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(11) **EP 1 479 607 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 158(3) EPC

(43) Date of publication:
24.11.2004 Bulletin 2004/48

(51) Int Cl.7: **B65B 3/02**

(21) Application number: **02796780.1**

(86) International application number:
PCT/ES2002/000586

(22) Date of filing: **10.12.2002**

(87) International publication number:
WO 2003/053785 (03.07.2003 Gazette 2003/27)

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
IE IT LI LU MC NL PT SE SI SK TR**
Designated Extension States:
AL LT LV MK RO

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(30) Priority: **21.12.2001 ES 200102864**

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(54) **AUTOMATIC PACKAGING MACHINE**

(57) The packaging machine comprises a container forming machine (FM) and a filling device (FD) linked by means of a transfer device (TD). The filling device (FD) comprises an endless vertical conveyor (44), which follows a path consisting of a vertical ascending section and a vertical descending section linked by their ends by means of semicircumferential sections, equipped with one or more support mechanisms (56) for contain-

ers (3) which successively and sequentially occupy a position for receiving the containers (3) at the lower end of the ascending section; a position for opening the containers (3) at the upper end of the ascending section; a position for filling the containers (3) at the upper end of the descending section; and a position for sealing the containers (3) at the lower end of the descending section.

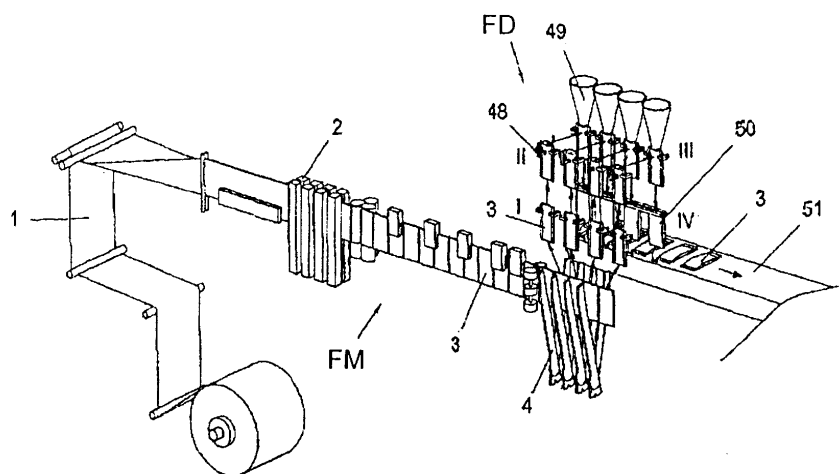


FIG. 3

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Description

Technical field of the invention

[0001] The object of the invention is an automatic packaging machine, particularly for the automatic packaging of products in the form of powder, solids, pastes, liquids, etc., like for example juice, soft drinks, ground coffee, detergents, etc., in containers in the form of bags obtained by their formation from a sheet of heat sealable material.

Background of the invention

[0002] There is a wide variety of known embodiments of machines used for the automatic packaging of products in the form of powder, solids, pastes, liquids, etc. in containers in the form of bags, obtained by their formation from a sheet of heat sealable material. In general, such automatic packaging machines comprise a container forming machine and a filling device, linked by means of a device that transfers containers from the forming machine to the filling device.

[0003] Fig. 1 schematically shows an embodiment of an automatic packaging machine of the previously disclosed type. Essentially, the automatic packaging machine comprises a forming machine FM for containers in the form of bags, a container transfer device TD and a filling device FD, laid out lengthways. The container forming machine FM is comprised of a means of feeding a sheet of heat sealable material 1, a continuous means of forming 2 the containers 3 in the form of bags and a means of cutting 4 to separate the containers 3 from the continuous formed sheet. The transfer device TD for the containers 3 comprises a means of transport 5 equipped with suction nozzles for opening the containers 3, in order to fill them. And, the filling device FD is equipped with a dispensing nozzle 6 and a means of closing 7 the filled containers 3.

[0004] Fig. 2 shows another embodiment of an automatic packaging machine of the previously disclosed type. In this embodiment, as in the embodiment shown in Fig. 1, the packaging machine comprises a container forming machine FM, a transfer device, not shown, and a filling device FD. Essentially, the container forming machine FM does not differ from the one previously disclosed for the embodiment in Fig. 1, and similar elements are designated the same reference numbers. The filling device FD is placed above the forming machine FM and comprises a quadrangular-shaped rotary support 8, in which each of its sides is provided with a means of supporting 9 the containers 3 for them to be filled by means of the dispensing nozzles 6 positioned on one of the sides.

[0005] In general, the main drawback of the embodiments of automatic packaging machines such as those disclosed is the following. Once the container has been filled with the product to be packaged, particularly in the

case of liquids, the displacement of the full container from the filling machine to the means of closing the container, means that the product held in the container is subject to accelerations and decelerations which cause significant changes in the level of the product in relation to the rim of the container, and that is the case whether the full container follows a linear path or a circular path, which makes it necessary to limit the speed of the full container's displacement in order to avoid spilling the product and/or wetting the area where the full container is closed by sealing; consequently, such a reduction in the speed with which the full containers are displaced before being sealed leads to a reduction in the packaging machine's production.

Explanation of the invention

[0006] The automatic packaging machine which is the object of the invention is of the type that comprises a forming machine for containers of a heat sealable material in the form of bags and a device for filling the bags with the product to be packaged, linked by means of a transfer device, positioned under the filling device, which transfers containers from the forming machine to the filling device.

[0007] The machine according to the invention is characterized in that the transfer device transfers the containers from the container forming machine to the filling device by means of a vertical displacement and a horizontal displacement of the containers, both displacements being carried out simultaneously, reciprocating and coplanarly, and in that the filling device comprises a chassis on which an endless vertical conveyor is positioned which follows a path formed by an ascending section and by a descending section which run parallel to and facing one another, linked by their corresponding ends by means of semicircular sections, the endless conveyor being equipped with one or more mechanisms to support the regularly distributed containers, simultaneously displaceable and so that each of them successively and sequentially occupies the lower end of the ascending section, or position where the containers supplied by the transfer device are received, the upper end of the ascending section, or position where the containers are opened in order to be filled, the upper end of the descending section, or position where the containers are filled with the product to be packaged and the lower end of the descending section, or position where the containers filled with the product to be packaged are sealed, from where they are placed on a means of evacuation for filled, closed containers.

[0008] The characteristics of the disclosed transfer device and filling device provide an innovative solution to the problems caused by the displacement of containers filled with the product to be packaged, before being sealed. In effect, the fact that the full containers are displaced following a vertical path from the upper end of

the descending section, where the means of filling the containers are positioned, to the lower end of the descending section, where the means of sealing the containers is positioned, means that the level of the product in the container remains horizontal, regardless of the speed at which said displacement is made. Thus, with the machine in the invention we manage, firstly, to avoid spilling the packaged product due to accelerations and decelerations during the displacement of the full container and/or soiling the sealing areas, and secondly, an increase in the machine's production in relation to those embodiments of automatic packaging machines in which the full containers, before being sealed, are displaced following a path in a straight or curved line.

