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(54) Filling and sealing machine and method for filling and sealing of a bag

(57) An apparatus for filling and sealing a bag with a filling opening, comprising a drive which is arranged for moving a sealing bar relative to a pressure bar between a clamping position and a rest position, first retaining means and second retaining means for retaining the bag on both sides of the filling opening, a drive and a mechanical coupling for coupling the movement of the clamping position to the rest position of the sealing and/or pressure bar to a movement of the first retaining means with respect to the second retaining means.

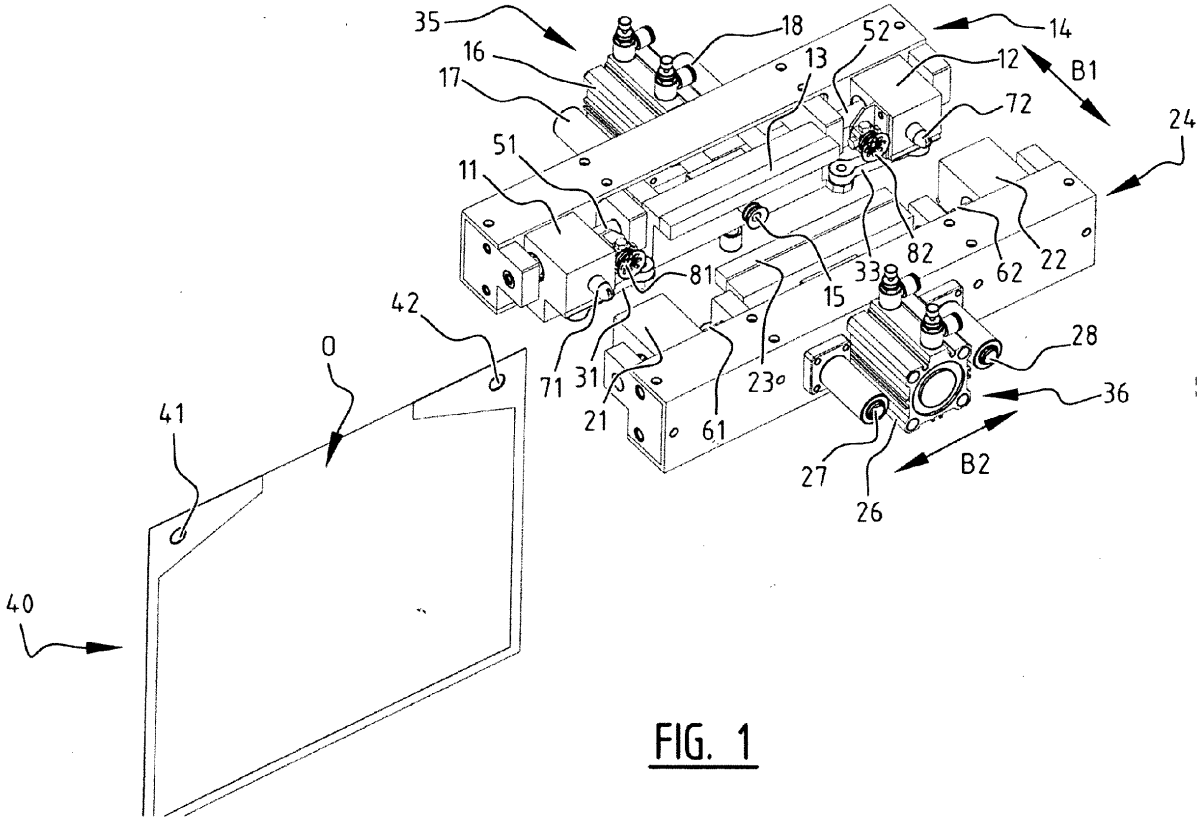

FIG. 1

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Description

[0001] The present invention relates to an apparatus and a method for filling and welding (sealing) of a bag. Furthermore, the invention relates to an apparatus and method for supplying a bag to a filling and / or sealing device. Finally, the invention relates to a bag, in particular for use in such an apparatus or method.

[0002] There are known apparatus and methods in which a bag is filled first in a first filling station and then brought to a welding station where the filling opening is sealed.

[0003] According to a first aspect, the present invention is to provide a device and a method with which a bag is filled and sealed in an improved and more efficient manner.

[0004] To that end, one embodiment of a device according to the invention comprises a sealing bar and a pressure bar, an actuator, first and second retaining means, and a mechanical coupling between the sealing bar and the first and / or second retaining means and between the pressure bar and the first and / or second retaining means. The sealing bar and pressure bar are arranged there between for receiving at least a peripheral edge of one or more filling openings of the bag and for welding of this peripheral edge. The actuator is arranged for moving the sealing bar in relation to the drive bar between a clamping position and a rest position in which the pressure bar and the sealing bar are at a distance from each other. The first retaining means and second retaining means are adapted for retaining the bag on both sides of the one or more filling openings, and are provided on both sides of the welding and pressure bar. The mechanical coupling is arranged for the coupling of a movement of the sealing bar in relation to the pressure bar from the clamping position to the rest position to a movement of the first retaining means with respect to the second retaining means from a tensioning position to a filling position. In the filling position, the distance between the first and second retaining means is smaller than in the clamping position in such a way that the one or more filling openings will be open.

[0005] Such a device has the advantage of being compact and to enable a filling and welding operation close to each other, without the bag having to be transferred from one station to another.

[0006] It is noted that, according to a possible embodiment, the pressure bar itself may also be a sealing bar.

[0007] The mechanical coupling is preferably arranged to move towards each other the first and second retaining means when the actuator brings the sealing bar and the pressure bar into the rest position and to move away from each other the first and second retaining means when the actuator brings the sealing bar and pressure bar from the rest position to the clamping position.

[0008] According to an advantageous embodiment of this invention, the mechanical coupling comprises a first rod that is pivotally connected at one end with the first retaining means and at another end with the sealing bar; and a second rod that is pivotally connected at one end to the first retaining means and at another end with the pressure bar. In this way, a moving apart of the pressure bar and the sealing bar will entrain that the first and second rod brings the first retaining means closer to the second retaining means. Preferably, the mechanical coupling also includes a third bar which is pivotally connected at one end with the second retaining means and at another end with the sealing bar, and a fourth rod that is pivotally connected at one end to the second retaining means and on the other end with the pressure bar. In this way, the first and second retaining means both move when the sealing bar moves relative to the pressure bar.

[0009] The actuator is preferably arranged to move the sealing bar in relation to the pressure bar in a first movement direction. The first and / or the second retaining means are preferably movably mounted in a second movement direction that is perpendicular to the first movement direction.

[0010] According to an advantageous embodiment, the pressure bar and / or the sealing bar are provided with a suction cup which is adapted to be pulled from a peripheral edge portion of a filling opening of the bag when the pressure bar and / or the sealing bar move to the rest position. This facilitates the opening of the bag while the distance between first and second retaining means decreases as a result of the mechanical coupling.

[0011] According to an advantageous embodiment, the first retaining means comprise a first and a second clamping block, between which a first side of the bag can be clamped. Also, the second retaining means may comprise a first and a second clamping block, between which include a second side of the bag can be clamped. In the case four rods are used as a mechanical coupling, the first and the second clamping block of the first retaining means are preferably pivotally connected respectively with the first and the second rod, and the first and the second clamping block of the second retaining means are preferably pivotally connected to with respectively the third and the fourth rod. The first clamping block(s) is preferably movable along a first guide shaft that extends in the second direction of movement and the second clamp block(s) is preferably movable along a second guide shaft that also extends in the second direction of movement. Although an embodiment with clamping blocks is advantageous, one skilled in the art understands that other embodiments of the first and second retaining means, such as gripping clamps and the like are also included within the scope of the invention.

[0012] According to an advantageous embodiment, the first and the second clamping block of the first retaining means are designed in such a way that a mechanical coupling arises when the first clamping block is placed against the second clamping block for holding a bag. In an analogous manner, the first and the second clamping block of the second retaining means are arranged so that a mechanical coupling arises when the first clamping

block is placed against the second clamping block for holding a bag. In this way, the first and the second clamping block are forced to move together and a synchronous movement of the pressure bar and of the sealing bar is guaranteed. This results in that a filling opening is safely opened during the movement towards each other of the first and second retaining means.

[0013] According to a possible embodiment, the clamping block or each first clamping block is provided with a pin arranged to stabbing through a hole in the bag and the second clamp block or each second clamp block is provided with a recess that can accommodate the pin. In this way, a bag can be positioned in a convenient way on the first clamping blocks, after which the bag can be clamped between the first and the second clamping blocks. Furthermore, such a pin acts with the associated recess as a mechanical coupling that ensures that the first and the second suspension block move together.

[0014] According to an advantageous embodiment, a first mounting piece is provided that is coupled to the sealing bar and a second mounting piece that is coupled to the pressure bar. Each of the first clamping block is preferably movably mounted on a first mounting piece on both sides of the sealing bar, and each second clamp block is preferably movably mounted on the second mounting piece, on both sides of the pressure bar. The actuator is preferably provided with a first and a second drive shaft supported in a first and second driving block that is affixed to, respectively, the first and second mounting piece. For guiding the movement of the clamping blocks, preferably first and second guide shafts are mounted on respectively the first and second mounting piece, whereby the clamping blocks are movable along these shafts. One or more guide shafts may further be provided, parallel to the first and second drive shaft, for guiding the movement of the sealing bar and the pressure bar.

[0015] According to an advantageous embodiment of this invention, the first and / or second retaining means comprise one or more suction cups for vacuum attachment of a bag. In the case a first and a second clamping block is provided, suction cups may be arranged for instance to affix a bag against the first clamping blocks before the second clamping blocks are placed against the first clamping blocks.

