Aug. 30, 1927. 1,640,500

R. HANSEN

VULCANIZING APPARATUS

Original Filed May 28, 1924 2 Sheets-Sheet 1

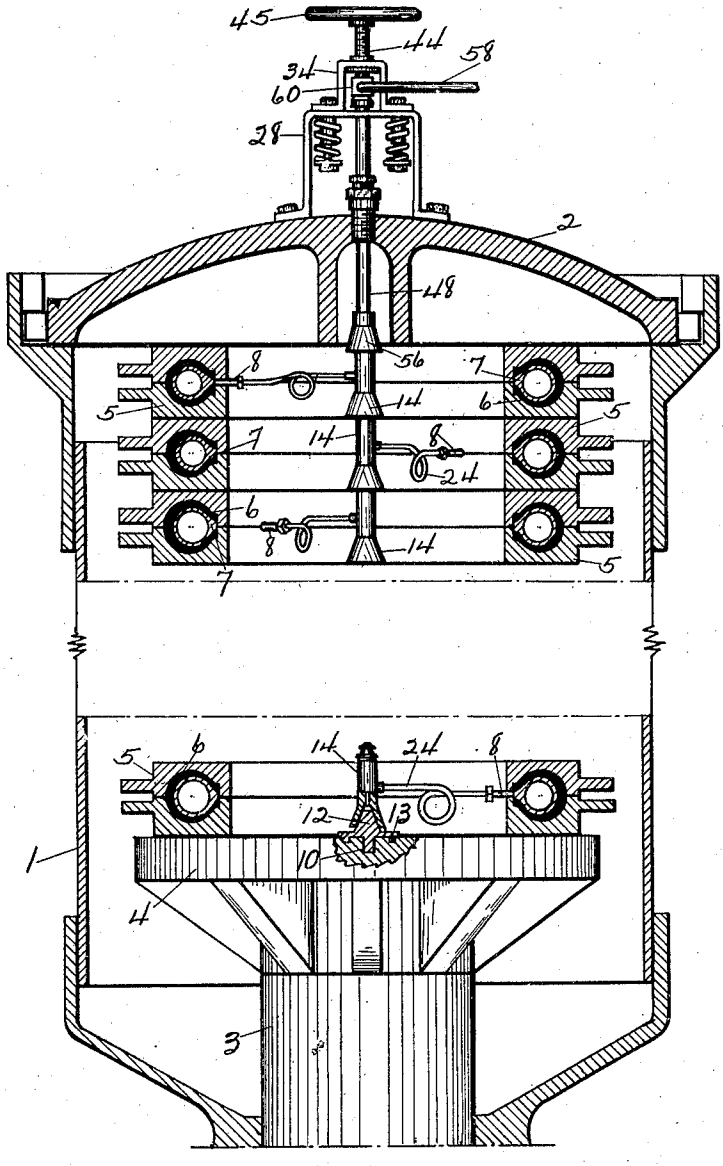


FIG. I

Raymond Hanson
Inventor
By Coates & Harvey
Attorney

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R. HANSEN

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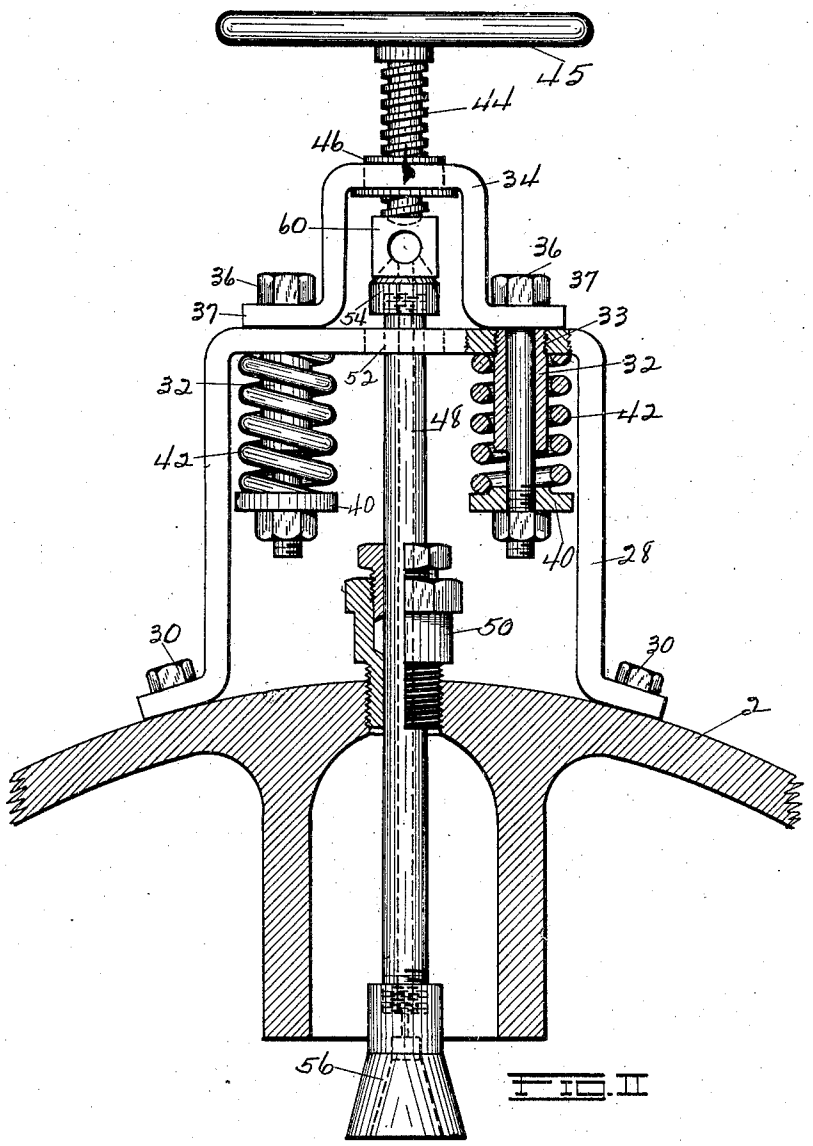


FIG. II

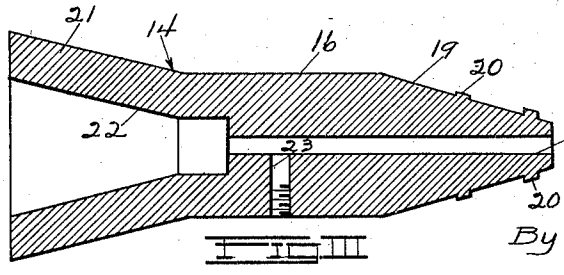


FIG III

Raymond Hansen
Inventor
By Robert M. Harney
Attorney.

Patented Aug. 30, 1927. 1,640,500

UNITED STATES PATENT OFFICE.

RAYMOND HANSEN, OF CUDAHY, WISCONSIN, ASSIGNOR TO THE FISK RUBBER COMPANY, OF CHICOPEE FALLS, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

VULCANIZING APPARATUS.

Application filed May 28, 1924, Serial No. 716,426. Renewed February 16, 1927.

My invention relates to appartus for vulcanizing hollow rubber or rubber and fabric articles such as pneumatic tire casings, and more particularly to the means for supplying fluid pressure to the interior of such articles or the pneumatic cores upon which they are vulcanized.

One object of my invention is to provide an improved type of manifold which shall permit of quick assembly of the molds in the vulcanizer and connection of the individual articles to the manifold. Another object is to provide means of the character referred to which may be quickly and effectively sealed against leakage of the fluid pressure. Other objects will be apparent from the following specification and claims.

In the accompanying drawings which disclose an illustrative embodiment of my invention

Figure 1 is a sectional view of a conventional vulcanizer with a stack of molds in position and showing a preferred form of my device,

Figure 2 is a detail of the means for applying pressure to the assembled sections, and in

Figure 3 is shown one of the connections in longitudinal section.

Referring to the drawings, I have illustrated my invention in connection with a conventional type of heater comprising a shell 1, a removable cover 2, a ram piston 3 and ram table 4. It will be understood that the ram is raised and lowered through the medium of hydraulic pressure, and steam is introduced into the shell to vulcanize the articles in the molds, all in a well known manner.

