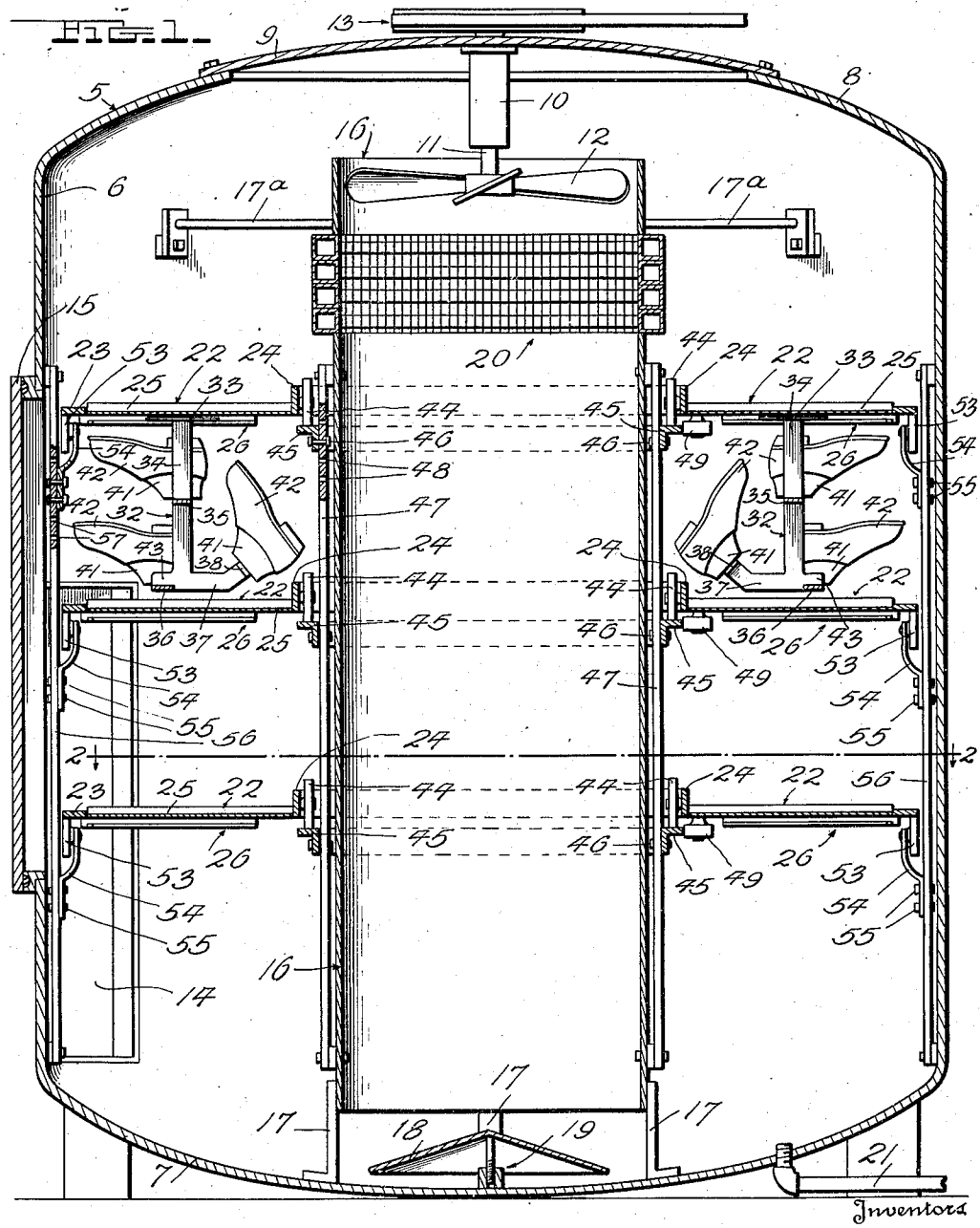
Sept. 25, 1945. L. J. LARKIN ET AL 2,385,628

FOOTWEAR VULCANIZER

Filed Aug. 25, 1944 3 Sheets-Sheet 1

FIG. 1.



