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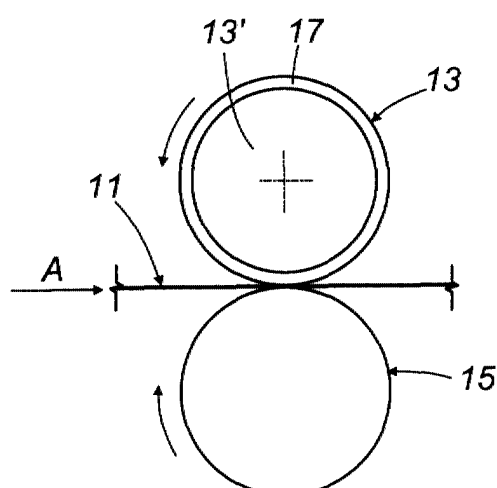
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(54) **A process for cutting flat sheets for making wrappers for a pasty product, a cutter for making wrappers, and a wrapper for a pasty product**

(57) A process for making sheets (10) of a material which can be folded to obtain a wrapper, in particular for a pasty product, such as processed or melted cheese or a similar product. Each sheet (10) has a peripheral profile (15) with a transversal front edge (15a) and a

transversal back edge (15b) opposite the transversal front edge (15a), and opposing first and second lateral edges (15c, 15d). The sheets (10) are obtained by cutting a continuous web (11) of the foldable material, the cutting being carried out with the web (11) moving with continuous feed.

FIG. 3



Description

[0001] The present invention relates to a process for the production of sheets for making wrappers for a pasty food product, such as processed or melted cheese. Conventional wrappers containing a single portion of processed or melted cheese, for example a portion with a base in the shape of the sector of a circle, comprise an outer wrap, made of foil and comprising a lower portion in the shape of a tray and a sheet which forms an upper lid and is held on the tray-shaped body by tabs which can be folded horizontally, extending from the lateral walls of the tray-shaped portion.

[0002] The lower, tray-shaped part of the container is obtained from a single sheet of foil with a suitable profile, which is folded in such a way as to form a base, the side walls of the wrapper and the tabs which hold on the lid. In the known machines, for production of the sheets which can be folded to make the above-mentioned tray-shaped bodies of the processed or melted cheese wrappers, a continuous web of foil is unwound from a reel which is driven with an alternating feed and dwell motion.

[0003] A cutter device with a cutter blade, shaped according to the profile of the sheet to be made, separates the individual sheets from the continuous web. The continuous web dwell state allows the cutter device to separate the individual sheet which will form the outer wrap of the wrapper with a single cutting motion.

[0004] However, operating in this way, that is to say, with alternating feed of the foil web from which the sheet is cut, means that the operating speed is low. Another disadvantage involves the alternating feed, which requires precision positioning of the web to be cut at the cutter part, which is not always achieved, resulting in badly cut sheets which lead to the production of irregular wrappers, to be rejected together with the product which they contain. To overcome these problems, the machine must sometimes be stopped, halting production and causing losses for the packaging companies.

[0005] In accordance with one aspect of the present invention, a process is provided for making sheets of a material which can be folded to obtain a wrapper, in particular for a pasty product, such as processed or melted cheese or similar products. Each sheet has a peripheral profile with a transversal front edge and a transversal back edge opposite the transversal front edge, and opposing first and second lateral edges. The sheets are obtained by cutting a continuous web of the foldable material, the web being cut longitudinally to form the lateral edges of the sheets, and transversally to form the front and back edges of the sheets. The process is characterised in that at least the step of longitudinally cutting the sheet is carried out with the web moving with continuous feed.

[0006] This allows the sheet cutting operation to be speeded up as far as possible. The dependent claims indicate other advantageous aspects of the process.

[0007] The present invention also relates to a rotary cutter part for making the sheets and a wrapper for a pasty product using the sheet obtained with the present process.

