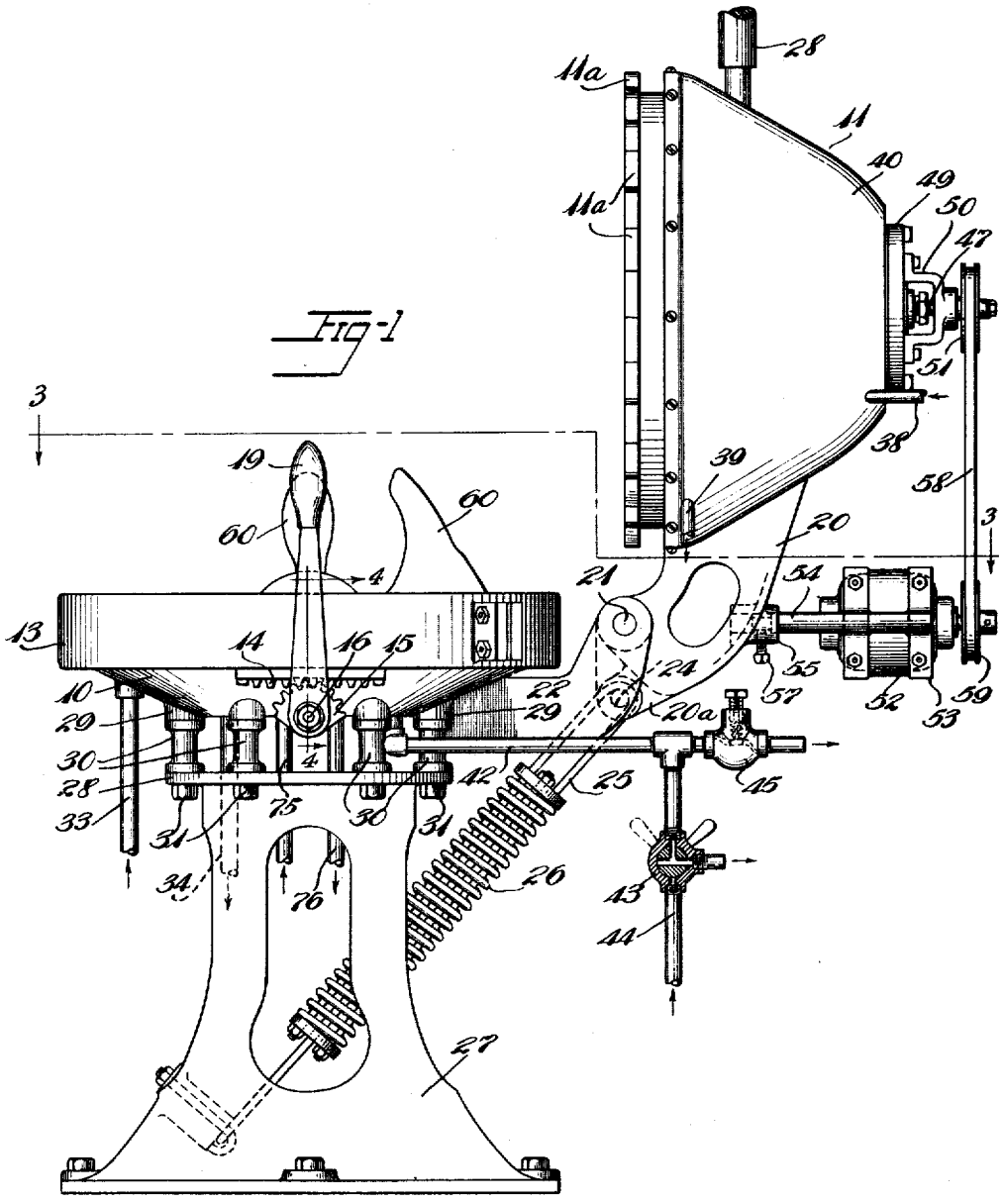
June 7, 1932. C. W. LEGUILLON 1,862,025

VULCANIZER

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