

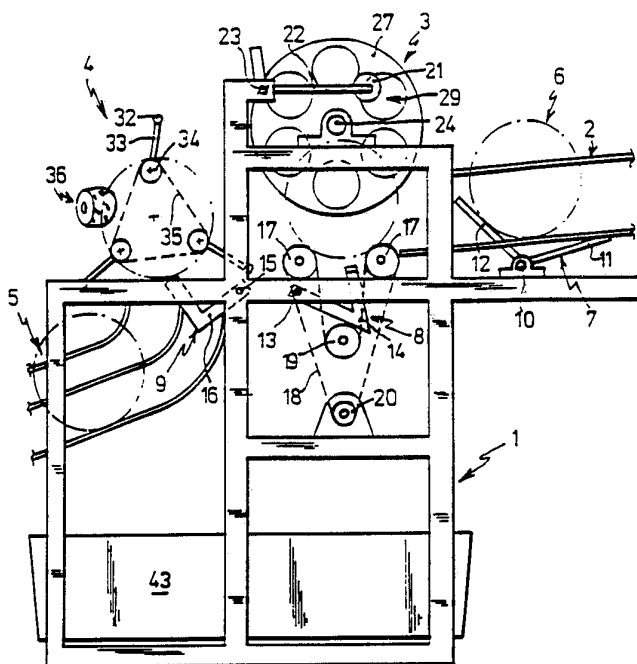


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(21) International Application Number: PCT/NL91/00226 (22) International Filing Date: 8 November 1991 (08.11.91) (30) Priority data: 9002434 8 November 1990 (08.11.90) NL (71) Applicant (for all designated States except US): VIJGEN-DAM B.V. [NL/NL]; Orion 17, NL-3902 SB Veenendaal (NL). (72) Inventor; and (75) Inventor/Applicant (for US only): VAN KOOTEN, Christian [NL/NL]; Vijgendam 29, NL-3901 SK Veenendaal (NL). (74) Agents: KOOY, L., W. et al.; Octrooibureau Vriesendorp & Gaade, P.O. Box 266, NL-2501 AW The Hague (NL).		(81) Designated States: AT (European patent), BE (European patent), CA, CH (European patent), DE (European patent), DK (European patent), ES (European patent), FR (European patent), GB (European patent), GR (European patent), IT (European patent), LU (European patent), NL (European patent), SE (European patent), US. Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i> <i>In English translation (filed in Dutch).</i>

(54) Title: CHEESE-RIND-CUTTING APPARATUS**(57) Abstract**

Cheese-rind-cutting apparatus, comprising a frame (1) in which the cheeses are rotatably supported, and rind-removing means for the removal of the rind, wherein the apparatus is provided with two stations (3, 4) in which an upright cheese (6) is supported drivably and revolvingly around its horizontal axis. The first station (3) is provided with first centring means (17, 21) as well as a first rind-removing means (25, 26; 36) being rotatable around an axis (24) and axially reciprocating for the removal of the rinds of the lower and upper surfaces of the cheeses. The second station (4) is provided with second centring means as well as second rind-removing means (36) being rotatable and following a curved path for the removal of the rinds of the lateral surfaces of the cheeses. First and second transferring means (7, 8) are arranged to transfer the cheeses (6) from a supply track (2) via said first to said second station, and in that a stopping means (9) is arranged beneath the second station (4), so as to temporarily retain the cheeses from moving on to the discharge track (5). The first rind-removing means consists of a pair of discs (27) being movable towards and away from each other onto which a plurality of spring (28)-supported washers (29) provided with a number of frusto-conical grating holes (30) directed towards the cheese are applied in circular arrangement. The second rind-removing means (36) consists of a convex cylinder (37) into which grating holes (39) are applied in helical series, as well as a cylinder bottom (38) comprising vent holes (40).



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⁺ Any designation of "SU" has effect in the Russian Federation. It is not yet known whether any such designation has effect in other States of the former Soviet Union.

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Cheese-rind-cutting Apparatus

The invention relates to a cheese-rind-cutting apparatus comprising a frame in which the cheeses are displaceably supported as well as cheese-removing means for the removal of the cheese rind.

5

A known cheese-rind-cutting apparatus consists of a swivel table similar to a potter's wheel onto which the cheese to be processed can be fixed. The rind-cutting operation is manually performed by manipulating with a knife or a similar tool. In this way, certainly in case of inaccuracy, more cheese is spilt than would be strictly necessary. In this context, the rind does not only comprise the synthetic coating but also a thin, coloured layer of the cheese underneath. Generally speaking, the rind-cutting operation is considered optimal if the amount of waste material is less than 10%, which is hard to realize when using the known cheese-cutting apparatus.

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The invention aims to improve these circumstances. To this end, the invention includes rind-removing means comprising at least one rotatable convex cylinder, the lateral surface of the cylinder being provided with a plurality of small holes, as well as means for slightly pressing the rind-removing means against the surface of the cheese.

