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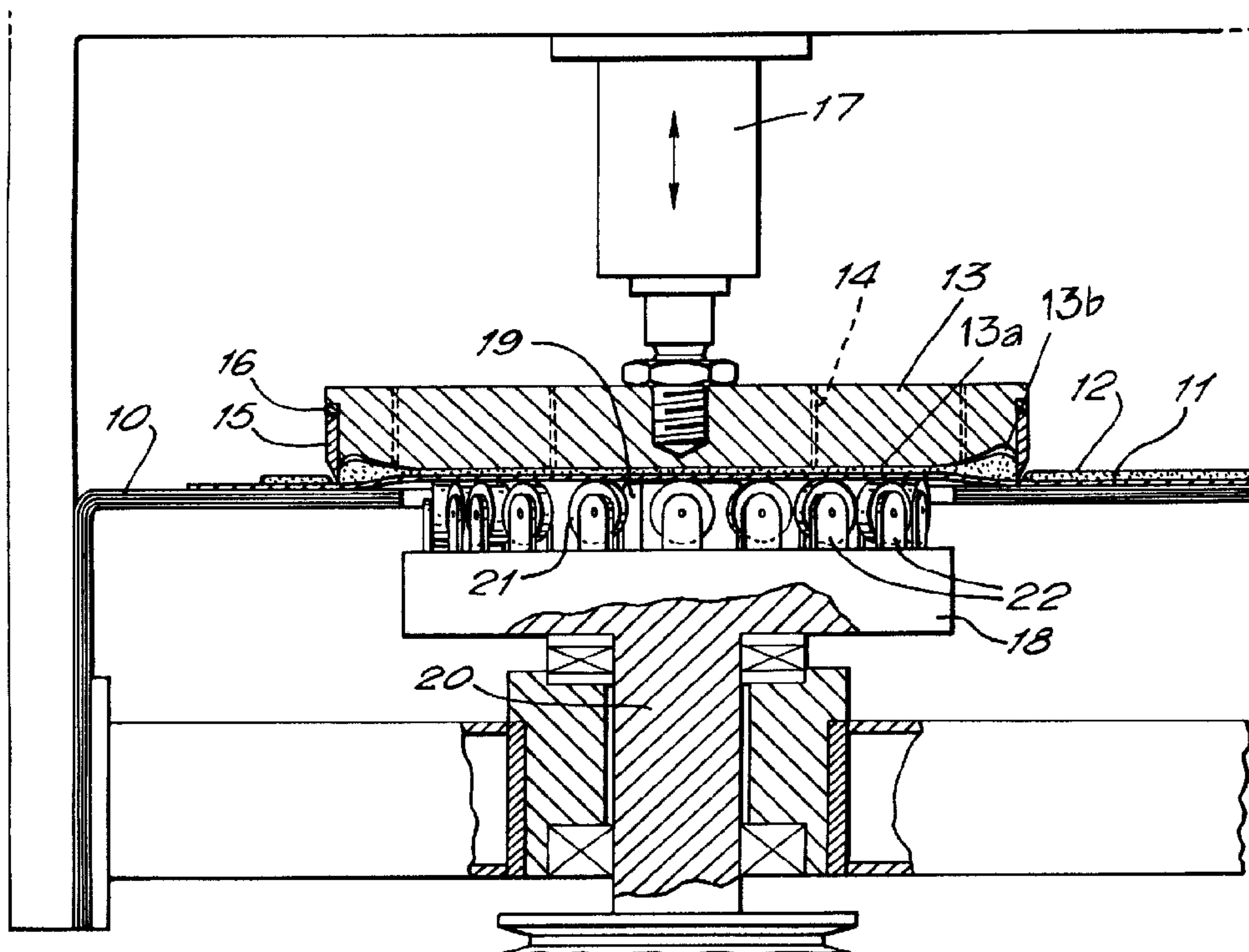
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(54) Titre : FAÇONNAGE DE PRODUITS A BASE DE PÂTE

(54) Title: FORMING OF DOUGH BASED PRODUCT



(57) Abrégé/Abstract:

A dough-based product is formed by a machine which has a reciprocable punch die and cutter fitted to the die positioned above an upper run of a conveyor, the die having a centrally disposed die surface which extends to a peripheral die surface channel positioned adjacent the cutter. The machine also has at least one set of a plurality of rollers, which are positioned beneath the conveyor upper run and arranged on a rotatable disc so that the at least one set forms a spiral configuration so that when the punch die reciprocates towards a dough product transported by the upper run, the dough product is pressed, formed and cut by the punch die and cutter, in cooperation with the rollers, into pieces having a thickened rim.



