E. W. SNYDER.

APPARATUS FOR DEVULCANIZING RUBBER.

APPLICATION FILED JULY 10, 1909.

951,974. Patented Mar. 15, 1910.

2 SHEETS—SHEET 1.

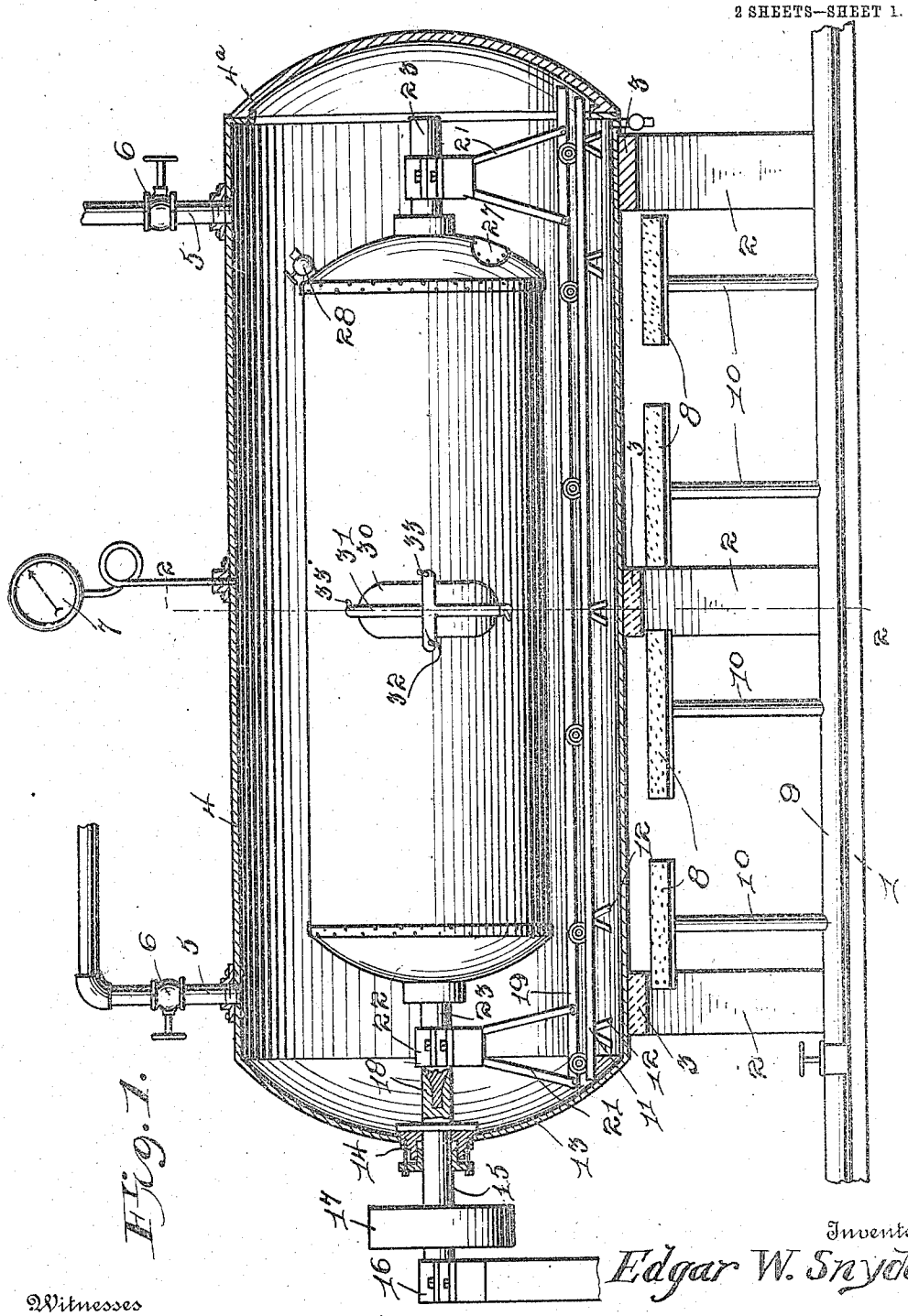


Fig. 1.

Witnesses

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2 SHEETS—SHEET 2.

