

May 2, 1933.

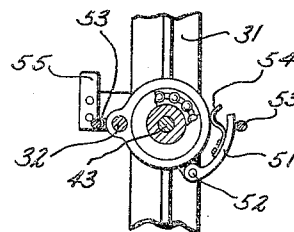
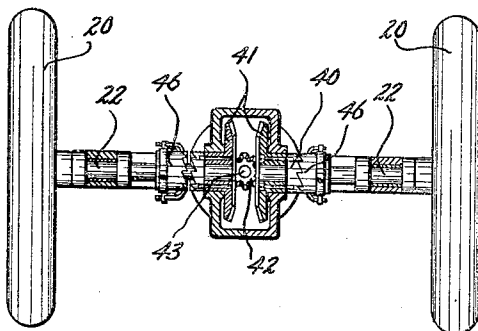
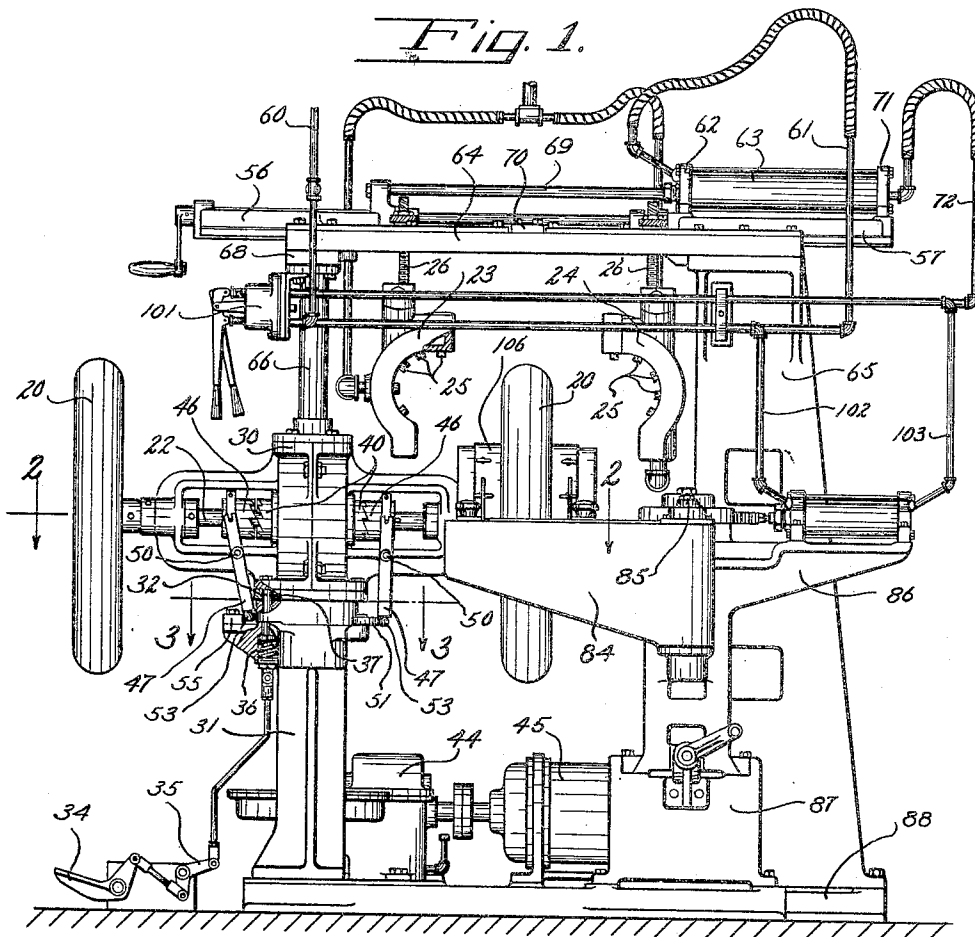
C. E. MAYNARD

