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(54) Method and packaging machine for covering, with folded cover sheet, metered amounts of material fed in pasty form

(57) A rotating central member (10) brings into rotation a plurality of shaped heads (20) distributed on a circumference centred on the rotation axis A of the member (10) itself,
each shaped head (20) having an external shape corresponding to the shape of a partially folded cover wrapper (Rp); means, applied in the central member (10), meter the material and insert the metered amount within said partially folded wrapper (Rp), operating through said shaped heads (20) and first folding means fold the cover sheets during the movement of the shaped heads (20). Around the central member (10), a plurality of hollow bodies (40) is placed, integrally movable in rotation with the central member (10), opposite and coaxial with the shaped heads (20), equipped with relative motion of approaching and moving away from the respective heads (20). Each hollow body (40) has a cavity (43) open towards the respective head (20) adapted to receive the partially folded wrapper (Rp) and a metered amount of material. Second folding means complete the folding of the cover.

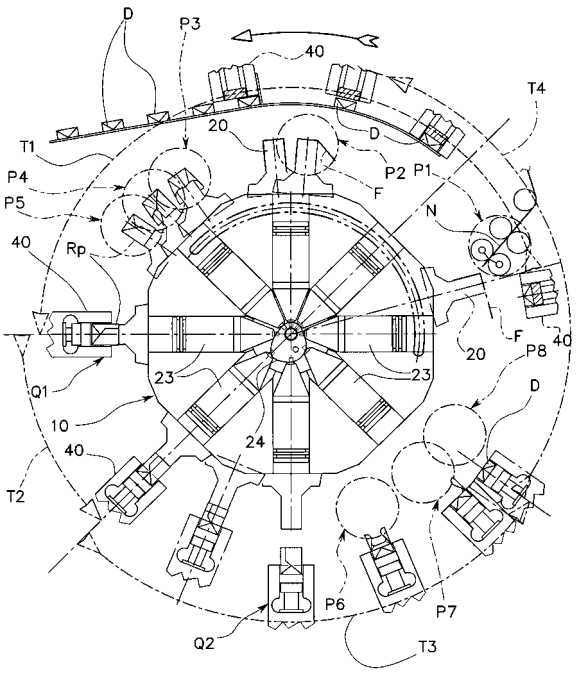
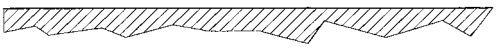


FIG.6



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Description

[0001] The present finding regards a method and packaging machine for covering metered amounts of material fed in pasty form with a cover sheet which is folded.

[0002] Typically, the invention is for packaging metered amounts of material of relatively small mass (in particular from 7-25 grams); nevertheless, the invention lends itself to also packaging amounts of greater mass, in practice up to 1 kg.

[0003] Typical applications are for packaging metered amounts of food material which is normally in pasty state: butter, margarine, soft cheese, broth cubes etc. Other applications are for other materials which can be fed into the machine in a more o or less viscous pasty state, such as soap.

[0004] The covering employed is in relatively thin or in any case folded sheets, typically tinfoil or parchment paper; other materials can also be used, for example simple paper or plastic film.

[0005] A known machine for wrapping in paper, in prismatic form, pasty material objects is illustrated in Italian patent No. 1104534 on behalf of the same present inventor. This regards a machine rotating at uniform speed which draws a single sheet at a time from a continuous belt, making a partially folded wrapper by means of first folders, and transferring said wrapper within a peripheral housing unit, to fill it with the foreseen metered material, and finally to complete the folding of the cover sheet around the metered amount.

[0006] Said machine is advantageously characterised for the fact that its main members are moved with uniform, adjustable speed, with consequent high operating speed, without considerable vibrations, with lower structural stress and consequently lower wear of the members and greater duration and overall reliability of the machine.

[0007] One object of the present invention is to improve the operating efficiency and the other advantageous characteristics of the known machine, in particular increasing its operating speed.

[0008] Another object of the invention is to make a machine capable of effectively producing packages with wrappers of various material, also material which does not spontaneously keep the folding, for example parchment paper, or plastic; this is not practically realisable with the abovementioned known machine.

[0009] Said and other objects are achieved by the finding in question as is characterised in the claims.

[0010] The machine according to the invention comprises:

a central rotating member which brings into rotation a plurality of shaped heads distributed over a circumference centred on the rotation axis of the member itself,
each shaped head having an external form corresponding with the form of a partially folded cover wrapper;
means, applied in the central member, for metering the material and inserting the amount within said partially folded wrapper, operating through said shaped heads along a first part of the rotation course of each head,
first folding means adapted to fold the cover sheets in combination with the movement of the shaped heads, to give shape to the partially folded wrapper, operating in a first part of the rotating course of the central member,
a plurality of hollow bodies, integrally movable in rotation with the movement of the central member, in equal number as well as opposite and coaxial with the shaped heads, provided with relative motion of approaching and moving away from the respective heads, in the direction of the heads' longitudinal axis, each hollow body having a cavity open towards the respective head adapted to receive the partially folded wrapper and a metered amount of material inside it;
second folded means adapted to fold the cover sheets in combination with the hollow bodies, to complete the folding of the metered amount covering, operating in a second part of the rotation course of the central member. In operation, the machine operates according to the following steps:

- wrapping each cover sheet around a shaped head following the rotation of the central member, until said partially folded wrapper is made;
- inserting a metered amount within the partially folded wrapper, this being placed within the cavity of a corresponding hollow body;
- completing the folding of the amount covering, following the rotation of the central body in a second part of the rotation course.

[0011] The invention is set forth in detail below with the aid of the attached figures which illustrate an embodiment thereof, as a non-exclusive example.

FIG. 1 shows, in simplified form, a front and vertical elevation view of the machine, with different members not illustrated and others partially sectioned.
FIG. 2 is a section of the machine along a vertical axial plane (indicated with II-II in Fig. 1).
FIG. 3 is an enlarged detail of Fig. 2, wherein the section is made in the III-III plane of Fig. 1.
FIG. 3A is another enlarged detail of Fig. 2.
FIG. 4 is a section of a shaped head and the related hollow body in the plane of trace IV-IV of Fig. 1.
FIG. 4A is a detail of Fig. 4, in a different operating step, wherein the cylindrical body 31 of the valve 30 is rotated 90 degrees with respect to the position of Fig. 4.
Figs. 5a and 5b respectively show a finished package and an only partially folded wrapper.
FIG. 6 schematically shows the functioning steps of

the machine.

FIG. 7 shows a portion of the central member 10 sectioned along a plane perpendicular to the axis A.

FIG. 7A is an enlarged detail of Fig. 7.

[0012] The machine possesses a central rotating member 10 which, according to the particular embodiment illustrated in the figures, is borne by a large main shaft 11 having a horizontal axis A, rotatably supported by a large support 131, in turn borne by a support structure 13, and driven into rotation by a motor 12. The shaft 11 projects forward from the large support 131 and bears the central member 10 on its front end.

[0013] In Fig. 1, the central member 10 rotates in the counter-clockwise direction.

[0014] The member 10 bears, on its periphery, a plurality of shaped heads 20 distributed along a circumference centred on the rotation axis A of the central organ 10.

[0015] Preferably, said shaped heads 20 are placed at equal angular distances from each other, and their own longitudinal axes B lie on a plane perpendicular to the rotation axis A of the central organ and in particular intersect said axis A.

[0016] Each shaped head 20 has an outer shape corresponding to the shape of a partially folded cover wrapper (i.e. a cover sheet on which a first series of folds has been carried out, up to forming an open recess on one side).

[0017] In the typical case in which the desired form of the wrapper to be made is parallelepiped (in Fig. 5A a typical example of finished packaged material is shown, indicated with D, which has parallelepiped form), the form of the head 20 is also a parallelepiped, as is the form of the partially folded wrapper (indicated with Rp and illustrated in figure 5b), however this is open on one side and has longer side faces which define a so-called "skirt" 9, i.e. a perimeter band which extends beyond the volume (indicated with V in Fig. 5B) which is filled with the metered amount.