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25

Due to the cylinder's design as well as the way of pressing it against the surface of the cheese, the surface can be followed very closely, even if the cheeses have very rough lower, upper or lateral surfaces.

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In order to remove the lateral surface of the cheese, preferably means for moving the at least one convex cylinder along a curved path, in a plane through the cylinder axis, are provided.

5

To remove the upper and/or lower surface of the cheese, preferably means for moving said at least one convex cylinder in axial direction are provided.

10

The holes on the outer surface of the convex cylinder, at least to some extent, may show a raised edge along their circumference. The raised edge, as viewed in the direction of rotation of the convex cylinder, may be positioned near a rear part of the corresponding hole and may be formed by a chisel.

15

The edge directed towards the cheese may be surfaced and hardened.

20

It is preferred that - at cheese-surface level - the direction of rotation of the convex cylinder is the same as the direction of movement of the cheese.

25

In a more detailed description said at least one convex cylinder comprises a cylinder bottom provided with air-suction holes.

30

In order to remove the rind effectively, it is preferred to apply the holes in helical series. In that way, the holes may overlap one another along a helix, in axial direction, or they may be staggered along a helix in relation to the holes along another helix.

Preferably, the rind-removing means are supported by springs.

35

According to the invention, the apparatus may be provided with two stations in which an upright cheese is supported drivingly

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and revolvingly around its horizontal axis, the first station being provided with first centring means as well as with a first rind-removing means being rotatable about an axis and axially reciprocating for the removal of the rinds of the lower and upper surfaces of the cheeses, and the second station being provided with second centring means as well as a second rind-removing means being rotatable and following a curved path for the removal of the rinds of the lateral surfaces of the cheeses, wherein first and second transferring means are arranged to transfer the cheeses from a supply track via said first to said second station, and wherein a stopping means is arranged beneath the second station, so as to temporarily retain the cheeses from moving on to the discharge track.

The first rind-removing means may consist of two discs being movable towards and away from each other onto which a plurality of possibly rotating rind-removing means, preferably six, are applied in circular arrangement. The rind-removing means may be spring-supported washers in which a number of frusto-conical grating holes directed towards the cheese are provided. Preferably, three grating holes are arranged at equal, mutual angular distance on a pitch circle of a smaller diameter than an outer pitch circle, the latter being provided not only with three grating holes arranged at equal, mutual angular distance but also with three larger holes for fastening means cooperating with the springs. Preferably, the edge of the grating holes directed towards the cheese is surfaced and hardened.

The second rind-removing means may consist of a convex cylinder into which grating holes are applied in helical series, said holes being similar to the grating holes of the first rind-removing means. Each quarter of the total number of grating holes of the second rind-removing means should prefe-

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rably be arranged along a helix extending across one quadrant convex cylinder, and the axial distance between all grating holes is equal to the displacement of the rind-removing means per revolution of the cheese.

5

The second station is provided with two discs that can cooperate with the rindless upper and lower surfaces of the cheeses at the first station, wherein one of said discs can be rotatingly driven.

10

The first centring means may consist of two lower driving rollers and a depressable upper roller, at least the lower roller being shaped like an hourglass or a diabololo.

15

The second centring means may consist of three swivel pins.

The first transferring means may consist of a flap having two wings that mutually include an angle exceeding 90°.

20

The two transferring means and the stopping means may be provided with tiltable and cranked levers.

25

According to a variant embodiment, the first rind-removing means consist of two reciprocating convex cylinders being movable towards and away from each other into which series of grating holes similar to the aforementioned ones are applied.

30

Beneath the stations a preferably extensible receptacle for waste is arranged.

The invention will be described below in detail by discussing a drawing in which a possible embodiment of an apparatus according to the invention is represented.

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In the drawing:

figure 1 is a schematic side view of a first embodiment of the rind-cutting apparatus,

figures 2 and 3 are schematic top views of the rind-removing means of both stations,

figure 4, at an enlarged scale, shows a front view of a washer of the first rind-removing means,

figure 5 shows a cross-section of the washer of figure 4 at line V-V.

figure 6, at an enlarged scale, shows a longitudinal cross-section of the second rind-removing means,

figure 7 shows a detail of a cross-section of a second embodiment of the second rind-removing means, and

figure 8 shows a schematic longitudinal view of a second embodiment of the first rind-removing means of the rind-cutting apparatus.

The rind-cutting apparatus as represented in figures 1-5 comprises a frame 1, a supply track 2, a first station 3, a second station 4, and a discharge track 5. Both tracks 2 and 5 consist of two rods on which the cheeses' lateral surfaces can be rolled by gravity as well as two rods that keep the cheeses in their rolling paths. The chain lines 6 indicate cheeses in different positions.

The first transferring means are positioned between the supply track 2 and the first station 3. Second transferring means 8

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are positioned between both stations, and stopping means 9 is positioned between the second station 4 and the discharge track 5.