Inventors

J. J. Regan,
G. A. Larkin,
L. J. Larkin.

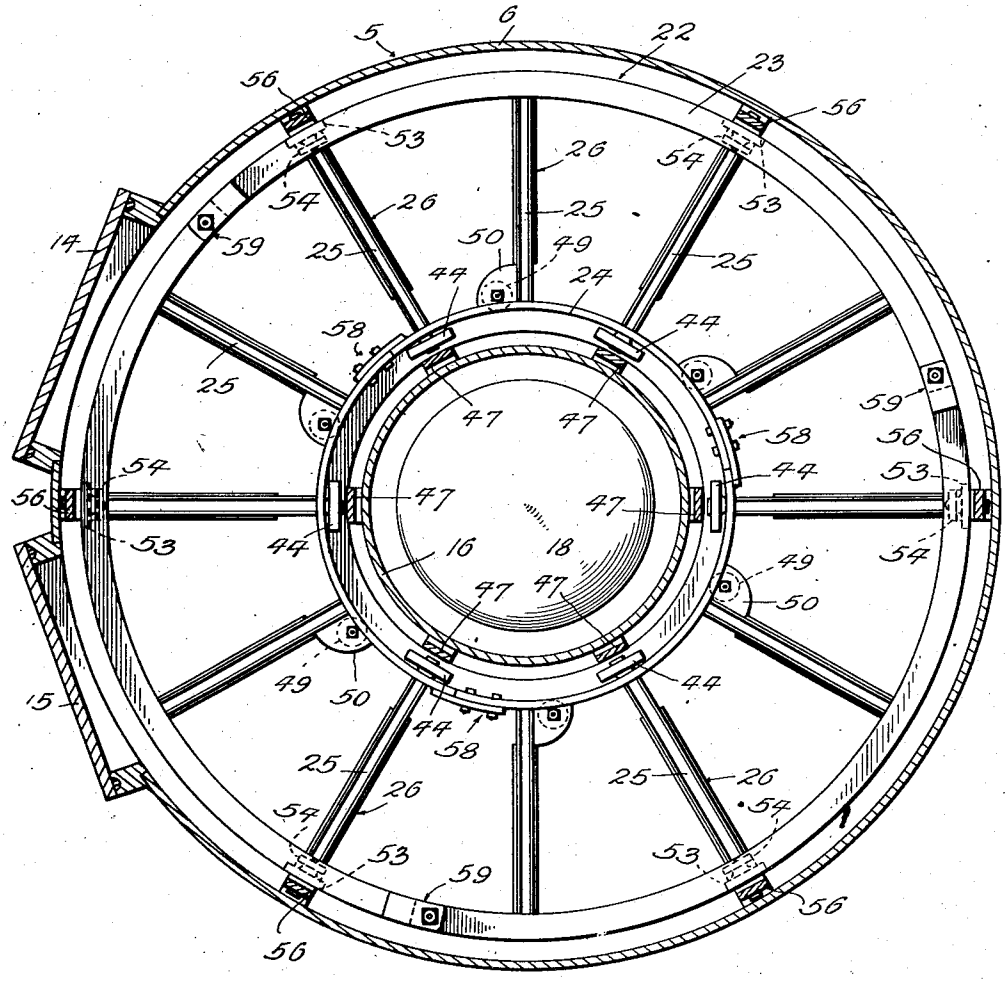
By H. Brewson & Co. Attorneys

Sept. 25, 1945. L. J. LARKIN ET AL 2,385,628

FOOTWEAR VULCANIZER

Filed Aug. 25, 1944 3 Sheets-Sheet 2

FIG. 2



Inventors

J. J. Regan,
G. A. Larkin,
L. J. Larkin.

By H. B. Wilson & Co. Attorneys

Sept. 25, 1945. L. J. LARKIN ET AL 2,385,628

FOOTWEAR VULCANIZER

Filed Aug. 25, 1944 3 Sheets-Sheet 3

FIG. 3.

