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(54) **AN APPARATUS FOR DOSING RESPECTIVE PORTIONS OF A PRODUCT**

VORRICHTUNG ZUM DOSIEREN VON JEWEILIGEN PORTIONEN EINES PRODUKTS

APPAREIL POUR DOSER DES PARTIES RESPECTIVES D'UN PRODUIT

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Description

Technical field

[0001] This invention relates to an apparatus for packing respective pasty food products. The product being, in particular, in the form of a foodstuff, and being preferably in the form of a pasty product, especially a semi-solid pasty product, that is to say, being in the form of yeast, stock cube paste, butter, margarine or other.

Background art

[0002] Apparatuses for packing pasty food product are known and comprise apparatus for dosing respective portions of a corresponding semi-solid pasty product, in particular yeast, which are designed to be used in corresponding apparatuses for packing respective portions of product in corresponding packages or wrappers.

[0003] The prior art dosing apparatuses comprise respective means for dosing respective predetermined portions of product, and means for feeding the product towards the dosing means, the feeding means being designed for delivering the product at a respective zone for inserting the product in the dosing means, in particular at an end and/or upper zone of the dosing means, that is, of the respective dosing chamber.

[0004] More specifically, a dosing apparatus is described in patent publication No. WO 2012/069971 which comprises respective screw means which are housed in a rotatable fashion inside a respective dosing chamber and which feed the product towards a respective nozzle for discharging corresponding predetermined portions of product from the dosing chamber.

[0005] Other examples of similar dosing apparatus are described in patent publications CH 370 695, FR 2 671 543, CH 399 288, US 4074 507 and DE 10 85 455B. Each document discloses a dosing apparatus comprising respective screw means which are housed in a rotatable fashion inside a respective dosing chamber and which feed the product towards a respective nozzle for discharging corresponding predetermined portions of product from the dosing chamber.

[0006] The need is felt in the field for dosing apparatus which is particularly effective and efficient and in particular which allows predetermined portions to be obtained which are particularly precise.

[0007] The need is also felt in the sector for dosing apparatus which avoids every risk of blocking of the product inside the dosing means, in particular when the product is in the form of a material which is excessively liquid or robust.

[0008] The need is also felt in the sector to provide a dosing apparatus which is easy to clean.

[0009] The need is further felt in the sector for dosing apparatus which has a reduced number of components and/or a reduced structural complexity. The need is also felt in the sector to provide a dosing apparatus which is

limited in size.

[0010] The need is also felt in the sector to provide a dosing apparatus which is quick and easy to maintain.

Disclosure of the invention

[0011] This invention therefore proposes a new solution as an alternative to the solutions known up to now and, more specifically, proposes to overcome one or more of the above mentioned drawbacks or problems and/or to meet one or more of the needs felt in the trade or inferable from the above.

[0012] An apparatus is therefore provided for dosing respective portions of a corresponding product, in particular in the form of a food product, and preferably in the form a pasty product, especially a semi-solid pasty product, such as yeast, stock cube paste, butter, margarine or other, the dosing apparatus being designed to be used in a corresponding apparatus for packing respective product portions in a corresponding containment package, preferably defined by a respective wrapper, in particular defined by a respective sheet of foldable material which is wrapped around, in particular in contact with, the respective portion of product; the dosing apparatus comprises means for dosing respective predetermined portions of product, the dosing means being in particular in the form of respective screw means which are housed in a rotatable fashion inside a respective dosing chamber, and which feed the product towards a respective nozzle for unloading from the dosing chamber; means for feeding the product towards the dosing means, the feeding means being designed for delivering the product at a respective zone for inserting the product in the dosing means, in particular at an end and/or upper zone of the dosing means, that is, of the respective dosing chamber; characterised in that the means for feeding the product towards the dosing means comprise means for feeding the product towards the dosing means, the means for feeding the product being in the form of corresponding screw means.

[0013] In this way, it is possible to provide a dosing apparatus which avoids every risk of blocking of the product inside the dosing means and at the same time allows predetermined portions to be obtained which are particularly precise.

Brief description of the drawings

[0014] These and other innovative aspects of the invention, or specific advantageous features, are set out in the appended claims and its technical features and advantages are apparent from the detailed description which follows of a preferred, advantageous embodiment of it, which must be considered purely as a non-limiting example. the description being made with reference to the accompanying drawings, in which:

- Figure 1 is a perspective view of a preferred embod-

- iment of packing apparatus using a dosing apparatus according to this invention;
- Figure 2 is a perspective view, shown in partial cut-away, of the preferred embodiment of the apparatus illustrated in Figure 1 showing in particular the screw means for feeding the product according to this invention;
 - Figure 3A is a cutaway view of the zone for feeding the product according to the preferred embodiment of the dosing apparatus according to this invention;
 - Figure 3B is a cutaway view of the preferred embodiment of the dosing apparatus according to this invention, similar to Figure 3A and in particular illustrates a different working position - relative to that of Figure 3A - of the means flattening and/or breaking the product;
 - Figure 4 is a schematic side view, showing the arrangement of the dosing screw and the screw for feeding the product, according to the preferred embodiment of the apparatus according to this invention;
 - Figure 5 is a top plan view of the preferred embodiment of the dosing device according to this invention, showing the arrangement of the screw for feeding the product;
 - Figure 6 is a vertical cross section through the line labelled VI-VI in Figure 5 of the preferred embodiment of the dosing apparatus according to this invention;
 - Figure 7 is a vertical cross section through the line labelled VII-VII in Figure 5 of the preferred embodiment of the dosing apparatus according to this invention;
 - Figure 8 is a transversal cross section through the line labelled VIII-VIII in Figure 4 of the preferred embodiment of the dosing apparatus according to this invention;
 - Figure 9 is a transversal cross section through the line labelled IX-IX in Figure 5 of the preferred embodiment of the dosing apparatus according to this invention;
 - Figure 10A is a perspective view of the screw for feeding the product towards the dosing means of the preferred embodiment of the dosing apparatus according to this invention;
 - Figure 10B is a perspective view, taken from a different angle to that of Figure 10A, of the screw for feeding the product towards the dosing means of the preferred embodiment of the dosing apparatus according to this invention;
 - Figure 10C is a perspective view showing only the movable component of the screw for feeding the product towards the dosing means of the preferred embodiment of the dosing apparatus according to this invention;
 - Figure 10D is a perspective view, taken from a different angle to that of Figure 10C, showing only the

movable component of the screw for feeding the product towards the dosing means of the preferred embodiment of the dosing apparatus according to this invention;

- Figure 10E is a front perspective view of the screw for feeding the product towards the dosing means of the preferred embodiment of the dosing apparatus according to this invention;
- Figure 11 is a transversal cross section of the chamber for feeding the product towards the dosing means of the preferred embodiment of the dosing apparatus according to this invention;
- Figure 12 is a perspective, cutaway view which shows in detail the chamber for feeding the product and the zone for inserting the product in the dosing means of the preferred embodiment of the dosing apparatus according to this invention;
- Figure 13 is a perspective view showing a second preferred embodiment of the comb means for flattening and/or breaking up the product in the feed chamber.

Detailed description of preferred embodiments of the invention

[0015] The accompanying drawings schematically illustrate a preferred embodiment 11 of apparatus for packaging a product or products in a corresponding package P, the package being preferably in the form of a wrapper for containing the corresponding product and which is defined by a respective sheet of foldable material, in particular a plastic or aluminium film or the like, the sheet or wrapper surrounding the respective portion of product and preferably in contact with the respective, especially the entire, outer surface of the product.

[0016] The product to be packaged is, in particular, in the form of a pasty product, and preferably in the form of a semi-solid pasty product, that is to say, it is such as to be deformable and have a plastic consistency; basically, the product is such as to maintain the shape given to the product.

[0017] More specifically, the product to be packed is in the form of a food product, and is preferably in the form of yeast, for example brewer's yeast, stock cube paste, butter, margarine or other items.

[0018] In short, although not specifically illustrated in the accompanying drawings, the wrapper or sheet in the packing apparatus is partly preformed, or folded, into a cup shape, open at the top to receive the predetermined portion of product, and is then reclosed, by folding on the same product of corresponding portions of the side walls, which protrude above the product.

[0019] As illustrated in Figure 1, the apparatus 11 comprises means 13 for feeding the packages being formed, which are in the form of a circular and rotatable feed table, on which are preferably dosed simultaneously two predetermined portions of product at a time; the feed means could be formed in any other suitable manner, for exam-

ple it could comprise an endless conveyor belt, which extends along a linear feed path.

[0020] More specifically, the means for feeding the packets, or feed table 13 comprises shaped seats or pockets, denoted by the reference numeral 15, which accommodate the cup-shaped container or wrapper.

[0021] As illustrated, the apparatus 11 also comprises an apparatus 10 for dosing respective portions of the product, in particular for simultaneously dosing two predetermined portions of product into corresponding cup-shaped packages or wrappers.

[0022] More specifically, as illustrated, the dosing apparatus 10 comprises means 12 for dosing respective predetermined portions of the product, the dosing means being, in particular, in the form of respective screw means 14, 14, which are housed in a rotatable fashion inside a respective dosing chamber 16, 16, the screw means 14, 14 feeding the product towards a respective nozzle 18 for discharging, in particular below, from the dosing chamber 16.

[0023] More specifically, as illustrated, the dosing apparatus 10 comprises first and second dosing means 12, 12, which are aligned with each other according to the direction, in particular circumferential, for feeding the packages and, as mentioned, which allow a pair of packages to be filled simultaneously.

[0024] The first and second dosing means 12, 12 comprise respective dosing chambers 16, 16 which, preferably, extend parallel to each other and which house respective screw dosing means 14, 14.

[0025] As illustrated, the dosing means are, preferably, directed vertically and, however, in other embodiments not illustrated, might also be oriented at a certain angle relative to the vertical and preferably convergent towards the zone for discharging the product.

[0026] More specifically, the dosing screw means 14, 14 comprise respective helical means 17, which are supported on a respective shaft 19 and which are designed to engage and feed the product. As illustrated, the spiral means 17 have a respective outer edge which mates with the inner profile of the respective dosing chamber 16.

[0027] As illustrated, the dosing means 12, 12 comprise corresponding drive means, or corresponding electric motor, 20, 20 which are connected to a respective upper end of the respective shaft 19 so as to rotate it and obtain, by the screw feeder 14, 14, the propulsion and compaction of the product feeding towards the respective nozzle 18, 18 for discharging from the corresponding dosing chamber 16, 16.

[0028] The screw dosing means 14, 14 could be made as described in international patent application No. WO 2012/069971 in the name of the same Applicant and the content of which must be considered as incorporated herein by reference.

[0029] More specifically, as illustrated, the dosing apparatus 10 comprises means 22 for feeding the product towards the dosing means 12, 12, the feeding means being designed for delivering the product at a respective

zone 120 for inserting the product in the dosing means 12, 12, in particular at an end and/or upper zone of the dosing means 12, 12, that is, of the respective dosing chamber 16, 16.

[0030] The means 22 for feeding the product towards the dosing means 12, 12 comprise means for feeding the product towards the same dosing means, the means for feeding the product being, advantageously, in the form of corresponding screw means 24.

[0031] Basically, advantageously, there are means 24 for feeding the product towards the dosing means, in particular in the form of respective screw means, which extend, that is, they have a respective front end which extends to, or in the vicinity of, or immediately in front of a zone 120, 120 for feeding product in the dosing means 12, 12.

[0032] Advantageously, as may be inferred from the corresponding drawings, the zone for introducing the product in the dosing means 12, 12 is in the form of a volumetric space, or space, extending longitudinally according to the direction of longitudinal extension of the dosing means 12, 12, or respective dosing screw means 14, 14, the volumetric space being in particular provided at the rear of the dosing means 12, 12, or respective dosing screw means 14, 14.

[0033] As illustrated, advantageously, at the volumetric space 120, 120 for introducing in the dosing means 12, 12 extend corresponding spiral means 17, 17 of the corresponding dosing screw means 14, 14.

[0034] Advantageously, as may be inferred and as will be explained in more detail below, the zone 120, 120 for introducing or inserting the product in the dosing means 12, 12 is in front, laterally, and delimited above by corresponding surface means, or surfaces, and is open at the front or frontally to allow the introduction of the material in the dosing means. Moreover, the zone 120, 120 for introducing or inserting the product in the dosing means 12, 12 opens at the bottom in the corresponding dosing means 12, 12, that is, in the respective dosing chamber 16, 16 which houses the corresponding dosing screw feeder 14, 14.

[0035] Advantageously, the means for feeding the product towards the dosing means 12, 12, which are in particular in the form of corresponding screw feeder means 24, are in the form of means which compress the product entering in the corresponding dosing means 12, 12.

[0036] This ensures that the product does not become blocked inside the corresponding screw or dosing means 12, 12.

[0037] More specifically, as may be inferred, the means for feeding the product towards the dosing means, which are in particular in the form of respective screw means 24, are in the form of means designed to compress the product, whilst this feeds, or is fed, towards the dosing means. Advantageously, as will be described in more detail below, the means for feeding the product towards the dosing means 12, 12, which are in particular

in the form of respective screw means 24, are in the form of means designed for crushing or breaking the compacted product, in particular designed for crushing or breaking the compacted product whilst feeding towards the dosing means 12, 12.

[0038] Advantageously, as may be seen, the means 24 for feeding the product towards the dosing means 12, 12, which are in particular in the form of respective screw means, comprise a part 24a, in particular at the rear, for picking up and feeding the product and a part 24b, in particular at the front, for feeding and compressing the product in the corresponding dosing means 12, 12.

[0039] Advantageously, as illustrated, the means 22 for feeding the product towards the dosing means 12, 12 comprise a respective chamber 26 for housing the means 24 for feeding the product, the housing chamber 26 opening, in particular at the front, in 26', at a zone 120, 120 for introducing the product of the corresponding dosing means 12, 12.

[0040] More specifically, as illustrated, the chamber 26 for housing the means 24 for feeding the product towards the dosing means 12, 12 is defined by a plurality of peripheral walls, respectively rear 26a, lateral, which are opposite to one another, 26b, 26c and lower 26d.

[0041] More specifically, as illustrated, the chamber 26 for housing the means 24 for feeding the product towards the dosing means 12, 12 is also which is open at the top, in 26", for receiving the product to be fed to the dosing means 12, 12.

[0042] Advantageously, as may be inferred from the drawings, the chamber 26 of the means for feeding the product towards the dosing means 12, 12 has a respective surface, in particular lower 26d, in particular circumferentially shaped, which mates with the profile or outer shape, in particular circumferential, of the means for feeding the product towards the dosing means 12, 12, or screw means 24.

[0043] Advantageously, as may be seen in the drawings, the chamber 26 of the means for feeding the product towards the dosing means 12, 12 has a respective surface, in particular lower 26d, which has a respective edge 26'd, in particular in the form of a front end edge, which protrudes, or delimits, the zone 120 for feeding in the dosing means 12, 12. Advantageously, as may be seen in the drawings, the chamber 26 of the means 22 for feeding the product towards the dosing means 12, 12 has at the zone 120, 120 for introducing the product in the corresponding dosing means 12, 12, or at the respective front part, an upper wall 12e which converges towards the inserting zone 120, 120 to define means for conveying the product in the zone 120, 120 for introducing the product in the dosing means 12, 12.

