

Sept. 27, 1932.

O. KREMMLING

1,879,327

PROCESS AND APPARATUS FOR EXPRESSING BAKERS' MATERIAL

Original Filed April 22, 1929. 2 Sheets-Sheet 1

Fig. 1.

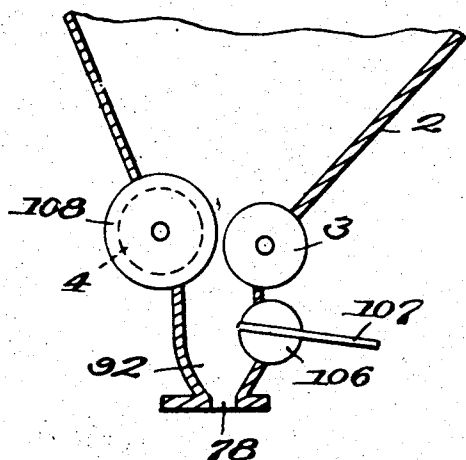


Fig. 2.

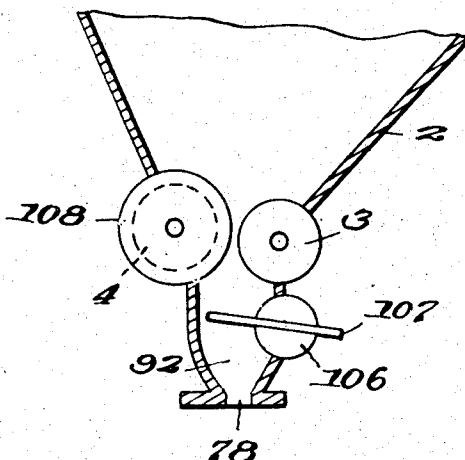


Fig. 3.

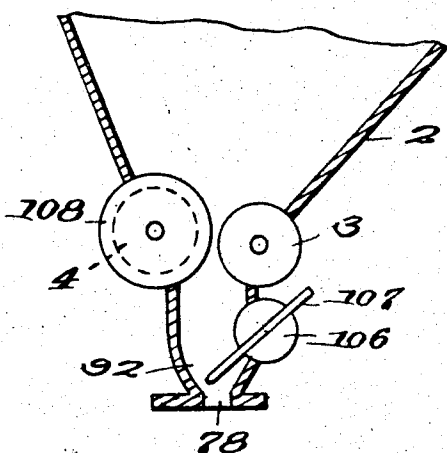
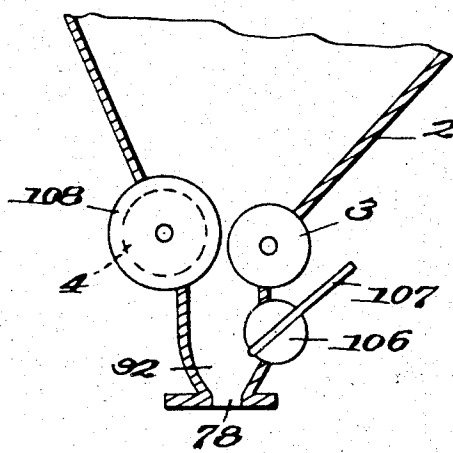


Fig. 4.



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Fig. 5.

