

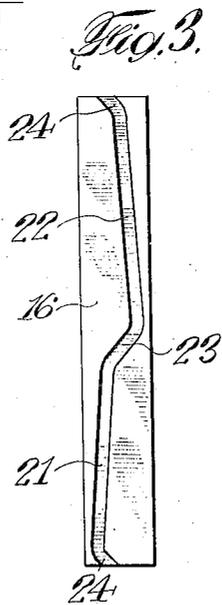
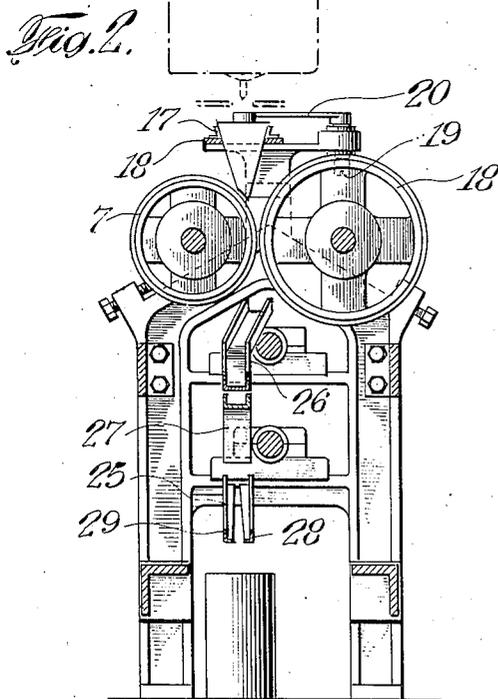
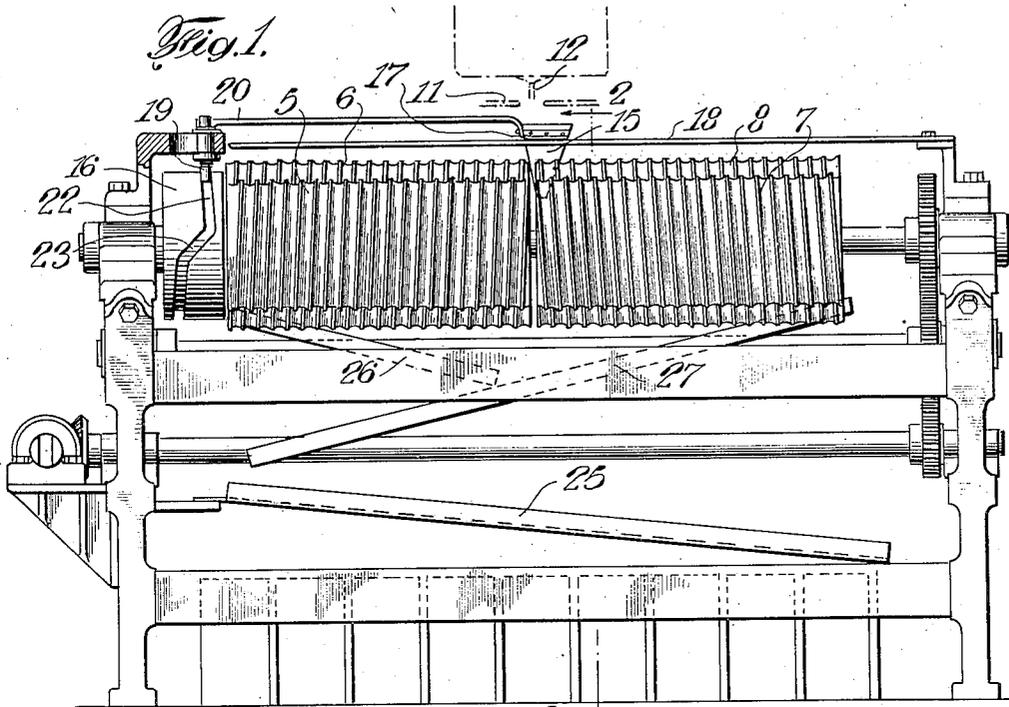
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MACHINE FOR MANUFACTURING SPHERICAL BODIES

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MACHINE FOR MANUFACTURING SPHERICAL BODIES

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The present invention relates to apparatus for forming spherical bodies and has for an object to provide an improved machine in which suitable charges are fed automatically to forming rolls.

The invention has been developed in connection with the production of apparatus for forming glass marbles and for convenience such an embodiment will be described to illustrate the principles of the invention. The mechanism for feeding, for example, charges of glass of a size suitable for forming marbles, is capable of feeding the charges much more rapidly than the forming rolls, as commonly made, are capable of receiving such charges and rolling the same to finished form.

The present invention provides a machine in which a plurality of sets of rolls are arranged to receive successive charges from one automatic feeding mechanism.

The nature and objects of the invention will more fully appear from a description of a particular illustrative embodiment thereof for the purpose of which description reference should be had to the accompanying drawing forming a part hereof and in which—

Figure 1 is a view in side elevation of a machine for forming marbles from glass or other plastic material,

Figure 2 is a sectional view of a portion of the machine taken on the line 2—2 of Fig. 1, and

Figure 3 is a detail view showing a development of the cam controlling the feeding of charges to the two sets of rolls.

In the apparatus shown for the purposes of illustration, two similar pairs of marble forming rolls 5, 6 and 7, 8 are arranged end to end with feeding mechanism for supplying charges of glass in plastic condition positioned to deliver successive charges alternately to the forming grooves of the two pairs of rolls. The two sets of forming grooves are oppositely directed so that they may be fed at their adjacent ends and the formed marbles may be delivered toward both outer ends of said rolls.