5 The first transferring means 7 consist of a flap that is rotatable about a horizontal axis and has two wings 11, 12 that mutually include an angle exceeding 90°. In an anti-clockwise direction of rotation of the flap in figure 1, wing 12 allows the cheese to move on to the first station 3 and
10 wing 11 retains the next cheese. This flap rotation is programmed in relation to the rotation of a cranked lever 14 of the second transferring means around a horizontal axis 13 in anti-clockwise direction, whereby a cheese is transferred from the first to the second station, and also in relation to the
15 rotation a similarly cranked lever 16 of the stopping means 9 in anti-clockwise direction around a horizontal axis 15, whereby a cheese from the second station 4 can be dropped onto the discharge track 5. 'Programmed' in this context means that the stations 2 and 3 cannot receive the next cheese until they
20 are empty. To keep a clear view, the motors, cylinders and the like have been omitted from the drawing.

By opposed rotation of the flap 11, 12 and the stopping means 9 the next cheese is retained. In other words, the flap 11, 12
25 also serves as a stopping means.

The first station 3 contains centring means in the form of two driving rollers 17 that are driven by a belt or chain 18 which is also guided over a tensioner roller 19 and a motor roller
30 20. It is evident that the belt or chain 18 does not run over the driving roller 17 itself. The design of the driving rollers 17 is adjusted to the shape of the lateral surfaces of the cheeses. Therefore, in a side view, they will be shaped like an hourglass or a diabolo. The stopping means 9 may also

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simply consist of a reciprocating rod. The cheese 6 is set into rotation in the first station by means of a pressing roller 21 mounted on an arm 22, which is rotatable around an elevated horizontal axis 23. Thus, the centring means in the first station also serve as driving means for the cheeses. The rollers 17 are also adjustable for height to cheeses of variable diameters, provided that their centres are positioned above the range of operation of the rind-removing means 25, 26, the next subject to be discussed.

The first station 3 comprises first rind-removing means 25, 26 (figure 2) that are rotatable about a horizontal axis 24 and axially reciprocating for the removal of the rinds of the cheeses' lower and upper surfaces that are positioned in vertical planes. Each of the rind-removing means 25 and 26 consists of a stainless steel disc 27 onto which six spring-supported washers 29 having a thickness of 1 cm and a diameter of circa 8 cm (figures 4 and 5) are applied in circular arrangement.

Said washers 29 are turned in the required profile. Subsequently, two groups of three small holes are drilled in two different pitch circles, respectively, at the position of the intended grating holes 30. From the bottom side those holes are counterbored down to a remaining wall thickness of ca. 2 mm. On the largest pitch circle three larger holes 30' are arranged for accommodating the spring support (vide 28 in figure 2). The remaining wall thickness of the small holes has been pressed outwards and is subsequently surfaced down to ca. 2 mm and hardened, so as to provide the grating holes 30 with a raised and - in this case - circular edge 31 directed towards the cheese.

If the speed n_1 of the rind-removing means is set at 200 r.p.m. and the cheese 6 is driven in an opposed direction at a

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speed n3 of 30 r.p.m., the speed n2 of the rind-removing means 26 should be set at 260 r.p.m. in the direction as indicated in figure 2. In this way, the difference in speed is the same for both surfaces of the cheese, so that an equal amount of waste material will be removed from both surfaces.

Such first washers 29 similar to the heads of an electric shaver (not rotating, however, around their axes in the illustrated embodiment) are suitable for processing cheeses having relatively smooth lower and upper surfaces. In case of less smooth lower and upper surfaces of the cheeses, the second embodiment represented in figure 8 will be more suitable, as it incorporates rind-removing means of the type as discussed below in relation to the second station 4 of the first embodiment.

The second station 4 comprises centring means in the form of three pins 32 applied onto an arm 33 that is slewable inwards and outwards around a drum 34. In figure 1 the arm slews inwards in clockwise direction and outwards in anti-clockwise direction. The drums 34 are jointly driven by a chain or belt 35. Thanks to this type of centring means cheeses of variable diameter can be processed.

The second station 4 also comprises a second rind-removing means 36 that is capable of following a curved path in a horizontal plane in order to remove the rinds of the lateral surfaces of the cheeses.

As is shown in detail in figure 6, the second rind-removing means consists of a convex cylinder 37 that has been turned, for example, out of a massive pipe, as well as a bottom 38 and a sleeve for connecting it to a rotatable axis of a driving means. Into that cylinder 37 sixteen frustro-conical grating

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holes 39 have been applied by punching, which are finished in the same way as the grating holes 30 of the washer 29. The cylinder bottom 38 is provided with oblique air-suction holes 40 that draw in air in order to stimulate the discharge of removed material.

The sixteen grating holes 39 of the second rind-removing means 36 have a diameter of ca. 3.5 mm. on the outer side of the cylinder 37. The grating holes are arranged in groups of four per one helix in one quadrant of the convex cylinder 37. As the axial distance of four grating holes is four times the size of their diameter, i.e. 14 mm, and each following helix is spaced 3.5 mm from the preceding one in axial direction, each portion of the lateral surface of the cheese will be cut off if the second rind-removing means covers a distance of 3.5 mm during one revolution of the cheese. Alternatively, the holes may be staggered along a helix in axial direction.

