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(54) **PASTY MATERIAL VOLUMETRIC DOSER APPARATUS FOR FILLING PURPOSES IN A THERMOFORM PACKAGING LINE**

(57) A volumetric dosing apparatus for filling purposes in a thermoform packaging line, comprising a dosing chamber (4) provided with a piston (5) which can be displaced by a pasty material (M) introduced from a first extremity (4a) of said chamber (4) from a first position (5A) to a second position (5B) and to be actuated by a pressure fluid (F) introduced through a second extremity (4b) to return to said first position (5A) thereby displacing a certain volume of pasty material (M) delimited between the position (5A and 5B), said volume being ejected through the first extremity (4a) which is associated, with sealed closing means (3, 17), to a first opening (6a) of a housing (6) which contains a valve body (7) with means (19) for its actuation, the housing communicating through an inlet (1) with said chamber (4), and alternatively, said chamber (4) communicating with the outlet (2), in a direct face-to-face relationship,; a pusher (20) is provided with means (21-26) to empty the body (7).

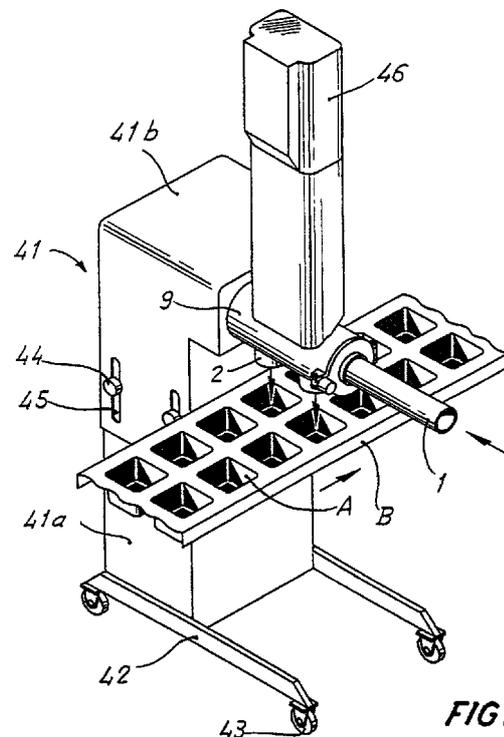


FIG. 1

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DescriptionField of the invention

[0001] This invention relates to a volumetric dosing apparatus for pasty material, namely for chopped meat and the like, for filling a packing line by thermoforming, of the type comprising at least an adjustable dosing chamber, having a known capacity, which can be automatically and cyclically filled and emptied to form portions having an identical volume and to deposit them in thermoformed cavities which are transferred on a travelling band under said chamber.

Background of the invention

[0002] In the state of the art some apparatuses for the volumetric dosing of this type are known, such as Patent WO 9014578 in which a machine is disclosed which includes a dosing chamber with an inlet and an outlet at one of its ends. Said dosing chamber is provided in its interior with a distributor to alternatively communicate said chamber with said inlet and with said outlet and a plunger which can be freely moved by the effect of the pressure exerted by a pasty material introduced in the dosing chamber by a feeder, a pump or the like, through said inlet and said distributor in inlet position. Said plunger free run goes from a first position to a second position which is predetermined by means of an accurately adjustable stop using a worm system which delimits the volume to be dosed. Thereafter, said plunger is driven in the opposite direction by means of compressed air, being forced to come back to said first position, moving the dosed volume of pasty material through said distributor in position of communication with said outlet, from which it can be collected in a container or stuffed. Said apparatus has pneumatic means which raise the whole dosing chamber in order to allow the access to the alternating distributor for its withdrawal, periodical cleaning and/or inspection.

[0003] Above apparatus is fully effective as for identical volume portions forming, but, however, it has the drawback that it expels the portions in an horizontal direction unsuitable for filling thermoformed cavities arranged on a continuous travelling band.

[0004] Another drawback stands in the low production capacity of said apparatus due to the existence of a single dosing chamber, over all if it is borne in mind that the travelling band admits, thanks to its width, multiple longitudinal rows of preformed cavities.

[0005] Last, it must be pointed out that the system for having access to the alternating distributor, by raising pieces having a large size and supporting them raised, shows several drawbacks; first, relatively powerful fluid mechanical means are required to carry out this operation; and second, any failure in said fluid mechanical means while it is having access to the distributor can provoke the descent of the supported pieces, which

directly involves a risk of accident for the handling worker.

Short description of the invention

[0006] For the above stated, an object of this invention is to provide with a volumetric dosing apparatus for pasty material for filling a packing line by thermoforming, provided with multiple outlet openings for the dosed portions situated uprightly downwards, mounted on a support which can be situated above a travelling band, so that said outlet openings are facing each other and close to thermoformed cavities arranged on it.

[0007] Another object of the invention is to provide with an apparatus of the type referred to with means of access to the distributing mechanism, simple, easy to handle and safe for the worker.

[0008] These objects are achieved with an apparatus according to this invention by uprightly arranging one or more dosing chambers provided with a pusher and a plunger within it served by an alternating distributor provided with a single valve body which rotates driven by means of its own, in an independent housing of the dosing chambers and situated orthogonally under them.

[0009] Said valve body, in cooperation with corresponding ducts communicated with said housing, is capable of conducting a pasty material introduced by an external feeder through an inlet arranged in axial position inwardly the dosing chambers and, successively and alternatively, to lead the pasty material from the interior of the dosing chambers, pushed by pneumatic means, up to other as many openings situated at the lower part of said housing of the valve body, aligned with said chambers.

[0010] As the withdrawal of the volume of dosed pasty material is carried out crossing the ducts formed by the valve body, the apparatus of the invention has available a combined system formed by plungers for withdrawing the portions of the volume from within the chambers, which correspond to the so-called doses, and pushers to finish to fully empty the lengths within the valve body. For this, said pushers are provided with stems which protrude at the top end of the dosing chambers while the plungers are provided with central holes by means of which they can freely slide along a portion of said stems. The top ends of all these stems are fixed on a plate provided with a slide which is sliding inserted in a second stem ended at both ends by stops. A pneumatic cylinder moves a pneumatic clamp which can grasp said plate to force, through the respective stems, the pushers to individually carry out said travel within the valve body and release said plate to allow that said pushers, together with their corresponding plungers, carry out their joint travel within their related dosing chambers, moved by the pressure of the pasty material during the filling, and impelled by means of compressed air injected by the top end of said chambers during the

emptying operation.