Abstract

A dough-based product is formed by a machine which has a reciprocable punch die and cutter fitted to the die positioned above an upper run of a conveyor, the die having a centrally disposed die surface which extends to a peripheral die surface channel positioned adjacent the cutter. The machine also has at least one set of a plurality of rollers, which are positioned beneath the conveyor upper run and arranged on a rotatable disc so that the at least one set forms a spiral configuration so that when the punch die reciprocates towards a dough product transported by the upper run, the dough product is pressed, formed and cut by the punch die and cutter, in cooperation with the rollers, into pieces having a thickened rim.

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The present invention relates to a machine and method for the automatic forming of dough based products, more particularly forming such products with a thick rim.

5 Normally, in the automatic production of pizza, the breads have the same thickness over the whole product. Baking of the pizza covered with a filling results either in the rim being overbaked and too hard because
10 the rim is not covered with the filling or in a satisfactorily baked rim with an insufficiently baked middle area.

We have devised a machine which eliminates this problem by making a thicker rim of the dough based product.

15 Accordingly, the present disclosure provides a machine for the automatic forming of dough based products comprising a conveyor belt above which is a reciprocating punch die fitted with a cutter shaped to conform to the
20 perimeter of the desired dough product and beneath which is a rotating disc provided on its upper surface with a plurality of small rollers arranged to form at least one spiral which rollers are adapted to press against the lower side of the conveyor belt when the punch die
25 descends.

The conveyor is conveniently an endless belt fitted with drive means enabling intermittent or continuous motion.

30 The cutter of the punch die may be circular when the dough product is desired to be cut into a circular shape. Preferably, the circumference of the punch die is greater than the circumference of the rotating disc by an amount approximately equal to the desired width of
35 the rim of the dough based product. The lower edge of the punch die may advantageously be shaped so that there is an annular channel adjacent to and circumscribed by

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the cutter roughly conforming to the desired configuration of the rim of the dough based product.

5 The punch die may conveniently be driven by a pneumatic cylinder.

10 The punch die is advantageously provided with one or more vertical air channels through which compressed air may flow downwards as the punch die ascends in order to build up a pressure between the punch die and the pizza in order to help the separation of the pizza from the bottom of the punch die.

15 The rotating disc is preferably continuously rotating. The rotating disc may be located permanently at a stationary position below the punch die or both the rotating disc and the punch die may travel at the same speed and direction as the belt in the same direction as the dough. In the former case the conveyor belt
20 transporting the dough travels intermittently and the punch die descends when the conveyor belt stops. In the latter case the conveyor belt travels continuously.

25 The rollers may be small wheels or ball bearings and generally they are arranged to form from two to six and preferably two to four spirals depending on the size of the rollers. The spirals conveniently extend substantially from the centre towards the edge of the disc. The diameter of the rollers may vary from 0.5 to 8
30 cm and is conveniently from 1.5 to 3 cm.

35 The rotating disc is positioned so that the rollers may contact and press against the lower side of the conveyor belt when the punch die descends, so that the action of the rollers on the rotating disc, because of the spiral form, sheets the dough from the middle area to build up a thicker rim.

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5 The present invention also provides a method for the automatic forming of dough based products comprising transporting a dough sheet along a conveyor belt to a position beneath a reciprocating punch die fitted with a cutter shaped to conform to the perimeter of the desired dough product and above a rotating disc provided on its upper surface with a plurality of small rollers arranged to form at least one spiral whereupon, the punch die first descends to cut the dough and press it and the
10 conveyor belt against the rollers to give a dough based product with a thicker rim and then ascends.

15 The speed of rotation of the rotating disc may be from 50 to 200, preferably from 75 to 175 and especially from 100 to 150 RPM. The duration of the pressing generally varies inversely with the speed of rotation of the disc and may be from 0.5 to 10 seconds, more usually from 1 to 3 seconds.

