Oct. 1, 1963 T. GIBBARD ETAL 3,105,891

SHOE BOTTOM HEATERS

Filed Dec. 22, 1961 4 Sheets-Sheet 1

Fig. 1

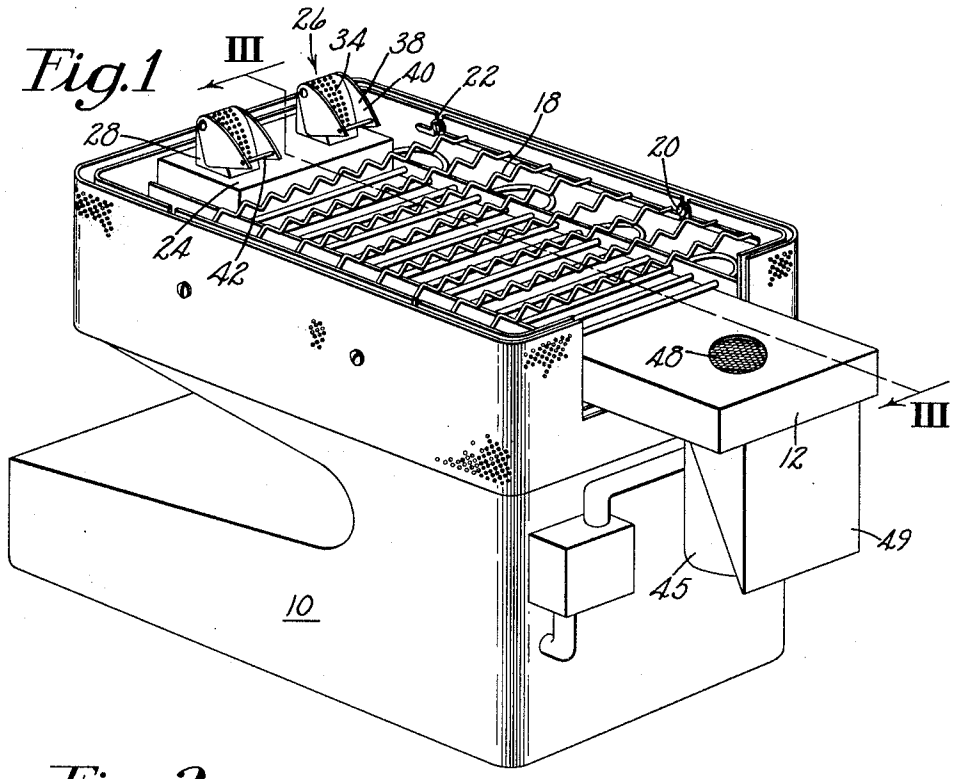
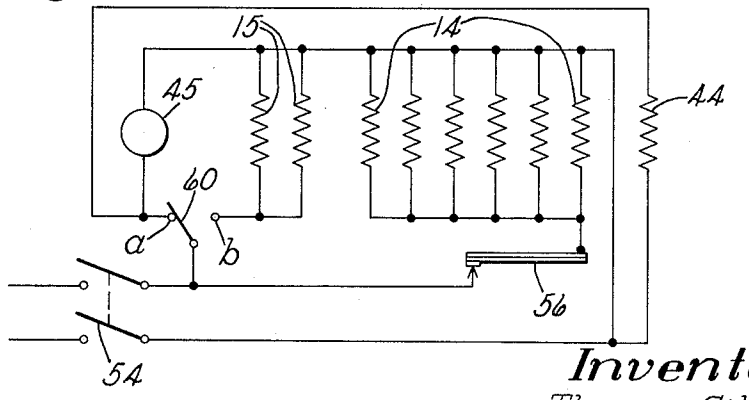


