



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**16.01.2019 Bulletin 2019/03**

(51) Int Cl.:  
**B65B 23/16** (2006.01) **B65B 35/40** (2006.01)  
**B65B 5/06** (2006.01)

(21) Application number: **18183269.2**

(22) Date of filing: **12.07.2018**

(84) Designated Contracting States:  
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**  
Designated Extension States:  
**BA ME**  
Designated Validation States:  
**KH MA MD TN**

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(30) Priority: **12.07.2017 LU 100336**

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(54) **PACKAGING METHOD AND PACKAGING STATION FOR INSERTING STACKS OF PRODUCTS INTO PACKAGING CONTAINERS**

(57) To insert a stack of products (2) in a packaging container (3; 103), the stack of products (2) is arranged in a vertically aligned position below a vertical housing (10) which ends at the bottom with an inlet opening (12); the stack of products (2) is lifted so as to be inserted through the inlet opening (12) into the vertical housing (10); a support device (24) is then moved into an advanced position, below the stack of products (2), so as to engage the inlet opening (12) and/or a lower portion of the vertical housing (10) to rest the stack of products (2) on the supporting device (24).

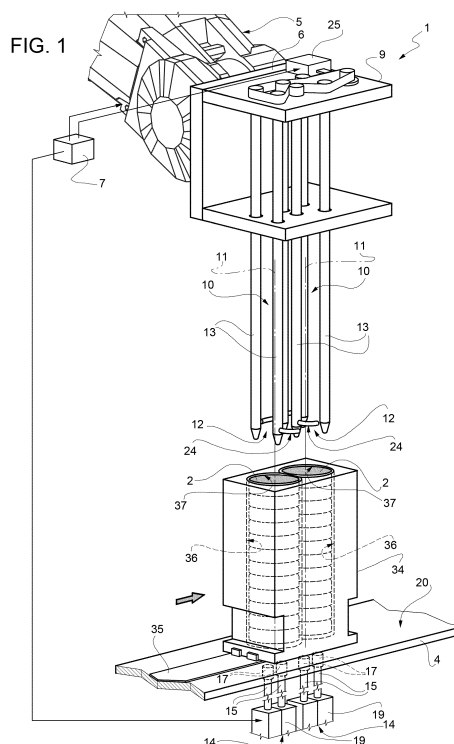
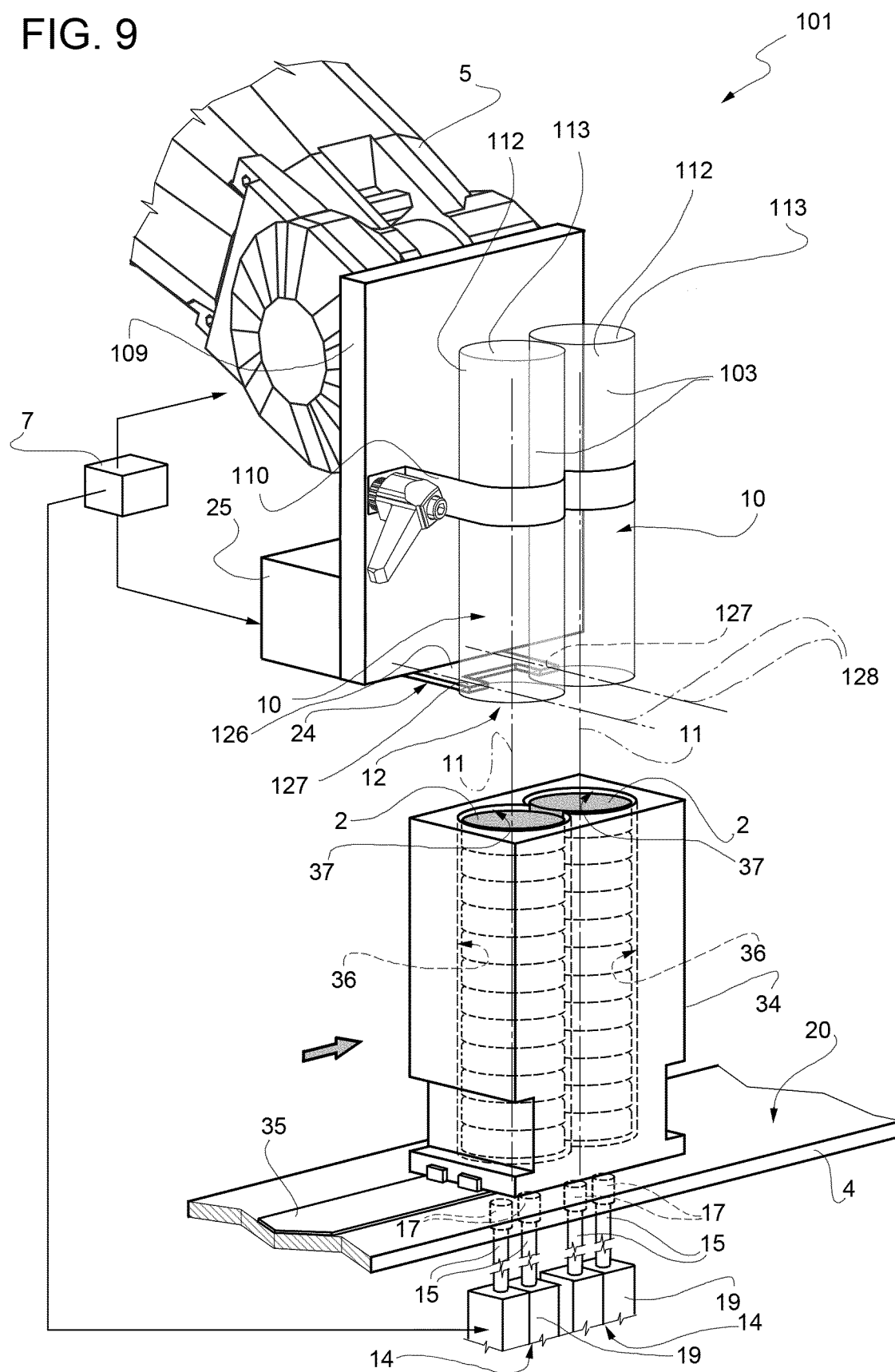


