No. 820,388. PATENTED MAY 15, 1906.

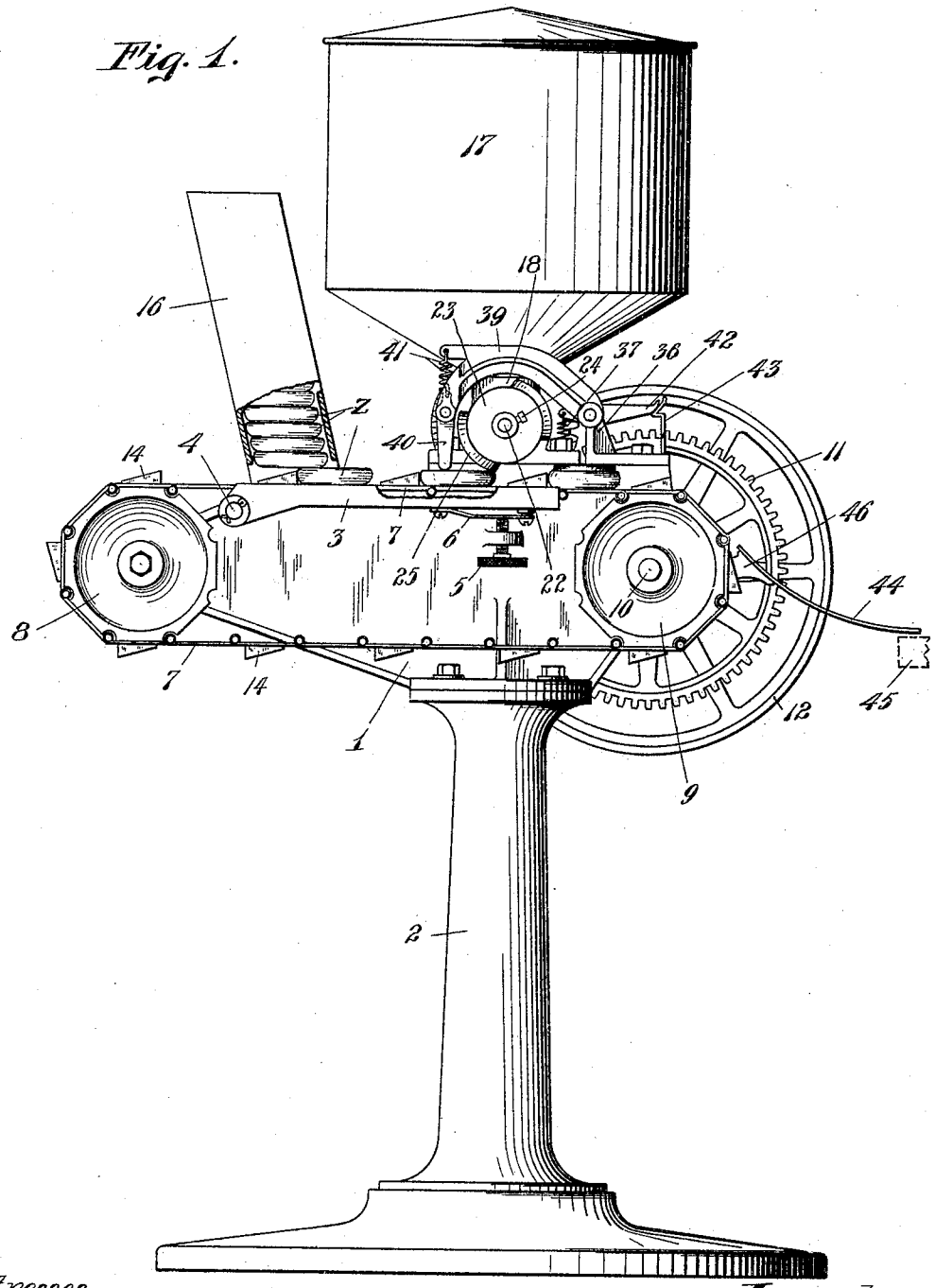
C. W. CARTER.

