to be located at a middle portion of the interior of a boot or shoe to divide air flow to opposite sides of a shoe to thereby efficiently direct hot air throughout the entire interior area of the shoe; said last mentioned plate having notched portions removably fitted over opposite edges of the upper open end of said hollow tubular conduit, whereby said baffle structure may be readily removed from said conduit and placed in a shoe preliminary to the mounting of the baffle structure and the shoe on the hollow tubular conduit to receive warm air from the open upper end thereof; lateral bars disposed at the upper portion of said last mentioned plate disposed to support the inner portion of a shoe, boot or sole to hold it in a substantially horizontal position.

References Cited

UNITED STATES PATENTS

426,111	4/1890	Coffin	34—104
994,259	6/1911	Kazanjian	219—369
1,444,264	2/1923	O'Neill	34—104
3,203,112	8/1965	Edmonds	34—104

FOREIGN PATENTS

1,285,346	1/1962	France.
3,226	2/1907	Great Britain.

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219—359, 523