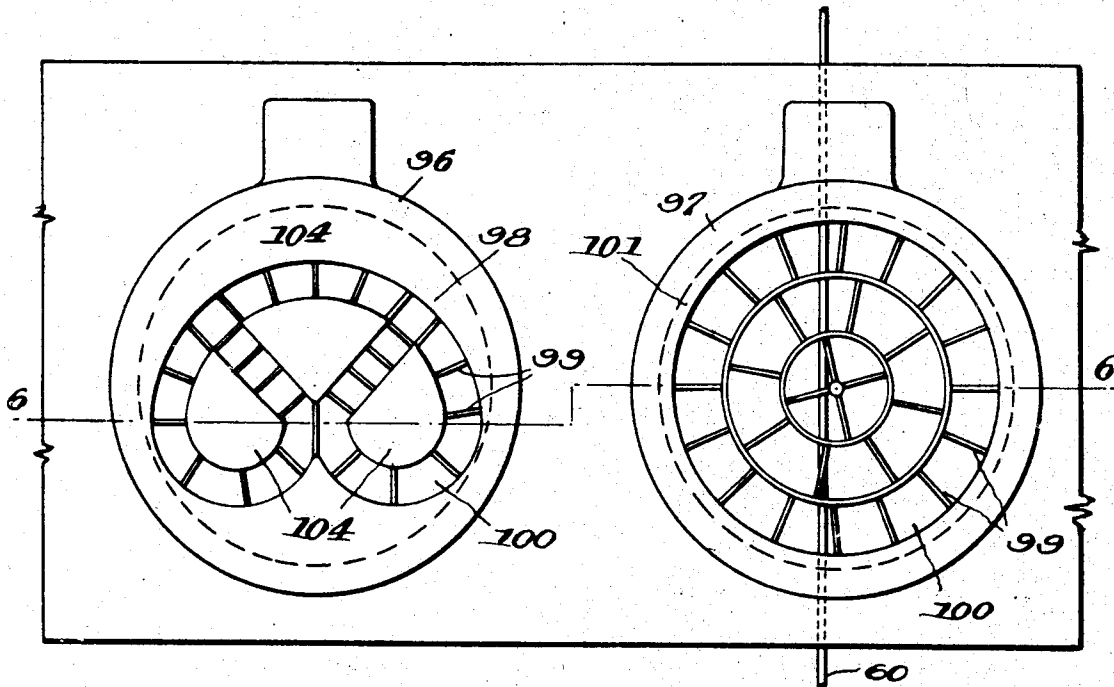


Fig. 6.

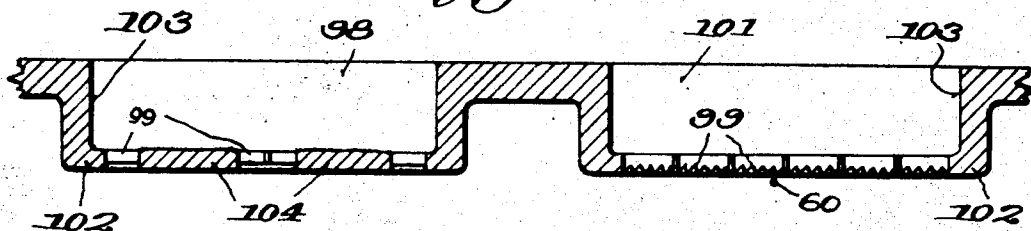
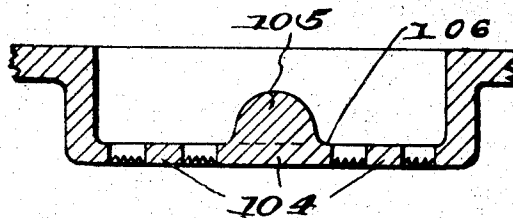


Fig. 7.



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PROCESS AND APPARATUS FOR EXPRESSING BAKERS' MATERIAL

Original application filed April 22, 1929, Serial No. 357,301, and in Germany June 16, 1926. Divided and this application filed July 9, 1930. Serial No. 466,829.

This invention relates to an apparatus for pressing out quantities of bakers' material of the consistency of icing, dough or pasty material through a nozzle. The invention includes smooth rollers which convey the material from a hopper into a small discharge chamber, and a plate slidable in a rotatable spindle for controlling communication between the hopper and the chamber. The material is then forced through outlet openings of a peculiar shape and structure onto a conveyor, the forcing being accomplished in such a way as to affect the delicate materials as little as possible.

This application is a division of my application S. N. 357,301, filed April 22, 1929. This application relates more particularly to that form of the invention in which the nozzles do not move, but are themselves shaped to give shape to the articles manufactured. The primary purpose of the invention is to provide nozzles through which material may be pressed out, the nozzles being so arranged that the shape is well preserved and that the thickness is uniform. More specifically, a template is provided crossed by a number of fine wires or supporting and division plates which act to preserve the shape of a large piece.