CAKE ICING MACHINE.

APPLICATION FILED JUNE 9, 1905.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses.

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2 SHEETS—SHEET 2.

Fig. 2.

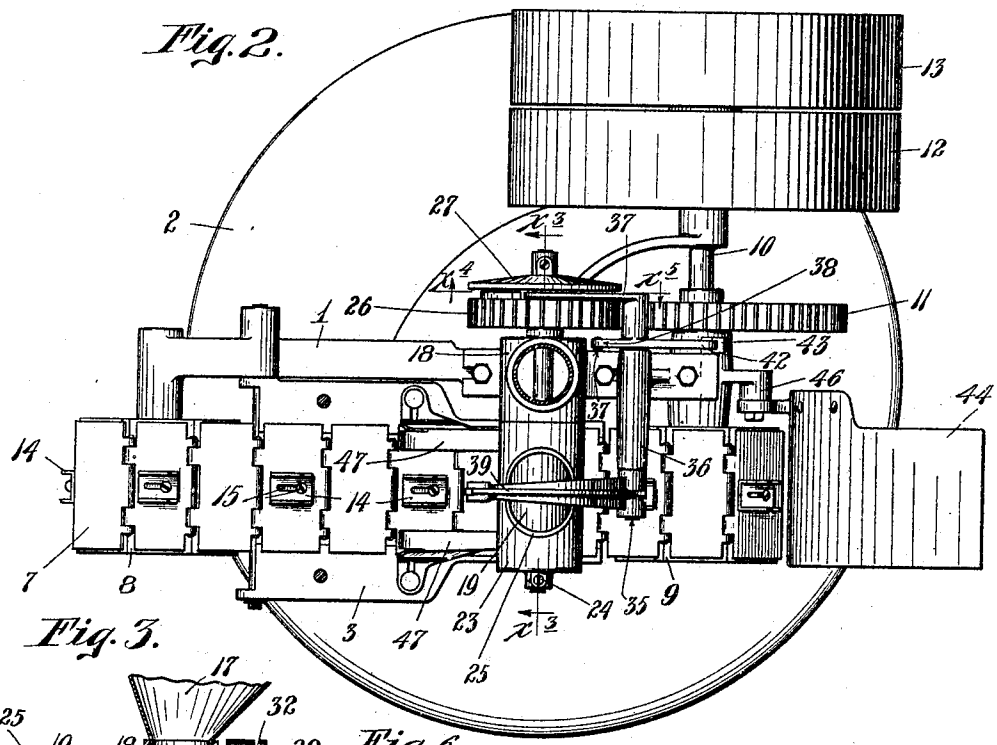


Fig. 3.

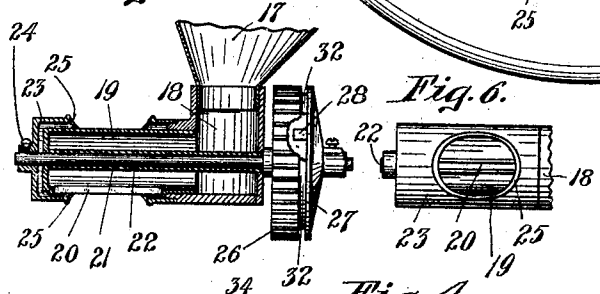


Fig. 6.

Fig. 5.

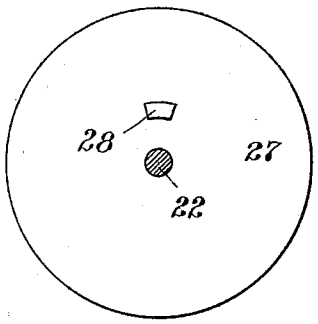
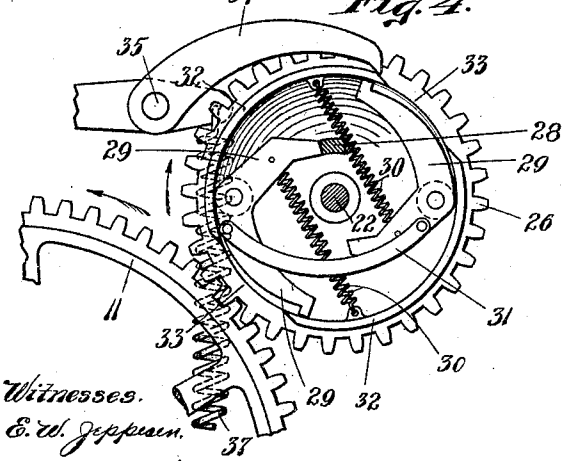


Fig. 4.