Fig. 1



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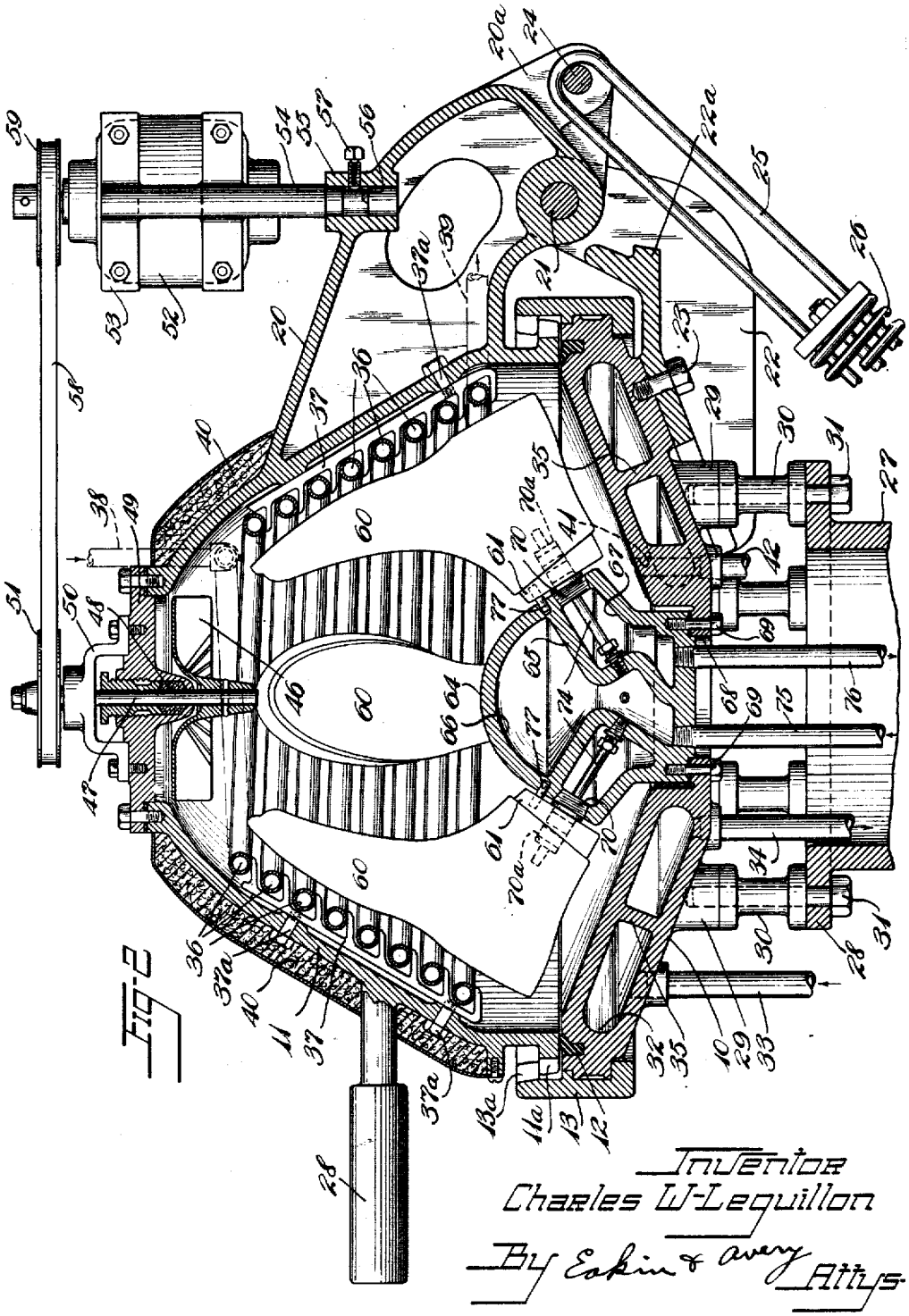


