

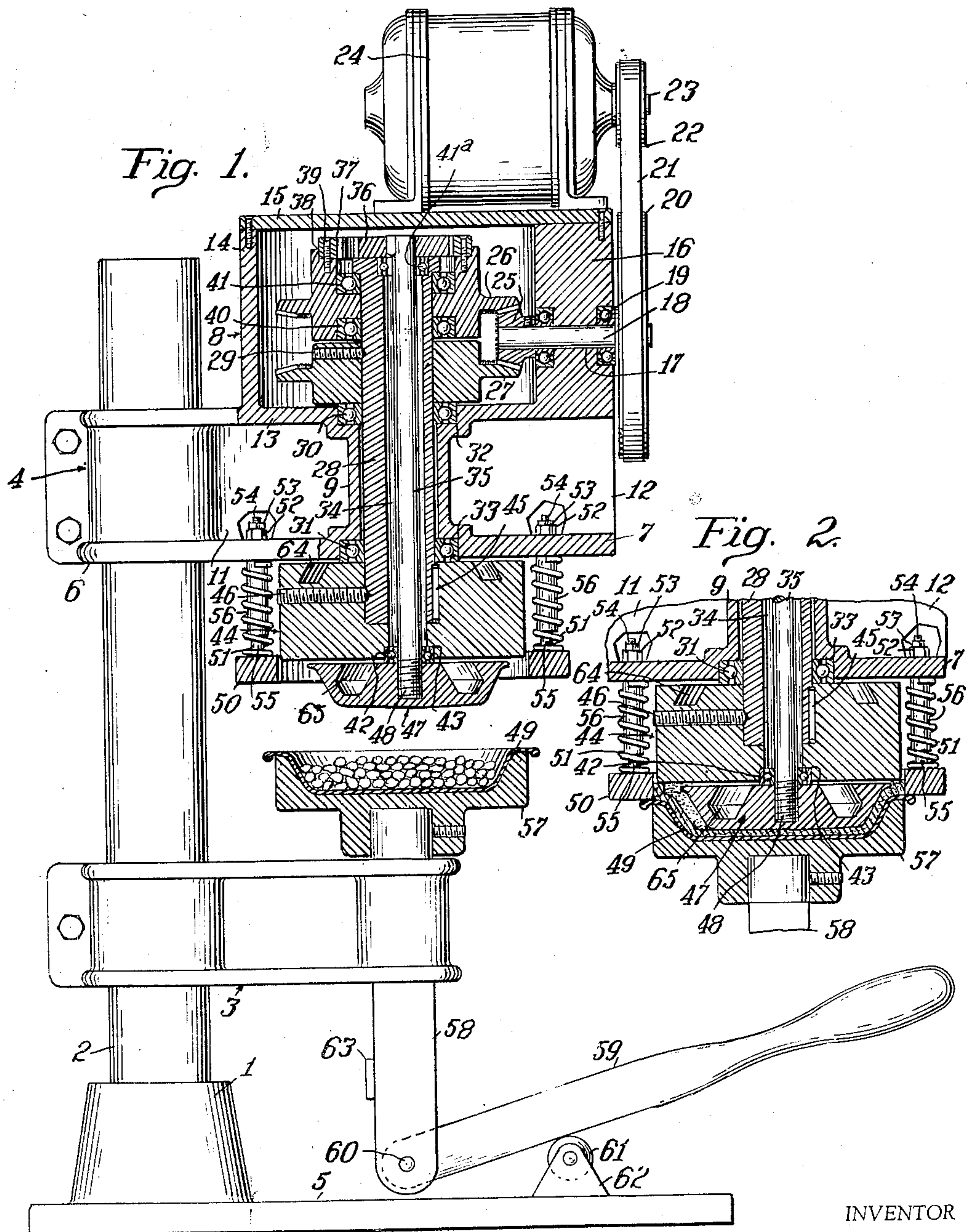
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PASTRY FORMING MACHINE

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## PASTRY FORMING MACHINE

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16 Claims. (Cl. 107—15)

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This invention relates to an improved apparatus for forming pastry pie shells and the like.

An object of this invention is to provide a simple, inexpensive, compact and durable machine for the rapid and economical production of pastry shells.

Another object is to provide a machine having means for forming or molding pastry to exact dimensions within a pie plate or form, thereby eliminating trimming, and combining the process of sheeting, stamping, molding and rimming into a simple, speedy operation.

