July 9, 1940. A. S. T. LAGAARD 2,207,546

DOUGHNUT MACHINE

Filed Oct. 30, 1939

Fig. 2

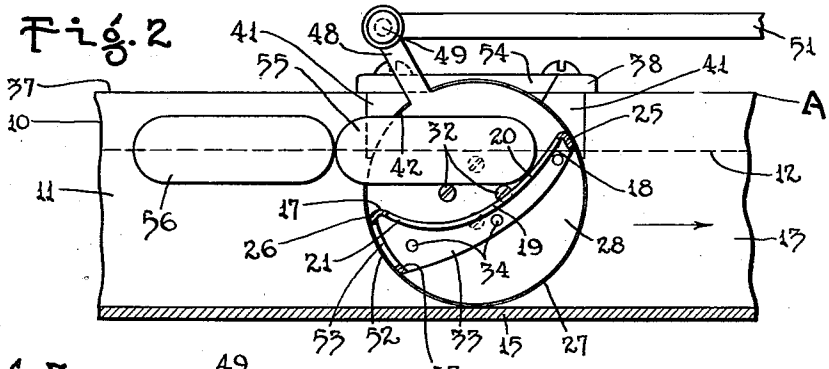


Fig. 3

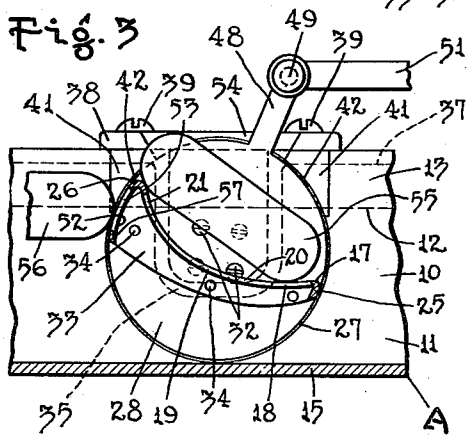
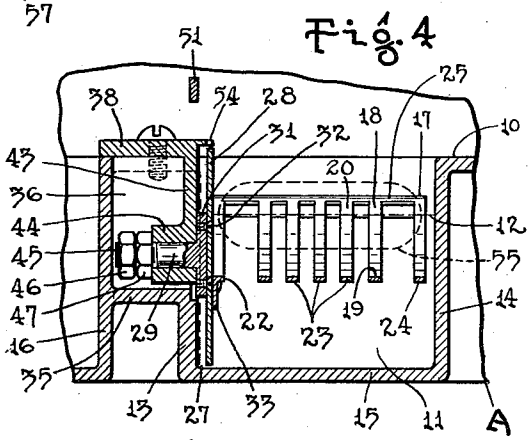


Fig. 4



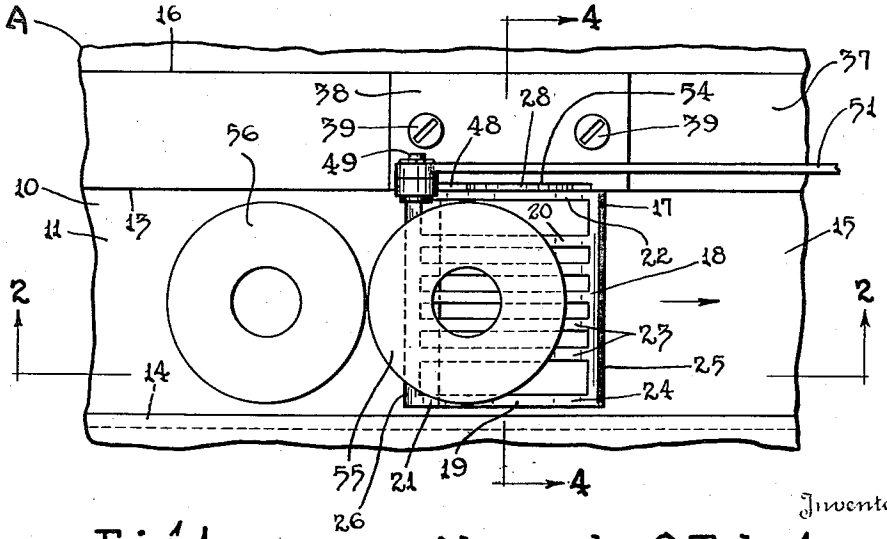


Fig. 1

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DOUGHNUT MACHINE

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Application October 30, 1939, Serial No. 301,993

