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(54) **WRAPPING METHOD AND WRAPPING MACHINE FOR CONFECTIONERY PRODUCTS**

UMWICKLUNGSVERFAHREN UND UMWICKLUNGSMASCHINE FÜR SÜSSWARENPRODUKTE

PROCÉDÉ D'EMBALLAGE ET MACHINE D'EMBALLAGE POUR DES PRODUITS DE CONFISERIE

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- **Prospectus ?EMC Continuous motion high speed wrapping machine for chocolate products in bunch wrap?; 03/2002**

EP 2 942 294 B2

Description

[0001] This invention relates to a wrapping method for wrapping confectionery products.

[0002] More specifically, the invention can be applied to the wrapping of confectionery products such as chocolates, to which this description will hereinafter refer but without limiting the scope of the invention.

[0003] Known from the prior art are confectionery wrapping machines comprising a transfer drum for transferring a succession of products to a wrapping device.

[0004] Generally speaking, the wrapping device comprises a first and a second folder roller tangent to each other at a product transfer station where the selfsame products pass from the first folder roller to the second.

[0005] More specifically, the first folder roller places a sheet of wrapping material round the respective product and the second folder roller, which is equipped with product retaining grippers, wraps the sheet of wrapping material on the corresponding product.

[0006] The wrapped reference confectionery products normally have a truncated cone shape with a base substantially flat and a rounded or bevelled end opposite the flat base and the wrapping style is of the "bunch" type. "Bunch" type wrapping comprises smoothing the sheet of wrapping material on the chocolate, on the rounded end and along a lateral surface of it, and, for example, folded on the flat base.

[0007] The retaining grippers of the second folding roller support the product provided with the respective sheet of wrapping material at the opposite portions of the lateral surface.

[0008] A smoothing step is performed using a brush unit moved relative to the chocolate at the second folding roller.

[0009] One example of known method for wrapping an article such as a praline with the wrapping style of the "bunch" type is disclosed in document GB542574.

[0010] The method consists in wrapping a sheet of material around the article to form a tube, folding the ends of the tube over surfaces of the articles which are transverse to the flat surface, and then passing the wrapped article through a resilient smoothing-device.

[0011] A drawback of the prior art wrapping machines derives from the fact that during the smoothing of the sheet of wrapping material the product is held, as already mentioned, by the lateral surface on which the sheet must be smoothed.

[0012] The sheet is not therefore smoothed at the grippers and the wrapping achieved is not entirely satisfactory.

[0013] In this context, the main technical purpose of this invention is to propose a wrapping method for confectionery products which is free of the above mentioned disadvantages.

[0014] The aim of this invention is to provide a wrapping method for confectionery products which is able to perform the smoothing of the sheet of wrapping material on the entire surface of the chocolate. The technical purpose and aims specified are substantially achieved by wrapping method according to claim 1.

[0015] Further features of the invention and its advantages are more apparent in the non-limiting description below, with reference to a preferred but non-exclusive embodiment of a wrapping method for confectionery products, as illustrated in the accompanying drawings, in which:

- Figure 1 illustrates a wrapping machine in a schematic front view, partly in blocks and with some parts cut away for greater clarity;
- Figures 2 to 7 illustrate a succession of steps of the wrapping method according to this invention performed with the wrapping machine of Figure 1;
- Figure 8 illustrates a schematic plan view, with some parts cut away for better clarity, of a detail of the wrapping machine of Figure 1 in a first operating position;
- Figure 9 illustrates a schematic plan view, with some parts cut away for better clarity, of the detail of Figure 8 in a second operating position;
- Figure 10 illustrates a schematic plan view, with some parts cut away for better clarity, of the detail of Figures 8 and 9 in a third operating position.

[0016] With reference in particular to Figure 1, the numeral 1 denotes a machine for wrapping food products 100, such as, for example, chocolates, to which express reference will hereinafter be made.

[0017] In the embodiment described, reference will be made to food products 100 having a flat base portion or base 101, an end portion or end 102 which is preferably rounded, a lateral surface 103 extending between the base portion 101 and the end portion of 102 having, preferably, a truncated cone shape.

[0018] The product 100 has an axis main A extending from the base portion 101 to the end portion 102 and a shape particularly suitable for being wrapped with a sheet 200 of wrapping material which is shaped around the product 100 in a wrapping style known as "bunch."

[0019] In this wrapping, the sheet 200 is usually stretched on the end 102 and on the lateral portion 103 of the chocolate 100 and folded at the base 101.

[0020] With reference in particular to Figure 1, it may be seen that the machine 1 has a frame 2, having, for example, a vertical wall 2a, and a unit 3 for wrapping products 100 mounted by the frame 2, in particular by the above-mentioned wall.

[0021] The wrapping unit 3 comprises an infeed station 4 for the products 100 and an outfeed station 5 for the products 100 and the products 100 are moved from the infeed station 4 to the outfeed station 5 in a direction of movement V.

[0022] The wrapping unit 3 comprises a winding unit 6 for winding, at least partly, the sheet 200 of wrapping material on the product 100.

[0023] The winding unit 6 comprises a winding drum 7 having an axis of rotation R1, preferably perpendicular to the wall 2a, and mounted on the frame 2. The drum 7 comprises means for gripping the products 100, for example grippers 8 by which the products 2 are picked up, for receiving the products 100 in the infeed station 4.

[0024] The drum 7, using the grippers 8, retains and feeds the products 100 in a clockwise direction as shown in Figure 1, rotating about the axis of rotation R1.

[0025] As illustrated, the grippers 8 grip the respective product 100 by the lateral surface 103 keeping the axis A substantially radial.

[0026] The drum 7 comprises a folding roller 9, substantially cylindrical, which supports the grippers 8; preferably, the grippers 8 are uniformly distributed along the base surface of the roller 9, and extend substantially according to radial directions radially from it in the known manner which is not described further.

[0027] It should be noted that for simplicity reference is made to grippers 8 extending radially substantially radial also to axis A of the products 100; in reality, according to the laws of motion of the drum 7 and grippers 8 in particular they can also adopt an orientation substantially skew relative to the axis of rotation R1.

[0028] The winding unit 6 comprises a device 10 for feeding the sheet 200 of wrapping material which is substantially known and not described further and facing the cylindrical outer periphery of the folding roller 9.

[0029] The first drum 7 comprises a plurality of pickup elements, for example grippers 11, by which the wrapping sheets 200 are picked up, each of which is located substantially at a corresponding gripper 8 for picking up the product 100.

[0030] The combination of the grippers 11 with the respective grippers 8 is of substantially known type and not described further.