A further object of the invention is to provide a machine to accomplish the above objects without undue punishment of or injury to the product, which will be equal to or better and more sanitary than hand formed pastry.

With the above and other objects in view, the invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings and pointed out in the claims hereto appended, it being understood that various changes in the form, proportions, and minor details of construction, within the scope of the claims, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings:

Fig. 1 is a side elevation of a pastry forming machine, partly in section, illustrating the preferred form of the invention;

Fig. 2 is a sectional view of the forming elements showing formed pastry.

In the accompanying drawings 1 designates a pedestal which supports in a rigid vertical position a standard 2 to which are adjustably clamped lower and upper brackets 3 and 4. The pedestal 1 and vertical standard 2, which may be constructed of any suitable material, are preferably in the form of a casting and are supported upon a suitable base 5 which may conveniently be formed integral with the pedestal, but any other desired material may be employed in the formation of the supporting base.

The upper clamping bracket preferably consists of a casting comprising a clamp 6 adjustably engaging the vertical standard 2, a lower horizontal plate or portion 7, an upper cylindrical housing 8 and a connecting vertically disposed sleeve 9. The bracket is also preferably provided with vertical radially disposed reinforcing webs 11 and 12 extending outwardly from the vertical sleeve 9 and preferably formed integrally with

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the same and with the lower plate or portion 7, the upper housing 8 and the clamp 6.

The reinforcing means of the upper bracket may be varied, as will be readily understood, and the substantially cylindrical housing 8, which may be varied in form, consists of a horizontal bottom wall 13 and a vertical circumferentially arranged wall 14 and is open at the top and provided with a removable horizontal cover plate 15 detachably secured to the housing 8 which houses the gearing, hereinafter described, for actuating the pastry forming elements. The wall 14 of the housing 8 is thickened at one side at 16 and is provided with a horizontal bore 17 through which passes a horizontal shaft 18 journaled in suitable bearings 19 which are preferably of the sealed ball bearing type.

The horizontal shaft 18 has fixedly mounted on it a pulley 20 which is connected by a belt 21, preferably of the V-type, with a pulley 22 fixedly mounted on the projecting outer portion of the shaft 23 of an electric motor 24 which is mounted upon the housing cover 15. The inner portion of the horizontal shaft projects interiorly of the housing 8 and has keyed or otherwise fixedly secured to it a pinion 25 located between and meshing with upper and lower horizontal gear wheels 26 and 27 which, when the horizontal shaft is rotated, are driven in opposite directions. The lower horizontal gear wheel 27 is fixedly mounted on a hollow vertical spindle 28 by an Allen set screw 29, but any other suitable means may, of course, be employed for this purpose. The hollow spindle 28 is journaled in upper and lower bearings 30 and 31, preferably of the sealed ball bearing type, located within annular recesses 32 and 33 located at the ends of the vertical sleeve 9.

The hollow spindle is provided with an eccentrically arranged vertical longitudinal bore or opening 34 through which passes a vertical shaft 35 to the upper end of which is keyed a horizontal spur gear 36 which meshes with the teeth of an internal gear 37 having a diameter greater than the diameter of the gear wheel 36 and mounted on the upper horizontal gear 26, preferably by being arranged in an interior annular recess 38 and fixedly secured to the same by screws 39, but the internal gear may be constructed in any other desired manner, as will be readily understood, so long as it is fixed to the horizontal gear 26 for rotation therewith. The horizontal gear wheel 26 is journaled on the hollow spindle at the upper end portion thereof, preferably by spaced upper and lower bearings 40



and 41 which may be of the sealed ball bearing type.

The lower portion of the pinion 25 which meshes with the lower gear wheel 27, drives the spindle in one direction while the upper portion of the pinion 25 which meshes with the upper gear wheel 26 rotates the vertical shaft 35 in the opposite direction and the bore or opening 34 is of sufficient diameter to accommodate the vertical shaft 35 which is arranged within the hollow spindle eccentrically with relation to the axis of rotation of the spindle. The upper end of the vertical shaft is journaled in bearings 41<sup>a</sup> at the upper end of the spindle and in lower bearings 42 in a bore or opening 43 of an inertia or flywheel 44 fixedly secured to the lower end of the spindle 28 by a key 45 and an Allen set screw 46. The bearings 41<sup>a</sup> and 42, which are preferably of the sealed ball bearing type, rotatably mount the vertical shaft 35 eccentrically with relation to the axis of the spindle 28. The inertia wheel 44 is concentric with relation to the axis of rotation of the spindle 28.