[0008] The technical features of the present invention and its advantages are set out in the detailed description which follows, with reference to the accompanying drawings, which illustrate a preferred embodiment without limiting the scope of application, and in which:

- Figure 1 is a top plan view of a sheet in accordance with a preferred embodiment of the present invention;
- Figure 2 is a perspective view of a wrapper for a pasty product made using the sheet in accordance with the preferred embodiment of the present invention;
- Figure 3 is a schematic side view of the continuous web longitudinal cutting zone;
- Figure 4 is a projection on a plane of the circular peripheral profile of the cutting edge of the part which makes the longitudinal cut in the continuous web;
- Figure 5 is a top plan example view of the continuous web from which the sheets are obtained, in accordance with a preferred embodiment of the present invention, showing a detail of the zones in which the sheets are obtained.

[0009] Figure 1 illustrates a preferred embodiment of a sheet 10 made of a material which can be folded to obtain a wrapper, in particular for a pasty product, such as processed or melted cheese or similar products.

[0010] The sheet 10 is suitably folded to obtain the lower, tray-shaped part 12 of the wrapper illustrated in Figure 2.

[0011] In Figure 1 the letter "M" denotes a longitudinal reference axis, whilst the numeral 15 is used in Figure 1 to indicate the border of the wrapping sheet which is suitably shaped by cutting, as described below.

[0012] The tray-shaped portion 12 of the wrapper comprises a base 16, which has the shape of a sector of a circle but which could also be triangular, longitudinal lateral walls 20, 22 and a back wall 24, which are folded perpendicularly to the base, horizontal tabs 26, 28, 30 extending respectively from the longitudinal lateral walls 20, 22 and the back wall 24 and folded parallel with the base to hold the pasty product, an upper lid 31, in the form of a separate triangular sheet, made of the same material as is used to make the lower, tray-shaped portion 12.

[0013] The numerals 34, 36, 40 denote the fold-over or folding tabs for the corresponding lateral walls of the wrapper.

[0014] The sheet 10 is folded along the fold or crease lines (illustrated with a dashed line in Figure 1) to obtain a central panel 16 designed to form the base of the wrapper, panels 20, 22, 24 arranged around the edge of the

base panel 16, which form the longitudinal lateral walls and the back wall of the wrapper, and panels 26, 28, 30 designed to form corresponding tabs for holding on the lid 31, extending from the panels 20, 22, 24 for the longitudinal lateral walls and back wall.

[0015] In particular, the central panel 16 is separated from the panels 20, 22 designed to form the longitudinal walls of the wrapper by longitudinal fold lines 1620 and 1622 (converging at a vertex point V), and is separated from the panel 24 which forms the back wall by an arced fold line 1624 extending substantially transversally to the longitudinal line M.

[0016] As illustrated in Figure 1, the panels 20, 22, 24 are, in turn, separated, by respective fold lines 2026, 2228, 2430, from the panels 26, 28, 30, which form the tabs for holding the lid on the present wrapper.

[0017] The panels 20, 22 are also separated at the front, by fold lines 2040, 2240, from panels 40a, 40b which can in turn be folded along an intermediate separating crease line (labelled 40ab), which divides the two panels 40a and 40b extending from the vertex V of the base panel 16 of the sheet 10.

[0018] The panels 40a and 40b are designed so that, in the folded configuration, they form the tab at the vertex 40, as illustrated in Figure 2, which is folded over a lateral wall 22 of the wrapper.

[0019] At the back, the panels 20, 22 are also separated, by fold lines 2034, 2236, from panels 34a, 36a, which can in turn be folded along intermediate fold lines (labelled 34ab, 36ab), relative to corresponding panels 34b and 36b, which are in turn separated by fold lines 2434 and 2436 from the back panel 24.

[0020] In the folded configuration, panels 34a, 34b and 36a, 36b, as described in detail below, form the fold-over tabs 34 and 36, which are folded over the longitudinal sides 20, 22 of the wrapper.

[0021] The rear edges of the blank, separated by fold lines, also have panels, labelled 34'a, 34'b and 36'a, 36'b which, in the folded configuration, form double layer fold-over portions, extending above the corresponding longitudinal lid tabs 26, 28 and which are labelled 34' and 36' in Figure 2.