1,906,327

AIRBAG TREATING MACHINE

Filed March 19, 1930

4 Sheets-Sheet 1



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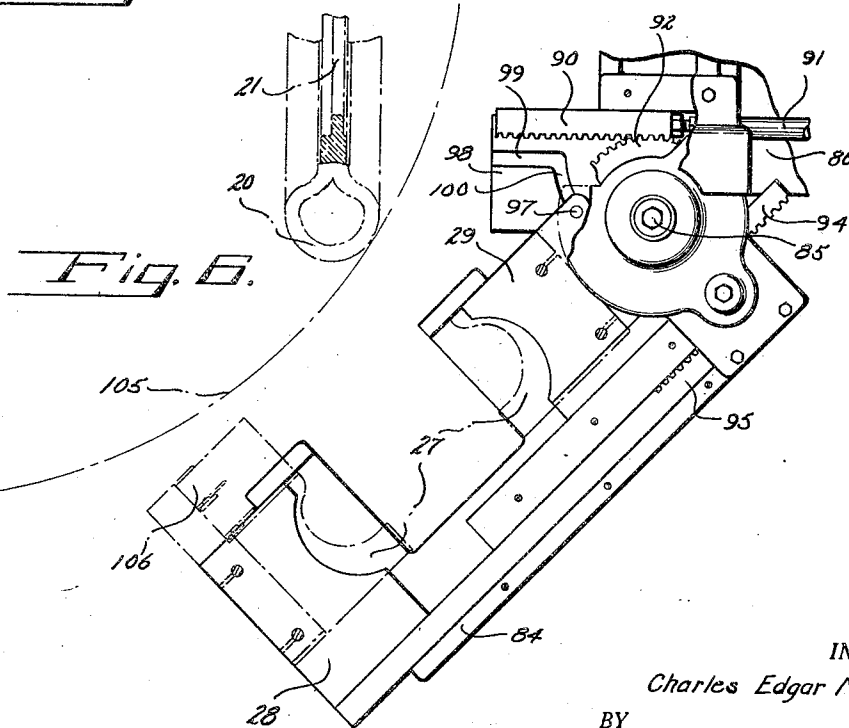
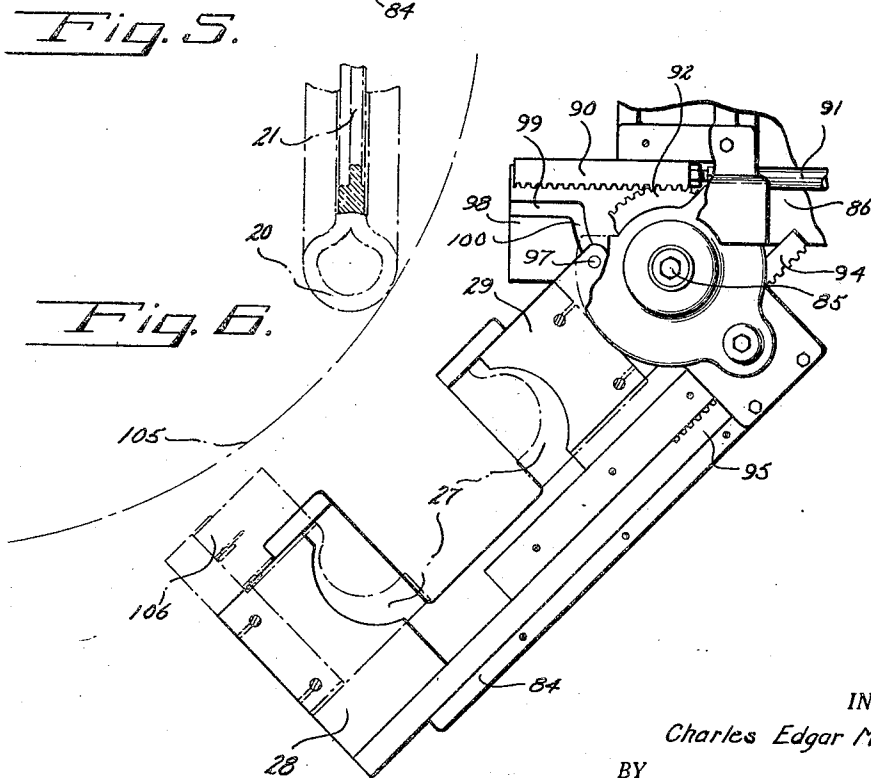
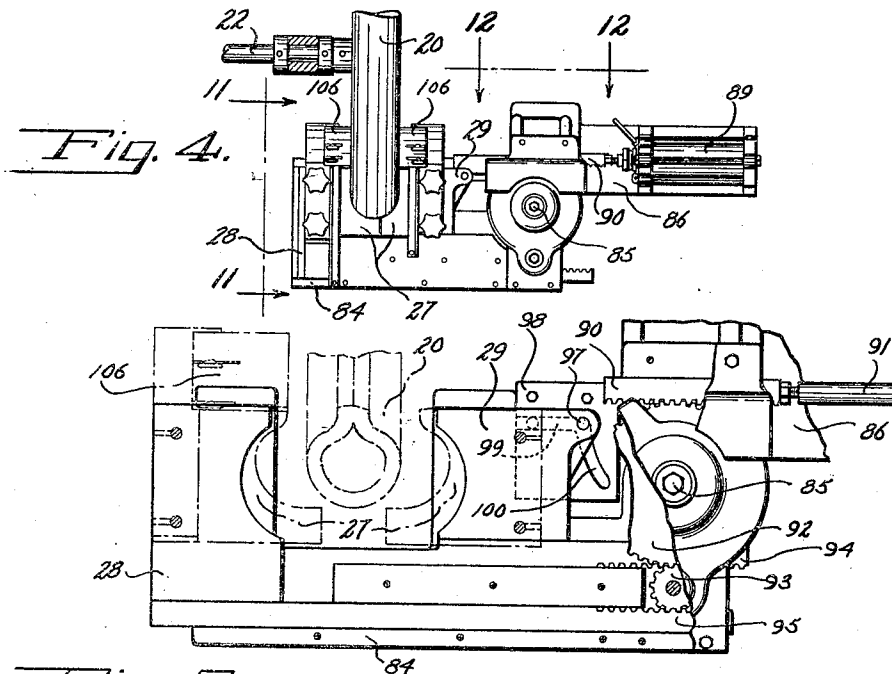
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AIRBAG TREATING MACHINE