[0011] When the pushers, together with the corresponding plungers start the portion of travel within the dosing chambers, said plate, freed of said clamp, contacts the top stop of the second stem pulling it along in its travel until said lower stop contacts a block situated in a predetermined position, accurately adjustable by means of a worm driven by an electric motor. The distance corresponding to the travel carried out between both stops, in combination with the internal diameter of the dosing chambers, determines the volume of the portions of pasty material formed, therefore said volume can be accurately adjusted and predetermined by adjusting the position of said blocks.

[0012] The embodiment of the valve body housing and its corresponding ducts and openings is carried out by means of a block fixed overhanging from a side cabinet, adjustable in height and provided with travelling feet on which block a base plate is hinged which bears said dosing chambers with their related mechanisms, covered by a housing. Said block incorporates sealing means for said plate in working position, as well as a cover likewise at one end likewise hinged and provided with sealing means. Said side cabinet incorporates a pneumatic cylinder for driving the valve body, as well as the electric and pneumatic circuits with their related control devices.

[0013] With this arrangement, the apparatus of this invention can be situated so that its dosing head remains above a travelling band, with said outlet openings facing each other and close to thermoformed cavities arranged on said band, for their filling, the cycles forming the dosed portions being synchronized with stop and forward movement cycles of said travelling band.

[0014] These and other characteristics of an apparatus according to the invention, as well as its operation, will result clearer from the detailed description thereof with reference with the drawings appended which are only illustrative of a possible embodiment of this invention, and are not to be purported as limitative. In the drawings appended:

Short description of the drawings

[0015]

Fig. 1 is a general view in perspective of an apparatus according to the invention.

Fig. 2 is a cross section, according to a conventional plane at 90° of Fig. 3 of an apparatus according to this invention;

Fig. 3 is a cross section, according to a conventional plane of 90° of Fig. 2 of an apparatus according to this invention;

Fig. 4 and 5 are enlarged detailed views of the assembly of the valve body and the dosing chambers in an apparatus according to the invention; and

Fig. 6 to 9 are schematic cross sections which illustrate a sequence of the different steps of this apparatus operation. For best understanding the drawing, some elements have been represented in their more separate positions and even some have been suppressed.

Detailed explanation of some examples of embodiment

[0016] Referring first to Fig. 1 it can be noted, with numeral 9, a block associated to dosing chambers 4 (see also the remaining figures), provided with joining means 47 to be fastened overhanging on a side housing 41 mounted on a pair of feet 42, provided with wheels 43, capable to keep the assembly in stable equilibrium leaving a large space between said feet 42 and the outlet mouths of the outlet ducts 2, said housing incorporating said cylinder 19 for driving the valve body 7, electric circuitry and fluid dynamic elements (not shown) with corresponding control elements thereof and means 44, 45 to adjust in height the position of said block 9 so that it can be positioned above and close to containers A formed on a self-conveyed band B, which is an integral part of the packing line, for example by thermoforming. Said means for adjusting in height the position of said block 9 consist in fastening elements 44 integral with a first portion 41a, associated to said at least one foot 42, of the housing 41, in cooperation with oblong holes 45 formed on a second portion 41b, bearing said block 9, of the housing 41, and in that it includes a protecting cover 46 of the dosing chambers 4 and mechanisms associated with them 21-35.

[0017] Fig. 2 to 5 show a part of said apparatus which includes a pair of dosing chambers 4 having an axial development, each provided within it with a plunger 5 which can travel from a first position 5A (see also the sequence illustrated in Fig. 6 to 9) and a second position 5B, said chambers 4 being associated, by a first end 4a, with sealing means 17, 36, to a duct of passageway 3 which ends at a first opening 6a of a housing 6 which houses a valve body 7, said housing 6 having a second opening 6b connected to an inlet duct 1 of pasty material M, and a third opening 6c, directly facing the first opening 6a, connected to an outlet duct 2 of pasty material M. A fluid dynamic cylinder 19 is arranged to move said valve body 7 within said housing 6 so that they are communicated through said second opening 6b with said dosing chamber 4, and successively and alternatively, said dosing chambers 4 with said first 6a and third 6c openings.

[0018] The dosing chambers 4 include, each, a pusher 20 which is moving together with the plunger 5 in the travel, in both directions, between their first 5A and second 5B positions. Said pusher 20 is provided, in addition, with means 21-26 to individually move it between a first position 20A, adjacent to the first position 5A of the plunger 5, and a second position 20B, level with the mouth of the outlet duct 2, crossing in said

travel the passageway 3 and outlet 2 ducts and the valve body 7.

[0019] Said housing 6 is embodied in a block 9 which includes said passageway 3 and outlet 2 ducts and second opening 6b communicated with said housing 6, an articulation 16, such as a hinge, for a base plate 18 of said dosing chambers 4, provided with appendages 35 to cooperate with a lock 17 to lock said chamber 4 in a working position, pressing sealing elastic joints 36 between said base plate 18 of the chambers 4 and said block 9. Also an hinge 37 is available for a cover 38 of said second opening 6b, provided with a hole 38a for said inlet duct 1, and a lock 39 to lock said cover 38 in a closed position, pressing a sealing elastic joint 40 between said cover 38 and said block 9.

[0020] Said valve body 7 is cylindric and is provided on its periphery with a mortise 10 which communicates through a passageway 11 with an opening 12 situated at one of its bases including in addition, for each dosing chamber 4, a cross through hole 13 which does not interfere with said mortise 10, so that said valve body 7 can alternatively rotate within its housing 6 driven by said fluid dynamic cylinder 19, with the opening 12 continuously facing the inlet opening 6b, between a first position 7A, in which the mortise 11 is facing the first end 4a of the dosing chambers 4, and a second position 7b in which the cross passing holes 13 are aligned on one side with said dosing chambers 4 through said passageway ducts 3, and on the other side with said outlet ducts 2, forming straight even lengths of evacuation ducts through which the pushers 20 are moving to complete the transfer from a dosed volume of pasty material M, to each of said cavities A, thermoformed in a cross row of a band B which is moving under and close to the mouth of said outlet duct 2.

