June 24, 1930. W. C. STEVENS 1,768,339

MANDREL POLISHING MACHINE

Filed June 17, 1926 3 Sheets-Sheet 1

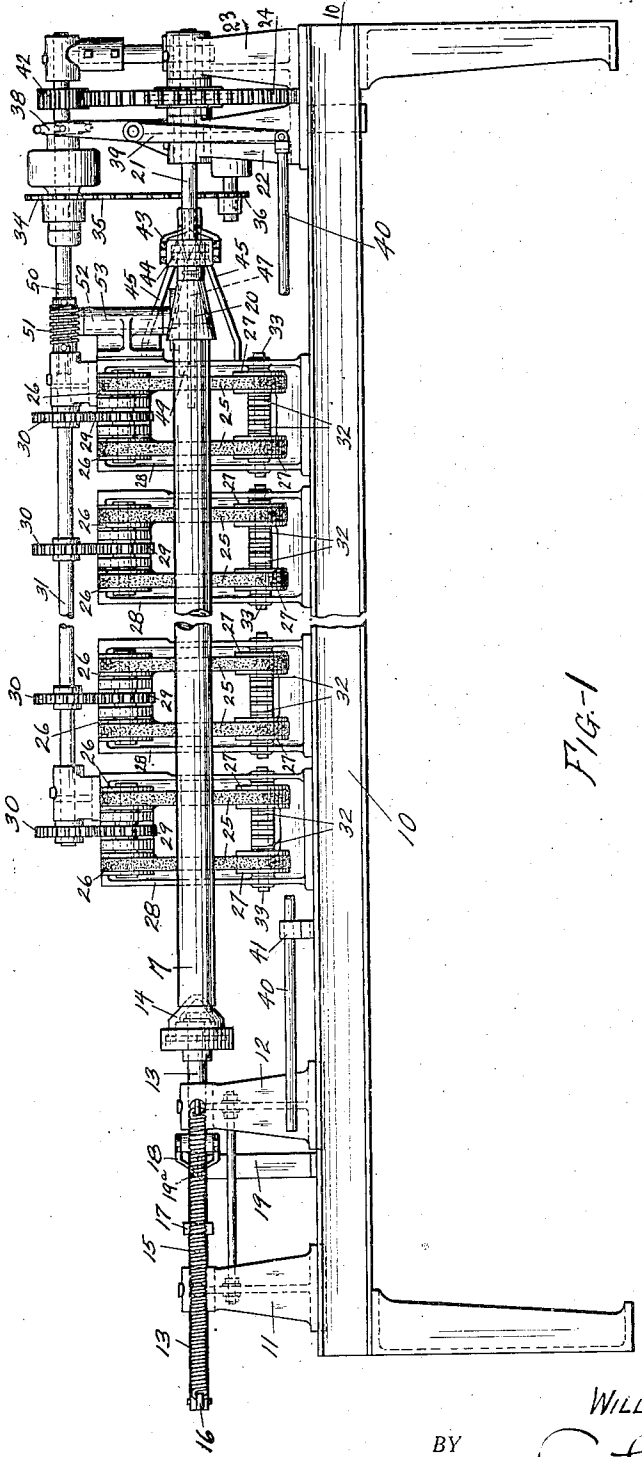


FIG. 1

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MANDREL POLISHING MACHINE

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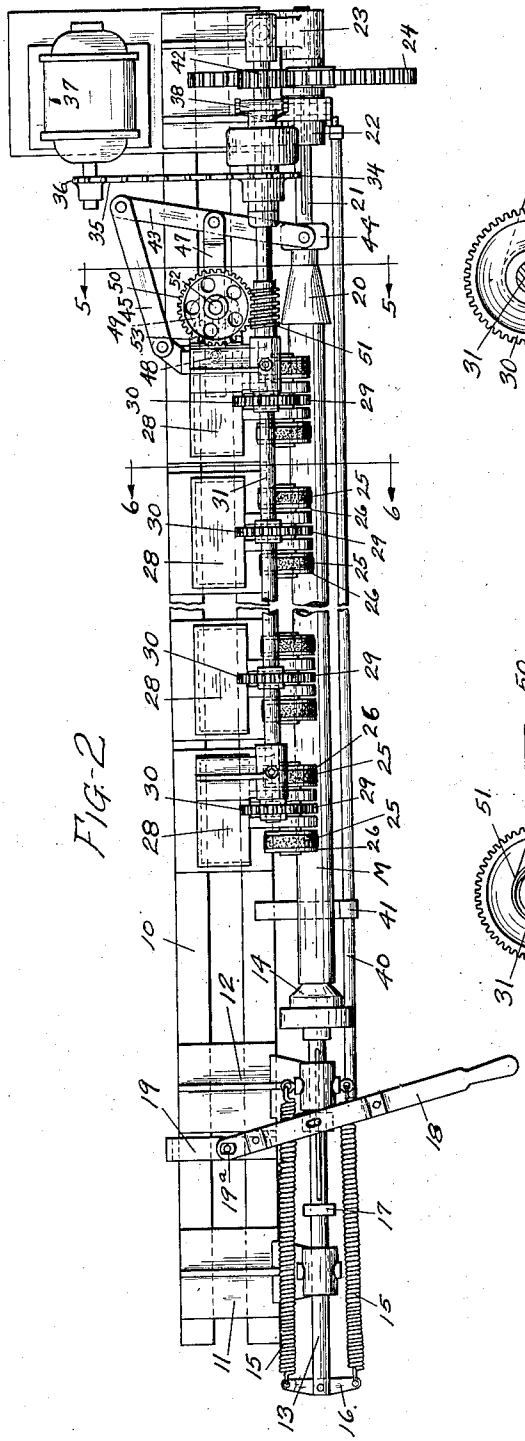