[0016] According to another aspect of the invention, there is provided a method for filling and sealing a bag. According to one embodiment, the method comprises: holding the bag by means of first and second retaining means on either side of one or more filling openings, wherein a sealing bar and pressure bar press against the peripheral edge portions of the one or more filling openings; moving away from each other the sealing bar and the pressure bar while the first and second retaining means move towards each other to open the bag; filling of the bag; moving towards each other of the sealing bar and the pressure bar while the first and second retaining means move away from each other for the closing of the bag; sealing of the one or more filling openings of the bag. Note that the terms 'move away from each other' and 'move toward each other' of two components, may mean that both of these elements move or that one of the two elements move.

[0017] According to an advantageous embodiment, a buffer with a plurality of bags is provided wherein each bag is provided with one or more filling openings, and the method comprises the retrieval of a bag from the buffer by the first and second retaining means. Note that the buffer may be provided of a feed system for feeding and presenting of a bag to the first and second retaining means.

[0018] According to another aspect of the invention, there is provided method that comprises the following steps. A buffer is provided with a plurality of bags, wherein each bag is provided with one or more openings and at a first and second side of the one or more filling openings with a first and second sealed portion provided, respectively, with a first and a second hole. A bag is taken from the buffer through pins that pass through the first and the second hole of the bag. The bag is filled and the one or more filling openings are sealed. The filled and sealed bag is then removed from the pins.

[0019] Further, according to another aspect of the invention an apparatus is provided for supplying a bag to a filling and / or sealing device. The device comprises a buffer with a plurality of bags, wherein each bag is provided with one or more openings and provided at a first and second side of the one or more filler openings of, respectively, a first and a second sealed portion with a first and a second hole; and first and second retaining means which are provided with, respectively, a first and a second pin that is adapted to stabbing respectively through the first and the second hole of a bag. In this way, bags are supplied in a convenient manner and removed to a welding and filling device, which may be as described above.

[0020] According to yet another aspect, there is provided an apparatus for supplying a bag to a filling and / or sealing device, with a buffer with a plurality of bags, wherein each bag is provided with one or more filling openings. The apparatus preferably comprises a first mounting frame and a second mounting frame with a sealing bar and a pressure bar, respectively, or vice versa, which sealing bar and pressure bar are adapted for receiving there between at least a peripheral edge of the one or more filling openings of the bag and for the welding of this peripheral edge. Further, a drive is provided with a drive shaft that is fixedly connected to a drive rod. The drive rod is pivotally connected to a first rod that is pivotally connected to the second mounting frame. The first mounting piece is pivotally connected by means of a second rod to a second fixed point of rotation and the second mounting frame is pivotally connected by means of a third rod to a third fixed point of rotation. A clutch is provided between the second and the third rod. The first, second and third rod and the coupling are arranged and dimen-

sioned so that the first mounting frame reaches on the one hand to the buffer, and on the other hand to a position opposite to the second mounting frame for the filling and / or welding operation.

[0021] Finally, the invention relates to a bag having at least one filling opening, comprising a first wall portion and a second wall portion that are attached to each other except at the level of the at least one filling opening, wherein a first part of the first wall portion and an opposite first part of the second wall portion are welded to each other and a first hole is arranged through the first parts, and wherein a second part of the first wall portion and an opposed second part of the second wall portion are welded to each other and a second hole is made through these second parts. Such a bag is preferably adapted for use in an apparatus or method as described above.

[0022] The present invention will be described with reference to a number is non-limiting merely exemplary embodiments with reference to the accompanying drawings, i.e.:

Figure 1 is a perspective view, seen from the top, of one embodiment of a filling and welding device according to the invention;
Figure 2 is a perspective view of the filling and welding device of Figure 1, seen from the bottom;
Figure 3A is a schematic view of an embodiment of a bag according to the invention;
Figure 3B and 3C show a variant of the bag of Figure 3A;
Figure 4 is a partial top plan view of the embodiment of
Figure 1;
Figures 5A and 5B illustrate the operation of an embodiment of a filling and welding device according to the invention;
Figures 6 and 7 schematically illustrate two variants of the embodiment of the invention in Figures 5A and 5B;
Figures 8A, 8B and 8C illustrate a side view, a front view and a top view of an embodiment of a driving device according to the invention, and
Figures 9A to 9E illustrate step-by-step views of the operation of the driving apparatus of Figures 8A-8C;
Figures 10A and 10B illustrate a side view of a second embodiment of a driving device according to the invention illustrating in a first and in a second position, and
Figure 11 illustrates an embodiment of a buffer and feeding system of bags according to the invention.

[0023] Figures 1, 2 and 4 illustrate an embodiment of a filling and welding device according to the invention. The device comprises a first mounting piece 14 and a second mounting piece 24 on which in each case a set of components are fixedly or movably mounted. The device comprises a sealing bar 13 that is mounted movably in a first direction of movement B1 on the first mounting piece 14. The sealing bar 13 is intended to work together with a pressure bar 23 which is movably mounted in the moving direction B1 on the second mounting piece 24. The sealing bar 13 and the pressure bar 23, are arranged for receiving there between at least the peripheral edge of the filling opening of the bag and for sealing of this opening.

[0024] For driving the movement of the sealing bar 13 and the pressure bar 23 are provided the drives 35, 36. In the illustrated embodiment, a separate drive is provided for the sealing bar 13 and the pressure bar 23. As will be seen further, see for example Figure 6, it is also possible to provide only one drive and to hold one of these components. In the illustrated embodiment, for the sealing bar 13 are provided guide rods 17, 18 that guide the movement of the sealing bar 13 in the direction of movement B1. In a similar manner are provided the guide rods 27, 28 to the pressure bar 23. However, one skilled in the art understands that this guidance in the direction B1 can be realized in many other ways.

[0025] For retaining the bag 40 on both sides of the filling opening O, a first retaining means in the form of a first clamping block 11 and a second clamp block 21, and second retaining means in the form of a first clamping block 12 and a second clamping block 22, are foreseen. The first clamping blocks 11, 12 are movably mounted on the mounting piece 14, on both sides of the sealing bar 13. The second clamping blocks 21, 22 are movably mounted on the mounting piece 24 on both sides of the pressure bar 23. For controlling the movement of the first and second clamping blocks 11, 12, 21, 22, a mechanical coupling is provided with the sealing bar 13 and the pressure bar 23. More specifically, a first rod 31 connects the sealing bar 13 with the first clamping block 11. The second clamping block 21 is connected to the pressure bar 23 by means of a second control rod 32. In a similar manner, the first and second clamping block 12, 22 are connected, respectively, by means of a third rod 33 and a fourth rod 34 to respectively the sealing bar 13 and the pressure bar 23. The ends of these rods 31-34 are each pivotally connected about a vertical pivot axis. These rods 31-34 have as a result that the moving away from each other of the sealing bar 13 and the pressure bar 23, the first retaining means 11, 21 and the second retaining means 12, 22 are moved towards each other. To control the movement of the first and second clamping blocks 11, 12 and 21, 22 are provided first and second guide shafts 51, 52 and 61, 62 which extend in a second movement direction B2 which is perpendicular to the first direction of movement B1. These first and second guide shafts 51, 52 and 61, 62 are mounted on the first mounting piece 14, and the second mounting piece 15 respectively.

[0026] In the illustrated embodiment, the clamping blocks 11, 12 are each provided with a pin 71, 72 which are intended to stabbing through respectively the holes 41, 42 of the bag. A possible embodiment of the bag is shown schematically in Figure 3A in which the pre-sealed parts are hatched, and after filling the sealed portion 46

is displayed in a dotted line. The holes 41, 42 are mounted in sealed portions at the top corners of the bag. Such a bag is typically manufactured by applying to one another and by sealing or welding the hatched parts of two or more layers of film material. Note that many other shapes and sizes for the bag are possible. Figure 3B illustrates another embodiment with two holes 141, 142 and a handle 145 which are arranged in the sealed parts of the bag. Note that each wall of the bag can be made out of a multi-layered film. The bag can also be provided with more than two holes and / or with several filling apertures. For example, Figure 3C shows a variant with two filling openings O1, O2, and a central sealed portion 243 is used for obtaining two distinct filling compartments 247, 248. The middle of the central portion 243 may further comprise a sealed tear line 249 along which the "double" 240 bag may be divided into two.

[0027] In the second clamping blocks 21, 22, recesses 81, 82 are provided in which the respective pins 71, 72 can be accommodated. In this way, the corners of a bag 40, 140 can be firmly clamped between a first clamping block 11, 12 and a second clamping block 21, 22. Further, the surface of the first and second clamping blocks that is intended to connect to the corners of the bag may be made rough in order to further improve the clamping. A certain profile can also be given to the contact surface, whereby the first clamping block 11, 12 and the corresponding second clamping block 21, 22 are provided with complementary profiles. This, too, can further improve the clamping of the corners of the bag. Note that the pins 71, 72 have a dual function: the positioning of a bag 40, 140 on the one hand and, on the other hand, the achievement of a mechanical coupling between each of the first and second clamp block that ensures that the first and second clamp block move jointly, ensuring a synchronous movement of the sealing bar 13 and the pressure bar 23. It is noted that this synchronous movement can be achieved in other ways, for example by coupling of actuators 35 and 36.

