No. 697,688. Patented Apr. 15, 1902.

# L. A. STELZER.

## DEVULCANIZING APPARATUS.

(Application filed Jan. 13, 1902.)

(No Model.)

Fig. 1.

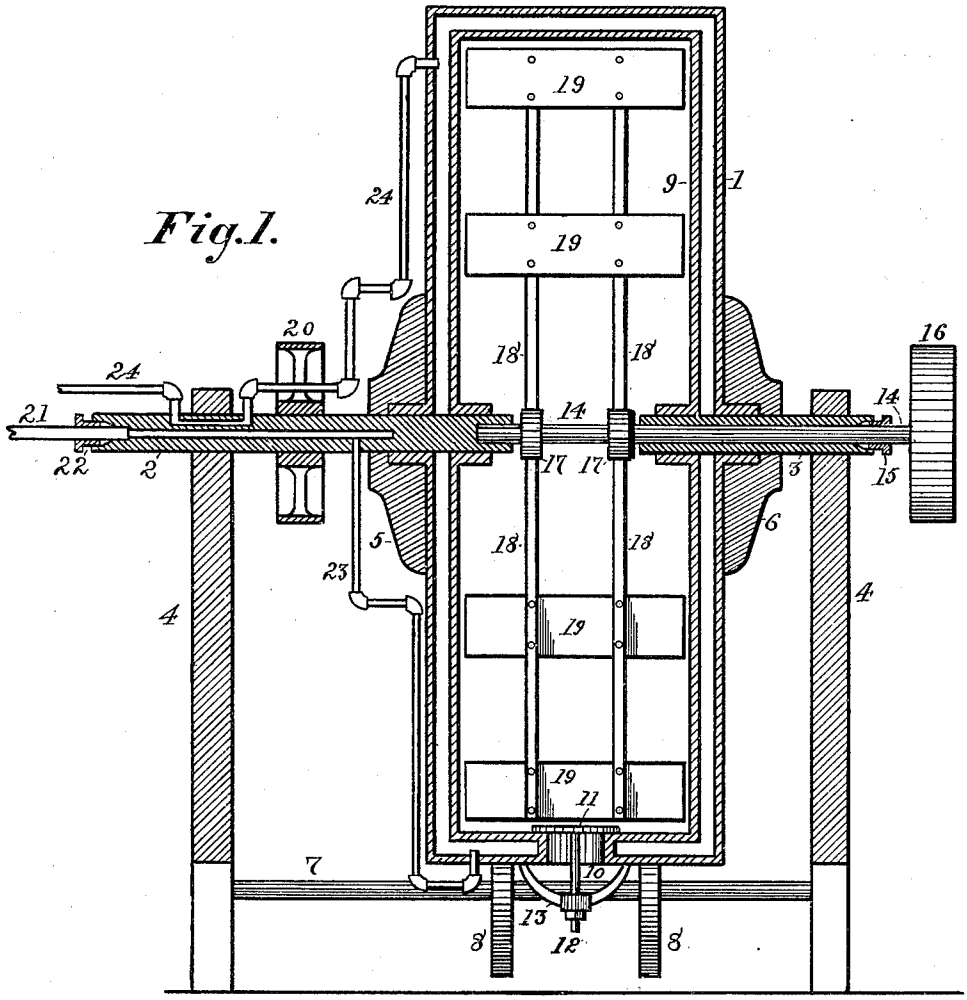
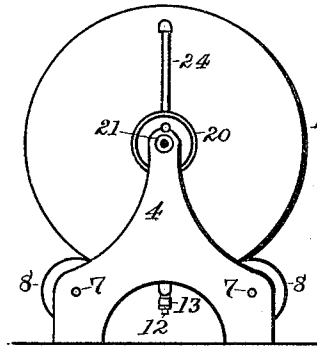



Fig. 2.




Witnesses:

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# UNITED STATES PATENT OFFICE.

LOUIS A. STELZER, OF AKRON, OHIO.

## DEVULCANIZING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 697,688, dated April 15, 1902.

Application filed January 13, 1902. Serial No. 89,530. (No model.)

*To all whom it may concern:*

Be it known that I, LOUIS A. STELZER, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented a certain new and useful Improvement in Devulcanizing Apparatus, of which the following is a specification.

My invention has relation to improvements in that class of machines known as "devulcanizers," the object and purpose of which is to reclaim rubber scrap and waste, so that it may be again used in the manufacture of rubber articles.