[0021] Said means for driving said pusher 20 include a first stem 22, coaxial to the chamber axis 4, bearing at one end the pusher 20 and joined by its other end, which protrudes by the second end 4b of the chamber 4, to a plate 24 which includes a slide 25 which is freely sliding along a first portion 23a of a second stem 23, parallel to the first stem 22, the length of said first portion 23a being equal to the distance between the first 20A and second 20B positions of said pusher 20 in its travel within the valve body 7, a fluid dynamic cylinder 21 is provided which has a stem 21a, having a run equivalent to said first portion 23a, bearing at its end a fluid dynamic clamp 26 which can grasp the plate 24 to force the pusher 20 to carry out its travel between its first 20A and second 20B positions and vice versa, through the valve body 7 at its second position 7B under the action of said cylinder 21, and to release said plate 24 to allow the pusher 20 together with the plunger 5 to carry out their joint travel between the first position 5A and the second position 5B, pushed by the effect of said pressure of the pastry material M which is coming in through the inlet duct 1, with the valve body 7 at its first position 7A, and said inverse travel driven by a fluid F

under pressure introduced by the second end 4b of the chamber 4 and with the valve body 7 at its second position 7B.

[0022] The plunger 5 (see enlarged detail of Fig. 3) has available a central hole 5c through which said first stem 22 freely inserted slides, said plunger 5 having as well on its periphery as within the central hole 5c, dynamic sealing elastic joints 27 with the internal wall of the chamber 4 and with the first stem 22, respectively.

[0023] In order to delimit the volume to be dosed, said second stem 23 includes a second portion 23b which can slide inserted through a hole of a block 29 fixed in an adjustable predetermined position by means of a worm 30, parallel to the second stem 23, driven by a motor 31, and said first 23a and second 23b portions incorporate respective first 32 and second 33 stops at their respective free ends, so that the slide 25, in its travel by the effect of filling the chamber 4, interferes with the first stop 32 pulling along the second stem 23, which is moved until the second stop 33 contacts said block 29 delimiting the second position 5B of the stem 5 accompanied by the pusher 20, a third fixed stem can be provided, parallel to the worm 30, on which the block can slide, inserted, to cooperate to its guiding.

[0024] The first position 5A of the stem 5 is delimited by a protrusion 28 formed by the slightly smaller diameter of the passageway duct 3 communicated with the housing 6.

[0025] The apparatus includes a detector 48 of end of stroke of said joint run of the stem 5 and the pusher 20, which releases a signal to stop the entrance of pasty material M through the inlet duct 1, to move the valve body 7 from the first position 7A to the second position 7B and activate the entrance of the fluid under pressure F by the second end 4b of the dosing chamber 4.

[0026] The steps which compose a container dosing and filling cycle are as follows: Fig. 6 illustrates a step in which the stem 5, together with the pusher 20 move within the chamber 4 under the effect of a pressure exerted by a pasty material introduced from the inlet duct 1 through the valve body 7 at the position 7A. Said pasty material is directly in contact with the pusher 20 which pulls along the stem 5 and the first stem 22 which is integral with the plate 24 bearing the slide 25 which contracts the stop 32 pulling along the second stem 23. The second stem 23 slides within a hole of a block 29, fixed at a predetermined position by means of a worm 30 driven by a motor 31, until the stop 33 of said stem 23 contacts said block 29 (Fig. 7), delimiting the second position 5B of the plunger 5. At that moment, the entrance of pasty material through the inlet duct 1 stops and the valve body 7 rotates within its housing 6 to adopt the second position 7A.

[0027] Thereafter, the injection of a fluid under pressure, preferably air, starts, by the second end 4b of the chamber 4, so that the stem 5 moves in direction to the first end 4a pulling along with it the pusher 20 and the first 22 and second 23 stems until said stem 5 stops

against the protrusion 28 at the first end 4a of the chamber 4, which delimits the first position 5A of the stem 5 (Fig. 8).

[0028] The volume delimited by the internal diameter of the chamber 4 and the distance between said first 5
5A and second 5B positions constitutes the accurate dose of the portions to be packed. Said distance is determined by the position of the block 29, and coincides with a second portion 23b of the second stem 23 which slides within a hole of said block. 10

[0029] Thereafter, a pneumatic cylinder 21, the stem of which 21a bears a pneumatic clamp 26 which closes grasping the plate 24, obliges the stem 22, bearing the pusher 20, to move within the valve body 7 and through the passageway 3 and outlet 2 ducts from a first position 20A adjacent to the first position 5A of the plunger 5, to a second position 20B level with the outlet duct 2 mouth (Fig. 9) completing the transfer of the pasty material M to the container A of the travelling band B located under and close to said outlet duct 2 20
20 mouth. In this run the slide 25 integral with the plate 24, slides on the first portion 23a of the second stem 23.