[0018] In detail, the head 20 has an end portion in parallelepiped form, on which the partially folded wrapper Rp is wrapped and formed, having an end wall 22, perpendicular to the axis B, two front 207 and back 208 frontal walls, placed on planes perpendicular to the rotation axis A and two lateral walls 201 and 202 perpendicular to the other walls 22, 207 and 208.

[0019] The machine moreover comprises a plurality of hollow bodies 40 integrally movable in rotation with the central member 10, in an equal number as well opposite and coaxial with the shaped heads 20, provided with relative motion of approaching and moving away from the respective heads 20, in the direction of the heads' longitudinal axis B.

[0020] According to the embodiment illustrated in the figures, eight shaped heads 20 are foreseen (but this number can be different), distributed with equal angles along the plane perpendicular to the axis A and an equal number of hollow bodies 40 brought by the same number of arms 14 projecting both radially and axially ahead, integral with the main shaft 11.

[0021] In the central member, means are foreseen for metering the material to be inserted and for inserting the amount within said partially folded wrapper Rp, operating through said shaped heads 20 along a first part of the rotation course of each head 20.

[0022] These metering means comprise a plurality of cylindrical compression chambers 21, made within the central member, coaxial with the shaped heads 20 and communicating with these; the shaped heads 20 are hollow and open towards the respective chambers 21 and have an end wall 22, perpendicular to the axis B, provided with a series of exit through holes 22a. Inside the chambers 21, thrust means are placed consisting of pistons 23 sliding for the length of the chambers 21, adapted to push the material placed in the chamber itself outside the head 20 through said exit holes 22a.

[0023] In each compression chamber 21, a respective movable piston 23 is placed with alternating course along the axis B of the chamber 21 itself; the piston 23 is driven by means of a fixed cam 24 coaxial with the axis A, adapted to sequentially drive all of the pistons 23 in a manner correlated to their angular position, in the general rotation plane of the central member 10.

[0024] In detail, the cam 24 is formed by an eccentric cylinder, whose side surface comes into contact with an idle roller 26a borne by an inner end appendage of each connecting rod-member 26 which drives a respective piston 23. The cam A is fixed to the end of a stem 17, coaxial with A, borne by a front support 13a fixed to the structure 13, which is vertically elevated from below before the central member 10.

[0025] Along the axis A, in addition to the fixed cam 24, general adjustment means are placed adapted to adjust the position of the bottom dead centre in the course of the pistons 23 in order to determine the supplied metered amount. Said means comprises a body 25, having a conical surface 25a, coaxial with A, adapted for abutting with an inner end appendage 26b of each connecting rod 26.

[0026] The body 25 is borne at the end of a shaft 15 placed within an axial cavity made in the main rotating shaft 11.

[0027] In the rotation of the central member 10, when the piston 23 is brought to the bottom dead centre (i.e. the closest point to the axis A), the respective end appendage 26b stops the course, since it comes into contact with the conical surface 25a while its idle roller 26 does not reach the contact with the cam 24; when instead the roller encounters the surface of the cam 24, the piston is pushed towards the top dead centre and the end appendage 26b is spaced from the conical surface 25a.

[0028] The axial position of the body 25 is adjustable (rotating the inner shaft 15 with respect to the main shaft 11) so to vary the position of the bottom dead centre of the pistons 23.

[0029] At the lower base of each shaped head 20, a valve 30 is placed, adapted to intercept the passage of the material coming from the compression chamber 21 and directed toward the cavity 20a of the hollow body 20. In detail, said valve 30 comprises a cylindrical body 31 inserted perfectly in a cylindrical seat 32, with axis parallel to the axis A, made in the base 20b of each head 20 having a longitudinal through slit 33 for the passage of the material. Rotating the body 31 90 degrees in one direction or the other respectively opens or closes the communication between the two chambers 21 and 20a; this rotation is for example produced by foreseeing an idle roller 34, applied to the body 31 in an eccentric manner with respect to its axis and driven by a fixed cam 35 centred on the axis A.

[0030] The material to be packaged is fed to the central member 10, in fluid state and with a sufficient pressure. The material arrives at a fixed distributor member 27 having the form of a plate provided with a flat surface placed adhering and with sliding seal on an external radial surface 10a (perpendicular to the axis A), made on the rotating member 10. The material is fed to an inlet 27a and from here runs along a distribution channel 27b which extends along an arc centred on the axis A for a specific angle. The channel 27b is made in a cavity in the thickness of the plate 27 and is closed by the radial surface 10a adhering and sliding against the plate 27. Each compression chamber 21 has an inlet through hole 21a, adapted to slide along the channel 27b, placed in the zone of the chamber 21, which is axially external with respect to the position of the piston 23. Sliding along the channel 27b (in the first part of the rotation tract indicated with T1 in Fig. 6), the chamber 21 receives from this the material under pressure, which fills the chamber itself and pushes the piston 23 towards the bottom dead centre. In the rotation tract (indicated with T2 in Fig. 6) wherein the piston is subsequently pushed by the cam 24 towards the top dead centre, the same piston pushes the material through the cavity 20a of the shaped head 20 and outside the head 20 through the exit holes 22a.

[0031] The shaped heads 20 comprise suction surfaces connected to suction channels, in turn connected with air suction sources, adapted to attract the foldable cover sheet, still in belt form N and then in sheet form F separated from the belt (Fig. 6).

[0032] According to the embodiment illustrated in the figures (see figures 3 and 7A), said suction surfaces are defined by the side walls 201 and 202 of the head 20, respectively front and rear with respect to the running direction; each of such walls is provided with different thin through holes and is associated with an inner air space 203 made inside the head 20 and isolated with respect to the cavity 20a which is in central position. The two air spaces 203 are in communication, by means of channels 204, with two respective distribution channels 28a and 28b, which extend along an arc centred on the axis A for a specific angle (Fig. 7). The channels 28a and 28b are both made in a second distributor member 28, which is fixed, having annular plate form provided with a flat surface placed adhering and with sliding seal on an external radial surface 10b perpendicular to the axis A, made on the rotating member 10, placed on the opposite side with respect to the surface 10a. The channels 28a and 28b are made in a cavity in the thickness of the plate 28 and are closed by the radial surface 10b adhering and sliding against the plate 28. Each channelling 204 communicates, by means of a respective through hole 205, with a respective channel 28a, 28b. The channels 28a and 28b are in turn connected with respective suction members, which place in them in reduced pressure. Preferably, the channels 28a and 28b are made in several segments isolated from each other, each connected to an independent suction member (see Fig. 7).

[0033] Behind the central member 10, a large, flat and circular support 16 is placed, fixed to the structure 13, centred on the axis A, in the form of a large disc placed on a plane perpendicular to the axis A.

[0034] The support 16 bears a plurality of first folding means placed in the positions P2 - P5 (illustrated only schematically in figures 1 - 6) of *per sé* known type, distributed along the course of the shaped heads 20, adapted to fold the cover sheet F dragged by the shaped head 20, in combination with the movement of the head itself, operating in a first part T1 of the rotation course of the head.

[0035] In operation, the main shaft 11 and with it the central member 10 and the hollow bodies 40 rotate with uniform speed (in counter-clockwise direction in the front views) .

The first part of the machine operation occurs in the following manner.

[0036] In the position P1, at the initial end of the distribution channel 28a connected to the front suction wall 201, the arrival point of the end of a belt N of cover material is placed exiting from a reel (not illustrated). This end is arranged so to be brushed against the front side wall 201 of each head 20 when it passes the position P1, and coming into contact with the wall 201 it is attracted to this and kept adherent due to the suction produced by the reduced pressure present in the channel 28a.

[0037] Continuing in the rotation, the head 20 separates by tearing a belt N segment which has been precut (by means of known type, not illustrated in the figures), the segment defining a sheet F of cover material.