[0009] According to another characteristic of the machine in the invention, the transfer device comprises a chassis equipped with two vertical axles parallel to and facing one another upon which a transfer gripper box may be displaced, making a reciprocating motion driven by a linear drive mechanism.

[0010] It is also characteristic of the machine according to the invention that the transfer gripper box comprises a pair of drive pulleys of different diameters, jointly and coaxially connected to one another, and a pair of driven pulleys of different diameters jointly and coaxially connected to one another, with both pairs of pulleys positioned vertically and coplanarly in relation to the other, with the pair of pulleys with a greater diameter linked by an outer drive belt and the pair of pulleys with a lesser diameter linked by an inner drive belt, and with the pair of drive pulleys connected to a fixed drive mechanism that imparts a reciprocating revolving motion to them, in accordance with the reciprocating motion that the linear drive mechanism imparts to the transfer gripper box.

[0011] Another characteristic of the invention is that the transfer gripper box is equipped with two horizontal axles parallel to one other and situated between the pair of drive pulleys and the pair of driven pulleys, adjusted so that upon these a number of transfer grippers, connected to the sides of the drive belts may be moved in both directions, making a reciprocating motion.

[0012] According to another characteristic of the invention, a first transfer gripper is connected to the upper side of the outer drive belt; a second transfer gripper, adjacent to the first, is connected to the upper side of the inner drive belt; a third transfer gripper, adjacent to the second, is connected to the lower side of the inner drive belt; and a fourth transfer gripper, adjacent to the third, is connected to the lower side of the outer drive belt, all adjusted so that the reciprocating rotation of the drive pulleys causes the reciprocating motion of the transfer grippers on the horizontal axles, so that the transfer grippers connected to the upper sides and the transfer grippers connected to the lower sides remain in positional symmetry in relation to a theoretical main cross axis of the horizontal axles.

[0013] The invention is also characterized in that the linear drive mechanism comprises a cam to which the

input arm of a first-order lever is connected, whose output arm is in turn connected to the foot of a connecting rod, while the head of the connecting rod is joined to the transfer gripper box, all adjusted so that the rotation of the cam causes the reciprocating motion of the lever, which the connecting rod then imparts to the transfer gripper box.

[0014] According to another characteristic of the invention, the fixed drive mechanism comprises a drive arm connected by one end to the pair of drive pulleys and by the other end to the foot of a connecting rod whose head is in turn connected to a crank linked to a fixed point.

[0015] It is also characteristic of the packaging machine in the invention that the transfer grippers are adjusted to occupy two positions, a first position for receiving a container from the container forming line and a second position for supporting the container by a centred longitudinal portion.

[0016] Another characteristic of the invention is that the chassis of the filling device comprises two parallel horizontal axles, to which two vertical supports are connected which may be displaced on the horizontal axles in both directions, causing them to move towards or away from each other, with the endless conveyor being connected to the vertical supports.

[0017] According to another characteristic of the invention, the endless conveyor comprises a shaft, connected to the lower ends of the vertical supports and equipped with two driving gearwheels, and two driven gearwheels, positioned at the upper ends of the vertical supports, the corresponding pairs of driving gearwheel and driven gearwheel being linked by means of a conveyor chain, and with the four horizontal mechanisms for supporting the containers being connected to the respective conveyor chains.

[0018] The invention is also characterized in that each support mechanism comprises a first horizontal support axle, connected by one end to a first conveyor chain, so that it occupies a fixed position in relation to this, and by the other end to a second conveyor chain, so that it may be displaced transversally in relation to this; and a second horizontal support axle situated above the first horizontal support axle, connected by one end to the first conveyor chain, so that it may be displaced transversally in relation to this, and by the other end to the second conveyor chain, so that it occupies a fixed position in relation to this, the first horizontal support axle being equipped with a first group of support grippers and the second horizontal support axle with a second group of support grippers, the grippers of both groups being positioned so that a gripper from the first group and a corresponding gripper from the second group allow a container to be supported, and all adjusted so that the displacement of the vertical supports on the horizontal axles of the chassis cause the grippers of one group to move towards or away from the corresponding grippers of the other group, in order to adjust the distance that

separates them to the dimensions of the container.

Brief description of the drawings

[0019] In the attached drawings an embodiment of the automatic packaging machine in the invention is illustrated by means of a non-limiting example. In said drawings:

Figs. 1 and 2 schematically represent respective embodiments of known automatic packaging machines;
 Fig. 3, is a schematic representation of the automatic packaging machine in the invention;
 Fig. 4, is an elevation view of the transfer device of the machine in the invention;
 Fig. 5, is a side view of the transfer device in Fig. 4;
 Fig. 6, is an elevation view of the transfer device according to the invention, in a different stage of operation to that shown in Fig. 4;
 Fig. 7, is a side view of the transfer device and of the filling device of the machine in the invention; and
 Fig. 8, is an elevation view of the filling device of the machine in the invention.

Detailed description of the drawings

[0020] Fig. 3 shows, schematically and in perspective, the automatic packaging machine according to the invention that is described as an example of embodiment. It can be seen that the machine comprises a container forming machine FM and a filling device FD, both devices FM and FD being linked by means of a container transfer device, which, to keep things simple, has not been shown in Fig. 3 and which has been shown in Figs. 4 to 7, which transfers the containers from the forming machine FM to the filling device FD.

[0021] The forming machine FM essentially comprises a means of feeding a sheet 1 of heat sealable material; a means of sealing 2 the containers 3 in the form of bags; and a means of cutting 4 to separate the containers 3 from the continuously formed sheet 1. In this example of embodiment the means of cutting 4 proceed to cut and separate the formed sheet 1 of four containers 3, simultaneously.

[0022] In Figs. 4 and 5 it can be seen that the transfer device TD comprises a quadrangular-shaped chassis 10 equipped with two vertical axles 11 positioned parallel to and facing one another and upon which a transfer gripper box 12 may be displaced, making a reciprocating vertical motion driven by a linear drive mechanism 13 that will later be described.

[0023] The transfer gripper box 12 contains a pair of drive pulleys connected jointly and coaxially in relation

to one another, of which the drive pulley with a greater diameter is 14 and the drive pulley with a lesser diameter is 15, and a pair of driven pulleys also connected jointly and coaxially in relation to one another, of which the driven pulley with a greater diameter is 16 and the driven pulley with a lesser diameter is 17, the pair of drive pulleys 14 and 15 and the pair of driven pulleys 16 and 17 being positioned horizontally and coplanarly. The pulleys with a greater diameter, drive pulley 14 and driven pulley 16, are linked by means of an outer drive belt 18, while the pulleys with a lesser diameter, drive pulley 15 and driven pulley 17, are linked by means of an inner drive belt 19. The drive pulleys 14 and 15 are connected to a fixed drive mechanism 20 which will later be described and which imparts a reciprocating rotary motion to the drive pulleys 14 and 15, all being adjusted so that the simultaneous rotation of the drive pulleys 14 and 15 also causes the simultaneous displacement of the drive belts in directions A and B shown in Fig. 4.