Fig. 2

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Fig-3

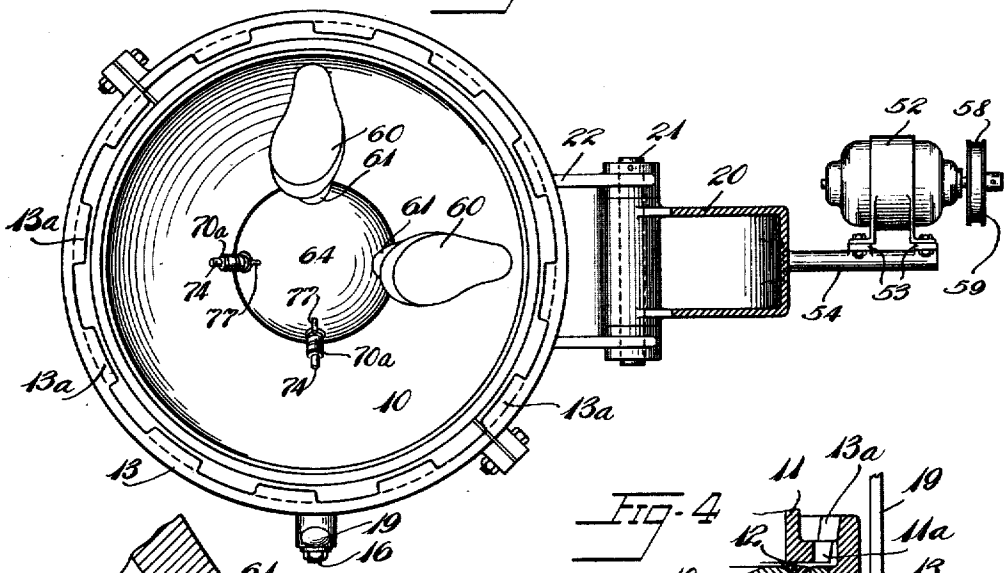


Fig-4

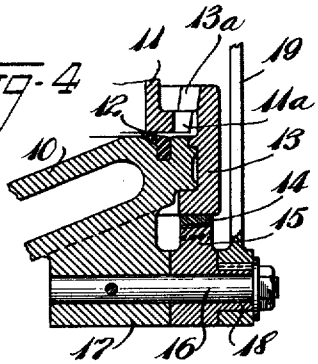
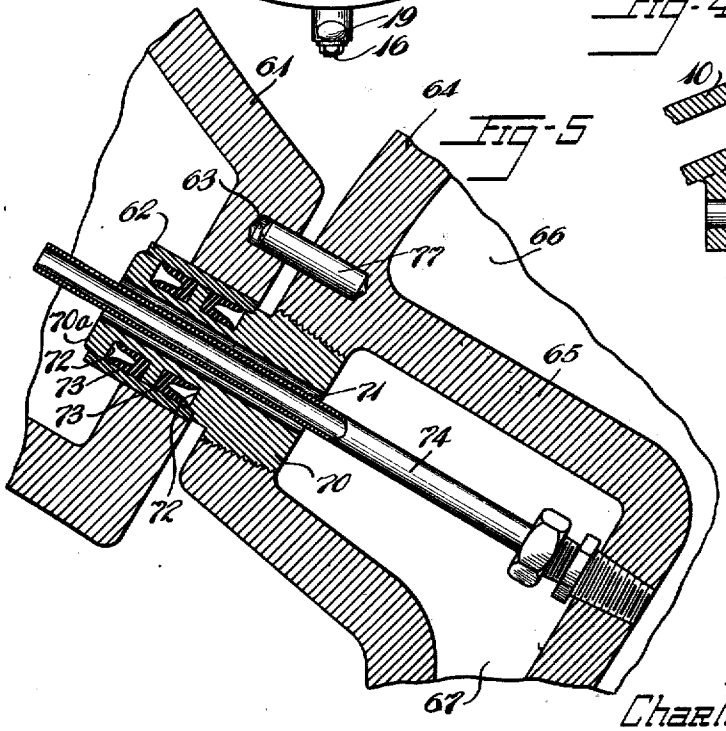


Fig-5



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Patented June 7, 1932

1,862,025

UNITED STATES PATENT OFFICE

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VULCANIZER

Application filed September 6, 1929. Serial No. 390,739.

This invention relates to vulcanizers, and especially to vulcanizers for footwear composed partly or wholly of rubber.

The chief objects of the invention are simplicity of construction, ease and efficiency of operation, and quick and uniform vulcanization of the articles.

The vulcanizer preferably is of relatively small size as compared with the usual type of vulcanizer employed for vulcanizing footwear in open heat. Each vulcanizer preferably is of such size as to accommodate from four to eight articles of footwear, and a plurality of the vulcanizers may be arranged in a group to be attended in rotation by one operator.