12 Claims. (Cl. 53—7)

My invention relates to doughnut machines and particularly to control devices for doughnut machines for controlling the travel of doughnuts to a doughnut turner or ejector of the continuous type such as disclosed in the application for patent of Peter J. Toews, Serial Number 114,395, filed December 6, 1936.

An object of the invention resides in providing a device by means of which the travel of doughnuts is positively and effectively controlled.

Another object of the invention resides in providing a device which will operate equally as effectively regardless of the size or shape of the doughnuts.

An object of the invention resides in providing a device which will not cause jamming of the doughnuts in the way along which the doughnuts travel.

A still further object of the invention resides in providing engaging means for engaging the doughnuts and in constructing said engaging means in the form of a cradle.

An object of the invention resides in providing pivot means for said engaging means, the axis of said pivot member extending transversely of the way along which the doughnuts travel and in a horizontal direction.

A feature of the invention resides in providing the cradle with an arcuate abutment or engaging member extending transversely of the way and disposed in concentric relation with respect to the axis of said pivot means.

A still further object of the invention resides in constructing the cradle with a number of longitudinally extending spaced bars connected together at their ends.

A feature of the invention resides in constructing the cradle with the forward portion thereof forming a slide along which the doughnuts travel in leaving the engaging means.

A feature of the invention resides in providing in the wall of the cooking kettle in which the control device is installed a circular socket adapted to receive a disc to which the cradle is attached and by means of which the cradle is supported.

Another object of the invention resides in providing within said wall, pivot means attached to said disc and concealed thereby.

An object of the invention resides in constructing the engaging means with two spaced engaging members extending transversely of the channel along which the doughnuts travel and both supported on a single pivoted member and adapted to be alternately moved from a position below the level of the cooking liquid upwardly to engage the doughnuts, one of said members raising the doughnuts to cause the same to move past the other engaging member.

Other objects of the invention reside in the novel combination and arrangement of parts and in the details of construction hereinafter illustrated and/or described.

In the drawing:

Fig. 1 is a plan view of a portion of a doughnut machine illustrating an embodiment of my invention.

Fig. 2 is an elevational sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is a view similar to Fig. 2 showing the parts in altered position.

Fig. 4 is a cross sectional view taken on line 4—4 of Fig. 1.

In the application for patent of Peter J. Toews, above referred to, a doughnut machine is disclosed in which the doughnuts are deposited in a cooking liquid contained in a kettle or receptacle providing a way along which the doughnuts may travel and in which the doughnuts are progressed through propulsion of the cooking liquid. In this way are disposed a turner and an ejector both of the continuous type which are adapted to turn or eject the doughnuts any time the doughnuts reach the same. With such device it becomes necessary to provide some means for controlling the rate of travel of the doughnuts to the turner or ejector which, in the application for patent of Peter J. Toews, referred to, consisted of a pair of alternately movable gates. The present invention is of the nature of said gates and may be used in substitution thereof.

Inasmuch as the construction of doughnut machines with which my invention may be used is well known in the art, a complete doughnut machine has not been illustrated in this application and only so much of the doughnut machine as is necessary to describe the present invention has been shown.

In the drawing a portion of a doughnut machine A has been illustrated, which consists of a kettle 10 having a way 11 in the same. This kettle contains the cooking liquid the level of which is indicated by the reference numeral 12 in Figs. 2 and 3. The cooking liquid travels in the direction of the arrow, Figs. 1 and 2, and causes the progression of the doughnuts along the way, the doughnuts floating upon the surface of the cooking liquid.