Fig. 2



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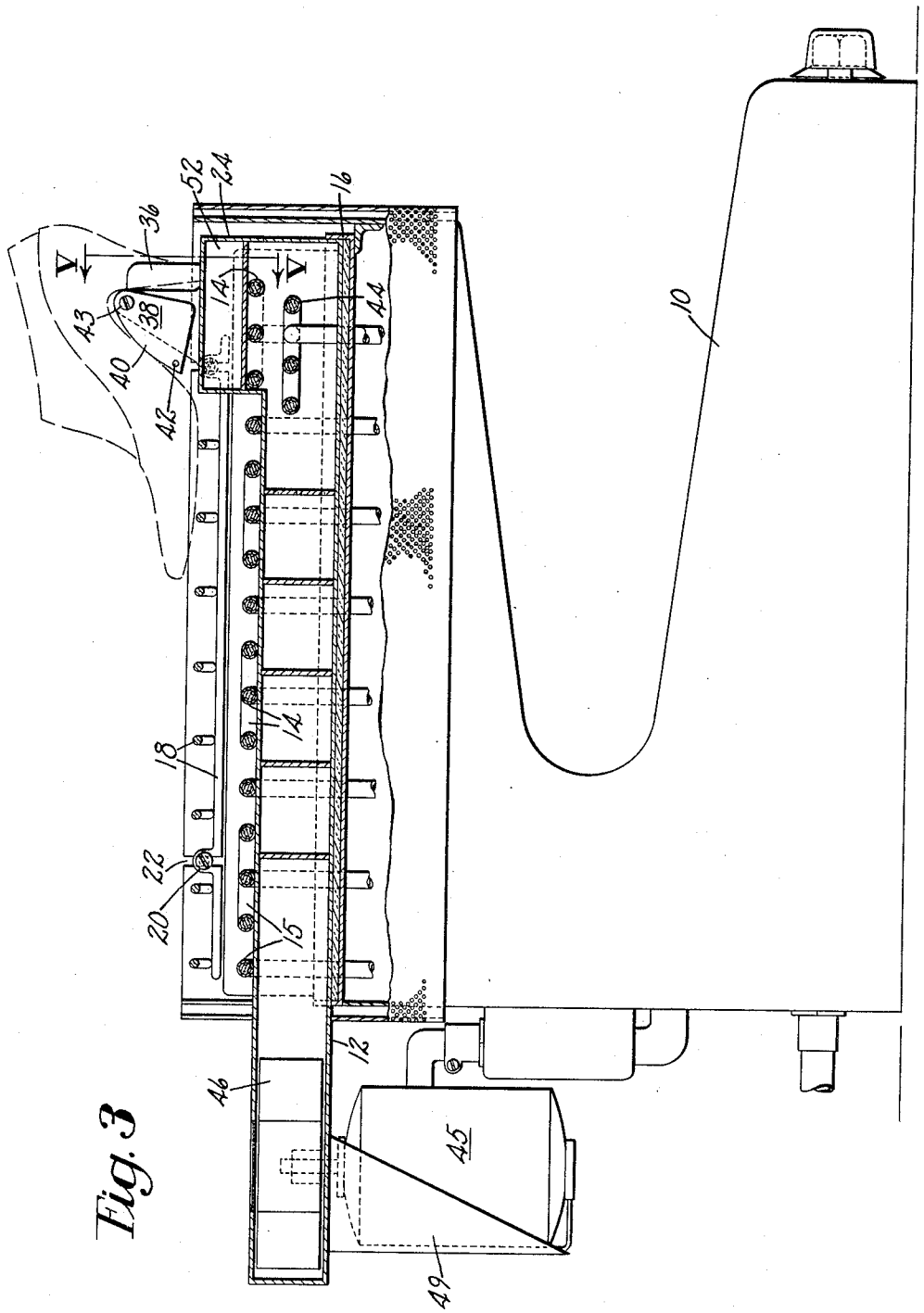