FIG. 9



## Description

### CROSS-REFERENCE TO RELATED APPLICATIONS

**[0001]** This application claims priority from Luxembourgian Patent Application No. 100336 filed on July 12, 2017.

**[0002]** The present invention relates to a packaging station for inserting stacks of products into packaging containers. The stacked products are generally flat in shape and, in this case, are defined by food products, for example by biscuits. The present invention can be broadly applied to packaging in rigid or semi-rigid containers, or packaging in bags of a size such as to each contain at least one stack of products.

**[0003]** To insert a stack of products into a corresponding bag, gripping devices are generally used. Such gripping devices grip the entire stack, and come into contact with the lateral edges of the stacked products in mutually diametrically opposite areas. After taking grip, the gripping device, together with the stack of products, is inserted through an open end of the bag. After this insertion, the device is operated so as to be opened and release the products and is finally removed from the bag so as to leave the products inside. The end of the bag is then closed, for example by means of heat sealing or by means of a zipper device borne by the bag.

**[0004]** Solutions of this type are not satisfactory, as the gripping action exerted on the edges of the food products can affect the shape and integrity of these products. In particular, in the case of biscuits, these may break and, if the biscuits are filled with a cream, the latter can come out and spread into the bag. There is therefore a great need to avoid gripping or compressing actions on the edge of the products during transport and packaging operations.

**[0005]** In addition, the gripping device described above requires bags having a relatively large opening and internal volume, to allow release of and removal from the stack of products deposited in the bag.

**[0006]** The purpose of the present invention is to provide a packaging method for inserting stacks of products into packaging containers which makes it possible to resolve the above problems simply and economically and, in particular, is simple to be carried out, requires limited spaces and/or can also be used with rigid or semi-rigid packaging containers, alternatively or in combination with packaging in bags.

**[0007]** According to the present invention a packaging method for inserting stacks of products into packaging containers is provided, as defined in claim 1.

**[0008]** The present invention also relates to a packaging station for inserting stacks of products into packaging containers, as defined in claim 11.

**[0009]** The invention will now be described with reference to the accompanying drawings which illustrate a non-limiting example of an embodiment, wherein:

- figure 1 shows a simplified schematic view of a first preferred embodiment of the packaging station where the method for inserting stacks of products into packaging containers, defined by bags, is carried out according to the teachings of the present invention;
- figure 2 shows, in enlarged scale and in cross-section according to a vertical cross-section plane, a component of figure 1, during a step of the packaging method;
- figures 3 to 8 show, in perspective and from different points of view, other steps of the packaging method carried out in the station of figure 1;
- figure 9 is similar to figure 1 and shows a second preferred embodiment of the station for carrying out the packaging method according to the present invention; and
- figures 10 to 12 show respective steps of the method carried out in the station of figure 9.

**[0010]** In figure 1, the reference number 1 indicates, as a whole, a packaging station for inserting stacks of products 2 into packaging containers, defined by bags 3 (figure 8). In particular, the stacked products have a flat shape. Specifically, the stacked products to be packaged are defined by food products. In greater detail, they are sweet or savoury products, for example biscuits, possibly filled with a cream.

