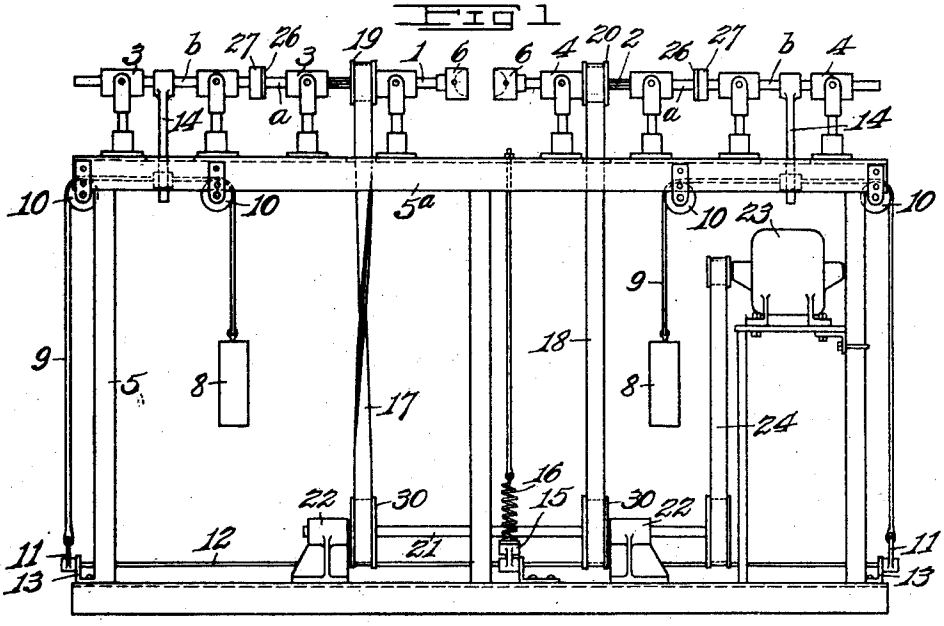
Aug. 21, 1928. 1,681,249

T. MULHOLLAND

MACHINE FOR FORMING SPHERICAL SOLID RUBBER BALLS

Original Filed July 29, 1925

Fig 1



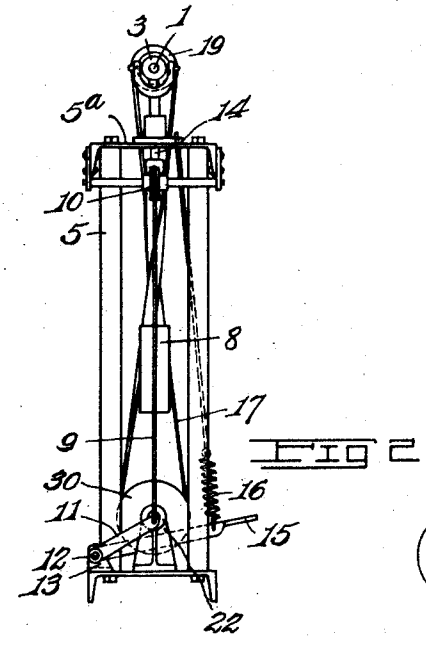


Fig 2

Fig 3

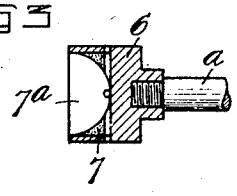


Fig 4

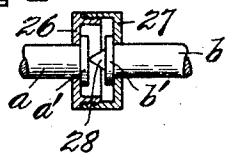


Fig 5



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UNITED STATES PATENT OFFICE.

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MACHINE FOR FORMING SPHERICAL SOLID-RUBBER BALLS.

Application filed July 29, 1925, Serial No. 46,827. Renewed January 13, 1928.

This invention relates to a machine for forming spherical rubber balls, and it has for its primary object to provide a simple, inexpensive and practical apparatus whereby substantially rectangular blocks of solid rubber may be turned to produce playing balls of spherical form.

In describing the invention in detail, reference is herein had to the accompanying drawings, in which—

Figure 1 is a side elevation of the invention;

Figure 2 is an end elevation of the same;

Figure 3 is an enlarged longitudinal section of one of the ball-shaping cups;

Figure 4 is an enlarged detail section of the friction cone coupling; and—

Figure 5 is an enlarged side elevation of a preliminarily shaped rubber block.