[0031] Downstream of the device 10 for feeding the sheet 200, in the direction of rotation of the drum 7, there is a fixed contact panel 12, also known as "tile" in the jargon of the trade, also facing the external cylindrical periphery of the drum 7.

[0032] In use, during the rotation of the folding roller 9, each gripper 8 feeds a product 100 starting from the infeed station 4. At the device 10 each gripper 11 picks up a sheet 200 of wrapping material coupling it to the product 100 fed by the gripper 8.

[0033] In substantially known manner, a first portion 200a of the sheet 200 is clamped against the product 100 by the corresponding gripper 11 and a second portion 200b is left to protrude radially towards the outside of the roller 7.

[0034] Next, after the rotation of the drum 7, the second portion of the sheet 200 is folded on the product 100 by interference with the fixed contact 12 which preferably has a substantially circular shape.

[0035] In a substantially known manner, during the motion along the tile 12, the portion 200b of the sheet 200 is then wound against the product 100, folded by the tile 12, whilst the portion 200a remains retained by the corresponding gripper 11.

[0036] The wrapping unit 3 comprises, positioned downstream of the winding unit 6 according to the direction of movement V, a unit 13 for folding the sheet 200 on the respective product 100; more specifically, the folding unit 13 is located downstream of the fixed tile 12 the direction of movement V.

[0037] The folding unit 13 folding comprises a wrapping drum 14 having axis of rotation R2, preferably perpendicular to the wall 2a, and mounted on the frame 2.

[0038] The machine 1 comprises a station 15 for transferring the products 100, together with the respective sheets 200 of wrapping material, wherein the products 100 pass from the drum 7 to the drum 14.

[0039] In practice, the drum 7 feeds the products 100 from the infeed station 4 to the transfer station 15 and the drum 14 feeds the products 100 from the transfer station 15 to the outfeed station 5.

[0040] As illustrated, the wrapping drums 7 and 14 are substantially tangent to each other at the transfer station 15.

[0041] The drum 14 comprises means for gripping the products 100, for example grippers 16 for gripping the products 100, for receiving the products 100, together with the sheets 200 of wrapping material, in the transfer station 15.

[0042] The drum 14, using the grippers 16, retains and feeds the products 100 in an anticlockwise direction as shown in Figure 1, rotating about the axis of rotation R2.

[0043] The drum 14 comprises a roller 17, substantially cylindrical, which supports the grippers 16; preferably, the grippers 16 are uniformly distributed along the base surface of the roller 17, and extend substantially radially from it in the known manner which is not described further.

[0044] In use, once the products 100 leave the fixed tile 12, the drum 14 picks up the products 100 with the respective sheet 200 of wrapping material.

[0045] As schematically illustrated, each gripper 16 grips, in the transfer station 15 and in a substantially known manner, a respective product 100 with the respective sheet 200 of wrapping material.

[0046] The grippers 16 keep the portion 200a of the sheet 200 of wrapping material in contact with the surface 103 and fold an end portion 200c in the direction of movement V, on the lateral surface 103 the product 100.

[0047] Once gripped by the grippers 16, the sheet 200 is wound around the product 100 in a substantially "U" shape, as shown in particular in Figures 1,2 and 3.

[0048] The sheet 100 folded into a "U" shape has the portion or flap 200a and the portion or flap 200c projecting towards the outside of the second drum 6; in the example illustrated, the portion 200c is positioned upstream of the portion 200a considering the anticlockwise direction of rotation of the drum 14.

[0049] With reference to Figures 3 to 7, it may be noted that the wrapping unit 3, and in particular the folding unit

13, comprise means 40 of retaining the product 100 operating at the wrapping drum 14.

[0050] The retaining means 40 are positioned between the transfer station 15 and the outfeed station 5 and are configured to grip the product 100, together with the respective sheet 200 of wrapping material, by the base 101 and the end 102.

[0051] The folding unit 13 comprises a mechanism for actuating the retaining means 40, schematically illustrated with a block 20, which determines the gripping of the product 100 with the retaining means 40.

[0052] The mechanism 20 is preferably coordinated with the grippers 16 in such a way that when the product 100 is gripped with the retaining means 40 the grippers 16 are open, as illustrated in Figure 4.

[0053] The wrapping unit 3, in particular the folding unit 13, comprises a brush unit 18 defining a channel 19 for the passage of the product 100, illustrated in particular in Figures 8, 9 and 10.

[0054] The unit 18 comprises substantially an annular member 21 and a plurality of bristles 22, supported by the member 21 and projected towards the inside of the member 21.

[0055] The free ends of the bristles 22, that is, the ends of the bristles 22 located on the side opposite the annular member 21, delimit, substantially, the above-mentioned channel 19.

[0056] The unit 18 is movable relative to the retaining means 40 for smoothing the sheet 200 on the product 100 starting from the end portion 102 along the lateral surface 103 when the product 100 and the sheet 200 of wrapping material are held by the retaining means 40.

[0057] More specifically, the bristles 22, passing along the product 100, determine the smoothing of the sheet 200.

[0058] In that way, since the grippers 16 are open during the smoothing, the entire surface 103 of the product 100 is adapted to the surface 103 of the product 100 in its entirety.

[0059] In particular with reference to Figures 3 to 7, looking in more detail at the retaining means 40, it should be noted that they comprise a first and a second jaw 23, 24 relatively mobile between a close position for engaging and retaining the product 100, illustrated in the accompanying drawings, and a far position not illustrated.

[0060] Considering the axis of rotation R2 of the drum 14, the jaw 23 defines, in practice, an inner contact element for griping the chocolate 100 and the jaw 24 defines an outer contact element, that is to say, further away from the axis R2 relative to the jaw 23 considering the closed position.

[0061] In a preferred embodiment illustrated, the jaws 23 and 24 are both movable when passing from the far position to the close position and vice versa.

[0062] In the example illustrated, the first jaw 23 is, for example, movable in a rotary fashion about an axis R3.

[0063] In an embodiment illustrated by the dashed line in Figure 5, the first jaw is 23 is fixed and, for example, associated with the roller 17 at each gripper 16.

[0064] In that case, the passing from the open configuration to the closed configuration and vice versa is accomplished by a movement of the single outer jaw 24.

[0065] With reference to Figures 5 to 10, looking in more detail at the brush unit 18 it may be noted that the latter comprises a first component 25 and a second component 26.

[0066] The component 25 comprises a first portion 27 of the annular member 21 supporting a corresponding first portion of bristles 22.

[0067] The component 26 comprises a second portion 28 of the annular member 21 supporting a corresponding second portion of bristles 22.

[0068] The component 25 and the component 26 are relatively mobile between a close position in which they define the above-mentioned transit channel 19, illustrated in Figures 6, 7 9 and 10, and a far position, shown in part in Figure 5 and 8.