[0030] Then, said cylinder 21 returns the pusher 20 to its first position 20A and the clamp 26 releases the plate 24, the apparatus remaining arranged for starting a new cycle. 25

Claims

1. Volumetric dosing apparatus for pasty material, for filling a packing line by thermoforming which includes a dosing chamber (4), of axial development, provided in its interior with a plunger (5) which can be freely moved through a pasty material (M), introduced by a first end (4a) of said chamber (4), from a first position (5A) to a second position (5B) and to be thereafter driven in opposite direction, by means of a fluid (F) under pressure introduced from a second end (4b) of the chamber (4) to come back to said first position (5A), moving a dosed volume of pasty material (M) delimited between the positions (5A) and (5B) to expel it through said first end (4a) characterized in that said chamber (4) is associated by said first end (4a), with sealing means (17, 36), to a passageway duct (3) which ends at a first opening (6a) of a housing (6) which houses a valve body (7), said housing (6) having a second opening (6b) connected to an inlet duct (1) of pasty material (M) and a third opening (6b) directly facing the first opening (6a), connected to an outlet duct (2) of pasty material (M), means (19) being provided to move said valve body (7) within said housing (6) so that they are communicated through said second opening (6b) with said dosing chamber (4) and successively and alternatively, said dosing chamber (4) with said first (6a) and third (6c) openings, and in that said dosing chamber (4) includes a pusher (20) which moves 30
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together with the plunger (5) in the travel between the first (5A) and second (5B) positions thereof, and vice versa provided with means (21-26), to move it in addition, individually, between a first position (20A) adjacent to the first position (5A) of the plunger (5), and a second position (20B) level with the outlet duct mouth (2), crossing in said travel the passageway (3) and outlet (2) ducts and the valve body (7).
2. Volumetric dosing apparatus, according to claim 1, characterized in that said chamber (4) is hinged with respect to the housing (6) and it can be tilt to provide access to said housing (6), valve body (7) and dosing chamber (4) for its cleaning and/or withdrawal.
3. Volumetric dosing apparatus, according to claim 1, characterized in that it includes a block (9), which defines said housing (6); said passageway (3) and outlet (2) ducts and second opening (6b) communicated with said housings (6); an articulation (16) such as a hinge, for a base plate (18) which extends the mouthpiece of said dosing chamber (4) provided with appendages (35) and/or openings to cooperate with locks (17) to lock said chamber (4) in a working position, pressing a sealing elastic joint (36) between said base plate (18) of the chamber (4) and said block (9); a hinge (37) for a cover (38) of said second opening (6b), provided with a hole (38a) for said inlet duct (1); and a lock (39) to lock said cover (38) in a closed position, pressing a sealing elastic joint (40) between said cover (38) and said block (9).
4. Volumetric dosing apparatus, according to claim 3, characterized in that said valve body (7) is cylindrical and is provided on its periphery with a mortise (10) which communicates through a passageway (11) with an opening (12) situated at one of its bases including in addition, a cross through hole (13) which does not interfere with said mortise (10), so that said valve body (7) can alternatively rotate within its housing (6) driven by said means (19), such as a fluid dynamic cylinder, with the opening (12) continuously facing the inlet opening (6b), between a first position (7A), in which the mortise (11) is facing the first end (4a) of the dosing chambers (4), and a second position (7b) in which the cross through hole (13) is aligned on one side with said dosing chambers (4) through said passageway duct (3), and on the other side with said outlet duct (2), forming a straight even length of evacuation duct through which the pusher (20) is moving to complete the transfer of a dosed volume of pasty material M, to a cavity (A), thermoformed on a band (B) which is moving under and close to the mouth of said outlet duct (2).

5. Volumetric dosing apparatus, according to claim 4, characterized in that said means for driving said pusher (20) include a first stem (22), coaxial to the chamber axis (4), bearing at one end the pusher (20) and joined by its other end, which protrudes by the second end (4b) of the chamber (4), to a plate (24) which includes a slide (25) which is freely sliding along a first portion (23a) of a second stem (23), parallel to the first stem (22), the length of said first portion (23a) being equal to the distance between the first (20A) and second (20B) positions of said pusher (20) in its travel within the valve body (7), a fluid dynamic cylinder (21) being provided which has a stem (21a), having a run at least equivalent to said first portion (23a), bearing at its end a fluid dynamic clamp (26) which can grasp the plate (24) to force the pusher (20) to carry out its travel between its first (20A) and second (20B) positions and vice versa, through the valve body (7) this later being at its second position (7B), and to release said plate (24) to allow the pusher (20) together with the plunger (5) to carry out their joint travel between the first position (5A) and the second position (5B), pushed by the effect of said pressure of the pastry material (M) which in coming in through the inlet duct (1), with the valve body (7) at its first position (7A), and said inverse travel driven by a fluid (F) under pressure introduced from the second end (4b) of the chamber (4) and with the valve body (7) at its second position (7B).
6. Volumetric dosing apparatus, according to claim 5, characterized in that the plunger (5) has a central hole (5c) through which said inserted first stem (22) freely slides, said plunger (5) having as well on its periphery as within the central hole (5c), dynamic sealing elastic joints (27) with the internal wall of the chamber (4) and the first stem (22), respectively.
7. Volumetric dosing apparatus, according to claim 6, characterized in that said second stem (23) includes a second portion (23b) which can slide inserted through a hole of a block (29) fixed in an adjustable predetermined position by means of a worm (30), parallel to the second stem (23), driven by an actuator (31), and in that said first (23a) and second (23b) portions incorporate respective first (32) and second (33) stops at their respective free ends, so that the slide (25), in its travel by the effect of filling the chamber (4), interferes with the first stop (32) pulling along, once the plate (24) has been released, the second stem (23), which is moving until the second stop (33) contacts said block (29) delimiting the second position (5B) of the stem (5) accompanied by the pusher (20), a third fixed stem being optionally provided, parallel to the worm (30), on which the block (29) can slide, inserted, to cooperate to its guiding.
8. Volumetric dosing apparatus, according to claim 7, characterized in that the first position (5A) of the stem (5) is delimited by a protrusion (28) formed by the slightly smaller diameter of the passageway duct (3) communicated with the housing (6).
9. Volumetric dosing apparatus, according to any of the claims 3 to 8, characterized in that it includes a detector (48) of end of stroke of said joint run of the stem (5) and the pusher (20), which releases a signal to stop the entrance of pasty material (M) through the inlet duct (1), to move the valve body (7) from the first position (7A) to the second position (7B) and activate the entrance of the fluid under pressure (F) through the second end (4b) of the dosing chamber (4).
10. Volumetric dosing apparatus, according to any of the claims 3 to 9, characterized in that it integrates at least two dosing chambers (4) with their respective mechanisms driven in unison, associated to a single housing (6) provided with a single second opening (6b) communicated with a single inlet duct (1) and as many first (6a) and third (6c) openings communicated with as many respective passageway (3) and outlet (2) ducts as there is dosing chambers (4) arranged.
11. Volumetric dosing apparatus, according to claim 10, characterized in that said at least two chambers (4) are joined to a single base plate (18) hinged to a single block (9) which defines a single housing (6) which includes a single second opening (6b) communicated with said housing (6) and as many passageway (3) and outlet (2) ducts as dosing chambers (4) are arranged, including in addition: an articulation (16), such as a hinge, for said base plate (18) of said dosing chambers (4), provided with appendages (35) and/or openings to cooperate with locks (17) to lock said chambers (4) in a working position, pressing a sealing elastic joint (36) between said base plate (18) and said block (9) for each chamber (4) arranged; a hinge (37) for a cover (38) of said second opening (6b), provided with a hole (38a) for said inlet duct (1); and a lock (39) to lock said cover (38) in a closed position, pressing a sealing elastic joint (40) between said cover (38) and said block (9).
12. Volumetric dosing apparatus, according to claim 11, characterized in that it includes a single valve body (7) with a single mortise (10) communicated through a passageway (11) with a single opening (12) situated at one of its bases, the single mortise (10) being capable to encompass the first ends (4a) of all the chambers (4) arranged, including in addition as many cross through holes (13) as dosing chambers (4) are arranged, said valve body (10)