The kettle 10, to form the way 11, is constructed with side wells 13 and 14 and a bottom

15 connected therewith. Adjacent the side wall 13 is another side wall 16 which constitutes one of the side walls of an adjacent run of the way 11. Where the run of the way 11, in which the invention is used, is disposed at the edge of the machine the lowermost portion of the wall 16 may be dispensed with. The walls 13 and 16 are connected together at their upper ends through a top wall 37.

The invention proper comprises engaging means 17 constructed in the form of a cradle, as best shown in Figs. 2 and 3. This engaging means has a forward portion 18, an intermediate portion 19 and a rearward portion 21. The two portions 21 and 18 incline toward the intermediate portion 19 and gradually merge into the same. These portions form an engaging member which has been indicated by the reference numeral 20. The engaging member 20 of the cradle 17 is constructed with a number of longitudinally extending bars 22, 23 and 24. Bars 22 and 24 are disposed at the sides of the cradle, while the bars 23 are disposed intermediate the bars 22 and 24. The bars 23 are fairly closely spaced and are separated some distance from the bars 22 and 24, as will become apparent from Fig. 4. The forward ends of the forward portion 18 of cradle 17 includes a transverse bar 25 which connects all of the bars 22, 23 and 24 together. In a similar manner a transverse bar 26, at the rearward portion 21 of the cradle, connects all of the bars 22, 23 and 24 together.

The cradle 17 is mounted for rocking movement in the following manner: Formed in the side wall 13 is a circular recess 27 in which is received a disc 28. Disc 28 is supported by a shaft 29. Shaft 29 has formed on it a flange 31 which is received within the recess 27. This flange is secured to the disc 28 by means of screws 32. The bar 22 of the cradle 17 has formed on it a flange 33. This flange overlies the disc 28 and is secured to said disc by means of rivets 34. In this manner the cradle is rigidly supported on the disc 28 which travels in close proximity to the edges of the wall 13 formed by the recess 27.

Between the two walls 13 and 16 is provided a transverse wall 35 which forms a pocket 36 between said walls. This pocket is open at the top and opens through the wall 13. The top wall 37, which connects the walls 13 and 16 together extends up to the wall 35 and thus closes the uppermost portion of the kettle between the walls 13 and 16 exteriorly of the pocket 36. The portion of the kettle 10 at the pocket 36 is closed by means of a cover 38. Cover 38 overlies the portions of the wall 37 beyond the pocket 36 and is secured thereto by means of screws 39 threaded into said wall 37. The recess 27 formed in the wall 13 is partly closed by means of two ears 41 attached to the cover 38, which ears have curved surfaces 42 lying in continuation of the edges of the recess 27. The cover 38 has a flange 43 depending therefrom, which flange is received within the pocket 36. This flange has formed on it a bearing 44 which rotatably supports the shaft 29. The end 45 of the shaft 29 is threaded to receive a nut 47 and a lock nut 46 which hold the said shaft from endwise movement. By means of this construction the shaft is journalled for rotation so that the disc 28 lies flush with the inner surface of the wall 13 of the kettle and fits closely to the edges of the recess 27.

By means of the recess 27, pocket 36 communicates with the way 11 so that all of the cooking liquid entering said pocket may drain out between the disc 28 and the edge of the recess 27, back into the way 11, when the machine is being drained of cooking liquid.

The disc 28 is oscillated by means of an arm 48 which extends outwardly from said disc. Arm 48 operates within a groove 54 in the cover 38. This arm has pivoted to it at 49 a link 51, which link is reciprocated by the transmission of the doughnut machine. Inasmuch as any construction, such as that shown in the Toews application for patent may be used for reciprocating the link 51, the same has not been illustrated in this application.

At the rearward end of the cradle 17, as best shown in Fig. 2, is provided an abutment 52 which constitutes another engaging member. This abutment is arcuate in form and is concentric with the axis of the shaft 29. The abutment 52 consists of a number of extensions 53 of the bars 22, 23 and 24, which extensions are connected together at their lowermost ends by means of a connecting bar 57.