[0022] As illustrated in Figure 1, the sheet 10 has a peripheral profile 15 which normally has the shape of an asymmetrical hexagon, comprising a transversal front edge 15a and a transversal back edge 15b opposite the transversal front edge 15a, and opposing first and second lateral edges 15c, 15d comprising front sections 15'c, 15'd extending from the front edge 15a at an angle to the axis M which widens the sheet 10 relative to the front edge 15a. There are also angled rear sections 15''c, 15''d extending from the back edge 15b at an angle to the axis M which widens the sheet 10 relative to the back edge 15b.

[0023] As illustrated in Figure 1, the rear sections 15''c, 15''d are shorter and set at a sharper angle than the front sections 15'c, 15'd.

[0024] As illustrated, for each lateral edge, the indi-

vidual sheet 10 also has a third rear angled section 15'''c, 15'''d of the edge of the sheet extending, between the second rear section 15''c, 15''d and the transversal back edge 15b, at an angle to the longitudinal axis M which is concordant with and greater than that of the second rear longitudinal section 15'c, 15'd.

[0025] In a preferred embodiment of the present process for making sheets 10 of a material which can be folded to obtain a wrapper, a continuous foldable web 11, preferably consisting of aluminium foil, is fed with a continuous motion. An example of this web feed movement is provided in Figure 5, which illustrates a longitudinal portion of the web, by arrow A.

[0026] Sheet 10 cutting comprises a first, longitudinal cutting step, carried out using a rotary cutter part 13 which presses against a countering device in the form of a roller 15, as illustrated in Figure 4. There are elastic or pneumatic compression means for suitably compressing the cutter part 13 and the countering part 15 against one another, inserting the web 11 to be cut longitudinally between them to form means for forcing the continuous web 11 of foldable material against the cutter part 13.

[0027] As illustrated in Figure 3, the cutter part has a cylindrical support drum or shaft 13' on which the cutter blades are mounted.

[0028] The rotary cutter part operates upon the continuous web, fed along a straight path, forming a peripheral profile which, for each longitudinal portion defining a sheet, has a substantially linear first front section 15'c, 15'd forming the outer edge of the lid tab and set at an angle to the longitudinal axis M so that, starting from the front zone 15a of the sheet, there is a transversal widening, that is to say, it is angled away from the longitudinal axis M of the sheet as far as a maximum width zone, and a second rear section 15''c, 15''d connected to the first section at the maximum width zone of the sheet 10, extending towards the back edge 15b, substantially linear and set at an angle to the longitudinal axis M which is opposite to the angle of the first section 15'c, 15'd, creating a transversal narrowing of the sheet. For each longitudinal portion defining a sheet, longitudinal cutting also provides the third section with a large angle 15'''c, 15'''d which connects the rear end of the second section 15''c, 15''d to the maximum narrowing zone relative to the back zone of the sheet, coinciding with the front zone of the next sheet.

[0029] In practice, for each longitudinal portion designed to form a sheet 10, the longitudinal cutting step provides lateral edges of the web which are shaped according to a succession of shaped lateral edges 15c, 15d, designed to form the sheets 10.

[0030] Cutting of the sheets from the web 11 is completed in a second step of transversally cutting the web 11, in which the front edge 15a and back edge 15b of the sheets 10 are formed. The transversal cutting step is carried out in a second zone, not illustrated in the accompanying drawings, located downstream of the first

zone where the web 11 is cut longitudinally.

[0031] As illustrated in Figure 5, according to an advantageous and preferred embodiment of the present process, the web longitudinal cutting step forms at least one first and one second separate web 11a, 11b, each for making a plurality of sheets 10. In this way, a single web, fed continuously, can be used to obtain a first and a second secondary web, which can be fed, after synchronisation if necessary, that is to say, after being positioned with the portions forming the sheets perfectly coinciding in the transversal direction, towards corresponding first and second packaging lines.

[0032] The position and shape of the lateral edges of the individual webs 11a, 11b is such that it reduces offcuts and wasted material. In practice, the widened portions of the sheets of a row of sheets (11a) are positioned at the narrowest portions of the sheets in the other row of sheets (11b). In Figure 5, the letter S indicates the offcut zones of the web 11, obtained as a result of the longitudinal cutting.