[0044] More specifically, as may be inferred from the drawings, the chamber 26 of the means 22 for feeding the product towards the dosing means 12, 12 is defined by the lower part of the hopper 260 for loading the product in the dosing apparatus 10.

[0045] Advantageously, as may be seen in the draw-

ings, the means 22 for feeding the product towards the dosing means 12, 12, in particular the means, or screw, 24 for feeding the product and/or the housing chamber 26 extend oriented transversally relative to the dosing means 12, 12. Advantageously, as may be seen in the drawings, the means 22 for feeding the product towards the dosing means 12, 12, in particular the means, or screw, 24 for feeding the product and/or the housing chamber 26, in particular the respective lower surface 26d, extend inclined at an angle to the plane perpendicular to the longitudinal axis, preferably vertical, of the dosing means 12, 12.

[0046] In this way, the operation for washing the inner part of this dosing apparatus is facilitated.

[0047] Advantageously, as may be seen in the drawings, the screw means for feeding the product towards the dosing means 12, 12 are in the form of a single screw feeder 24, in particular designed to feed a first and a second dosing screw feeder 12, 12.

[0048] In this way, a reduced number of components and a lower structural complexity of the dosing apparatus is achieved.

[0049] More specifically, as illustrated, the screw feeder means for feeding the product towards the dosing means 12, 12 are in the form of a respective screw 24 having a respective rotary shaft 240 on which extend peripherally respective spiral means 241 advantageously defining first spiral means 24a for picking up and feeding the product and second spiral means 24b for feeding and compressing the product in the dosing means 12, 12.

[0050] Advantageously, as illustrated, the screw means 24 for feeding the product towards the dosing means 12, 12 comprise, at the respective end or front part 24b, a first and a second front spiral profile 241b, 242b, which, are, in particular, substantially transversal to each other, that is, at the same longitudinal height, and are angularly spaced or circumferentially distributed, in such a way as to apply a compression as much as possible continuous or uniform of the product during the steps of compressing the latter in the pickup zone 120, 120 of the dosing means 12, 12. Advantageously, as illustrated, the screw means 24 for feeding the product comprise a respective spiral profile, which defines the first front compression profile 241b and also the first spiral means 24a (rear part) for picking up and feeding the product.

[0051] Further advantageously, the screw means 24 for feeding the product towards the dosing means 12, 12 comprise a spiral body 24' which is rotatably supported by a respective fixed supporting body 24". Advantageously, as shown, the spiral body 24' comprises a rotatable shaft, or sleeve, 24'b which supports, and is preferably integral with, the spiral profiles 241b, 242b and which is, in turn, rotatably supported, preferably at the end of the fixed supporting body 24".

[0052] Advantageously, as shown, the spiral means, in particular the part of these which defines the means for picking up and feeding the product, extends in a can-

tilever fashion behind the rotatable shaft 24'b and they are positioned in use peripherally, with a respective radial clearance or space, around the fixed supporting body 24".

[0053] Advantageously, as illustrated in particular in Figure 8, the fixed supporting body 24" has a flange 24f for coupling to the rear wall 26a of the feed chamber, the fixed body 24" extending from the coupling flange 24f and being suitably hollow to allow the rotatable passage of respective drive transmission means, in particular in the form of a respective shaft 24t, to the spiral means, that is, to the rotatable shaft or sleeve 24'b for supporting the spiral means.

[0054] More specifically, as illustrated, the shaft or rotatable sleeve 24'b, which supports the spiral means is connected to the transmission shaft 24t, thanks to an end screw, labelled in Figure 8 with the reference numeral 24v.

[0055] More specifically, as illustrated, the screw means 24 for feeding the product comprise respective rotation means or electric motor 242, which are, in particular, supported on the rear wall 26a, that is, on the flange 24f, of the chamber 26 for housing the screw feed means 24, in particular at the end opposite that of the dosing means 12, 12.

[0056] Advantageously, as may be inferred in particular from Figures 8 and 9, the spiral means 241 have a respective diameter corresponding to the total width of the dosing means 12, 12, that is to say, a diameter that is such as to feed the first and second dosing means 12, 12.

[0057] In practice, the spiral 241 of the feed means 22 has a width, or diameter, which substantially corresponds to the distance between the lateral ends of the first and second dosing means 12, 12, that is to say, the opposite transversal ends of the respective dosing chambers 26, 26 or substantially of the respective volumetric spaces 120, 120 for introducing the product in the dosing means.

[0058] Advantageously, there are means designed for adjusting the speed of rotation of the screw means 24 for feeding the product towards the dosing means 12, 12 as a function of a respective condition for feeding the product towards the dosing means, in particular depending on a respective condition of pressure, of the product being fed towards the dosing means 12, 12.

[0059] Advantageously, the means designed for adjusting the speed of rotation of the screw means 24 for feeding the product towards the dosing means 12, 12 are designed to vary, respectively to increase and decrease, the speed of rotation of the screw means 24 during the step for feeding the product towards the dosing means 12, 12 in particular whilst the respective dosing means 12, 12 are dosing the product, especially for increasing or decreasing the condition of compression of the product being fed to the dosing means 12, 12.

[0060] Advantageously, the means designed for adjusting the speed of rotation of the screw means 24 for feeding the product towards the dosing means 12, 12 are

designed to stop the screw means 24, in particular whilst the dosing means 12, 12 are dosing the product.

[0061] Advantageously, the means designed for adjusting the speed of rotation of the screw means 24 for feeding the product towards the dosing means 12, 12 are designed to drive the screw feeder in an angular direction opposite to the direction for feeding the product, in particular whilst the dosing means 12, 12 are dosing the product.

[0062] In this way, it is possible to vary as desired and in a suitable manner the degree of compressing the product into the dosing means 12, 12. Advantageously, there are means 27 for detecting a condition of pressure of the product being fed towards the dosing means 12, 12.

[0063] Advantageously, as may be seen in the drawings, the means 27 for detecting a condition of pressure of the product being fed towards the dosing means 12, 12 are situated inside the zone 120, 120 for feeding in and/or introducing in the dosing means 12, 12.

[0064] Advantageously, there are means 121 for diverting or conveying the flow of product in the respective first and second dosing means 12, 12, in particular provided at the zone 120, 120 for introducing into the corresponding dosing means 12, 12.

[0065] Advantageously, as may be inferred from the corresponding drawings, the means 121 for diverting the flow of products in the respective first and second dosing means 12, 12 comprise a first and a second opposite surfaces diverging from each other 121a, 121b positioned between the first 12 and the second 12 dosing means.

[0066] Advantageously, as may be inferred from the corresponding drawings, the first and second opposite surfaces for diverting the flow of products 121a, 121b extend from a single vertex or joining zone 121c and are preferably extended vertically.

[0067] Advantageously, the means, or sensor, 27 for detecting the pressure of the product are provided on the means 121 for diverting the flow of products, in particular at the zone, or face, 121c for joining between the first and second diverting surfaces 121a, 121b.

[0068] Advantageously, as may be inferred from the corresponding drawings, the means 121 for diverting the flow of products, in particular the first and second diverting surfaces 121a, 121b extend on the side of the dosing means 12, 12 which is opposite that of extension of the feeding means 22. Advantageously, the screw means for feeding the product towards the dosing means 12, 12, in particular the respective rotary supporting shaft 240, extend in a cantilever fashion from the respective fixed supporting means 24", that is to say, from the rear wall 26a of the chamber 26 for feeding the product.

[0069] More specifically, as illustrated, the means 27 for detecting the pressure are positioned above, in particular just above, the zone of extension of the screw means 24 for feeding the product towards the dosing means 12, 12. Advantageously, there are means 28 for flattening or pushing the product in the means 22 for feed-

ing the product.

[0070] Advantageously, there are also means 24, 28 for splitting or breaking the compacted product.

[0071] More specifically, the means 28 for flattening the product in the feed means 22 define respective means for crushing or breaking up the compacted product.

[0072] Advantageously, the means 28 for flattening and/or breaking up the product are positioned above the means 22 for feeding the product towards the dosing means 12, 12.

[0073] Advantageously, as may be seen in the corresponding drawings, the means 28 for flattening and/or breaking up the product are positioned, in particular are fixed, to the loading hopper, in particular at or in the vicinity of the chamber 26 for housing the means 24 for feeding the product from the means 26 for feeding the product towards the dosing means.

[0074] In particular, as illustrated, in the flattening position, the means for flattening and/or breaking up the product extend to or inside the feeding chamber 26.

[0075] Advantageously, as may be seen in the corresponding drawings, the means for flattening and/or breaking up the product are moveable between a rest position, preferably raised, in particular allowing free passage of the product being fed to the chamber 26 of the means for feeding towards the dosing means 12, 12 and a position for engaging with the product, preferably lowered.

[0076] Advantageously, the means 28 for flattening and/or breaking up the product are driven periodically, preferably after a predetermined number of machine cycles, in particular a number of predetermined machine cycles depending on the features of the respective product to be dosed. Advantageously, as may be inferred from the corresponding drawings, the means for flattening and/or breaking up the product are defined by corresponding comb unit means 28 having a plurality of prongs or rods 281 transversally spaced, and preferably parallel to each other, supported by a corresponding transversal rod 282.

[0077] Advantageously, as may be inferred from the corresponding drawings, the means 28 for flattening and/or breaking up the product are rotatable with respect to an articulation pin 282, in particular defined by the supporting rod of the prongs 281, between the rest position, preferably raised, in particular allowing free passage of the product being fed to the containment hopper and the position for engaging with the product, preferably lowered.

[0078] Advantageously, as may be inferred from the corresponding drawings, the means 28 for flattening and/or breaking up comprise respective drive means 283, in particular in the form of a respective actuator or pneumatic cylinder, which are fixed outside the hopper body 260 defining the chamber 26 of the means 22 for feeding the product towards the dosing means 12, 12.

[0079] Advantageously, as may be seen in the corre-

sponding drawings, there are means 30 which are designed to clean the means 28 for flattening and/or breaking up the compacted product.

[0080] Advantageously, as can be seen in the corresponding drawings, the means 30 designed to clean the means 28 for flattening and/or breaking up the compacted product are in the form of corresponding fixed comb unit means, that is to say, they comprise a plurality of prongs, or rods, 301, transversally spaced from each other, and preferably parallel to each other, which are located offset with respect to the prongs or rods 281 of the movable comb unit means 28, in such a way that, when the means 28 for breaking up and/or flattening reach the respective rest position, more specifically raised, the prongs or rods 281 of the movable comb unit means 28 pass, or are positioned, between the prongs or rods 301 of the fixed comb unit means making it possible to achieve an action for disengaging the product from the movable comb unit means 28.

[0081] More specifically, as illustrated, the means 30 designed to clean the forming means are provided above the means 22 for feeding the product towards the dosing means 12, 12, in particular being fixed to the loading hopper 260, in particular above the chamber 26 for housing the means 24 for feeding the product from the means 26 for feeding the product towards the dosing means.

[0082] Advantageously, the means 24 for crushing or breaking up the compacted product are inside the chamber 26 for feeding the product towards the dosing means 12, 12.

[0083] In effect, as already mentioned above, the screw means 24 are designed for crushing or breaking the compacted product inside the chamber 26 for feeding the product towards the dosing means 12, 12, and in particular they are designed for crushing or breaking the compacted product whilst feeding towards the dosing means 12, 12.

[0084] Advantageously, as may be inferred from the corresponding drawings, and in particular from Figure 11, there are means 32 designed to engage the product which are radially protruding with respect to the screw means 24 for feeding the product towards the dosing means 12, 12. Advantageously, the means 32 designed to engage the product, which is radially protruding with respect to the screw means 24 for feeding the product towards the dosing means 12, 12 comprise corresponding means 32 protruding from the surface, in particular from the lower surface 26d, of the chamber 26 of the means 22 for feeding the product towards the dosing means 12, 12.

[0085] In particular, as illustrated, the means 32 designed to engage the product which is radially protruding with respect to the screw means 24 for feeding the product towards the dosing means 12, 12 comprise a plurality of respective slats 32, which extend along the feed direction of the product inside the chamber 26 or according to the direction of extension of the screw means 24 for feeding the product, in particular the slats 32 protruding

from the surface of the respective lower wall 26d of the feed chamber 26 and being preferably circumferentially equidistant from each other.

[0086] Advantageously, there are means 35 which exert on the dosing screw means 14 a counter-thrust, or an opposing retaining action, to the thrust exerted on the product produced by the means 22 for feeding the product to the dosing means 12, 12.

[0087] More specifically, the counter-thrust means comprise, or are in the form of, a respective collar 35, preferably made of rigid plastic material, which wraps around the outside of the shaft 19 of the dosing screw means, preferably at the end for attaching this to the respective drive means and in particular in the upper position of the corresponding zone 120, 120 for introducing the product in the dosing means 12, 12, and the inner surface of the collar 35 is engaged by the shaft 19 of the dosing means 12, 12 on the side opposite that of thrust by the product, and preferably only when this thrust becomes excessive or exceeds a respective level of stress. Figure 13 shows a second preferred embodiment of the means 28 for flattening or pushing the product in the means 22 for feeding the product, and which are designed to cause the crushing or breaking up the compacted product.

[0088] The second preferred embodiment of the means 28 for flattening and/or breaking up the product is identical to that of the first preferred embodiment, from which it differs, however, in that, further advantageously, the means for flattening and/or breaking up the product are defined by corresponding comb unit means 28 having a plurality of prongs or rods 281 which are transversally spaced, and substantially parallel to each other, which are located, or extend, at least the respective front end of these, along a respective arc-shaped path, which corresponds to, or mates with, the outer circumferential profile of the screw means so as to push the product into the screw means, in particular inside the means, or portion, 24a for picking up and feeding these, in a substantially uniform manner along most of the perimeter outer edge, in particular along the entire upper side, of the screw means 24, that is, so as to position substantially the entire series of prongs 281 in the vicinity of the outer perimeter of the screw means or the respective propeller.

[0089] More specifically, as illustrated, the transversal end or lateral prongs L. 281 are positioned, in a condition for flattening and/or breaking up the product, alongside the screw means, especially alongside the screw of the screw means.

[0090] Basically, as is evident, the features described above allow the following corresponding advantageous effects to be achieved:

- having a dosing apparatus which is particularly effective and efficient and in particular which allows predetermined portions to be obtained which are particularly precise;
- having a dosing apparatus which avoids every risk

of blocking of the product inside the dosing means, in particular when the product is in the form of a material which is excessively hard and robust;

- of providing a dosing apparatus which is easy to clean;
- having a dosing apparatus which has a reduced number of components and/or a reduced structural complexity;
- of providing a dosing apparatus which is of limited size; and/or
- of providing a dosing apparatus which is easy to maintain.

[0091] The invention described has evident industrial applications. It would be obvious to one skilled in the art that several changes and modifications can be made to the invention without departing from the spirit and scope of the invention, described in depth above. It is also easy to imagine further preferred embodiments of the invention comprising one or more of the features described herein. Moreover, it will be understood that all the details of the invention may be substituted for technically equivalent elements.