[0024] The transfer gripper box 12 also contains two horizontal axles 21, positioned between the pair of drive pulleys 14 and 15 and the pair of driven pulleys 16 and 17 and they are parallel to one another. Connected to the two horizontal axles 21 are four transfer grippers, shown with references 22 to 25, which may be displaced in directions A and B. The first transfer gripper 22 is connected to the upper side of the outer drive belt 18; the second transfer gripper 23 is positioned next to the first 22 and is connected to the upper side of the inner drive belt 19; the third transfer gripper 24 is positioned next to the second 23 and is connected to the lower side of the inner drive belt 19; and the fourth transfer gripper 25 is positioned next to the third 24 and is connected to the lower side of the outer drive belt 18.

[0025] The linear drive mechanism 13 comprises a cam 26 to which the input arm 27 is connected, that of a first-order lever 28 in which the fulcrum 29 is joined to a fixed point, while the output arm 30, which forms an angle with the input arm 27, is connected to the foot of a connecting rod 31 whose head is connected to the transfer gripper box 12; the rotation of the cam 26, by means of an operation which is not shown, causes a reciprocating rotary motion of the lever around the fulcrum 29 and a reciprocating vertical translation motion of the connecting rod 31 and of the transfer gripper box 12. The fixed drive mechanism 20 comprises a drive lever 32 which is connected by one end to the pair of driving wheels 14 and 15, while its other end is connected to the foot of a connecting rod 33, the head of the connecting rod 33 being connected to a crank 34 joined by means of a vertical support 35 to a fixed point 36.

[0026] In Fig. 5 it can be seen that each transfer gripper comprises a horizontal fixed arm 37 and a horizontal moving arm 38, the moving arm 38 being able to be displaced in both directions shown C and D, the inner end of the moving arm 38 being joined to the output arm 39 of a first-order lever 40 whose input arm 41 is connected to a pneumatic cylinder 42; all adjusted so that the mov-

ing arm 38 may occupy two positions, the first for receiving a container 3, from the means of cutting 4 of the forming machine FM, and a position for closing (Fig. 5) in which the container 3 is centrally supported by its upper end.

[0027] A description of how the transfer device TD works follows. In Fig. 7 it can be seen that the transfer device TD is positioned under the filling device FD; the transfer gripper box 12 is in a lower position for receiving containers 3; the transfer grippers 22 to 25, are in a closed position, each of them centrally supporting a corresponding container 3 by its upper end; and, as can be seen in Fig. 4, the transfer grippers 22 to 25 are each positioned as close as possible to the next, the pair of first and second transfer grippers 22 and 23, and the pair of third and fourth transfer grippers 24 and 25 keeping in positional symmetry in relation to a theoretical cross axis Y-Y of the transfer gripper box 12.

[0028] This being the case, once the containers 3 have been separated from the continuously formed sheet 1 by the means of cutting 4, the rotation of the cam 26, by means of the first-order lever 28 and the connecting rod 31, causes the transfer gripper box 12 to be pushed upwards; the drive pulleys 14 and 15 are rotated by means of the drive lever 32 of the connecting rod 33 and the crank 34 in a direction such that it imparts to the upper side of the outer drive belt 18 and to the upper side of the inner drive belt 19, a displacement in the direction shown as B, and to the lower side of the inner drive belt 19 and to the lower side of the outer drive belt 18, a displacement in the direction shown as A; consequently, the rotation of the drive pulleys 14 and 15 during the lifting of the transfer gripper box 12 produces, by means of the drive belts 18 and 19, the separation of two adjoining transfer grippers, at the same time as the position of each pair of transfer grippers keeps in symmetry in relation to the cross axis Y-Y. In Fig. 6 it can be seen that the transfer gripper box 12 has reached a high transfer position, with the transfer grippers 22 to 25 occupying a position in which the containers 3 are collected by the filling device FD. Once the containers 3 are collected by the filling device FD, the rotation of the cam 26 brings about the lowering of the transfer gripper box 12; the rotation of the drive pulleys 14 and 15 in the opposite direction to before; the displacements of the drive belts 18 and 19 in the opposite direction to before; and the positioning of the transfer grippers 22 to 25 specified in Fig. 4, situated in order to support another group of containers 3.

[0029] In Figs. 7 and 8 it can be seen that the filling device FD comprises a chassis 43 upon which an endless conveyor 44 is positioned, which consists of an ascending section and a descending section that are parallel to and facing one another, linked by their respective ends by means of semicircular sections, upon which four horizontal support mechanisms 56 for containers 3 are mounted.

[0030] Fig. 3 shows a simplified drawing of the filling

device FD, showing at the lower end I of the ascending section of the endless conveyor 44 the position for transferring the containers 3 from the forming machine FM to the filling device FD; at the upper end II of the ascending section the position for opening the containers 3 in order to fill them, making said opening operation by means of suction nozzles 48; at the upper end III of the descending section the position for filling the containers 3 with the product to be packaged, by means of dispensing nozzles 49; and at the lower end IV of the descending section the position for closing the full containers 3, by means of a sealing device 50. The containers 3, once closed, are placed on a means of evacuating the containers, consisting of a conveyor belt 51.

[0031] The chassis 43 comprises two horizontal axes 45 parallel to one another upon which two vertical supports 46 may be displaced in both directions, shown as E and F in Fig. 8, upon which the endless conveyor 44 is mounted.

[0032] The endless conveyor 44 comprises an intermittent rotation system of 180° 53, equipped with a shaft 47 connected to the lower ends of the vertical supports 46, the shaft 47 being equipped with two driving gearwheels 52 positioned between the two supports 46; two driven gearwheels 54 positioned at the top ends of the vertical supports 46, facing one another and coplanarly in relation to the driving gearwheels 52; and a first and second conveyor chain 55 and 58, each of them linking a driving gearwheel 52 with its corresponding driven gearwheel 54, with the four regularly distributed horizontal support mechanisms 56 mounted on both conveyor chains 55 and 58.

[0033] In Fig. 8 it can be seen that each horizontal support mechanism 56 comprises a first horizontal support axle 57 connected by one end to the first conveyor chain 55, so that it occupies a fixed position in relation thereto, while its other end is connected to the second conveyor chain 58 which may be displaced transversally in relation thereto; and a second horizontal support axle 59 situated above the first horizontal support axle 57, connected by one of its ends to the first conveyor chain 55 which may be displaced transversally in relation thereto, while the other end is connected to the second conveyor chain 58 so that it occupies a fixed position in relation thereto.