A forming roller 47 is attached to the lower end of the shaft 35 by left hand screw threads 48 with its top horizontal surface positioned closely adjacent to the lower horizontal surface of the inertia wheel 44. The particular arrangement of the gears and shafts causes the inertia wheel 44 and forming roller 47 to rotate in opposite directions and at the same time produces an eccentric motion of the forming roller 47. The forming roller 47 has its lower surface conforming to the configuration of the interior and upper surfaces of a pie plate 49 and is of a diameter approximately one-half inch less than that of the pie plate 49. The inertia wheel operates above the pie plate and adjacent to the periphery of the inertia wheel 44 and extending below the same is a pie plate clamping ring 50 arranged horizontally and having an interior diameter slightly greater than the circumference of the inertia wheel and sufficient to permit rotation of the concentrically mounted inertia wheel within the pie plate clamping ring. The pie plate clamping ring 50, which is mounted for vertical movement, is spring loaded and is urged downwardly by compression springs 51. The downward movement of the clamping ring is limited by adjusting and locking nuts 52 and 53 mounted on the threaded upper ends 54 of rods 55 rigidly secured to the clamping ring and slidable through the lower portion 7 of the upper bracket 4. The rods 55 extend through guide tubes 56 rigid with and depending from said lower portion 7 of the upper bracket and the springs are disposed on the guide tubes and are interposed between the lower portion 7 of the bearing bracket and the upper face of the clamping ring.

The pie plate 49 containing the required amount of pastry dough received from a mixer (not shown) is placed in a plate holder 57 which is formed to fit the plate 49 snugly and is concentric with the axis of the inertia wheel 44 and the clamping ring 50. The plate holder 57 is positioned a predetermined distance below the forming roller 47 and is rigidly mounted on the upper end of a rod 58 which is slidably supported by the lower clamping bracket 3. An approximately horizontally disposed operating lever 59 is pivoted at its inner end at 60 to the lower end of the vertically slidable rod 58 and at an intermediate point it rests upon a fulcrum roller 61 and is provided at its outer end with a handle or grip. The fulcrum roller 61 is journaled in a suitable

bearing bracket 62 which extends upwardly from the base 5. As the free outer handle end of the lever 59 is forced downwardly it causes the rod 58 to rise, bringing the rim of the plate 49 into contact with the clamping ring 50 and the contents of the plate into contact with the rotating forming elements consisting of said inertia wheel 44 and the eccentrically mounted rotary forming roller 47.

The clamping ring 50 rises with the plate 49 until a stop 63 properly positioned on the rod 58 contacts the lower clamping bracket. The thickness of the pastry shell or pie crust is regulated by the stop 63 which maintains a space of approximately  $\frac{1}{8}$  of an inch between the inertia wheel 44, forming roller 47, and the plate 49. The shell is formed by pressure and the rolling action of the forming roller which rolls the pastry dough against the interior of the plate 49. The rim of the pastry shell or pie crust is formed against the peripheral portion of the lower horizontal face of the inertia wheel and the inner cylindrical face of the clamping ring which confines the dough on the peripheral portion of the pie plate.

The eccentric motion of the forming roller 47 maintains an air space between said roller thereby eliminating the formation of a partial vacuum and in conjunction with the spinning motion of the forming roller and the inertia wheel prevents adherence of the pastry to the forming elements.

The lower surface of the forming roller 47 is slightly tapered from its periphery toward its center to reduce the amount of roller surface in contact with the formed pastry shell.

Provided that the correct amount or volume of pastry dough needed to fill the allotted space between the pie plate and the forming elements is used, there will be little or no pressure on the pastry after it is completely formed. When the pastry shell is completely formed, which occurs almost instantly, pressure is removed from the operating lever 59 and the rod 58, the plate holder 57 and the pie plate with the formed pastry shell move downwardly by gravity with an assist from the spring loaded clamping ring 50, completing the forming operation.

Recesses 64 and 65 are formed in the upper face of the forming roller and in the upper face of the inertia wheel to trap any grease or oil that may escape from the sealed bearings immediately above the forming roller and the inertia wheel.