[0033] As illustrated in Figure 4, according to a preferred and advantageous embodiment, the cutter part has cutter means 17, 19, 21 which have a circular cutting profile extending from the drum 13' with a transversal direction suitable for making the lateral edges 15c, 15d of the sheets 10. In particular, the cutter part 13 has a first and a second lateral circular cutter element 17, 19 and an intermediate circular cutter element 21 for separating the two rows of sheets 10, substantially equidistant from the circular cutters in a transversal direction.

[0034] As illustrated in Figure 4, for each sheet 10 formed by the lateral circular cutters 17, 19, the profile of the lateral circular cutters 17, 19 has a first portion 17', 19' extending transversally so as to form the corresponding first angled front section 15'c, 15'd of the sheet 10 and a second portion 17'', 19'' extending transversally with inversion in the direction of downstream transversal extension, according to the direction of rotation of the cutter part, of the first portion, to define the corresponding second angled rear section 15''c, 15''d of the corresponding lateral edge of the sheet 10.

[0035] Moreover, for each sheet 10 formed by the intermediate circular cutter 21, the profile of the intermediate cutter 21 has a main cutter part which has a first portion 21a extending transversally to form the first angled front section 15'd of a sheet in a first plurality of sheets and a second portion 21b extending transversally in the opposite direction to the first portion 21a, forming the second angled rear section 15''d of a sheet 10 in the first plurality of sheets.

[0036] The profile of the intermediate cutter 21 also has secondary cutter means, in the form of a third portion 21c extending downstream, in accordance with the direction of rotation of the cutter part, from the second portion 21b extending transversally to form the short third angled rear section 15'''d which connects the rear section 15''d to the zone which forms the transversal back edge 15b of the first plurality 11a of sheets 10. A

fourth portion 21d has a first section 21'd extending from the second portion 21b to form an end of the first front section 21a of the second plurality 11b of sheets 10, and a fifth portion 21e extends from the second portion 21b to the intermediate point of the first portion 21a, forming the end of the first front section 21a of the second plurality 11b of sheets 10.

[0037] As illustrated in Figure 4, the fourth portion 21d also has a second section 21''d which extends from the first section 21'd at an angle opposite to the angle of the first section 21'd, forming the short third angled rear section 15'''c, 15'''d which connects the rear section 15''c, 15''d to the transversal back edge 15b of the second plurality 11b of sheets 10.

[0038] As illustrated in Figure 4, each of the cutters 17, 19, 21 have the shape of a rounded edge at the zones where the transversal direction of the cutter profile is inverted. This facilitates the production and, in particular, the grinding of the cutter blade.

[0039] In particular, the rounded edge is also advantageous in the zone forming the back and front section of two successive sheets, that is to say, a zone with limited transversal extension. In this zone, the fact that sharp edges are not made prevents the formation of points which could be the starting points of fractures and generate tears in the web with the consequent disadvantages.

[0040] In particular, the continuous web 11 for the lower, tray-shaped portion 12 is a sheet of aluminium foil or a heat-sealable plastic film.

[0041] The upper lid 31 is obtained from a different reel of the same type of material as that used for the sheet with which the lower, tray-shaped portion is made.

[0042] The webs of material for making the tray-shaped body and the lid may consist of heat-sealable material, with the aim of obtaining seals at the zones where there is reciprocal contact, completely sealing the wrapper if necessary.

[0043] The invention described can be subject to modifications and variations without thereby departing from the scope of the inventive concept. Moreover, all the details of the invention may be substituted by technically equivalent elements.

Claims

1. A process for making sheets (10) of a material which can be folded to obtain a wrapper, in particular for a pasty product, such as processed or melted cheese or similar products, each sheet (10) having a peripheral profile (15) with a transversal front edge (15a) and a transversal back edge (15b) opposite the transversal front edge (15a), and opposing first and second lateral edges (15c, 15d), the sheets (10) being obtained by cutting a continuous web (11) of the foldable material, the web (11) being cut longitudinally to form the lateral edges (15c,

15d) of the sheets, and transversally to form the front edge (15a) and the back edge (15b) of the sheets (10), the process being **characterised in that** at least the step of longitudinally cutting the sheets is carried out with the web (11) moving with a continuous feed motion.