Claims

1. An apparatus (11) for packing respective pasty food product portions in a corresponding containment package, preferably defined by a respective wrapper, in particular defined by a respective sheet of foldable material which is wrapped around, in particular in contact with, the respective portion of product, said apparatus (11) comprising an apparatus (10) for dosing respective portions of a corresponding pasty food product comprising means (12) for dosing respective predetermined portions of product, the dosing means being in particular in the form of respective screw means (14) which are housed in a rotatable fashion inside in a respective dosing chamber (16), and which feed the product towards a respective nozzle (18) for unloading from the dosing chamber (16); means (22) for feeding the product towards the dosing means (12, 12), the feeding means being designed for delivering the product at a respective zone (120) for inserting the product in the dosing means (12, 12), in particular at an end and/or upper zone of the dosing means (12, 12), that is, of the respective dosing chamber (16, 16); the means (22) for feeding the product being in the form of corresponding screw means (24), wherein the screw feeder means for feeding the product towards the dosing means (12, 12) are in the form of a respective screw feeder (24) having a respective rotary shaft (240) on which extend peripherally respective spiral means (241) defining first spiral means (24a) for picking up and feeding the product and second spiral means (24b) for feeding and compressing the

product in the dosing means (12, 12), **characterised in that** the screw means (24) for feeding the product towards the dosing means (12, 12) comprise, at the respective end or front part (24b), a first and a second front spiral profile (241b, 242b), which are transversal to each other, that is, at the same longitudinal height, and being angularly spaced or circumferentially distributed, in such a way as to apply a compression as much as possible continuous or uniform of the product during the steps of compressing the latter in the pickup zone (120, 120) of the dosing means (12, 12).

2. The apparatus according to claim 1, comprises means (24) for feeding the product towards the dosing means, in particular in the form of respective screw means, which extend, that is, they have a respective front end which extends in front of a zone (120, 120) for inserting the product in the dosing means (12, 12).
3. The apparatus according to any one of the preceding claims, wherein the inserting zone in the dosing means (12, 12) is in the form of a volumetric space longitudinally extended according to the longitudinal direction of extension of the dosing means (12, 12), or respective dosing screw feeder, the volumetric space being, in particular, provided at the rear part of the dosing means (12, 12), or respective dosing screw feeder, and at the respective volumetric inserting space (120, 120) extend corresponding spiral means (17, 17) of the corresponding dosing screw feeder means.
4. The apparatus according to any one of the preceding claims, wherein the inserting zone in the dosing means (12, 12) is in front, delimited to the side and above by corresponding surface means and is open at the front to allow the introduction of the material in the dosing means and open below at the corresponding dosing means (12, 12), that is, in the respective dosing chamber (16, 16) containing the corresponding dosing screw feeder (14, 14).
5. The apparatus according to any one of the preceding claims, wherein the means (24) for feeding the product towards the dosing means (12, 12), in particular in the form of corresponding screw means, are in the form of means which compress the product entering in the corresponding dosing means (12, 12).
6. The apparatus according to any one of the preceding claims, wherein the means (24) for feeding the product towards the dosing means (12, 12), in particular in the form of respective screw means, comprise a part (24a), in particular at the rear, for picking up and feeding the product and a part (24b), in particular at the front, for feeding and compressing the product

in the corresponding dosing means (12, 12).

7. The apparatus according to any one of the preceding claims, wherein the screw feeder means for feeding the product towards the dosing means (12, 12) are in the form of a single screw feeder (24), in particular designed to feed a first and a second dosing screw feeder (12, 12).
8. The apparatus according to any one of the preceding claims, wherein the screw feeder means (24) for feeding the product towards the dosing means (12, 12) comprise a spiral body (24') which is rotatably supported by a respective fixed supporting body (24''), the spiral body (24') comprising a rotatable shaft, or sleeve, (24'b) which supports the spiral means (241b, 242b) and which is rotatably supported, preferably at the end of the fixed supporting body (24''); and wherein the spiral means (241b, 242b), in particular the part of these which defines the means for picking up and feeding the product, extends in a cantilever fashion behind the supporting shaft (24'b) and they are positioned in use peripherally, with a respective radial clearance or space, around the fixed supporting body (24'').
9. The apparatus according to claim 8, wherein the fixed supporting body (24') has a flange (24f) for coupling, in particular to the rear wall of the chamber for feeding the product, from the coupling flange (24f) extending the fixed body (24'), which is suitably hollow to allow the rotatable passage of respective drive transmission means, in particular in the form of a respective shaft (24t), to the spiral means, that is, to the rotatable shaft or sleeve (24'b) for supporting the spiral means.
10. The apparatus according to any one of the preceding claims, comprises means designed for adjusting the speed of rotation of the screw feeder means (24) for feeding the product towards the dosing means (12, 12) as a function of a respective condition for feeding the product towards the dosing means, in particular depending on a respective condition, in particular of pressure, of the product being fed towards the dosing means (12, 12).
11. The apparatus according to claim 10, wherein the means designed for adjusting the speed of rotation of the screw feeder means (24) for feeding the product towards the dosing means (12, 12) are designed to vary, respectively to increase and decrease, the speed of rotation of the screw feeder means (24) during the step for inserting the product towards the dosing means (12, 12) and/or whilst the respective dosing means (12, 12) are dosing the product, especially for increasing or decreasing the condition of compression of the product being fed to the dosing

means (12, 12).

12. The apparatus according to claim 10 or 11, wherein the means designed for adjusting the speed of rotation of the screw means (24) for feeding the product towards the dosing means (12, 12) are designed to stop the screw means (24), in particular whilst the dosing means (12, 12) are dosing the product; and/or in that the means designed for adjusting the speed of rotation of the screw means (24) for feeding the product towards the dosing means (12, 12) are designed to drive the screw feeder in an angular direction opposite to the direction for feeding the product, in particular whilst the dosing means (12, 12) are dosing the product.
13. The apparatus according to any one of the preceding claims, comprises means (27) for detecting a condition of pressure of the product being fed towards the dosing means (12, 12); and wherein the means (27) for detecting a condition of pressure of the product being fed towards the dosing means (12, 12) are situated inside the zone (120, 120) for inserting the product in the dosing means (12, 12).
14. The apparatus according to any one of the preceding claims, comprises means (121) for diverting or conveying the flow of product in the respective first and second dosing means (12, 12), in particular provided at the zone (120, 120) for inserting the product into the corresponding dosing means (12, 12); wherein the means (121) for diverting the flow of product in the respective first and second dosing means (12, 12) comprise a first and a second opposite surface (121a, 121b) diverging from each other, positioned between the first (12) and the second (12) dosing means; and wherein the first and second opposite surfaces for diverting the flow of product (121a, 121b) extend from a single vertex or joining zone (121c) and are preferably extended vertically.
15. The apparatus according to claim 13 and 14, wherein the means, or sensor, (27) for detecting the pressure of the product are provided on the means (121) for diverting the flow of products, in particular at the zone, or face, (121c) for joining between the first and second diverting surfaces (121a, 121b).
16. The apparatus according to any one of the preceding claims, comprises means (28) for flattening or pushing the product in the means (22) for feeding the product; the means (28) for flattening the product in the means (22) for feeding the product defining respective means for crushing or breaking up the compacted product.
17. The apparatus according to claim 16, wherein the means (28) for flattening and/or breaking up the

product are positioned above the means (22) for feeding the product towards the dosing means (12, 12); and/or the means (28) for flattening and/or breaking up the product are positioned, in particular are fixed, to the loading hopper, in particular at or in the vicinity of the chamber (26) for housing the means (24) for feeding the product from the means for feeding the product towards the dosing means.

Patentansprüche

1. Vorrichtung (11) zum Verpacken von jeweiligen pastösen Lebensmittelproduktportionen in einer entsprechenden Sicherheitsverpackung, vorzugsweise definiert durch eine jeweilige Hülle, insbesondere definiert durch eine jeweilige Bahn aus faltbarem Material, die um die jeweiligen Portion des Produkts, insbesondere in Kontakt mit ihnen, gewickelt ist, wobei die Vorrichtung (11) eine Vorrichtung (10) zum Dosieren von jeweiligen Lebensmittelprodukten umfasst, die Mittel (12) zum Dosieren von jeweiligen vorbestimmten Portionen des Produkts umfasst, wobei die Dosiermittel insbesondere in Form von jeweiligen Schneckenmitteln (14) sind, die drehbar in einer jeweiligen Dosierkammer (16) untergebracht sind und die das Produkt zu einer jeweiligen Düse (18) zum Entladen aus der Dosierkammer (16) zuführen; Mittel (22) zum Zuführen des Produkts zu den Dosiermitteln (12, 12), wobei die Zuführmittel zum Abgeben des Produkts an einer jeweiligen Zone (120) zum Einfügen des Produkts in die Dosiermittel (12, 12), besonders an einem Ende und/oder einer oberen Zone der Dosiermittel (12, 12), d.h. der jeweiligen Dosierkammer (16, 16) ausgelegt sind; wobei die Mittel (22) zum Zuführen des Produkts in Form von entsprechenden Schneckenmitteln (24) sind, wobei die Schneckenzuführmittel zum Zuführen des Produkts zu den Dosiermitteln (12, 12) in Form eines jeweiligen Schneckenzuführers (24) sind, der eine jeweilige Drehwelle (240) aufweist, auf der sich jeweils Spiralmittel (241) peripher erstrecken, die erste Spiralmittel (24a) zum Aufnehmen und Zuführen des Produkts und zweite Spiralmittel (24b) zum Zuführen und Komprimieren des Produkts in die Dosiermittel (12, 12) definieren, **dadurch gekennzeichnet, dass** die Schneckenmittel (24) zum Zuführen des Produkts zu den Dosiermitteln (12, 12) am jeweiligen Ende oder vorderen Teil (24b) ein erstes und ein zweites vorderes Spiralprofil (241b, 242b) umfassen, die quer zueinander sind, d.h. auf derselben Längshöhe liegen und winkelig beabstandet oder in Umfangsrichtung verteilt sind, so dass sie eine möglichst kontinuierliche oder gleichmäßige Kompression des Produkts während der Schritte zum Komprimieren des letzteren in der Aufnahmezone (120, 120) der Dosiermittel (12, 12) ausgeübt

- wird.
2. Vorrichtung nach Anspruch 1, umfassend Mittel (24) zum Zuführen des Produkts zu den Dosiermitteln, insbesondere in Form von jeweiligen Schneckenmitteln, die sich erstrecken, d.h. sie ein jeweiliges vorderes Ende aufweisen, das sich vor einer Zone (120, 120) zum Einfügen des Produkts in die Dosiermittel (12, 12) erstreckt. 5
 3. Vorrichtung nach einem der vorhergehenden Ansprüche, wobei die Einfügezone in die Dosiermittel (12, 12) in Form eines Volumenraums vorliegt, der sich in Längsrichtung gemäß der Längserstreckungsrichtung der Dosiermittel (12, 12) oder des jeweiligen Dosierschneckenzuführers erstreckt, wobei der Volumenraum insbesondere am hinteren Teil der Dosiermittel (12, 12) oder am jeweiligen Dosierschneckenzuführer vorgesehen ist und wobei entsprechende Spiralmittel (17, 17) der entsprechenden Dosierschneckenzuführermittel am jeweiligen volumetrischen Einfügeraum (120, 120) erstrecken. 10 15
 4. Vorrichtung nach einem der vorhergehenden Ansprüche, wobei die Einfügezone in den Dosiermitteln (12, 12) vorne liegt, seitlich und oben durch entsprechende Oberflächenmittel begrenzt ist und vorne offen ist, um die Einführung des Materials in die Dosiermittel zu ermöglichen und unten an den entsprechenden Dosiermitteln (12, 12) offen ist, d.h. in der jeweiligen Dosierkammer (16, 16), die den entsprechenden Dosierschneckenzuführer (14, 14) enthält. 20 25
 5. Vorrichtung nach einem der vorhergehenden Ansprüche, wobei die Mittel (24) zum Zuführen des Produkts zu den Dosiermitteln (12, 12), insbesondere in Form von entsprechenden Schneckenmitteln, in Form von Mitteln vorliegen, die das in die entsprechenden Dosiermittel (12, 12) eintretende Produkt komprimieren. 30 35
 6. Vorrichtung nach einem der vorhergehenden Ansprüche, wobei die Mittel (24) zum Zuführen des Produkts zu den Dosiermitteln (12, 12), insbesondere in Form von jeweiligen Schneckenmitteln, einen Teil (24a), insbesondere hinten, zum Aufnehmen und Zuführen des Produkts und einen Teil (24b), insbesondere vorne, zum Zuführen und Komprimieren des Produkts in den entsprechenden Dosiermitteln (12, 12) umfassen. 40 45 50
 7. Vorrichtung nach einem der vorhergehenden Ansprüche, wobei die Schneckenzuführermittel zum Zuführen des Produkts zu den Dosiermitteln (12, 12) in Form eines einzelnen Schneckenzuführers (24) vorliegen, der insbesondere zum Zuführen eines ersten und eines zweiten Dosierschneckenzuführers (12, 12) ausgelegt sind. 55
 8. Vorrichtung nach einem der vorhergehenden Ansprüche, wobei die Schneckenzuführermittel (24) zum Zuführen des Produkts zu den Dosiermitteln (12, 12) einen Spiralkörper (24') umfassen, der drehbar von einem jeweiligen festen Tragkörper (24'') getragen ist, wobei der Spiralkörper (24') eine drehbare Welle oder Hülse (24'b) umfasst, die die Spiralmittel (241b, 242b) trägt und die drehbar, vorzugsweise am Ende des festen Tragkörpers (24''), gelagert ist; und wobei sich die Spiralmittel (241b, 242b), insbesondere der Teil davon, der die Mittel zum Aufnehmen und Zuführen des Produkts definiert, freitragend hinter der Tragwelle (24'b) erstrecken und sie im Gebrauch peripher mit einem jeweiligen radialen Spielraum oder Abstand um den festen Tragkörper (24'') positioniert sind.
 9. Vorrichtung nach Anspruch 8, wobei der feste Tragkörper (24') einen Flansch (24f) zum Koppeln, insbesondere an die Rückwand der Kammer zum Zuführen des Produkts, von dem Kopplungsflansch (24f) aufweist, der den festen Körper (24') verlängert, der geeignet hohl ist, um den drehbaren Durchgang der jeweiligen Antriebsübertragungsmittel, insbesondere in Form von einer jeweiligen Welle (24t), zu den Spiralmitteln zu ermöglichen, d.h. zu der drehbaren Welle oder Hülse (24'b) zum Tragen der Spiralmittel.
 10. Vorrichtung nach einem der vorhergehenden Ansprüche, umfassend Mittel, die zum Einstellen der Drehzahl der Schneckenzuführermittel (24) zum Zuführen des Produkts zu den Dosiermitteln (12, 12) als Funktion eines jeweiligen Zustands für das Zuführen des Produkts zu den Dosiermitteln, insbesondere abhängig von einem jeweiligen Zustand, insbesondere von Druck, des Produkts, das zu den Dosiermitteln (12, 12) zugeführt wird, ausgelegt sind.
 11. Vorrichtung nach Anspruch 10, wobei die Mittel, die zum Einstellen der Drehzahl der Schneckenzuführermittel (24) zum Zuführen des Produkts zu den Dosiermitteln (12, 12) ausgelegt sind, so ausgelegt sind, dass sie die Drehzahl der Schneckenzuführermittel (24) während des Schritts zum Einfügen des Produkts zu den Dosiermitteln (12, 12) und/oder während die jeweiligen Dosiermittel (12, 12) das Produkt dosieren, insbesondere zum Erhöhen oder Verringern des Kompressionszustand des Produkts, das zu den Dosiermittel (12, 12) zugeführt wird, variieren, jeweils erhöhen bzw. verringern.
 12. Vorrichtung nach Anspruch 10 oder 11, wobei die Mittel, die zum Einstellen der Drehzahl der Schneckenmittel (24) zum Zuführen des Produkts zu den Dosiermitteln (12, 12) ausgelegt sind, so ausgelegt sind, dass sie die Schneckenmittel (24) stoppen, insbesondere während die Dosiermittel (12, 12) das

Produkt dosieren; und/oder dadurch dass die Mittel, die zum Einstellen der Drehzahl der Schneckenmittel (24) zum Zuführen des Produkts zu den Dosiermitteln (12, 12) ausgelegt sind, so ausgelegt sind, dass sie den Schneckenzuführer in einer Winkelrichtung antreiben, die der Richtung zum Zuführen des Produkts entgegengesetzt ist, insbesondere während die Dosiermittel (12, 12) das Produkt dosieren.