Of the accompanying drawings:

Fig. 1 is a side elevation of a vulcanizer embodying my invention in its preferred form, and the work therein, the cover of the vulcanizer being open.

Fig. 2 is a vertical section through the vulcanizer shown in Fig. 1, parts being broken away and the cover being closed.

Fig. 3 is a horizontal section of the vulcanizer on line 3—3 of Fig. 1.

Fig. 4 is a section on line 4—4 of Fig. 1.

Fig. 5 is a sectional detail on a large scale of a last-supporting structure.

Referring to the drawings, the vulcanizer comprises a disked, steam-cavitied base member 10 and a conoidal hood or cover 11 adapted to seat thereupon, and a flexible lip gasket 12 of rubber is mounted upon the base member 10 to effect a seal between it and the cover when the cover is closed. A two-part locking ring 13 is swivelled upon the periphery of the base member 10, and has its upper edge extended above the latter and formed with breach-block lugs 13^a, 13^a, adapted to interlock with complemental lugs 11^a, 11^a, formed on the cover 11 to lock the cover in closed position. For turning the locking ring 13 to lock and unlock the cover an arcuate rack 14 is mounted on the lower face of the ring and is meshed with a pinion segment 15 journaled upon a stub-shaft 16 extending radially from a bracket 17 (Fig. 4) formed integral with the bottom wall of the base member 10, the pinion 15 being formed with a hub extension 18 on which is keyed a hand lever 19.

The cover 11 is formed on one side with a radially extending bracket 20 which is hinged by a pin 21 to a bracket 22 secured by bolts, such as the bolt 23 (Fig. 2) to the under side of the base member 10. The bracket 20 is formed with a rearward extension 20^a having mounted therein a pin 24 which is engaged in one end of a counter-balance device 25 including a compression spring 26, the other end of the said device being secured to a supporting pedestal 27 upon which the vulcanizer is mounted, the counter-balance device 25 permitting the cover 11 to be opened and closed manually with little effort, by means of a radially extending handle 28 projecting from the cover. An extension 20^a of the bracket 20 is adapted to engage an abutment 22^a formed on the bracket 22 to hold the cover in an over-center open position.

The pedestal 27 is hollow and has its top margin formed with an annular flange 28 to which the base member 10 is secured, the bottom face of the base member being formed with an annular series of bosses 29, 29 which rest upon respective waisted spacer members 30, 30 mounted on the flange 28. Attaching bolts 31, 31 extend through the flange 28 and spacer members 30 and are threaded into the respective bosses 29. The arrangement is such that there is low heat-conductivity between the base member 10 and pedestal 27 so that but little heat is lost from the base member 10 by conduction into the pedestal 27.

The base member 10 is formed with a steam-chamber 32 in its wall and is provided with respective steam inlet and steam outlet pipes 33, 34, a suitable baffle 35 being provided in the steam chamber 32 to assure complete circulation of the steam through the chamber.

The inner face of the cover 11 is lined with coils 36 of steam pipes which are positioned adjacent the wall of the cover and supported upon a plurality of brackets 37, 37 suitably secured to said wall by screw bolts 37^a, 37^a (Fig. 2). The coils 36 are provided with steam inlet and steam outlet pipes 38, 39 respectively (Figs. 1 and 2), which preferably are flex-

ible to permit raising and lowering of the cover. The outer surface of the cover 11 is substantially covered with heat-insulating material 40 to prevent outward radiation of heat from the vulcanizer.

The wall of the base member 10 is provided with a port 41, Fig. 2, through which a pressure fluid may be conducted into the vulcanizing chamber, a pipe 42 being coupled to said port and being connected, through a three-way valve 43, with a supply pipe 44 from a source of gaseous pressure fluid (not shown), and a relief valve 45 (Fig. 1) is connected with the pipe 42 for automatically controlling the pressure of the fluid in the vulcanizing chamber.

For inducing circulation of the gaseous pressure fluid within the vulcanizer, a fan 46 is mounted on the inside of the cover 11 at the apex thereof, the arrangement being such as to cause the fluid to flow downwardly from the fan past the steam coils 36 and from the steam coils inward toward the center of the chamber. The fan 46 is mounted upon the lower end of a shaft 47 which extends upwardly through a stuffing box 48 in a cover-plate 49 secured on the top of the cover 11 and through a journal bracket 50 mounted on the cover-plate, the outer, upper end of the shaft 47 being provided with a belt pulley 51.

