March 17, 1931. W. H. ESEMAN 1,796,922

DOUGH MOLDER

Filed May 2, 1928 4 Sheets-Sheet 1

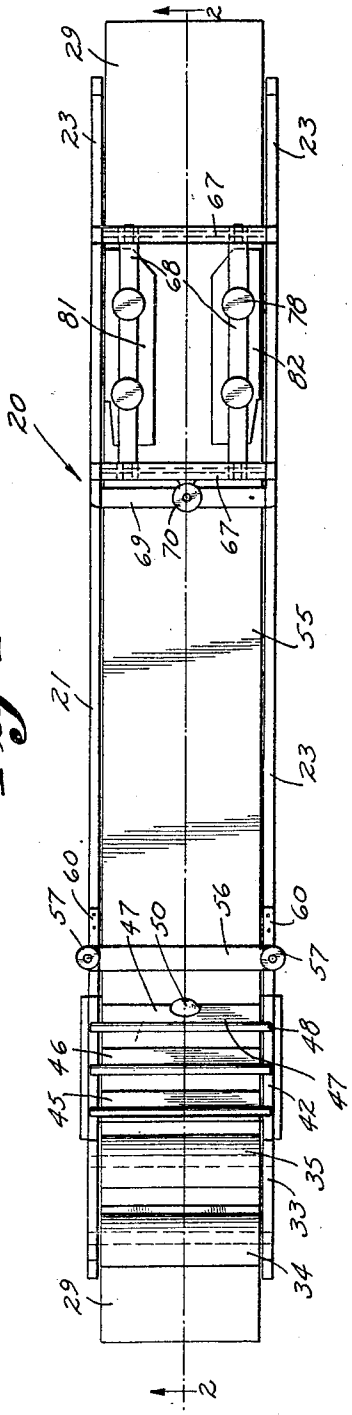


Fig. 1.

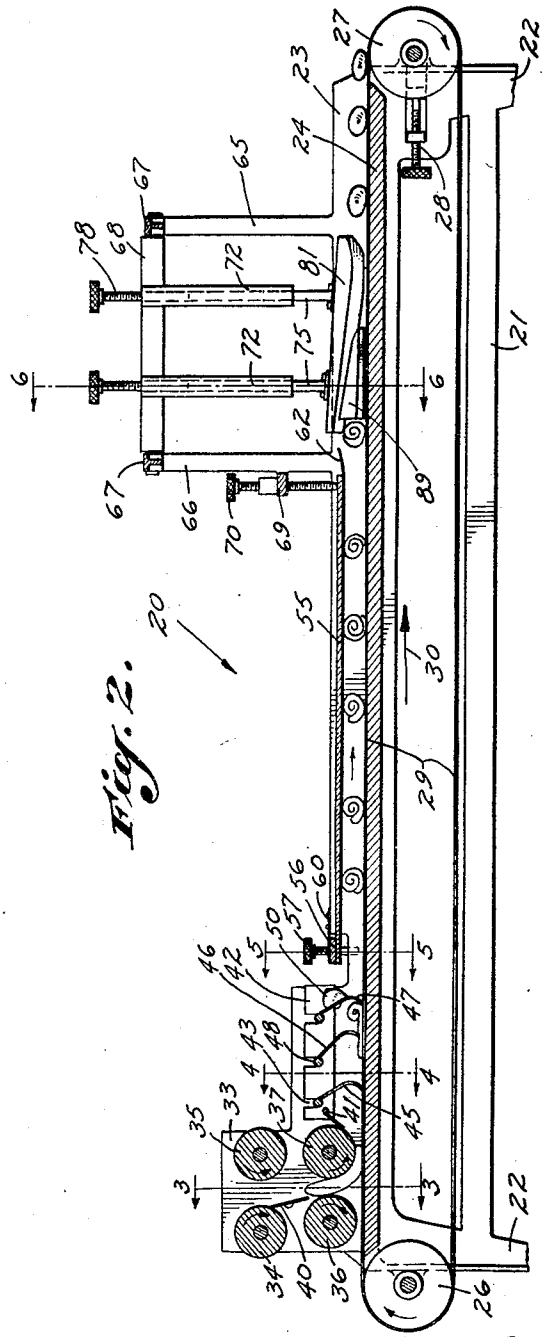


Fig. 2.

INVENTOR:
Walter H. Eseman,
BY Fad Alfanil
ATTORNEY.

March 17, 1931. W. H. ESEMAN 1,796,922

DOUGH MOLDER

Filed May 2, 1928 4 Sheets-Sheet 2

Fig. 3.