After having been centred, the cheeses are rotatingly driven in the second station 4 by discs 41, 42 that move towards or away from the rindless lower and upper surfaces of the cheese and that are driven for rotation around a centre line lying in the plane of the drawing of figure 3. If only cheeses of equal thickness are processed, one of the discs 41 may be axially-fixed, rotatably supported, otherwise the disc should be axially adjustable. As has been stated before, the second rind-removing means 36 runs at a speed of 3.5 mm per revolution of the cheese in a circle track, the centre of which substantially coincides with the centre of the radius of curvature of the lateral surface of the cheese. Thanks to the provision of spring means a perfect removal of the rind is effected. The speed of rotation of the cylinder should preferably exceed the speed of displacement of the cheese by a factor of one.

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A suitable raised edge 31 can also be obtained by using a slightly projecting, e.g. 0.1 mm, chisel 45 (vide figure 7) mounted near a rear portion of the hole 39, as viewed in the direction of rotation of the cylinder 37. As in this case the raised edge 31 is present at only one side of the hole 39, the direction of rotation of the cylinder 37, indicated in figure 7 by a curved arrow, is fixed. A very accurate removal of the rind can be achieved if the cheese 6 is displaced at the level of the convex cylinder 37, either by rotation or translation of the cheese, in a direction similar to the direction of rotation of the convex cylinder 37 near the cheese surface 44. In that way, a deep cut in the cheese is avoided, and moreover, the resilience of the cheese will be fully utilized.

All the removed material is received in a container 43.

Both first rind-removing means of the first station 3 of the variant embodiment represented in figure 8 are of the same type as the single second rind-removing means 36 of the second station 3 of the first embodiment. Just like those of the first embodiment, both rind-removing means are slightly pressed against the lower and upper surfaces. This embodiment is particularly suited for cheeses having very rough lower and upper surfaces.

Both driving rollers 17 serve to support two cheeses 6 of different diameters. The convex cylinders 37, one for the upper surfaces of the cheese and one for the lower, are being axially moved up and down as they are rotating. This axial movement is perpendicular to the axial movements of the rind-removing means of the first embodiment.

The different drives of figure 8 will not be discussed any further, as was the case in describing the other figures. The

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same applies to the housings that are provided for the sake of safety, as well as to the knob-controlled cabinet and other safety equipment.

- 5 Within the scope of the claims also variants of the embodiments represented in the drawing are feasible.

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C L A I M S

1. Cheese-rind-cutting apparatus, comprising a frame in which the cheeses are rotatably supported, and rind-removing means for the removal of the rind, characterized in that the apparatus is provided with two stations (3, 4) in which an upright
5 cheese (6) is supported drivably and revolvingly around its horizontal axis, the first station (3) being provided with first centring means (17, 21) as well as a first rind-removing means (25, 26; 36) being rotatable around an axis (24) and axially reciprocating for the removal of the rinds of the
10 lower and upper surfaces of the cheeses, and the second station (4) being provided with second centring means as well as a second rind-removing means (36) being rotatable and following a curved path for the removal of the rinds of the lateral surfaces of the cheeses, in that first and second transferring
15 means (7, 8) are arranged to transfer the cheeses (6) from a supply track (2) via said first to said second station, and in that a stopping means (9) is arranged beneath the second station (4), so as to temporarily retain the cheeses from moving on to the discharge track (5).

20 2. Apparatus according to claim 1, characterized in that the first rind-removing means consists of a pair of discs (27) being movable towards and away from each other onto which a plurality of possibly rotating cutting means, preferably six,
25 are applied in circular arrangement.

3. Apparatus according to claim 2, characterized in that the cutting means are spring(28)-supported washers (29) in which
30 a number of frusto-conical grating holes (30) directed towards the cheese are provided.

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4. Apparatus according to claim 2 or 3, **characterized in that** three grating holes (30) are arranged at equal, mutual angular distance on a pitch circle of a smaller diameter than an outer pitch circle, the latter being provided not only with three
5 grating holes arranged at equal, mutual angular distance but also with three larger holes (30') for fastening means cooperating with the springs (28).

5. Apparatus according to one of the claims 2-4, **characterized**
10 **in that** the edge (31) of the grating holes (30) directed towards the cheese is surfaced and hardened.

6. Apparatus according to claim 1, **characterized in that** the second rind-removing means (36) consists of a convex cylinder
15 (37) into which grating holes (39) according to claim 3 or 5 are applied in helical series, as well as a cylinder bottom (38) comprising vent holes (40).

7. Apparatus according to claim 6, **characterized in that** each
20 quarter of the total number of grating holes (39) of the second rind-removing means (36) is arranged along a helix extending across one quadrant of the convex cylinder (37), and in that the axial distance between all grating holes is equal to the displacement of the rind-removing means per revolution
25 of the cheese.