[0034] The first horizontal support axle 57 is equipped with a first group of support grippers consisting of four support grippers 60, positioned so that the distance that separates one of them from another adjacent one is constant, while the second horizontal support axle 59 is equipped with a second group of support grippers consisting of four support grippers 61, positioned so that the distance that separates one of them from another adjacent one is constant. Both groups of support grippers are positioned so that support grippers 60 from the first group of grippers and the corresponding support gripper 61 from the second group of grippers allow a container 3 to be held.

[0035] The previously described horizontal support mechanisms for the containers 56 allow the distance that separates the pairs of support grippers 60 and 61 of the containers 3 to be adjusted to the width of the container in the following way. The displacement of the vertical supports 46 upon the horizontal axles 45 of the chassis 43, causes the displacement of the horizontal support axles 57 and 59 of each of the horizontal support mechanisms 56, these being joined to a respective conveyor chain 55 and 58. To be precise, the displacement of the vertical supports 46 towards one other causes the support grippers 60 and 61 of each pair of support grippers for a container 3 to move away from each other, while the displacement of the vertical supports 46 away from each other, causes the support grippers 60 and 61 of each pair of support grippers for a container 3 to move towards each other.

Claims

1. Automatic packaging machine, of the kind that comprises a forming machine (FM) for containers (3) of a heat sealable material in the form of bags and a filling device (FD) for the containers (3) with the product to be packaged, linked by means of a transfer device (TD) positioned under the filling device (FD) that transfers containers (3) from the forming machine (FM) to the filling device (FD), that is **characterized in that** the transfer device (TD) transfers the containers (3) from the forming machine (FM) to the filling device (FD) by means of a vertical displacement and a horizontal displacement of the containers, making both movements simultaneously, reciprocating and coplanarly, and **in that** the filling device (FD) comprises a chassis (43) on which an endless vertical conveyor (44) is positioned that follows a path formed by an ascending section and a descending section which are parallel to and facing one another, linked by their corresponding ends by means of semicircumferential sections, the endless conveyor being equipped with one or more support mechanisms (56) for the containers (3) regularly distributed, which may be displaced simultaneously and so that each of them occupies, successively and sequentially, the lower end of the ascending section, or position for receiving the containers (3) supplied by the transfer device (TD), the upper end of the ascending section, or position for opening the containers (3) in order to fill them, the upper end of the descending section, or position for filling the containers (3) with the product to be packaged and the lower end of the descending section, or position for sealing the containers (3) filled with the product to be packaged, from where they are placed upon a means of evacuation (51) for full or dosed containers (3).
2. Automatic packaging machine according to claim 1, which is **characterized in that** the transfer device (TD) comprises a chassis (10) equipped with two vertical axles (11) which are parallel to and facing one another upon which a transfer gripper box (12) may be displaced, making a reciprocating motion driven by a linear drive mechanism (13).
3. Automatic packaging machine according to claim 2, which is **characterized in that** the transfer gripper box (12) comprises a pair of drive pulleys of different diameters (14, 15), connected jointly and coaxially in relation to one another, and a pair of driven pulleys (16, 17) of different diameters, connected jointly and coaxially in relation to one another, both pairs of pulleys (14, 15; 16, 17) being positioned vertically and coplanarly in relation to one another, the pair of pulleys with a greater diameter (14, 16) being linked by an outer drive belt (18) and the pair of pulleys with a lesser diameter (15, 17) linked by an inner drive belt (19), and the pair of drive pulleys (14, 15) being connected to a fixed drive mechanism (20) that imparts a reciprocating rotary motion to them, in accordance with the reciprocating motion that the linear drive mechanism (13) imparts to the transfer gripper box (12).
4. Automatic packaging machine according to claims 2 and 3, which is **characterized in that** the transfer gripper box (12) is equipped with two horizontal axles (21) parallel to one another and situated between the pair of drive pulleys (14, 15) and the pair of driven pulleys (16, 17), adjusted to allow a number of transfer grippers (22, 23, 24, 25), connected to the sides of the drive belts (18, 19) to be displaced on these in both directions, making a reciprocating motion.
5. Automatic packaging machine according to claims 2 to 4, which is **characterized in that** a first transfer gripper (22) is connected to the upper side of the outer drive belt (18); a second transfer gripper (23), adjacent to the first (22), is connected to the upper side of the inner drive belt (19); a third transfer gripper (24), adjacent to the second (23), is connected to the lower side of the inner drive belt (19); and a fourth transfer gripper (25), adjacent to the third (24), is connected to the lower side of the outer drive belt (18), all adjusted so that the reciprocating rotation of the drive pulleys (14, 15) causes the reciprocating motion of the transfer grippers (22, 23, 24, 25) upon the horizontal axles (21), so that the transfer grippers (22, 23) connected to the upper sides and the transfer grippers (24, 25) connected to the lower sides are in positional symmetry in relation to a main theoretical cross axis (Y-Y) of the horizontal axles (21).

6. Automatic packaging machine according to claim 2, that is **characterized in that** the linear drive mechanism (13) comprises a cam (26) to which the input arm (27) of a first-order lever (28) is connected, whose output arm (30) is in turn connected to the foot of a connecting rod (31), while the head of the connecting rod (31) is joined to the transfer gripper box (12), all adjusted so that the rotation of the cam (26) causes the reciprocating motion of the lever (28), which the connecting rod (31) then imparts to the transfer gripper box (12). 5 10
7. Automatic packaging machine according to claim 3, which is **characterized in that** the fixed drive mechanism (20) comprises a drive arm (32) connected by one end to the pair of drive pulleys (14, 15) and by its other end to the foot of a connecting rod (33), whose head is in turn connected to a crank (34) linked to a fixed point (36). 15 20
8. Automatic packaging machine according to claim 2, which is **characterized in that** the transfer grippers (22, 23, 24, 25) are adjusted to occupy two positions, a first position for receiving a container (3) from the container forming machine (FM) and a second position for supporting the container (3) by a centred longitudinal portion. 25
9. Automatic packaging machine according to claim 1, which is **characterized in that** the chassis (43) of the filling device (FD) comprises two parallel horizontal axles (45), to which two vertical supports (46) are connected which may be displaced on the horizontal axles (45) in both directions, causing them to move closer to or further from one another, the endless conveyor (44) being connected to the vertical supports (46). 30 35
10. Automatic packaging machine according to claim 9, which is **characterized in that** the endless conveyor (44) comprises a shaft (47), connected to the lower ends of the vertical supports (46) and equipped with two driving gearwheels (52), and two driven gearwheels (54), positioned at the upper ends of the vertical supports (46), the corresponding pairs of driving gearwheel (52) and driven gearwheel (54) being linked by means of a conveyor chain (55, 58), with the support mechanisms (56) for the containers (3) being connected to the respective conveyor chains (55, 58). 40 45 50
11. Automatic packaging machine according to claims 9 and 10, which is **characterized in that** each support mechanism (56) comprises a first horizontal support axle (57), connected by one end to a first conveyor chain (55), so that it occupies a fixed position in relation thereto, and by the other end to a second conveyor chain (58), so that it may be dis-

placed transversally in relation thereto; and a second horizontal support axle (59) situated above the first horizontal support axle (57), connected by one end to the first conveyor chain (55), so that it may be displaced transversally in relation thereto, and by the other end to the second conveyor chain (58), so that it occupies a fixed position in relation thereto, the first horizontal support axle (57) being equipped with a first group of support grippers (60) and the second horizontal support axle (59) with a second group of support grippers (61), the grippers of both groups being positioned so that a gripper from the first group and a corresponding gripper from the second group allow a container (3) to be held, and all being adjusted so that the displacement of the vertical supports (46) upon the horizontal axles (45) of the chassis (43) causes the grippers (60) of one group to move towards or away from the corresponding grippers (61) of the other group, in order to adjust the distance that separates them to the dimensions of the container (3).