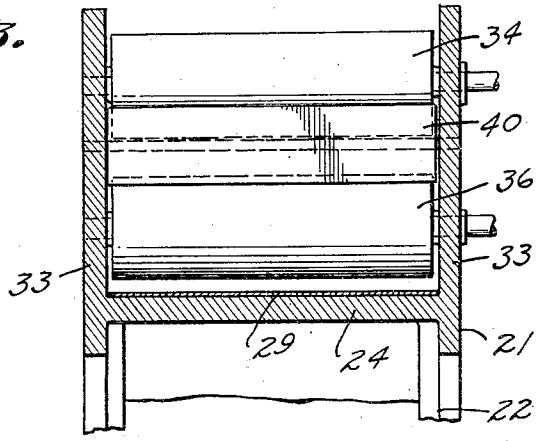


Fig. 4.

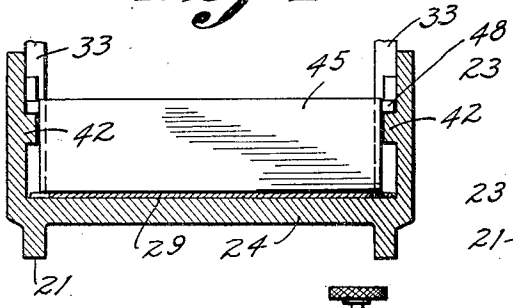


Fig. 5.

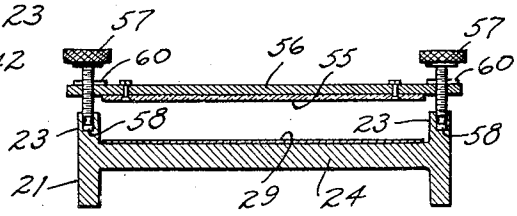
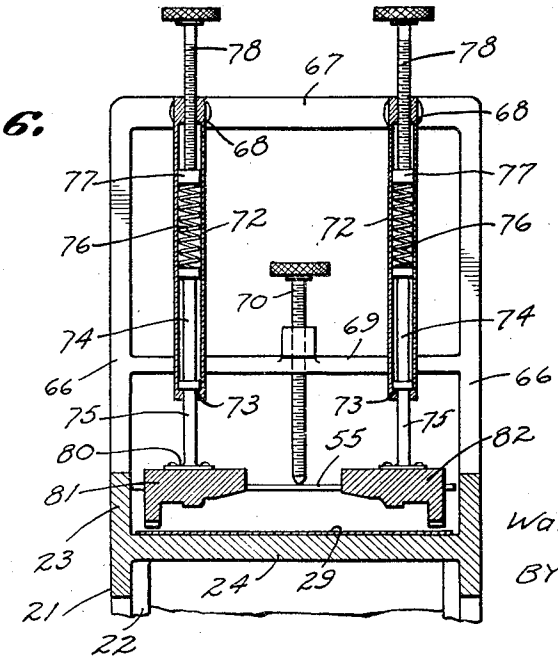


Fig. 6.



INVENTOR:
Walter H. Eseman,
BY Fad Mann
ATTORNEY.

March 17, 1931. W. H. ESEMAN 1,796,922

DOUGH MOLDER

Filed May 2, 1928 4 Sheets-Sheet 3

Fig. 7.

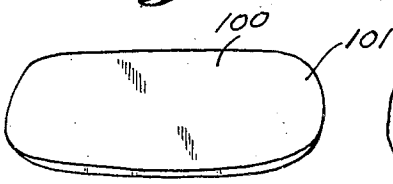


Fig. 8.

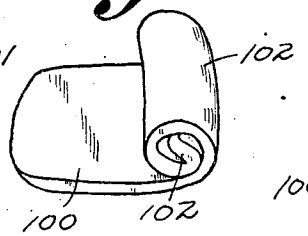


Fig. 9.

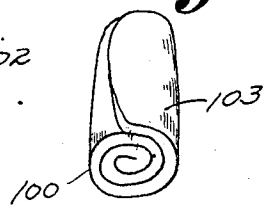


Fig. 16.

