No. 646,230. Patented Mar. 27, 1900.

A. H. MARKS.

DEVULCANIZING APPARATUS.

(Application filed Apr. 14, 1899. Renewed Dec. 5, 1899.)

(No Model.)

Fig. 1,

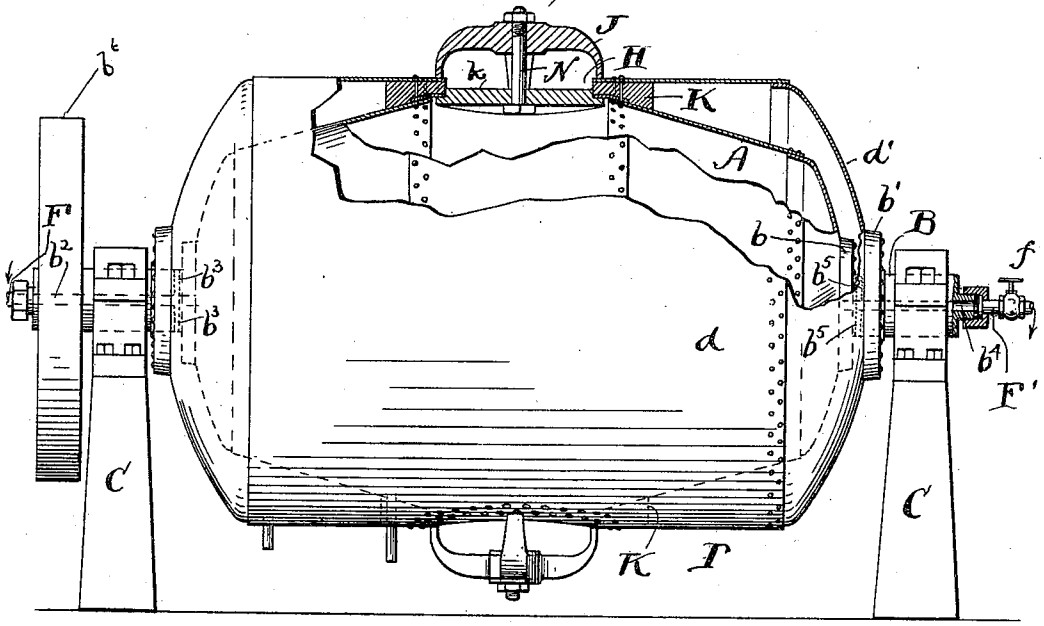
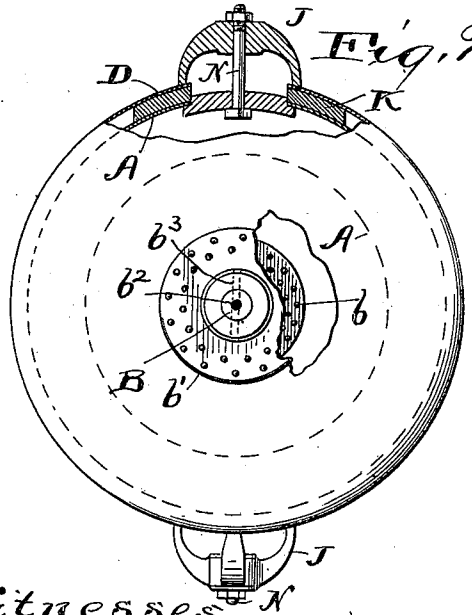


Fig. 2,



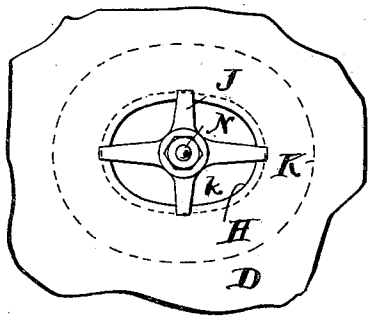


Fig. 3,

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ARTHUR H. MARKS, OF AKRON, OHIO.

DEVULCANIZING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 646,230, dated March 27, 1900.

Application filed April 14, 1899. Renewed December 5, 1899. Serial No. 739,313. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR H. MARKS, 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 full, clear, and exact description, reference being had to the accompanying drawings.

The apparatus embodying my invention, as shown, is especially designed for devulcanizing ground-rubber waste by a process which involves the mixing of the waste and a chemical solution in a sealed suitable receptacle, in heating the said mixture to a high temperature, and in maintaining the temperature for a number of hours under conditions which will insure an intimate contact of the solution with all of the rubber.