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4 Sheets-Sheet 2



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AIRBAG TREATING MACHINE

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4 Sheets-Sheet 3



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AIRBAG TREATING MACHINE

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4 Sheets-Sheet 4

Fig. 9.

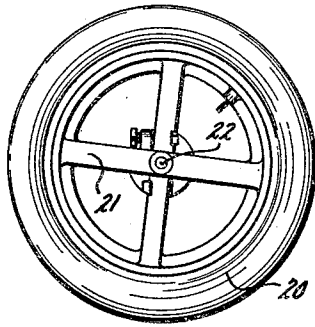


Fig. 10.

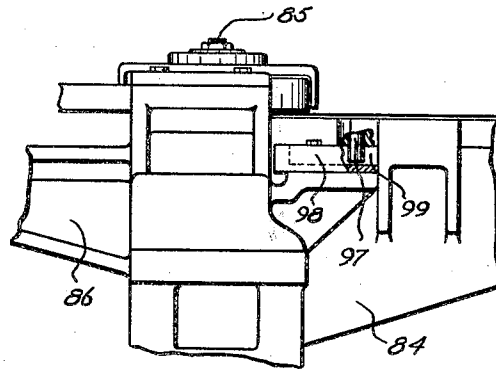
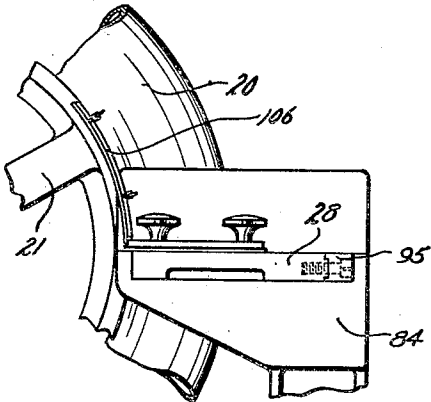
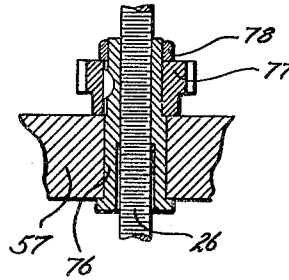


Fig. 11.