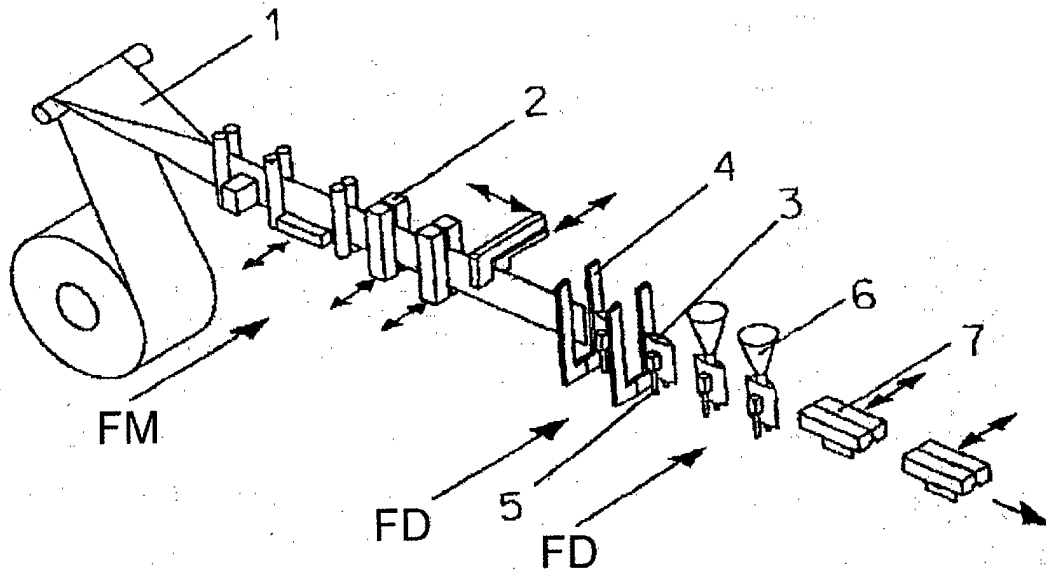


FIG. 1

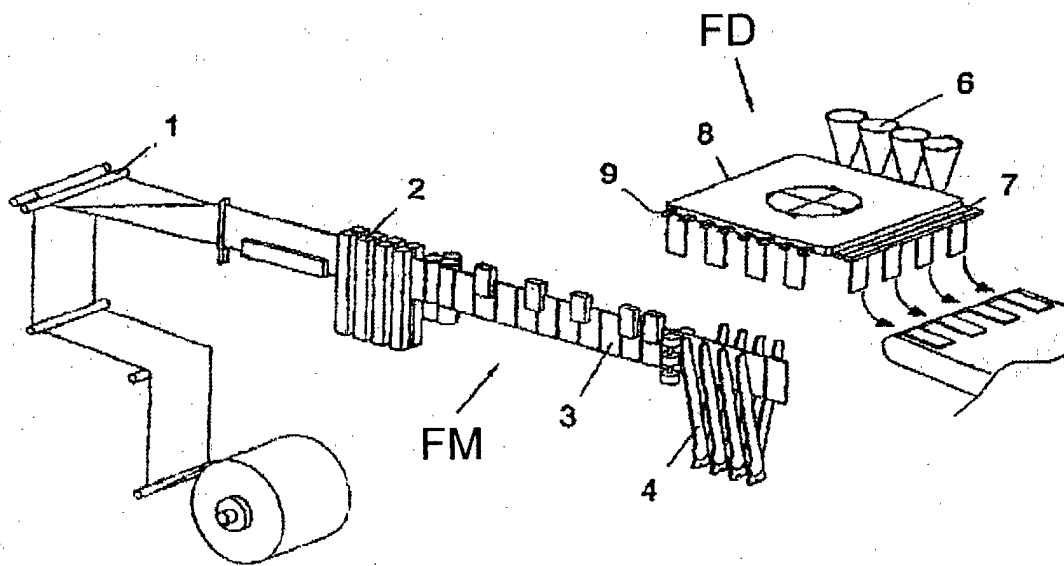


FIG. 2