being driven by a single fluid dynamic cylinder (19).

13. Volumetric dosing apparatus, according to claim 12, characterized in that each of the stems (22) bearing the pusher (20) corresponding to said at least two dosing chambers (4) are joined to a single plate (24) with a single slide (25) associated to a single second stem (23), a single fluid dynamic cylinder (21) bearing a single fluid dynamic clamp (26) which can grasp the plate (24) and a single block (29) adjusted by means of a single worm (30) driven by a single actuator (31) and guided by a single third fixed stem (34). 5 10
14. Volumetric dosing apparatus, according any of the claims 3 to 13, characterized in that said block (9) associated to one or more dosing chambers (4), is provided with joining means (47) to be fastened overhanging on a side housing (41) mounted on at least one foot (42), provided with wheels (43), capable to keep the assembly in stable equilibrium leaving a large space between said at least one foot (42) and the outlet mouth or mouths of one or more outlet ducts (2), said housing incorporating said cylinder (19) for driving the valve body (7), electric circuitry and fluid dynamic elements with corresponding control elements thereof and means to adjust in height the position of said block (9) so that it can be positioned above and close to containers (A) formed on a self-conveyed band (B), which is an integral part of a packing line, for example by thermoforming. 15 20 25 30
15. Volumetric dosing apparatus, according to claim 14, characterized in that said means for adjusting in height the position of said block (9) consist in fastening elements (44) integral with a first portion (41a), associated to said at least one foot (42), of the housing (41), in cooperation with oblong holes (45) formed on a second portion (41b), bearing said block (9), of the housing (41), and in that it includes a protecting cover (46) of the dosing chambers (4) and mechanisms associated with them (21-35). 35 40 45 50 55