8. Apparatus according to one of the preceding claims, **characterized in that** the second station (4) is provided with two discs (41, 42) that can cooperate with the rindless upper and
30 lower surfaces of the cheeses (6) at the first station (3), wherein one of said discs can be rotatingly driven.

9. Apparatus according to claim 1, **characterized in that** the first centring means consist of two lower driving rollers (17)

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and a depressable upper roller (21), at least the lower rollers having an hourglass-shaped appearance.

10. Apparatus according to claim 1, **characterized in that** the second centring means consist of three swivel pins (32).

11. Apparatus according to claim 1, **characterized in that** the first transferring means (7) consist of a flap having two wings (11, 12) that mutually include an angle exceeding 90°.

12. Apparatus according to claim 1, **characterized in that** the second transferring means (8) and the stopping means (9) are provided with tiltable and cranked levers (14, 16).

13. Apparatus according to any of the claims 1 and 8-12, **characterized in that** the first rind removing means consist of a pair of convex cylinders (37) that are movable towards and away from each other as well as up and down into which series of grating holes (39) according to claim 6 or 7 are applied.

14. Apparatus according to one of the preceding claims, **characterized in that** beneath the stations an extensible receptacle (41) for waste is arranged.

15. Cheese-rind-cutting apparatus comprising a frame (1) in which the cheese (6) is displacably supported as well as rind-removing means for the removal of the cheese rind, wherein said rind-removing means (36) comprises at least one rotatable convex cylinder (37), the lateral surface of the cylinder being provided with a plurality of small holes (39), and wherein means are provided for slightly pressing the rind-removing means (36) against the surface of the cheese (6).

16. Cheese-rind-cutting apparatus according to claim 15, **characterized in that** means are provided for moving said at

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least one convex cylinder (37) along a curved path in a plane through the cylinder axis, so as to remove the lateral surface of the cheese (figure 3).

5 17. Cheese-rind-cutting apparatus according to claim 15 or 16, **characterized in that** means are provided for moving said at least one convex cylinder (37) in axial direction, so as to remove the upper and lower surfaces of the cheese (figure 8).

10 18. Cheese-rind-cutting apparatus according to any of the claims 15-17, **characterized in that** the holes (39) on the outer surface of the convex cylinder (37), at least to some extent, show a raised edge (31) along their circumference.

15 19. Cheese-rind-cutting apparatus according to claim 18, **characterized in that** the raised edge (31), as viewed in the direction of rotation of the convex cylinder (37), is positioned near a rear part of the corresponding hole (39).

20 20. Cheese-rind-cutting apparatus according to claim 19, **characterized in that** the raised edge (31) is formed by a chisel (45).

25 21. Cheese-rind-cutting apparatus according to claim 18 or 19, **characterized in that** the holes (39) consist of frustro-conical holes.

30 22. Cheese-rind-cutting apparatus according to any of the claims 18-21, **characterized in that** the edge (31) directed towards the cheese is surfaced and hardened.

23. Cheese-rind-cutting apparatus according to any of the claims 15-22, **characterized in that**, at cheese-surface level,

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the direction of rotation of the convex cylinder (37) is similar to the direction of movement of the cheese (6).

5 24. Cheese-rind-cutting apparatus according to any of the claims 15-23, **characterized in that** said at least one convex cylinder (37) comprises a cylinder bottom (38) that is provided with air-suction holes (40).

10 25. Cheese-rind-cutting apparatus according to any of the claims 15-24, **characterized in that** said holes (30) are applied in helical series.

15 26. Cheese-rind-cutting apparatus according to claim 25, **characterized in that** said holes (39) are applied along a helix in axial direction in such a way that they overlap one another.

20 27. Cheese-rind-cutting apparatus according to claim 25, **characterized in that** said holes along one helix are staggered in relation to those arranged along another helix.

25 28. Cheese-rind-cutting apparatus according to any of the preceding claims, **characterized in that** the rind-removing means are supported by springs.