Fig. 3

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SHOE BOTTOM HEATERS

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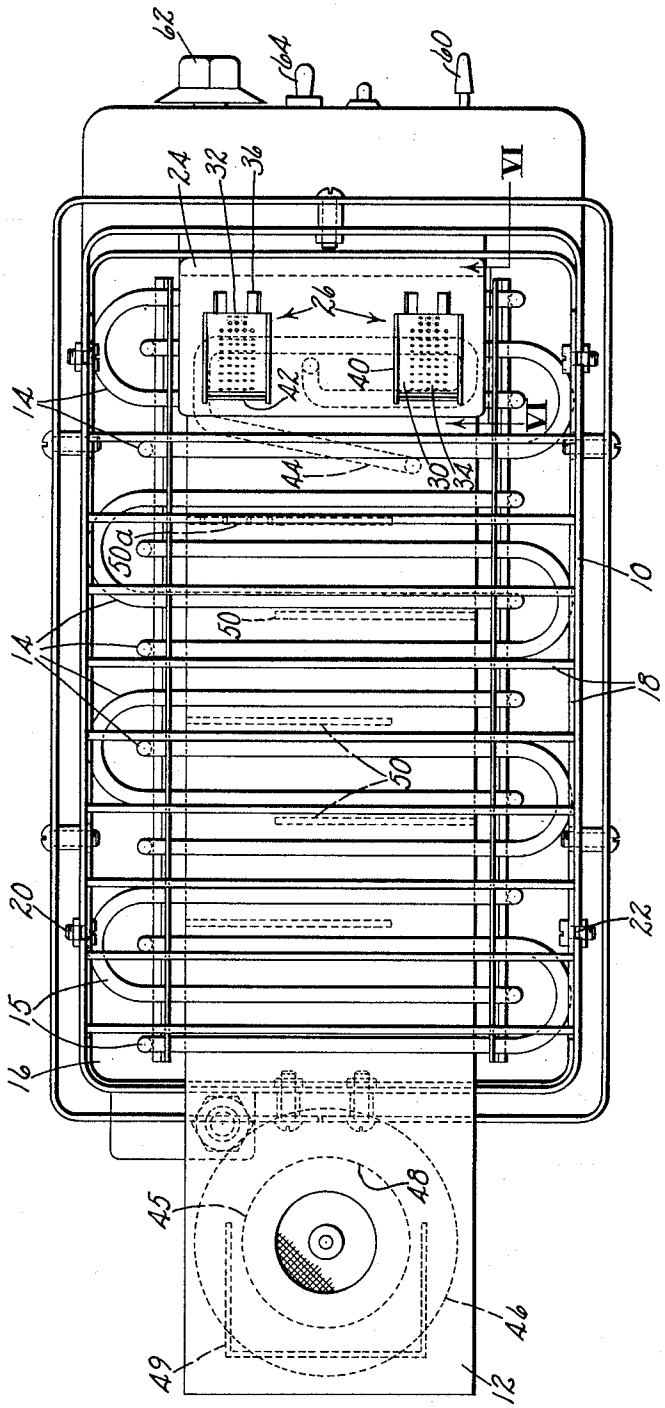