20 After the cutting and sheeting, the dough may be transported by the conveyor, usually beneath a mandrel with cutting teeth for docking, then to a filling station for covering with a filling such as a sauce and finally to a baking oven.

25 Embodiments of the present invention will now be further illustrated by way of example only with reference to the accompanying drawings in which

30 Figure 1 represents a diagrammatic cross section of the machine looking in the direction of the flow of the dough,

35 Figure 2 represents a diagrammatic top plan view of a machine, and

Figure 3 represents a diagrammatic top plan view of a rotating disc.

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Referring to the drawings, the machine comprises a conveyor frame 10, a conveyor belt 11 which transports a pizza dough sheet 12 having a thickness of 4 mm above which is a punch die 13 provided with air channels 14, a circular cutter 15, a damping ring 16 and driven by a pneumatic cylinder 17. The circular cutter 15 has a centrally disposed die surface 13a which extends to a peripheral channel 13b adjacent cutter 15 about the perimeter of the die. Beneath the conveyor belt 11 is a rotating disc 18 rotating about a centre point 19 on a shaft 20 and provided with rollers 21 having a diameter of 2.5 cms secured to the upper surface of the rotating disc by means of supports 22. As seen in Fig. 3 these rollers are arranged in two spirals, one extending from roller 23 to roller 24 and the other extending from roller 25 to roller 26. Upstream of the punch die and positioned above the conveyor belt as seen in Fig. 2 are positioned a mandrel with cutting teeth 27, a sauce filling device 28 and a sauce distributor 29.

In operation, the conveyor belt 11 carrying the pizza dough sheet 12 travels intermittently. When the conveyor belt stops the punch die 13 and the cutter 15 descend to cut out a circular pizza bread from the dough sheet 12 and to press it close to the belt and the rotating disc 18 rotating at 100 RPM for a period of 2 seconds after which the punch die and cutter ascend and the conveyor restarts. The action of the rollers 21 arranged in two spirals on the rotating disc sheets the dough from the middle region to built up a thicker rim. The damping ring 16 prevents the cutter 15 from cutting the conveyor belt. As the punch die ascends, compressed air flows through the air channels 14 to build up a pressure between the bottom of the punch die and the pizza so that the punch die readily separates from the pizza.

The cut and pressed pizza bread now has a ground thickness of 3 mm and a rim of 8 mm thickness. The conveyor then transports the pizza bread beneath the mandrel with cutting teeth 27 (docking) then beneath the sauce filing device 28 and a sauce distributor 29.

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After baking, the filled pizza is baked evenly all over.

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CLAIMS:

1. A machine for forming a dough-based product comprising:
 - a conveyor positioned to have an upper run having a surface for transporting a dough product;
 - at least one set of rollers positioned beneath the upper run transport surface and arranged on a rotatable disc so that the at least one set of rollers forms a spiral configuration; and
 - a reciprocable punch die and a cutter fitted to the die, wherein the die has a centrally disposed die surface portion which extends to a peripheral die surface channel portion which is positioned adjacent the cutter, the die and cutter being positioned for reciprocating to and from the upper run transport surface and the rollers so that when the die reciprocates towards a dough product transported on the transport surface, the dough product is pressed, formed and cut by the punch die and cutter, in cooperation with the rollers, into a piece having a rim having a thickness greater than a centrally disposed portion of the cut piece.
2. A machine according to claim 1 further comprising a damping ring for fitting the cutter to the die.
3. A machine according to claim 1 wherein the die further comprises at least one channel for building a pressure between the die and cut piece for separating the cut piece from the die.
4. A machine according to claim 1 wherein the at least one set of rollers extends substantially from a centre to an edge of the rotatable disc.
5. A machine according to claim 1 wherein there are from two to four sets of rollers.
6. A machine according to claim 1 further comprising a frame

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which is positioned beneath the upper run for supporting the upper run and which has an aperture therethrough so that a perimeter edge of the frame about the aperture is positioned about a perimeter of the at least one set of rollers.

7. A machine according to claim 6 wherein the die and cutter have a perimeter which extends to a position beyond the perimeter of the at least one set of rollers and wherein the perimeter aperture edge of the frame extends to a position within the perimeter encompassed by the die and cutter.