The pie dough may be in any convenient form, however, small particles are preferable to a lump, and the said dough is deposited from a suitable mixer (not shown); it does not require any previous sheeting and dough trimming is eliminated and a batch of pastry dough is completely formed into a pastry shell by the operation of the machine.

I claim:

1. A pastry forming machine including a hollow vertical spindle, means for mounting the spindle for rotary movement on a central vertical axis, a vertical shaft arranged within the hollow spindle eccentrically with relation to the axis of rotation of the spindle and carried thereby, means for mounting the vertical shaft for rotary movement relative to the spindle, a dough forming element carried by the lower end of the spindle, a dough-forming element carried by the lower end of the shaft, and means connected with the spindle and the shaft for rotating the same in opposite directions.

2. A pastry forming machine including a hollow vertical spindle, means for mounting the



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spindle for rotary movement on a central vertical axis, a vertical shaft arranged within the hollow spindle eccentrically with relation to the axis of rotation of the spindle and carried thereby, means for mounting the vertical shaft for rotary movement relative to the spindle, a dough forming element carried by the lower end of the spindle, a dough-forming element carried by the lower end of the shaft, a lower horizontal gear wheel fixed to the spindle, an upper horizontal gear wheel mounted for rotation on the spindle, a driven shaft having a pinion meshing with the said gear wheels for rotating the same in opposite directions, an internal gear carried by the upper horizontal gear wheel in the rotation thereof, and a spur gear wheel fixed to the upper end of the shaft and meshing with the internal gear, the latter being of sufficient diameter to permit eccentric movement of said shaft.

3. A pastry forming machine including a hollow vertical spindle, means for mounting the spindle for rotary movement on a central vertical axis, a vertical shaft arranged within the hollow spindle eccentrically with relation to the axis of rotation of the spindle and carried thereby, means for mounting the vertical shaft for rotary movement relative to the spindle, a rotary dough forming roller secured to the lower end of the shaft, and a dough forming element concentrically mounted on the lower end of the spindle and extending horizontally beyond the roller and cooperating with the same in the formation of a pastry shell.

4. A pastry forming machine including a hollow vertical spindle, means for mounting the spindle for rotary movement on a central vertical axis, a vertical shaft arranged within the hollow spindle eccentrically with relation to the axis of rotation of the spindle and carried thereby, means for mounting the vertical shaft for rotary movement relative to the spindle, a dough forming roller secured to the lower end of the shaft, and an inertia wheel secured to the lower end of the spindle and having a dough forming lower face projecting beyond the roller and cooperating therewith in the formation of a pastry shell.

5. A pastry forming machine including a hollow vertical spindle, means for mounting the spindle for rotary movement on a central vertical axis, a vertical shaft arranged within the hollow spindle eccentrically with relation to the axis of rotation of the spindle and carried thereby, means for mounting the vertical shaft for rotary movement relative to the spindle, a dough forming roller secured to the lower end of the shaft, an inertia wheel mounted on the lower end of the spindle concentrically with relation to the axis of rotation of the spindle and having a lower dough engaging surface extending outwardly beyond the forming roller, and a ring surrounding the inertia wheel and extending below the same and having an inner peripheral surface arranged to limit the spread of the dough on the rim of a plate or pan and cooperating with the forming roller and the inertia wheel in the formation of a pastry shell.

6. A pastry forming machine including a hollow vertical spindle, means for mounting the spindle for rotary movement on a central vertical axis, a vertical shaft arranged within the hollow spindle eccentrically with relation to the axis of rotation of the spindle and carried thereby, means for mounting the vertical shaft for rotary movement relative to the spindle, a rotary dough forming roller secured to the lower end

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of the shaft, and a dough forming element concentrically mounted on the lower end of the spindle and extending horizontally beyond the roller and cooperating with the same in the formation of a pastry shell, said forming roller having its lower portion slightly tapered with its lower surface inclined downwardly and inwardly toward the center of the forming roller to reduce contact of the same with a completely formed pastry shell.