[0038] In the rotation, the head 20 drags with it the sheet F adhering to the wall 201, which in the subsequent position P2 undergoes (by known means and illustrated only schematically in the figures) the folding of its rear border, which is brought to adhere also to the end wall 22 and to the rear side wall 202.

[0039] Continuing further in the rotation, the head 20 passes through three further positions, P3, P4 and P5, placed in succession near each other, where the cover sheet is first centrally and laterally folded on the two fron-

tal walls 207 and 208, such to adhere also to these two walls: the result is that said partially folded wrapper Rp is obtained wrapped around the head 20 (illustrated in Fig. 5B), which has the form of a parallelepiped wrapper open on one face.

[0040] Subsequently, as illustrated below, a metered amount is inserted within the partially folded wrapper Rp, this being placed within the cavity 43 of a corresponding hollow body 40.

[0041] Continuing in the detailed description of the machine, each hollow body 40 is borne by a guide means 41, fixed to the free end of a respective arm 14, which defines a radial track parallel to the longitudinal axis B of a respective head 20. In detail, the hollow body 40 is fixed to a sliding block 41a bound to a respective guide means 41 with the possibility of moving along the track and is arranged with its own longitudinal axis coinciding with the axis B of the respective head 20.

[0042] The position of the hollow body 40 along the track of the means 41 is determined by a fixed cam 42 borne by the support structure 13, which runs along the annular zone defined by the course of the guides 41 and surrounds the central member for an angle of 360 degrees, along which the cam engages idle roller 42a borne by each sliding block 41a.

[0043] Each hollow body 40 possesses a cavity 43, open on the side turned towards the respective head 20, shaped like the shaped head 20, adapted to perfectly receive the partially folded wrapper Rp and the end of the same head 20 and a metered amount of material inside the wrapper Rp.

[0044] The cavity 43 is defined by side walls 44 parallel to the axis B, which defines a prismatic corridor within which a movable bottom plate 46 slides in the B direction, perpendicular to the axis B, which defines the transverse surface inside the cavity itself, adapted to adhere to the end wall 22 of the head 20. The bottom plate 46 is fixed to the inner end of a stem 47, coaxial with the axis B and sliding in the direction of its own axis. The outer end of the stem 47 bears an idle roller 48a which is engaged with a fixed cam 48. Analogous to the fixed cam 42, the cam 48 also slides along the annular zone defined by the course of the guides 41 and surrounds the central member 10 for a 360 degrees angle, along which the cam engages the idle rollers 48a of the various hollow bodies 40, in a manner correlated to the angular position of these in the general rotation plane of the central member.

[0045] Said plate 46 is movable along the cavity 43 of the hollow body in the longitudinal direction, between a position wherein the partially folded wrapper Rp and the metered amount are completely contained within the cavity 43 and a position such to eject both of them from the cavity itself.

[0046] The plate 46 is perforated with thin holes and is in contact with a rear chamber 49 connected with air suction sources; therefore, the surface of the plate defines a suction surface adapted to attract the partially folded wrapper Rp to it.

[0047] In the second part of the machine operation, after the sheet F has been transformed into a partially folded wrapper Rp around a respective shaped head 20, following the rotation of the head 20, the respective hollow body 40 is brought closer to the head 20 due to the action of the cam 42, until it penetrates this and the partial wrapper Rp within the cavity 43. The zone wherein the head 20 penetrates most in the hollow body 40 is indicated with Q1 in Fig. 6.

[0048] In this position, the partial wrapper Rp is attracted, adhering to the plate 46 also by the suction action produced by the plate itself.

[0049] At this point, along a section of the rotation course of the head 20 indicated with T2, the material to be packaged (after the valve 30 was brought into "open" position) is inserted in metered manner through the perforated wall 22, within the partial wrapper Rp placed within the cavity 43; this occurs due to the movement of the piston 23 towards the top dead centre, produced by the cam 24; at the same time as the injection of the metered amount, the hollow body 40 and integrally with it the plate 46 are moved away (in the direction of the axis B) from the head 20 such that, while the metered material enters in the partial wrapper Rp, this is kept adherent against the plate 46, in addition to against the side walls 44. At the end of the metered amount injection, the preset quantity of material is found inside the partial wrapper Rp, which in turn is found inside the cavity 43. Only the side walls of the partial wrapper Rp still adhering to the side and frontal faces of the head 20 (which define said skirt 9) remain outside the cavity 43. Moreover, at the end of the injection of the metered amount, the valve 30 is brought into closed position.

[0050] Subsequently, the rotation of the head 20 continuing, the hollow body 40 and with it the plate 46 are further removed from the head 20 and since they are capable of holding the partial wrapper Rp and the metered amount within the cavity 43 (above all due to the suction action of the plate 46), there is the separation of the head 20 from the wall 22. This is moreover unthreaded from the entire skirt 9 of the partial wrapper Rp (Q2 zone).

[0051] In the subsequent tract T3 of the shaft rotation 11, along the course of the hollow body 40, second folding means are foreseen adapted to fold the partially folded covering sheets in combination with the hollow bodies 40, in order to complete the folding of the metered amount covering. Said second folding means are placed in positions P6 - P8 (illustrated only schematically in figures 1 and 6) of *per sé* known type, which are borne by the support 16, distributed along a second part of the rotation course of the hollow bodies 40, and are adapted to fold the remaining part of the partial wrapper Rp dragged by the hollow body 40, in combination with its movement.

[0052] In the position P6, downstream of the zone Q2, the partial wrapper Rp undergoes the central fold of the skirt 9 and subsequently, in the position P7, undergoes the first side folding, and finally, in the position P8 it un-

dergoes the final folding which determines the complete closure of the covering and the definition of the finished package (indicated with D in the figures).

[0053] Finally, the finished package D is brought by the respective hollow body 40 onto a fixed upper slide track 60 placed above the zone where the first folder means are placed; when it reaches this point, the suction action of the plate 46 ceases and the package D, by means of relative movement between the plate 46 and the hollow body 40, is ejected from the hollow body 40 and released onto the track 60, along which it is pushed to the clearing point.

[0054] In summary (as illustrated in figure 6), in operation, each head 20 together with the related hollow body 40 produces the packaging of a metered amount of material in the course of a complete rotation turn. In the first tract T1 of the course (slightly less than 180 degrees long), there is the folding of the sheet F until the partial wrapper Rp is formed, and the insertion of the wrapper in the hollow body 40. In the first part of this same tract, sliding the compression chamber 21 along the channel 27b, material is introduced in the fluid state within the chamber itself, which causes the piston 23 to move back to the bottom dead centre.

[0055] In the subsequent tract T2, the piston 23, driven by the cam 24, injects a metered amount of material within the partial wrapper Rp placed within the cavity 43.

[0056] In the subsequent third tract T3, the partial wrapper Rp, filled with a metered amount of material, remains partially inside the cavity 43 and undergoes the completion of the folding while it is brought around by the hollow body 40. In this step, the shaped head 20 is ineffective.

[0057] In the fourth tract T4, which overlaps the beginning of the first tract T1, the hollow body 40 brings the finished package D above the downloading slide 60 and releases it thereon.

[0058] The entire machine functions with uniform rotation and relatively gentle radial movements. There is thus the possibility to operate with high speed, lack of considerable vibrations, lower structural stress and consequently lower wear to the members, greater duration and general reliability of the machine.

[0059] An experimental prototype of the machine was capable of operating at the pace of about 600 packages per minute, with packages of about 15 grams.

[0060] Moreover, due to the fact that immediately after the forming of the partial wrapper Rp, this is introduced within the hollow body 40 which keeps it bound, there is the possibility to use cover sheets which intrinsically tend not to maintain the folding, as is the case with parchment paper and plastic paper.

[0061] Of course, numerous modification of practical-applicative nature can be made to the invention in question, without departing from the scope of the inventive idea as claimed below.