[0069] More specifically, in the close position the portions 27 and 28 are closed to form the annular member 21 and the respective bristles 22 delimit the channel 19.

[0070] As mentioned, the unit 18 is movable relative to the retaining means 40, in particular the unit 18 is movable relative to the jaws 23, 24 between a first operating position or starting position, illustrated in Figures 6 and 9, substantially at the inner jaw 23, and a second operating position or arrival position, illustrated in Figures 7 and 10, substantially at the outer jaw 24, considering in particular the jaws 23, 24 in the close position.

[0071] The brush unit 18, that is, each of the components 25 and 26 of the member 16, is movable in a smoothing direction D extending between the inner jaw 23 and the outer jaw 24 considering them in the close position. More specifically, the direction D is substantially parallel to the main axis A of a generic chocolate 100 held by jaws 23, 24.

[0072] The retaining means 40, in particular the jaws 23 and 24, and the brush unit 18 define a zone 29 for smoothing the sheet 200 of wrapping material on the corresponding product 100.

[0073] With reference to Figure 1, it may be noted that the machine 1 comprises, downstream of the smoothing zone 29 considering the direction of movement V of the products 100, a succession of folders, of substantially known type and schematically illustrated with a block 30, which complete the wrapping of the products 100 folding the sheet 200 at the base 101 of the corresponding product.

[0074] The above mentioned outfeed station 5 for the products 100 is positioned downstream of the folders 30 in the direction V for moving the products 100.

[0075] As illustrated, the machine 1 comprises a wheel 31, rotatable about an axis of rotation R4, for feeding the products 100 to the wrapping unit 3, in particular to the infeed station 4.

[0076] The wheel 31, of substantially known type and not described further, picks up the products 100 from a

feed line L and feeds them to the wrapping unit 3.

[0077] As mentioned, a process for wrapping the product 100 with the sheet 200 of wrapping material comprises, once the product 100 has been transferred, in the infeed station 4, to the winding unit 6, a step for feeding the product 100 along the direction of movement V by of the drum 7. During this feed, the product 100 is held by the grippers 8 at the relative lateral surface 103, in particular at a first and a second portion of the lateral surface 103 located opposite each other.

[0078] The process comprises a step of coupling the sheet 200 of wrapping material to the food product 100 during the feed; the sheet 200 is fed by the device 10 and kept attached to the product 100 by the grippers 11.

[0079] The sheet 200 is then folded around the product 100 by the contact tile 12 which folds, substantially in an "L" shape as shown in Figure 1, the sheet 200 on the end portion 102 of the product 100.

[0080] Downstream of the tile 12 according to the direction of movement V, at the transfer station 15, the product 100 provided with the sheet 200 is transferred the grippers 16.

[0081] As illustrated in Figure 1, when the product 100 with the respective sheet 200 is gripped the latter is folded into a "U" shape about the chocolate.

[0082] A portion of the sheet 200 of wrapping material forming a base of the so-called "U" shape is positioned at the end portion 102 of the chocolate 100. The grippers 16 hold the product 100 and the sheet 200 by the lateral surface 103 the product 100, in particular acting on two portions of the lateral surface 103 opposite each other and alternated with the gripping portions of the grippers 8.

[0083] At the zone 29, the jaws 23, 24 close to grip the product 100, with the respective sheet 200, from the base 101 and from the end portion 102 in such a way that the sheet 200 is only held at the end portion.

[0084] Once the product 100 is gripped by the jaws 23, 24, the grippers 16 open. The first and the second component 25, 26 of the unit 18 pass from the far position to the close position defining the unit 18 itself, in particular at the jaw 23 that is, in the first operating or starting position.

[0085] The process comprises a step of smoothing the sheet 200 which occurs whilst the product 100 is held by the jaws 23, 24.

[0086] The smoothing step is performed by moving the unit 18 from the first operating position to the second operating position along the smoothing direction D in such a way that the sheet 200 smoothes on the product 100 in the passage through the channel 19, as illustrated schematically in Figures 7 and 10.

[0087] In a preferred embodiment, the smoothing step occurs with the wrapping drum 14 stationary, that is, it is performed during a pause of the drum 14. In other words, the smoothing step occurs in the zone 29 without feeding the products 100 in the direction of movement V.

[0088] In alternative embodiments, the smoothing step occurs simultaneously with a feeding the products 100 in the direction V of movement.

[0089] In that case, the jaws 23, 24 and the components 25, 26 of the brush unit are also movable for feeding and following the product 100 with the respective sheet 200 with a movement according to the direction of movement V.

[0090] At the end of the smoothing step, the product 100 together with the sheet 200 is gripped by the gripper 16, as shown in Figure 1, whilst the jaws 23, 24 return to the far position.

[0091] The grippers 16 move the product 100 in the direction of movement V to the folders 30 which complete the folding of the sheet 200 at the base 101 of the chocolate.

[0092] The products 100 wrapped in the respective sheet 200 are fed to the outfeed station 5 where they are released from the grippers 16 and, in general, destined to subsequent processing, for example packaging, substantially known and not described further.

[0093] The invention described brings important advantages.

[0094] More specifically, smoothing the sheet of wrapping material on the product holding both by the end portion and by the base of the chocolate achieves a uniform smoothing of the sheet of wrapping material over the entire lateral surface of the product.

Claims

1. A method for wrapping a food product (100) comprising a lateral surface (103), a top portion (102) and a base portion (101) which are positioned on opposite sides of the lateral surface, said method comprising

   a step of winding a wrapping sheet (200) around said food product (100), said wrapping sheet (200) being wound substantially in a "U" shape around said food product (100), a portion of the wrapping sheet, forming a base of said "U" shape, being positioned at said top portion;
   a step of feeding said food product (100) provided with said wrapping sheet (200) in a direction of movement (V), said food product (100) and said wrapping sheet (200) being retained by pickup grippers (16), acting on said lateral surface (103); a step of retaining said food product (100) and said wrapping sheet (200) using said top portion (102) and said base portion (101), said pickup grippers (16) releasing said food product (100) and the respective sheet (200) of wrapping material during said retaining step;
   a step of smoothing said wrapping sheet (200) during said retaining step using a brush unit (18) delimiting a transit channel (19) for said food product (100) and the respective wrapping sheet (200),

said wrapping method being **characterised in that** said smoothing step is performed by moving said brush unit (18) relative to said food product (100) provided with the wrapping sheet (200), said food product passing through said transit channel (19) during the smoothing step.