7. A pastry forming machine including a hollow vertical spindle, means for mounting the spindle for rotary movement on a central vertical axis, a vertical shaft arranged within the hollow spindle eccentrically with relation to the axis of rotation of the spindle and carried thereby, means for mounting the vertical shaft for rotary movement relative to the spindle, a dough forming roller secured to the lower end of the shaft, an inertia wheel secured to the lower end of the spindle and having a dough forming lower face projecting beyond the roller and cooperating therewith in the formation of a pastry shell, a spring loaded clamping ring surrounding the inertia wheel closely adjacent the same, a holder adapted to support a dough receiving plate, and manually operable means for raising and lowering the holder to carry the rim of the plate into engagement with the spring loaded ring whereby the plate is clamped on the holder contiguous to the forming roller and in position to receive the same for shaping dough within the plate.

8. A pastry forming machine including a hollow vertical spindle, means for mounting the spindle for rotary movement on a central vertical axis, a vertical shaft arranged within the hollow spindle eccentrically with relation to the axis of rotation of the spindle and carried thereby, means for mounting the vertical shaft for rotary movement relative to the spindle, a dough forming roller secured to the lower end of the shaft, an inertia wheel secured to the lower end of the spindle and having a dough forming lower face projecting beyond the roller and cooperating therewith in the formation of a pastry shell, a spring loaded clamping ring surrounding the inertia wheel closely adjacent the same, a holder adapted to support a dough receiving plate, manually operable means for raising and lowering the holder to carry the rim of the plate into engagement with the spring loaded ring whereby the plate is clamped on the holder contiguous to the forming roller and in position to receive the same for shaping dough within the plate, a vertically movable rod having its upper end connected to said holder, means for slidably mounting the rod for vertical movement of the same, and manually operable means connected with the rod for raising and lowering the latter.

9. A pastry forming machine including a hollow vertical spindle, means for mounting the spindle for rotary movement on a central vertical axis, a vertical shaft arranged within the hollow spindle eccentrically with relation to the axis of rotation of the spindle and carried thereby, means for mounting the vertical shaft for rotary movement relative to the spindle, a dough forming roller secured to the lower end of the shaft, an inertia wheel secured to the lower end of the spindle and having a dough forming lower face projecting beyond the roller and cooperating therewith in the formation of a pastry shell, a spring loaded clamping ring surrounding the inertia wheel closely adjacent the same, a holder adapted to support a dough receiving plate, man-



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ually operable means for raising and lowering the holder to carry the rim of the plate into engagement with the spring loaded ring whereby the plate is clamped on the holder contiguous to the forming roller and in position to receive the same for shaping dough within the plate, a vertically movable rod having its upper end connected to said holder, means for slidably mounting the rod for vertical movement of the same, an operating lever pivotally connected at one end to said rod, and a roller arranged intermediately of the ends of said lever and forming a fulcrum support for the same for enabling the lever to raise and lower the rod and plate holder.

10. A pastry forming machine including a hollow vertical spindle, means for mounting the spindle for rotary movement on a central vertical axis, a vertical shaft arranged within the hollow spindle eccentrically with relation to the axis of rotation of the spindle and carried thereby, means for mounting the vertical shaft for rotary movement relative to the spindle, a dough forming roller secured to the lower end of the shaft, an inertia wheel secured to the lower end of the spindle and having a dough forming lower face projecting beyond the roller and cooperating therewith in the formation of a pastry shell, a spring loaded clamping ring surrounding the inertia wheel closely adjacent the same, a holder adapted to support a dough receiving plate, manually operable means for raising and lowering the holder to carry the rim of the plate into engagement with the spring loaded ring whereby the plate is clamped on the holder contiguous to the forming roller and in position to receive the same for shaping dough within the plate, a vertically movable rod having its upper end connected to said holder, a bracket slidably guiding the rod in its vertical movement, an operating lever fulcrumed intermediately of its ends and connected with the rod for raising and lowering the holder, and a stop carried by the rod and arranged to engage the bracket to limit the upward movement of the holder for controlling the thickness of a pastry shell.

11. A pastry forming machine including a vertical standard, a bracket having a clamp engaging the standard, said bracket including a sleeve and a housing located above the sleeve, a spindle journaled in the sleeve for rotation on a central axis and having an eccentrically arranged longitudinal opening, a vertical shaft journaled for rotary movement relative to and within said opening in the spindle eccentrically with relation to the axis of rotation of the spindle and carried thereby, gearing arranged within the housing and connected with the spindle and said shaft for rotating the same in opposite directions, a dough forming element carried by the lower end of the spindle, and a dough-forming element carried by the lower end of the vertical shaft.