In position on the ram table I have shown a series of molds 5 with tire casings 6 and air bags 7 enclosed therein. The air bags are provided with stems 8 to which the fluid connection may be made. The ram table 4 is provided with a recess 10 in which is received a plug 12, which may be provided with dowel pins 13, if desired, to prevent turning of the plug. The plug 12 is adapted to seal the lower end of a series of tubular sections 14 which as shown in Figure 1 are assembled one upon another to form a continuous fluid conduit or manifold. As shown in Figure 3 these sections comprise a tubular shaped member 16, centrally bored at 18, and tapered at one end as shown at 19. The tapered portion may preferably be provided with rings or projections 20. The other end of the section is flared as at 21 and provided with a seat 22, which telescopes onto the tapered portion of the section beneath. A transverse passage 23 connects the passage 18 with a flexible tube 24 which is adapted to be connected to the stem 8 of an air bag.

The means for applying endwise pressure to the assembled sections to render the manifold fluid tight is best shown in Figure 2 and comprises a yoke 28 secured to the heater cover at 30. Apertured guides 32 are secured in the yoke as at 33. A second yoke 34 is yieldingly secured to yoke 28 by bolts 36 passing through the horizontal feet 37 of yoke 34 and through guides 32. The bolts 36 are provided at their lower ends with abutment plates 40, between which and yoke 28 springs 42 are positioned. A screw 44 provided with handwheel 45 supported in a stationary nut 46 secured in upper yoke 34. A fluid conduit 48 is slidably supported in the heater cover 2, passing through a conventional stuffing box 50. The upper end of conduit 48 passes through an aperture 52 in yoke 28 and is provided with a conical head 54 while the lower end is provided with a bell seat 56 adapted to engage the tapered end of the uppermost section of the manifold. Compressed air, or other fluid, is supplied to conduit 48 by pipe 58, provided at its end with a suitably apertured block 60 recessed to seat on conical head 54 and adapted to be engaged by screw 44, as shown in Figure 2.

The operation is as follows: The ram table 4 is raised to the top of the heater shell and the first mold 5 is slid into position from a suitable conveyor, or otherwise positioned on the table. Plug 12 is then inserted in aperture 10, the ram table 4 is lowered the proper amount and a second mold positioned on the preceding mold. A manifold section 14 is now placed on plug 12 and tube 24 connected to the bag stem 8. This operation is then repeated, the manifold being built up as the molds are assembled in the heater. When the heater is filled or the desired number of molds have been positioned, cover 2 is applied to the heater, bell 56 engaging the uppermost manifold section as shown in Figure 1. The cover is secured in position in any conventional manner, and the ram 3

raised to apply the desired pressure to the molds engaged between table 4 and cover 2, which form the press members. Block 60 is now positioned between member 54 and screw 44 and the latter lowered by hand-wheel 45 to seat the block 60 on member 54 and to apply pressure to the units of the sectional manifold and force them into fluid tight relation. Compressed air may then be supplied through pipe 58 to inflate the bags 7 in accordance with well known practice.

When a large number of molds are positioned in a single heater and the manifold is in consequence of substantial length it is desirable to provide automatic means to compensate for the expansion of the manifold sections due to the temperature rise and for this purpose the springs 42 are interposed between the action of screw 44 and the manifold as above described. The expansion may however be compensated for by subsequent adjustment of the screw, the springs 42 being omitted and screw 44 allowed to act directly on the column of manifold sections. Where only a few molds are cured at a time and the expansion is inconsiderable no compensation whatever may be required. It is preferable however to make the action of the pressure applying means automatically responsive to whatever expansion may occur and it will be understood that any suitable means to this end may be employed, the specific spring arrangement being illustrative only.

My sectional manifold above described permits the heater to be quickly loaded since each connection is made as the mold is positioned, and the parts to be connected are easily accessible. The independent means for applying sealing pressure to the manifold, entirely apart from the pressure of the ram cylinder, prevents possible damage to the manifold sections, due to excessive pressure, as well as buckling of the manifold and consequent leakage.