13. Vorrichtung nach einem der vorhergehenden Ansprüche, umfassend Mittel (27) zum Erfassen eines Druckzustands des Produkts, das zu den Dosiermitteln (12, 12) zugeführt wird; und wobei die Mittel (27) zum Erfassen eines Druckzustands des Produkts, das zu den Dosiermitteln (12, 12) zugeführt wird, innerhalb der Zone (120, 120) zum Einfügen des Produkts in die Dosiermittel (12, 12) angeordnet sind. 10
14. Vorrichtung nach einem der vorhergehenden Ansprüche, umfassend Mittel (121) zum Umleiten oder Fördern des Produktflusses in den jeweiligen ersten und zweiten Dosiermitteln (12, 12), die insbesondere an der Zone (120, 120) zum Einfügen des Produkts in die entsprechenden Dosiermittel (12, 12) vorgesehen sind; wobei die Mittel (121) zum Umleiten des Produktflusses in die jeweiligen ersten und zweiten Dosiermittel (12, 12) eine erste und eine zweite entgegengesetzte Oberfläche (121a, 121b) umfassen, die voneinander abweichen und zwischen den ersten (12) und den zweiten (12) Dosierungsmitteln positioniert sind; und wobei sich die erste und die zweite entgegengesetzte Oberfläche zum Umleiten des Produktflusses (121a, 121b) von einem einzelnen Scheitelpunkt oder Zusammenfügungszone (121c) erstrecken und vorzugsweise vertikal verlängert sind. 20 25 30 35
15. Vorrichtung nach Anspruch 13 und 14, wobei die Mittel oder Sensor (27) zum Erfassen des Drucks des Produkts an den Mitteln (121) zum Umleiten des Produktflusses, insbesondere an der Zone oder Fläche (121c) zum Zusammenfügen zwischen der ersten und der zweiten Umleitungsfläche (121a, 121b) vorgesehen sind. 40
16. Vorrichtung nach einem der vorhergehenden Ansprüche, umfassend Mittel (28) zum Abflachen oder Schieben des Produkts in die Mittel (22) zum Zuführen des Produkts; wobei die Mittel (28) zum Abflachen des Produkts in den Mitteln (22) zum Zuführen des Produkts jeweilige Mittel zum Zerkleinern oder Aufbrechen des verdichteten Produkts definieren. 45 50
17. Vorrichtung nach Anspruch 16, wobei die Mittel (28) zum Abflachen und/oder Aufbrechen des Produkts über den Mitteln (22) zum Zuführen des Produkts zu den Dosiermitteln (12, 12) angeordnet sind; und/oder die Mittel (28) zum Abflachen und/oder Auf-

brechen des Produkts sind am Ladetrichter, insbesondere an oder in der Nähe der Kammer (26) zum Unterbringen der Mittel (24) zum Zuführen des Produkts von den Mitteln zum Zuführen des Produkts zu den Dosiermitteln, positioniert, insbesondere fixiert.

Revendications

1. Appareil (11) pour emballer des parties respectives de produits alimentaires pâteux dans un emballage de contenance correspondant, de préférence défini par une enveloppe respective, en particulier définie par une feuille respective de matériau pliable étant enroulée autour de la partie respective de produit, en particulier en contact avec celle-ci, ledit appareil (11) comprenant un appareil (10) servant à doser des parties respectives d'un produit alimentaire pâteux correspondant comprenant des moyens (12) pour doser des parties prédéterminées respectives de produit, les moyens de dosage se présentant, en particulier, sous la forme de moyens à vis (14) respectifs étant logés de manière rotative à l'intérieur d'une chambre de dosage (16) respective, et alimentant le produit vers une buse (18) respective pour le décharger de la chambre de dosage (16); des moyens (22) servant à alimenter le produit vers les moyens de dosage (12, 12), les moyens d'alimentation étant conçus pour délivrer le produit en correspondance d'une zone (120) respective pour introduire le produit dans les moyens de dosage (12, 12), en particulier, à une extrémité et/ou en correspondance d'une zone supérieure des moyens de dosage (12, 12), c'est-à-dire de la chambre de dosage (16, 16) respective ; les moyens (22) servant à alimenter le produit se présentant sous la forme de moyens à vis (24) correspondants, dans lequel les moyens d'alimentation à vis servant à alimenter le produit vers les moyens de dosage (12, 12) se présentent sous la forme d'un alimentateur à vis (24) respectif comportant un arbre rotatif (240) respectif sur lequel se prolongent périphériquement des moyens à spirale (241) respectifs définissant des premiers moyens à spirale (24a) pour saisir et alimenter le produit et des seconds moyens à spirale (24b) pour alimenter et comprimer le produit dans les moyens de dosage (12, 12), **caractérisé en ce que** les moyens à vis (24) servant à alimenter le produit vers les moyens de dosage (12, 12) comprennent, à l'extrémité respective ou en correspondance de la partie avant (24b), un premier et un second profils à spirale avant (241b, 242b) étant transversaux l'un par rapport à l'autre, c'est-à-dire à la même hauteur longitudinale, et étant angulairement espacés ou répartis sur la circonférence, de manière à appliquer une compression aussi continue ou uniforme que possible du produit pendant

- les étapes de compression de ce dernier dans la zone de préhension (120, 120) des moyens de dosage (12, 12) .
2. Appareil selon la revendication 1, comprenant des moyens (24) servant à alimenter le produit vers les moyens de dosage, en particulier sous la forme de moyens à vis respectifs, qui se prolongent, c'est-à-dire qu'ils comportent une extrémité avant respective qui se prolonge devant une zone (120, 120) d'introduction du produit dans les moyens de dosage (12, 12). 5
 3. Appareil selon l'une quelconque des revendications précédentes, dans lequel la zone d'introduction dans les moyens de dosage (12, 12) se présente sous la forme d'un espace volumétrique se prolongeant longitudinalement selon la direction longitudinale d'extension des moyens de dosage (12, 12), ou d'un alimentateur à vis de dosage respectif, l'espace volumétrique étant, en particulier, prévu en correspondance de la partie arrière des moyens de dosage (12, 12), ou de l'alimentateur à vis de dosage respectif, et en correspondance de l'espace d'introduction volumétrique (120, 120) respectif se prolongent des moyens à spirale (17, 17) correspondants des moyens d'alimentation à vis de dosage correspondants. 10 15 20 25
 4. Appareil selon l'une quelconque des revendications précédentes, dans lequel la zone d'introduction dans les moyens de dosage (12, 12) se trouve à l'avant, délimitée sur le côté et au-dessus par des moyens de surface correspondants et est ouverte à l'avant pour permettre l'introduction du matériau dans les moyens de dosage et ouverte en dessous en correspondance des moyens de dosage (12, 12) correspondants, c'est-à-dire dans la chambre de dosage (16, 16) respective contenant l'alimentateur à vis de dosage (14, 14) correspondant. 30 35 40
 5. Appareil selon l'une quelconque des revendications précédentes, dans lequel les moyens (24) servant à alimenter le produit vers les moyens de dosage (12, 12), en particulier sous la forme de moyens à vis correspondants, se présentent sous la forme de moyens qui compriment le produit entrant dans les moyens de dosage (12, 12) correspondants. 45
 6. Appareil selon l'une quelconque des revendications précédentes, dans lequel les moyens (24) servant à alimenter le produit vers les moyens de dosage (12, 12), en particulier sous la forme de moyens à vis respectifs, comprennent une partie (24a), en particulier à l'arrière, servant à saisir et alimenter le produit et une partie (24b), en particulier à l'avant, servant à alimenter et à comprimer le produit dans les moyens de dosage (12, 12) correspondants. 50
 7. Appareil selon l'une quelconque des revendications précédentes, dans lequel les moyens d'alimentation à vis servant à alimenter le produit vers les moyens de dosage (12, 12) se présentent sous la forme d'un unique alimentateur à vis (24), en particulier conçu pour alimenter un premier et un second alimentateur à vis de dosage (12, 12). 5
 8. Appareil selon l'une quelconque des revendications précédentes, dans lequel les moyens d'alimentation à vis (24) servant à alimenter le produit vers les moyens de dosage (12, 12) comprennent un corps en spirale (24') étant supporté de manière rotative par un corps de support fixe (24'') respectif, le corps en spirale (24') comprenant un arbre rotatif, ou manchon, (24'b) qui supporte les moyens à spirale (241b, 242b) et qui est supporté de manière rotative, de préférence à l'extrémité du corps de support fixe (24'') ; et dans lequel les moyens à spirale (241b, 242b), en particulier la partie de ceux-ci définissant les moyens de préhension et d'alimentation du produit, se prolongent en porte-à-faux derrière l'arbre de support (24'b) et sont positionnés, en fonctionnement, de manière périphérique, avec un jeu ou un espace radial respectif, autour du corps de support fixe (24''). 10 15 20 25
 9. Appareil selon la revendication 8, dans lequel le corps de support fixe (24') comporte une bride (24f) pour l'accouplement, en particulier à la paroi arrière de la chambre pour l'alimentation du produit, à partir de la bride d'accouplement (24f) prolongeant le corps fixe (24'), étant creuse de façon appropriée pour permettre le passage en rotation de moyens de transmission d'entraînement respectifs, en particulier sous la forme d'un arbre (24t) respectif, vers les moyens à spirale, c'est-à-dire vers l'arbre ou le manchon rotatif (24'b) pour supporter les moyens à spirale. 30 35 40
 10. Appareil selon l'une quelconque des revendications précédentes, comprenant des moyens conçus pour régler la vitesse de rotation des moyens d'alimentation à vis (24) servant à alimenter le produit vers les moyens de dosage (12, 12) en fonction d'une condition respective d'alimentation du produit vers les moyens de dosage, en particulier en fonction d'une condition respective, notamment de pression, du produit étant alimenté vers les moyens de dosage (12, 12). 45
 11. Appareil selon la revendication 10, dans lequel les moyens conçus pour régler la vitesse de rotation des moyens d'alimentation à vis (24) servant à alimenter le produit vers les moyens de dosage (12, 12) sont conçus pour faire varier, respectivement pour augmenter et diminuer, la vitesse de rotation des moyens d'alimentation à vis (24) pendant l'étape 50 55

d'introduction du produit vers les moyens de dosage (12, 12) et/ou pendant que les moyens de dosage (12, 12) respectifs dosent le produit, surtout pour augmenter ou diminuer la condition de compression du produit étant alimenté vers les moyens de dosage (12, 12).

12. Appareil selon la revendication 10 ou 11, dans lequel les moyens conçus pour régler la vitesse de rotation des moyens à vis (24) servant à alimenter le produit vers les moyens de dosage (12, 12) sont conçus pour arrêter les moyens à vis (24), en particulier pendant que les moyens de dosage (12, 12) dosent le produit ; et/ou en ce que les moyens conçus pour régler la vitesse de rotation des moyens à vis (24) servant à alimenter le produit vers les moyens de dosage (12, 12) sont conçus pour entraîner l'alimentation a vis dans une direction angulaire opposée à la direction d'alimentation du produit, en particulier pendant que les moyens de dosage (12, 12) dosent le produit. 5 10 15 20
13. Appareil selon l'une quelconque des revendications précédentes, comprenant des moyens (27) servant à détecter une condition de pression du produit étant alimenté vers les moyens de dosage (12, 12) ; et dans lequel les moyens (27) servant à détecter une condition de pression du produit étant alimenté vers les moyens de dosage (12, 12) sont situés à l'intérieur de la zone (120, 120) servant à introduire le produit dans les moyens de dosage (12, 12). 25 30
14. Appareil selon l'une quelconque des revendications précédentes, comprenant des moyens (121) servant à dévier ou à acheminer le flux de produit dans les premier et second moyens de dosage (12, 12) respectifs, en particulier prévus en correspondance de la zone (120, 120) d'introduction du produit dans les moyens de dosage (12, 12) correspondants ; dans lequel les moyens (121) servant à dévier le flux de produit dans les premier et second moyens de dosage (12, 12) respectifs comprennent une première et une seconde surfaces opposées (121a, 121b) divergeant l'une de l'autre, positionnées entre les premier (12) et second (12) moyens de dosage ; et dans lequel les première et seconde surfaces opposées servant à dévier le flux de produit (121a, 121b) se prolongent à partir d'un seul sommet ou zone de jonction (121c) et sont de préférence étendues verticalement. 35 40 45 50
15. Appareil selon les revendications 13 et 14, dans lequel les moyens ou capteur (27) servant à détecter la pression du produit sont prévus sur les moyens (121) servant à dévier le flux de produits, en particulier en correspondance de la zone ou face (121c) de jonction entre les première et seconde surfaces de déviation (121a, 121b). 55

16. Appareil selon l'une quelconque des revendications précédentes, comprenant des moyens (28) servant à aplatir ou à pousser le produit dans les moyens (22) servant à alimenter le produit ; les moyens (28) servant à aplatir le produit dans les moyens (22) d'alimentation du produit définissant des moyens respectifs pour écraser ou briser le produit compacté.

17. Appareil selon la revendication 16, dans lequel les moyens (28) servant à aplatir et/ou à briser le produit sont positionnés au-dessus des moyens (22) servant à alimenter le produit vers les moyens de dosage (12, 12) ; et/ou les moyens (28) servant à aplatir et/ou briser le produit sont positionnés, en particulier sont fixés, à la trémie de chargement, en particulier en correspondance ou à proximité de la chambre (26) servant à loger les moyens (24) d'alimentation du produit à partir des moyens servant à alimenter le produit vers les moyens de dosage.