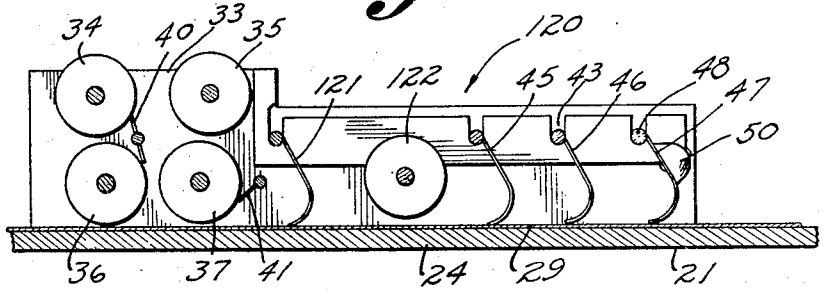


Fig. 17.

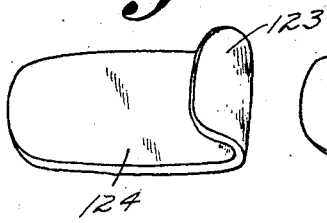


Fig. 18.

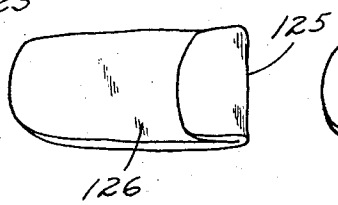
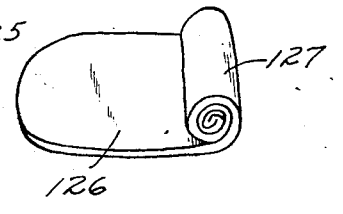


Fig. 19.



INVENTOR:
Walter H. Eseman,
BY
Fred W. Amis
ATTORNEY.

March 17, 1931. W. H. ESEMAN 1,796,922

DOUGH MOLDER

Filed May 2, 1928 4 Sheets-Sheet 4

Fig. 10.

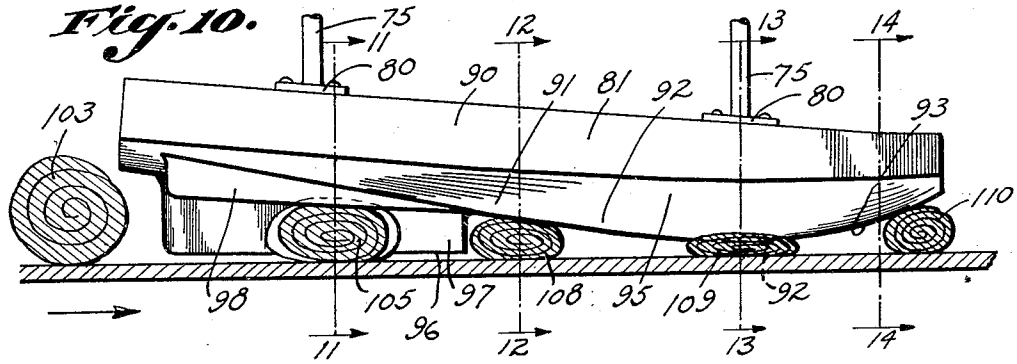


Fig. 11.

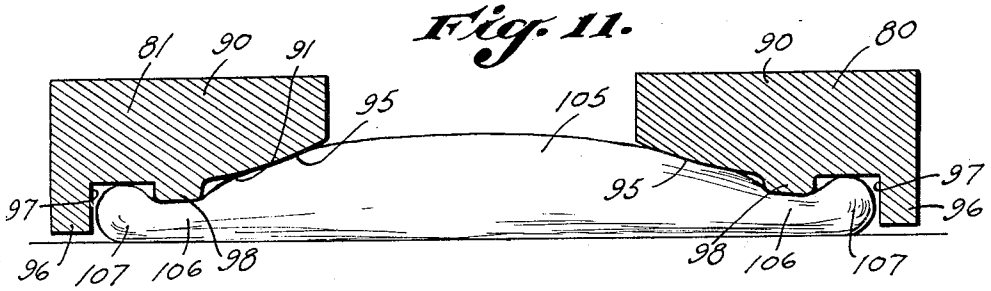


Fig. 12.

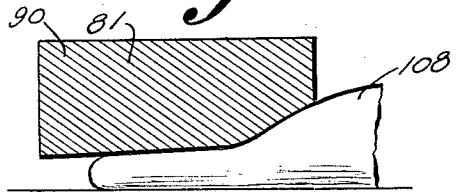


Fig. 13.