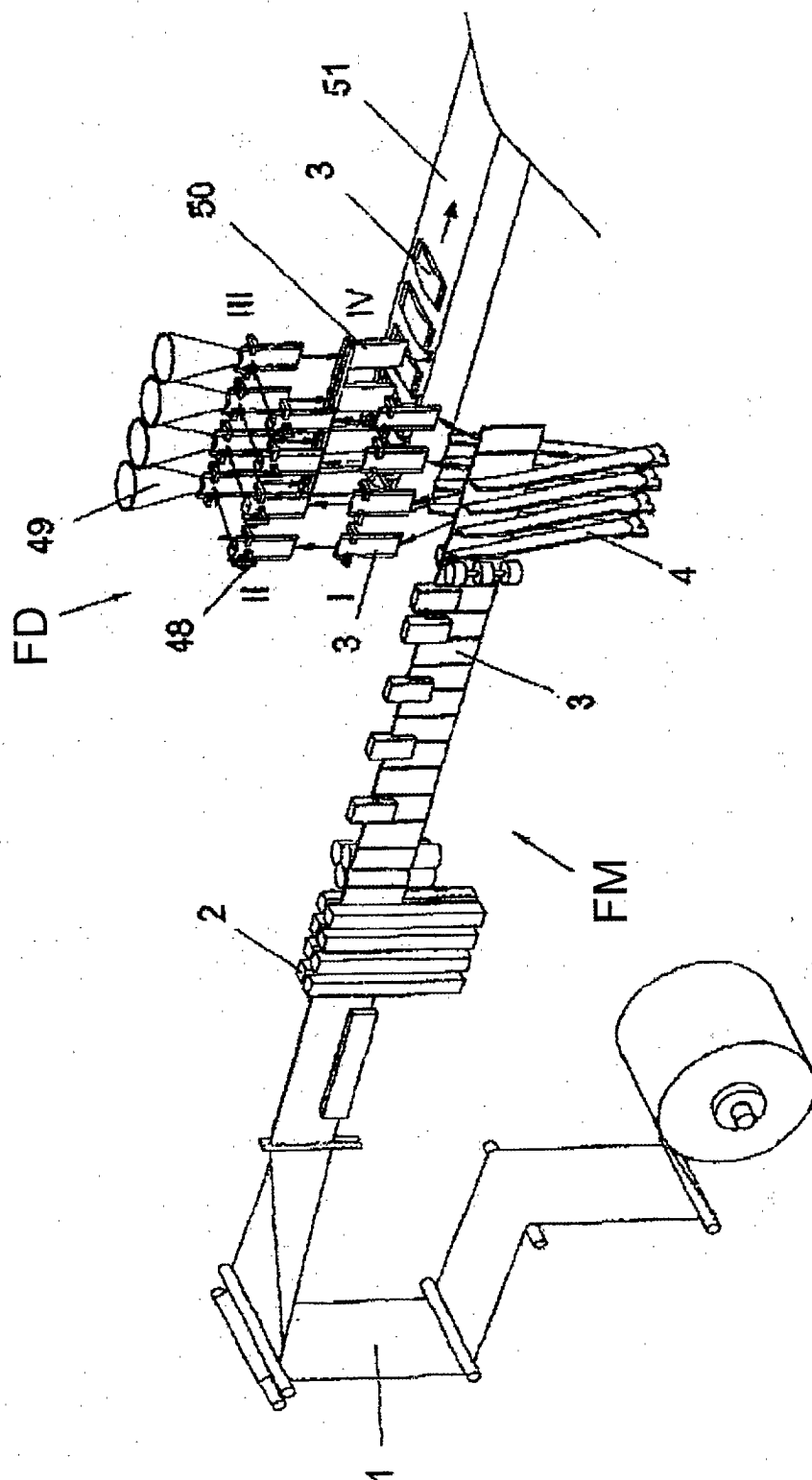


FIG. 3

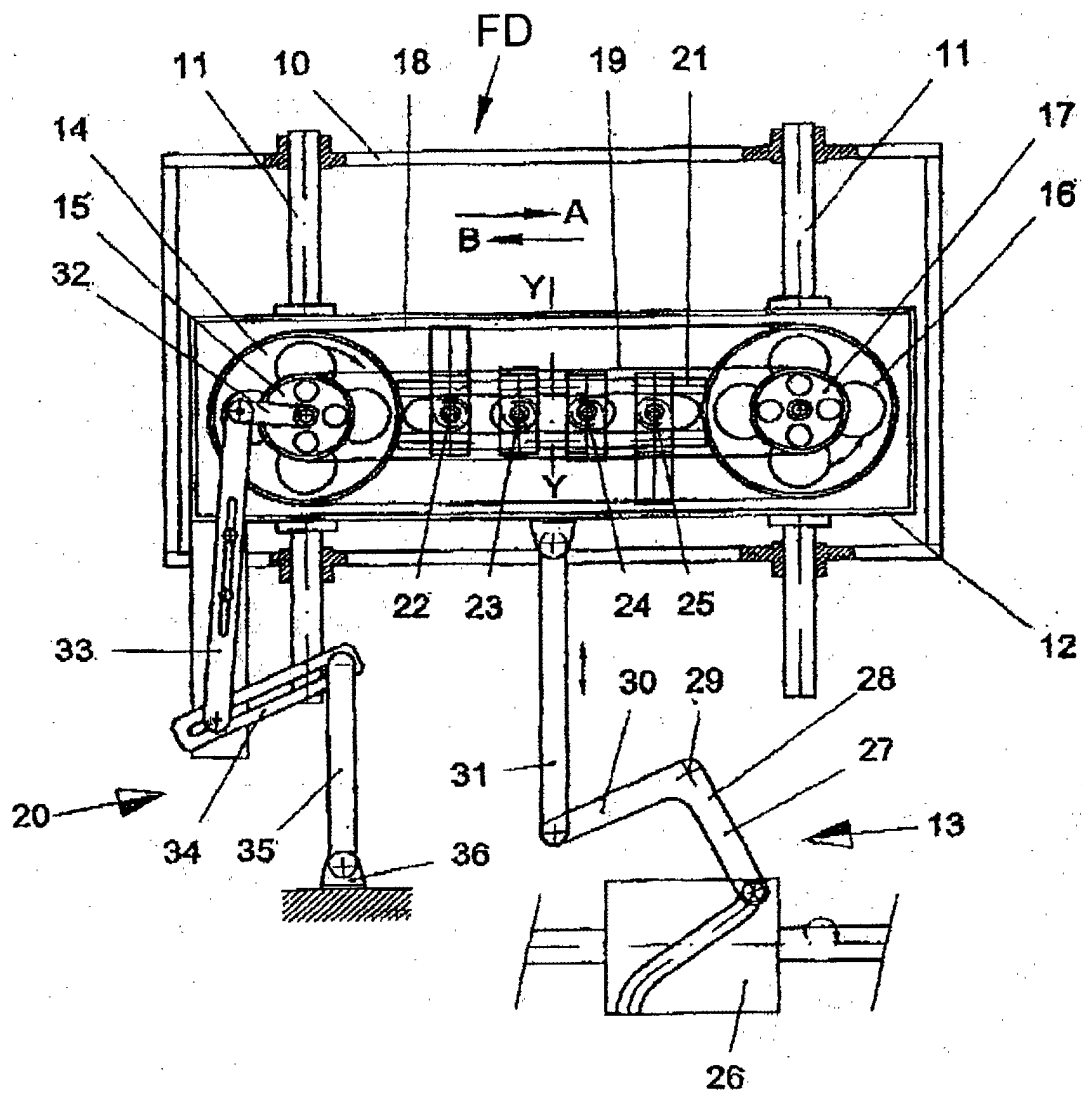
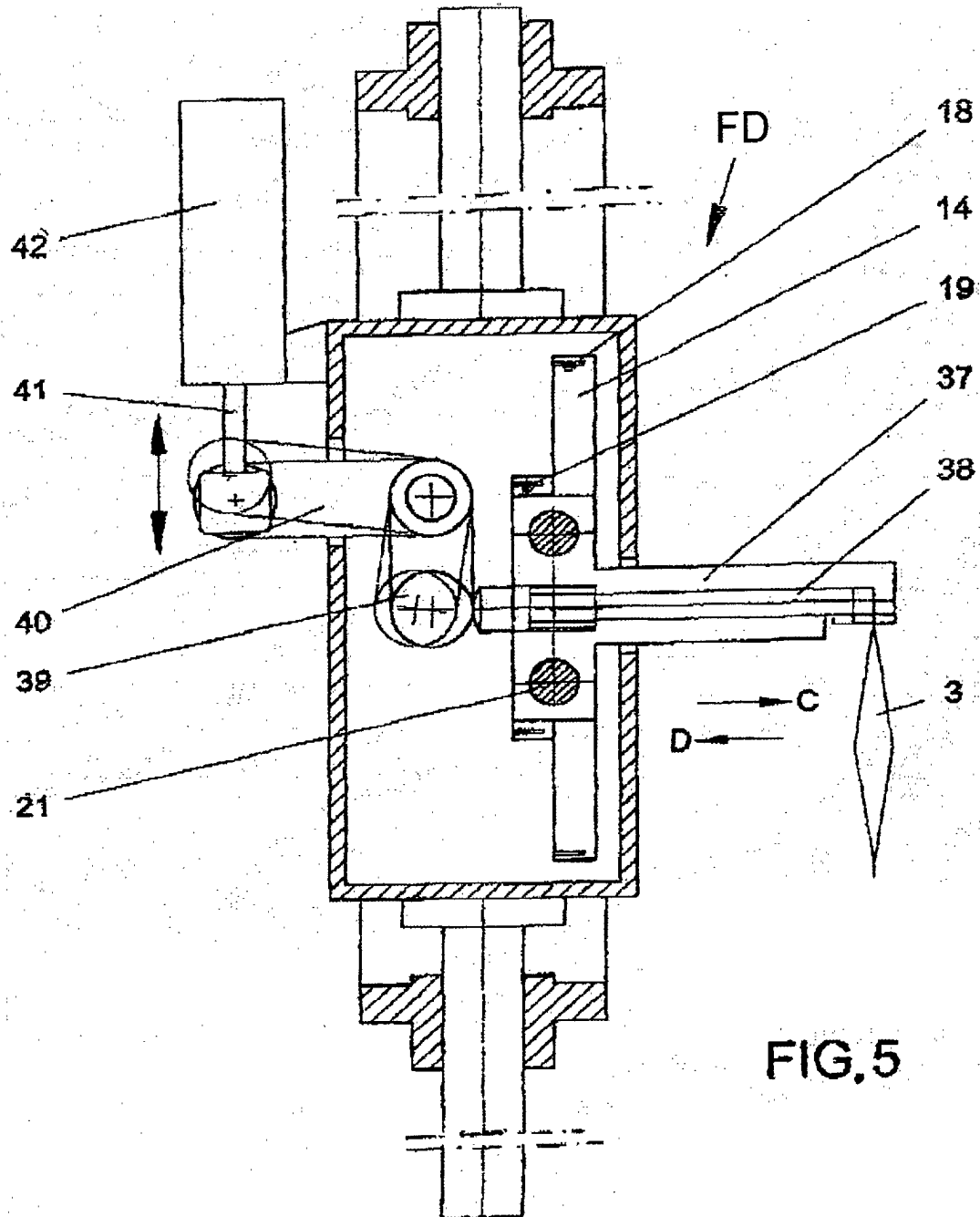