Fig. 4

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SHOE BOTTOM HEATERS

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Fig. 5

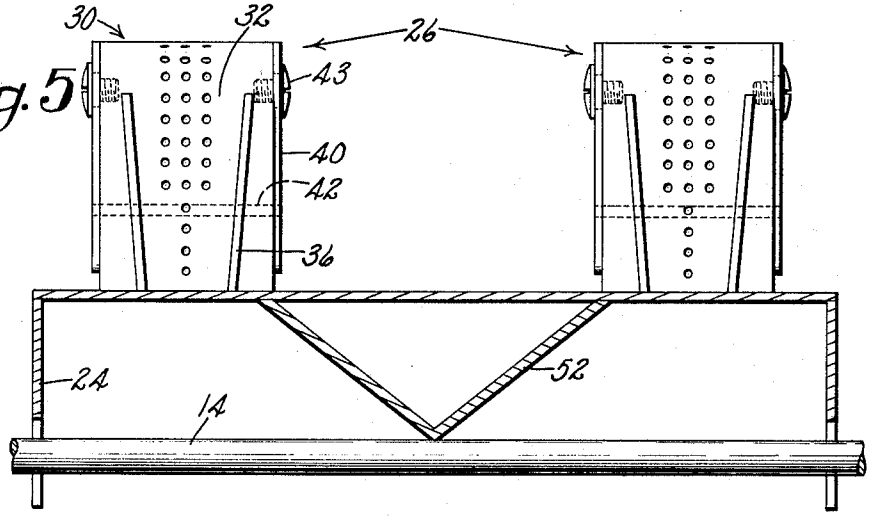
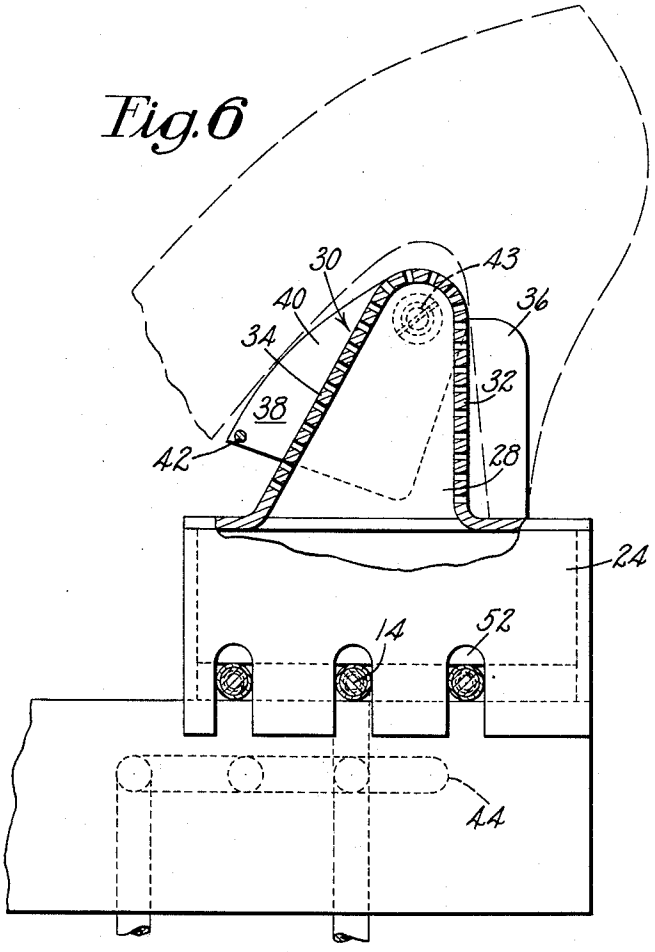


Fig. 6



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3,105,891

SHOE BOTTOM HEATERS

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6 Claims. (Cl. 219—39)

This invention relates to improvements in apparatus for use in heating shoe bottoms and is illustrated as embodied in apparatus for use in heating the bottoms of shoes having high heels such as Louis heels. The word "shoe," as used herein, denotes either a completed shoe or an upper assembled to an insole to which an outsole is to be attached, while "shoe bottom" includes a heel breast to which an outsole is to be bonded.

In a procedure which has recently become common in the manufacture of women's shoes with Louis heels, a heel is secured to the bottom of a lasted shoe before the outsole is attached to the shoe bottom and thereafter an outsole, of uniform thickness where it will overlie the forepart and shank of the shoe bottom and with a thinner portion arranged to lie over the breast of the heel, is bonded to the shoe and heel breast, suitably by neoprene adhesive. In making the bond, the adhesive is first applied to the shoe bottom and complementary portions of the outsole and allowed to dry. The dried adhesive film on the outsole is activated by heat, and the outsole and shoe assembled together under pressure so that the outsole becomes firmly bonded to the lasting margin and heel breast of the shoe.

Because of the difficulty of uniformly heating the bottom of a shoe having a high heel, heat activation of the adhesive film on the shoe bottom has not commonly been attempted. However, in many cases it would be advantageous to heat activate the adhesive on the shoe bottom rather than on the sole, for example where the sole is of a heat softenable composition.

Accordingly, an object of the present invention is to provide apparatus for use in heating the bottoms of shoes to which heels have been attached, which apparatus is adapted uniformly to activate films of adhesive on the shoe bottoms preparatory to the attachment of outsoles.

To this end and in accordance with a feature of the present invention, there is provided apparatus for use in heating the bottoms of lasted shoes to which heels have been attached comprising means for subjecting the foreparts of the shoe bottoms to radiant heat and means for directing a current of hot air onto the shank and heel breast portions of the shoe bottoms.

Another object of the present invention is to provide apparatus adapted for use in heating the bottoms of shoes to which heels have been attached, which apparatus may also be used for heating the comparatively flat bottoms of shoes intended to have low heels that have not yet been attached.