FIG. 1

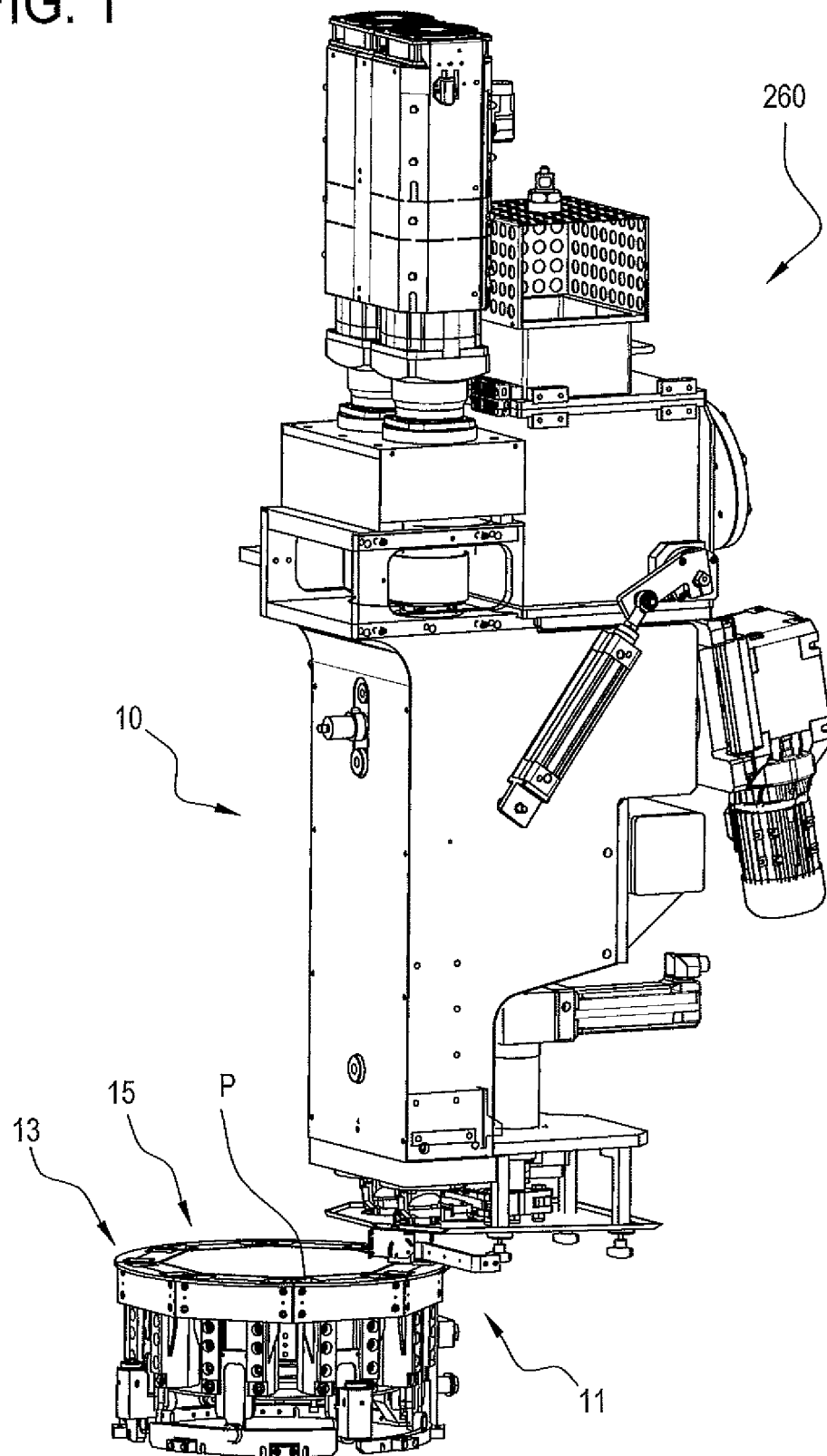
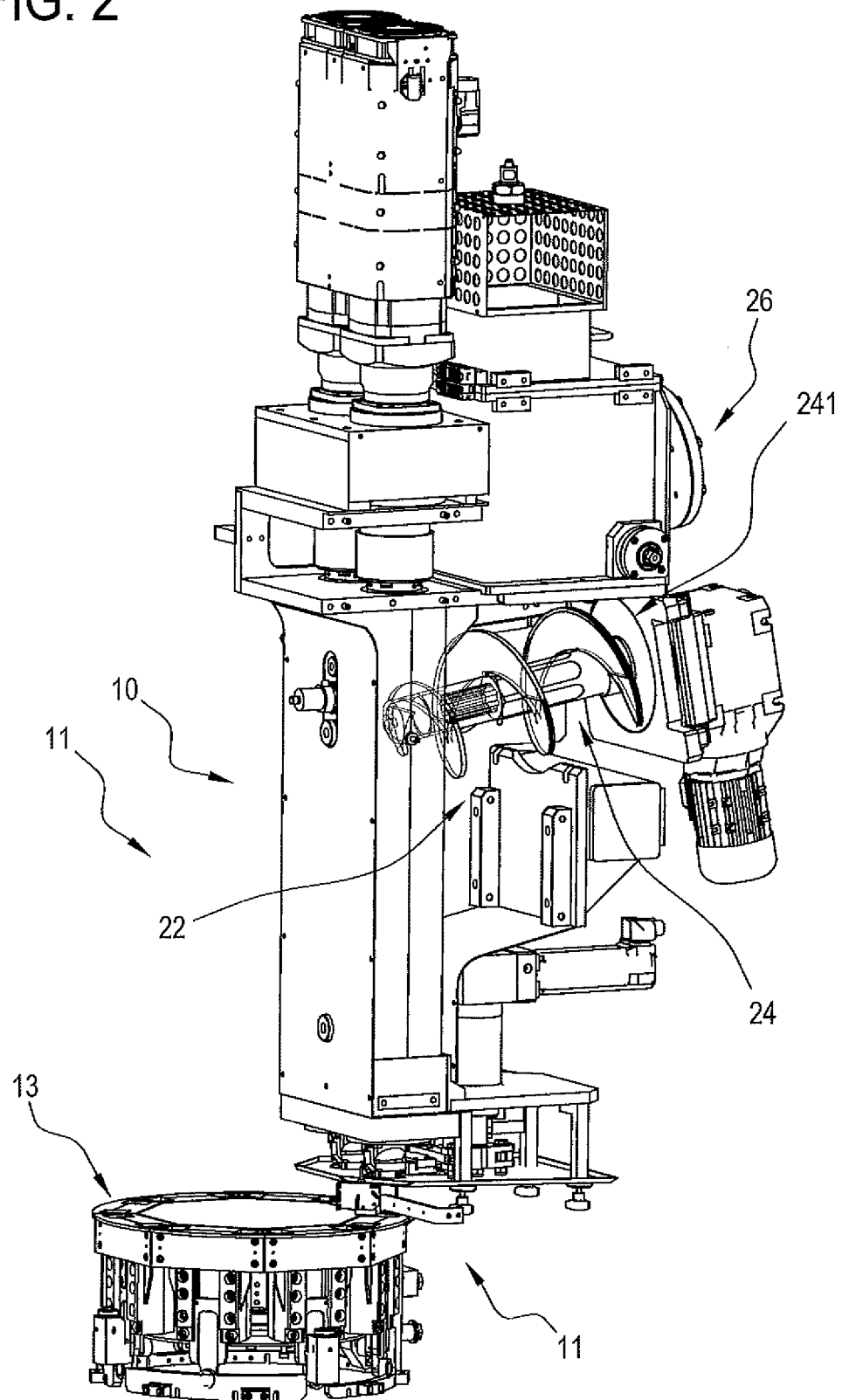


FIG. 2



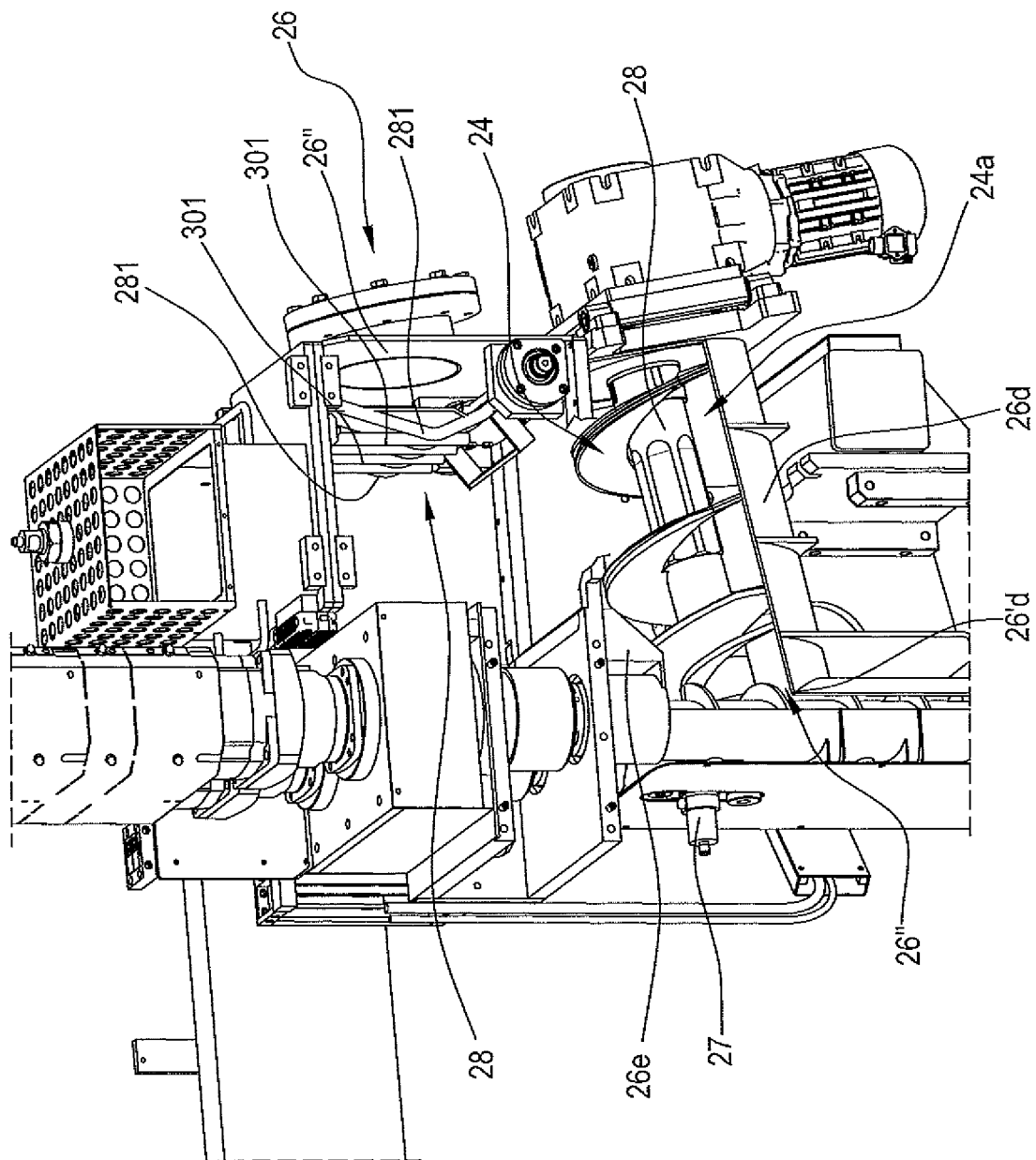


FIG. 3A

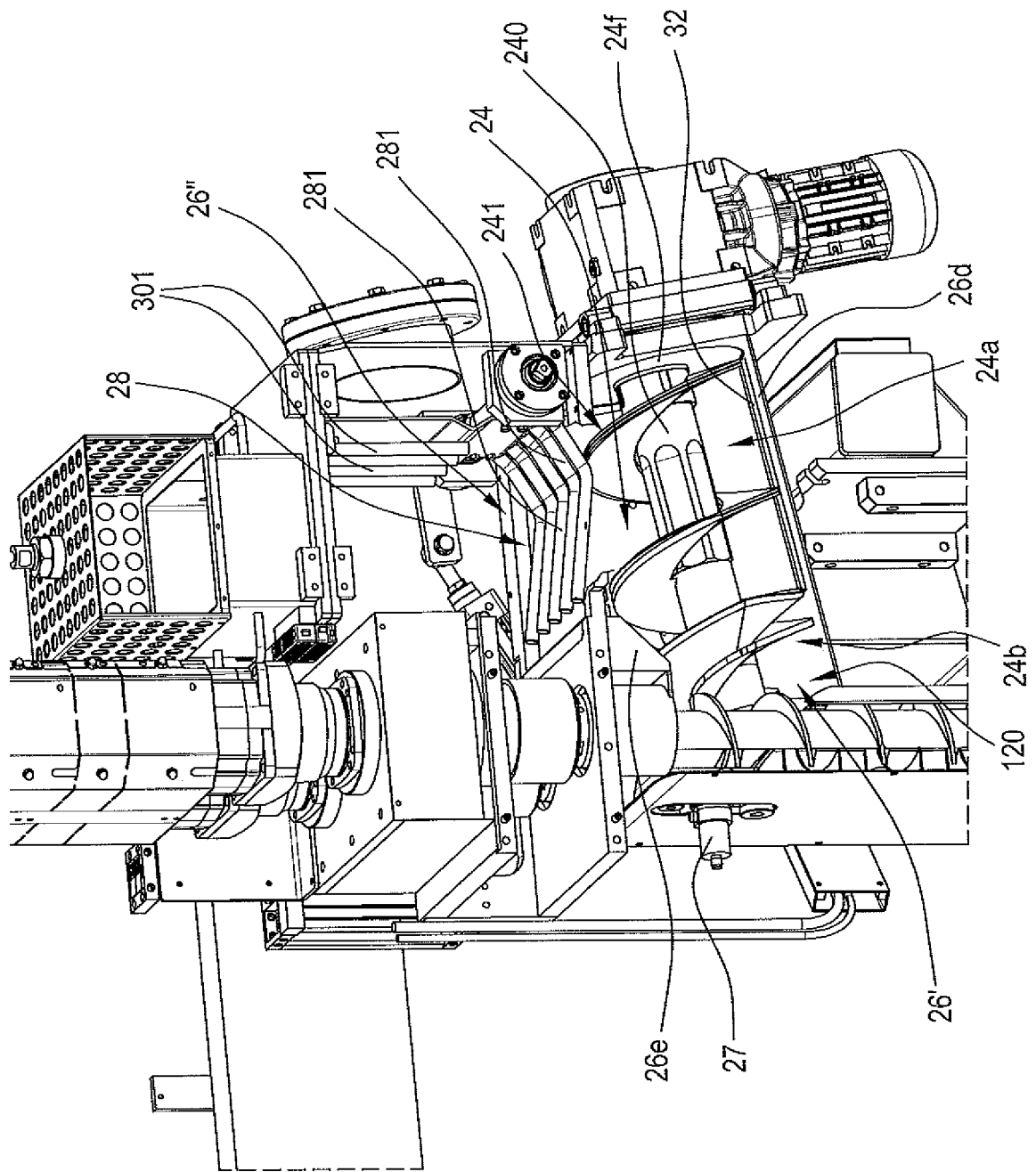
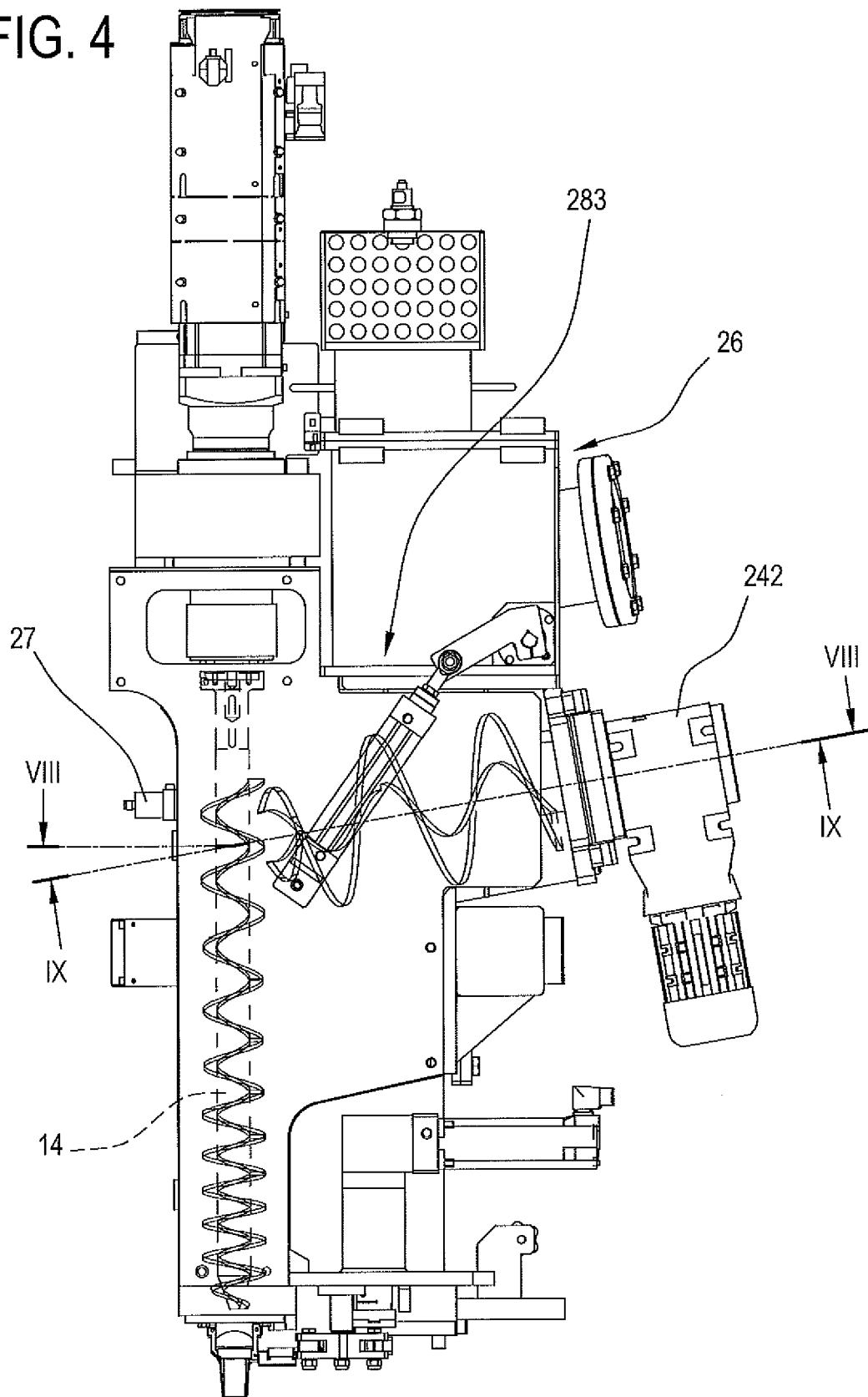