The object of my invention is to provide an apparatus with which this process may be effectually and economically practiced and the loading and unloading of the apparatus be easily and quickly effected.

The invention consists in the construction and combination of parts, as hereinafter described, and pointed out definitely in the claims.

In the drawings, Figure 1 is a side elevation, partly in section, of the apparatus embodying my invention. Fig. 2 is an end view of the same when parts of the containing vessel and the jacket are broken away, substantially as shown. Fig. 3 is a plan view of a part of the apparatus associated with one of the manholes.

Referring to the parts by letters, A represents the inner receptacle, which is adapted to contain the ground-rubber waste and chemicals. This receptacle is of largest diameter at and near its middle, while it decreases in diameter toward its ends. In other words, each of the end sections is substantially the form of the truncated cone. The ends of this receptacle are made fast by means of rivets or other suitable means to the flanged ends of shafts B B. Each of these shafts is mounted in bearings in suitable standards C.

D represents the outer receptacle or jacket, which has a substantially-cylindrical body d and concavo-convex ends d', through which the shafts B B pass, and these ends d' are secured by rivets or other suitable means to the flanges b' on the shafts B B. The receptacle A and the jacket D are preferably made of sheet metal, and they are strengthened and braced by the plates K K, which are fitted between them at diametrically-opposite points and are secured to them by rivets or other suitable means. The manholes H are formed through the receptacle A, the jacket D, and through these interposed plates. The materials to be treated—that is to say, the ground-rubber waste and the chemical solution—may be dumped into the inner receptacle through one of the manholes from an elevation-platform, (not shown,) and the inner receptacle may be sealed up by manhole-plates k and their operating mechanism—viz., the yokes J and bolts N.

An inlet-port b^2 is formed in one of the shafts B, and transverse branch ports b^3 place this port into communication with the space between the inner receptacle and the other jacket. An outlet-port b^4 and a transverse branch port b^5 are formed in the other shaft B, the branch ports communicating with the space between the receptacles. Steam-pipes F and F' are connected by swivel connections with the ends of these shafts and in communication with the ports therein. The steam-outlet pipe F' has a valve f, by which the steam-pressure in the steam-jacket may be maintained.

In carrying out the process, after the apparatus has been charged and sealed steam is admitted at suitable pressure through the pipe F and ports b^4 b^5, and this steam-pressure and the resulting temperature are maintained for as long as may be necessary. During this time the entire apparatus may be rotated slowly in the bearings of the shafts B B by means of a belt passing over the pulley b^6, secured to one of said shafts. This rotation of the apparatus causes a thorough mixing of the chemicals and the ground-rubber waste. When the process has been completed, steam shut off, and one or both of the manhole-covers are removed, the material will flow out of the bottom manhole into any receptacle or trough placed beneath the same, and because of the inclination of the ends of the inner re-

ceptacle toward these manholes substantially all of the contained material will empty itself out through these manholes.

Having described my invention, I claim—

1. In a devulcanizing apparatus, the combination of a jacket, and two shafts which extend through the ends of said jacket and have flanges to which said ends are rigidly secured, said shafts having ports which communicate with the interior of said jacket, and steam-pipes which are connected with the ends of said shafts by swivel connections, with a receptacle within the jacket which is secured at its ends to the said shafts, and strengthening-plates lying between and secured both to the inner receptacle and the jacket, the jacket, receptacle and plate having a manhole through them, and a cover for closing said manhole, substantially as specified.

2. In a devulcanizing apparatus, the combination of an outer jacket, shafts which pass through the ends of said jacket, and have flanges to which said ends are riveted and other flanges on their ends within the jacket, said shafts having also longitudinal ports and transverse ports which communicate with the interior of the jacket, with an inner receptacle which is of largest diameter at and near its middle and decreases in diameter toward each end, said receptacle being secured to the end flanges on the shafts, strengthening-plates fitted between and secured to said jacket and inner receptacle, said jacket, receptacle and plates having manholes through them, manhole-covers and their operating mechanism, bearings for said shafts, and steam-pipes connected with the ends of the shafts by swivel connections, substantially as specified.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

ARTHUR H. MARKS.

Witnesses:

WILLIAM B. MILLER,

A. H. NOAH.