The object of my invention is to produce a new and improved machine of the class specified which shall be simple and effective in operation and whereby the waste rubber in small pieces shall be constantly agitated and stirred in an externally-heated closed vessel containing a restoring solution and which can be conveniently filled, emptied, and cleansed in a brief time.

To the aforesaid objects my invention consists in the peculiar and novel construction, arrangement, and combination of parts hereinafter described and then specifically pointed out in the claims, reference being had to the accompanying drawings, which form a part of this specification.

In the accompanying drawings, in which similar reference-numerals indicate like parts in the different figures, Figure 1 is a vertical central section of my improved devulcanizer; and Fig. 2, an end elevation, on a reduced scale, looking from the left of Fig. 1.

Referring to the figures, 1 is a narrow circular metallic case secured on two shafts 2 3 of like size and in alinement, that extend outside of said case and a short distance inside and are revolubly mounted in journal-posts 4. At the points where the shafts 2 3 enter the case 1 the latter is reinforced by hub-flanges 5 6 for greater strength. The journal-posts 4 are widened near the base, and in these widened parts, on each side, are journaled shafts 7, each bearing pairs of wheels 8, on which the case 1 bears and which assist to sustain its weight.

Within the case 1 and secured on the inner projecting ends of the shafts 2 3 is a similarly-shaped smaller case 9, leaving an open space between the cases, and both cases are provided with a tubular hand-hole 10, closed by a cover 11, held by a bolt 12 and a bracket 13.

The shaft 3 is hollow, and the inner end of the shaft 2 is bored for a short distance in alinement with this hollow, and in the opening so made is a revoluble shaft 14, guarded at the outer end of the shaft 3 by a stuffing-box 15 and bearing a pulley 16, by which it can be driven. On the shaft 14 between the ends of the shafts 2 3 are fixed hubs 17, from which project paddle-arms 18, bearing paddle-blades 19.

On the shaft 2 is a pulley 20, by which it, with the cases 1 and 9 and shaft 3, can be revolved. The shaft 2 is hollow from its outer end nearly to the outer case 1, and at its outer end receives a pipe 21, guarded by a stuffing-box 22. From the inner end of the hole in the shaft 2 a branch connecting-pipe 23 leads into the case 1 and serves to convey live steam between the cases. An exhaust-pipe 24 leads from the opposite portion of the case 1 and by means of sections and elbows leads through the wheel 20 and inside of the shaft 2 at its bearing in the left post 4 and again out to exhaust into the outer air.

In operation the chemical compound used to devulcanize the rubber and the rubber are introduced into the case 9 through the hand-hole 10 and the latter closed by the cover 11. Steam is then introduced through the pipe 21, and by means of belts on the pulleys 16 20 the paddle-wheel is revolved in one direction and the cases 1 and 9 in the opposite direction. This double motion insures a greater stirring and tumbling of the contents of the case 9 than if either the case or the paddle-wheel revolved singly. This process is continued until such time as the process of devulcanization is completed. The cases are then stopped, the hand-hole cover removed, and the cases turned until the hand-hole is below, which permits the devulcanizing solution and a part of the rubber to escape, by which arrangement the solution is saved. The remainder of the rubber is also removed by revolving the paddle-wheel while the cases are stationary, which keeps agitating it until all has passed out.

In the foregoing process the peculiar narrow vertical shape of the case 9 is particularly serviceable, as it insures massing the

rubber more closely than if the cases were wider, thus subjecting it more completely to the action of the paddles.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. An improved devulcanizing apparatus consisting of a circular hollow case, and an outer inclosing concentric case, with an opening to introduce material into said inner case, and a cover to close it, said cases being journaled to revolve on horizontal axes, and means for revolving them, a paddle-wheel journaled inside of and concentric with said inner case, and means for driving it in a direction opposite to that of said case, means for introducing live steam between said cases, and an exhaust to permit its escape therefrom, substantially as shown and described.

2. An improved devulcanizer consisting of a circular hollow case having its diameter greater than its length to cause the contents to accumulate in a closer mass by gravitation, a concentric inclosing case separated therefrom to leave a steam-space, means for introducing live steam into said space and permitting its escape therefrom, common journals to revolubly support said cases, means for revolving said cases; a paddle-wheel concentrically mounted in said inner case and means for revolving it independently of said cases, substantially as shown and described.

In testimony that I claim the above I hereunto set my hand in the presence of two subscribing witnesses.

LOUIS A. STELZER.

In presence of—
C. P. HUMPHREY,
C. E. HUMPHREY.