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UNITED STATES PATENT OFFICE.

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CAKE-ICING MACHINE.

No. 820,388. Specification of Letters Patent. Patented May 15, 1906.

Application filed June 9, 1905. Serial No. 264,407.

To all whom it may concern:

Be it known that I, CLARENCE W. CARTER, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Cake-Icing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to machines for molding icing, frosting, or other semifluid or semiplastic material on cakes, cookies, and the like, and has for its object to improve the construction and operation of such machines in the several particulars hereinafter noted.

The invention consists of the novel devices and combinations of devices hereinafter described, and defined in the claims.

As a general outline of the machine illustrated in the drawings and hereinafter more specifically described the following general statements are made. The cakes are placed in a magazine and the icing or frosting is placed in a supply-hopper. This supply-hopper has a delivery-tube that is provided with a horizontally-disposed discharge-slit, through which the icing is discharged onto the cake. Working on this delivery-tube and operating as a valve to intermittently open and close the discharge-slit of said delivery-sleeve is a rotary sleeve-like die having one or more die-openings that deliver the icing onto the cakes and give form thereto. The cakes are fed from the magazine to the die by means of an endless conveyer.

The improved die constitutes one of the broadly new features of my present invention.

As another broadly new feature I provide automatic means for controlling the action of the die or devices for applying icing or similar material to the cakes or similar articles. This automatic controlling mechanism, in what I believe to be the best form of the machine, involves a clutch in the die-driving mechanism, a trip device for intermittently throwing the clutch out of action to stop the die whenever a cake is omitted from its proper place on the conveyer, and an "intercepting" device, so called, for preventing the trip device from throwing the clutch out of action and stopping the die as long as the cakes are found in proper position on the conveyer.

The above statements indicate briefly a machine which has been constructed and put into actual use and which machine is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Referring to the drawings, Figure 1 is a view in side elevation, showing the improved machine, some parts thereof being broken away. Fig. 2 is a view of the machine, chiefly in plan, but with some parts sectioned and others removed. Fig. 3 is a detail in vertical section, taken on the line x^3 x^3 of Fig. 2. Figs. 4 and 5 are views chiefly in elevation, some parts being sectioned on the line x^4 x^5 of Fig. 2, the parts shown in Fig. 4 being viewed in the direction indicated by the arrow marked on the said sectioned line at the left and the parts shown in Fig. 5 being viewed in the direction of the arrow marked at the right; and Fig. 6 is a bottom plan view of the so-called "rotary" die and showing also the interior delivery-tube.

The running parts of the machine are mounted on the horizontally-extended head portion 1 of a pedestal 2. A short feed-table 3 is pivotally connected at one end to a horizontally-extended stud 4, secured at one end to a lug on the head 1. The free and inner end of this table 3 is yieldingly supported, preferably by means of an adjusting-screw 5, that works through a lug on one side of said head 1 and engages the intermediate portion of a leaf-spring 6, secured to the bottom of said table, as best shown in Fig. 1.

The table 3 is provided in its upper face with a shallow longitudinally-extended groove, through which works an endless feed-belt 7, made up of flat pivotally-connected metallic plates. This feed-belt is mounted to run over sprocket-like wheels 8 and 9, both of which are journaled on the pedestal-head 1 and the latter of which is provided with a shaft 10, that is provided with a spur-gear 11, with a fixed pulley 12 and a loose pulley 13. On certain of the plates of the feed-belt 7 are push-lugs 14, that are preferably made adjustable by a slot-and-screw connection 15.