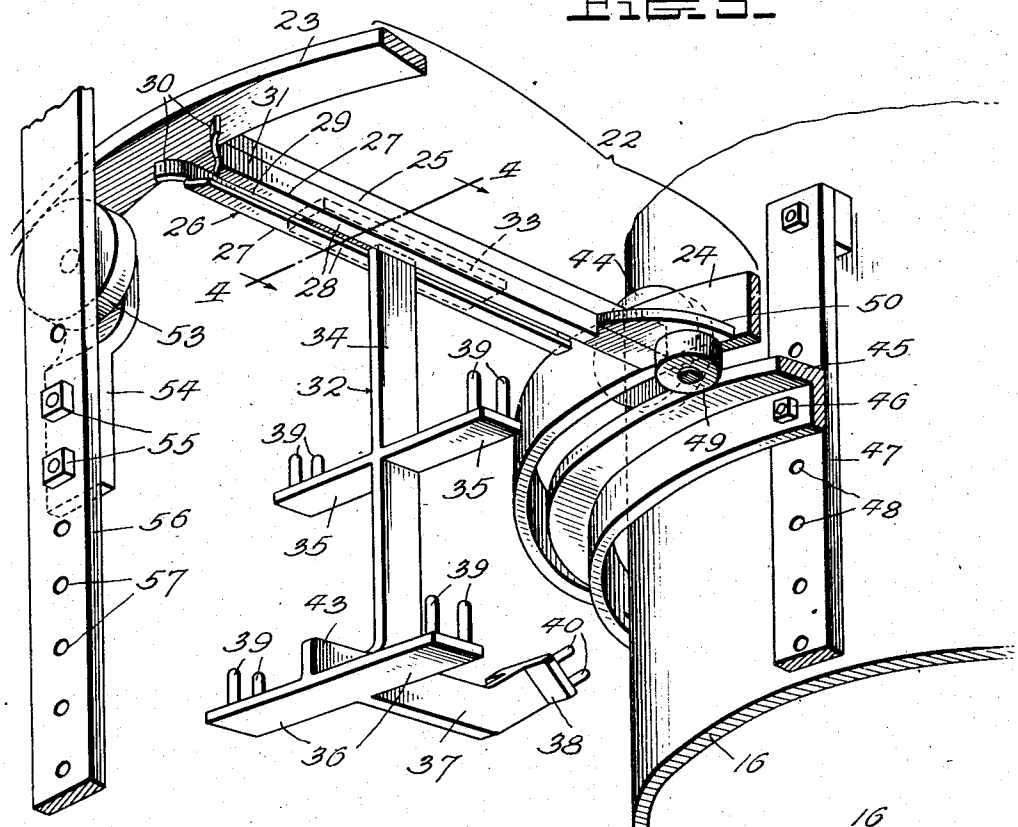
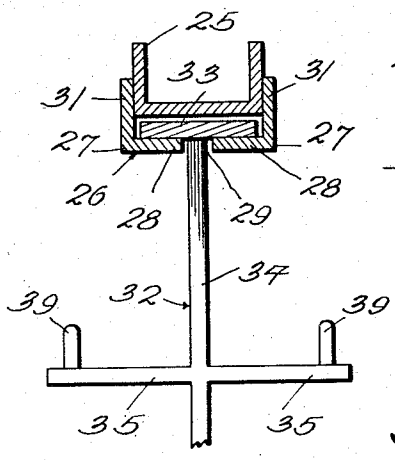


FIG. 4.



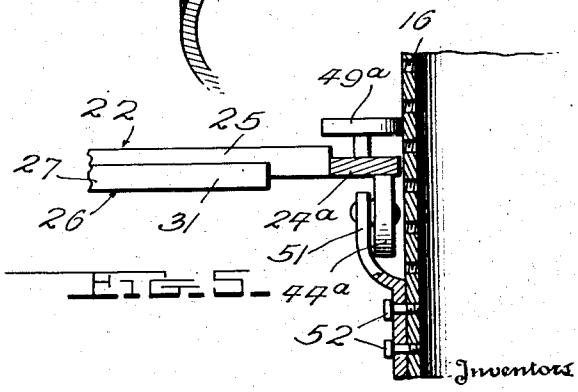


FIG. 5.

Inventors

J. J. Regan,
G. A. Larkin,
L. J. Larkin.

By A. B. Wilson & Co. Attorney

Patented Sept. 25, 1945 2,385,628

UNITED STATES PATENT OFFICE

2,385,628

FOOTWEAR VULCANIZER

Leo James Larkin, Gerald A. Larkin, and John J. Regan, La Crosse, Wis., assignors to La Crosse Rubber Mills Company, La Crosse, Wis., a corporation of Wisconsin

Application August 25, 1944, Serial No. 551,214

2 Claims. (Cl. 18—6)

The invention aims to provide a new and improved vulcanizer designed primarily for use in the manufacture of rubber footwear, which will produce more uniform vulcanizing than vulcanizers of the types commonly in use, and will be rapid and desirable from all standpoints.

Another object is to provide a novel vulcanizer having rotatable supports provided with radial spokes with which racks loaded with footwear or other articles may be rapidly and easily engaged, said loaded racks being removable from said spokes with equal facility after the vulcanizing operation.

A further object is to provide a novel construction in which the aforesaid rotatable supports may be adjusted into as closely spaced relation with each other as the articles and racks will permit, and to provide for the insertion of one or more additional supports when the necessary space is available, to insure operation at full capacity, said construction also allowing adjustment of the supports into more widely spaced relation and removal of one or more if necessary, when larger articles and racks are to be inserted.

A still further object is to provide a vulcanizing unit which can be more readily located in close proximity to that section of a footwear factory where the previous step in manufacture is carried out, thereby eliminating the necessity for conveyors and heater cars now commonly used and permitting the making, curing and packing of shoes at one given location, reducing floor space requirements, giving greater usage of lasts, and effecting savings in investment, time and labor, power and maintenance.