Claims

1. Packaging machine for covering, with folded cover sheets, metered amounts of material fed in pasty state **characterised in that** it comprises
a rotating central member (10) which brings into rotation
a plurality of shaped heads (20) distributed on a circumference centred on the rotation axis A of the member (10) itself,
each shaped head (20) having an external shape corresponding with the shape of a partially folded cover wrapper (Rp);
means, applied in the central member (10), for metering the material and for inserting the metered amount within said partially folded wrapper (Rp), operating through said shaped heads (20) along the rotation course of each head (20),
first folding means adapted to fold the cover sheets in combination with the movement of the shaped heads (20), to give shape to the partially folded wrapper (Rp), operating in a first part of the rotation course of the central member (10),
a plurality of hollow bodies (40), integrally movable in rotation with the central member (10), in equal number to, as well as opposite and coaxial with the shaped heads (20), equipped with relative motion of approaching and moving away from the respective heads (20) in the direction of the heads' longitudinal axis,
each hollow body (40) having a cavity (43) open towards the respective head (20) adapted to receive the partially folded wrapper (Rp) and a metered amount of material at its own interior;
second folding means adapted to fold the cover sheets in combination with the hollow bodies (40), in order to complete the folding of the metered amount cover, operating in a second part of the rotation course.

2. Machine according to claim 1, **characterised in that** said shaped heads (20) are distributed with their longitudinal axes B placed on a plane perpendicular to the rotation axis (A) of the central member (10).

3. Machine according to claim 1, **characterised in that**, in order to meter the material, the central member (10) comprises a plurality of cylindrical compression chambers (21), coaxial with the shaped heads (20) and communicating with these; the shaped heads (20) being hollow and open towards the respective chambers (21) and each having an end wall (22) perpendicular to the axis (B) of the chamber itself, provided with a series of exit through holes (22a); there being provided, inside the chambers (21), thrust means (23) sliding for the length of the chambers (21), adapted to push the material placed in the chamber itself outside the head (20) through

said exit holes (22a).

4. Machine according to claim 3, **characterised in that** said thrust means (23) are driven by means of cam means (24) adapted to sequentially drive all thrust means (23) in a manner correlated to their angular position in the general rotation plane of the central member (10).

5. Machine according to claim 3, **characterised in that** said thrust means (23) comprise, for each compression chamber (21), a respective thrust piston (23) movable with alternating movement along the axis (B) of the chamber, and comprises, along the axis (A) of the central member (10), general adjustment means (15, 25) adapted to adjust the position of the bottom dead centre in the movement of the thrust means (23) in order to determine the supplied metered amount.

6. Machine according to claim 1, **characterised in that** said shaped heads (20) comprise suction surfaces (201, 202) connected to suction channels (28a, 28b) in turn connected with air suction sources, adapted to attract the foldable sheet.

7. Machine according to claim 6, **characterised in that** said first folding means (P2 - P5) are placed along the course of the shaped heads (20), and are adapted to fold the cover sheet (F) dragged by the shaped head (20), in combination with the movement of the head (20) itself.

8. Machine according to claim 1, **characterised in that** the shape of the cavity (43) of the hollow bodies (40) is such to substantially perfectly receive the end of the corresponding shaped head (20).

9. Machine according to claim 8, **characterised in that** each hollow body (40) comprises a movable plate (46) placed in the cavity (43) of the hollow body (40) itself, adapted to define the transverse and inner surface of the cavity itself (43).

10. Machine according to claim 9, **characterised in that** said plate (46) is movable along the cavity (43) in the longitudinal direction and comprises means adapted to move the plate (46) between a position wherein the partially folded wrapper (Rp) and the metered amount are contained completely within the cavity (43), and a position such to eject the metered amount from the cavity (43).

11. Machine according to claim 10, **characterised in that** said means for moving the plates (46) are driven by means of sequential cam means (48) and in a manner correlated to their angular position in the general rotation plane of the central member (10).

12. Machine according to claim 9, **characterised in that** said plate (46) is perforated with thin holes connected to air suction sources in order to define a suction surface adapted to attract the partially folded cover wrapper (Rp) to it.

13. Method for covering, with folded cover sheet, metered amounts of material fed in pasty state by means of a packaging machine, **characterised in that** it comprises:

- the packaging machine having a central rotating member (10) which bears a plurality of shaped heads (20) distributed on a circumference centred on the rotation axis A of the central member (10),
- each shaped head (20) having an external shape corresponding with the shape of a partially folded wrapper (Rp),
- and having a plurality of hollow bodies (40), integrally movable in rotation with the movement of the central member (10), in equal number to, as well as opposite and coaxial with the shaped heads (20), provided with relative motion of approaching and moving away from the respective heads (20), each hollow body (40) having a cavity (43) adapted to receive the partially folded wrapper (Rp) and a metered amount of material inside this;
- wrapping each cover sheet around a shaped head (20) following the rotation of the central member (10), until it makes said partially folded wrapper (Rp);
- inserting a metered amount within the partially folded wrapper (Rp), this being placed within the cavity (43) of a corresponding hollow body (40);
completing the folding of the cover (Rp) of the metered amounts, following the rotation of the central member (10).

14. Method according to claim 13, **characterised in that**, after the insertion of the metered amount within the partially folded wrapper (Rp) placed within the cavity (43) of a hollow body (40), the partially folded wrapper (Rp) is removed from the respective shaped head (20), and by means of suction action holds within it the metered amount, causing its separation from the shaped head (20).