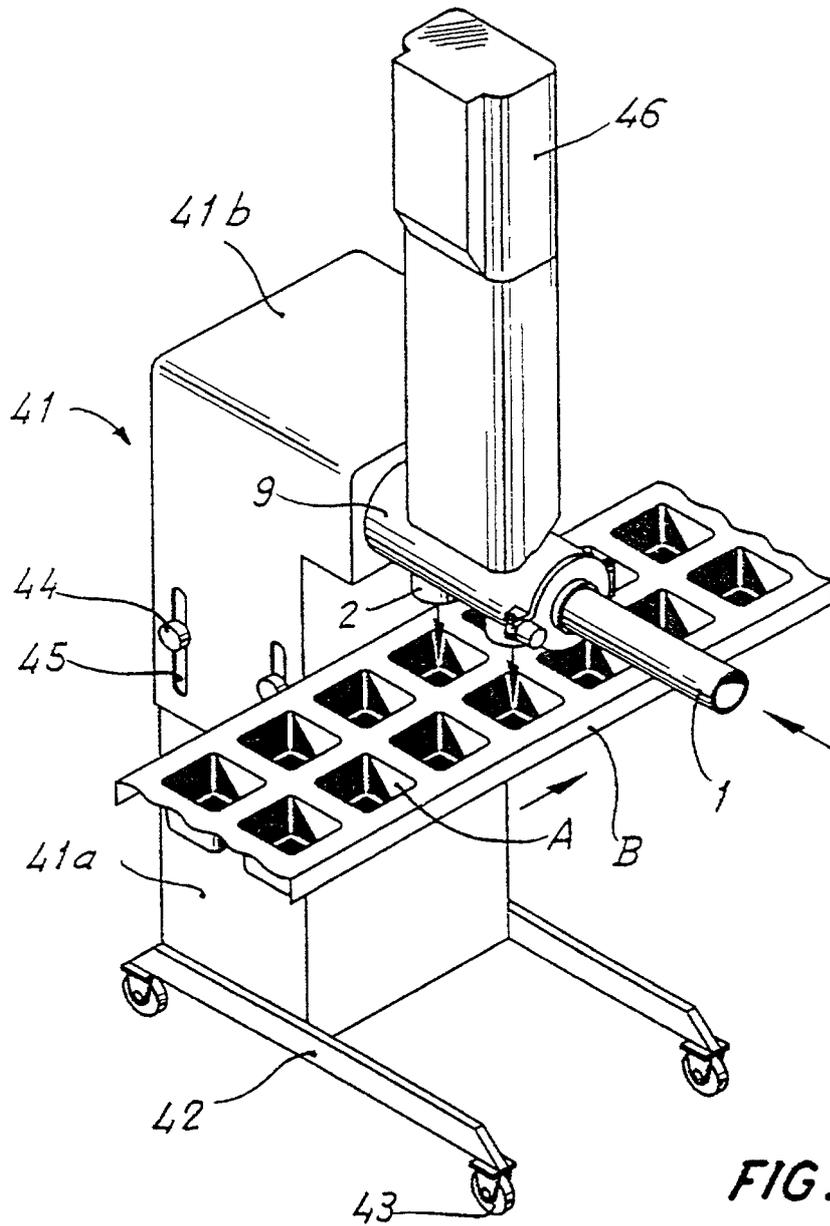
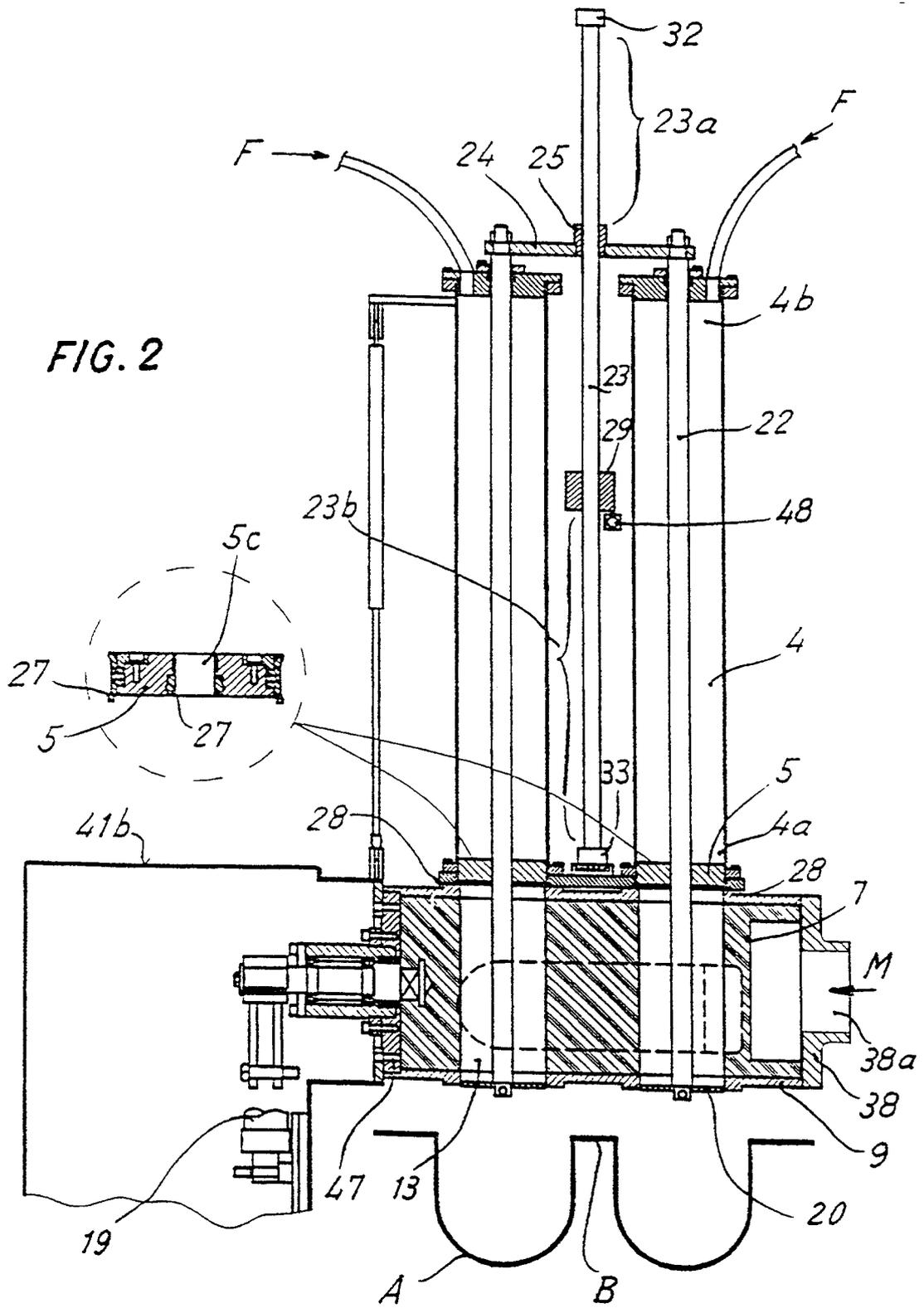