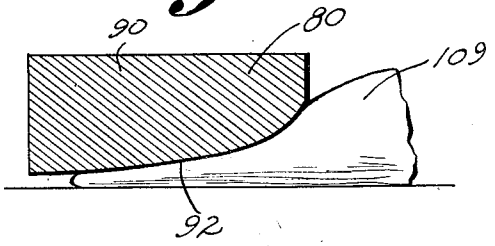
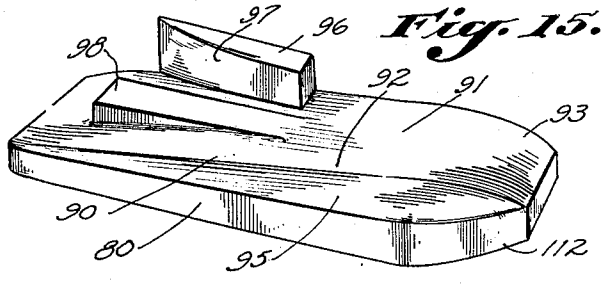


Fig. 14.



Fig. 15.



INVENTOR:
Walter H. Eseman,
BY Fad W. Lamb
ATTORNEY.

Patented Mar. 17, 1931

1,796,922

UNITED STATES PATENT OFFICE

WALTER H. ESEMAN, OF BEVERLY HILLS, CALIFORNIA, ASSIGNOR TO FRANCO-AMERICAN BAKING CO., OF LOS ANGELES, CALIFORNIA, A CORPORATION OF CALIFORNIA

DOUGH MOLDER

Application filed May 2, 1928. Serial No. 274,378.

My invention relates to bakers' equipment and more particularly to dough molders.

It is an object of my invention to provide a dough molder capable of molding dough into proper shape for making pointed and round end rolls and bread.

In dough molding machines in common use, the dough is compressed between a pair of opposed, relatively flat surfaces, this having a certain kneading effect upon the dough. I have noted that this kneading effect varies with the amount of distortion of the dough between the compression surfaces. In the machines in use, however, it is practically impossible to observe the distortion of the dough during compression.

Another object of my invention is to provide a dough molder in which the dough is visible while being compressed, thus permitting inspection to determine the proper amount of pressure to apply to the dough to prevent distortion.

Further objects and advantages will be made manifest in the following description and in the accompanying drawings in which:

Fig. 1 is a plan view of a preferred embodiment of the dough molder of my invention.

Fig. 2 is a vertical longitudinal sectional view taken on line 2—2 of Fig. 1.

Figs. 3, 4, 5 and 6 are vertical transverse sectional views taken on correspondingly numbered lines of Fig. 2.

Figs. 7, 8 and 9 are perspective views of a piece of dough at various stages of its passage through the dough molder of my invention.

Fig. 10 is a fragmentary sectional view taken on the line 2—2 of Fig. 1, and illustrating the action of a compression shoe of my invention on a piece of dough.

Figs. 11, 12, 13 and 14 are transverse sectional views taken on the correspondingly numbered lines of Fig. 10, illustrating the progressive change of shape in the piece of dough effected by contact of the shoe shown in Fig. 10 with the dough.

Fig. 15 is a perspective view of the bottom of one of the shoes shown in Fig. 10.

Fig. 16 is a diagrammatically longitudinal sectional view illustrating a modified form of dough curling mechanism which is suitable for use in the dough molder of my invention.

Figs. 17, 18 and 19 are perspective views of a piece of dough in progressive stages of its passage through the dough curling mechanism of Fig. 16.

Referring specifically to the drawings, the dough molder 20, which is shown diagrammatically in Figs. 1 and 2 for illustrative purposes, may include a base frame 21 having legs 22, longitudinal side wall members 23 and a platform 24 extending between the walls 23, a slight distance below the upper edge of these walls. Rotatably mounted on one end of the frame 21 is a pulley 26. At the opposite end of the frame 21 is rotatably mounted a pulley 27, which is provided with longitudinal adjustment means 28. Passing around the pulleys 26 and 27, so that the upper flight thereof rests upon the upper surface of the platform 24, is a belt 29, preferably formed of a close woven fabric or a fabric impregnated with rubber.

Suitable means (not shown) are provided for rotating the pulley 26 so as to cause a continuous movement of the upper flight of the belt 29 in the direction of the arrow 30, Fig. 2.

At the left hand end of the frame 21, the walls 23 have upward extensions 33, between which are mounted an upper pair of dough rollers 34 and 35, and a lower pair of dough rollers 36 and 37, the latter being preferably disposed from $\frac{1}{8}$ to $\frac{3}{16}$ of an inch above the upper surface of the upper flight of the belt 29. As will be noticed, the rollers 34 and 35 are slightly further apart than the rollers 36 and 37. Suitable means are provided for rotating these rollers in directions indicated by the arrows drawn thereon.