2. The method according to claim 1, wherein

said winding step comprises a step of coupling the wrapping sheet (200) with said food product (100) during said feed step;
a step of folding said wrapping sheet (200) around said food product (100) during said feed step using a fixed curved panel (12);
a step of transferring said food product (100) provided with the wrapping sheet (200) to said pickup grippers (16), said transfer step comprising a step of folding the wrapping sheet (200) around the food product (100) for obtaining said substantial "U" shape of said wrapping sheet (200) around said food product (100).

3. The method according to claim 1, wherein said smoothing step is performed by moving said brush unit (18) relative to said food product (100) along a smoothing line (D) extending between said top portion (102) and said base portion (101) from said top portion (102) to said base portion (103).

4. The method according to any one of the preceding claims, wherein the smoothing step comprises a step of preparing said brush unit (18) substantially at the top portion (102) of said food product (100).

5. The method according to claim 4, wherein said step of preparing said brush unit (18) comprises a step of coupling a first component (25) of said brush unit to a second component (26) of said brush unit to form said transit channel (19).

6. The method according to any one of the preceding claims, wherein said retaining step ends at the end of the smoothing step, said pickup grippers (16) gripping said food product (100) at the end of the smoothing step.

7. The method according to any one of the preceding claims, wherein it comprises, after the smoothing step, a step of folding said sheet (200) of wrapping material at said base portion (101) of said food product (100).

8. The method according to any one of the preceding claims, wherein said smoothing step is performed during a pause of said pickup grippers (16) during said feed step.

9. The method according to any one of the preceding claims, wherein said retaining step is performed by gripping said food product (100) with a first jaw (23) at said top portion (102) and with a second jaw (24) at said base portion (101).

Patentansprüche

1. Verfahren zum Umwickeln eines Nahrungsmittelprodukts (100), umfassend eine seitliche Oberfläche (103), einen oberseitigen Abschnitt (102) und einen Basisabschnitt (101), die auf entgegengesetzten Seiten der seitlichen Oberfläche positioniert sind, wobei das Verfahren umfasst:

einen Schritt zum Wickeln eines Umwicklungsblatts (200) rund um das Nahrungsmittelprodukt (100), wobei das Umwicklungsblatt (200) im Wesentlichen in einer U-Form rund um das Nahrungsmittelprodukt (100) gewickelt wird, wobei ein Abschnitt des Umwicklungsblatts, der eine Basis der U-Form bildet, am oberseitigen Abschnitt positioniert wird;
einen Schritt zum Zuführen des Nahrungsmittelprodukts (100), das mit dem Umwicklungsblatt (200) versehen ist, in einer Bewegungsrichtung (V), wobei das Nahrungsmittelprodukt (100) und das Umwicklungsblatt (200) von Aufnahmegreifern (16) gehalten werden, die auf die seitliche Oberfläche (103) wirken;
einen Schritt zum Halten des Nahrungsmittelprodukts (100) und des Umwicklungsblatts (200) unter Nutzung des oberseitigen Abschnitts (102) und des Basisabschnitts (101), wobei die Aufnahmegreifer (16) das Nahrungsmittelprodukt (100) und das entsprechende Blatt (200) Umwicklungsmaterial während dieses Schritts zum Halten freigeben;
einen Schritt zum Glätten des Umwicklungsblatts (200) während des Schritts zum Halten unter Nutzung einer Bürsteneinheit (18), begrenzend einen Durchgangskanal (19) für das Nahrungsmittelprodukt (100) und das jeweilige Umwicklungsblatt (200),
wobei das Umwicklungsverfahren **dadurch gekennzeichnet ist, dass** der Schritt zum Glätten durch die Bewegung der Bürsteneinheit (18) relativ zum Nahrungsmittelprodukt (100), das mit dem Umwicklungsblatt (200) versehen ist, durchgeführt wird, wobei das Nahrungsmittelprodukt während des Schritts zum Glätten durch den Durchgangskanal (19) geführt wird.

2. Verfahren nach Anspruch 1, wobei der Schritt zum Umwickeln einen Schritt zum Verbinden des Umwicklungsblatts (200) mit dem Nahrungsmittelprodukt (100) während des Schritts zum Zuführen um-

fasst, einen Schritt zum Falten des Umwicklungsblatts (200) rund um das Nahrungsmittelprodukt (100) während des Schritts zum Zuführen unter Nutzung eines fixierten gekrümmten Paneels (12), einen Schritt zum Übergeben des Nahrungsmittelprodukts (100), das mit dem Umwicklungsblatt (200) versehen ist, an die Aufnahmegreifer (16), wobei der Übergabeschritt einen Schritt zum Falten des Umwicklungsblatts (200) rund um das Nahrungsmittelprodukt (100) umfasst, um die wesentliche U-Form des Umwicklungsblatts (200) rund um das Nahrungsmittelprodukt (100) zu erhalten.

3. Verfahren nach Anspruch 1, wobei der Schritt zum Glätten durch die Bewegung der Bürsteneinheit (18) relativ zum Nahrungsmittelprodukt (100) entlang einer Glättungslinie (D) durchgeführt wird, die sich zwischen dem oberseitigen Abschnitt (102) und dem Basisabschnitt (101) vom oberseitigen Abschnitt (102) zum Basisabschnitt (103) erstreckt.

4. Verfahren nach einem der vorhergehenden Ansprüche, wobei der Schritt zum Glätten einen Schritt zum Vorbereiten der Bürsteneinheit (18) im Wesentlichen am oberseitigen Abschnitt (102) des Nahrungsmittelprodukts (100) umfasst.

5. Verfahren nach Anspruch 4, wobei der Schritt zum Vorbereiten der Bürsteneinheit (18) einen Schritt zum Verbinden einer ersten Komponente (25) der Bürsteneinheit mit einer zweiten Komponente (26) der Bürsteneinheit umfasst, um den Durchgangskanal (19) zu formen.

6. Verfahren nach einem der vorhergehenden Ansprüche, wobei der Schritt zum Halten am Ende des Schritts zum Glätten endet, wobei die Aufnahmegreifer (16) das Nahrungsmittelprodukt (100) am Ende des Schritts zum Glätten greifen.

7. Verfahren nach einem der vorhergehenden Ansprüche, wobei dieses nach dem Schritt zum Glätten einen Schritt zum Falten des Blatts (200) Umwicklungsmaterial am Basisabschnitt (101) des Nahrungsmittelprodukts (100) umfasst.

8. Verfahren nach einem der vorhergehenden Ansprüche, wobei der Schritt zum Glätten während einer Pause der Aufnahmegreifer (16) während des Schritts zum Zuführen durchgeführt wird.