Another object of the invention is to provide a plate slidably mounted in a rotatable spindle, the spindle being located wholly out of vertical alignment with the nozzle, so that the baker's material is pressed out of the chamber in the same direction in which it enters the chamber, so that the material is compressed and intermixed as little as possible. By this method the material, especially if light and fluffy, retains its nature much more consistently than if it is forced through a curved or tortuous path.

Other objects and advantages will appear from the following description when taken in conjunction with the accompanying drawings which form a part thereof.

In the drawings:

Figs. 1 to 4 are vertical cross sections of the mechanism for expelling the material.

Fig. 5 is a bottom plan view of the nozzles.

Fig. 6 is a cross section on the line 6—6 of Fig. 5.

Fig. 7 is a cross section of a modified form of nozzle.

In Figs. 1 to 4, the hopper into which the material is fed is indicated at 2. In the lower portion of the hopper are feed rolls 3, 4, which rotate inwardly to feed the material into the lower or expression chamber 92. In one wall of the chamber is a rotatable spindle 106 in which is slidably mounted a blade 107. This blade is operated by any suitable mechanism, for example that shown in the patent to Copland, No. 1,657,457, through the various positions shown in Figs. 1 to 4, to express material through opening 78 in which the nozzle is arranged.

In Fig. 1, the blade is shown at the beginning of the operation. The blade moves outward into the chamber (Fig. 2) to cut off the desired amount of material from that in the hopper. The spindle then rotates (Fig. 3) to push the material out of the chamber 92. The blade is then withdrawn into the spindle (Fig. 4) and the spindle is restored to its original position. By repetition of these steps successive equal amounts of material are expressed.

An edge disk 108 is provided at each end of one of the feed rolls. This closes the ends of the space between the feed rolls. The opening 78 is directly below the space between the rolls, and the spindle is set in one side of the chamber and is wholly out of vertical alignment with the opening. In this way the material is expressed from the chamber in the same direction as that in which it enters the chamber, thus damaging the sensitive material as little as possible.

Figs. 5 to 7 show the novel form of nozzles. Fig. 5 shows a nozzle plate having two outlets made according to the present invention. The left hand opening, or template, 96 is intended for the manufacture of a paste or dough pretzel, while the right hand opening 97 forms an approximately round cake, the so-called "stone pavement". The expression opening 98 of the template 96 is subdivided, and the inner solid portions are supported, by narrow supporting and division

plates 99 into compartments 100. This construction is also adopted in the right hand opening, except that there are no solid portions and the compartments 100 fill the whole space 101. The dough introduced into the template is thus divided during expression into small pieces which, after passing the plates, will recombine on account of the swelling of the dough and the pressure of the cutting wire.

A cutting wire 60 or blade is passed beneath the nozzles when the proper amount has been extruded so as to cut off a piece of uniform thickness. The bridges 99 divide the dough into a number of closely adjacent portions as it passes through the die. The knife or wire cuts these portions at a point slightly below, but spaced from, the lower edges of the plates. The plates act to support the divided portions of dough individually against the pressure of the cutting wire, so that the usual distortion of the whole piece is reduced to a considerable extent and the thickness and shape of the piece is thus kept almost uniform throughout the whole piece. The edges of the bridges are set back from the bottom of the die, and therefore from the plane of action of the cutting wire, so that the pieces will not be cut off individually. This may be accomplished either by setting back the whole edge or by making the bridges with teeth or serrate as shown in Fig. 7. The slight space between the bridges and the cutting wire permits the individual pieces to reunite to some extent because of the natural swelling of the dough, and the cutting wire also presses together the pieces so that they will be set down on the receiving tray in a coherent state, as a single unitary article. In this way, large pieces expressed from a die may be cut off without variations in shape or thickness.

Preferably, an edge or flange 102 is provided around the openings projecting as far as possible toward the inner walls 103. The result of this is that the dough is subjected to substantially the same friction at all points of the opening. This causes less sticking, and there is less internal friction which would destroy the pores and make the dough unfit for baking.