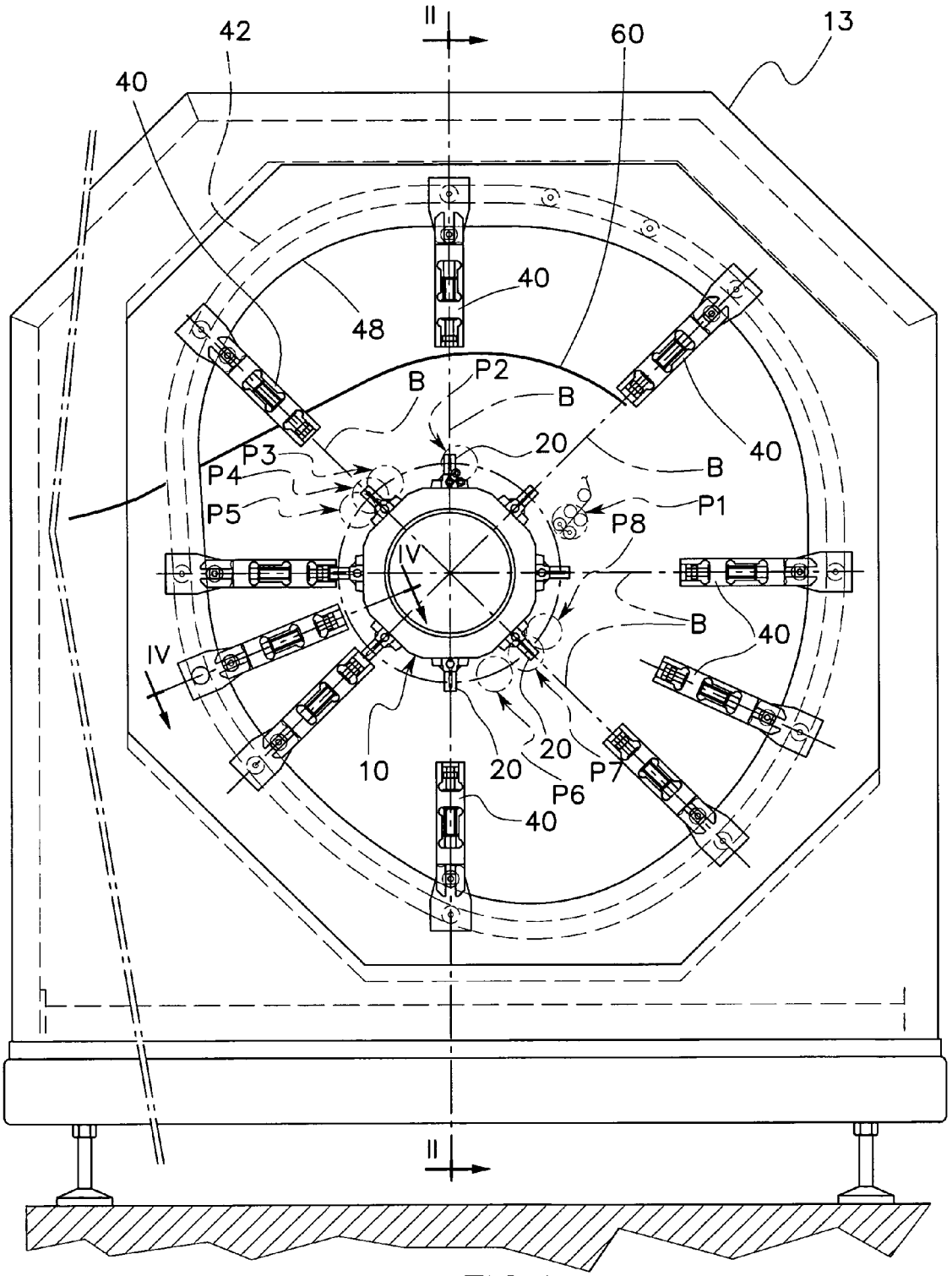

II
42
60
13
40
48
40
B
P2
B
20
40
P3
P4
P5
B
P1
P8
IV
B
40
IV
10
20
20
P7
P6
40
II

FIG.1

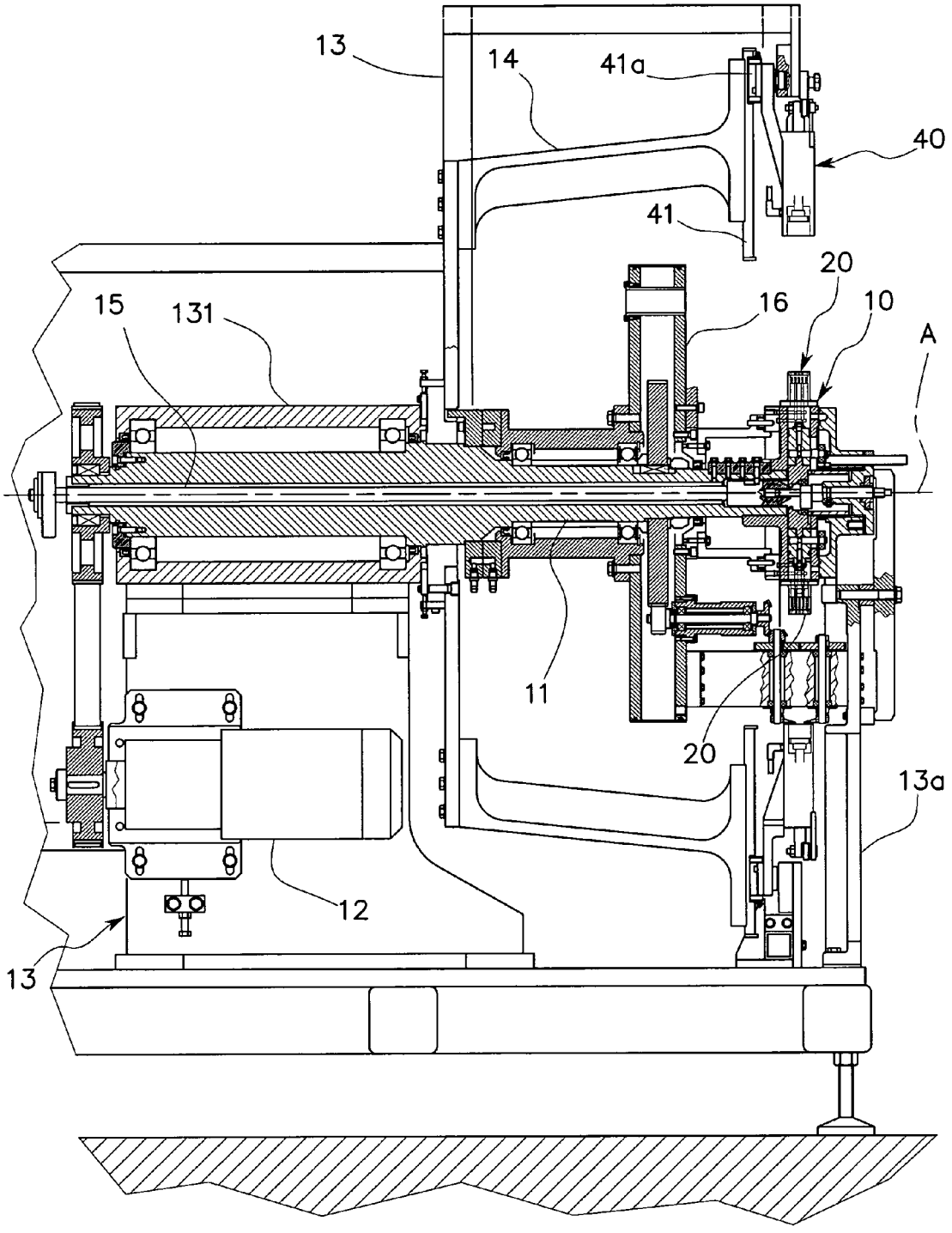


FIG.2

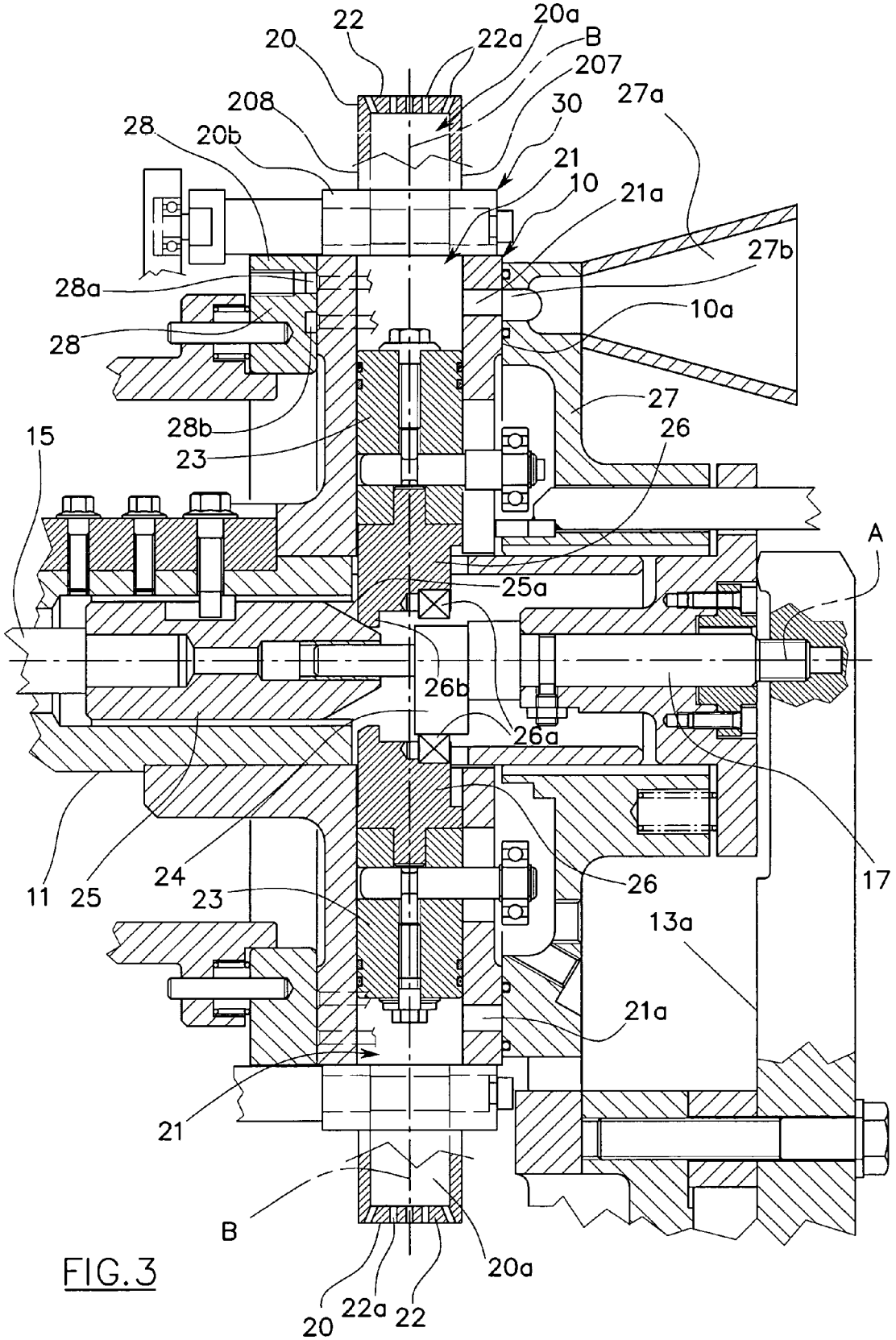

22