2. The process according to claim 1, **characterised in that** the sheet (10) cutting operation comprises a first step of longitudinally cutting the web (11) to form the lateral edges (15c, 15d) of the sheets, and a second transversal cutting step to form the front edge (15a) and the back edge (15b) of the sheets (10).

3. The process according to either of the foregoing claims, **characterised in that** the longitudinal cutting step provides lateral edges (15c, 15d) of the sheets (10) shaped in such a way that they have a substantially linear first front section (15'c, 15'd) which is at an angle to the longitudinal axis (M) such that, starting from the front zone (15a) of the sheet, there is a transversal widening of the sheet as far as a maximum width zone, and a second rear section (15''c, 15''d) connected to the first section at the maximum width zone for the sheet (10) and extending towards the back edge (15b), the second section being substantially linear and at an angle to the longitudinal axis (M) which is opposite to the angle of the first section (15'c, 15'd) and creating a transversal narrowing of the sheet.

4. The process according to claim 3, **characterised in that** the longitudinal cutting step provides a third angled rear section (15'''c, 15'''d) of the edge of the sheet, extending with an angle concordant with and greater than that of the second longitudinal rear section (15''c, 15''d), between the second rear section (15''c, 15''d) and the transversal back edge (15b).

5. The process according to any of the foregoing claims, **characterised in that** the step of cutting the web longitudinally forms at least one first and one second separate web (11a, 11b), each for making a plurality of sheets (10).

6. The process according to any of the foregoing claims, **characterised in that** the step of cutting the web (11) longitudinally to form the lateral edges (15c, 15d) of the sheets (10), is carried out using a rotary circular cutter part (13, 13', 17, 19, 21) rotating with continuous motion.

7. The process according to claim 6, **characterised in that** the cutter part has cutter means (17, 19, 21) with a circular cutting profile extending transversally, suitable for making the lateral edges (15c, 15d)

of the sheets (10).

8. The process according to either of the foregoing claims from 6 or 7, **characterised in that** the cutter part (13) has a first and a second lateral circular cutter element (17, 19) and an intermediate circular cutter element (21) for separating the two rows of sheets (11a, 11b).

9. The process according to claim 8, **characterised in that**, for each sheet (10) formed by the lateral circular cutters (17, 19), the profile of the lateral circular cutters (17, 19) has a first portion (17', 19') extending transversally to form the first angled front section (15'c, 15'd) of the sheet (10) and a second portion (17'', 19'') extending transversally with inversion in the direction of transversal extension, forming the second angled rear section (15''c, 15''d) of the lateral edge of the sheet (10).

10. The process according to claim 8 or 9, **characterised in that**, for each sheet (10) formed by the intermediate circular cutter (21), the intermediate cutter (21) profile has a main cutter part with a first portion (21a) extending transversally, forming the first angled front section (15'c, 15'd) of a sheet in a first plurality sheets and a second portion (21b) extending transversally in the opposite direction to the first portion (21a), forming the second angled rear section (15''c, 15''d) of a sheet (10) in the first plurality of sheets.

11. The process according to claim 10, **characterised in that** the profile of the intermediate cutter (21) has secondary cutter means in the form of a third portion (21c), extending downstream according to the direction of rotation of the cutter part, from the second portion (21b) which extends transversally, forming the third angled rear section (15'''c, 15'''d) which connects the rear section (15''c, 15''d) to the transversal back edge (15b) of the first plurality (11a) of sheets (10), a fourth portion (21d) having a first section (21'd) which extends from the second portion (21b), forming one end of the first front section (21a) of the second plurality (11b) of sheets (10), and a fifth portion (21e) extending from the second portion (21b) to an intermediate point of the first portion (21a), forming the end of the first front section (21a) of the second plurality (11b) of sheets (10).

12. The process according to claim 11, **characterised in that** the fourth portion (21d) has a second section (21''d) which extends from the first section (21'd) at an angle opposite to the angle of the first section (21'd), forming the third angled rear section (15'''c, 15'''d) which connects the rear section (15''c, 15''d) to the transversal back edge (15b) of the second plurality (11b) of sheets (10).