The illustrative apparatus comprises a horizontally disposed work support on which two shoes can stand side by side, the work support comprising an apertured portion and a closed portion. Heating elements in the form of bent heater bars are disposed beneath the apertured portion of the work support to heat the foreparts of the shoe bottoms while two perforated pillars upstanding from the closed portion of the work support are arranged to direct hot air supplied thereto onto the shank and heel breast portions of the two shoes. The hot air is supplied by an electric motor driven fan through a duct passing beneath the heater bars so that the air is warmed thereby as it is guided by baffles in a zig-zag path through the duct. Before emerging through the pillars, the air is superheated by a heater bar maintained at a higher temperature than those arranged to heat the forepart portions of the shoe bottoms. The pillars are constructed and arranged to be received within the arches of the shoes resting on the work support and are provided with adjustable baffles to accommodate for satisfactorily heating shoes having heels of widely differing heights, such accommodations being provided by mere swinging of the adjustable baffles into substantial engagement with the shoe bottoms.

Where it is desired to use the apparatus for heating the bottoms of shoes having comparatively flat bottoms, means are provided for disconnecting from the heater circuit the electric motor and the superheater bar while additional heater bars disposed beneath the apertured portion of the work support are connected into the heater circuit. Other features and advantages of the present invention will best be understood when taken in connection with the accompanying drawings in which:

FIG. 1 is an angular view of apparatus embodying the present invention taken from the right rear of the apparatus;

FIG. 2 is a schematic of the electric circuits;

FIG. 3 is a left elevation, partly in section, of the apparatus shown in FIG. 1, the section being taken on line III—III of FIG. 1;

FIG. 4 is a plan view of the apparatus shown in FIG. 1;

FIG. 5 is a partial section taken on line V—V of FIG. 3; and

FIG. 6 is a partial section taken on the line VI—VI of FIG. 4.

The illustrative apparatus comprises a hollow casing **10** adapted to stand on a bench. In the upper portion of the casing **10** a horizontally disposed metal duct **12** extends from rear to front. Six heater bars **14** and two heater bars **15** pass up through a flat plate **16** of the casing and U-shaped portions of the bars are disposed closely above the flat top of the duct **12**, the heater bars being of the sheathed conductor type comprising a resistance heating wire supported in a metallic tube by means of electrical insulating material such as magnesium oxide.

At the top of the casing **10** is a work support having an apertured portion comprising a grid-like rest **18** secured by bolts **20** in vertical slots **22** formed in the casing **10** and a closed portion comprising a raised hollow platform **24** forming a front portion of the duct **12**.

On the platform **24** stand two hollow perforated pillars **26**, the interiors of which communicate with the interior of the duct. Each pillar has solid vertical side walls **28** and a central perforated wall **30**, a front face **32** of which is vertical and a rear face **34** of which is inclined, the top of each wall **30** being rounded. Accordingly, each pillar is adapted to be received in the arch of a shoe having a high heel with the front face **32** opposing the heel breast portion of the shoe and the rear face **34** opposing the shank portion of the shoe. Against the front face **32** of each pillar stand two baffles **36** projecting a short distance from the wall and so inclined as to be slightly farther apart at the top than at the bottom. Thus, the baffles are adapted to receive between them the heel of a shoe. An adjustable baffle **38** comprising two plates **40** connected by a rod **42** is pivotally mounted on each pillar by screws **43**, the plates **40** lying alongside the side walls of the pillars when the baffle **38** is in an ineffective position, but being capable of being swung about the pivot into substantial engagement with a shoe bottom (FIG. 6) as required for shoes of differing heel heights more effectively to confine the

air directed from the pillar against the shank portion of the shoe bottom.

Below the platform 24 of the illustrative apparatus a bent heater bar 44 is disposed within the duct 12. This heater bar is designed to operate at red heat when energized, drawing suitably about 1,200 watts while the remaining heater bars remain black in operation, drawing about 400 watts each.

The rear end of the duct 12 supports an electric motor 45 which drives a fan 46 situated below an aperture 48 in the top of the duct, the motor being protected by a shield 49. Air forced along the duct by the fan is compelled by baffles 50 to take a zig-zag course. To even the air flow to the two pillars, the front one 50*a* of the baffles 50 is perforated in a portion half its length while a V-shaped baffle 52 (FIG. 5) is mounted inside the platform 24. By these means, a current of air may be caused to flow along the duct 12 where it is heated by the metal of the duct adjacent the heater bars 14, past the red hot superheater bar 44, up through the platform 24 and out through the perforations in the walls 30 of the pillars 26.