9. Verfahren nach einem der vorhergehenden Ansprüche, wobei der Schritt zum Halten durch das Greifen des Nahrungsmittelprodukts (100) mit einer ersten Spanneinrichtung (23) am oberseitigen Abschnitt (102) und mit einer zweiten Spanneinrichtung (24) am Basisabschnitt (101) durchgeführt wird.

Revendications

1. Procédé d'emballage d'un produit alimentaire (100), comprenant une surface latérale (103), une partie supérieure (102) et une partie de base (101) étant positionnées sur des côtés opposés de la surface latérale, ledit procédé comprenant :

une étape consistant à enrouler une feuille d'emballage (200) autour dudit produit alimentaire (100), ladite feuille d'emballage (200) étant substantiellement enroulée en forme de « U » autour dudit produit alimentaire (100), une partie de la feuille d'emballage, formant une base de ladite forme en « U », étant positionnée au niveau de ladite partie supérieure ;
une étape consistant à alimenter ledit produit alimentaire (100) pourvu de ladite feuille d'emballage (200) dans une direction de mouvement (V), ledit produit alimentaire (100) et ladite feuille d'emballage (200) étant retenus par des pinces de préhension (16) agissant sur ladite surface latérale (103) ;
une étape consistant à retenir ledit produit alimentaire (100) et ladite feuille d'emballage (200) en utilisant ladite partie supérieure (102) et ladite partie de base (101), lesdites pinces de préhension (16) relâchant ledit produit alimentaire (100) et la feuille respective (200) de matière d'emballage lors de ladite étape de retenue ;
une étape consistant à lisser ladite feuille d'emballage (200) lors de ladite étape de retenue en utilisant un organe à brosse (18) délimitant un canal de passage (19) pour ledit produit alimentaire (100) et la feuille d'emballage respective (200),
ledit procédé d'emballage étant **caractérisé en ce que** ladite étape de lissage est effectuée en déplaçant ledit organe à brosse (18) par rapport au dit produit alimentaire (100) pourvu de la feuille d'emballage (200), ledit produit alimentaire traversant ledit canal de passage (19) lors de l'étape de lissage.

2. Procédé selon la revendication 1, dans lequel ladite étape d'enroulement comprend une étape consistant à accoupler la feuille d'emballage (200) au dit produit alimentaire (100) lors de ladite étape d'alimentation ; une étape de pliage de ladite feuille d'emballage (200) autour dudit produit alimentaire (100) lors de ladite étape d'alimentation en utilisant un panneau fixe incurvé (12) ; une étape consistant à transférer ledit produit alimentaire (100) pourvu de la feuille d'emballage (200) auxdites pinces de préhension (16), ladite étape de transfert comprenant une étape de pliage de la feuille d'emballage (200) autour du produit alimentaire (100) pour obtenir substantiellement ladite forme en « U » de ladite

d'emballage (200) autour dudit produit alimentaire (100) .

3. Procédé selon la revendication 1, dans lequel ladite étape de lissage est réalisée en déplaçant ledit organe à brosse (18) par rapport au dit produit alimentaire (100) le long d'une ligne de lissage (D) se prolongeant entre ladite partie supérieure (102) et ladite partie de base (101) de ladite partie supérieure (102) jusqu'à ladite partie de base (103).

4. Procédé selon l'une quelconque des revendications précédentes, dans lequel l'étape de lissage comprend une étape consistant à préparer ledit organe à brosse (18) substantiellement en correspondance de la partie supérieure (102) dudit produit alimentaire (100).

5. Procédé selon la revendication 4, dans lequel ladite étape consistant à préparer ledit organe à brosse (18) comprend une étape consistant à accoupler un premier élément (25) dudit organe à brosse à un second élément (26) dudit organe à brosse pour former ledit canal de passage (19).

6. Procédé selon l'une quelconque des revendications précédentes, dans lequel ladite étape de retenue se termine à la fin de l'étape de lissage, lesdites pinces de préhension (16) saisissant ledit produit alimentaire (100) à la fin de l'étape de lissage.

7. Procédé selon l'une quelconque des revendications précédentes, dans lequel il comprend, après l'étape de lissage, une étape consistant à plier ladite feuille (200) de matière d'emballage en correspondance de ladite partie de base (101) dudit produit alimentaire (100) .

8. Procédé selon l'une quelconque des revendications précédentes, dans lequel ladite étape de lissage est effectuée lors d'une pause desdites pinces de préhension (16) lors de ladite étape d'alimentation.

9. Procédé selon l'une quelconque des revendications précédentes, dans lequel ladite étape de retenue est effectuée en saisissant ledit produit alimentaire (100) par le biais d'une première mâchoire (23) au niveau de ladite partie supérieure (102) et d'une seconde mâchoire (24) au niveau de ladite partie de base (101).