13. The process according to any of the foregoing claims from 8 to 12, **characterised in that** each of the cutters (17, 19, 21) has a rounded edge shape at the zones where the transversal direction of the cutter profile is inverted. 5
14. A cutter part, **characterised in that** it is made in accordance with any of the foregoing claims.
15. A wrapper for a pasty product, such as processed or melted cheese or similar products, **characterised in that** it has a lower part normally in the shape of a tray, made from a flat sheet which is obtained in accordance with any of the foregoing claims. 10

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FIG. 1

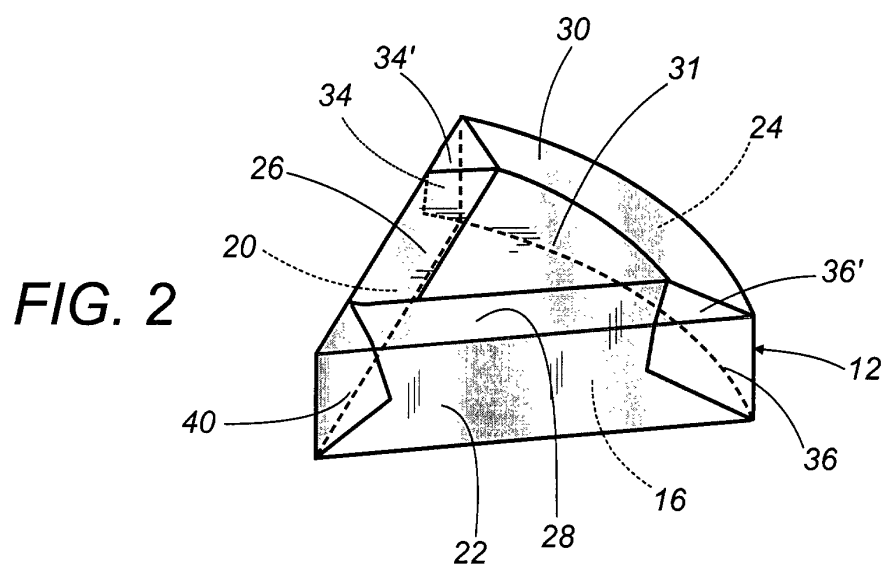
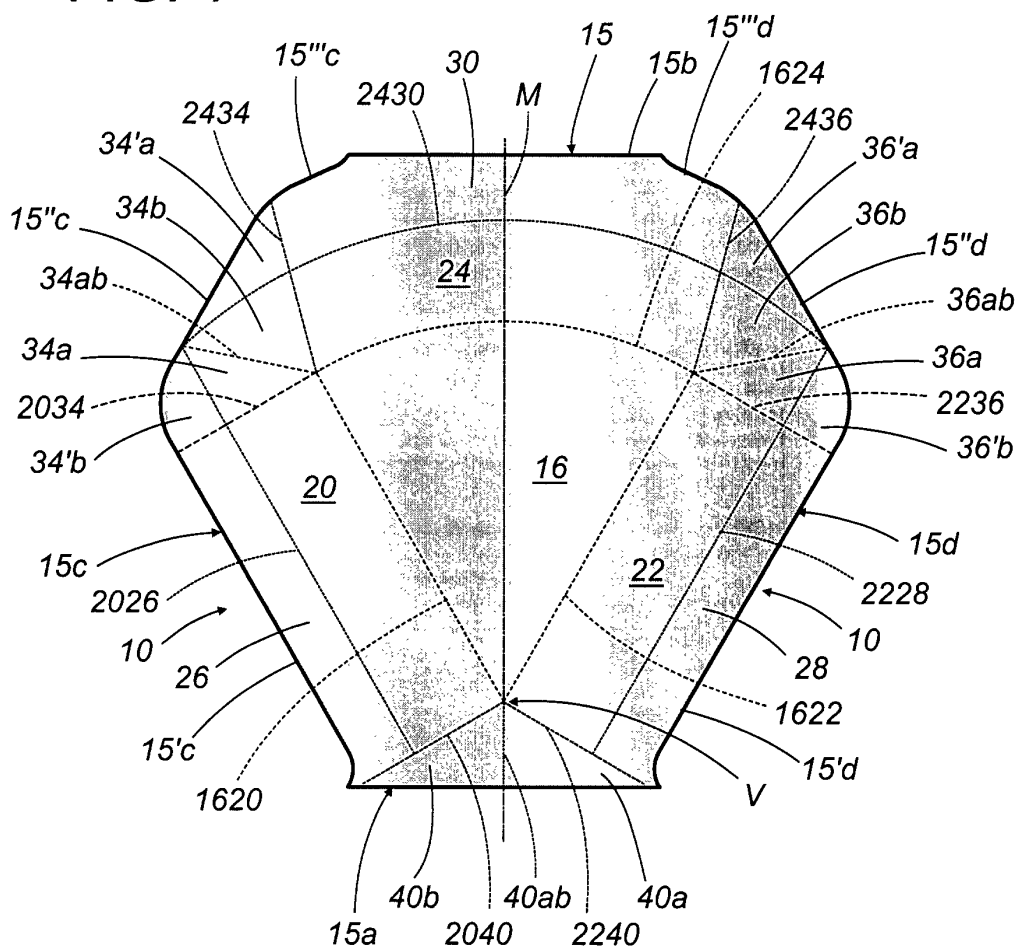