[0028] Further, between each of said first clamping block 11, 12 and the sealing bar 13, a suction cup 81, 82 is provided. These suction cups 81, 82 will continue to hold a bag when the bag is brought on the pins 71, 72, prior to the closing of the clamping blocks, that is to say, prior to the bringing together of the first and second clamping blocks. Furthermore, the sealing bar 13 is provided with a first suction cup 15 and the pressure bar 23 is provided with a second suction cup 25. These suction cups 15, 25 are intended to respectively draw with it a first part 43 and a second part 44 of a peripheral edge of the filling opening when the sealing bar 13 and the pressure bar 23 move away from each other to a rest position, while the first retaining means 11, 21 and the second retaining means 12, 22 move toward each other to a filling position. See also Figures 5A and 5B that will be discussed herein below.

[0029] Now, the operation of the device according to the invention is described with reference to the schematic drawings of Figures 5A and 5B. Figure 5A illustrates the situation in which a bag 40 is held between the first clamping blocks 11, 12 and the second clamping blocks 21, 22. The sealing bar 13 and the pressure bar 23 are located in a clamping position, in which the suction cups 15, 25 are placed at, respectively, a first part 43 and a second part 44 of the peripheral edge around the opening O of the pressing bag 40. In this position, the distance D1 between the first and second retaining means is set to hold the bag into a stretched position. To move the sealing bar 13 and the pressure bar 23 to their rest position, they are moved away from each other by means of the actuators 35, 36, causing the first retaining means 11, 21 and the second retaining means 12, 22 to move towards each other, see the arrows in Figure 5A. In this way, the distance between the first and second retaining means (D2 in Figure 5B) is smaller, the filling opening O opens and a product, typically a liquid, can be introduced into the bag. Figure 5B shows the filling position, in which the sealing bar 13 and the pressure bar 23 are in a rest position. After the filling of the bag, the sealing bar 13 and the pressure bar 23 are moved back to the clamping position of Figure 5A, and the filling opening is closed by welding. In this position, the first and the second retaining means are back in their farthest position in which the bag is nicely stretched.

[0030] The skilled person understands that also non-symmetric embodiments are conceivable within the scope of the invention. For example, Figure 6 illustrates an embodiment in which the pressure bar 323 can move freely. In such a situation, the retaining means will move as a result of the mechanical coupling between the first and the second clamping block in the direction of movement B3 which is perpendicular to the moving direction B1 of the sealing bar 313, and thus provide for a movement of the pressure bar 323 which is synchronous to the movement of the sealing bar 313. Figure 7 illustrates yet another embodiment in which the first retaining means 411, 421 are held fixed and only the second retaining means 412, 422 are movably mounted. The skilled person also understands that more than two pair of clamping blocks may be provided, which can be used for example with bags provided with two or more holes. Although the symmetrical variant that has been discussed with reference to Figures 1-4, 5A and 5B enjoy preference, the variants of Figures 6 and 7 are also within the invention, and the skilled person understands that further variants are conceivable within the scope of the invention.

[0031] Now will be described, with reference to Figures 8A-8C and Figures 9A-9E, a device for automatic pick up, filling and sealing a bag. The device comprises a first mounting part 114 to which a sealing bar 113 is provided, and a second mounting part 124 on which a pressure bar 123 is provided, see Figures 8A and 8C. The mounting parts 114, 124 and their associated or linked components may be analogous to the above-discussed first and second mounting pieces 14, 24 and their associated or

linked components, but may also be arranged in a different way. For moving the first and the second mounting piece 114, 124, an actuator 202 and a set of drive rods are provided. The actuator 202 rotates a drive shaft 203 which is fixedly connected to two drive rods 204, see Figures 8A and 8B. The establishment has three fixed points of rotation such as: a first fixed rotation point 211 formed by shaft 203, a second fixed point of rotation 212 and a third fixed point of rotation 213. The first mounting part 114 is pivotally connected via two rods 206 with the third fixed point of rotation 213. The second mounting piece 124 is pivotally connected on the one hand by means of rods 205 to the drive rods 204 and on the other hand via a rod 207 pivotally connected to the second fixed point of rotation 212. The movement of the first mounting part 114 is coupled to the movement of the second mounting piece 124 via connecting rods 208. Furthermore, additional rods 206', 207' are provided to maintain, respectively, the first mounting part 114 and the second mounting piece 124 fixed in a horizontal position. As illustrated in Figures 9A-9E, a rotation of the drive shaft 203 will first move upward the second mounting element 124, while the first mounting part 114 will move in the direction of a buffer 201 having a plurality of bags, as shown in Figure 9B. Figure 9C shows the highest position of the second mounting piece 124, in which the first mounting piece 114 is placed against the buffer 201 in order to retrieve a bag 40. Then, the second mounting element 124 moves back down, while the first mounting piece 114 moves to the rear, see Figure 9D. In the lowest position, which is shown in Figure 9E, the second mounting piece 224 is located opposite to the first mounting piece 114. In this position, the bag may be filled and sealed, for example, in the manner that has been discussed above with reference to Figures 5A and 5B. After the filling and welding operations, the following rotational movement can be initiated. Such a way of working will allow to fully automating the method according to the invention

[0032] In the embodiment illustrated in Figures 8A-C, a buffer 201 is used in which the bags 40 are hung vertically. The skilled person understands that it is also possible to store the bags obliquely or horizontally. Figures 10A, 10B and 11 illustrate a system with a horizontal buffer 301. As it is best seen in Figure 11, the bags 40 are stored horizontally, in which positioning the pins 396 stab through the holes in the bag. Furthermore, a conveyor belt 390 is provided. A number of pick-up pins 391, 392, 393 is moved by means of the conveyor belt 390 from a first position (see rod 391) adjacent the upper edge of a bag 40 in the buffer 301 to a second position (see the rod 393) in which the retrieved bag is supplied to the retaining means of the first mounting piece 314, see also Figure 10B. Rod 392 is located in an intermediate position between the first and the second position. Each pick-up rod 391, 392, 393 is provided with a plurality of suction cups 395 which are preferably positioned such that they engage near the openings at the sealed part of the bag 40.

[0033] The skilled person understands that the invention is not limited to the embodiments described above and that many variants and modifications are conceivable within the scope of the invention that is determined by the following claims.

Claims

1. An apparatus for filling and sealing a bag (40) with a filling opening (O), comprising:

   a sealing bar (13) and a pressure bar (23) which are arranged for receiving there between at least a peripheral edge of the filling opening of the bag and for welding of the peripheral edge;
   a drive which is arranged for moving the sealing bar in relation to the pressure bar between a clamping position and
   a rest position in which the pressure bar is at a distance from the sealing bar;
   first retaining means (11, 21) and second retaining means (12, 22) for holding the bag on both sides of the filling opening;
   a mechanical coupling between the first and / or second retaining means and the sealing bar and between the first and / or second retaining means and the pressure bar, which mechanical coupling is adapted for coupling of a movement of the clamping position to the rest position to a movement of the first retaining means with respect to the second retaining means of a tensioning position to a filling position, in which filling position the distance (D2) between the first and second retaining means is smaller than the distance (D1) there between in the clamping position.

2. Apparatus according to claim 1, **characterized in that** the mechanical coupling (30) includes a first rod (31) which is pivotally connected at one end to the first retaining means (11) and at another end with the sealing bar (13) and a second rod (32) pivotally connected at one end to the first retaining means (21) and at another end with the pressure bar (23).

3. Apparatus according to claim 1 or 2, **characterized in that** the mechanical coupling includes a third rod (33) which is pivotally connected at one end with the second retaining means and at another end with the sealing bar and a fourth rod (34) pivotally connected at one end to the second retaining means and at another end with the pressure bar (23).

4. Apparatus according to one of the preceding claims, **characterized in that** the drive (35, 36) is adapted to move the sealing bar in a first moving direction B1

in relation to the pressure bar, and that the first and / or the second retaining means are mounted movably in a second movement direction B2, said second direction of movement B2 being perpendicular to the first direction of movement B1.

5. Apparatus according to one of the preceding claims, **characterized in that** the first retaining means comprise a first and a second clamp block (11, 21) which are pivotally connected respectively with the first and the second rod (31, 32), and between which a first side of the bag can be clamped.

6. Apparatus according to one of the preceding claims, **characterized in that** the second retaining means comprise a first and a second clamp block (12, 22) which are pivotally connected respectively with the third and the fourth rod (33, 34), and between which a second side of the bag can be clamped.

7. Apparatus according to one of claims 5 and 6, when dependent on claim 4, **characterized in that** the or each first clamping block (11, 12) is movably mounted along a first guide shaft (51, 52) extending in the second direction of movement (B2) and **in that** the or each second clamp block (21, 22) is movably mounted along a second guide shaft (61, 62) which extending in the second direction of movement (B2)

8. Apparatus according to one of claims 5-7, **characterized in that** the or each first clamping block (11, 12) is mechanically coupled to the or each corresponding second clamp block (21, 22) in a position in which one side of the bag is clamped between the first and the second clamping block.

9. Apparatus according to one of the claims 5-8, **characterized in that** the or each first clamping block (11, 12) is provided with a pin (71, 72) which is arranged to stab through a hole (41, 42) in the bag and that the or each second clamping block (21, 22) is provided with a recess (81, 82) in which the pin can be accommodated.

10. Apparatus according to one of the claims 5-9, **characterized in that** each first clamp block (11, 12) is movably mounted on a first mounting piece (14), and **in that** each second clamp block (21, 22) is provided on a second mounting piece (24), and **that** the drive is equipped with a first and a second drive shaft which is borne in a first and second driving block (16, 26) which is mounted on, respectively, the first and second mounting piece (14, 24).

11. Apparatus according to claims 7 and 10, **characterized in that** the first and second guide shafts (51, 52, 61, 62) are mounted on respectively the first and second mounting piece (14, 24), and that for the first and the second mounting piece are provided one or more guide shafts (17, 18, 27, 28) which are parallel to the first and second drive shaft for guiding the movement of the sealing bar and the pressure bar.