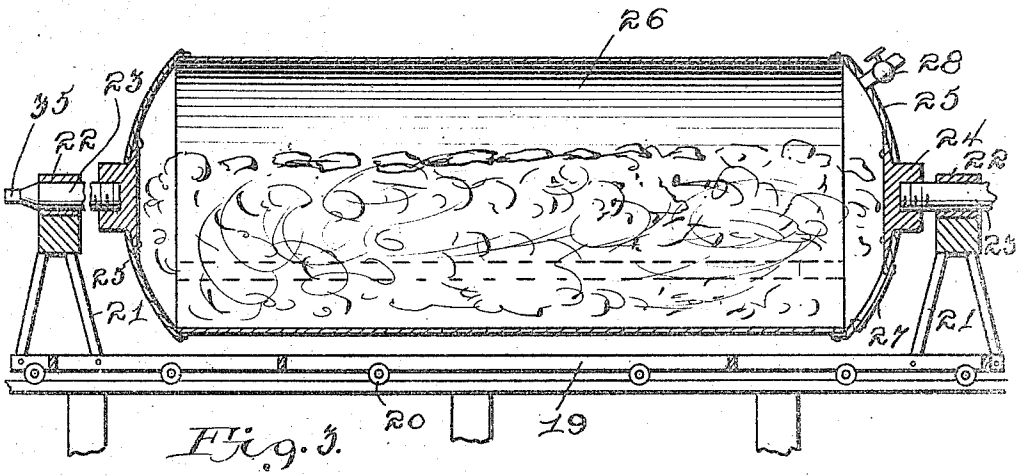


Fig. 3.

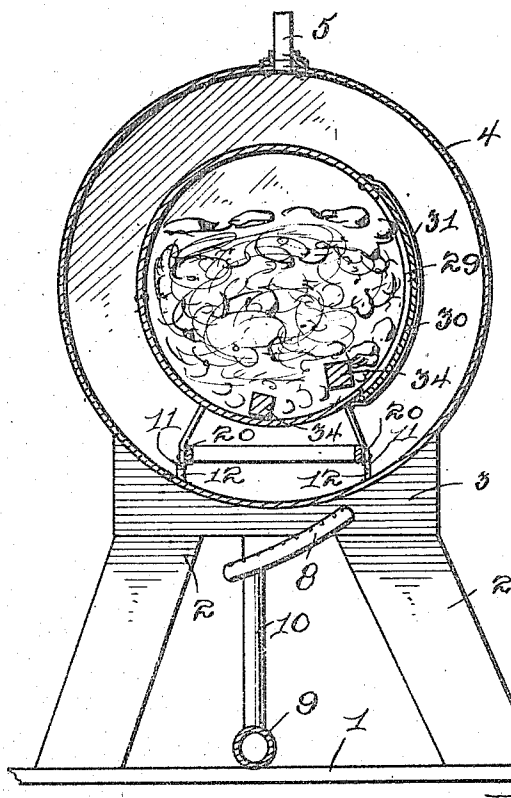


Fig. 2.

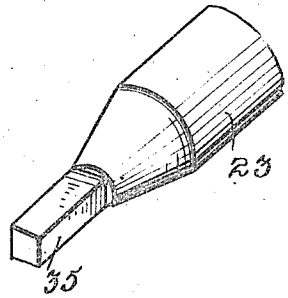


Fig. 4.

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UNITED STATES PATENT OFFICE.

EDGAR W. SNYDER, OF OLATHE, KANSAS.

APPARATUS FOR DEVULCANIZING RUBBER.

951,974. Specification of Letters Patent. Patented Mar. 15, 1910.

Application filed July 10, 1909. Serial No. 506,947.

To all whom it may concern:

Be it known that I, EDGAR W. SNYDER, a citizen of the United States, residing at Olathe, in the county of Johnson and State of Kansas, have invented certain new and useful Improvements in Apparatus for Devulcanizing Rubber, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to the subject of reclaiming waste rubber, such as tires, hose, over-shoes, and the like, and the principal object of the same is to provide an apparatus for reclaiming rubber in which the foreign matter is removed therefrom so as to restore the rubber to its original condition.

In carrying out the objects of the invention generally stated above, it will be understood, of course, that the essential features thereof are necessarily susceptible of changes in details and structural arrangements, but a preferred and practical embodiment thereof is shown in the accompanying drawings, wherein—

Figure 1 is a central vertical longitudinal sectional view of the improved apparatus. Fig. 2 is a central vertical transverse sectional view taken on the line 2—2, Fig. 1. Fig. 3 is a central vertical longitudinal sectional view of the devulcanizing chamber. Fig. 4 is a detailed perspective view of one of the end shafts of said devulcanizing chamber.

Referring to said drawings by numerals, it will be observed that the improved apparatus is supported upon a concrete bed composed of a base 1, a plurality of standards 2, said standards carrying horizontal upper members 3 which form a support and to which is rigidly attached the heating chamber 4. Said heating chamber is in the form of a cylinder and is supported in a horizontal position by said concrete bed. Each end of said cylinder is outwardly rounded, one end thereof being in the form of a door 4^a by means of which access may be had to said heating chamber. Two or more steam pipes 5, one arranged adjacent each end of said heating chamber and provided with valves 6 are adapted to deliver steam therein. A steam gage 7 is associated with said chamber. As aforesaid, the chamber is held in a horizontal position by the said concrete bed and heat is delivered to the bottom of said chamber by means of upwardly-inclined burners 8 which are supplied by the main 9 and vertical pipes 10. The interior of said chamber is provided with tracks 11 which are supported by short standards 12, said tracks extending longitudinally of said chamber and located in the lower portion thereof. The closed end 13 of said chamber carries a stuffing box 14 through which the power shaft 15 extends. The outer end of said shaft 15 is mounted in suitable bearings 16 and carries a pulley 17 by means of which rotary movement is communicated to said shaft. Said shaft extends within said chamber and is provided with a longitudinally arranged flaring end socket 18.