The operation of the invention is as follows: When the arm 48 is at the rearward end of the groove 54, as shown in Fig. 2, the forward portion 18 of the engaging member 20 of cradle 17 extends upwardly in inclined relation, as illustrated. In Fig. 2 two doughnuts 55 and 56 have been shown. Due to the arrangement of the cradle 17, the doughnut 55 engages the forward portion 18 of said cradle and travel of the doughnuts along the way is obstructed. When the arm 48 is oscillated by means of link 51, the cradle 17 is rocked and the rearward portion 21 of the cradle is raised until the cross bar 26 thereof engages the doughnut 55 near its rearward end. This tilts the doughnut until the same occupies the position shown in Fig. 3. As the arm 48 reaches the forward end of the groove 54, the front end of the doughnut 55 slides off from the forward portion 18 of the cradle and the rear end of the doughnut downwardly along the rearward portion 21 of the cradle. As this occurs the doughnut floats away from the cradle and is progressed through the flow of the cooking liquid beyond the engaging member. At the same time the rearward portion 21 of the cradle 17 is raised, also the abutment 52 is elevated which is brought into a position to engage the doughnut 56, as shown in Fig. 3. When the arm 48 is moved to the position shown in Fig. 2, the abutment 52 is disengaged from the doughnut 56 and the same permitted to advance to the position occupied by doughnut 55 in Fig. 2. It will thus be seen that only one doughnut at a time is allowed to pass through the control device, the same operating to obstruct the travel of the following doughnuts. Inasmuch as the cross bar 26 of the cradle 17 engages the doughnuts to be released at a locality rearwardly of the forward end thereof, it will become apparent that the operation of the invention does not depend upon the size of the doughnuts nor is it necessary for the engaging member 52 to enter between the doughnuts as is the case with the structure shown in the application of Peter J. Toews, above referred to. Thus the invention will operate equally as efficiently with any size or shape of doughnut within the limits now adopted for the market.

My invention is highly advantageous. The device is extremely simple and has but the single operating member for producing the desired results. The device being disposed below the level of the cooking liquid and operating from below the doughnuts will not clog the machine and

will not allow the doughnuts to pile, one upon the other, or to otherwise jam in the machine. The device can be constructed at a nominal expense. With my invention there are no unsightly nor unattractive structures exposed with the interior of the machine.

Changes in the specific form of my invention, as herein disclosed, may be made within the scope of what is claimed without departing from the spirit of my invention.

Having described my invention, what I claim as now and desire to protect by Letters Patent is:

1. In a doughnut machine in which the doughnuts are progressed along a way through the flow of the cooking liquid, engaging means disposed below the level of the cooking liquid, means forming a pivot for said engaging means, the axis of said pivot extending in a horizontal direction transversely of the way and intermediate the forward and rearward ends of said means, and means for oscillating said member about said pivot means.

2. In a doughnut machine in which the doughnuts are progressed along a way through the flow of the cooking liquid, a cradle extending transversely of the way, means forming a pivot for said cradle, the axis of said pivot extending across said cradle intermediate the forward and rearward ends thereof and transversely of said way in a substantially horizontal direction, and means for rocking said cradle.

3. In a doughnut machine in which the doughnuts are progressed along a way through the flow of the cooking liquid, a cradle having forward and rearward portions inclining toward the center and extending transversely of the way, means forming a pivot for said cradle, the axis of said pivot extending across said cradle intermediate the forward and rearward portions thereof and transversely of said way in a substantially horizontal direction, said cradle being disposed with the intermediate portion thereof below the level of the cooking liquid, the forward and rearward portions thereof upon rocking of the cradle being adapted to alternately move upwardly and to obstruct the travel of doughnuts along the way, and means for rocking said cradle.

4. In a doughnut machine in which the doughnuts are progressed along a way through the flow of the cooking liquid, a cradle having forward and rearward portions inclining toward the center and extending transversely of the way, means forming a pivot for said cradle disposed intermediate the forward and rearward portions thereof and extending transversely of said way in a substantially horizontal direction, said cradle being disposed with the intermediate portion thereof below the level of the cooking liquid, the forward and rearward portions thereof upon rocking of the cradle being adapted to alternately move upwardly and to obstruct the travel of doughnuts along the way, said forward portion forming a slide along which the doughnuts slide off from the cradle when the cradle is rocked, and means for rocking said cradle.