With the foregoing in view, the invention resides in the novel subject matter hereinafter described and claimed, description being accomplished by reference to the accompanying drawings.

Figure 1 is a vertical sectional view.

Fig. 2 is a horizontal section on line 2—2 of Fig. 1.

Fig. 3 is a perspective view showing a portion of one of the rotatable supports and its mounting means, and showing one of the racks engaged with one of the radial spokes of said support.

Fig. 4 is a detail section on line 4—4 of Fig. 3.

Fig. 5 is a detail section showing a slight modification.

In the drawings above briefly described, one form of construction has been illustrated, and while that construction will be specifically explained, it is to be understood that various changes may be made within the scope of the invention as claimed.

A vertical casing 5 is shown, said casing having a cylindrical side wall 6, a bottom 7, and a top 8. The bottom 7 and top 8 are shown of concavo-convex form, the convex sides of said bottom and top being disposed outwardly, but said bottom and top could well be of other suitable shape. The entire casing may well be covered and/or lined with thermal insulation (not shown).

The top 8 in the present disclosure, is provided with a removable central section 9 which carries a suitable central bearing assembly 10 for the shaft 11 of a rotary fan 12, said shaft being driven in any suitable way, for example, by a belt and pulley drive 13 from an electric motor or the like. If desired, a plurality of fans could be employed.

The side wall 6 may either be provided with one tall door or may have a plurality of doors at different elevations. In the present disclosure, two doors 14 and 15 are shown, and there may be a third (not shown) for giving access to the upper end portion of the casing interior. The doors may be constructed and mounted in any suitable way and provided with any appropriate means for clamping them in closed position.

A sleeve 16 which is open at both of its ends, is mounted vertically in the central portion of the casing, and supporting legs for said sleeve have been illustrated at 17. Tie rods for bracing the upper end of the sleeve, are shown at 17a. The lower end of the sleeve 16 is spaced upwardly from the casing bottom 7 and this bottom may well carry a conical air deflector 18. It is preferable to provide appropriate means 19, whereby the deflector 18 may be vertically adjusted.

The upper end of the sleeve 16 is downwardly spaced from the top 8, and across said upper end of said sleeve, we have shown a finned air-heating radiator 20 preferably utilizing steam as the heating medium, but it will be understood that electrical or other heating means could be substituted if desired.

A pipe 21 (Fig. 1) is shown for admitting air under pressure to the casing 5 to maintain preferably about 60 lbs. pressure in said casing while vulcanizing.

Vertically spaced annular openwork supports 22 are provided in the casing 5 around the sleeve 16 and are rotatably mounted to facilitate loading and unloading. Each support includes an outer ring 23, an inner ring denoted at 24 in most views but shown in modified form at 24a in Fig. 5, and radial spokes 25 welded or otherwise secured to said outer and inner rings. Each spoke 25 is provided with a longitudinal track 26 at its lower side, said track being preferably of slotted tubular form constructed (see Figs. 3 and 4) by welding or otherwise securing angle-metal bars 27 to said spoke with their lower flanges 28 underlying and spaced below said spoke, said flanges 28 being horizontally spaced from each other to leave a slot 29. The outer ends 30 of the vertical flanges 31 of the bars 27 preferably project beyond the horizontal flanges 28 and are bent into outwardly

diverging relation to provide the slotted tubular track 26 with a flared entrance throat.

Racks 32, for holding the articles to be vulcanized, are provided, said racks being readily engageable with and removable from the tracks 26. In the present disclosure, each rack 32 comprises an elongated head 33 slidable into the track 26, a bar 34 depending from said head, two upper horizontal arms 35 projecting laterally from opposite sides of said bar in directions at right angles to the length of said head 33, two lower horizontal arms 36 projecting laterally from the lower end of said bar 34 in the same directions as said upper arms 35, and a third lower arm 37 projecting laterally and upwardly from said bar 34 in a direction at right angles to said arms 36; said arm 37 having a head 38 on its free end which inclines toward the bar 34. The arms 35 and 36 are provided with upstanding vertical pins 39, and the head 38 of arm 37 carries inclined pins 40, all of said pins being receivable in the usual sockets of shoe lasts 41 which carry the rubber footwear 42 to be vulcanized. The lower end of the bar 34 is preferably formed with a projection 43 extending away from the arm 37 and carrying the arms 36.

Each rack 32, when constructed as shown, will carry five lasts and shoes and the entire vulcanizer will, therefore, have large capacity. Racks of other sizes and shapes may of course be provided for carrying other articles to be vulcanized, boots for example.