Fig. 12.

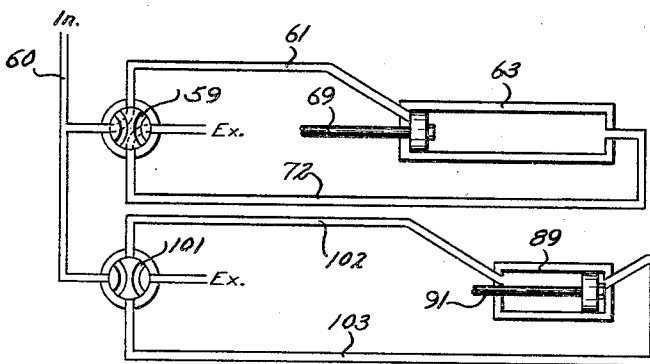


Fig. 13.

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UNITED STATES PATENT OFFICE

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AIRBAG TREATING MACHINE

Application filed March 19, 1930. Serial No. 437,141.

My invention pertains to a machine for treating articles such, for example, as the fluid pressure or vulcanizing bags used in curing pneumatic tire casings, and more particularly to a machine for treating the outer surface of such bag after such surface has become hard and brittle from repeated use.

It is an object of my invention to provide a machine for carrying out the airbag treating method disclosed in Patent No. 1,494,157, granted May 13, 1924 in an economical and more efficient manner than heretofore. Other and further objects will be apparent from the following specification and claims.

In the accompanying drawings which illustrate one embodiment of my invention,

Fig. 1 is a front elevation of my machine showing a bag in place ready to be burned and scraped;

Fig. 2 is a view taken substantially on line 2—2 of Fig. 1;

Fig. 3 is a view taken substantially on line 3—3 of Fig. 1;

Fig. 4 is a plan view substantially a continuation of Fig. 2, showing the scraper operating mechanism;

Fig. 5 is a view partially broken away, and at a somewhat larger scale, showing the scrapers drawn away from engagement with a bag;

Fig. 6 is a view showing the scrapers fully drawn from the proximity of the bag;

Fig. 7 is a view, partially broken away, showing the burner controlling mechanism in position shown in Fig. 1;

Fig. 8 is a similar view showing the burners when brought into operating position;

Fig. 9 is a view of the bag holding chuck;

Fig. 10 is a view taken substantially on line 10—10 of Fig. 7, showing a portion of the height adjusting mechanism for the burners;

Fig. 11 is a view taken substantially on line 11—11 of Fig. 4;

Fig. 12 is a view taken on line 12—12 of Fig. 4; and

Fig. 13 is a diagrammatic view of the burner and scraper controlling means and in position shown in Fig. 1.

In the drawings, fluid pressure bags 20 are

shown mounted on suitable chucks 21 (Fig. 9) which are carried by rotatable shafts 22. Chambered burners 23 and 24, having a plurality of nozzles 25, are carried by adjusting screws 26 and are adapted to be brought to or from the proximity of a bag to be burned in a manner later described. Adjustable scrapers 27, carried by slides 28 and 29 which are adapted to bring the scrapers into and out of engagement with the bag, are shaped to conform to the outer periphery of a section of the bag and are adapted to scrape the bag after or during the time the bag is being burned.

The shafts 22 are carried in a turret 30 rotatably mounted on a stand 31. The turret may be turned and locked in such a manner on the stand 31 that as a bag on one chuck 21 is in position to be operated upon the other bag may be removed from the chuck and another positioned on the chuck. The locking of the turret in its correct position is accomplished by a spring controlled pin 32 carried by the turret stand 31 and operated by a foot treadle 34 and a bell crank arrangement 35. Ordinarily the spring 36 will hold the pin 32 in one of two holes 37 in the base of the turret 30. Pressure on the treadle 34 will withdraw the pin from the hole 37 and allow the turret to be swung until the pin 32 slides into the other hole.