FIG-2

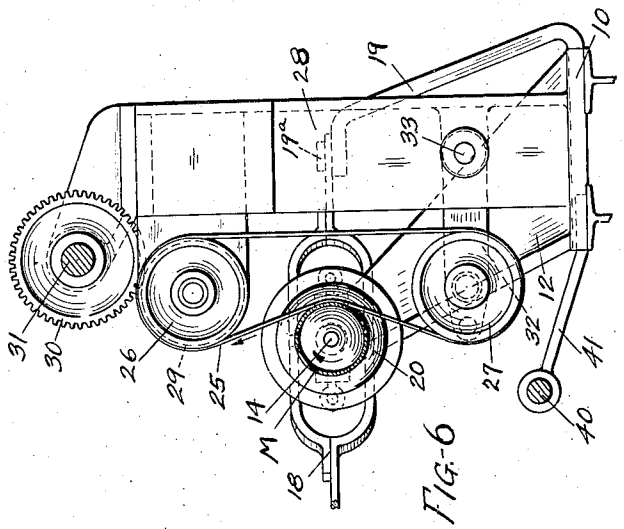


FIG-6

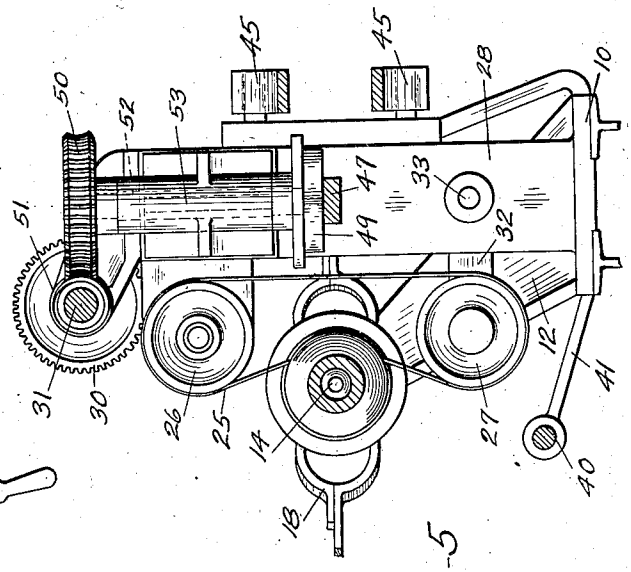


FIG-5

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MANDREL POLISHING MACHINE

Filed June 17, 1926 3 Sheets-Sheet 3

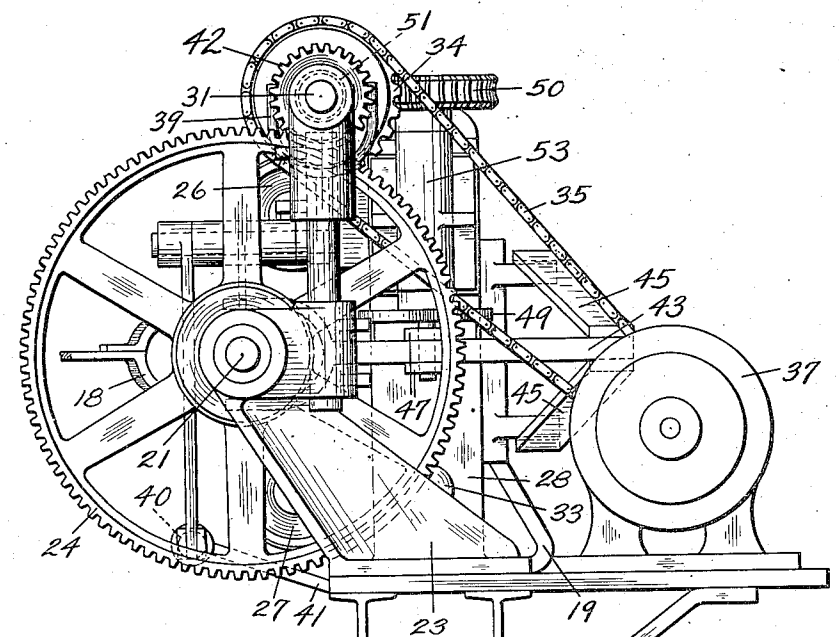


FIG. 3

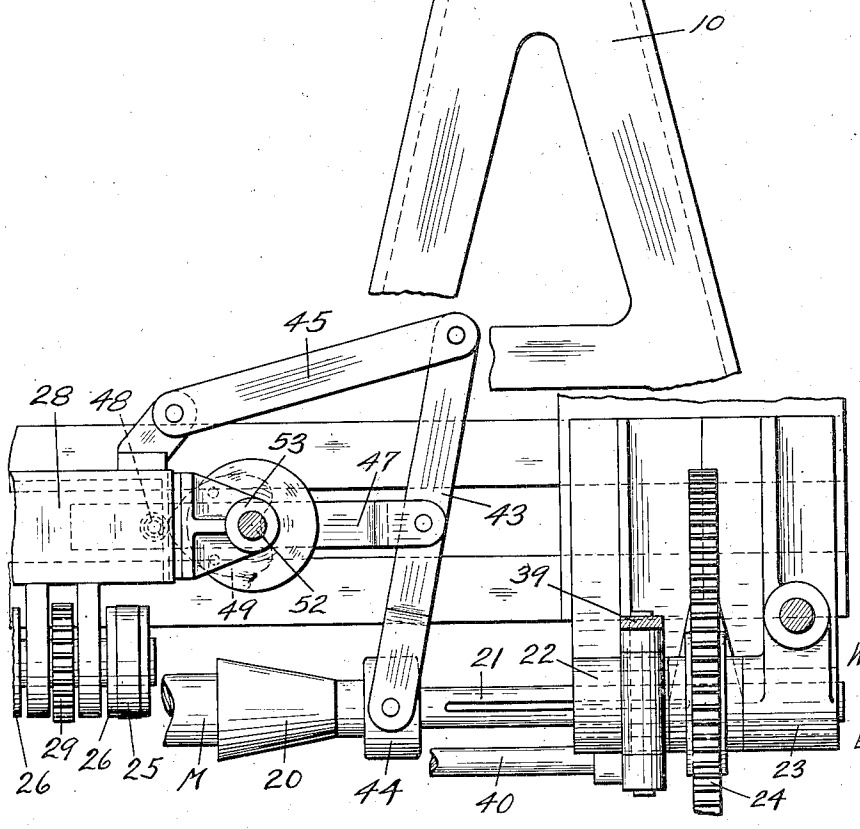


FIG. 4

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UNITED STATES PATENT OFFICE

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MANDREL-POLISHING MACHINE

Application filed June 17, 1926. Serial No. 116,576.

This invention relates to machines for cleaning or polishing poles or mandrels, such, for example, as are used in the manufacture of inner tubes.

Inner tubes of the smaller sizes are manufactured by rolling or applying vulcanizable rubber to poles or mandrels about nine or more feet long, and vulcanizing the tubes on the mandrels in heaters. Subsequent to the vulcanization the tubes are reversely stripped from the mandrels and completed by a splicing operation. Accordingly, it is desirable to maintain the surface of the mandrel clean and smooth so that the outside of the finished tube will be smooth and non-pitted. The vulcanizing action forms deposits on the mandrels which renders necessary occasional polishing thereof to keep them in the desired condition.

It is the object of the present invention to provide an effective device for thoroughly polishing poles or mandrels as described above. The device is capable of general application to other uses than the specific one herein disclosed so that the accompanying drawings and the following description thereof are intended for purposes of illustration, the invention in its broadest aspects not being limited to the specific use set forth.

Of the accompanying drawings:

Figure 1 is a front elevation, partly broken away, of a machine embodying the invention;

Figure 2 is a plan, partly broken away, thereof;

Figure 3 is a right end elevation thereof;

Figure 4 is a part plan of the right end of the machine;

Figure 5 is a section on line 5—5 of Figure 1; and

Figure 6 is a section on line 6—6 of Figure 1.