12. A pastry forming machine including a vertical standard, a bracket having a clamp engaging the standard, said bracket including a sleeve and a housing located above the sleeve, a spindle journaled in the sleeve for rotation on a central axis and having an eccentrically arranged longitudinal opening, a vertical shaft journaled for rotary movement relative to and within said opening in the spindle eccentrically with relation to the axis of rotation of the spindle and supported thereby, gearing arranged within the housing and connected with the shaft and the spindle for rotating the same in opposite directions and including a horizontal shaft extending exteriorly of the

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housing, an electric motor supported upon the housing, means for transmitting motion from the motor to the horizontal shaft, a dough forming element carried by the lower end of the spindle, and a dough-forming element carried by the lower end of said shaft.

13. A pastry forming machine including a vertical standard, a bracket having a clamp engaging the standard, said bracket including a sleeve and a housing located above the sleeve, a spindle journaled in the sleeve for rotation on a central axis and having an eccentrically arranged longitudinal opening, a vertical shaft journaled for rotary movement relative to and within said opening in the spindle eccentrically with relation to the axis of rotation of the spindle and supported thereby, gearing arranged within the housing and connected with the shaft and the spindle for rotating the same in opposite directions and including a horizontal shaft extending exteriorly of the housing, an electric motor supported upon the housing, means for transmitting motion from the motor to the horizontal shaft, a dough forming element carried by the lower end of the spindle, a dough-forming element carried by the lower end of said shaft, a clamping ring surrounding the dough forming elements and provided with vertical rods slidably mounted at their upper portions in said bracket, and coil compression springs surrounding the rods and interposed between the clamping ring and the bracket for urging the clamping ring downwardly.

14. A pastry forming machine including a vertical standard, a bracket having a clamp engaging the standard, said bracket including a sleeve and a housing located above the sleeve, a spindle journaled in the sleeve for rotation on a central axis and having an eccentrically arranged longitudinal opening, a vertical shaft journaled for rotary movement relative to and within said opening in the spindle eccentrically with relation to the axis of rotation of the spindle and supported thereby, gearing arranged within the housing and connected with the shaft and the spindle for rotating the same in opposite directions and including a horizontal shaft extending exteriorly of the housing, an electric motor supported upon the housing, means for transmitting motion from the motor to the horizontal shaft, a dough forming element carried by the lower end of the spindle, a dough-forming element carried by the lower end of said shaft, vertical guide tubes rigid with and depending from the bracket and located adjacent the forming element of the spindle, a clamping ring surrounding the forming element of the spindle and arranged closely adjacent the same and provided with rods extending through the guide tubes and slidably mounted at their upper ends on the bracket, and coil expansion springs disposed on the guide tubes and interposed between the bracket and the clamping ring for urging the latter downwardly.

15. A pastry forming machine including a bracket, a vertical spindle journaled in the bracket for rotary movement on a central axis and having an eccentrically arranged longitudinal opening, a vertical shaft arranged eccentrically with relation to the axis of rotation of the spindle and supported thereby, said shaft being journaled for rotary movement within the opening of said spindle relative thereto, means for rotating the spindle and the shaft in opposite directions, an inertia wheel mounted on the lower end of the spindle, a dough forming roller carried by the lower end of the shaft, said inertia wheel and



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forming roller being provided in their upper faces with recesses arranged to trap oil or grease from bearings located above said inertia wheel and forming roller.

16. A pastry forming machine including a fixed vertical standard, an upper bracket having a clamp adjustably engaging the standard, a vertical spindle journaled in the bracket and having an eccentrically arranged longitudinal opening, a vertical shaft arranged in said opening eccentrically with relation to the axis of rotation of said spindle and supported thereby, said shaft being journaled for rotation relative to the spindle, means mounted on the upper bracket for rotating the spindle and the shaft in opposite directions, an inertia wheel secured to the lower end of the spindle, a forming roller carried by the lower end of the vertical shaft and arranged below the inertia wheel, a lower bracket having a clamp engaging the standard, a vertical rod slidably mounted in the lower bracket, a holder

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mounted on the upper end of said rod and adapted to support a plate containing dough to be shaped into a pastry shell, manually operable means connected with the rod for raising and lowering the holder, and a spring loaded clamping ring surrounding the inertia wheel and arranged to be engaged by a plate on said holder for clamping the plate thereon.

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