A pair of clutch members 40 freely rotatable on the shafts 22 are constantly driven by being pinned to bevel gears 41 (Fig. 2) rotated by a gear 42 fixed to a shaft 43 which is driven, through gearing (not shown) in housing 44 from motor 45. Another pair of clutch members 46, keyed on the shafts 22, but slidable thereon, are brought into engagement with members 40 by the positioning of the turret 30. Clutch arms 47, one of which is hinged to either side of the turret, are operatively connected to the clutch members 46 in such a manner that the clutch on the shaft supporting the bag in operative position is in engagement with its mate while the other is out of engagement.

The clutch arms 47, hinged at 50, slide the clutch members 46 toward the members 40 by the action of a yieldable cam 51 pivoted on

the turret stand 31 at 52 and acting on rollers 53 carried by the arms 47. A spring 54 behind the cam 51 is provided in case the member 46 does not immediately mesh with member 40. The clutch is disengaged by another cam 55 fixed on the stand 31 and also engaging with rollers 53. This cam, however, acts to swing the arm 47 in the opposite direction so that member 46 will slide out of engagement with clutch member 40.

When the bag 20 is brought into burning position by rotation of the turret the burners 23 and 24 are in the position shown in Figs. 1 and 7. The burners are now brought together about the bag (Fig. 8) by operating a valve 59. Air from the main line 60 is admitted through a lead 61 to the head end 62 of a cylinder 63. This cylinder is mounted on the carriage 57 slidably mounted in carriage ways 64 which are supported by a stand 65 and a pedestal 66. The pedestal 66 is secured to the top of the turret 30 and is rotatable in a thrust bearing 67 carried by a way support 68. The free end of piston rod 69 of cylinder 63 is connected to carriage 56, also slidable in ways 64. Air brought to the head end of the cylinder 63 will draw the two carriages toward each other, their inward movement being limited by a block 70 fixed to the ways 64. The block 70 also serves to center the burners with respect to the bag. Air led to the opposite end 71 of the cylinder 63 through leads 72 from the valve 59 will repel the two carriages, this movement being limited by stops 73 and 74 carried by the carriages.

The burners are raised and lowered to accommodate bags of various diameters by adjustments on screws 26. The screws 26 are threaded in spindles 76 (Fig. 10) rotatably held in the carriages 56 and 57. Keyed to the spindles 76 are spiral gears 77 held in place by a locknut 78. The gears 77 mesh with other spiral gears 79 keyed to a shaft 80 carried by carriage 56 and supported by carriage 57. A crank 81 on the shaft 80 is adapted to turn the shaft 80 as desired, thus turning the gears 77 and 79 simultaneously and raising or lowering the burners 23 and 24 together.

The slides 28 and 29 which carry the scrapers 27 ride in ways in a scraper supporting arm 84. This arm is pivoted on a shaft 85 carried by a carriage 86 supported on a base 87. The scraper arm 84 is moved into or out of engagement with an airbag in burning position by an air cylinder 89 mounted on the scraper arm carriage 86. A rack 90 operably connected to the piston rod 91 of the cylinder 89 is in constant engagement with a gear 92 freely rotatable on the shaft 85. The gear 92 is also in mesh with a pinion 93 set between and meshing with a pair of parallel racks 94 and 95. Following through the gearing shown in Figs. 4, 5 and 6, it will be seen that movement of the

piston rack 90 will rotate the gears 92 and 93 and move the racks 94 and 95 in opposite directions. The carriage 86 may be moved back and forth as a unit to adjust the scraping apparatus to bags of various diameters.