Mounted between the rollers 34 and 36 so as to scrape the surface of the roller 34 and guide the dough passing therefrom between the rollers 36 and 37, is a scraper blade 40. Also mounted between the upward extensions 33 of the walls 23, is a scraper 41 which is disposed on the right hand side of the roller 37 so as to scrape any dough tending to adhere to this roller after it has passed between

the roller 37 and the belt 29. Extending inwardly from the wall extensions 33 on the right hand side of the roller 37, are horizontal bosses 42 having notches 43 provided downwardly therein.

Disposed between the bosses 42 are a plurality of transverse claws 45, 46 and 47, which are pivotally mounted on trunnions 48 which extend into the notches 43. One or more of these claws, and preferably the claw 47, is provided with a weight 50 which is for a purpose to be described later.

Disposed between central portions of the walls 23, is a transparent impression plate 55. The left hand end of the plate 55, which is preferably formed of plate glass, is supported by a transverse bar 56 having thumb screws 57 threaded through openings in opposite ends thereof, said screws resting in holes 58 formed in the upper edges of the walls 23. Rigidly secured to the walls 23, adjacent to the transverse bar 56, are leaf springs 60, which extend over the bar 56 and exert a yieldable downward pressure thereon.

The right hand end of the plate 55 is provided with a flexible tongue 62 for a purpose to be described later. The right hand end of the plate 55 when not otherwise supported, tends to rest downwardly against the upper plate of the belt 29.

Extending upwardly from the right hand portions of the walls 23, are uprights 65 and 66, connected at their upper ends by cross members 67, between which are pivotally mounted longitudinal pendulum hubs 68. Extending between the uprights 66 is a bar 69, having an adjustment thumb screw 70 which extends downwardly so as to contact the right hand end of the plate 55 when this is elevated a given distance from the upper flight of the belt 29.

Each of the pendulum hubs 68 has a pair of tubes 72 extending downwardly therefrom. The lower end of each of the tubes 72 has a shoulder 73. Slidably mounted in the lower portion of each tube 72, is a plunger 74 having a stem 75 which extends downwardly from the lower end of the tube 72, said plunger normally contacting the shoulder 73.

Disposed in the tube 72 above the plunger 74, is a light spring 76, upon which adjustable pressure is impressed by a plunger 77, actuated by a thumb screw 78 extending through and threadedly engaging the hub 68 upon which said tube 72 is provided.

Each of the stems 75 is provided with a flange plate 80 which is inclined at a slight angle to the axis of said stem. Rigidly secured to, and supported by the flanges 80 of each of the pendulum hubs 68, is one of a pair of pendulum shoes 81 and 82.

The shoes 81 and 82 are oppositely formed so as to have identically the same function relative to opposite ends of a piece of dough handled by the molder 20, in a manner to be described later. In other words, when facing towards the right in Figs. 1, 2 and 10, the shoe 81 is the left hand shoe and the shoe 82 is the right hand shoe.

Each of the shoes 81 and 82 may be formed of a block of metal such as aluminum or of a suitable wood, and has a body 90 having a lower surface 91 which slopes downwardly to a point 92 which is close to the forward end of the shoe. A convex portion 93 of the surface 91, forward of the point 92, slopes upwardly. The inner portion 95 of the surface 91 is bevelled, as clearly shown in Fig. 15.

Extending downwardly from the outer edge of the rear half of the body 90, is a dough roll guide wall 96, having an inner surface 97 which slopes inwardly, as clearly shown in Fig. 15. Spaced inwardly from the wall 96, and also extending downwardly from the body 90, is a neck forming wall or rib 98 formed as clearly shown in Figs. 10, 11 and 15.

The method of operation of the dough molder of my invention is as follows:

As before mentioned, the pulley 26 is rotated by a suitable source of power so that the upper flight of the belt 29 is constantly moving in the direction of the arrow 30. The rollers 34, 35, 36 and 37 are also constantly rotated in the direction of the arrows drawn thereon in Fig. 2.

Pieces of the dough to be molded by the machine 20 are prepared in pieces of uniform weight, each piece being of sufficient quantity for the formation of a roll or loaf of bread.

The method at present in general use for preparing these individual pieces of dough so that each, when baked, will form a roll or loaf of bread, is to squeeze these pieces of dough out into the desired shape by hand. This usually requires expert bakers as there is considerable danger of twisting the ends of the dough in the endeavor to point these. Helical lines are formed on the outer surface of the roll produced by baking the twisted piece of dough, which spoils the appearance of the rolls and reduces their market value.