29. Apparatus as shown in the drawing and/or as described with reference to the drawing.

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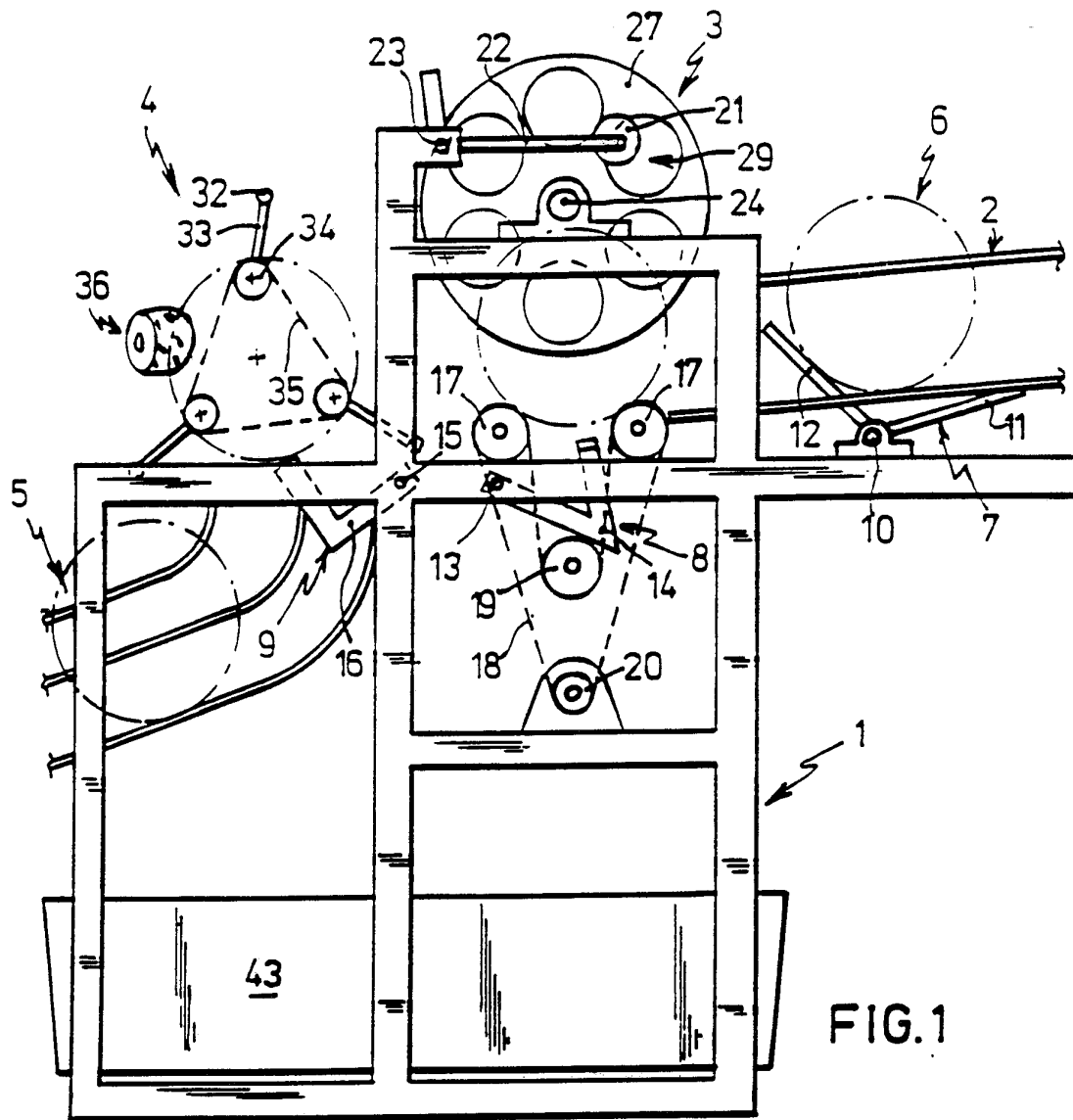