The racks 94 and 95 are respectively fixed to slides 28 and 29 and are the means by which the scrapers are moved into and out of engagement with the bags to be scraped. However, in order that bags may be brought or swung into position to be operated upon the arm 84 must be moved away from the bag after the scrapers are withdrawn from engagement with it. To do this I use the final portion of the piston rod movement.

A cam roller 97 carried by slide 29 rides in the cam groove of a cam 98 fixed to the scraper arm carriage 86. The initial movement of the rack 90, and consequently the scrapers 27 from their bag-engaging position, does not affect the scraper arm 84 as the cam roller will simply ride inoperatively in the straight portion 99 of the cam groove. However, when the roller 97 leaves this straight portion it continues its travel in the curved section 100 of the groove and in so doing pivots the arm 84 about the shaft 85. The return movement of bringing the scrapers back into operating position is the reverse of the movement just described. The movement either way of the slides 28 and 29 and the swinging of arm 84 is limited by the piston striking against the end of the cylinder 89. This cylinder is operated as is the cylinder previously described. Air is admitted through pipe 101 from the main supply pipe 60 through leads 102 and 103.

The swinging of the arm 84 (Fig. 6 which shows at 105 the minimum clearance needed by a bag being brought into place) must be great enough to allow guards 106 to clear the largest size bag that may be burned or scraped on the machine as it is pivoted into place to be operated upon. These guards 106, which are shown in phantom in some of the figures so as not to cover certain parts, are carried by the slides 28 and 29 and prevent scraped scale from dropping on a freshly scraped surface. They fit along the edges of the base of the bags 20 and are made adjustable to accommodate bags of various width bases.

At the start of the bag burning and scraping operation the scraper arm 84 is back as in Fig. 6 and the burners 23 and 24 are in position shown in Fig. 1. The motor 45 is started and the burners, supplied with gas under pressure, or other fuel, are lighted. A bag 20 is placed on the chuck 21 and the turret 30 given a half turn after first being unlocked through the operation of the foot treadle 34. With the turret again locked and the bag 20 slowly rotating between the burners 23 and 24, the valve 59 is operated, thus bringing the burners close about the bag.

As soon as the bag being treated has been given approximately a quarter revolution the valve 101 is operated to bring the scrapers 27 into action on the bag. The scrapers are
 5 fixed on the slides 28 and 29 in such a manner that they will engage with the bag before the piston has gone the limit of its stroke, in this way causing a yielding pressure to be exerted by the scrapers on the bag. These
 10 scrapers will then remove all the freshly burned scale, leaving the bag soft and fresh with a smooth outer surface.

After the bag has made at least one complete revolution the valve 59 is again operated, this time to spread the burners 23 and
 15 24. Then, when the treated portion of the bag is completely scraped, the scrapers are also removed from engagement with the bag by operation of valve 101. If necessary, the
 20 bag may be burned and scraped through more than one revolution. If the bag to be operated upon has been standing or lying for quite a period of time, as is often the case, it may be of advantage to slightly inflate the
 25 bag to remove any flat spots.

While one bag is being treated upon the machine the operator may be soapstoning the previously treated bag, removing it from the chuck, and replacing it with another bag to
 30 be treated.

Having thus described my invention, I claim:

1. A device for renovating vulcanizing bags which comprises means for fusing the
 35 surface of the bag, means for moving the fusing means into and out of operating relation with the bag, means for removing the fused portion, and means for moving the last named means into and out of operating relation with the bag.

2. A device for treating vulcanizing bags which comprises a rotatable support for the bag, means for fusing the surface of the bag,
 40 means for scraping the surface of the bag, said fusing means and scraping means being so positioned that the surface of the bag to be treated is successively fused and scraped as the support is rotated, and means to rotate the support.

3. A device for treating vulcanizing bags which comprises a rotatable support for the bag, means for rotating the support, means for fusing the surfaces of the bag, means for
 45 scraping the surface of the bag, said fusing means and said scraping means being so positioned that the surface of the bag to be treated is successively fused and scraped as the support is rotated, and means to move said fusing means and scraping means to and
 50 from operative relation with said support.