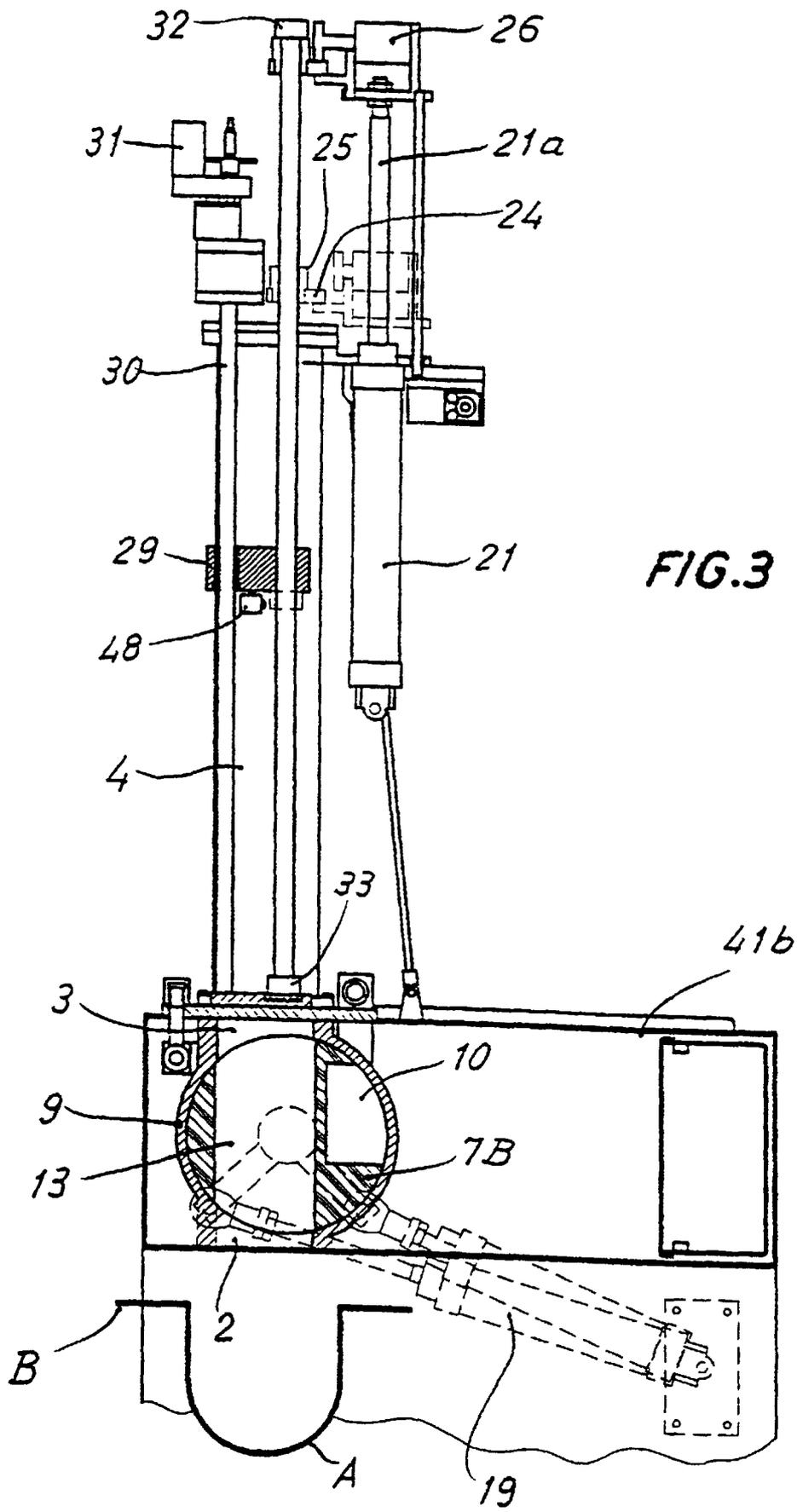