Referring to the drawings, 10 represents a suitable supporting table on which is mounted, at the left end, brackets 11 and 12 in which is slidably mounted a rod 13 carrying a center 14 journaled thereon for supporting one end of a mandrel, indicated at M. Tensile springs 15, 15 normally urge center 14 to the right, these springs being connected to bracket 12 and a crosshead 16 on rod 13. Center 14 may be manually shifted by means of a lever 18 connected to a bracket 19 shiftable into engagement with a collar 17 fixed on rod 13, lever 18 being pivoted at 19a on table 10.

To support the other end of mandrel M and to rotate the same, there is arranged a chuck 20 of hollow, conical shape into which one end of the mandrel M may be inserted, chuck 20 being secured on a shaft 21 journaled and shiftable in bearing brackets 22 and 23 mounted on table 10 and keyed or splined to a gear 24 held on shaft 21 between brackets 22 and 23 and through which shaft 21 may be driven while being shifted back and forth in bearings 22 and 23.

Operable against the surface of mandrel M are sets of abrasive belts 25, 25 which are each trained over pulleys 26 and 27 mounted on brackets 28 on the rear of table 10 and which may be driven in pairs by gears 29 secured to pairs of pulleys 26 and meshed with driven gears 30 secured on a shaft 31 journaled in bearings on brackets 28 and 23. The lower pulleys 27 are preferably carried by arms 32, pivoted on brackets 28 at 33, so that belts 25 are yieldably tensioned by the weight of pulleys 27 and arms 32. Shaft 31 is adapted to be driven by a sprocket 34 over which is trained a chain 35 driven by a sprocket 36 on the shaft of a motor 37. Sprocket 34 is rotatable on shaft 31 and a clutch 38 is arranged to connect sprocket 34 to the shaft 31 at will, clutch 38 being operable by a lever 39 pivoted on bracket 22 and operable from any point along the machine by a rod 40 connected thereto and shiftable in bearing brackets 41, 41 supported on table 10.

Rotation and shifting or reciprocation of mandrel M may be effected, respectively, by a gear 42 on shaft 31 meshed with gear 24, so that mandrel M and belts 25 will be driven reversely with respect to each other, and by a shiftable toggle arm 43 connected to a shifting collar 44 on shaft 21, arm 43 being pivotally connected to toggle arms 45 pivoted on table 10 and being operable by

a follower 47 reciprocable on table 10 and having a roller 48 thereon engaged with a heart-shaped cam 49 arranged to be rotated by a worm gear 50 connected thereto and meshed with a worm 51 on shaft 31, worm gear 50 and cam 49 being secured on a shaft 52 journaled in a bearing 53 on the right end of bracket 28.

In operation, a mandrel M is inserted in the machine, clutch 38 being disengaged, one end of the mandrel being inserted in chuck 20, and center 14 being shifted by lever 18 against the action of springs 15 to permit mounting the other end of the mandrel thereon.

It will now appear that springs 15 through mandrel M, toggle arm 43 and follower 47 urge follower roller 48 against cam 49. It will also be apparent that in mounting the mandrel in the chuck 20 and on center 14, the forward reaches of belts 25 are depressed inwardly by the mandrel, pulleys 27 yielding upwardly to permit this action and also serving to hold the belts 25 against mandrel M with considerable pressure.

The machine is now ready for operation. Motor 37 may be continuously driven. Clutch 38 is then engaged by shifting rod 40, thus driving shaft 31 which, in turn, drives mandrel M and belts 25 in opposite directions at their engaged surfaces and also shifting mandrel M longitudinally to and fro so that its entire surface will be subjected to the action of belts 25, the shifting movement being imparted to the mandrel through worm 51, worm gear 50, cam 49, toggle arm 43 and chuck 20, follower roller 48 being held against cam 49 by springs 15 throughout the shifting of the mandrel M. Springs 15 also serve to retain the mandrels in the chuck and on the center as will be understood.

Modifications of the invention may be resorted to without departing from the spirit thereof or the scope of the appended claim.

What is claimed is:

Apparatus for polishing poles, comprising a shiftably mounted chuck, a shiftably mounted center, yielding means urging the center toward the chuck, abrasive belts operable against a pole supported in the chuck and center, each belt being mounted on pulleys one of which is yieldable toward and from the other to tension the belt and urge it against the pole, means for rotating the chuck to drive the pole and for driving the belts in opposite lineal directions to the pole, and means for shifting the chuck and center against said yielding means to shift the pole longitudinally to and fro relative to the belts.

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