FIG. 3B

FIG. 4



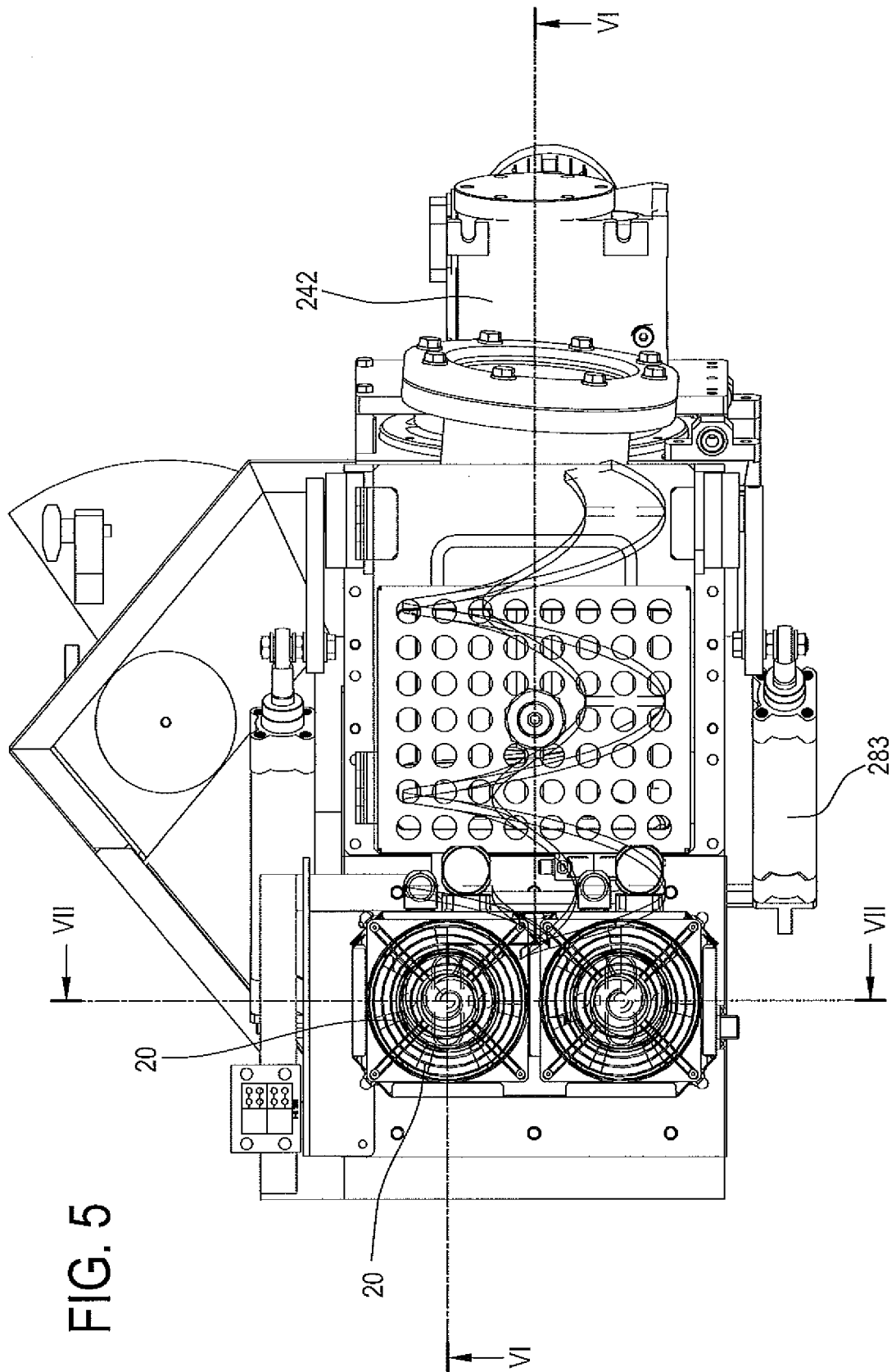


FIG. 6

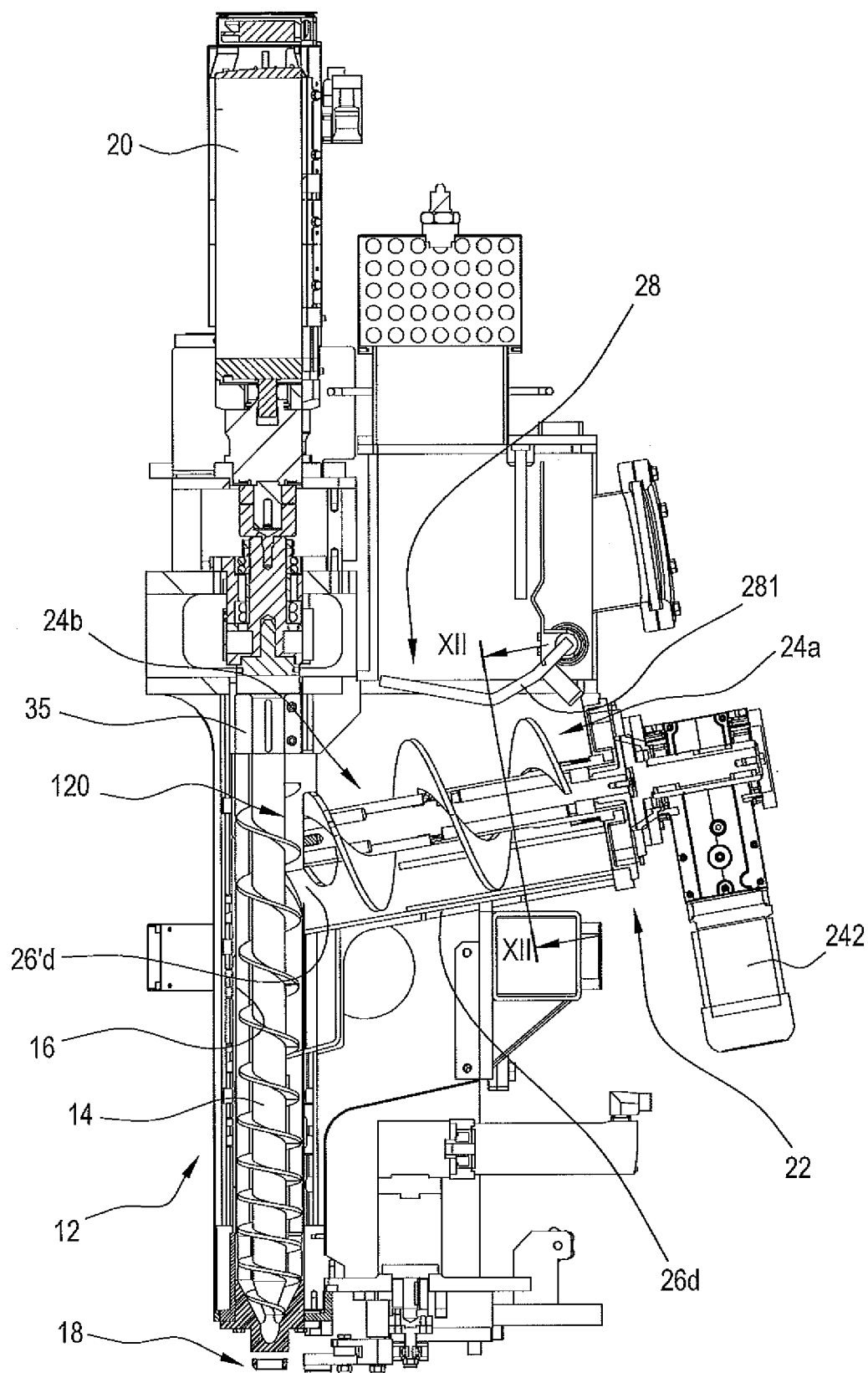


FIG. 7

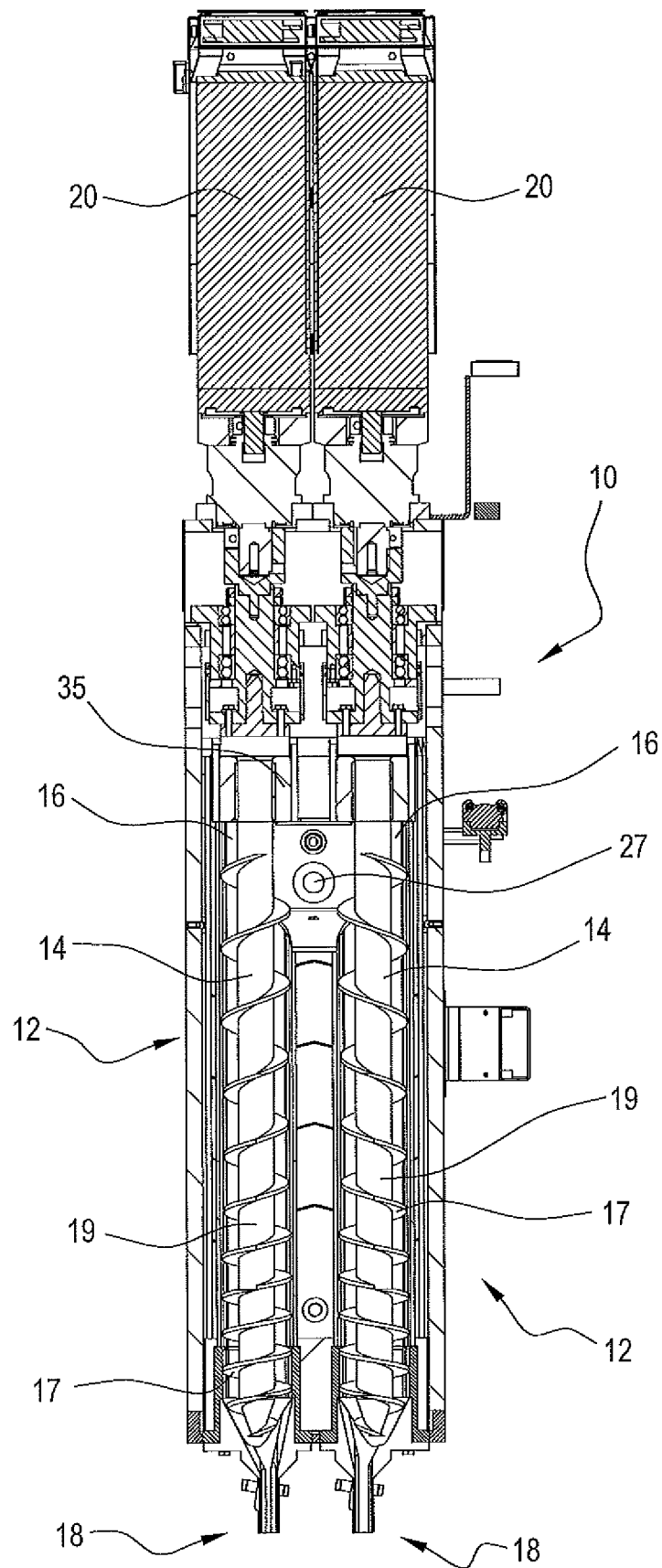


FIG. 8

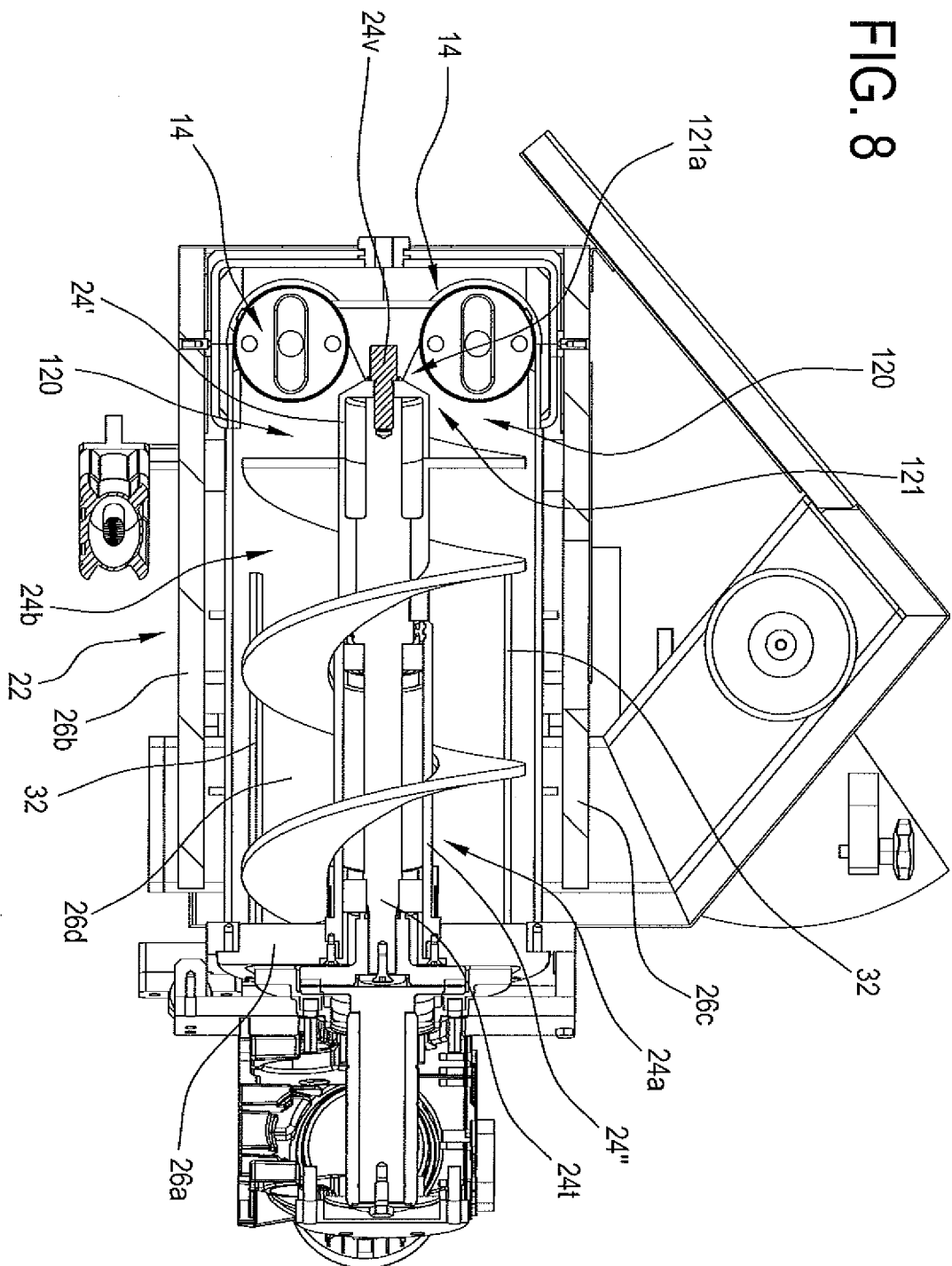


FIG. 9

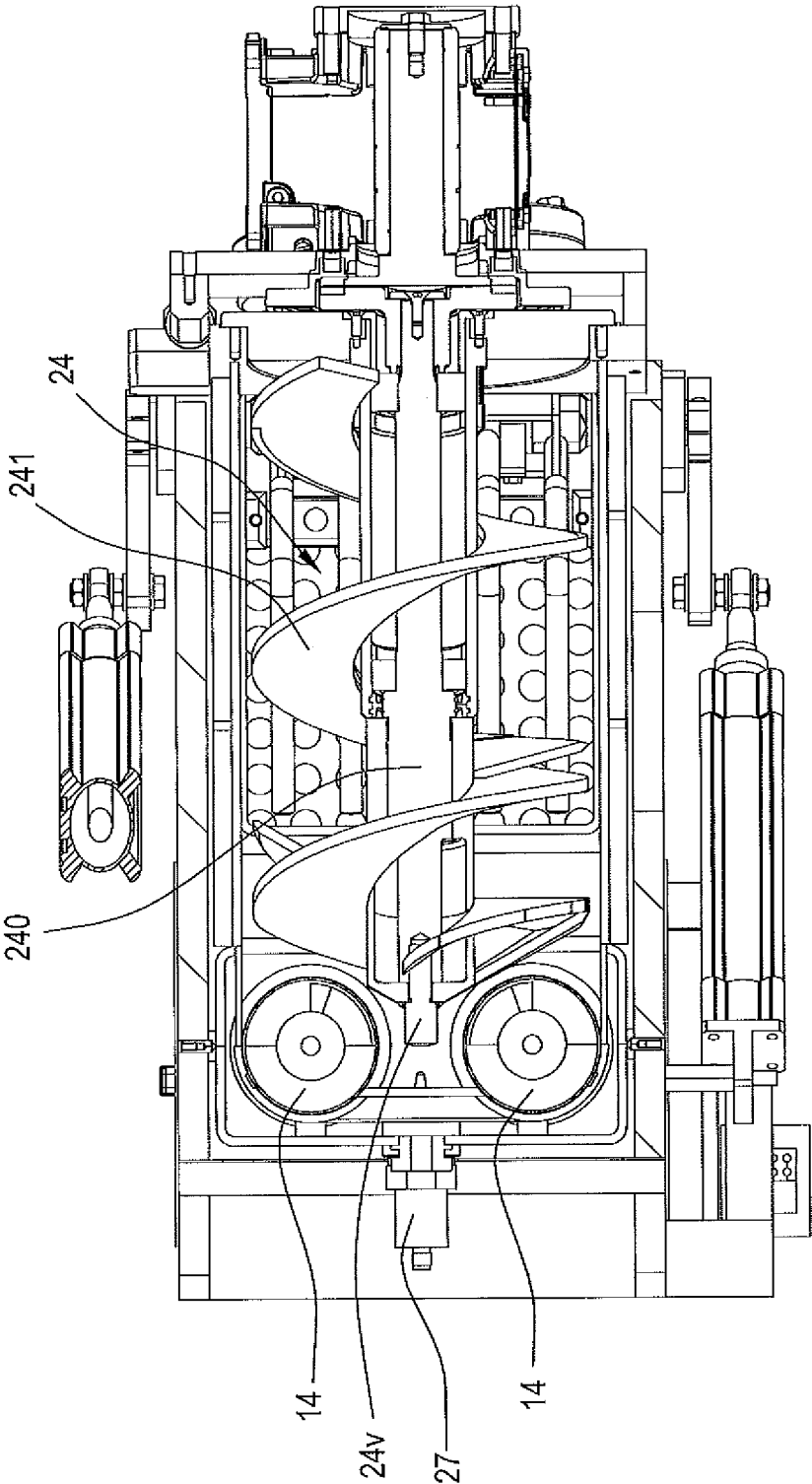