The dough molder 20 accomplishes the molding of these pieces of dough into the proper shape so that they will bake into rolls or bread without the formation of these helical lines. In other words, this dough molder accomplishes the work of several expert bakers with uniform excellence.

In accomplishing this, the pieces of dough are fed successively downward between the rollers 34 and 35, and are squeezed into a somewhat flattened shape and then passed between the rollers 36 and 37 and between the roller 37 and belt 29, so as to be formed into a sheet of dough 100, as shown in Fig. 7.

This sheet of dough lies upon the upper flight of the belt 29 and moves to the right, so that the forward edge 101 thereof is engaged by the claw 45 and curled back over

the body of the sheet 100. The claw 45 then rides over the curled edge of the sheet 100, and this curled edge is engaged by the next claw 46 which curls it over a little further. The claw 46 then passes over the curled edge 101, and this edge is caught by the weighted claw 47 and still further curled into a partially formed roll 102 as shown in Fig. 8. The partially formed roll 102 is carried further along on the belt 29 and is of sufficient height so that it contacts the plate 55. This resists forward movement of the upper portion of the roll 102 and results in this roll being turned between the plate 55 and the belt 29, rolling the partly formed roll 102 into a completely coiled roll 103. The length of the plate 55 is sufficient so that as the roll 103 rolls the complete length of the plate 55, any air pockets formed therein are pressed out and a fairly good skin is formed on the outer surface of this roll of dough. The roll 103, as shown in Fig. 9 emerges from the right hand end of the plate 55 beneath the free tongue 62. In case this roll is the only one underneath the plate 55, the entire weight of the plate is upon this roll and this weight is gradually removed by the yielding engagement of the tongue 62 with the roll 103.

Referring now particularly to Figs. 10 to 14, inclusive, the roll of dough 103 is shown approaching the rear end of the shoes 80 and 81.

This roll is now approximately cylindrical in shape but is of such length that the opposite ends contact with the inner surface 97 of the guide walls 96 of the shoes 80 and 81. Owing to the freedom of the pendulum hubs 68 to rotate about their axes, the shoes 80 and 81 are free to swing a slight distance outwardly to accommodate themselves to each individual dough roll 103. This insures that the neck forming walls 98 of the shoes 80 and 81 contact each roll 103 at uniform distances from its extremities. When one of the rolls 103 has passed into the position of the roll 105 shown in Figs. 10 and 11, necks 106 have been formed in opposite end portions of the roll so as to grip these ends of the roll and prevent the resilience of the dough withdrawing the end portions of the roll 105 from beneath the shoes 80 and 81 during the compression of these end portions to decrease their diameter so as to give the dough roll 105 the proper formation for baking into a roll or loaf of bread. The formation of the necks 106 separates the heads 107 from the main body of the dough roll 105.

By the time the dough roll 105 has reached the forward end of the wall 98 where the heads 107 are flattened, the compression of the end portions of the roll 105 has increased so as to effectively decrease the diameter of these portions by rolling out the roll 105 into the shape of roll 108.

At this point, therefore, the tendency of the end portions of the dough roll 108 to withdraw from between the compressing surfaces 91 of the shoes 80 and 81 and the belt 29, is not so marked as to defeat the final completion of the tapering of the opposite end portions of the dough roll 108. Therefore, the dough roll 108 passes on to the point of maximum compression which is accomplished under the point 92 of the surface 91 as shown by the condition of the roll 109.

When the dough roll 109 progresses further forward beneath the upwardly inclined convex portion 93 of the compression surface 91, it is permitted to expand into the shape of the roll 110 which is shown in Fig. 14, and is perfectly shaped for baking into a roll or loaf of bread. For the purpose of gradually withdrawing the pressure laterally as well as upwardy upon the roll 109 as it passes into the position of roll 110, the forward inner corners 112 of each of the shoes 80 and 81 are bevelled, as clearly shown in Fig. 15.

As the rolls completely formed in a similar manner to the roll 110 pass out of contact with the shoes 80 and 81, they are deposited by the belt 29 upon a suitable baking pan (not shown) provided at the right hand end of the dough molder 20.

Referring now to Figs. 16 to 19 inclusive, I may provide the dough molder 20 of my invention with a dough sheet turning mechanism, which differs from the dough sheet turning mechanism illustrated in Figs. 1 and 2, in the provision of a claw 121 and a roller 122 between the roller 37 and the claw 45.