8. A machine according to claim 6 wherein the peripheral die surface channel portion defines a perimeter which extends beyond the perimeter of the at least one set of rollers and wherein the perimeter aperture edge of the frame extends to be encompassed within the perimeter of the peripheral die surface channel portion.

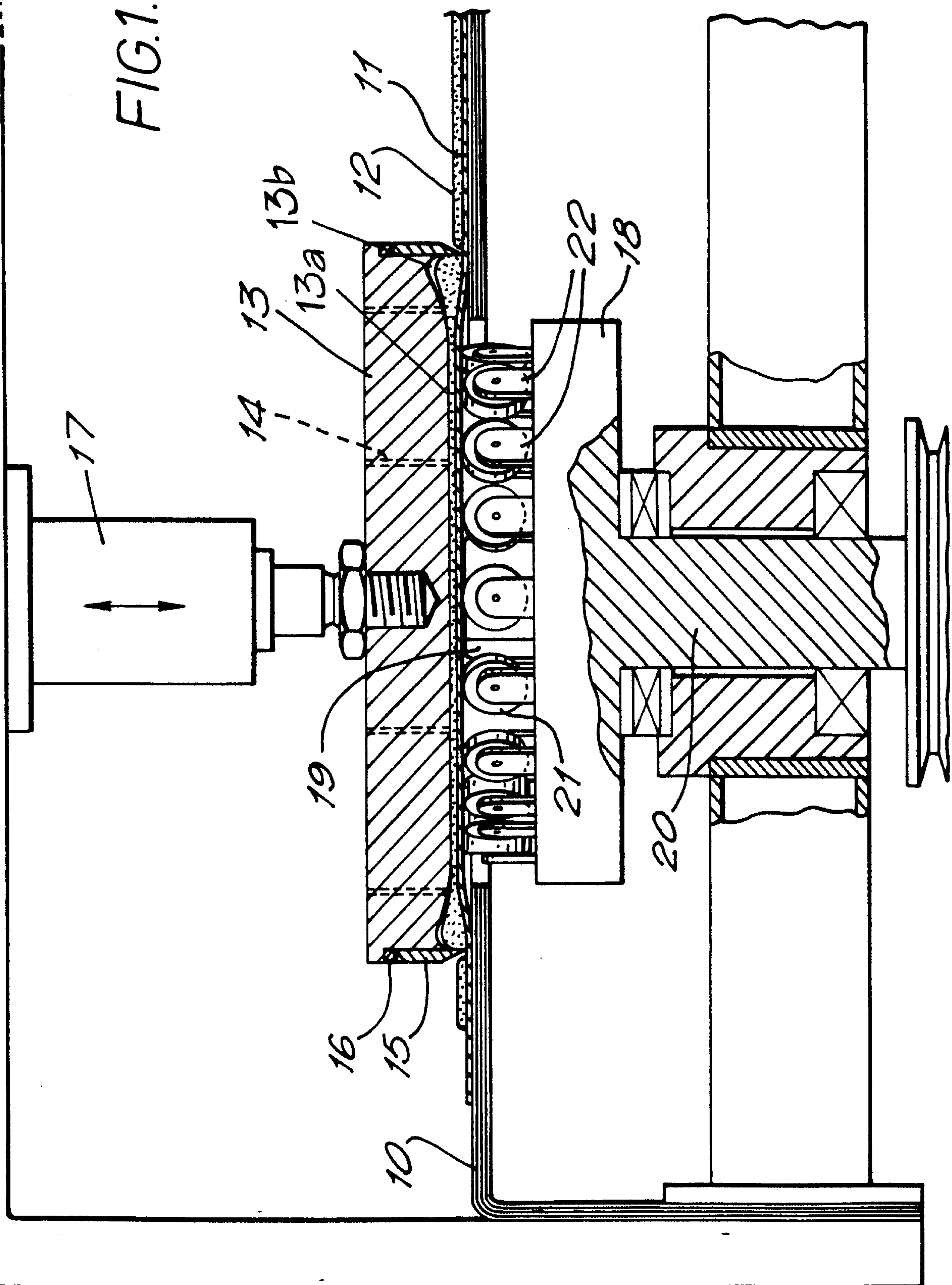
9. A method for the automatic forming of dough based products comprising transporting a dough sheet along a conveyor belt to a position beneath a reciprocating punch die fitted with a cutter shaped to conform to the perimeter of a desired dough product and above a rotating disc having an upper surface with a plurality of small rollers arranged to form at least one spiral, whereupon the punch die first descends to cut the dough and presses it and the conveyor against the rollers to give a dough based product with a thicker rim and then ascends.