FIG. 1

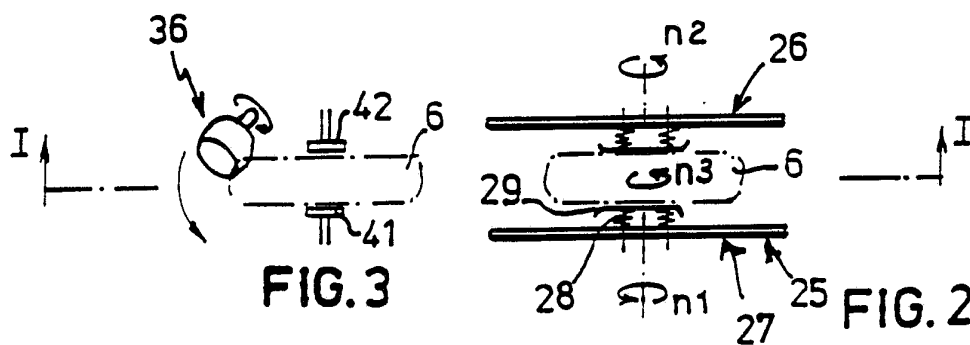


FIG. 3

FIG. 2

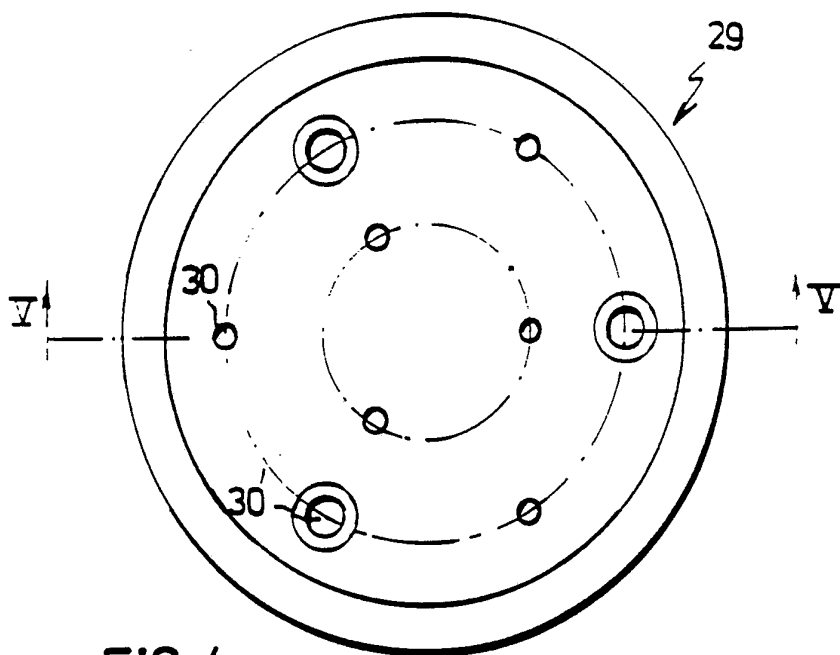


FIG. 4

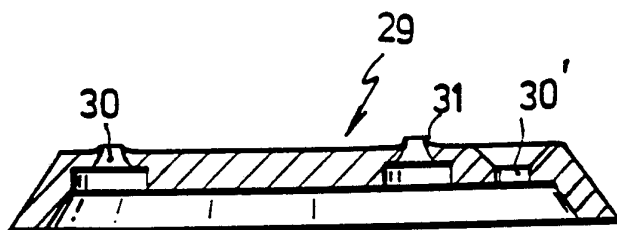


FIG. 5

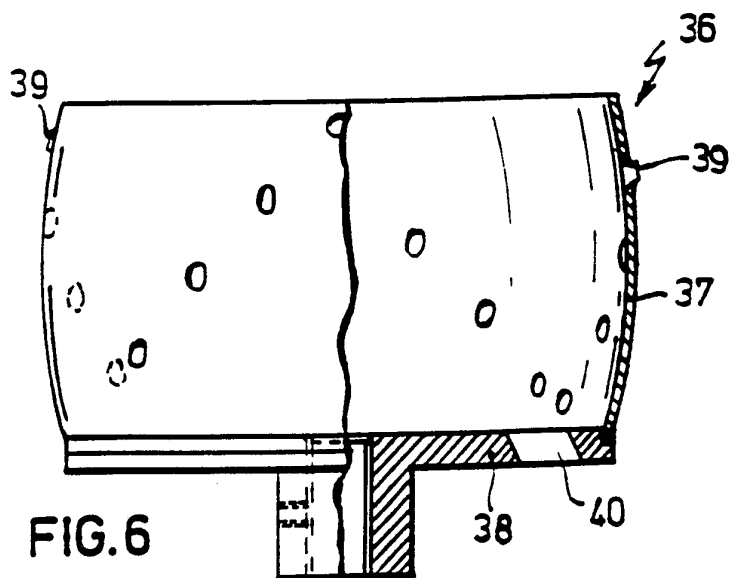


FIG. 6

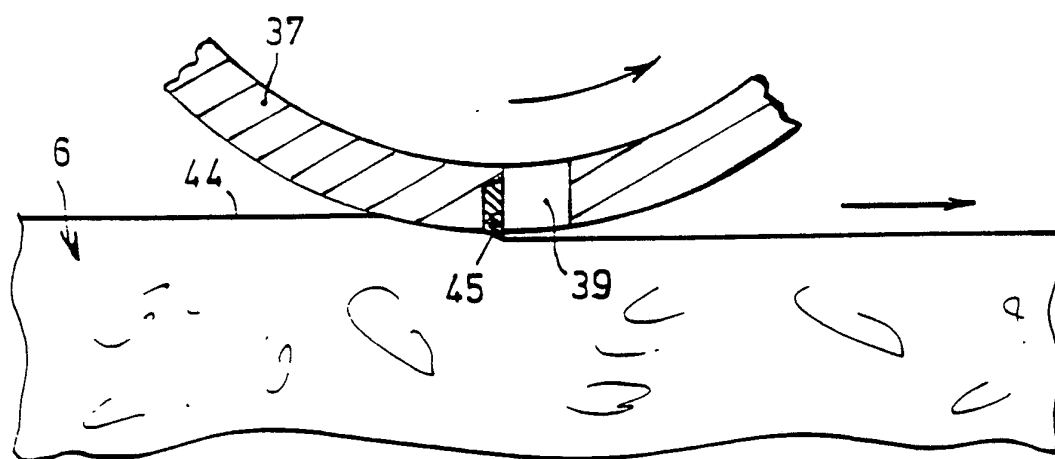
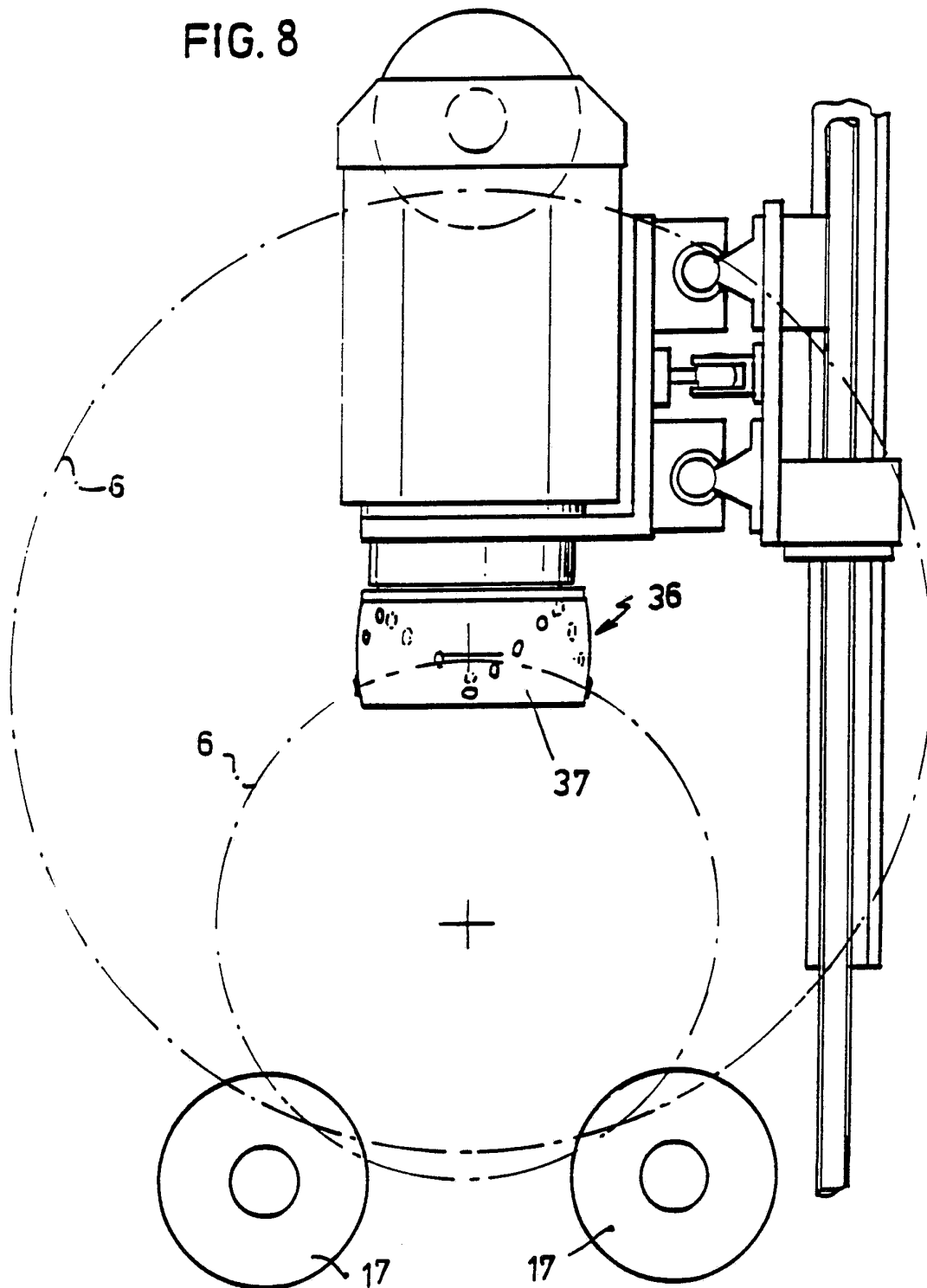


FIG. 7

FIG. 8



INTERNATIONAL SEARCH REPORT

International Application No

PCT/NL 91/00226

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC		
Int.Cl. 5 A01J27/00; B26D3/28		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
Int.Cl. 5	A01J ; B26D	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
III. DOCUMENTS CONSIDERED TO BE RELEVANT⁹		
Category ¹⁰	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
A	NL,A,7 713 110 (C.W. IN 'T HOUT) 30 May 1979 see page 5, line 10 - page 6, line 13; figures ---	1, 15
A	EP,A,0 168 117 (MACHINEFABRIEK JOHS ABERSON B.V.) 15 January 1986 see page 3, line 13 - line 19 ---	15
A	NL,C,77 059 (GOUDSCHE MACHINEFABRIEK) 16 August 1954 ---	
A	FR,A,2 403 019 (ETABLISSEMENTS AVRILLON FRERES) 13 April 1979 ---	
¹⁰ Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "&" document member of the same patent family		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
18 FEBRUARY 1992	20.03.92	
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**ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.**

NL 9100226
SA 53240

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.
The members are as contained in the European Patent Office EDP file on
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
NL-A-7713110	30-05-79	DE-A- 2803773	31-05-79
		FR-A- 2409694	22-06-79
		GB-A- 2008933	13-06-79
		SE-A- 7812151	29-05-79
EP-A-0168117	15-01-86	NL-A- 8402196	03-02-86
NL-C-77059		None	
FR-A-2403019	13-04-79	None	