12. Apparatus according to one of the preceding claims, **characterized in, that** comprise the first and / or second retaining means comprise one or more suction cups.

13. Apparatus according to one of the preceding claims 1 to 12, provided with a device for supplying bags, comprising:

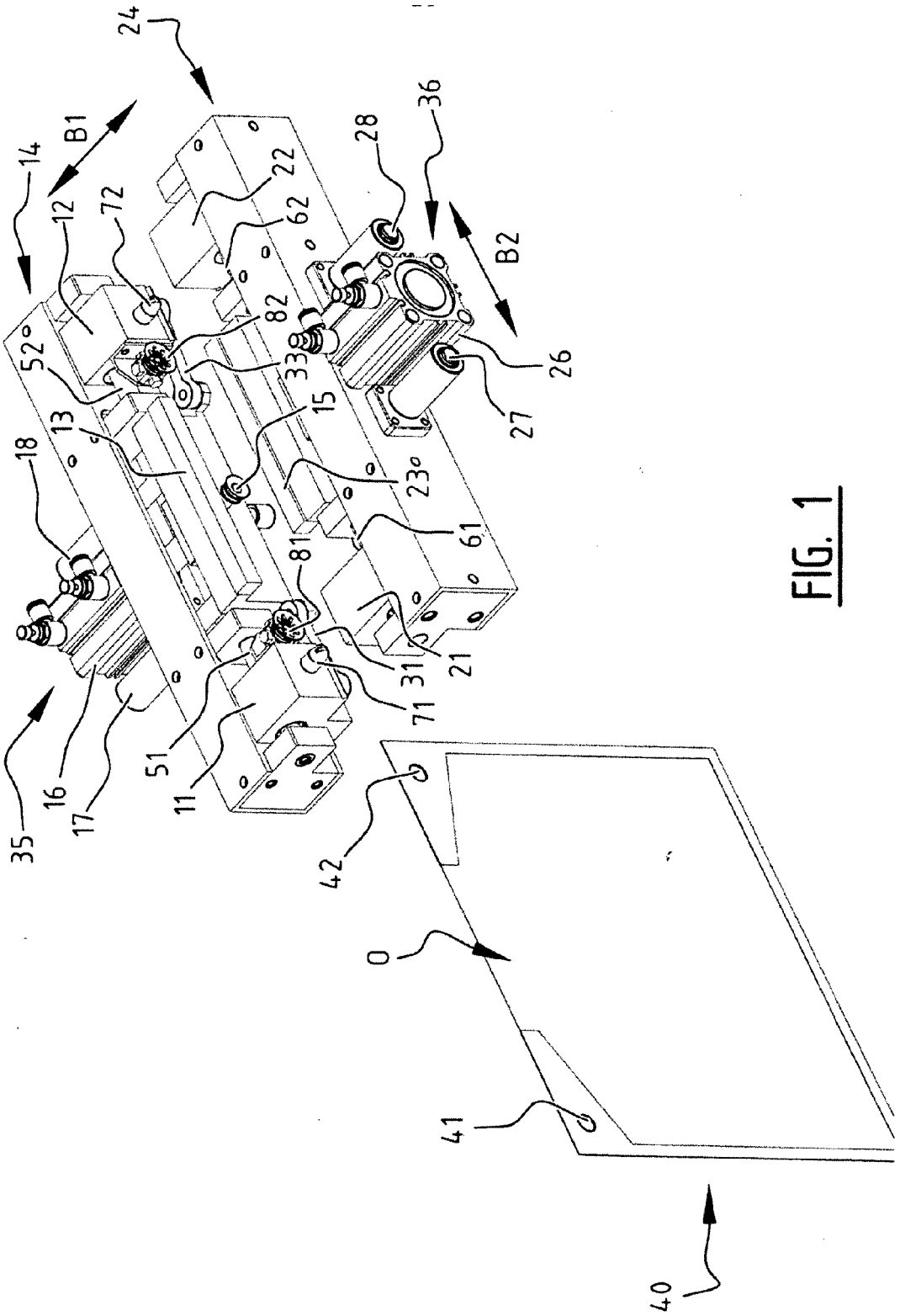
a buffer with a plurality of bags, wherein each bag is provided with a filling opening;
a first mounting frame (114) and a second mounting frame (124) having a sealing bar (113) and a pressure bar, respectively (123), or vice versa, which sealing bar and
pressure bar are adapted for receiving there between at least a peripheral edge of the filling opening of the bag and for welding of the peripheral edge;
a drive (202) having a drive shaft (203) which is fixedly connected to a drive rod (204), which drive rod is pivotally connected to a first rod (205) which is pivotally connected to the second mounting frame;
wherein the first mounting piece is pivotally connected by a second rod (206) with a second fixed point of rotation and the second mounting frame is pivotally connected by a third rod (207) to a third fixed point of rotation;
wherein a clutch (208) is provided between the second and the third rod.

14. A method for filling and sealing a bag by means of an apparatus according to any one of the preceding claims, comprising:

holding the bag by means of first and second retaining means which hold the bag on both sides of a feed tube while a sealing bar and pressure bar surround the edges of the filling opening;
moving away from each other of the sealing bar and the pressure bar while the first and second retaining means are moved towards each other to open the bag;
filling of the bag;
moving towards each other of the sealing bar and the pressure bar while the first and second retaining means are moved away from each other to close the bag;
sealing of the filling opening of the bag.

15. Bag for use in an apparatus according to any one of

claims 1-13 or in a method according to claim 14 with at least one filling opening (O, O1, O2) comprising a first wall portion and a second wall portion which are secured to each other along their circumference except at the level of the at least one filling opening, wherein a first part of the first wall portion and an opposing first part of the second wall portion are welded to each other and a first hole (41, 141) is provided through the first parts, and wherein a second part of the first wall portion and an opposed second part of the second wall portion are welded to each other and a second hole (42, 142) is provided through said second parts.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B1
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12
72
22
62
28
36
B2
52°
82
33
26
27
13
15
18
23°
61
81
21
31
71
51
11
16
17
35
42
0
41
40

FIG. 1

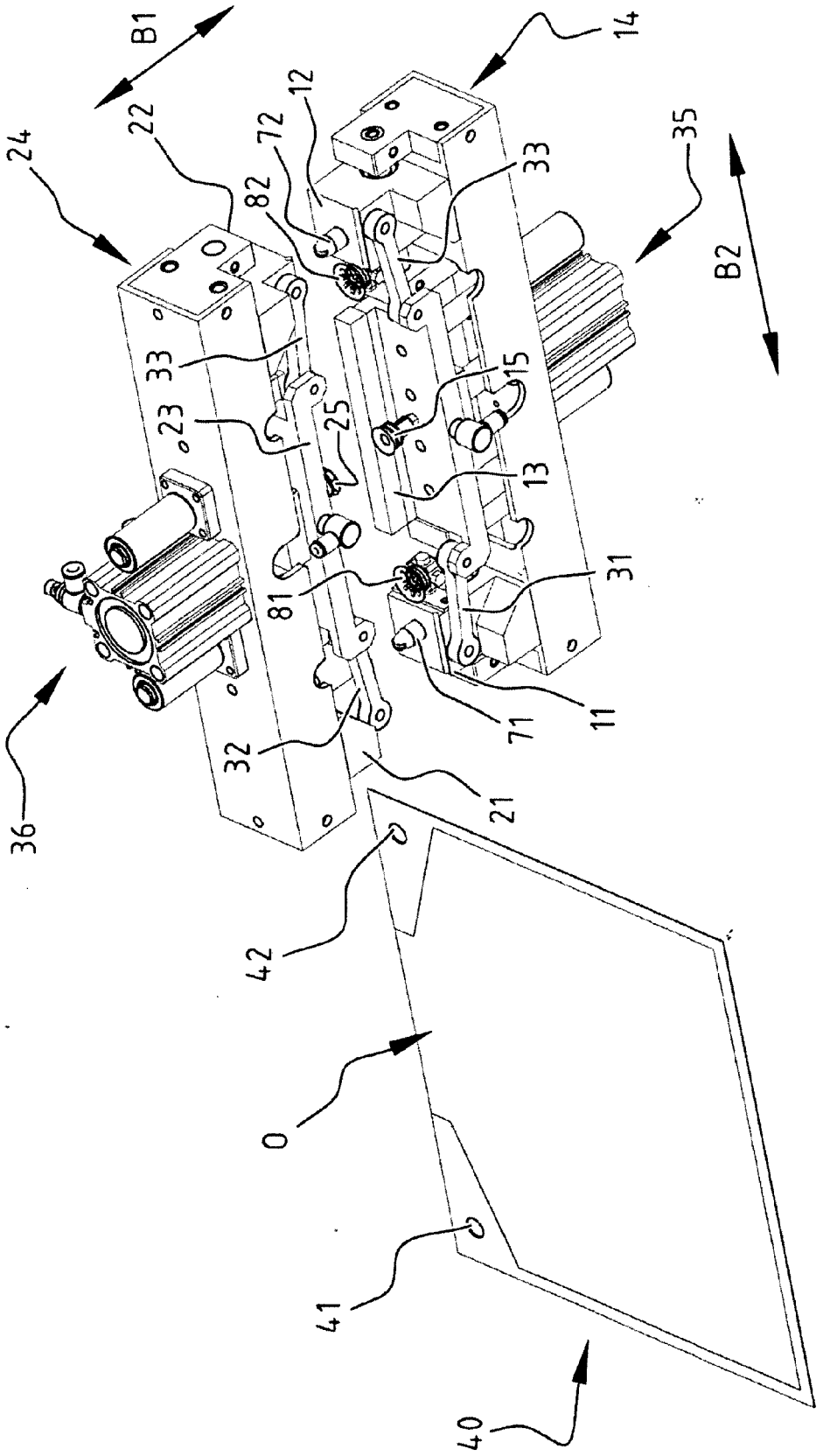
B1
14
22
12
72
24
82
33
35
B2
33
15
23
25
13
81
31
71
11
32
21
36
42
0
41
40