It will be understood that the specific form of my invention above described is illustrative only and I am not limited thereto.

I claim:

1. The combination with a vulcanizing press of a sectional manifold comprising a series of loosely assembled sections and means, associated with one of the press members, adapted to force the sections into fluid tight relation, said means being operable independently of the action of the press members.

2. The combination with a vulcanizing press of a sectional manifold comprising a series of loosely assembled sections and means adapted to force the sections into fluid tight relation, said means being operable subsequent to the operation of the press members.

3. The combination with a vulcanizing press of a sectional manifold comprising a series of loosely assembled sections adapted to rest on one member of the press and independently operated means, associated with the other press member, adapted to force said sections into fluid tight relation.

4. The combination with a vulcanizing press of a sectional manifold comprising a series of loosely assembled sections, means adapted to connect the several sections with articles in the heater, and independent means, associated with one of the press members, to force the sections into fluid tight relation.

5. The combination with a vulcanizing press of a sectional manifold comprising a series of loosely assembled sections and independently operated means, associated with one of the press members, to force the sections into fluid tight relation, said means adapted to compensate for expansion of the manifold sections.

6. The combination with a vulcanizing press of a sectional manifold comprising a series of loosely assembled sections and independently operated means, associated with one of the press members, to force the sections into fluid tight relation, said means being yieldable to automatically compensate for expansion of the manifold sections.

7. In combination a vulcanizing heater adapted to receive a stack of tire molds, a fluid conducting manifold within said heater comprising a series of tubular units with interfitting ends adapted to supply fluid pressure to the tire molds, and independently operated means associated with the cover of said heater adapted to apply pressure to said units to seal the joints thereof.

8. In combination a vulcanizing heater provided with a movable cover, a movable platen within the heater adapted to receive a stack of tire molds, a sectional manifold comprising a series of loosely assembled sections supported by the platen and independently operated means associated with the heater cover for forcing the assembled sections into fluid tight relation.

9. In combination a vulcanizing heater provided with a movable cover, a movable platen within the heater adapted to receive a stack of tire molds, a sectional manifold comprising a series of loosely assembled sections supported by the platen and means carried by the heater cover for yieldingly forcing the sections into fluid tight relation, said means operating independently of the movement of the platen.

10. In combination a vulcanizing heater provided with a movable cover, a movable platen within the heater adapted to receive a stack of tire molds, a sectional manifold comprising a series of loosely assembled sections supported by the platen and a screw threaded member carried by the heater cover

for forcing the sections into fluid tight relation.

11. In combination a vulcanizing heater provided with a movable cover, a movable platen within the heater adapted to receive a stack of tire molds, a sectional manifold comprising a series of loosely assembled sections supported by the platen, a screw threaded member carried by the heater cover for forcing the sections into fluid tight relation and a spring interposed between the said member and the sections to compensate for expansion of the latter.

12. In a vulcanizer, the combination with a vulcanizing tank adapted to receive a pile of tire moulds, said tank having a detachably fastened cover whereby access may be had to the interior of the tank, of a fluid conducting tree having sections each corresponding in height to the height of a tire mould, said sections having fluid tight quick detachable slip connections, each section having a branch tube adapted to be detachably connected to a mould and to supply fluid thereto, and means carried by the cover to supply fluid to the tree and to exert an endwise pressure thereon.

13. In a vulcanizer, the combination with a vulcanizing tank adapted to receive a pile of annular tire moulds, of a sectional fluid conducting tree adapted to be built up between the bottom and top of the tank, said tank having a detachably fastened cover whereby access may be had to the interior of the tank, the lowermost section of the tree being secured to the bottom of the tank and the uppermost section thereof being secured to the cover, said sections being tubular and joined together end to end with slip joints in sealing engagement, branch tubes extending from the sections and adapted to be detachably connected to moulds to supply fluid thereto, means for admitting fluid through the cover to the tree, and means associated with said means for transmitting endwise pressure to the tree to maintain the joints in fluid tight engagement.

In testimony whereof I have signed my name to the above specification.

RAYMOND HANSEN.