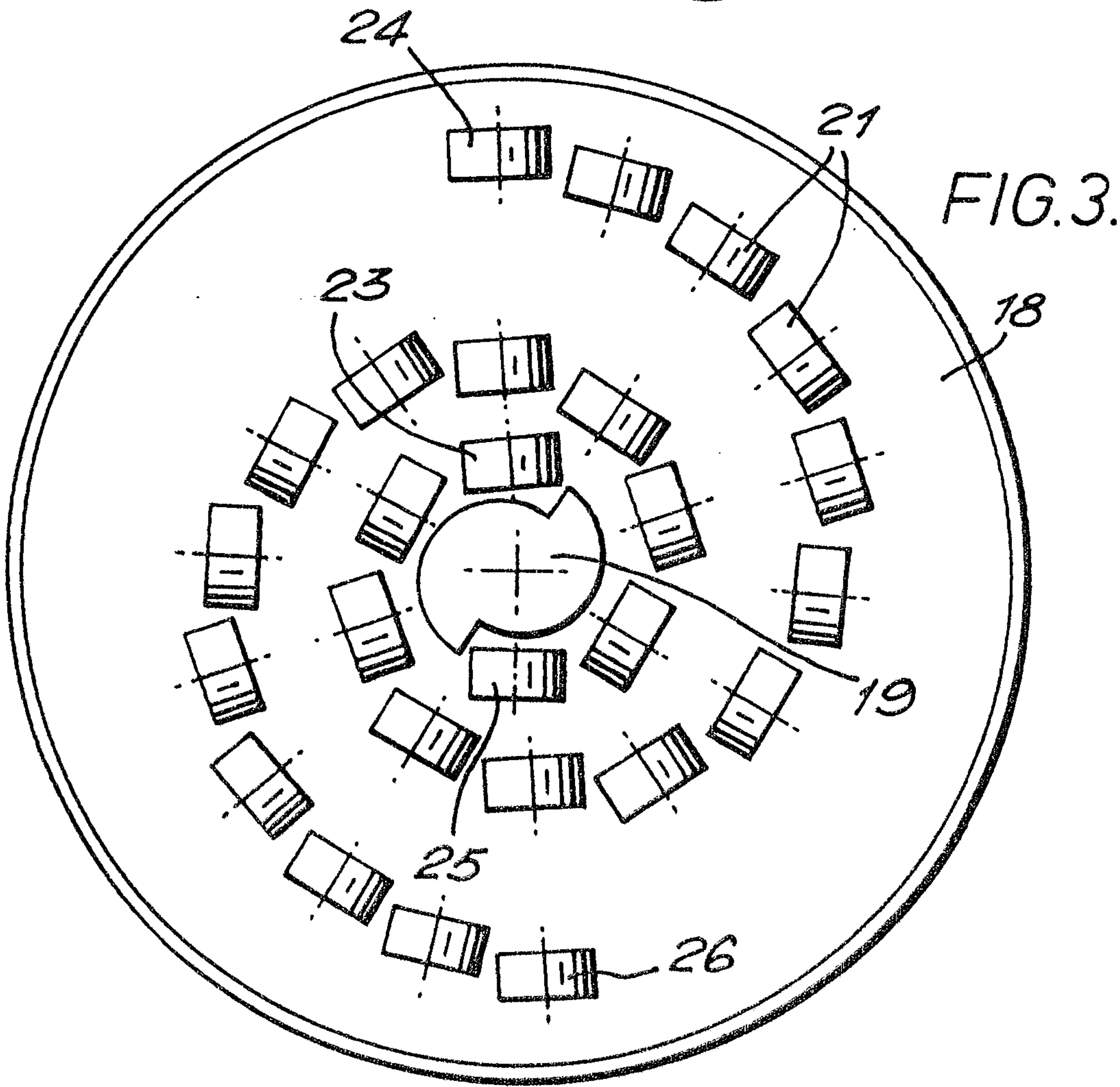
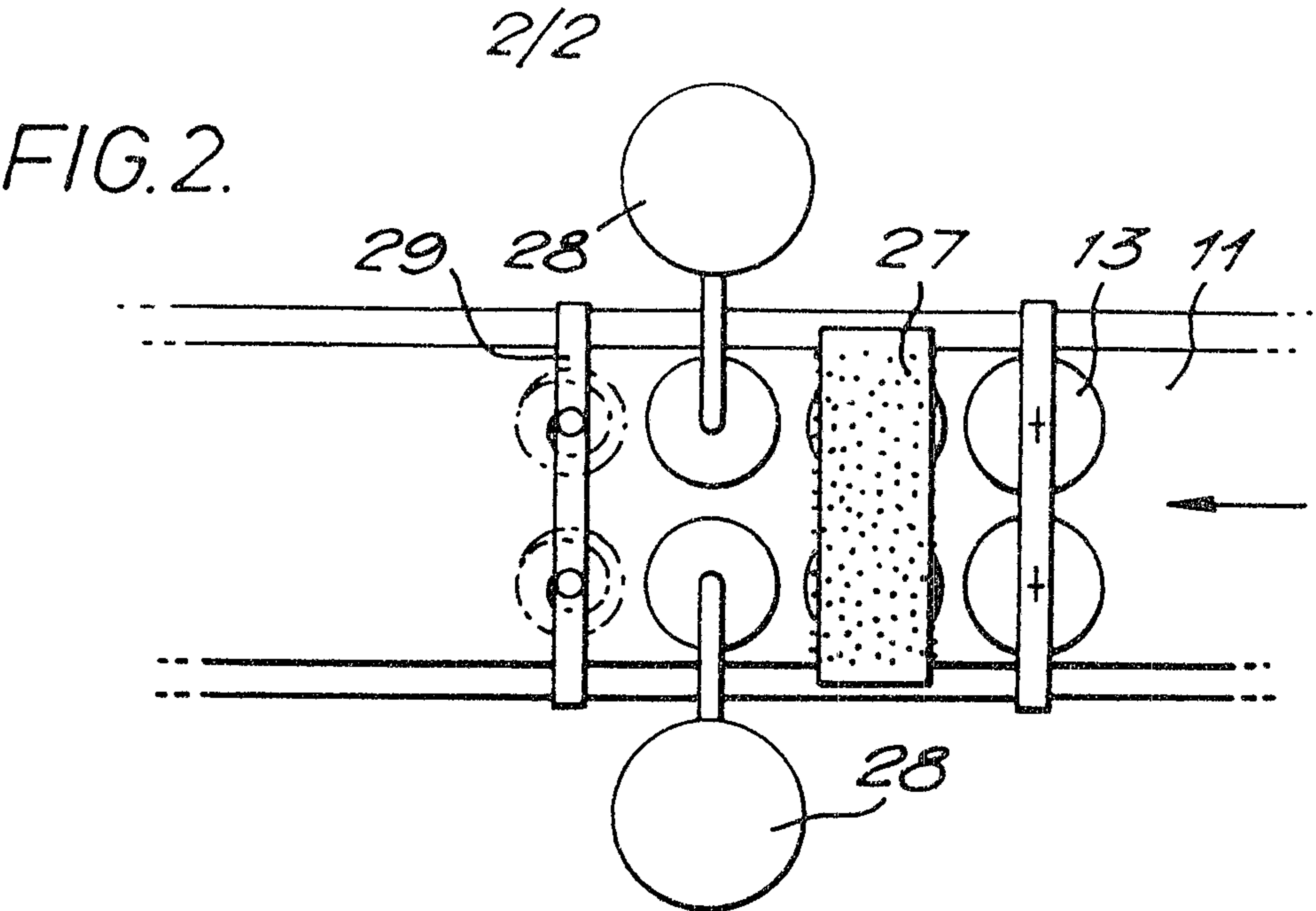
10. A method according to claim 9 wherein a speed of rotation of the rotating disc is from 50 to 200 RPM.

11. A method according to claim 9 wherein the pressing lasts from 0.5 to 5 seconds.

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FIG.1.





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