For rotatably and adjustably mounting the supports 22, suitable supporting and thrust rollers are provided. In Figs. 1 to 3, inner rollers 44 are mounted on the rings 24 and rest upon circular tracks 45 which are bolted at 46 to vertical bars 47, said bars being secured to the sleeve 16 or otherwise mounted. These bars 47 have vertically spaced openings 48 for permitting vertical adjustment of the tracks 45. Thrust rollers 49 are shown mounted on webs 50 and abutting the periphery of the tracks 45; said webs being welded to the rings 24 and to some of the spokes 25. The inner ring 24^a (Fig. 5) rests upon rollers, one of which is shown at 44^a. A bracket 51 supports the roller 44^a and is bolted at 52 to the sleeve 16 for vertical adjustment. In this view, a thrust roller 49^a is shown mounted on the ring 24^a and abutting the aforesaid sleeve 16.

Whether the inner ring of each support 22 be mounted as seen in Figs. 1 to 3 or in the manner shown in Fig. 5, the outer ring 23 preferably rests on rollers 53 carried by brackets 54 which are bolted at 55 to fixed bars 56 secured to the casing wall 6 or otherwise mounted, said bars 56 having spaced openings 57 to permit vertical adjustment of said brackets 54.

Either way of mounting the supports 22 permits vertical adjustment of them into as close relation with each other as the racks and the articles to be vulcanized will permit, to allow loading of the vulcanizer to maximum capacity, and when said supports 22 are adjusted into said close relation, one or more supports may be added. Also, when it is necessary to adjust the supports 22 into widely spaced relation, one or more may be removed. To permit such addition and removal of supports, each one of these supports is of sectional construction with its sections detachably secured together as seen at 58 and 59 in Fig. 2, said sections being of such size as to permit movement through the doors 14 and 15.

The vulcanizer is filled with the loaded racks by passing said loaded racks through the doors and engaging them with the tracks 26, the filling operation being facilitated by rotating the supports 22. Then the doors are closed, the proper air pressure is admitted, the heating means 20 is brought into operation, and the fan 12 is driven. This fan creates a circulation of hot air continuously in the casing 5 around the articles, insuring uniform and rapid vulcanizing. Unloading of the vulcanized articles is also facilitated by the rotatable supports 22.

From the foregoing, taken in connection with the accompanying drawings, it will be seen that novel and advantageous provision has been made for carrying out the objects of the invention, and while preferences have been shown, attention is again invited to the possibility of making variations within the scope of the invention as claimed. The vulcanizer may be of either vertical or horizontal type; it may be constructed to circulate the air in either direction; adequate automatic or manual controls may be provided, etc.

We claim:

1. A vulcanizer comprising a cylindrical pressure-tight casing having its axis disposed vertically, said casing having at least one door in its vertical side wall, means for admitting compressed air to said casing to place the articles to be vulcanized under pressure, a vertical cylindrical sleeve secured centrally in said casing to provide a vulcanizing space between said sleeve and said casing side wall, said sleeve having open ends spaced inwardly from the casing ends, circular horizontal openwork supports surrounding said sleeve to support articles to be vulcanized in said vulcanizing space, means rotatably mounting said supports in vertically spaced relation for rotation about the axis of said sleeve to facilitate loading and unloading of said supports through said door, an air-heating radiator extending across said sleeve for heating the casing-contained compressed air to a vulcanizing temperature, and a rotary fan axially alined with said sleeve for circulating the hot compressed air through said radiator, said sleeve and said vulcanizing space.

2. A vulcanizer comprising a cylindrical pressure-tight casing having its axis disposed vertically, said casing having at least one door in its vertical side wall, means for admitting compressed air to said casing to place the articles to be vulcanized under pressure, a vertical cylindrical sleeve secured centrally in said casing to provide a vulcanizing space between said sleeve and said casing side wall, said sleeve having open ends spaced inwardly from the casing ends, circular horizontal openwork supports surrounding said sleeve to support articles to be vulcanized in said vulcanizing space, means rotatably mounting said supports in vertically spaced relation for rotation about the axis of said sleeve to facilitate loading and unloading of said supports through said door, an air-heating radiator extending across the upper end portion of said sleeve for heating the casing-contained compressed air to a vulcanizing temperature, and a rotary fan axially alined with said sleeve and mounted over said radiator for circulating the hot compressed air downwardly through said radiator and sleeve and upwardly through said vulcanizing space.

LEO JAMES LARKIN.
GERALD A. LARKIN.
JOHN J. REGAN.