The cakes (indicated by the character Z)

are supplied to the feed-belt 7 from an upright magazine 16, that is rigidly supported at its sides from the feed-table 3, and the front and rear walls of which are terminated above said feed-belt and the table 3 far enough to permit but one cake at a time to be fed from the magazine by the push-lugs 14 of said feed-belt.

The hopper, which contains the supply of icing in semifluid or semiplastic condition, is indicated by the numeral 17 and is supported in working position by an "elbow-tube" 18, which in turn is rigidly supported from the pedestal-head 1. The contracted neck at the bottom of the hopper 17 discharges directly into the upturned branch of this elbow-tube, and the other branch of said tube projects horizontally and extends above the feed-table 3. To the said horizontally-extended branch of the elbow-tube 18 is rigidly secured the slit delivery-tube 19, which tube is provided at its lower portion with a longitudinally-extended discharge slit or orifice 20. The outer end of this sleeve 19 is closed, and the said sleeve is provided with a small axially-extended tubular core 21, that affords a closed bearing for a shaft 22.

The rotary sleeve-like die 23 is closed at its outer end, surrounds the non-rotary delivery-sleeve 19, is spaced apart therefrom slightly, and is journaled at its inner end on a horizontally-projected branch of the elbow-tube 18. The outer end of this rotary die 23 is rigidly connected by a set-screw 24 or other device to the forwardly-projecting end of the shaft 22, and hence of course rotates with said shaft. The discharge-slit 20 of the delivery-sleeve 19 is provided with a marginal flange that has close engagement with the interior of said rotary die 23. As shown, this rotary die 23 is provided with diametrically opposite peripheral die-openings 25, through which the icing will be discharged and by which it will be given form on the face of the cake or other article to be iced. These die-openings 25 are also preferably formed with external marginal ribs that engage directly with the cakes or cookies in the icing action.

The gear 11 on the drive-shaft 10 meshes with a smaller gear 26, that is loosely journaled on the rear end of the die-carrying shaft 22. Rigidly secured on the rear end of the said shaft 22, adjacent to the gear 26, is a disk 27, that is provided with a clutch-lug 28 on its inner face. (See Figs. 3 and 4.) A pair of clutch-dogs 29 are pivotally mounted on and carried by the gear 26 and are normally held in operative positions with their inner ends in position to engage the clutch-lug 28 of the disk 27 by means of springs 30, which springs are laterally offset out of the plane of said lug 28. One of these driving-dogs is all that would be necessary if but a single die-opening were provided in the rotary die; but the use of two dogs is necessary when two such die-openings are provided. These two dogs are connected for common movements by means of a link 31. The gear 26, adjacent to the disk 27, is provided with laterally-projecting segmental trip-detaining flanges 32, that are spaced apart to form diametrically opposite gaps 33.

The clutch-tripping device preferably involves a trip 34, secured to a rock-shaft 35, that is mounted in a bearing 36, rigidly secured to the pedestal-head 1, as shown in Figs. 1 and 2. The free end of the trip-arm 34 rides upon the detaining-flanges 32 under the tension of a quite strong coiled spring 37, attached to a short arm 38 on the rock-shaft 35 and to the pedestal-head 1 or part rigid thereon. Rigidly secured to the forward end of the rock-shaft 35 and overlying the feed-belt 7 and the rotary die 23, with its free end projecting forward of the latter, is the trip-intercepting arm 39. To the free end of said arm 39 is pivoted a yielding finger 40, that is yieldingly held in a vertical position by a light coiled spring 41, attached to the said finger above its end to an overlying lug on the arm 39.

The finger 40 stands in position to be engaged with the cakes in succession and at times just before the particular cake is brought into position for icing—that is, into contact with a flanged die-opening of the rotary die—and at a time just before the said die begins to open up the discharge-slit 20 of the delivery-tube 19.

The numeral 42 indicates an arm that projects outward from the rock-shaft 35 and is adapted to be engaged by a spring-latch 43 on the bearing 36, when it is desired to throw the intercepting-arm out of action.