20a
20
22a
B
207
208
30
27a
28
20b
21
10
21a
27b
28a
10a
28
27
28b
26
15
23
A
25a
26b
26a
11
25
24
23
26
17
13a
21a
21
B
20a
20
22a
22

FIG.3

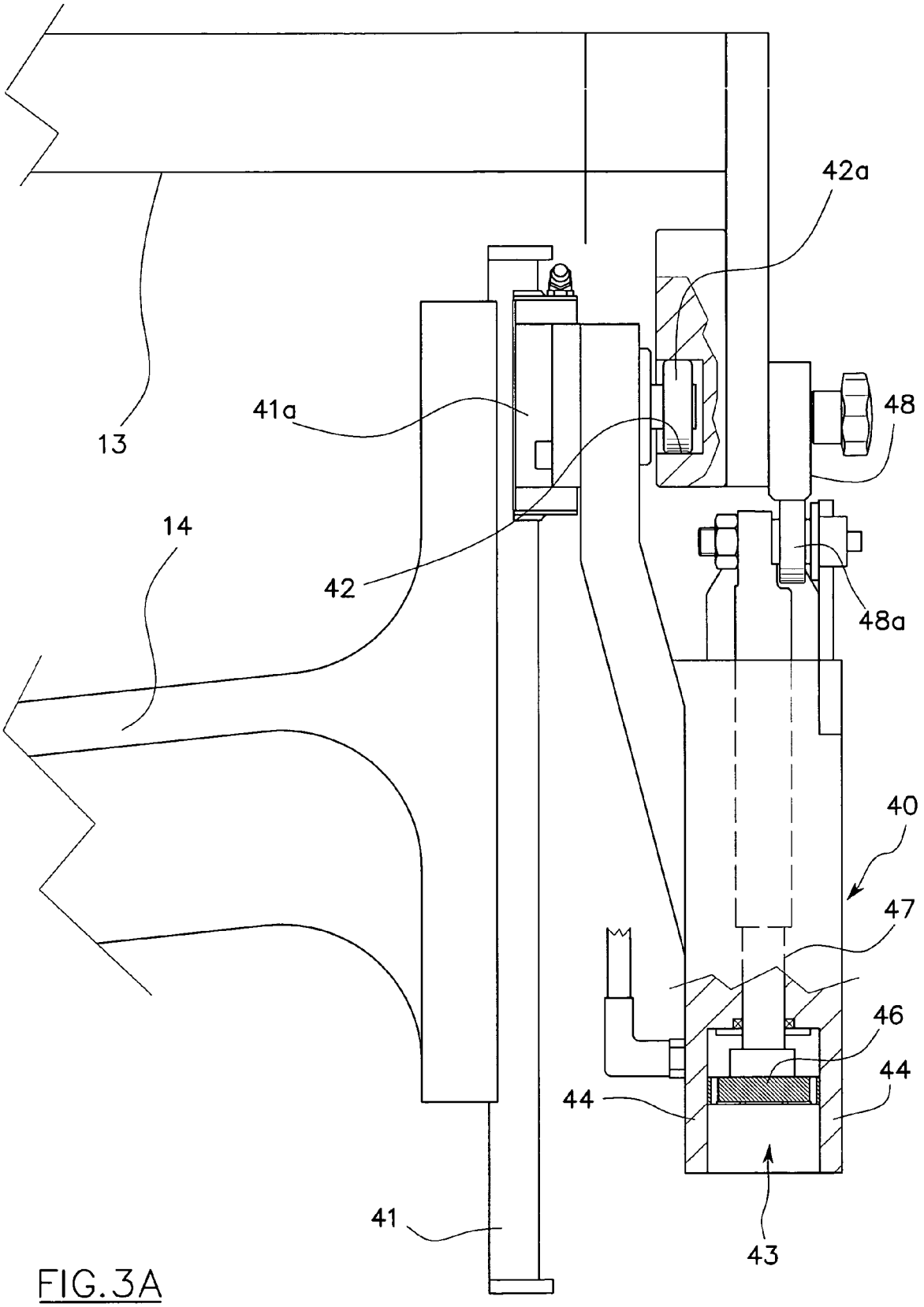
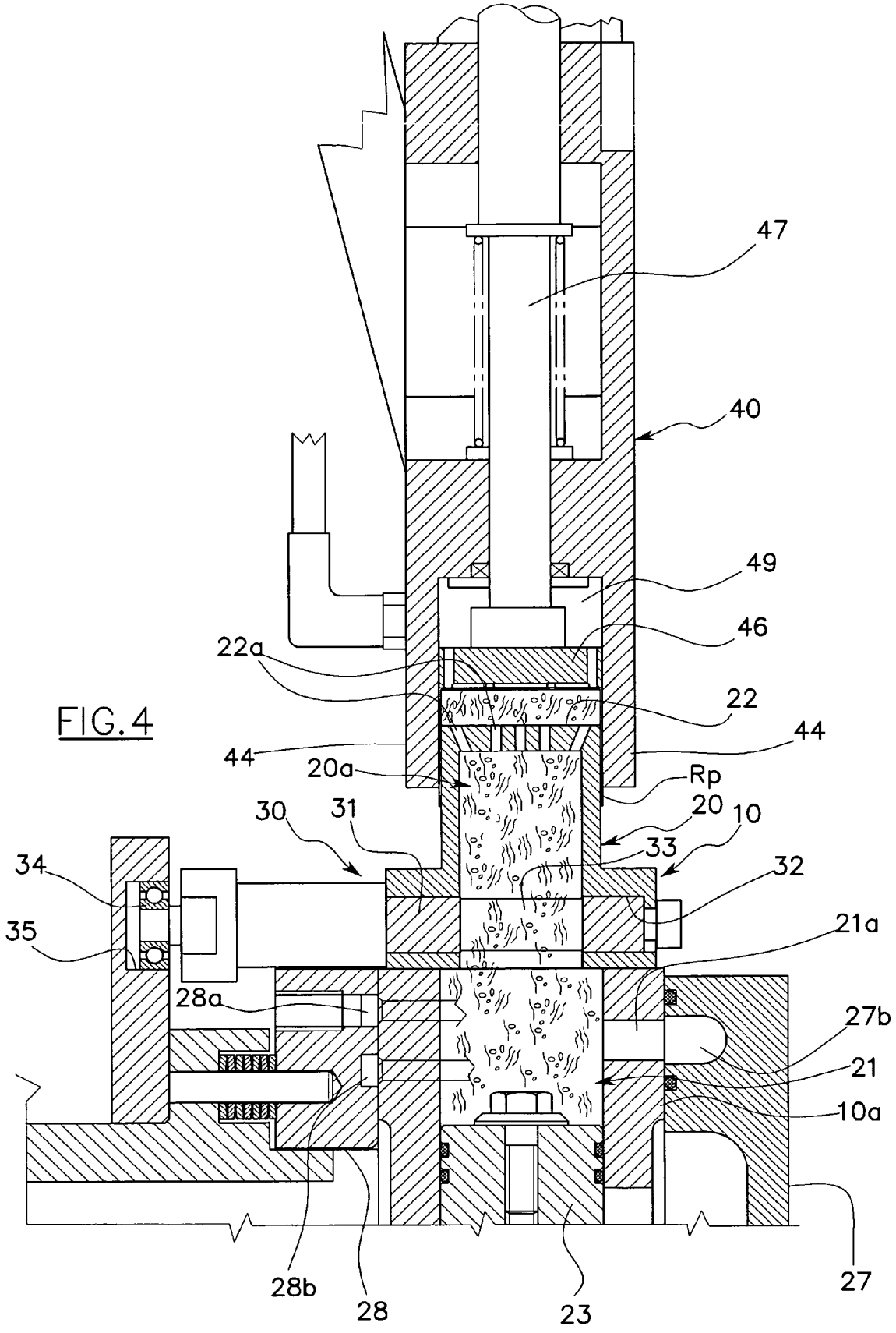