A supporting frame 19 composed of longitudinally extending side members and connecting end members is provided with rollers 20, said frame being of a size to permit its rollers 20 to run on the tracks within the heating chamber 4. Standards 21 are arranged in pairs at each end of said frame 19, and at their upper end carry bearings 22 in which stub shafts 23 are mounted, the inner ends of said shafts being in threaded engagement with enlarged protuberances 24 carried by the rounded ends 25 of a devulcanizing chamber 26. Said devulcanizing chamber 26 is supported in said bearing in a horizontal position and is constructed preferably in the form of a cylinder. One end of said devulcanizing chamber carries a man hole 27 and is also provided with a relief valve 28. An enlarged opening 29 is formed in one side of said devulcanizing chamber, said opening being normally sealed by means of a door 30 and is preferably reinforced by vertical and horizontal stay bars 31—32 arranged in crossing relation. The ends of said stay bars project beyond the edge of said door and are adapted to be engaged by locking bolts 33 to retain said door in a closed position. A pair of mixing bars 34 are arranged longitudinally in said devulcanizing chamber, said mixing bars being loose therein and adapted to be rotated by the movement of said devulcanizing chamber to agitate the material therein, as will presently appear. Preferably said bars 34 are rectangular in cross section. One of the shafts 23 has its end portion projected beyond its bearing 22 and is reduced and has its extreme end rectangularly shaped as at 35 to fit the socket 18 formed in the shaft 15 by means of which the rotary movement of said shaft 15 is communicated to the devulcanizing chamber 26.

Normally the parts of the apparatus are in the position shown in Fig. 1, the devulcanizing chamber being within the heating chamber and having its end shaft 22 in locked engagement with the socket in the end of the power shaft 15. Power is communicated to said shaft 15 through the pulley 17, which causes the devulcanizing chamber to rotate and the material therein is thoroughly mixed with the chemical agents therein, such for instance as hydrocarbon for restoring the rubber and ammonia for preserving the same, by means of the bars 34 which are loose in said devulcanizing chamber.

To remove the contents of the devulcanizing chamber, the door 4ª of the heating chamber is opened and said devulcanizing chamber and its supporting frame run out from said heating chamber by means of the tracks 11. The door 30 of the devulcanizing chamber is then opened and the material discharged is conveyed in any suitable manner to the usual mill. To re-charge the devulcanizing chamber, the previously prepared waste material is placed therein and said devulcanizing chamber is run back into the heating chamber and its shaft 23 is locked to the shaft 15. Steam is then admitted to the heating chamber and heat is applied to the bottom of said heating chamber through the burners 8. Power is communicated to the shaft 15 to rotate the devulcanizing chamber, as is described above.

What I claim as my invention is:—

1. An apparatus of the character described comprising a stationary heating chamber, a power shaft projecting into the same, tracks in said heating chamber, a supporting frame provided with rollers for said tracks, a devulcanizing chamber rotatably supported by said frame and adapted to be locked to said power shaft, and means for rotating said power shaft.

2. An apparatus of the character described comprising a stationary heating chamber, a power shaft projecting into one end thereof, tracks supported by the base of said heating chamber, a supporting frame removably mounted on said tracks, a devulcanizing chamber provided with end shafts rotatably mounted in said supporting frame, and means for connecting one of said end shafts to said power shaft whereby the movement of said power shaft is communicated to said devulcanizing chamber.

3. An apparatus of the character described comprising a stationary heating chamber in communication with a source of steam supply, interior tracks carried by said heating chamber, a power shaft projecting into said heating chamber, a supporting frame provided with rollers and movably mounted upon said tracks, a devulcanizing chamber provided with end shafts rotatably mounted in said supporting frame, and means for connecting one of said end shafts to the power shaft.

4. An apparatus of the character described comprising a stationary heating chamber, a door for one end of the same, a power shaft projecting through the other end of said chamber, tracks within said chamber and supported upon the base thereof, a supporting frame provided with rollers for removably engaging said tracks, end standards carried by said supporting frame and provided with bearings, a devulcanizing chamber provided with end shafts rotatably mounted in said bearings, one of said shafts being adapted for communication with said power shaft for rotating said devulcanizing chamber.

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

EDGAR W. SNYDER.

Witnesses:
C. L. RANDALL,
GEO. B. WHITE.