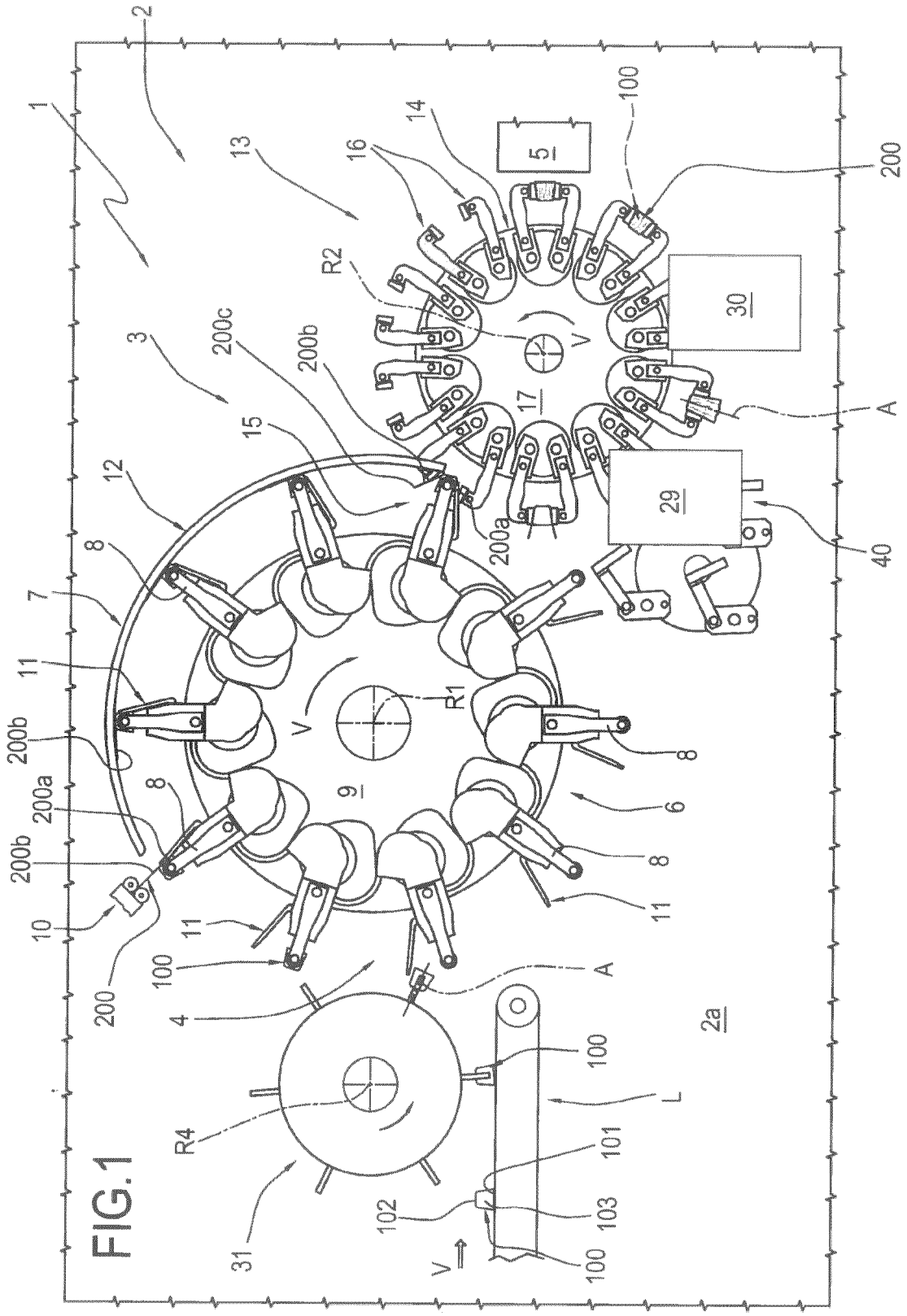

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
29
30
31
40
100
101
102
103
200
200a
200b
200c
2a
A
L
R1
R2
R4
V