The dough sheet curling mechanism 120 operates in identically the same manner as the mechanism embodied in the machine 20 excepting that the claw 121 turns over the leading edge 123 of a sheet of dough 124, as shown in Fig. 17, and the roller 122 rolls this curled edge down, as shown in Fig. 18 to present a straight leading edge 125. After the dough sheet 126 having a straight leading edge 125, passes from underneath the roller 122, it is engaged successively by the claws 45, 46 and 47 in a similar manner as previously described for the dough sheet 100 so as to form a tight partly formed roll 127 as clearly shown in Fig. 19.

The advantage of the curling mechanism 120 is that the curling of the dough sheet after a straight edge 125 has been formed thereon, tends to eliminate air pockets in the dough roll when it is finally formed. As is well known in the art, air pockets in a dough roll produce large cavities in the bread when it is baked, which considerably reduces its value.

I claim as my invention:

1. In a dough molder the combination of: means for rolling a piece of dough into a substantially cylindrical roll; means for gripping end portions of said roll by pinching

necks in said end portions; and means for compressing said end portions to effect a reduction in their diameter.

2. In a dough molder the combination of: means for rolling a piece of dough into a substantially cylindrical roll; means for gripping end portions of said roll by pinching necks in said end portions; and means for rolling said end portions to effect a reduction in their diameter.

3. In a dough molder the combination of: means for forming a piece of dough into a sheet; means for conveying said sheet of dough; means for curling over a leading edge of said sheet; and means coacting with said conveying means to form said sheet of dough into a roll of dough, said last mentioned roll forming means including a transparent pressure member through which the roll may be viewed.

4. In a dough molder the combination of: means for forming a roll of dough; means for conveying said roll; and means positioned over said conveying means to yieldably contact said roll so as to turn said roll and compress the end portions thereof, thus reducing the diameter of said end portions, said means being expansible transversely of said conveying means to accommodate rolls of different lengths.

5. In a dough molder the combination of: means for forming a roll of dough; means for conveying said roll; and means positioned over said conveying means to contact said roll so as to turn said roll, form necks between end portions and the middle portion of said roll and compress the end portions thereof, thus reducing the diameter of said end portions.

6. In a dough molder the combination of: means for forming a roll of dough; means for conveying said roll; and a pair of shoes yieldably urged downwardly and positioned over said conveying means to contact said roll so as to turn said roll and compress the end portions thereof, thus reducing the diameter of said end portions, said shoes each being free to move transversely of said conveying means to compensate for rolls of different lengths.

7. In a dough molder the combination of: means for forming a roll of dough; means for conveying said roll; and a pair of shoes yieldably urged downwardly positioned over said conveying means to contact said roll so as to turn said roll, form necks between end portions and the middle portion of said roll and compress the end portions thereof, thus reducing the diameter of said end portions.

8. In a dough molder the combination of: means for forming a piece of dough into a sheet; an endless conveyer for carrying said sheet of dough; a claw for curling over a leading edge of said sheet; means for flattening said curled over edge against said sheet, thus forming a straight leading edge; a claw for curling over said straight leading edge; and means coacting with said conveying means to form said sheet of dough into a roll of dough.

9. In a dough molder, the combination of: means for conveying a roll of dough; and molding means positioned over said conveying means to contact the end portions of said roll so as to turn said roll and compress said end portions thereof, said molding means being provided with two depending ribs each positioned to grip an end portion of said roll and form a neck defining a terminal head.

10. In a dough molder, the combination of: means for conveying a roll of dough; and molding means positioned over said conveying means to contact the end portions of said roll so as to turn said roll and compress said end portions thereof, said molding means being provided with two depending ribs each positioned to grip an end portion of said roll and form a neck defining a terminal head, and said molding means being expansible transversely of said conveying means to accommodate rolls of different lengths.

11. In a dough molder, the combination of: means for conveying a roll of dough; and molding means positioned over said conveying means to contact the end portions of said roll so as to turn said roll and compress said end portions thereof, said molding means being provided with two depending ribs each positioned to grip an end portion of said roll and form a neck defining a terminal head, and said molding means being expansible transversely of said conveying means to accommodate rolls of different lengths and provided with side walls engaging the ends of said rolls to insure engagement of said ribs with the rolls a given uniform distance from the ends thereof.

12. In a dough molder, the combination of: means for conveying a roll of dough; and molding means positioned over said conveying means to contact the end portions of said roll so as to turn said roll and compress said end portions thereof, said molding means including two molding shoes each adapted to engage an end portion of said roll and having a depending rib positioned to grip said end portion and form a neck defining a terminal head, said shoes being free to move transversely of said conveying means to compensate for rolls of different lengths.