The thickness of the core pieces 104 and of the flanges 102 is made as small as possible to reduce friction and to ensure a uniform expression of all the small sections of dough. Vertical or oblique walls extending the whole height of the mold and directly upward from the edges of the openings would produce considerable friction which would damage the dough and prevent uniform thickness. The core pieces may, however, be arched as at 105, Fig. 7. In this case, a flange 106 is left around the arched portion.

Having described one embodiment of my invention, I wish it to be understood that I

do not intend to limit myself thereby except within the scope of the appended claims.

I claim:

1. A die for apparatus for expressing and shaping bakers' material, said die having an opening in the bottom, and a plurality of spaced supporting and division plates across the said opening to support the material expressed through said opening to preserve the shape thereof against a cutting action, the lower edges of said plates being close to but slightly spaced from the lower side of said bottom.

2. A die for apparatus for expressing and shaping bakers' material, said die having an opening in the bottom, and a plurality of spaced supporting and division plates across the said opening to support the material expressed through said opening to preserve the shape thereof against a cutting action, portions of the lower edges of said plates being close to but slightly spaced from the lower side of said bottom.

3. A die for apparatus for expressing and shaping bakers' material, said die having an opening in the bottom, and a plurality of spaced supporting and division plates across the said opening to support the material expressed through said opening to preserve the shape thereof against a cutting action, the lower edges of said plates being serrate.

4. In an apparatus for shaping articles of bakers' material, a die comprising a thin plate having an opening therein, and supporting and dividing bridges across said opening, every part of said bridges lying between the planes of the top and bottom surfaces of said plate, said bridges dividing the material into a plurality of closely adjacent portions as it is expressed therethrough and supporting said portions individually against a cutting action, the lower edges of said bridges being close to but at least in part slightly spaced from the plane of the lower surface of said plate.

5. In an apparatus for making articles of bakers' material having means for expressing said material and a moving wire for cutting off said expressed material, a nozzle through which the material is expressed, said nozzle having a discharge opening and a plurality of thin supporting and division plates across said opening, the lower edges of said plates being close to the plane of movement of said cutting wire but spaced therefrom by a distance sufficient to permit partial reuniting of the dough, said plates dividing the material into a plurality of closely adjacent portions and supporting said portions individually against the action of the cutting wire.

6. Apparatus for forming articles of bakers' material comprising a container, a spindle rotatably mounted in the wall of said container, a slide adjustable in said spindle and adapted to cut off a portion of the material

and to express it from said container, said container having a bottom and an opening in said bottom, the said spindle lying entirely out of vertical alignment with any portion of said opening, said opening having a plurality of spaced supporting and division plates thereacross to divide the material expressed through said opening into a plurality of closely adjacent portions and to support said portions individually against a cutting action, the lower edges of said plates being close to but slightly spaced from the lower side of said bottom.

7. In a process of shaping articles of delicate bakers' material, the steps of dividing a mass of the material of the desired shape in cross section while in motion into a plurality of closely adjacent parts and while preserving said parts for a certain part of their path in divided relation simultaneously supporting said parts individually, then at a later stage of said path permitting said parts to reunite, cutting said mass transversely through the parts at a point close to but slightly spaced from the point at which the parts are permitted to reunite so that the parts are still supported individually against the transverse force of the cutting action, and are cut after they have reunited to some extent because of the natural swelling of the material, the cutting force aiding in the reuniting of said portions.

8. The method of shaping articles of delicate bakers' material which consists in expressing said material through a large die opening of the required shape, dividing said material at a point near but slightly spaced inwardly from the outer end of the die into a plurality of closely adjacent portions and simultaneously supporting them individually, cutting said portions transversely at a place spaced slightly from the outer end of the die opening so that the portions are still supported individually against transverse force of the cutting action and after they have reunited to some extent because of the natural swelling of the material, the cutting force aiding in the reuniting of said portions.

In testimony whereof I have hereunto set my signature.

OTTO KREMMLING.