FIG. 10A

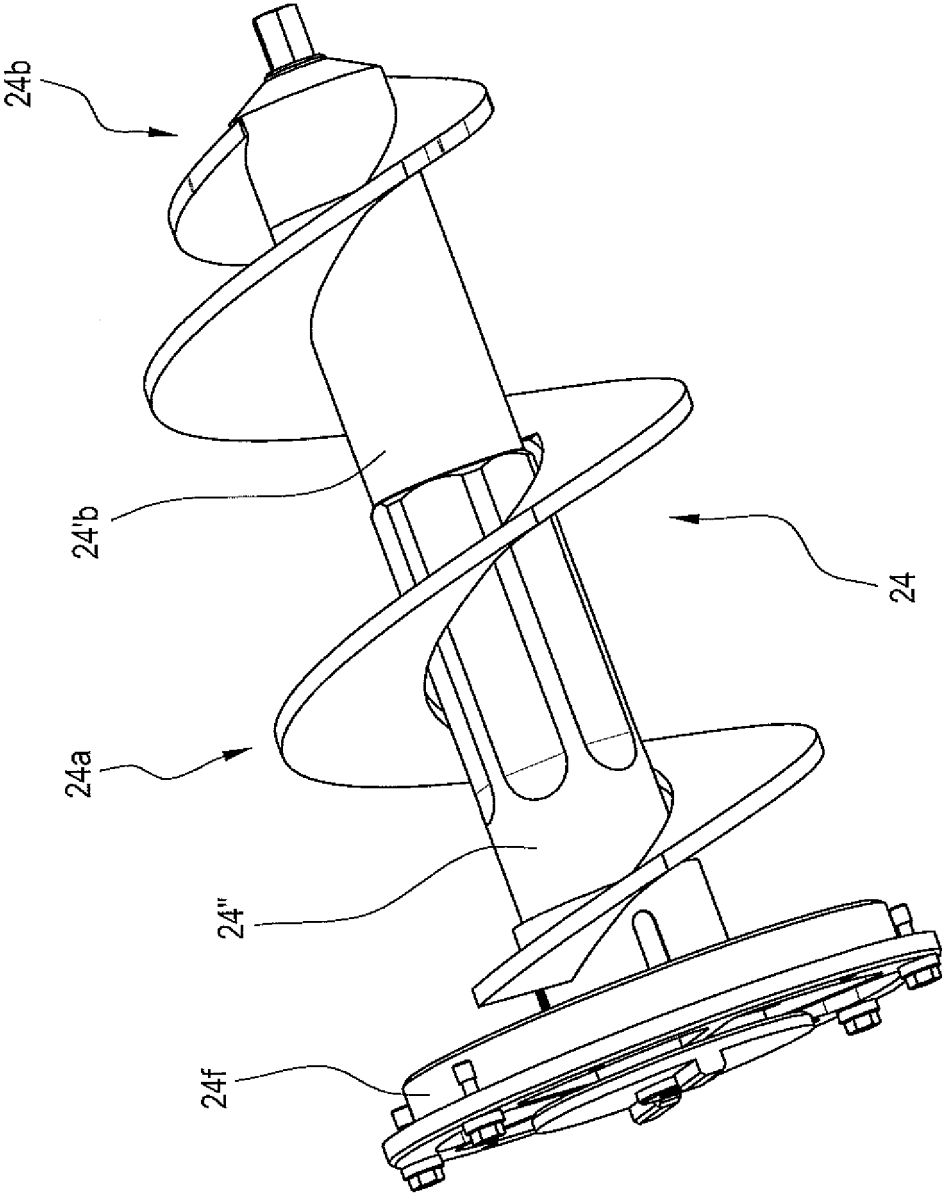


FIG. 10B

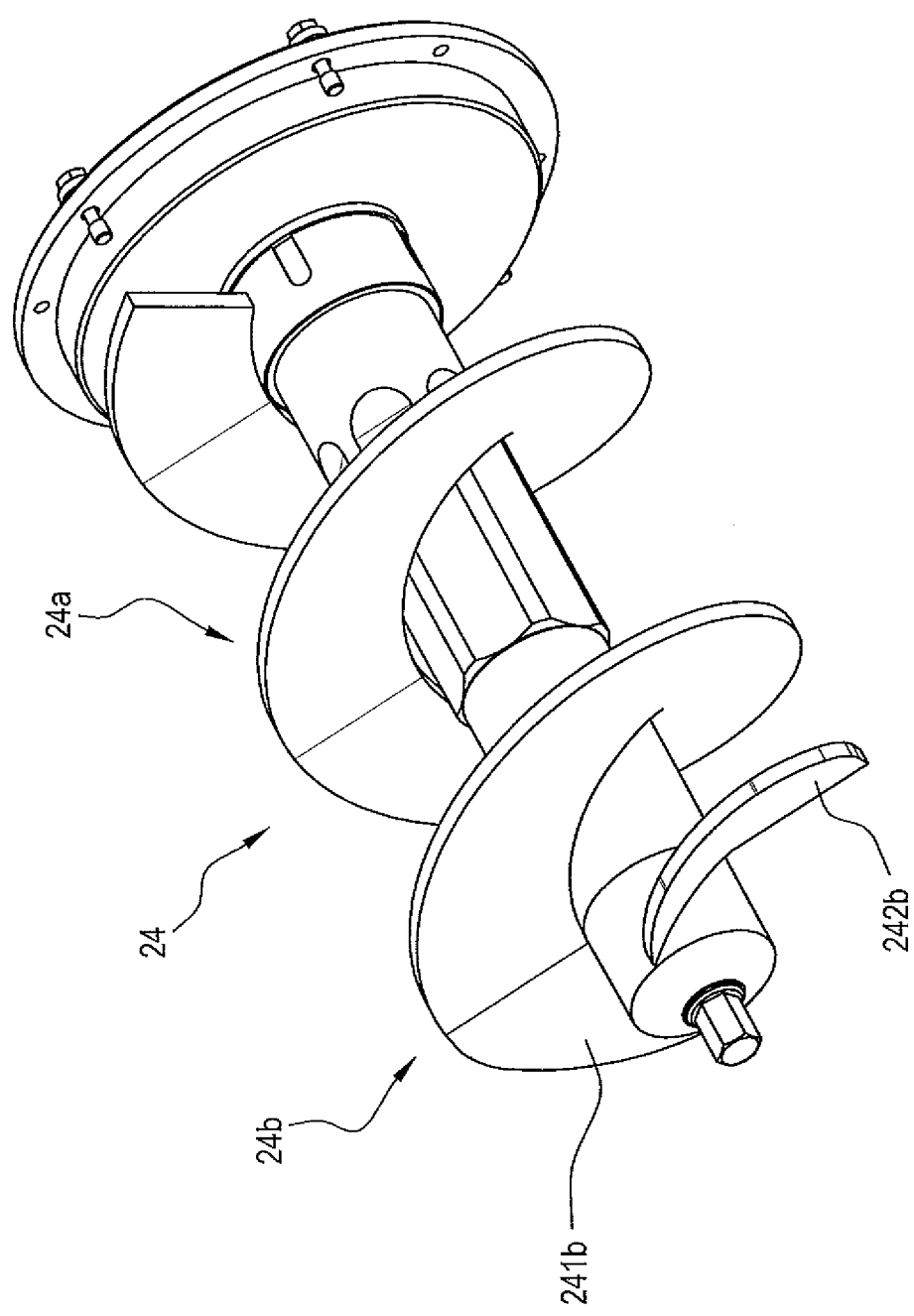


FIG. 10C

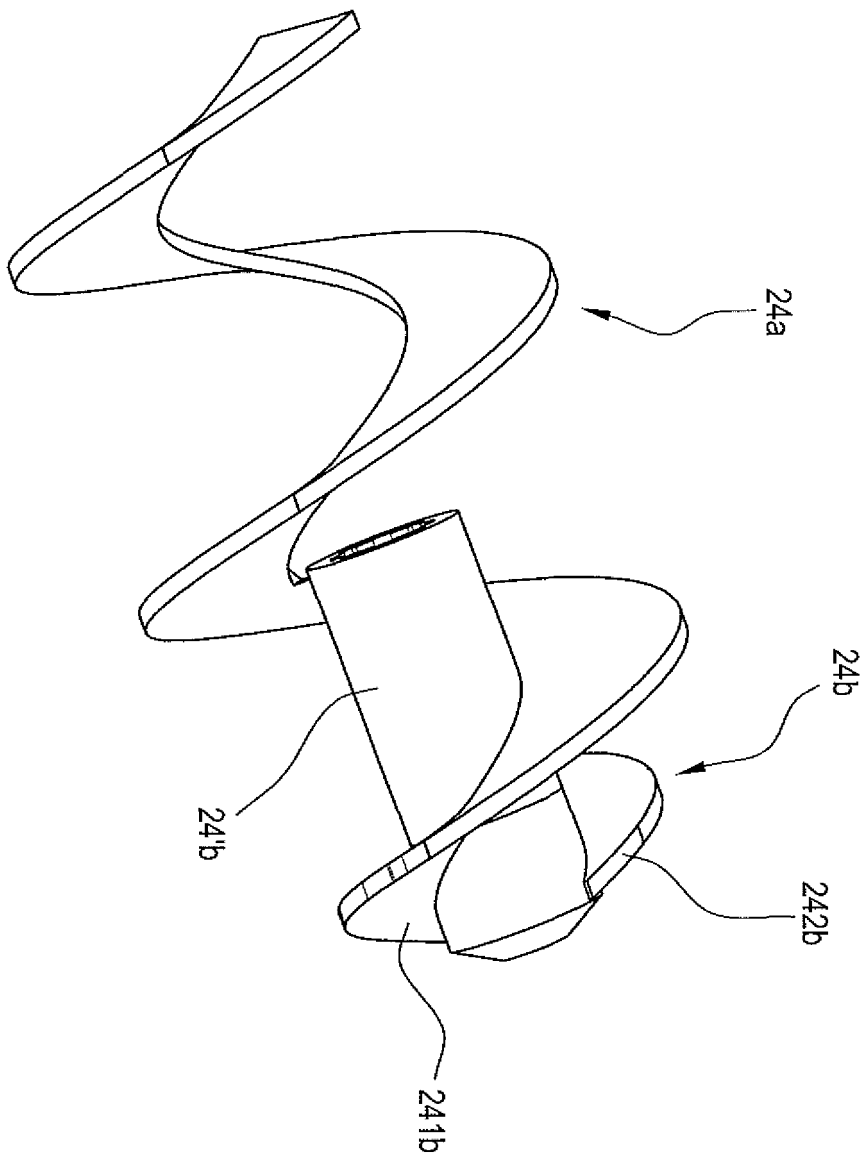


FIG. 10D

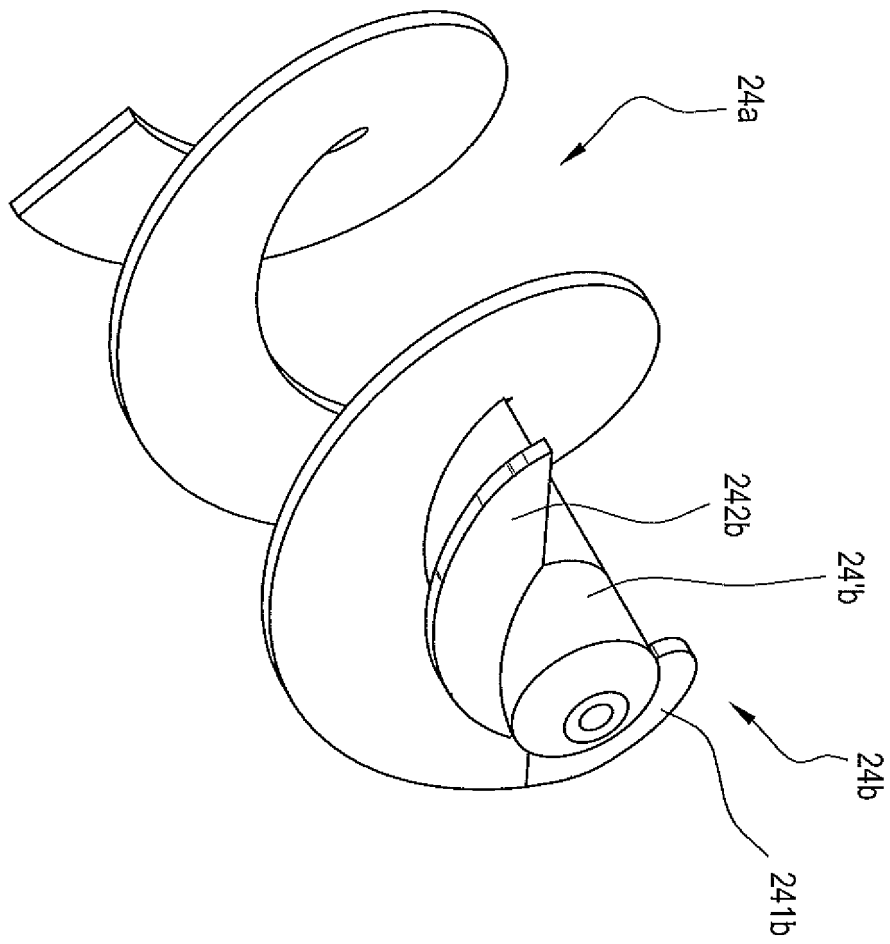


FIG. 10E

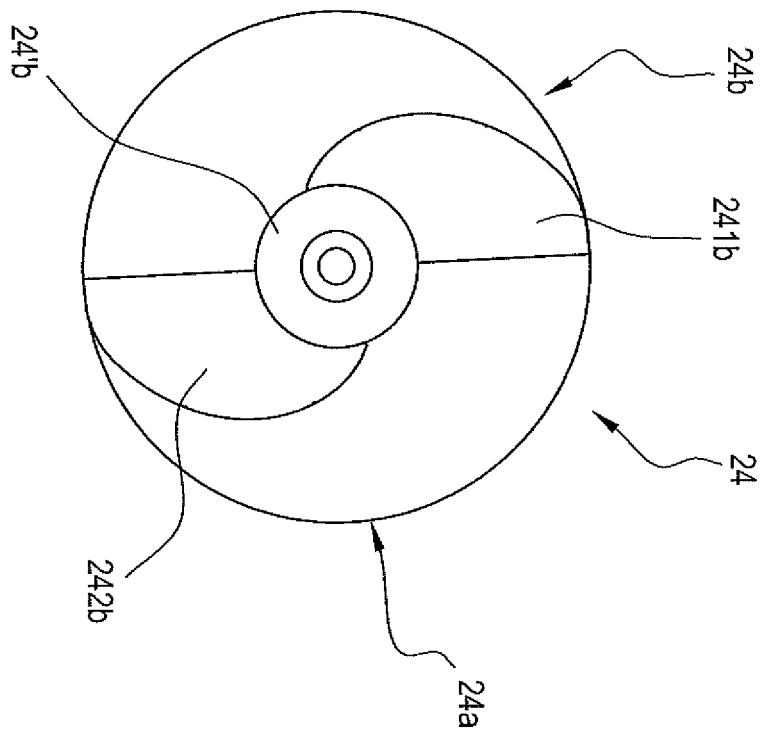