13. In a dough molder, the combination of: means for conveying a roll of dough; and molding means positioned over said conveying means to contact the end portions of said roll so as to turn said roll and compress said end portions thereof, said molding means including two molding shoes each adapted to engage an end portion of said roll and having a depending rib positioned to grip said end portion and form a neck defining a terminal

head, said shoes being free to move transversely of said conveying means to compensate for rolls of different lengths and provided with outer side walls engaging the ends of said rolls to insure engagement of said ribs with the rolls a given uniform distance from the ends thereof.

14. In a dough molder, the combination of: means for conveying a roll of dough; and molding means positioned over said conveying means to contact the end portions of said roll so as to turn said roll and compress said end portion thereof, said molding means including two opposed molding shoes adapted to engage and compress opposite end portions of said roll, said shoes being free to move transversely of said conveying means to compensate for rolls of different lengths and each shoe having a side wall engaging an end of said roll and a neck molding rib spaced inwardly from said wall, said ribs gripping said end portions of a roll to form necks defining terminal heads on said roll and prevent longitudinal contraction of said roll.

15. A combination as defined in claim 10, in which said molding means forwardly of said neck forming ribs is contoured to eliminate said necks and heads and taper the end portions of the roll.

16. A combination as defined in claim 11, in which said molding means forwardly of said neck forming ribs and said side walls is contoured to eliminate said necks and heads and taper the end portions of the roll.

17. A combination as defined in claim 12, in which said shoes forwardly of their neck forming ribs are contoured to eliminate said necks and heads and taper the end portions of the roll.

18. A combination as defined in claim 13, in which said shoes forwardly of their neck forming ribs and said side walls are contoured to eliminate said necks and heads and taper the end portions of the roll.

19. A combination as defined in claim 14, in which the shoes forwardly of their neck forming ribs and their side walls are formed to eliminate said necks and heads to taper the end portions of the roll and to permit a lengthening of the roll due to such tapering thereof.

20. An end molding means for compressing and molding the end portions of a roll of dough, said means being provided with two ribs each positioned to engage an end portion inwardly from its terminal end to form a neck defining terminal head, said means being expansible longitudinally of the roll to accommodate rolls of different lengths.

21. An end molding means for compressing and molding the end portions of a roll of dough, said means being provided with two ribs each positioned to engage an end portion inwardly from its terminal end to form a neck defining a terminal head, said means being expansible longitudinally of the roll to accommodate rolls of different lengths and provided with side walls engaging the ends of said roll to insure engagement of said ribs with said roll a given uniform distance from the ends thereof.

22. An end molding means for compressing and molding the end portions of a roll of dough, said means including two molding shoes each adapted to engage an end portion of said roll and having a depending rib positioned to engage said end portion and form a neck defining a terminal head, said shoes being free to move longitudinally of said roll to compensate for rolls of different lengths.

23. An end molding means for compressing and molding the end portions of a roll of dough, said means including two molding shoes each adapted to engage an end portion of said roll and having a depending rib positioned to engage said end portion and form a neck defining a terminal head, said shoes being free to move longitudinally of said roll to compensate for rolls of different lengths and provided with outer side walls engaging the ends of said roll to insure engagement of said ribs with said roll a given uniform distance from the ends thereof.

24. A molding shoe for compressing and molding an end portion of a roll of dough, said shoe having a molding surface, a longitudinally disposed side wall projecting from said surface, and a longitudinally disposed rib spaced from said side wall and projecting from said surface.

25. A molding shoe for compressing and molding an end portion of a roll of dough, said shoe providing a lower molding surface having a rear portion longitudinally tapered downwardly to a zone of maximum compression, and said shoe having a longitudinally disposed side wall depending from said rear portion of said molding surface and adapted to engage a terminal end of said roll, and a longitudinally disposed rib spaced inwardly from said side wall and depending from said rear portion of said molding surface and adapted to engage the end portion of said roll inwardly from its terminal end to form a neck defining a terminal head, the molding surface forwardly of said zone of maximum compression being formed to eliminate said neck and head and taper the end portion of said roll.

26. In a dough molder, the combination of: means for conveying a roll of dough; molding means positioned over said conveying means to contact the end portions of said roll so as to turn said roll and compress said end portions thereof; and depending ribs provided on said molding means, each positioned to grip an end portion of said roll and form

a neck defining a terminal head, said molding means forwardly of said neck forming ribs being contoured to eliminate said necks and heads and taper the end portions of the roll.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 27th day of April, 1928.

WALTER H. ESEMAN.