The cover-plate 49 and the hole in the cover which it closes are larger than the fan, so that the cover-plate assembly, including the fan, may readily be mounted and removed as a unit.

For driving the fan 46 a motor 52 is mounted on a bracket 53 which is provided with an off-set stem 54, which is swiveled in an apertured boss 55 formed on the cover-bracket 20, and adapted to be held in longitudinal and rotative positions of adjustment by a set screw 57 threaded through the boss 55, for aligning and tightening a drive-belt 58 connecting the pulley 51 with a pulley 59 on the shaft of the motor 52. The motor 52 is relatively remote from the heated walls of the vulcanizer, and, being connected therewith only through the single stem 54 of the bracket 53 little heat is conducted from the vulcanizer to the motor.

The footwear to be vulcanized shown at 60, 60, is mounted in the vulcanizer upon the same lasts 61, 61 on which it is built. The lasts are hollow and each last has a tubular bushing 62 (Fig. 5) mounted in the end wall of its shank and the outer face of the end wall is also formed with a dowel recess 63.

A central manifold 64 is mounted in the vulcanizing chamber and comprises a hollow, generally hemispherical structure which is formed interiorly with an annular partition 65 to provide a central chamber 66 and a circumscribing chamber 67. The lower portion of the manifold is formed with a cylindrical extension which is seated in and closes an axial aperture 68 in the base member 10, the manifold being secured to a flange, surrounding said recess, by bolts 69, 69.

The hemispherical wall of the manifold, over the chamber 67, is formed with an annular series of equally spaced, threaded, radial apertures in which are mounted respective threaded plugs 70. Each plug is formed with an axial bore or passage 71, and has an outwardly extending portion 70^a of reduced diameter adapted to slidably interfit with a tubular bushing 62 of a shoe-last 61, the plugs thus being adapted to support the lasted shoes. The reduced portion 70^a of each plug 70 is formed with a pair of circumferential grooves 72, 72 in which are mounted respective U-shaped lip gaskets 73, 73, said gaskets having reverse positions with relation to each other to prevent the escape of fluid into or out of the hollow shoe-last between the bushing 62 and plug 70. Tubular pipes or nozzles 74, 74 of smaller diameter than the bores 71 of the plugs 70 are disposed coaxially therein, the outer end of each nozzle extending beyond the end of the plug 70 so as to be positioned well within the hollow interior of a last mounted upon said plug. The other end of each nozzle 74 is threaded through the partition 65 to provide communication between the hollow interior of a last 61 and the central chamber 66 of the manifold 64.

A pipe 75 which is threaded through the bottom wall of the manifold 64 and into the chamber 66 therein extends to a suitable steam supply (not shown). A pipe 76 similarly threaded through the bottom wall of the manifold 64 and into the chamber 67 therein extends to a steam-trap and drain (not shown). The arrangement is such that steam may be conducted concurrently to the several lasts 61 mounted upon the manifold, and water of condensation concurrently conducted from said lasts.

Studs 77 are mounted in the manifold beside the respective plugs 70 and are adapted to seat in the recesses 63 of the respective lasts, the arrangement being such that the shoes are positioned with their soles adjacent and substantially parallel to the steam coils 36 so that the sole portion of the footwear, which portion contains the greatest thickness of rubber, is vulcanized uniformly by heat radiated from the heat coil.

The general operation of the apparatus will be clearly apparent from the foregoing description.

Although the vulcanizer may be used for vulcanizing processes employing various media, and a wide range of temperatures and pressures, it will be found especially useful for vulcanizing those types of footwear which it has been found impractical to vulcanize in open steam, and which consequently heretofore have required relatively long

periods of time for vulcanization in hot air or other dry gaseous fluid.

The following is a typical example of vulcanizing processes for which the improved vulcanizer is especially adapted.