FIG. 11

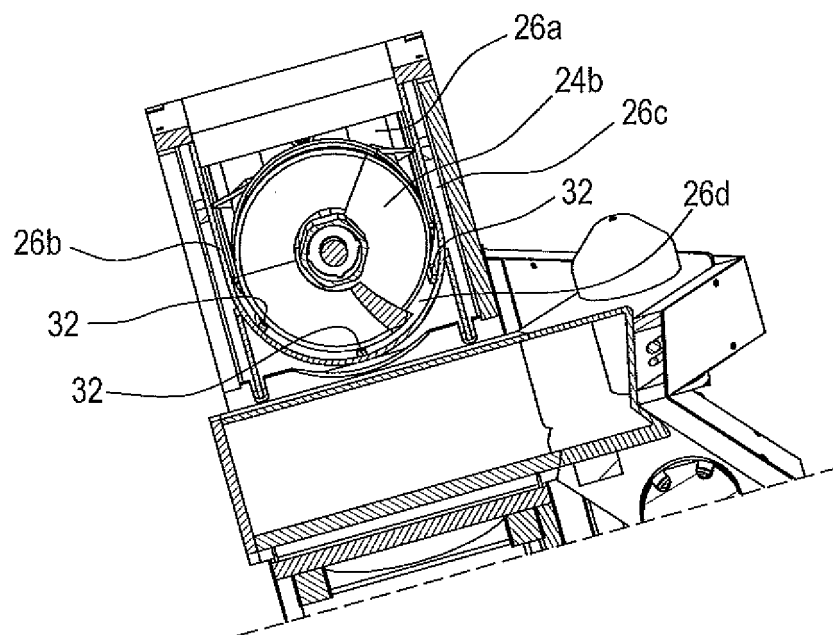


FIG. 12

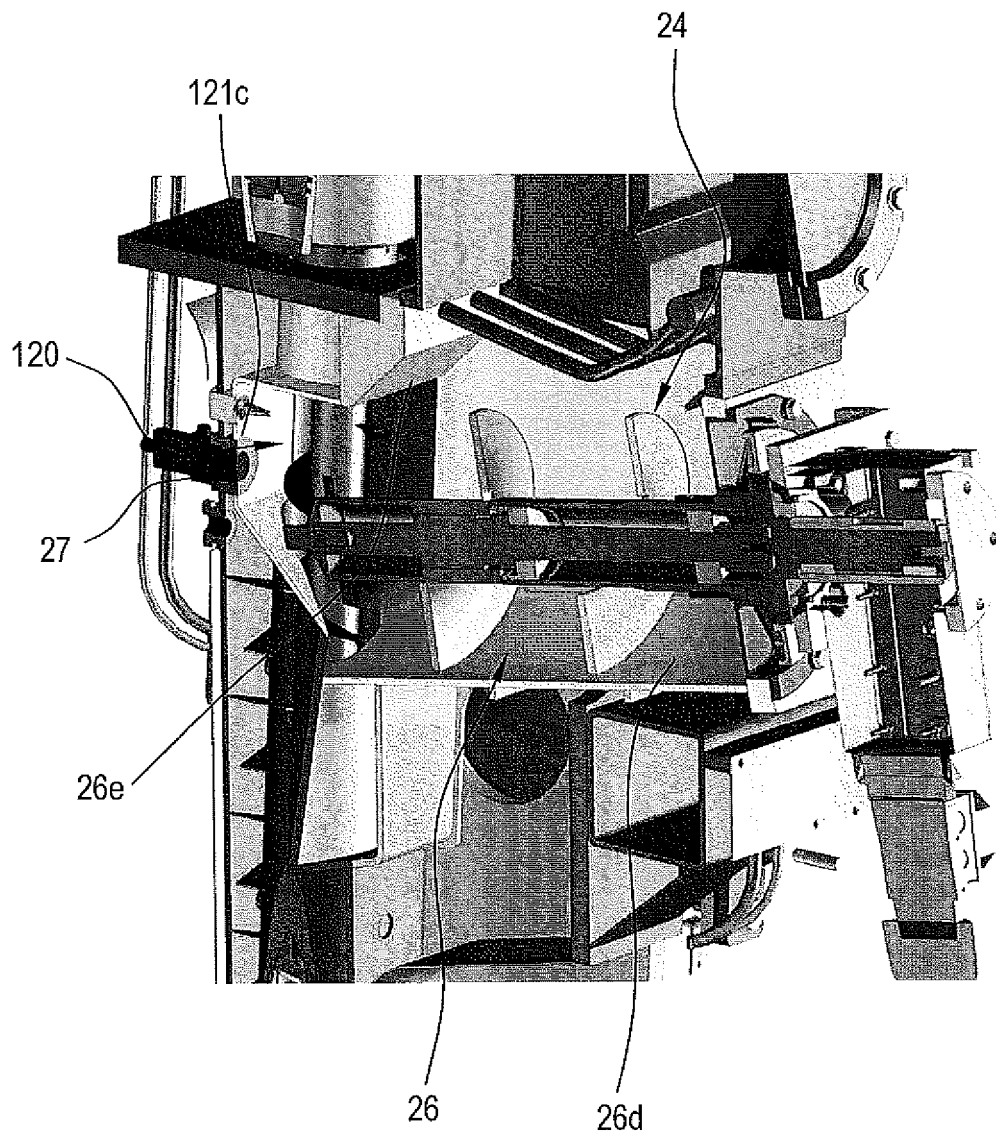
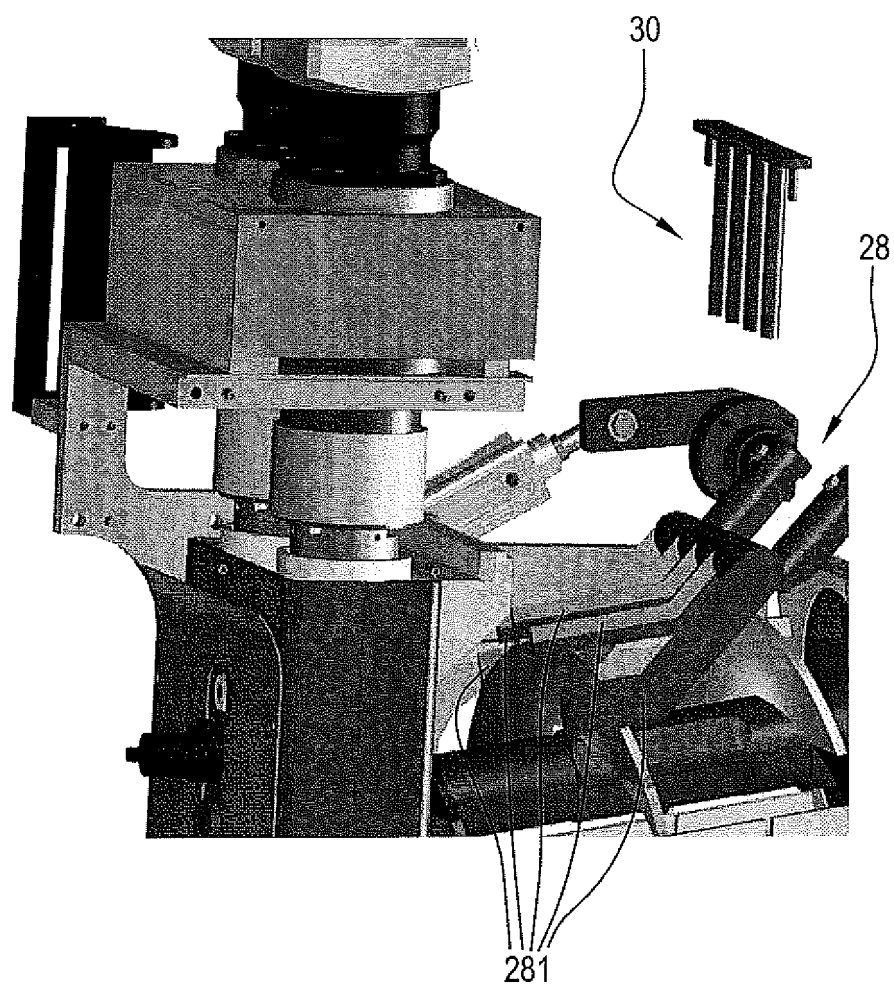


FIG. 13



REFERENCES CITED IN THE DESCRIPTION

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