FIG.1

FIG.2

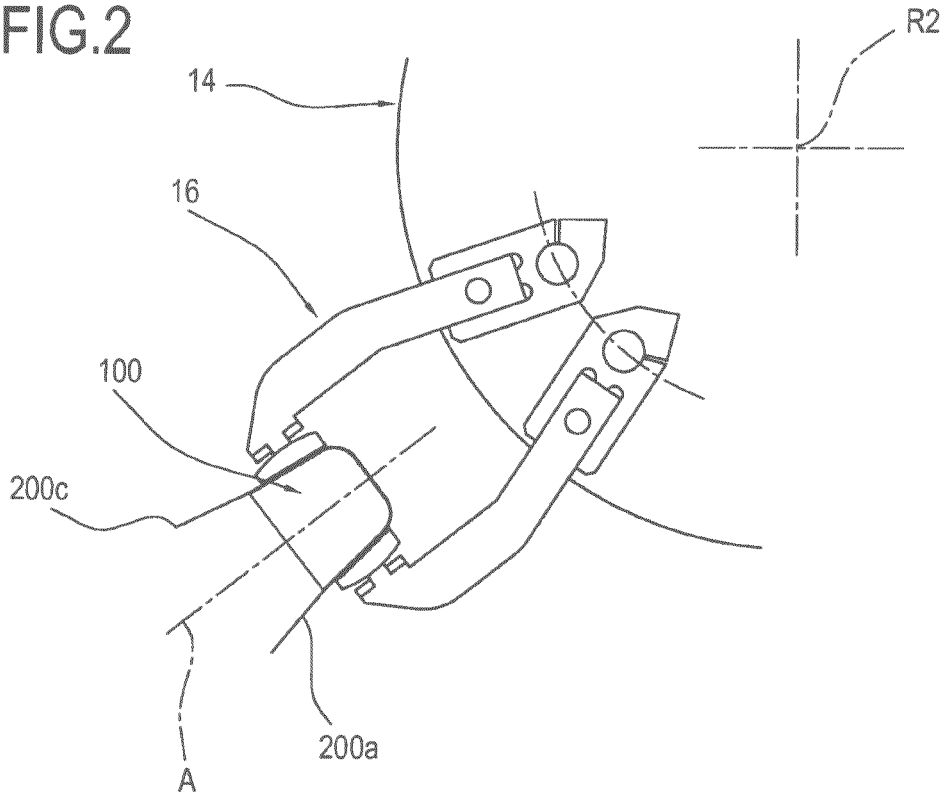


FIG.3

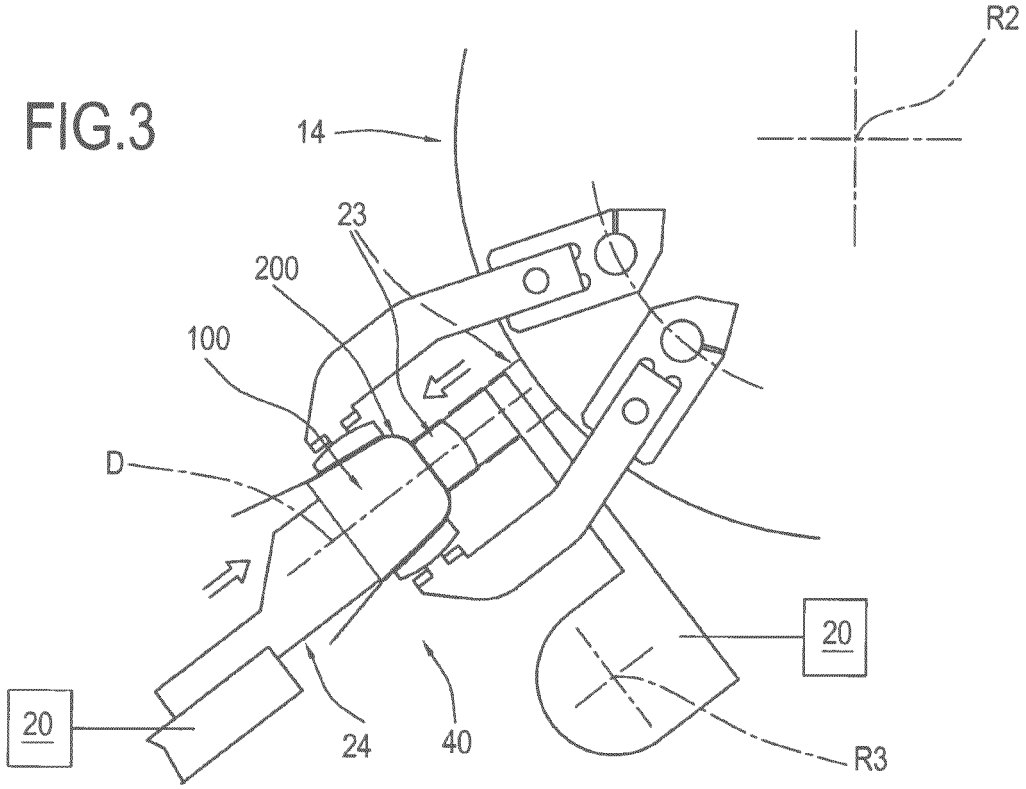


FIG.4

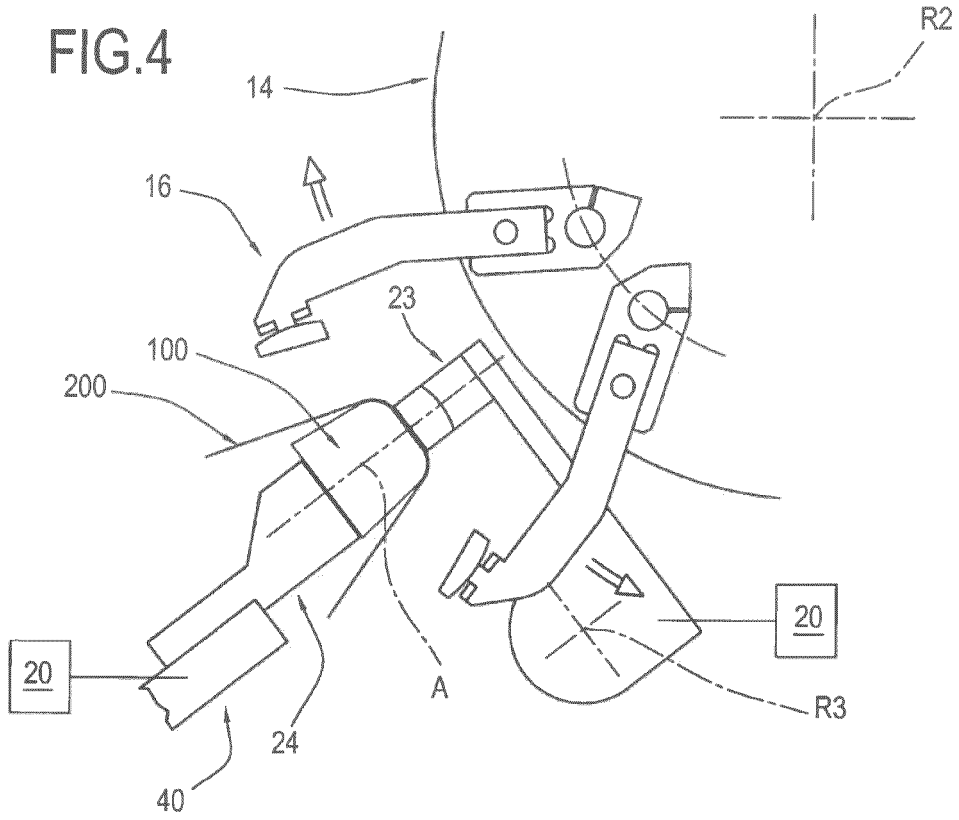

R2
14
16
23
100
200
20
20
A
24
40
R3

FIG.5

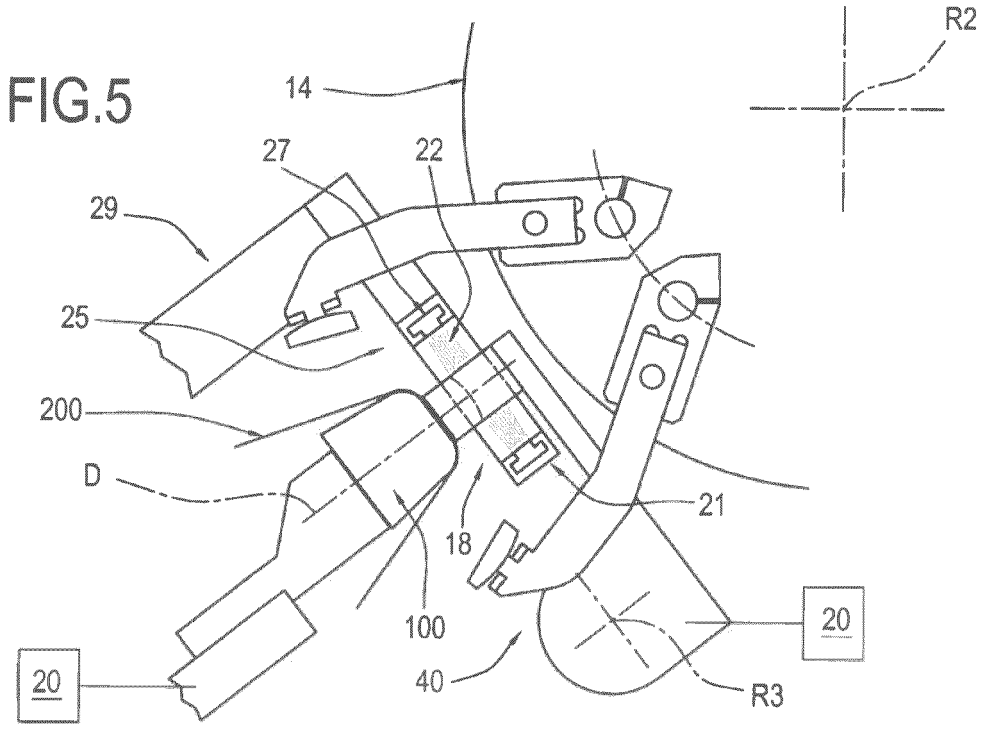

R2
14
27
22
29
25
200
D
21
18
100
40
20
20
R3

FIG.6

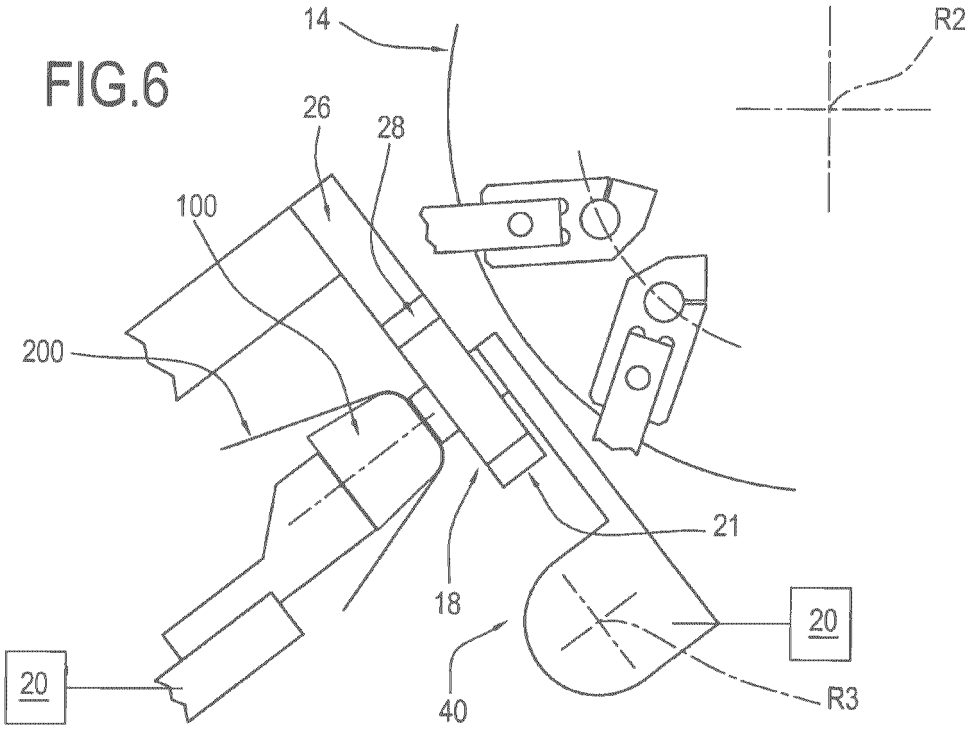

14
R2
26
28
100
200
21
18
20
20
40
R3

FIG.7