FIG. 2

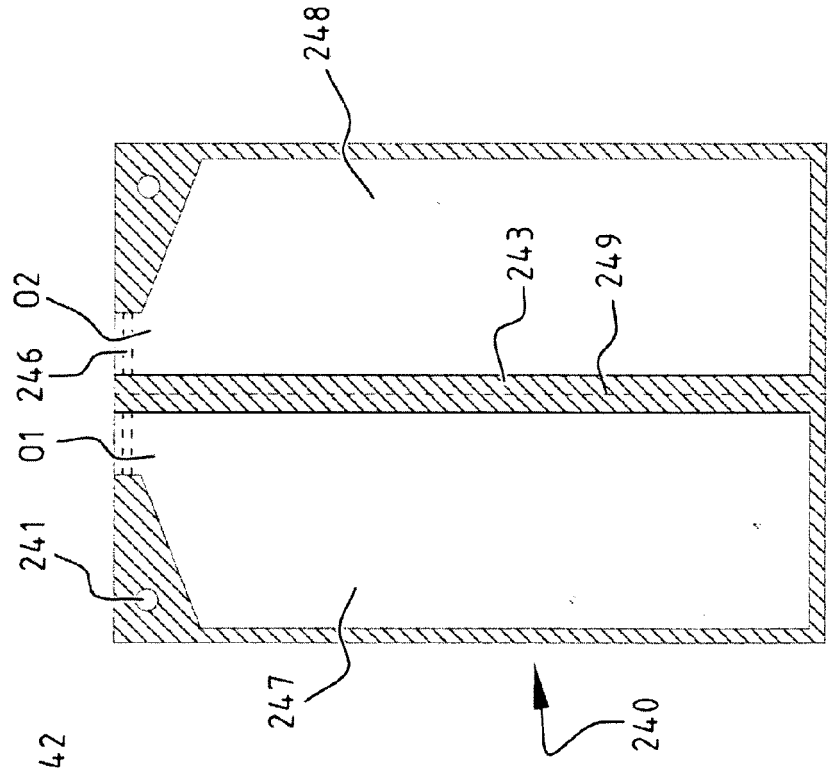

FIG. 3C

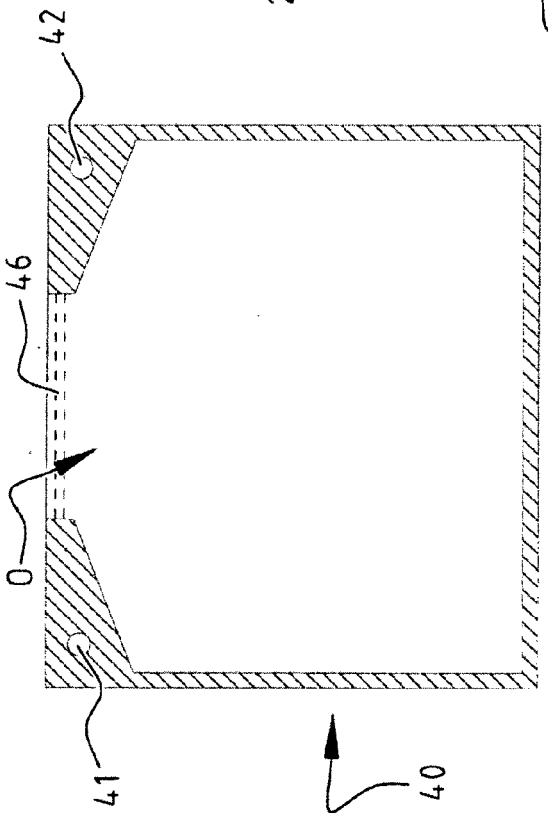

FIG. 3A

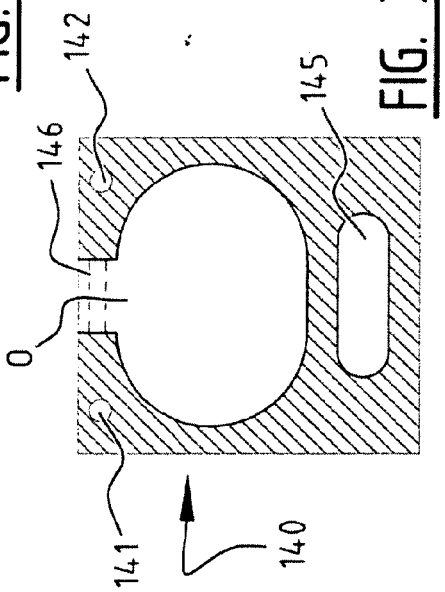

FIG. 3B

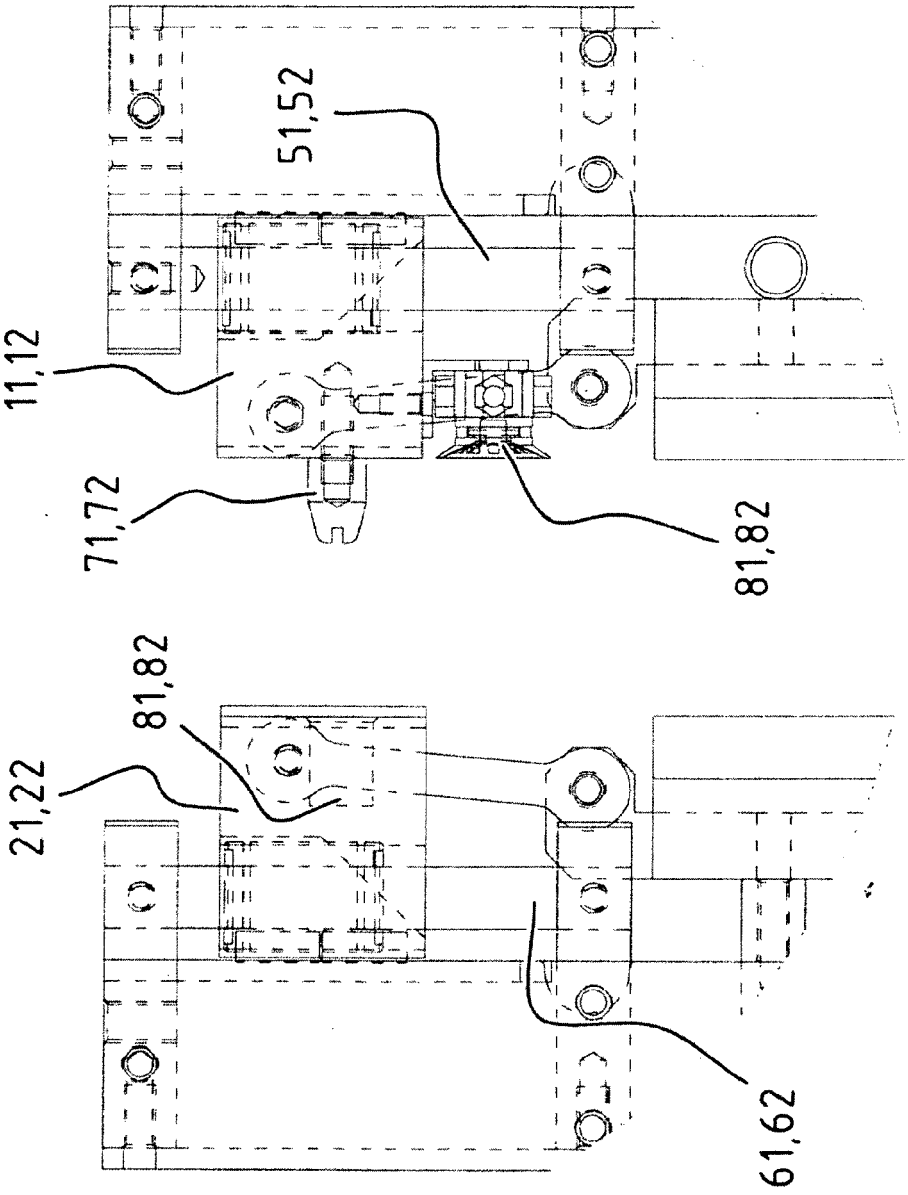

FIG. 4

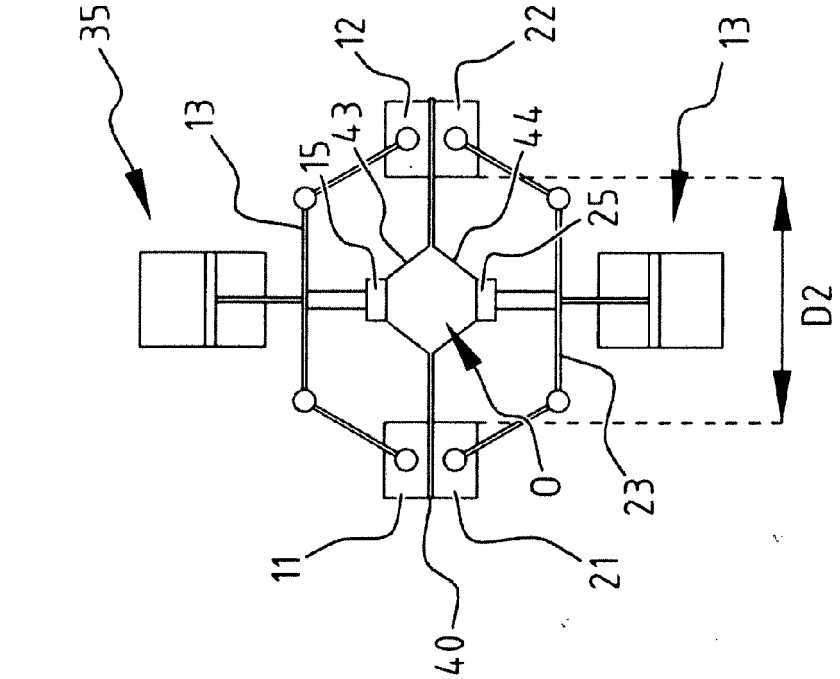
35
13
12
22
13
15
43
44
25
D2
O
23
11
21
40