The numeral 44 indicates an inclined discharge-plate, which stands in position to receive the iced cakes from the feed-belt 7 and to deliver the same onto the table or support. (Shown in part by dotted lines in Fig. 1 and designated by the numeral 45.) As shown, this plate 44 is pivoted to a bearing-lug 46 on the pedestal-head 1. 47 are cooky-guides adjustably secured on the feed-table 3.

The machine may be driven from a power-driven belt. (Not shown, but which would be arranged to run over the pulleys 12 and 13.) As is evident, the machine may be thrown into action by running the belt onto the fixed pulley 12 and may be thrown out of action by running the belt onto the loose pulley 13.

Normally, or when the trip-arm 34 is held out of action by the segmental detaining-flanges 32, one or the other of the clutch-dogs 29 will engage the clutch-lug 28 of the disk 27 and the rotary die 23 will be positively driven. The endless feed-belt 7 will of course be kept under continuous motion as long as the driving-belt is running on the fixed pulley 12. Under each rotation of the gear 26 each of

the gaps 33 will be brought into line with the free end of the trip-arm 34, and each time this occurs the free end of said trip-arm (unless the said arm is restrained or held back by the intercepting device) will engage with one of the clutch-dogs 29, force the outer arm thereof inward, trip the inner arm of said dog out of engagement with the clutch-lug 28 of the disk 27, and thus leave the rotary die 23 standing still in a position in which it will close the discharge-slit 20 of the delivery-tube 19. This tripping action will always take place whenever a cake is not found in proper position under the finger 40 of the intercepting-arm 39, because there is then nothing to prevent the downward movement of said intercepting-arm 39 and the trip-arm 34 under the tension of the spring 37. When, however, there is a cake or cooky in proper place on the feed-belt under the finger 40 and one of the segmental detaining-flanges 32 runs out from under the free end of the trip-arm 34, there will be only a very slight downward movement of the free end of said trip-arm and of said intercepting-arm, not sufficient to bring the free end of said trip-arm into action on the underlying clutch-dog, and hence the clutch will remain in action, and the rotary die will continue its rotary movement and apply the icing to the cake.

The purpose of yieldingly mounting the finger 40 is to permit the same to travel slightly while in engagement with a cake or cooky.

From what has been said it will be seen that whenever a cake or cooky is omitted on the feed-belt in position for application thereto of the icing the rotary die or icing-applying device will be thrown out of action, will remain out of action as long as there are no cakes on the feed-belt in proper position for icing, but will be immediately started into action by the first cake or cooky that happens to be in proper position on the feed-belt. This device is therefore perfectly automatic in all of its actions, both as to throwing the die into action and out of action. The machine consequently requires but little attention, and there is no danger of spilling or wasting the icing material.

It will be seen that the rotary die applies the icing to the cake under a rolling action as distinguished from a direct stamping action, and it will also be noted that the cake which is being iced and the die-opening of the rotary die move at the same speed and without slipping of the one with respect to the other. It will also be noted that in applying the icing to the cake that the die-opening of the rotary die gradually opens up and gradually closes the discharge-slit of the non-rotary delivery-tube, so that the icing is applied to the cake with an action which is very much like that of a wide and narrow brush passing laterally over the perforations of a stencil or perforated plate. This device therefore overcomes the difficulty experienced in separating the cakes or cookies from the die, which is due to suction in devices wherein the icing is applied with a direct stamping action.

The purpose of the springs 6 is to permit of slight depression of the feed-table 3 to compensate for varying thickness of the cakes or cookies that are being iced and to keep the same always pressed tightly against the flanged die-opening of the rotary die without crushing or breaking said cakes.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. In an icing-machine, a rotary die having a peripheral die-opening and arranged to apply the icing to the cake, with a rolling action, substantially as described.

2. In an icing-machine, the combination with means for supplying the icing, of a rotary die having a peripheral discharge-opening and arranged to open and close the discharge-orifice for the icing, and to apply the icing to the cakes, with a rolling action, substantially as described.