The base member 10 and pipe coils 36 are constantly heated by steam at about 80 pounds pressure (324°). Lasts 61 with unvulcanized footwear 60 thereon are mounted upon the manifold plugs 70 in the manner previously described, after which the cover 11 is closed, and locked by angular movement of the locking ring 13. Gaseous fluid such as air, at room temperature, is then admitted to the interior of the vulcanizer through the pipe 42, the valve 45 being set to maintain the air in the vulcanizer substantially at about 55 pounds pressure. Steam at about 50 pounds pressure is admitted through the pipe 75 to the interiors of the lasts 61, and rotation of the fan 46 is started to induce a circulation of the air within the vulcanizer, and said air by passing over the heated steam coils 36 and heated surface of the base member 10 quickly is raised to vulcanizing temperature. Under these conditions, vulcanization of the footwear is effected in the relatively short time of about 15 minutes.

Certain features of the apparatus and procedure disclosed herein are not claimed by me, these features being the invention of James W. Schade and constituting subject matter claimed in the application of the latter, Serial No. 364,428, filed May 20, 1929.

My invention may be modified within the scope of the appended claims, as I do not limit my claims wholly to the specific construction shown.

I claim:

1. In a vulcanizer the combination of a heat-radiating structure defining interiorly thereof a conoidal vulcanizing-chamber space, means for supporting a plurality of articles of footwear within and with their soles in approximately uniform heat-receiving relation to the said structure, and means at the apex of the said structure for directing a gaseous current past the said structure to the soles of the said articles of footwear.

2. In a vulcanizer the combination of a heat-radiating structure defining interiorly thereof a conoidal vulcanizing-chamber space, means for supporting a plurality of articles of footwear within and with their soles in approximately uniform heat-receiving relation to the said structure, means at the apex of the said structure for directing a gaseous current past the said structure to the soles of the said articles of footwear, and means for interiorly heating the articles of footwear.

3. Vulcanizing apparatus comprising a stationary base, a heat-radiating structure defining interiorly thereof a conoidal vulcanizing-chamber space and hinged with relation to and adapted to mate with and seal against the said base, means for supporting a plurality of articles of footwear within and with their soles in approximately uniform heat-receiving relation to the said structure, a fan so mounted in the interior of the said structure at the apex thereof as to direct a gaseous current past the heat-radiating surface of the said structure to the soles of the said articles of footwear, and a motor mounted upon but in non-heat-conductive relation to said structure for driving the fan.

4. In a vulcanizer the combination of a heat-radiating structure defining interiorly thereof a conoidal vulcanizing-chamber space, means for supporting a plurality of articles of footwear within and with their soles in approximately uniform heat-receiving relation to the said structure, and means at the apex of the said structure for directing a gaseous current past the said structure to the soles of the said articles of footwear, the said supporting means comprising a manifold structure for conducting fluid to the interiors of the articles of footwear.

5. Vulcanizing apparatus comprising a chamber-defining base member, a manifold mounted on the inner face thereof and adapted to support a plurality of hollow articles to be vulcanized and to conduct a fluid to the interiors thereof, a hood member adapted to mate with the base member to define a vulcanizing chamber, and means carried by the hood member for supplying heat to the articles.

6. In a vulcanizer the combination of a heat-radiating structure defining interiorly thereof a conoidal vulcanizing-chamber space, means for supporting a plurality of articles of footwear within and with their soles in approximately uniform heat-receiving relation to the said structure, and means at the apex of the said structure for directing a gaseous current past the said structure to the soles of the said articles of footwear, the said structure comprising a conoidal pipe coil so positioned as to cause the gaseous current to pass between its coils in passing from the fan to the soles of the articles of footwear.

7. In a vulcanizer the combination of a heat-radiating structure defining interiorly thereof a conoidal vulcanizing-chamber space, means for supporting a plurality of articles of footwear within and with their soles in approximately uniform heat-receiving relation to the said structure, means at the apex of the said structure for directing a gaseous current past the said structure to the soles of the said articles of footwear, and non-heat-conductive means for supporting the said structure.

8. Vulcanizing apparatus comprising a stationary, chamber-defining base member, a hood member mounted in hinged relation to said base member and adapted to mate therewith to define a vulcanizing chamber, a mani-

fold mounted on the inner face of the said base member and adapted to support and conduct a fluid into the articles to be vulcanized, and means carried by the hood member for supplying heat to the articles.

In witness whereof I have hereunto set my hand this 3rd day of September, 1929.

CHARLES W. LEGUILLON.