FIG. 5B

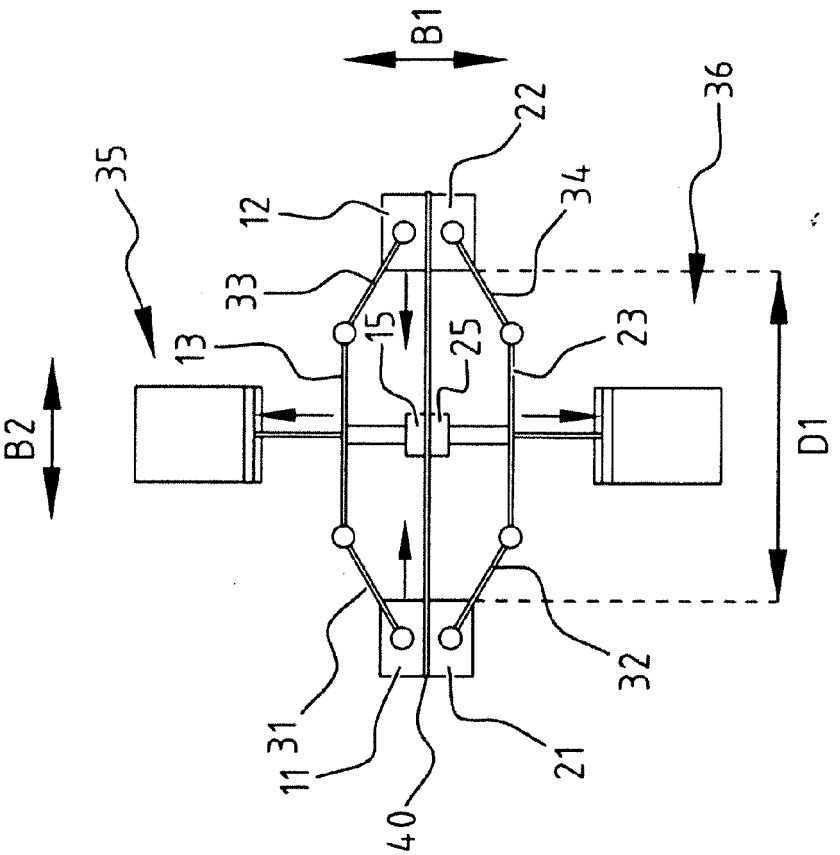
B1
22
36
35
12
34
33
13
15
25
23
B2
D1
32
31
11
21
40