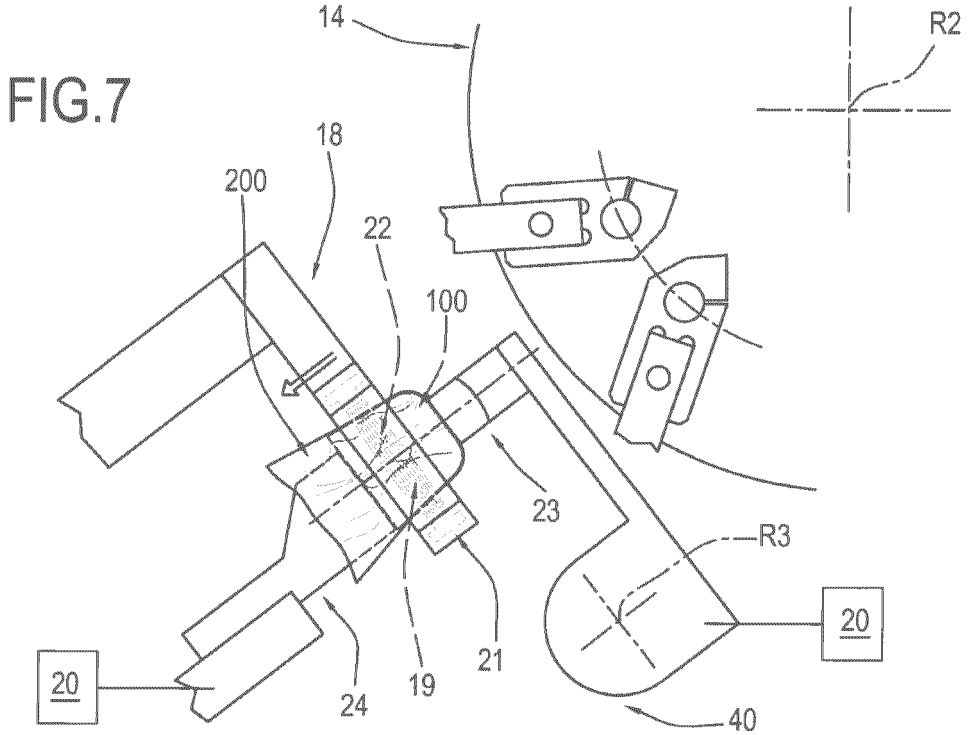

14
R2
18
200
22
100
23
R3
20
20
21
19
24
40

FIG.8

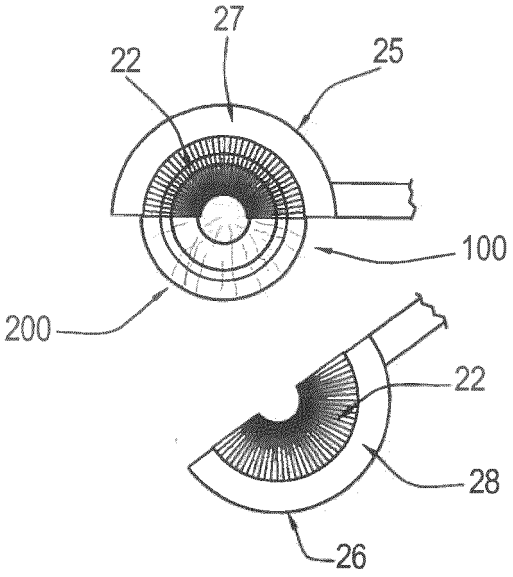


FIG.9

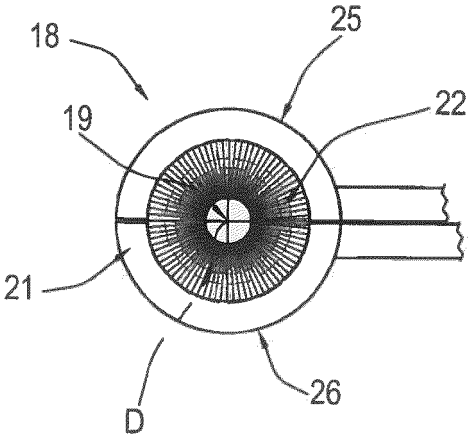
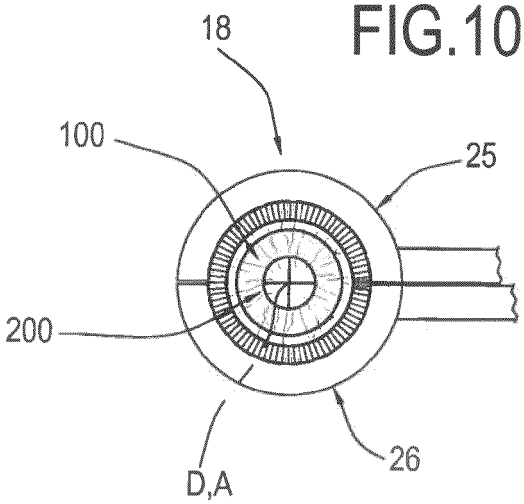


FIG.10



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Patent documents cited in the description

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