

UNITED STATES PATENT OFFICE

JESSE S. COHEN, OF BROOKLYN, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO
FREDERIC H. FRAZIER, OF NEW YORK, N. Y.

METHOD AND APPARATUS FOR THE FORMATION OF HOLLOW ARTICLES

Application filed April 30, 1932. Serial No. 608,386.

This invention relates to method and apparatus for the formation of hollow articles, and more particularly to method and apparatus for solidifying fluid chocolate or other fluid material about the inner surfaces of the molds.

An object of the invention is to provide improved methods and apparatus for the formation of hollow articles in molds.

10 Another object is to provide apparatus of the character described which will efficiently perform the purposes for which it is intended, which is simple and economical of construction, which can be conveniently operated, and which can be readily manufactured and assembled.

A further object is to provide improved track means along which a mold-containing barrel may be rolled.

20 Another object is to provide a method for forming hollow articles in molds whereby the distribution of the fluid material may be effected in a particularly desirable manner.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises the several steps and the relation and order of one or more of such steps with respect to each of the others, and the apparatus embodying features of construction, combinations of elements and arrangement of parts which are adapted to effect such steps, all as exemplified in the following detailed disclosure, and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawing, in which:

Figure 1 is a side view of one form of machine embodying the invention, certain of the parts being cut away; and

45 Fig. 2 is a horizontal section taken on the line 2—2 in Fig. 1.

In the formation of hollow articles of chocolate or other fluid, solidifiable materials in molds, an amount of material insufficient to fill the molds may be poured there-

in, and the molds thereafter subjected to movements while the material hardens to form a coating over the entire inner surfaces of the molds. As set forth in the co-pending application of David Lantinberg and Frank Stefendel, Serial No. 472,330, filed August 1, 1930, a mold-carrying unit may be rolled along a course while the axis of the unit is inclined, first in one direction and then in the other.

The present invention contemplates the provision of a method and means whereby the fluid material may be solidified upon the inner surfaces of the molds in a particularly uniform manner, so that the articles, when removed from the molds, will have a desirable thickness throughout all portions of their surfaces.

It has been found that such result is desirably secured when the changes in the inclination of the axis of the mold-carrying units are gradual. In accordance with the invention the unit is rotated while the hardening process proceeds, the axis of the unit being tipped in a gradual manner in one direction and thereafter in a gradual manner in the other direction during its rotation. Preferably the unit is maintained with its axis inclined at its maximum pitch for a substantial period after each inclination of the unit in either direction is complete.

A desirable form of apparatus to this end may be a pair of tracks formed with staggered rising and descending portions and, preferably, with aligned portions therebetween. However, in its broader aspects the invention contemplates the use of other means, such as similar portions on the unit for effectuating such movement.

As exemplified, the invention is shown as embodied in a form of apparatus disclosed in greater detail in the copending application of David Lantinberg and Glenn M. Jones, Serial No. 577,894, filed November 30, 1931, wherein endless conveyor means are provided for moving the unit along the track, and the units are exemplified as barrel-shaped members, each of which may be adapted to hold a plurality of mold elements.

In the drawing a conveyor shown at 10

is exemplified as carrying forked members 11, each of which is adapted to receive extensions 12 at the ends of a mold-carrying unit or barrel 13, and to roll the barrel along the course which may carry it, for example, through chambers 14 and 15 having different temperatures. In the formation of chocolate articles it is often desirable to have refrigerated air supplied to the chamber 15.

10 In accordance with the invention there is provided a pair of tracks 16 and 17 each formed with a rising portion 18 and a descending portion 19, the portions 18 on one track being opposite the portions 19 on the other track. Preferably also, the tracks are 15 provided with raised portions 20 and with depressed portions 21 between the portions 18 and 19. Accordingly, as the barrel is rolled along, the axis of the barrel is at one 20 period inclined in one direction, as indicated at 22, and at another period is inclined in another direction, as indicated at 23. Between these positions the axis of the barrel is gradually moved to a horizontal position 25 and thence to the other inclined portion without any violent jolt or jar, with the result that a smooth and even movement of the fluid material about the inside of the molds is caused, and a desirable thickness of material is formed on the inner surface of the 30 molds as the chocolate or other liquid material hardens.

As will be seen, the tracks 16 and 17 are formed with teeth 24 and the barrels, in the 35 present instance, with cooperating, toothed, wheel portions 25. In order that these wheel portions may ride easily and smoothly on the track portions, the portions 18 and 19 of the tracks are outwardly bowed, as indicated in Fig. 2.

40 It is to be understood that the mold-carrying units utilized may be adapted to carry one or more separable or integral molds in any desired manner.