4. A device for treating vulcanizing bags which comprises a rotatable support for the bag, means to rotate the support, arcuate
 55 shaped burners positioned adjacent the support, means to move the burners into posi-

tion to embrace the crown and sides of the bag, arcuate shaped scrapers positioned adjacent the support, and means to move the scrapers into position to embrace the crown
 60 and sides of the bag, said burners and scrapers being so positioned with respect to each other when in operative position that the surfaces of the bag to be treated are successively fused and scraped as the support is rotated.

5. A device for treating vulcanizing bags which comprises a rotatable support for the bag, means to rotate the support, burners positioned adjacent the support, scrapers positioned adjacent the support, and means to
 65 simultaneously move the burners and scrapers to and from operative position, the burners and scrapers being so positioned with respect to each other when in operative position that the surfaces of the bag to be treated are successively fused and scraped as the support is rotated.

6. A device for renovating vulcanizing bags which comprises a turret adapted to support a bag at opposing sides of the pivot of the turret, means for rotating one of said
 70 bags, means for positioning other of said bags for removal and replacement, means for fusing the surface of the rotating bag, and means for removing the fused portion as the bag is being rotated.

7. A device for renovating vulcanizing bags which comprises means for fusing the bag, means for removing the fused portion, a turret, rotatable shafts carried by the turret adapted to carry bags, and means for rotating one shaft when the bag carried by the
 75 shaft is in fusing position.

8. A device for renovating vulcanizing bags which comprises means for fusing the bag, means for removing the fused portion, a turret, rotatable shafts carried by the turret, chucks for supporting a bag and adapted to fit on the shafts, constantly rotating clutch members running on the shafts, mating clutch members keyed to the shafts and
 80 slidable thereon, links on the latter clutch members, a clutch engaging cam operating through the said links and adapted to be engaged when bag is in burning position, a clutch disengaging cam operating through the links and engaged when a bag is moved from burning position, and means for locking the turret in bag burning position.

9. A device for renovating vulcanizing bags which comprises means for fusing the bag, scrapers for removing the fused portion, said scrapers being made substantially to the cross-sectional periphery of the bag, and means for moving the scrapers into and
 85 out of bag engaging position.

10. A device for renovating vulcanizing bags which comprises means for fusing the bag, scrapers for removing the fused portion, said scrapers being formed substantially to the cross-sectional periphery of the bag,

slides adapted to carry the scrapers, means for moving the slides in opposite directions, an arm for mounting the slides, means for moving the arm into proximity with the bag when the scrapers are to be operated, and means for pivoting the arm away from the bag when the scrapers are disengaged.

11. A device for renovating vulcanizing bags which comprises means for fusing the bag, means for removing the fused portion, and means for lowering or raising the fusing means to accommodate bags varying in size.

12. A device for renovating vulcanizing bags which comprises means for fusing the bag, scrapers for removing the fused portion, said scrapers being formed to fit tightly about the bag, slides for carrying the scrapers, an arm on which the slides may fit, a pedestal pivotally supporting the slide arm, a cam pin carried by one of said slides, a cam fixed to the pedestal and mating with the cam pin, and means for moving the slides.

13. A device for renovating vulcanizing bags which comprises means for fusing the bag, scrapers for removing the fused portion, said scrapers being formed to fit tightly about the bag, scraper supporting slides, racks on the slides, a gear rotatably held between and meshing with the slides, means for rotating the said gear, a pedestal, an arm pivotally mounted on the pedestal and carrying the slides, racks, and gear, a cam fixed on the pedestal, and a mating cam pin carried by one of said slides adapted to rotate the arm about its pivot during the final portion of the movement of the slides away from the bag.

14. A device for treating vulcanizing bags which comprises fusing means shaped to simultaneously fuse the side and crown surfaces of the bag, and means associated therewith and subsequently operative to remove the fused portion of the bag.

15. In a device for renovating vulcanizing bags, a plurality of scrapers mounted for movement into and out of contact with the bag being renovated, said scrapers when in contact with the bag conforming to the cross-sectional shape of the portion of the bag being renovated and means to move said scrapers.

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