5. In a doughnut machine in which the doughnuts are progressed along a way through the flow of the cooking liquid, a cradle having forward and rearward portions inclining toward the center and extending transversely of the way, means forming a pivot for said cradle, the axis of said pivot extending across said cradle intermediate the forward and rearward portions thereof and transversely of said way in a substantially horizontal direction, said cradle being disposed with the intermediate portion thereof below the level of the cooking liquid, the forward and rearward portions thereof upon rocking of the cradle being adapted to alternately move upwardly to obstruct the travel of doughnuts along the way, an abutment on the rearward end of said cradle adapted to engage the doughnuts when the rearward end of the cradle is uppermost, and means rocking the cradle.

6. In a doughnut machine in which the doughnuts are progressed along a way through the flow of the cooking liquid, a cradle having forward and rearward portions inclining toward the center and extending transversely of the way, means forming a pivot for said cradle, the axis of said pivot extending across said cradle intermediate the forward and rearward portions thereof and transversely of said way in a substantially horizontal direction, said cradle being disposed with the intermediate portion thereof below the level of the cooking liquid, the forward and rearward portions thereof upon rocking of the cradle being adapted to alternately move upwardly and to obstruct the travel of doughnuts along the way, an abutment on the rearward end of said cradle adapted to engage the doughnuts when the rearward end of the cradle is uppermost, said abutment being arcuate in form and concentric with the axis of said pivot, and means for rocking the cradle.

7. In a doughnut machine in which the doughnuts are progressed along a way through the flow of the cooking liquid, a cradle extending transversely of the way, said cradle having a forward portion, a rearward portion and an intermediate portion, said forward and rearward portions inclining toward the intermediate portion, a pivot for said cradle, the axis of said pivot extending above said intermediate portion and parallel with said forward and rearward portions and said axis extending transversely of the way in a substantially horizontal direction, and means for rocking said cradle.

8. In a doughnut machine having two walls and a bottom and forming a way for the reception of cooking liquid and in which the doughnuts are progressed through the flow of the cooking liquid, a circular pocket in one of said walls, a disc in said pocket, means forming a bearing confined within said wall for supporting said disc for rotation within said pocket, a cradle attached to said disc and projecting transversely of said way, and means for rocking said disc and cradle about the axis of said bearing.

9. In a doughnut machine having two walls and a bottom and forming a way for the reception of cooking liquid and in which the doughnuts are progressed through the flow of the cooking liquid, a circular pocket in one of said walls, a disc in said pocket, means forming a bearing confined within said wall for supporting said disc for rotation within said pocket, a cradle attached to said disc and projecting transversely of said way, an arm projecting outwardly from said disc and a link pivoted to said arm for oscillating said disc about the axis of said bearing to rock said cradle.

10. In a doughnut machine in which the doughnuts are progressed along a way through the flow of the cooking liquid, a cradle extending transversely of the way, said cradle consisting of a number of bars extending in the direction of extent of the way, means forming a pivot for said cradle, the axis of said pivot extending

transversely of said bars and transversely of said way, and means for rocking said cradle.

11. In a doughnut machine having two walls and a bottom and forming a way for the reception of the cooking liquid and in which the doughnuts are progressed through the flow of the cooking liquid, a pocket in one of said walls opening laterally of the wall and into said way, a disc in said pocket closing the same, means forming a bearing confined within said wall and supporting said disc for rotation, doughnut engaging means carried by said disc and projecting transversely of the way, and means for moving said disc about the axis of said bearing to procure operation of said engaging means.

12. In a doughnut machine in which the doughnuts are progressed along a way through the flow of the cooking liquid, a pivoted member having an axis extending in a horizontal direction transversely of the way, two spaced engaging members carried by said pivoted member and disposed one forwardly of the axis thereof and the other rearwardly of the axis thereof, said members being adapted to be alternately moved from positions below the level of the cooking liquid and upwardly to alternately engage the doughnuts and release the doughnuts one at a time and means for oscillating said pivoted member about its axis.

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