45 Since certain changes in carrying out the above process and in the constructions set forth, which embody the invention may be made without departing from its scope, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

50 It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

55 Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In apparatus for the formation of hollow articles in molds, the combination with a mold-carrying unit and means to roll said 60 unit from one end to the other end of a

course, of means adapted to gradually cause the axis of said unit to be inclined in one direction at a plurality of periods during its said movement and to gradually cause the axis of the unit to be inclined in another direction at a plurality of intermediate periods. 70

2. In apparatus for the formation of hollow articles in molds, the combination with a mold-carrying unit and means to roll said unit from one end to the other end of a course, of means adapted to gradually cause the axis of said unit to be inclined in one direction at a plurality of periods during its said movement and to gradually cause the axis of the unit to be inclined in another direction at a plurality of intermediate periods and to maintain the unit in each inclined position for a period during its said movement before an opposite inclination is initiated. 75 80 85

3. In apparatus for the formation of hollow articles in molds, the combination with a mold-carrying unit and means to roll said unit along a course, of track means adapted to gradually cause the axis of said unit to be inclined in one direction at a plurality of periods during its movement and to gradually cause the axis of the unit to be inclined in another direction at a plurality of intermediate periods. 90 95

4. In apparatus for the formation of hollow articles in molds, the combination with a mold-carrying unit and means to roll said unit from one end to the other end of a course, of means gradually to raise one end of the unit while gradually lowering the other end, and to reverse and repeat said operations at regularly-spaced periods in the movement of the unit along said course. 100 105

5. In apparatus for the formation of hollow articles in molds, the combination of a mold-carrying unit, a pair of tracks therefor, and means to move the unit along said tracks, each of said tracks having gradually rising and gradually descending portions, and the rising and descending portions on the respective tracks being staggered. 110

6. In apparatus for the formation of hollow articles in molds, the combination of a mold-carrying unit formed with wheel portions adjacent its ends, track means adapted to cooperate with said wheel portions, and means on said cooperating members to incline the axis of said unit in one direction at a plurality of periods during its movement and to incline the axis of the unit in another direction at a plurality of intermediate periods, said means being arranged to effect the change from each inclination to the other in a gradual manner. 115 120 125

7. In apparatus for the formation of hollow articles in molds, the combination with a mold-carrying unit formed with wheel portions adjacent its ends and means to roll said barrel along a course, of track means 130

arranged to cooperate with said wheel portions to incline the axis of said unit in one direction at a plurality of periods during its movement and to incline the axis of the unit in another direction at a plurality of intermediate periods, said track means being arranged to effect the change from each inclination to the other in a gradual manner.

8. In apparatus for the formation of hollow articles in molds, the combination of a mold-carrying unit, a pair of tracks therefor, and means to move the unit along said tracks, each of said tracks having gradually rising portions and raised horizontal portions followed by gradually descending portions and depressed horizontal portions, the raised and depressed portions on the respective tracks being staggered.

9. In apparatus for the formation of hollow articles in molds, the combination of a mold-carrying unit, a pair of tracks therefor, and means to move the unit along said tracks, each of said tracks having gradually rising and gradually descending portions, the rising and descending portions on the respective tracks being staggered, and such inclined portions on each track being outwardly bowed.

10. In apparatus for the formation of hollow articles in molds, the combination, of a mold-carrying unit formed with wheel portions adjacent its ends, track means adapted to cooperate with said wheel portions, and means on said cooperating members to incline the axis of said unit in one direction at a plurality of periods during its movement and to incline the axis of the unit in another direction at a plurality of intermediate periods, said means being arranged to effect the change from each inclination to the other in a gradual manner, and said track means including bowed portions to conform with the path of movement of the wheel portions.

11. In apparatus for the formation of hollow articles in molds, the combination of a mold-carrying unit, a pair of tracks therefor, and means to move the unit along said tracks, each of said tracks having gradually rising portions and raised horizontal portions followed by gradually descending portions and depressed horizontal portions, the raised and depressed portions on the respective tracks being staggered, and the rising and descending portions on each track being outwardly bowed.

12. The method of forming hollow articles in molds which comprises rolling a mold-carrying unit from one end to the other end of a course, gradually inclining the axis of said unit to an acute angle with the horizontal during such movement, rolling the unit for a period with its axis so inclined, gradually decreasing the inclination of said axis and gradually inclining said axis in an opposite direction to a similar angle with the horizontal

at a further stage in such movement, rolling the unit for a period with its axis so inclined, and repeating said operations at further stages of said movement.

13. The method of forming hollow articles in molds which comprises rolling a mold-carrying unit from one end to the other end of a course, gradually inclining the axis of said unit in one direction to an acute angle with the horizontal during such movement, gradually decreasing the inclination of said axis and gradually inclining said axis in an opposite direction to an acute angle with the horizontal at a further stage in such movement, and repeating said operations at further stages in such movement.

In testimony whereof I affix my signature.
JESSE S. COHEN.

70

75

80

85

90

95

100

105

110

115

120

125

130