FIG. 5A

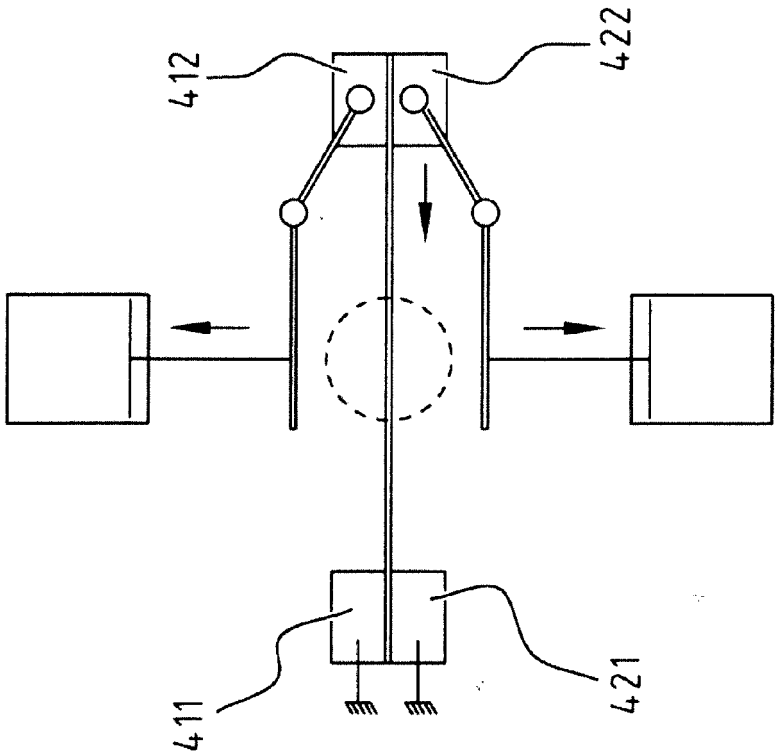

FIG. 7

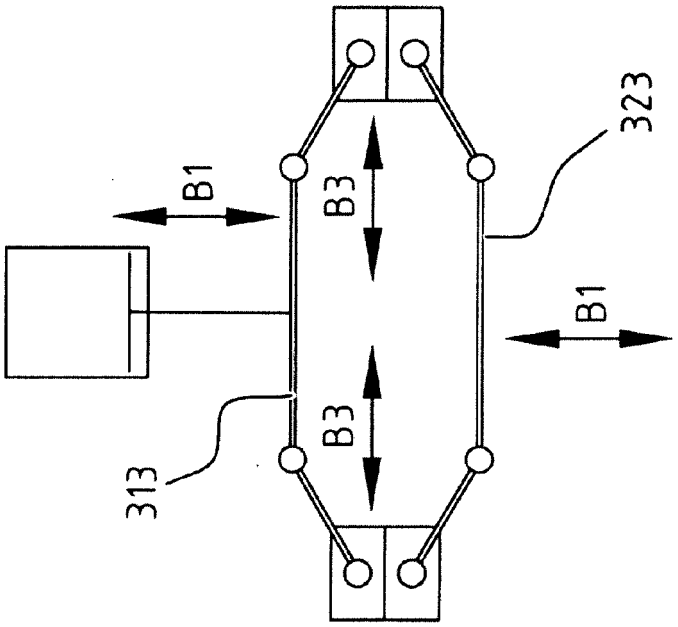

FIG. 6

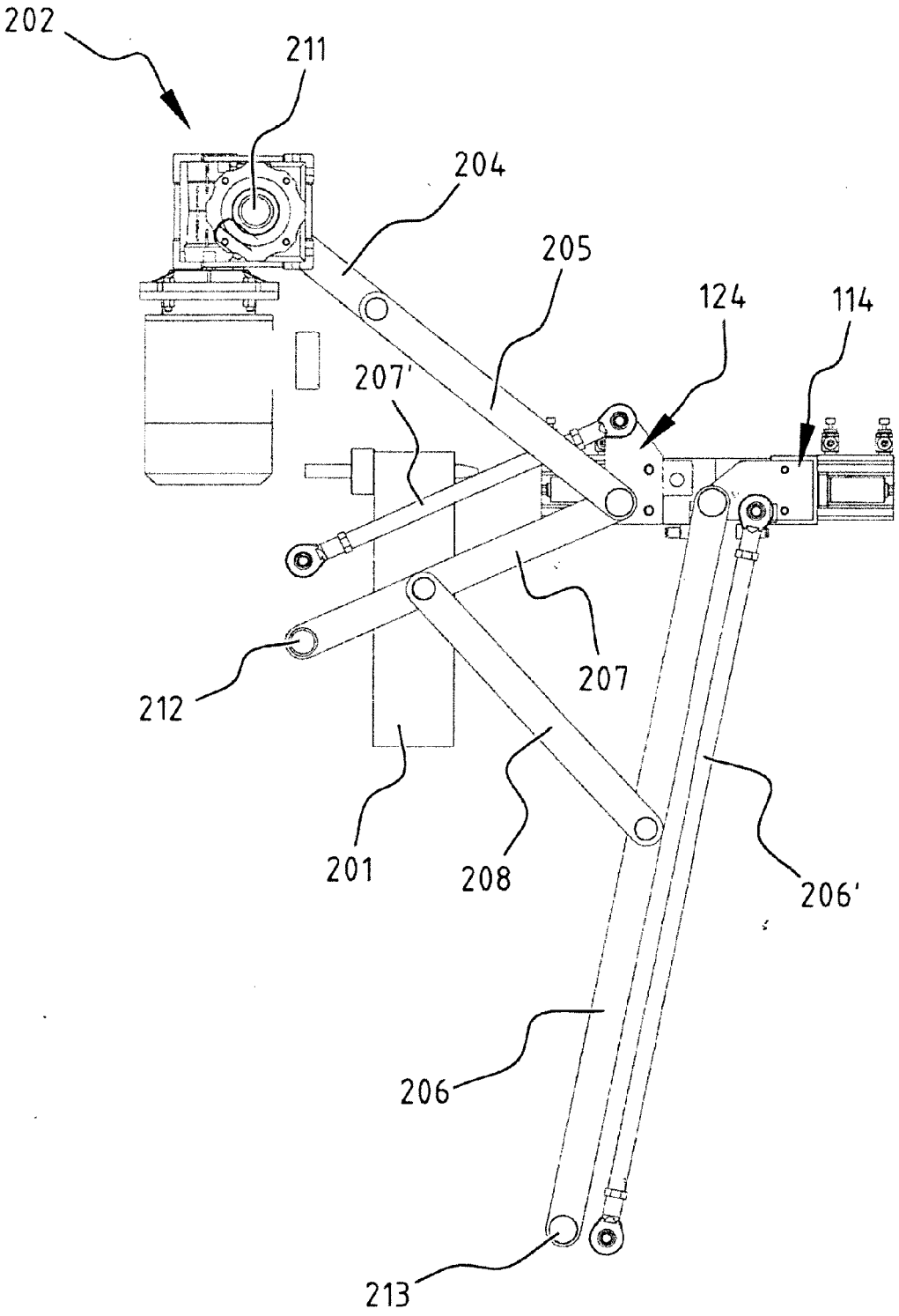

FIG. 8A

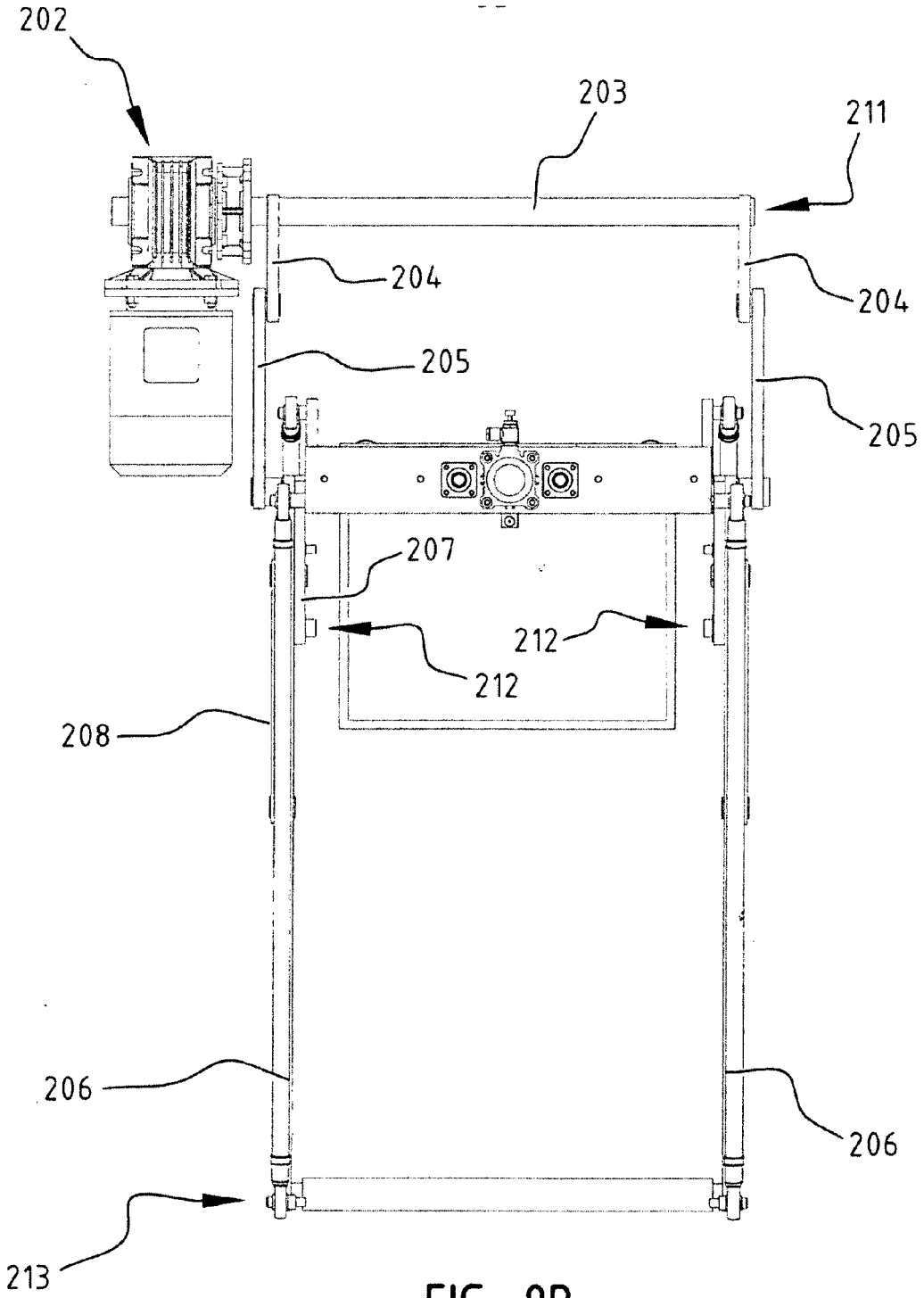

FIG. 8B

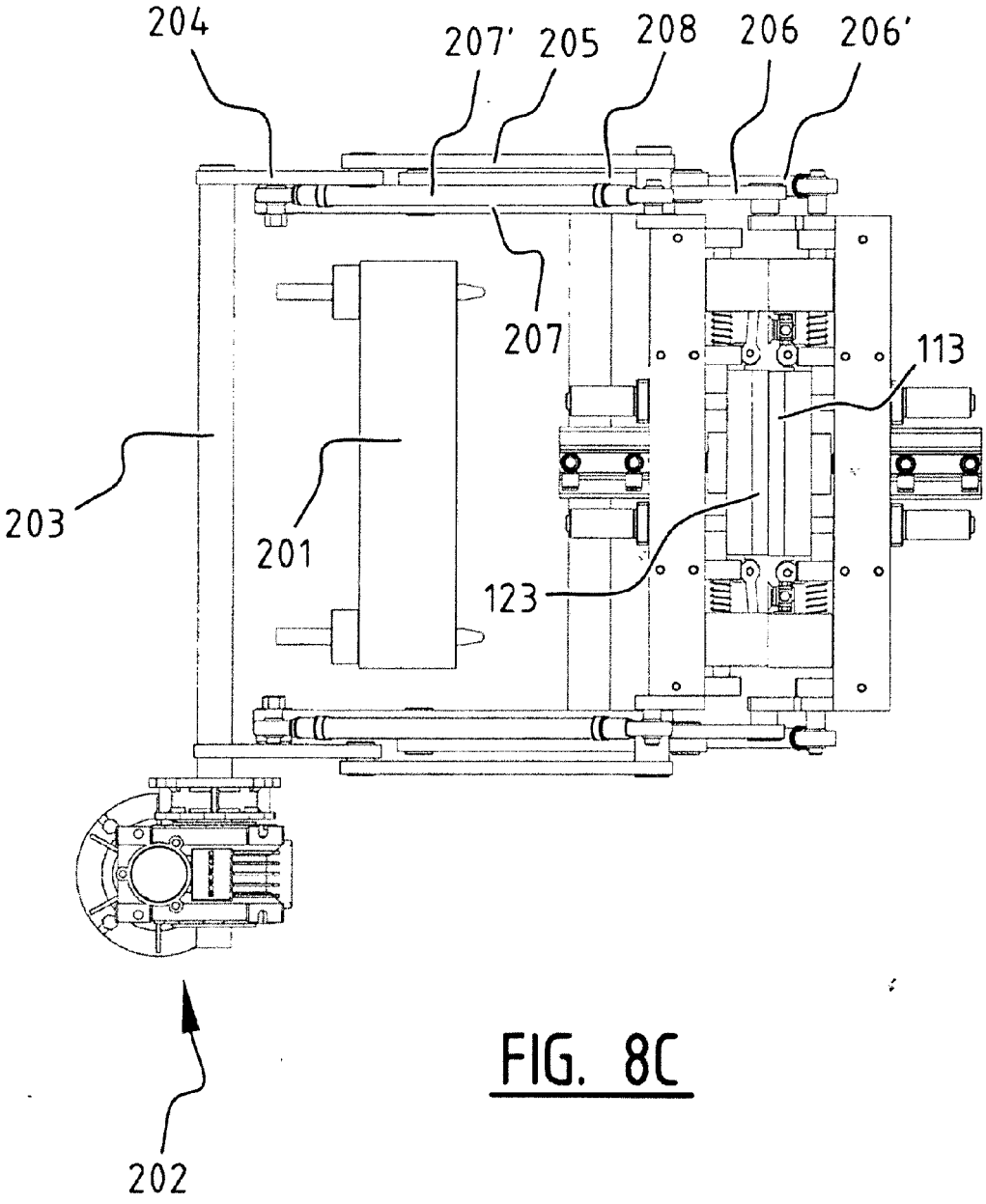

FIG. 8C

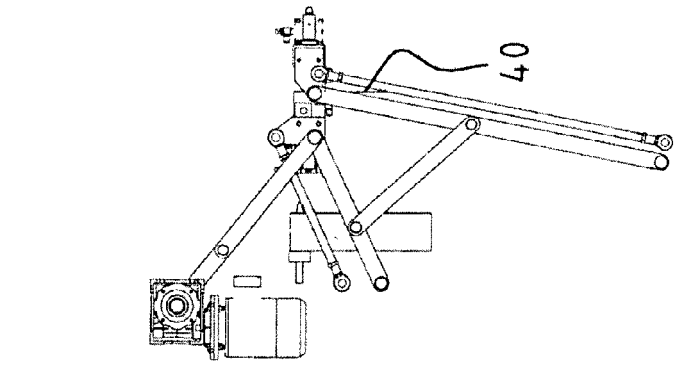

FIG. 9E

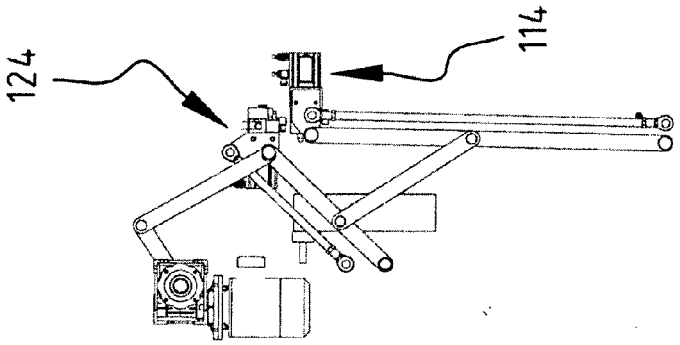