Referring to said drawings, 1 and 2 indicate two alined shafts journaled in suitable bearings 3 and 4 carried on the top 5^a of a suitable supporting stand or frame 5. Said shafts, which are longitudinally shiftable in their said bearings, are normally disposed in a position in which their adjacent ends are separated an appropriate distance, and each shaft carries upon its said end a fixed head 6 of socketed form within which is held a block 7 of abrasive material, as carborundum. Each of said blocks is made of cup-like shape, being provided with a hemispherical socket 7^a.

In the normal position of said shafts, the confronting faces of the heads 6 are disposed substantially in engagement one with the other, being held in said position by suitable means, as by weights 8 suspended upon the free ends of cables 9 which are passed over a pair of horizontally alined pulleys 10 carried by the frame 5 and which have their opposite ends attached to crank-arms 11 fixed on a rock-shaft 12 that is mounted for rotary movement in suitable bearings 13 mounted on the lower part of the frame. Each of said cables has fixed thereto intermediate the therewith associated pulleys 10 a depending arm 14 which is fixed upon the overlying shaft, as shown. Thus, through the cables 9 and arms 14 the shafts are actuated to approach each other longitudinally following outward movement thereof, which movement may be effected by manual force applied to a treadle-like lever 15 fixed on the rock-shaft 12. A retractile coil spring 16 may be interposed between said treadle 15 and a stationary part of the structure, as to a depending rod 17 carried by the frame, to supplement the weights 8 in returning the rock-shaft to its normal position.

Simultaneous rotation in reverse directions is imparted to the shafts 1 and 2 by any suitable means, as by belts 17 and 18 connecting pulleys 19 and 20 carried by the shafts to similar pulleys 30 carried by a drive-shaft 21 which is journaled in bearings 22 mounted on the lower part of the frame and which is driven from the rotor of an electric motor 23 by means of a belt 24. The pulleys 19 and 20 are splined on their shafts so that the latter are freely shiftable relative thereto.

In practice, the preliminarily formed rubber block 25, illustrated in Fig. 5, is introduced lengthwise between the reversely rotatable heads 6 with its ends received in the sockets 7^a of the abrading blocks 7, the shafts being relatively retracted to permit of such introduction. Said rubber block is made with all its dimensions slightly greater than the diameter of the ball which is to be produced therefrom, and it has its said opposite ends somewhat rounded to correspond approximately with the sockets 7^a to provide for positive seating in the latter. Following release of the separated shafts, the heads 6 are actuated to approach each other as closely as is permitted by the introduced rubber block. Rapid reverse rotation of said heads causes the abrading blocks to act upon said rubber block to grind off, or to wear away by attrition, the excess of rubber in said rubber block over that which is required to form a truly spherical ball accommodated within the sockets 7^a when the heads 6 have moved into contact for disposing said sockets in complemental relation.

To guard against such sudden rapid starting of the heads 6 as would be liable to result in displacing the rubber block from its seats upon the starting of the motor, each of the shafts 1 and 2 may be made in two alined sections a and b with an interposed friction-cone coupling, as is clearly shown in Fig. 4. Said shaft sections a and b have collars a' and b', respectively, formed on their adjacent ends, and embracing said sections and seated against the non-confronting faces of said col-

lars are male and female housing members 26 and 27 having flanges in threaded coupling relation. A cone-like axial projection 28 carried on the end of one of said shaft sections is seated in frictional bearing relation to the adjacent end of the other section, as shown. In practice, the coupling members may be relatively adjusted to increase or diminish the pressure of the cone 28 upon the end of the other shaft section for increasing and decreasing the frictional driving force communicated through the coupling. As is obvious, this coupling is utilized to minimize shocks imparted by sudden starting of the motor, preventing the same from being communicated to the shaft sections which bear the ball-shaping heads 6.

It will be understood that I do not desire to limit myself to structural details beyond those required by specific limitations set out in the appended claim.

What is claimed is—

A machine for forming spherical balls from blocks of rubber, comprising a pair of alined rotatable shafts, each of said shafts having a fixed head, abrading means carried by each of said heads, each of said means being shaped to provide a hemispherical socket, at least one of said shafts being longitudinally shiftable, means tending to maintain such shaft advanced to a position in which the socket of the abrading means carried by the head thereof complements the other of said sockets, means for retracting the shiftable shaft, means for rotating said shafts in opposite directions, at least one of said shafts being formed in two sections, and a friction coupling operatively connecting said sections, said coupling comprising collars fixed on the adjacent ends of said sections, an axial cone projection borne by one of said sections in seated relation to the end of the other section, and relatively adjustable housing members having portions embracing said sections and seated against the non-confronting faces of said collars.

In testimony whereof, I affix my signature.

THOMAS MULHOLLAND.