FIG. 4



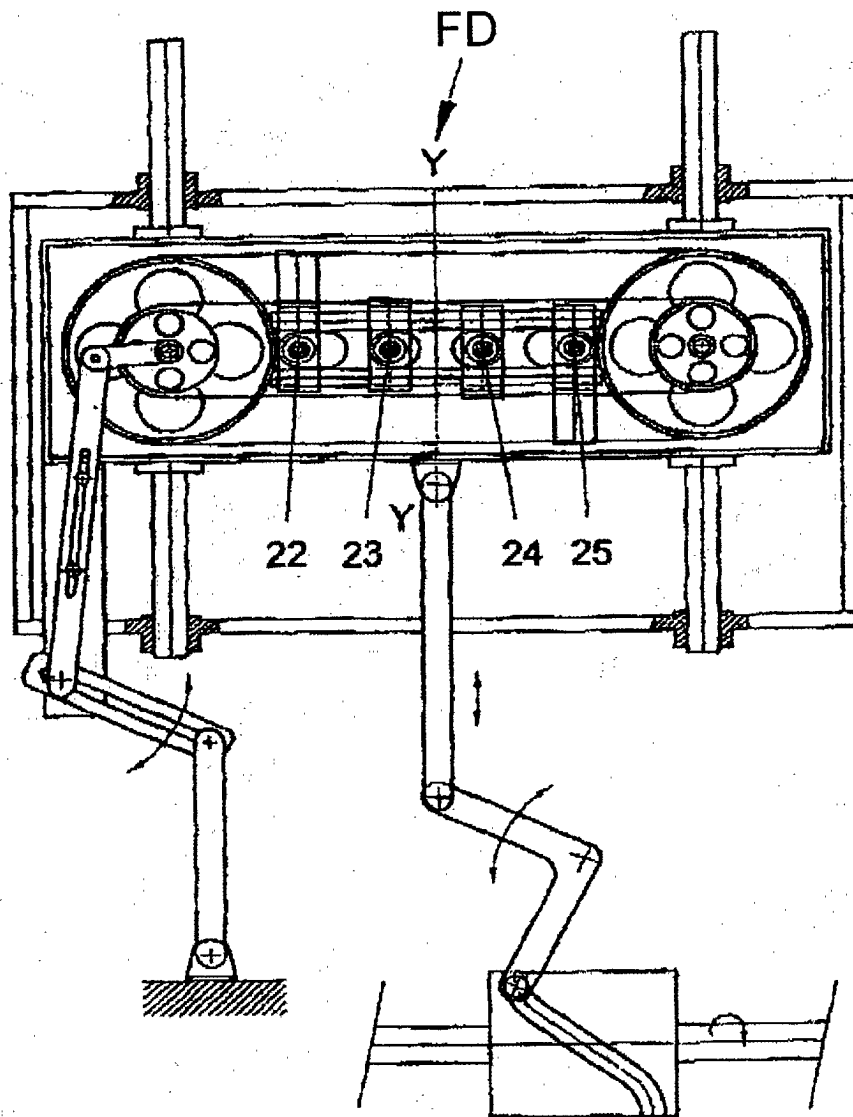


FIG.6

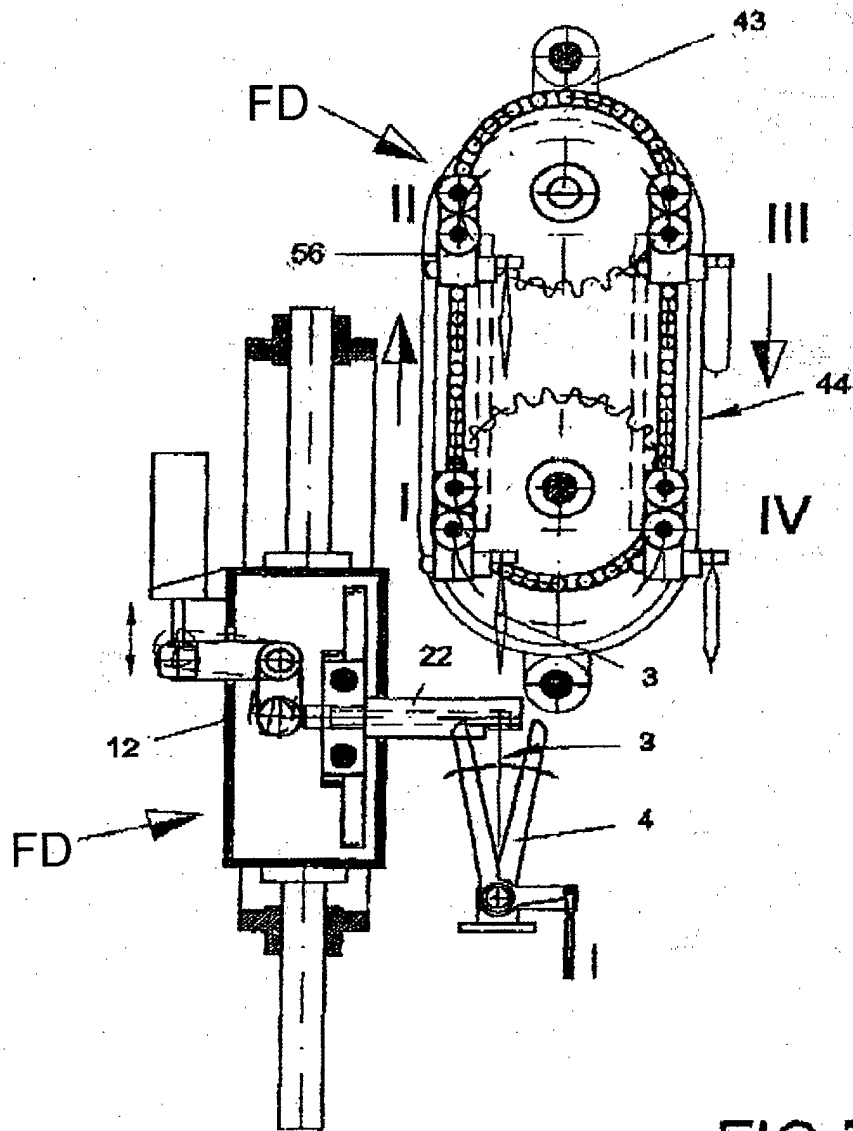


FIG. 7

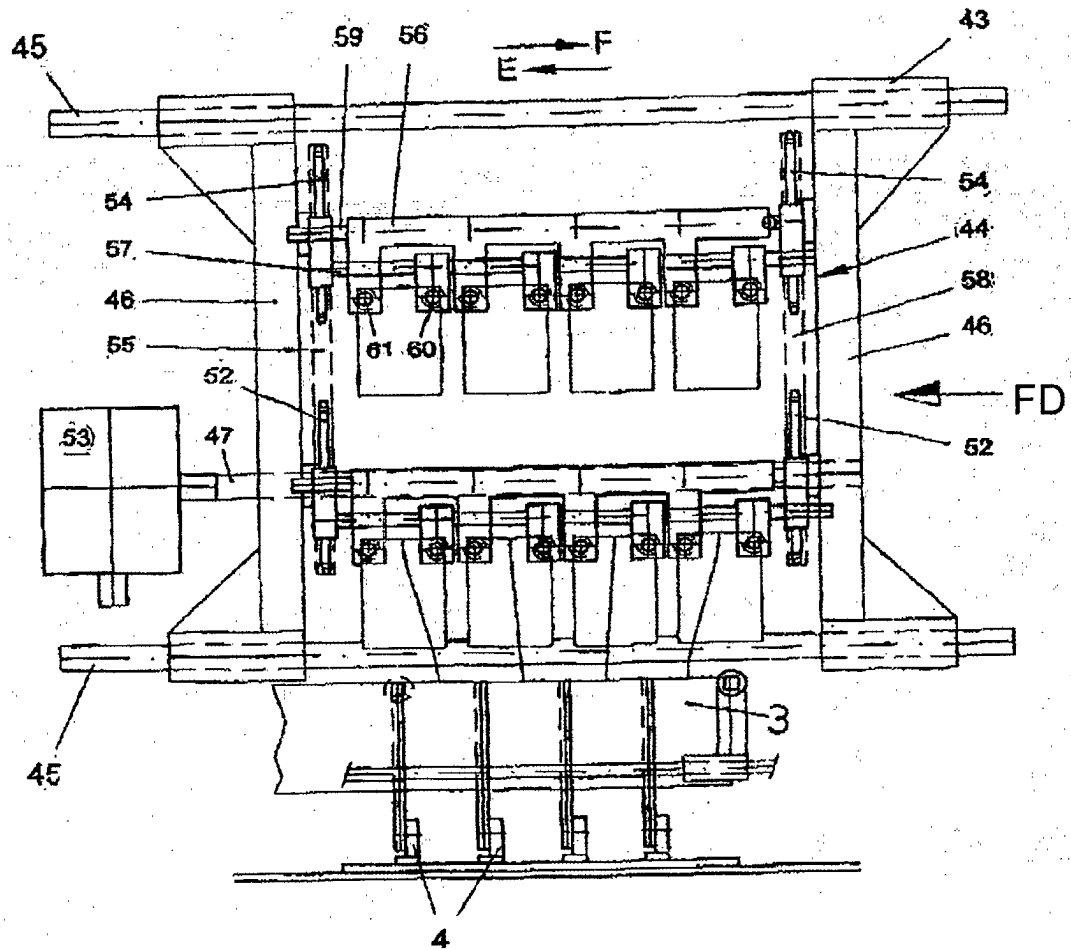


FIG. 8

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES 02/00586

A. CLASSIFICATION OF SUBJECT MATTER		
IPC ⁷ B65B3/02		
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 ⁷ B65B3, B65B1, B65B9		
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 practicable, search terms used)		
EPODOC, WPI, PAJ, CIBEPAT		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	ES 2098169 B1 (BATALLA) 16.04.1997 Abstract; claims 1-4; figures	1-11
A	US 4509313 A (KOPPE) 09.04.1985 See the whole document	1-11
A	ES 2017255 A6 (VOLPAK) 16.01.1991 Abstract; figure 1	6,7
A	EP 1172295 A1 (VOLPAK) 16.01.2002 See the whole document	1,2
A	EP 0765807 A1 (BOSSAR) 02.04.1997 Abstract; figures 1,2	1,2
A	ES 2161111 B1 (BOSSAR) 16.11.2001 See the whole document	1,2
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family 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 "&" document member of the same patent family		
Date of the actual completion of the international search 26 March 2003 (26.03.03)		Date of mailing of the international search report 28 March 2003 (28.03.03)
Name and mailing address of the ISA/ SPTO		Authorized officer
Facsimile No.		Telephone No.

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INTERNATIONAL SEARCH REPORT
 Information on patent family members

International Application No

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ES 2098169 B1	16.04.1997	NONE	---
US 4509313 A	09.04.1985	US 4353198 A	12.10.1982
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EP 1172295 A1	16.01.2002	WO 0110715 A AU 6443600 A ES 2156563 A	15.02.2001 05.03.2001 16.06.2001
EP 0765807 A1	02.04.1997	WO 9633094 A ES 2117929 A US 5862653 A	24.10.1996 02.04.1997 16.08.1998
ES 2161111 B1	16.11.2001	NONE	----

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