FIG. 9D

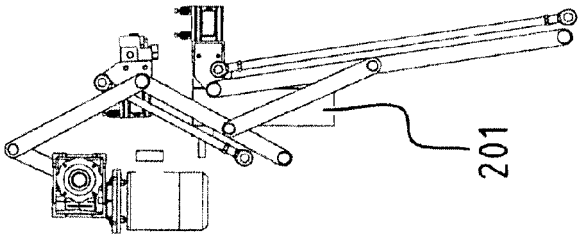

FIG. 9C

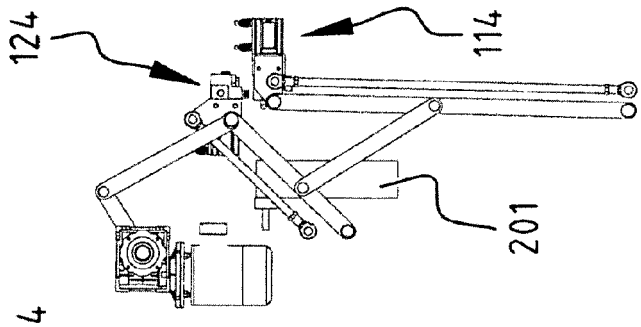

FIG. 9B

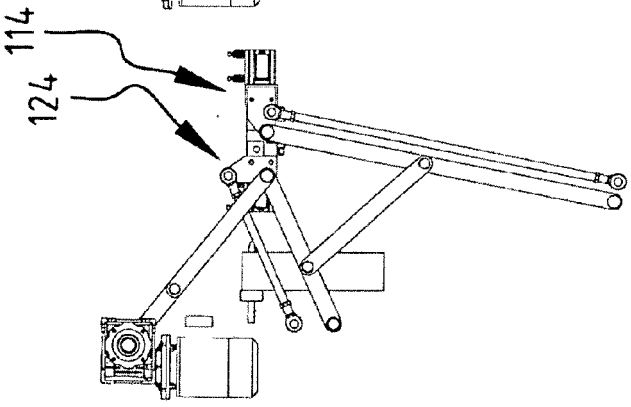

FIG. 9A

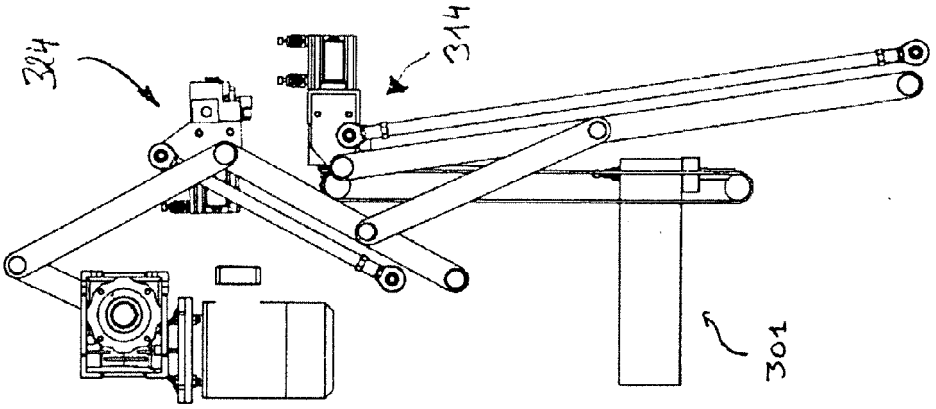

FIG. 10B

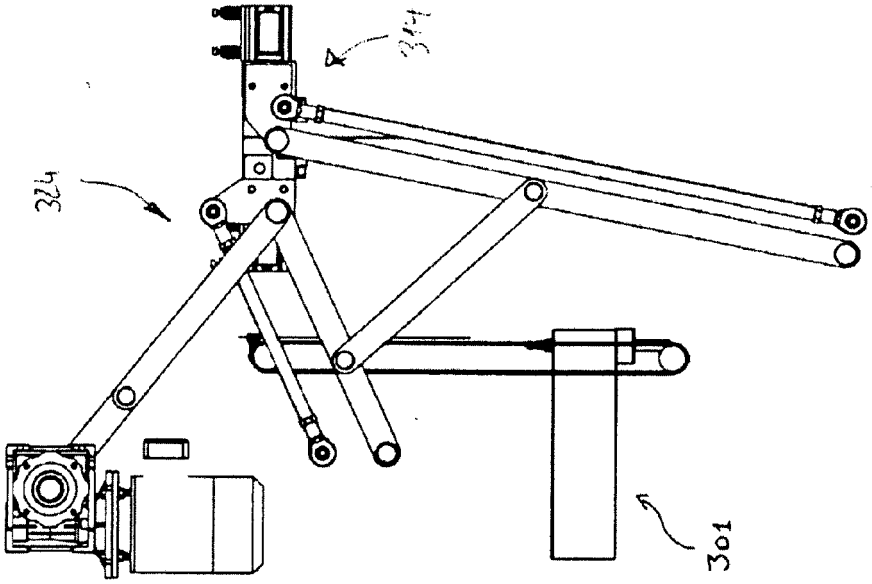

FIG. 10A

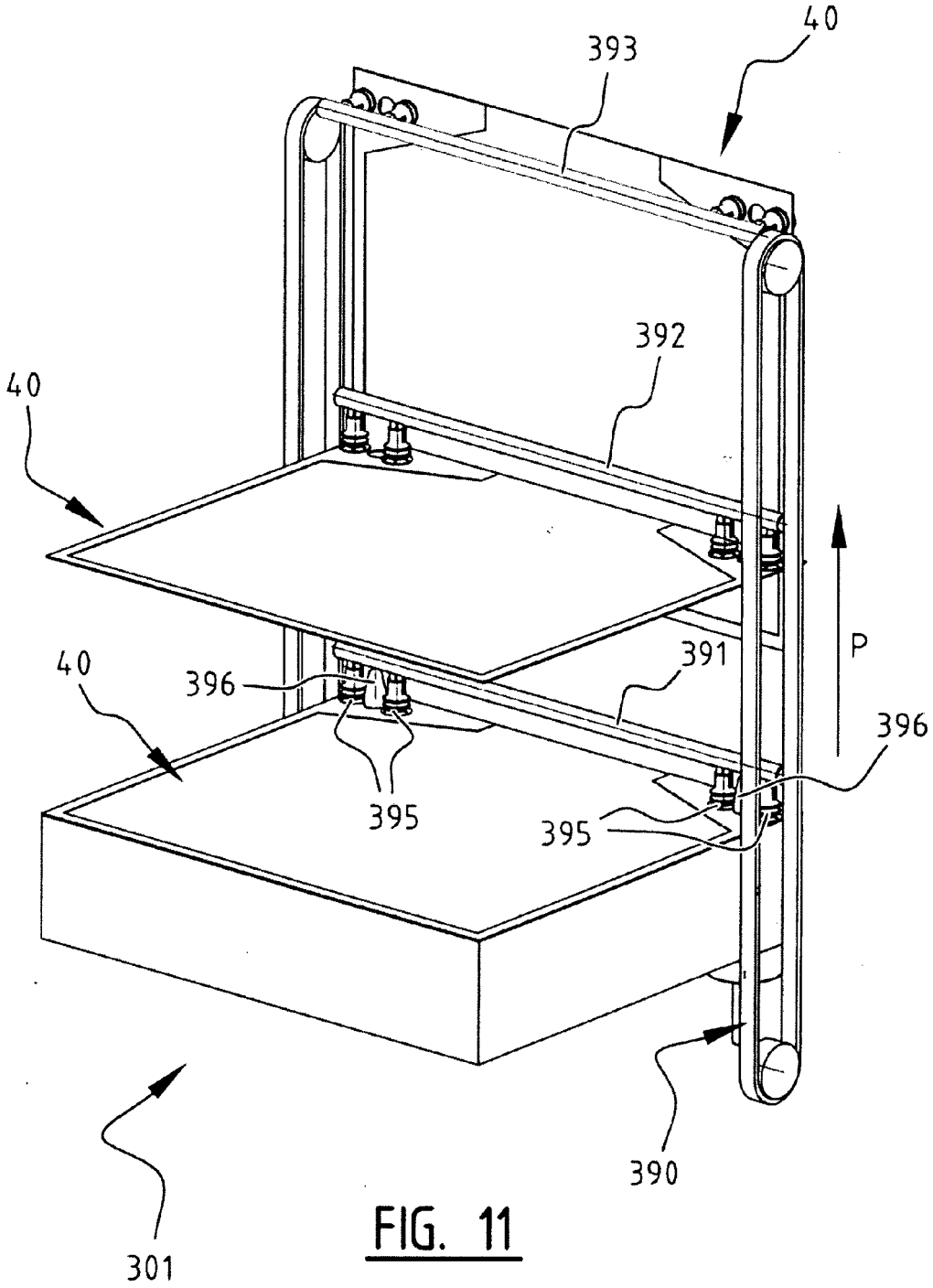

FIG. 11