A suitable automatic feeding device 10 is arranged above the rolls to deliver successive-

ly charges of plastic material at desired intervals and in desired sizes. The feeding mechanism may comprise a pair of shears 11 arranged to sever masses of material flowing from the orifice 12 of the feeding mechanism. Immediately below the shears is positioned a guide for directing the severed mass to the forming rolls.

In the embodiment of the invention shown arrangement is made for delivering the successive charges alternately to the first turns of the grooves of the two pairs of rolls. By this arrangement the feeding mechanism may be operated at maximum speed and the successive charges will be spaced a sufficient distance along the grooves of the rolls in operation so that they will not interfere with each other and true spherical bodies will be formed. As shown, the guiding means comprises a guide 15 which is controlled by a cam 16 which may conveniently be carried on one of the roll shafts at the outer end of one of the rolls. The guide is carried on a suitable slide 17 supported by a bracket 18 attached to the frame of the machine. A follower 19 engages the cam and is connected by a link 20 to the guide to control the same.

It is desirable that the guide may be accurately positioned over the center of the forming groove at the moment the charge of material is fed to said groove. Accordingly the cam 16 is so shaped that one portion 21 of its operative groove corresponds to the pitch of the forming grooves of one pair of rolls to maintain the guide centered thereover during the feed of one charge and another portion 22 of the groove similarly corresponds to the pitch of the groove of the other set of rolls to center the guide thereover during the feed of the next charge. The intermediate portions of the cam indicated at 23 and 24 may be formed to rapidly transfer the guide from position over the groove of one set of rolls across the intervening space to operative position over the groove of the other set of rolls.

Beneath the rolls channel members 26, 27 receive the finished marbles and convey them to a suitable sorting device. The apparatus shown comprises a pair of angle irons 28, 29

slightly higher at one end and gradually diverging toward the other end. Beneath the diverging angle irons cans are placed to receive the marbles in assorted sizes.

5 The particular description of the foregoing embodiment is illustrative merely and is not intended as defining the limits of the invention.

I claim:

10 1. In a machine for forming spherical bodies, the combination with a plurality of pairs of rolls arranged end to end each pair of rolls having cooperating peripheral grooves of means for feeding successive charges of molten material at a fixed point, a guide for directing said charges into the grooves of the two pairs of rolls and means for shifting said guide to maintain it in substantial registration with the grooves of both pairs of rolls alternately comprising a cam having two portions adapted for moving the guide slowly while maintaining it in registration with one or the other of the grooves of said pairs of rolls and intermediate portions for shifting the guide quickly from the groove of one pair of rolls to the groove of the other pair of rolls.

2. In a machine for forming spherical bodies, the combination with pairs of helically grooved rolls arranged end to end and having the forming portions of the grooves of the pairs of said rolls in substantially the same horizontal plane, the feed ends of the grooves in said rolls being adjacent to each other, means for feeding successive charges of molten material to said rolls, said means comprising an oscillatory guide arranged with each oscillation to deposit unformed masses of glass alternately in the adjacent grooves of each pair of rolls, the forming portions of each pair of rolls comprising means for simultaneously supporting, forming and conveying the successive charges of molten material in diametrically opposite directions from the point of deposit on the rolls to the point of delivery therefrom.

3. In a machine for forming spherical bodies, the combination with pairs of helically grooved rolls mounted on parallel axes, each roll of one pair having an axis in alignment with a roll of the other pair and the forming portions of each pair being in substantially the same horizontal plane, means for alternately feeding successive charges of unformed molten material to each pair of said rolls at their adjacent ends, said means comprising an oscillatory guide adapted in each oscillation to direct a predetermined quantity of molten material alternately into the forming portion of each pair of rolls.

4. In a machine for forming spherical bodies, the combination with a plurality of oppositely arranged rolls having sets of cooperating helical peripheral grooves, the sets of grooves having adjacent feed ends and

remote discharge ends and comprising means for simultaneously supporting, forming and conveying the successive charges of molten material in diametrically opposite directions from the point of deposit thereon to the point of discharge therefrom; means for feeding successive charges of molten material including a cutoff mechanism, a guide for receiving the said charges having its receiving end always in vertical alignment with the cutoff mechanism, and means for shifting the discharge end of said guide to maintain such discharge end in substantial registration with the feed end of either set of grooves in alternation.

5. In a machine for forming spherical bodies, the combination with a plurality of pairs of rolls arranged end to end, each pair of rolls having cooperating peripheral grooves adapted to form and advance the bodies, of means for feeding successive charges of molten material, including a cutoff mechanism, a guide for receiving the said charges having its receiving end always in vertical alignment with the cutoff mechanism, and means for shifting the discharge end of said guide to maintain such discharge end in substantial registration directly with the grooves of either pair of rolls alternately during delivery of alternate charges thereinto.

6. In a machine for forming spherical bodies the combination with a plurality of pairs of rolls arranged end to end, each pair of rolls having cooperating peripheral grooves adapted to form and advance the bodies axially of the rolls, of means for feeding successive charges of molten material, a guide for directing said charges alternately into the grooves of each pair of rolls, and means for shifting said guide to maintain it in substantial registration with the grooves of either pair of rolls alternately.

In testimony whereof, I have signed my name to this specification this 16th day of May, 1928.

JOHN F. EARLY.

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