3. In an icing-machine, the combination with means for feeding the cakes, of means for supplying the icing, and a rotary die having a peripheral discharge-opening and arranged to open and close the discharge-orifice for the icing, and to apply the said icing to the cakes, substantially as described.

4. The combination with cake-supplying means and die mechanism for applying icing to the cakes, of means operating to automatically stop the action of said die mechanism whenever a cake is omitted from proper ism into action, whenever a cake is again in position, and to again throw said die mechanproper position, substantially as described.

5. The combination with cake-supplying means, of means for automatically stopping the action of said die mechanism whenever a cake is omitted from proper position, and without stopping said cake-supplying means, substantially as described.

6. In an icing-machine, the combination with die mechanism, of a receptacle for the icing having a delivery-passage extending to said die, and means for automatically stopping said die whenever a cake is omitted from proper position, substantially as described.

7. The combination with a conveyer for the cakes, of die mechanism for applying icing to the cakes, and an automatic controller for said die mechanism, arranged to trip said die out of action, when a cake is omitted from its proper position on said conveyer, and to again throw said die mechanism into action, whenever a cake is again in proper position on the conveyer, substantially as described.

8. In an icing-machine, the combination with a rotary die and a coöperating deliv-

ery-tube, the former being mounted on the latter and operating to apply the icing to the cakes, substantially as described.

9. The combination with a conveyer for the cakes to be iced, of a rotary die and coöperating delivery-tube, the former being mounted on the latter and operating to apply the icing to the cakes while the same are being moved by said conveyer, and means for supplying the icing to said delivery-tube, substantially as described.

10. The combination with a conveyer for the cakes to be iced, of a rotary sleeve-like die and a coöperating delivery-tube, the former being mounted on the latter, and means for supplying the icing to said delivery-tube, substantially as described.

11. The combination with a supply-hopper for the icing having a slit delivery-tube, of a sleeve-like die rotatively mounted on said delivery-tube and operating to open and close the discharge-slit thereof and to apply the icing to the cakes, a drive for said sleeve involving a clutch, an intermittently-released trip for said clutch, and a trip-intercepting device, arranged to act on the cakes as they are presented to said die, substantially as described.

12. The combination with a conveyer for the cakes, of a supply-hopper for the icing, having a slit delivery-tube, a sleeve-like die rotatively mounted on the said delivery-tube and operating to open and close the discharge-slit thereof and to apply the icing to the cakes, a drive for said sleeve, involving a clutch, an intermittently-released trip for said clutch, and a trip-intercepting device, arranged for action on the cakes, as they are brought to the said die, by said conveyer, substantially as described.

13. The combination with a conveyer for the cakes to be iced, of a supply-hopper for the icing, having a slit delivery-tube, a sleeve-like die rotatively mounted on the said delivery-tube and operating to intermittently open and close the discharge-slit of said delivery-tube and to apply the icing to the cakes, a drive for said rotary die involving a clutch, a trip for said clutch, a trip-detainer, operating to intermittently release said trip, and a trip-intercepting device arranged to act upon the cakes as they are delivered to said die, substantially as described.

14. The combination with a conveyer for cakes to be iced, of a slit delivery-tube for the icing, a sleeve-like die rotatively mounted on said delivery-tube, a drive for said sleeve involving a clutch, an intermittently-released trip for action on said clutch, and a trip-intercepting device, holding said trip out of action, when a cake is in proper position on the said conveyer, for icing, but permitting said trip to throw said clutch out of action, when the cake is not in proper position for icing, substantially as described.

15. The combination with a magazine for the cakes, of a hopper for the icing, said hopper having a slit delivery-tube, a sleeve-like die rotatively mounted on said delivery-tube, a feed-belt for feeding the cakes one at a time from said magazine to said die, a trip for said rotary die, and means under the control of the cakes on the said conveyer, for throwing said die out of action whenever a cake is omitted from proper position on said feed-belt, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

CLARENCE W. CARTER.

Witnesses:

H. M. RENSHAW,

F. D. MERCHANT.