FIG.3A

FIG. 4


47
40
49
46
22a
22
44
44
20a
Rp
30
31
20
10
33
34
32
35
21a
28a
27b
21
10a
28b
28
23
27

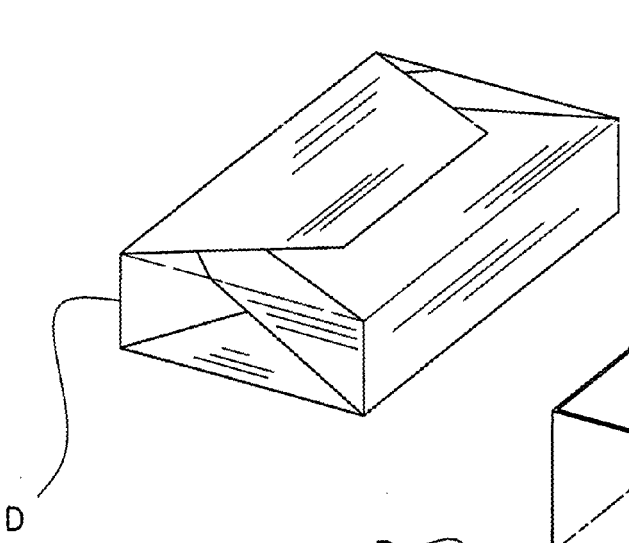


FIG.5A

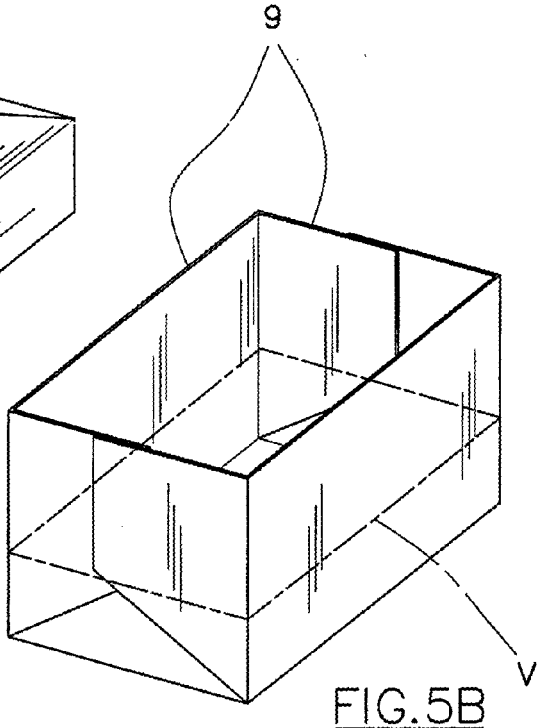
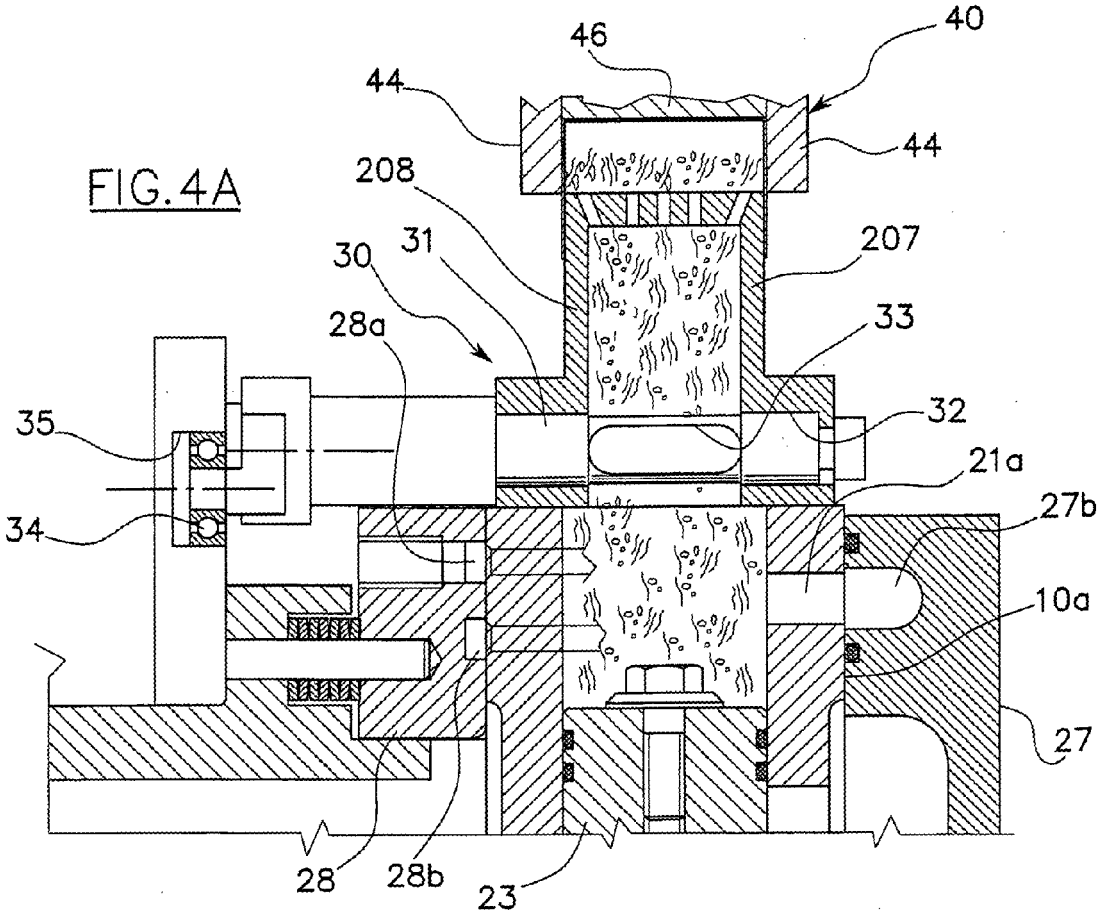