Referring to the schematic of FIG. 2, means for supplying electric energy to the apparatus comprises a main switch 54, a thermostatic switch 56, which may be manually adjusted to regulate the heat provided by the elements 14 in accordance with ambient temperature, and a selector switch 60 which may be positioned to close the circuit either to its contact *a* or its contact *b* in accordance with the operator's choice of the two modes of operation of the apparatus. With the switch 60 closed to its contact *a*, the electric motor 45 and the superheater element 44 are energized from one side of the line through the switch 60 to the other side of the line, providing a "hot air" mode.

In operation in the hot air mode with the switch 60 closed to its contact *a*, a shoe is disposed with its arch over a pillar 26, its forepart resting on the grid-like rest 18 and its heel resting on the flat top of the platform 24 between the baffles 36 projecting from the pillar. If needed, the baffle 38 is swung clockwise as viewed in FIG. 6 until the baffle engages the shoe. This arrangement has been found to bring the shoe bottom to a temperature in the region of 90° C. in 10 seconds.

For operation in the other mode for heating the bottoms of flat shoes the switch 60 is closed to its contact *b*, and thus the motor 45 and superheater element 44 are disconnected while heater elements 15 are connected across the power leads providing an "all radiant heat" mode. The grid-like rest 18 of the illustrative apparatus is long enough to accommodate the entire length of a shoe.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent of the United States is:

1. In apparatus for heating the bottom of a shoe having a high heel attached thereto, in combination, a support for the shoe, a radiant heater arranged to radiate energy through a portion of the support for heating the forepart of the shoe, a hollow perforated pillar disposed to be received under the arch of the shoe when said shoe is disposed with its forepart portion exposed to the radiant energy from said heater, and means for supplying heated air under pressure to the interior of said perforated pillar.

2. In apparatus for heating the bottom of a shoe having an attached high heel, in combination, a support for the shoe, said support having an apertured portion and a closed portion and being adapted to support a shoe with its forepart on the apertured portion with its heel resting on the closed portion, a radiant heater arranged to radiate energy through the apertured portion of the support for heating the forepart of the shoe, a hollow pillar disposed on the closed portion of the support, the interior of said pillar communicating with a source of pressurized heated air, said pillar having solid vertical side walls and a perforated central wall having a vertical face to oppose the heel breast portion of the shoe bottom and an inclined face to oppose the shank portion of the shoe bottom.

3. An apparatus as in claim 2 and additionally comprising two baffles projecting from the vertical face of the pillar and adapted to receive between them the heel of the shoe.

4. Apparatus as in claim 2 and additionally comprising an adjustable baffle comprising two plates pivotally mounted on said pillar for swinging into engagement with the shank portion of a shoe.

5. In apparatus for heating the bottom of a shoe having an attached high heel, in combination, a support for a shoe, said support comprising an apertured portion and a closed portion and being adapted to support a shoe with its forepart portion on the apertured portion and with its heel on the closed portion, electric heater elements arrayed beneath the apertured portion of the support, an air duct communicating with the closed portion of the support and having an upper wall of metal extending beneath and in substantial engagement with the arrayed heater elements, power driven means for forcing air along said duct toward the closed portion of the support, baffles within said duct for causing the air to take a zig-zag course, and a hollow pillar on the closed portion of said support, the interior of said pillar communicating with the interior of said duct, said pillar having solid side walls and a central perforated wall adapted to emit the heated air from the duct against the heel breast and shank portions of the shoe.

6. An apparatus for heating the bottom of a shoe comprising, in combination, a support for a shoe, said support having an apertured portion and a closed portion, electrically operated means for forcing heated air through the closed portion of said support and against the shank and heel breast portion of a shoe having a high heel and supported with its forepart on the apertured portion and its heel on the closed portion of said support, radiant heater elements arrayed beneath the apertured portion of said support, and switch means operable selectively either to connect said electrically operated hot air means and less than all heater elements to a source of electrical energy for heating the bottoms of shoes with high heels or to connect all of said heater elements while deenergizing said hot air means for heating the bottoms of flat shoes.

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