FIG. 4

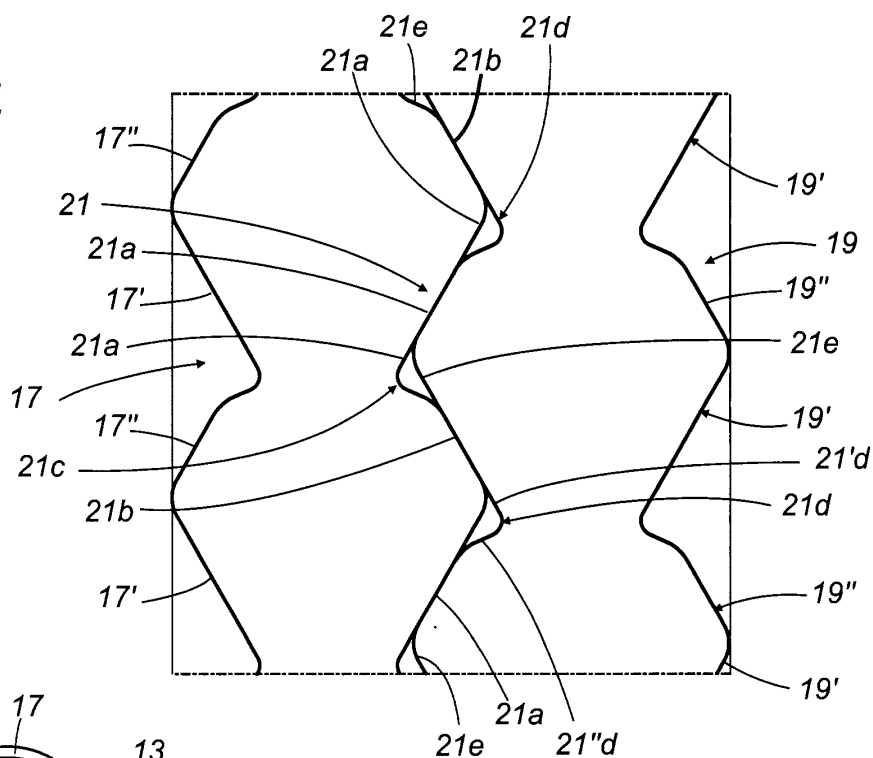


FIG. 3

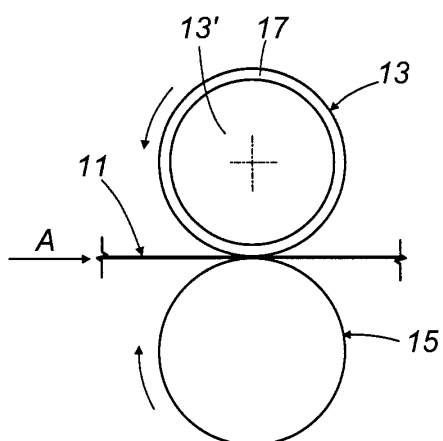


FIG. 5