FIG.5B

FIG.4A



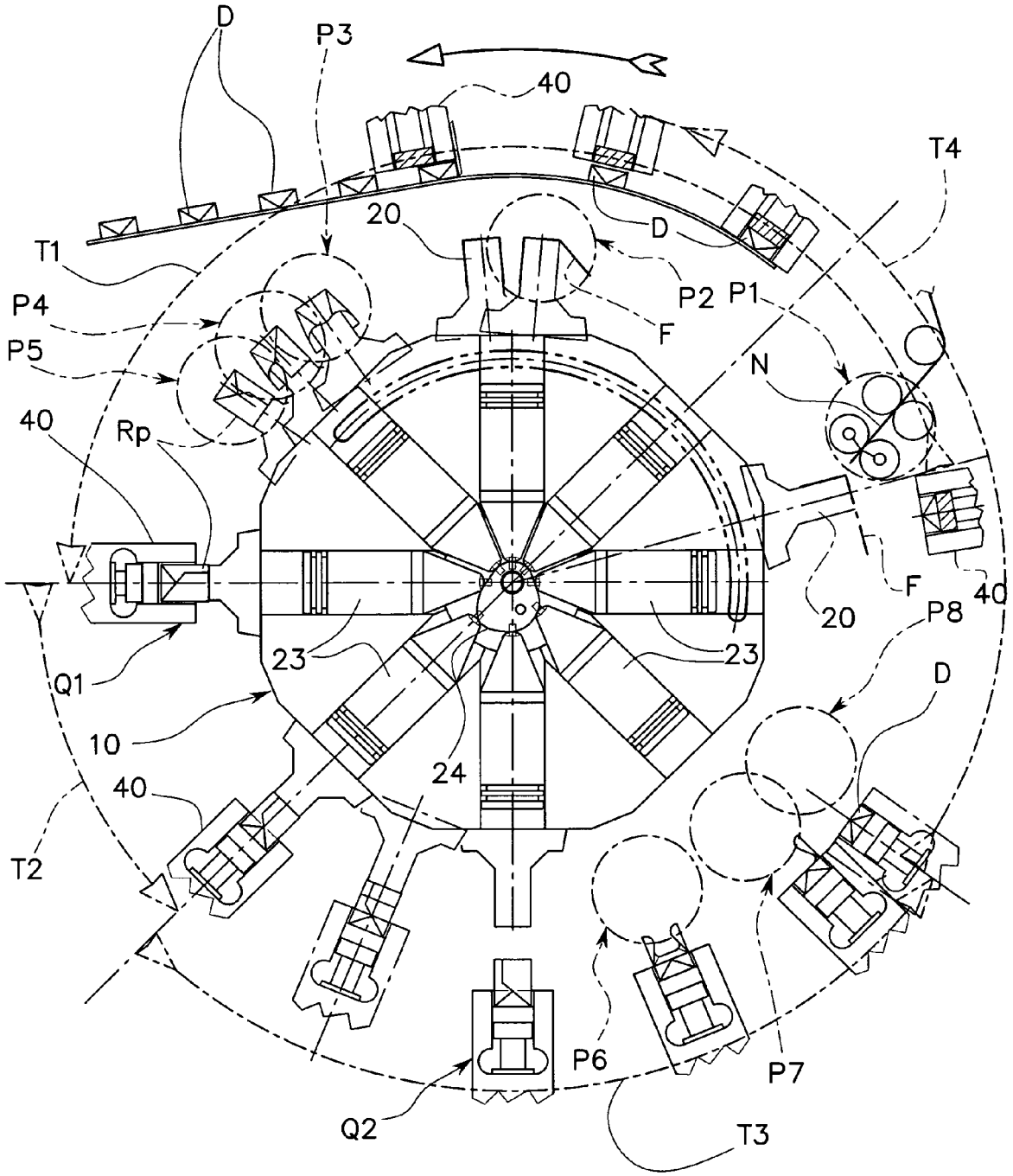
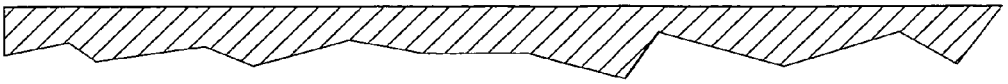

D
P3
40
T4
20
D
T1
P2
P1
P4
F
P5
N
40
Rp
F
40
20
P8
23
23
D
Q1
10
24
40
T2
P6
P7
Q2
T3

FIG.6



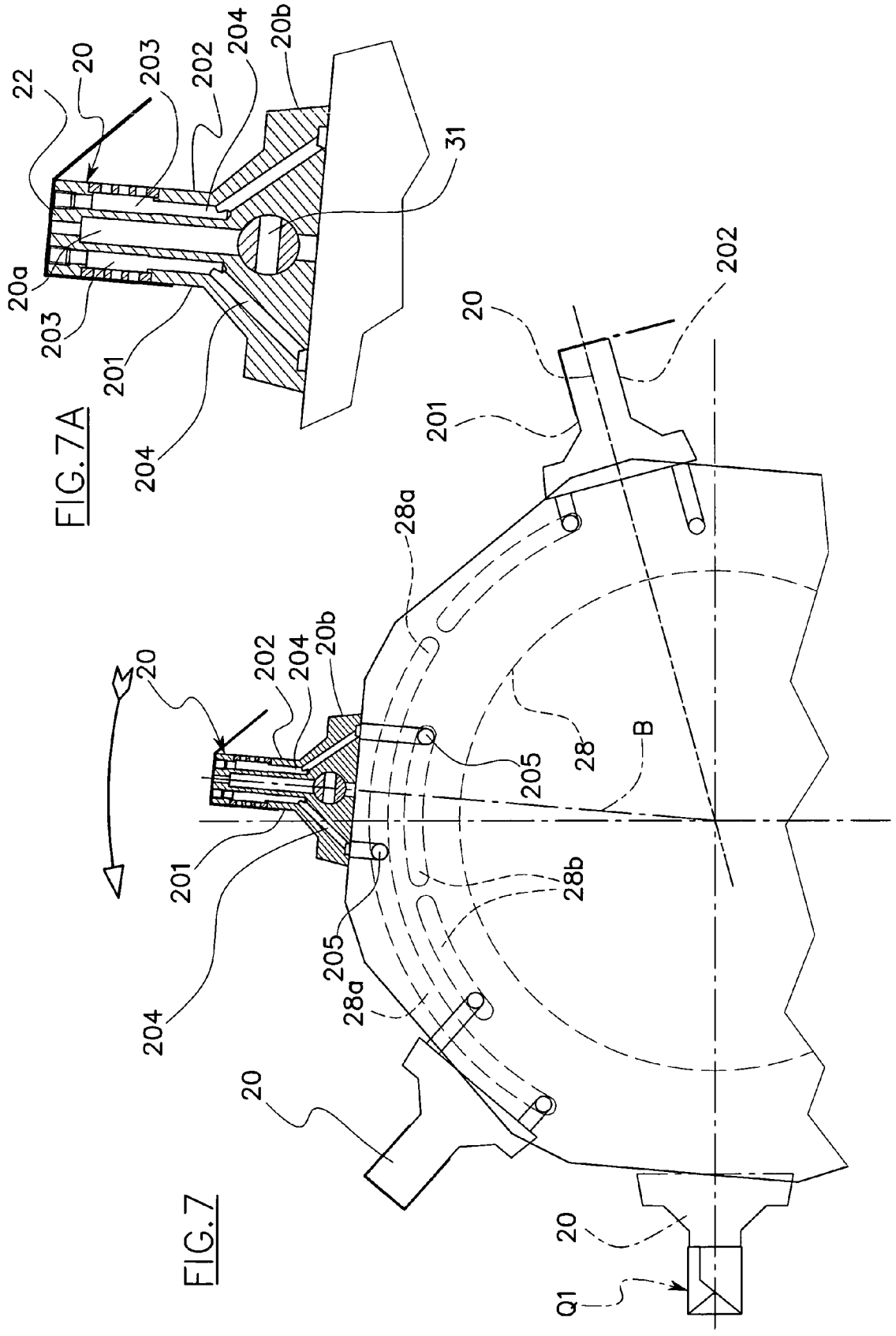

22
20
203
202
204
20b
31
20a
203
201
204
20
202
201
28a
20
202
204
20b
205
28
B
201
28b
205
28a
204
20
20
Q1

FIG.7A

FIG.7

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 07 6833

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 4 445 311 A (NENTWIG JUERGEN [AT]) 1 May 1984 (1984-05-01) * the whole document *	1,13	INV. B65B3/02 B65B3/32
A		2-12,14	

TECHNICAL FIELDS SEARCHED (IPC)
B65B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	23 January 2007	Schelle, Joseph

CATEGORY OF CITED DOCUMENTS

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1

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23-01-2007

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US 4445311 A	01-05-1984	NONE	

EPO FORM P0459

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