FIG. 1





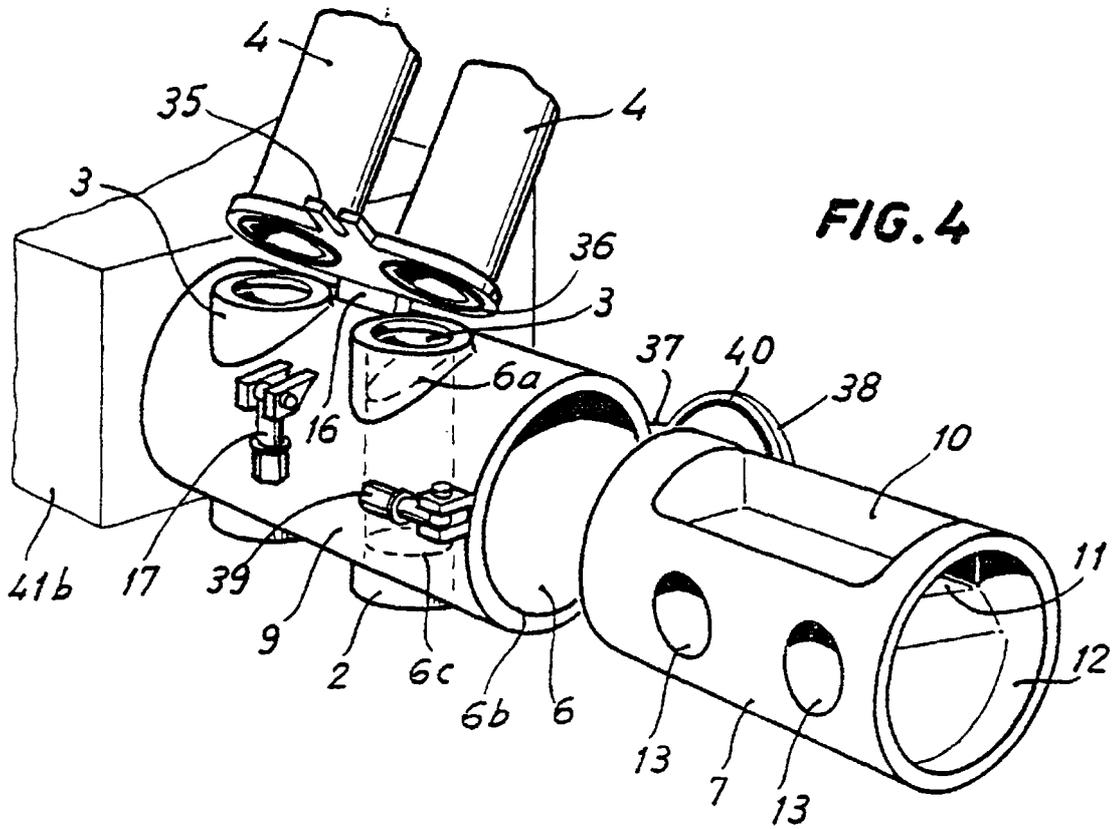


FIG. 4

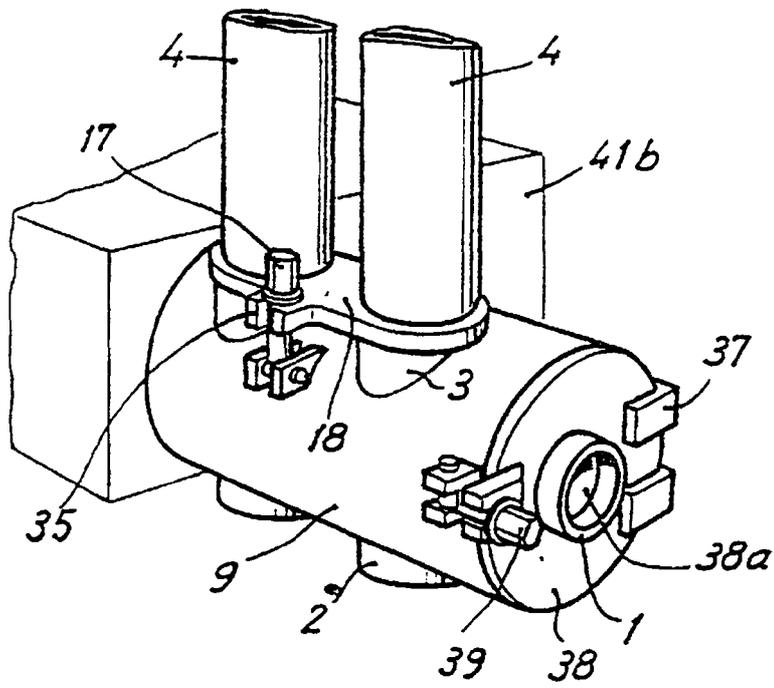


FIG. 5

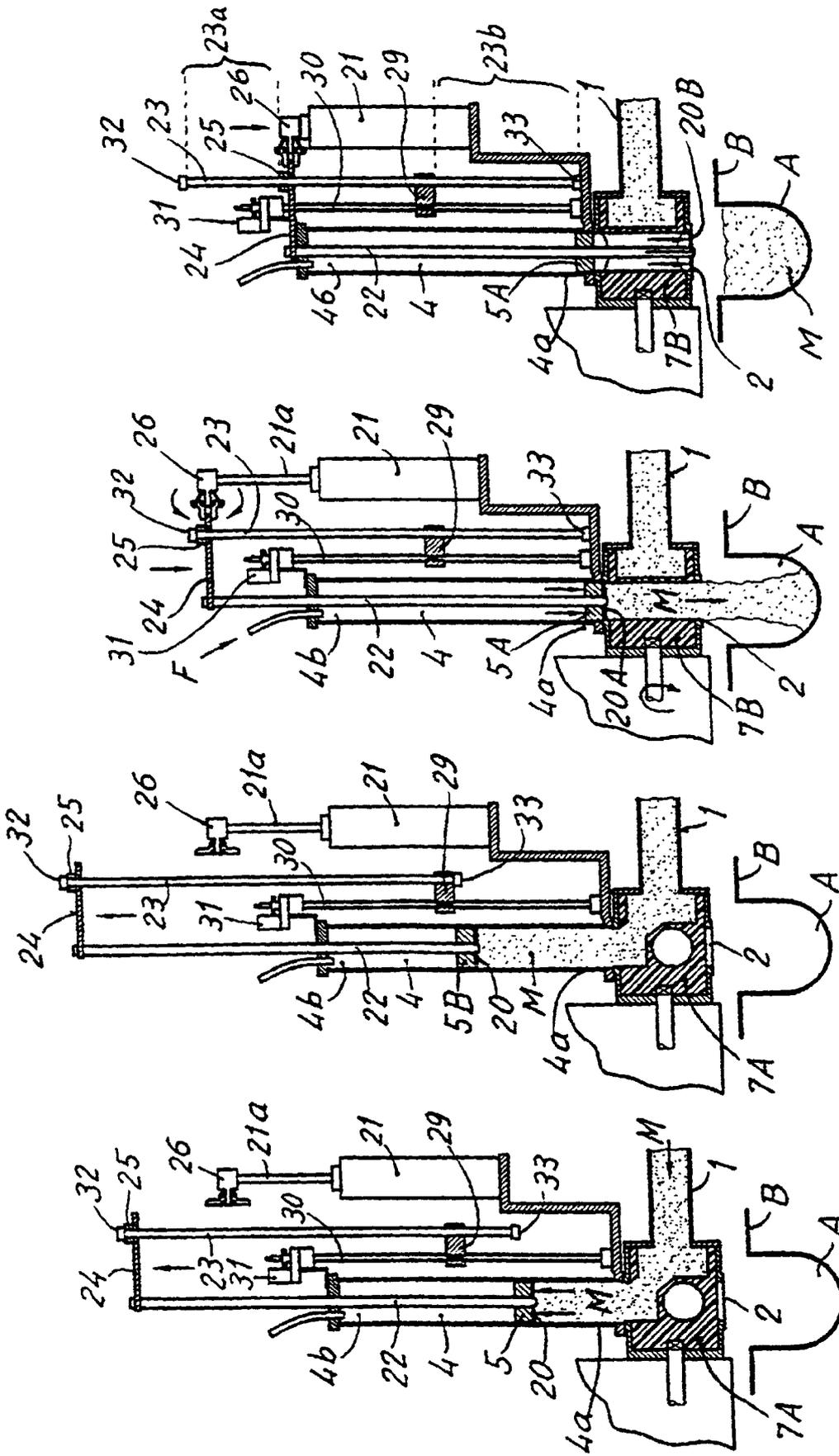


FIG. 9

FIG. 8

FIG. 7

FIG. 6

INTERNATIONAL SEARCH REPORT

International Application No
PCT/ES 99/00164

A. CLASSIFICATION OF SUBJECT MATTER		
IPC 6 B65B3/32		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
IPC 6 B65B A22C		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 90 14578 A (MARLEN RES CORP) 29 November 1990 (1990-11-29) cited in the application figure 2 ---	1
A	FR 1 503 994 A (HELY-JOLY) 12 February 1968 (1968-02-12) figure 3 ---	1,2
A	GB 1 040 190 A (LOUIS C. EDWARDS & SONS) 24 August 1966 (1966-08-24) figures 3,4 ---	1
A	US 3 865 281 A (BYRD CARL ET AL) 11 February 1975 (1975-02-11) figures 11,12 ---	1
	-/--	
<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> Patent family members are listed in annex.		
* Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "Z" document member of the same patent family		
Date of the actual completion of the international search		Date of mailing of the international search report
23 September 1999		6 October 1999 (06.10.99)
Name and mailing address of the ISA European Patent Office, P.B. 5816 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 851 apo nl, Fax: (+31-70) 340-3016		Authorized officer Martínez Navarro, A.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 097 876 A (LAGARES NARCISO C) 24 March 1992 (1992-03-24) column 4, line 57 - line 65; figures 1,6 ---	1
A	US 5 685 349 A (MIHAIL STAVROS ET AL) 11 November 1997 (1997-11-11) figures 8-10 -----	1

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