**[0011]** To perform the packaging operations, which will be described below, the station 1 has a fixed structure 4 (shown partially and in a simplified view) and at least one robot 5 (partially illustrated), for example a robot of the anthropomorphic type. The robot 5 ends with an operating member 6 and is controlled by a control unit 7 to move the member 6 in space. The member 6 is secured to a frame 9, defined for example by a horizontal plate, supporting at least one housing 10, which is arranged below the frame 9, extends along a vertical axis 11 and ends with a lower inlet opening 12.

**[0012]** The radial dimensions of the housing 10 are such as to be able to accommodate and vertically guide a corresponding stack of products 2, with a relatively small clearance. In other words, the cross-section of the housing 10 (with a cross-section plane orthogonal to the axis 11) is approximately the same size but slightly larger than the dimensions, in a plan view, of the stacked products.

**[0013]** The cross-section of the housing 10 is constant along the axis 11, with the possible exception of an area at the lower end, i.e. at the opening 12, where the cross-section may be larger. In particular, the area at the lower end of the housing 10 has a flared shape so as to define an initially enlarged opening to facilitate entry of the stack of products 2.

**[0014]** In the example shown, two housings 10 are provided. Such housings 10 are parallel and arranged beside each other.

**[0015]** Advantageously, each housing 10 is defined by

a plurality of uprights or vertical bars 13, which are arranged around the axis 11 in positions which are spaced out from one another and project downwards from the frame 9. In particular, the lower ends of the uprights 13 have a tapered, pointed, or truncated cone shape in order to define the flared shape at the opening 12.

**[0016]** Preferably, each housing 10 is defined by four uprights 13. Even more preferably, two of the four uprights 13 are in common with the adjacent housing 10. In the specific example, a total of six uprights 13 are thus provided.

**[0017]** For at least a part of the packaging process, the housings 10 are positioned above the structure 4, in such a way as to be aligned along the axes 11 with respective lifting devices 14 supported by the structure 4 in a manner not shown.

**[0018]** Each device 14 comprises at least one vertical push rod 15, having an upper free end defined by a head 17, which has an upper bearing and pushing surface, indicated with the reference number 18 in the plan view in figure 5. Advantageously, the head 17 is defined by a part made of softer material than that of the remaining part of the rod 15. For example, the head 17 is made of a plastic material and is mounted on a metal stem.

**[0019]** The rods 15 can be moved vertically between a lowered position and a raised position, by the operation of at least one actuator 19, shown schematically, controlled by the unit 7. In particular, as shown in figure 1, each device 14 comprises a pair of rods 15, parallel and spaced out from each other, simultaneously operated by the corresponding actuator 19. In particular, in the lowered position, the rods 15 are arranged below a horizontal reference plane 20 of the structure 4, while in the raised position they project upwards with respect to the plane 20 (as shown in figure 2).

**[0020]** The surfaces 18 of the two rods 15 are coplanar. Preferably, as also shown in figure 5, the area of each surface 18 is greater than the cross-section of the remaining part of the rod 15. Overall, the area and the positions of the two surfaces 18 are established to project so as to be able to support the stack of products 2 in a stable manner.

**[0021]** According to a preferred aspect of the present invention, the station 1 has, for each housing 10, a supporting device 24 (figure 4), which is carried directly or indirectly by the frame 9 and can be moved by the operation of at least one actuator 25 (figures 1 and 6). The actuator 25 is also carried by the frame 9 and is controlled by the unit 7 in order to move the device 24 between a retracted position (in broken line in figure 4), in which the housing 10 and the opening 12 are open, and an extended position (continuous line in figure 4), in which the device 24 engages the opening 12 and/or a lower portion of the housing 10 and defines an upper surface 26 on which the stack of products 2 can rest after it has previously been inserted through the opening 12, as described in more detail below.

**[0022]** In the specific embodiment of figures 1-8, for

each housing 10, the device 24 comprises two arms 27. As shown in figure 4, the arms 27 associated with each housing 10 project horizontally from respective uprights 13a (forming part of the set of uprights 13), which are coupled to the frame 9 so as to be able to rotate about their vertical axes 28. Preferably, the two uprights 13a are arranged in diametrically opposite positions with respect to the axis 11. Given that the arms 27 are fixed with respect to the uprights 13a, the rotation of the latter causes the arms 27 to be unfurled or furled in a horizontal plane between the retracted and extended positions.

**[0023]** Preferably, as shown in figure 6, a transmission belt 30 is provided to transmit the rotation from a single actuator 25 to the uprights 13a. In the example shown, the actuator 25 is a linear actuator that operates a lever transmission (for example a connecting rod and crankshaft transmission). Alternatively, the actuator 25 is a rotary motor. The path of the transmission belt 30 extends in a manner not described in detail, in such a way as to rotate the two arms 27 of each housing 10 simultaneously and in opposite directions of rotation. In this case, where two housings 10 are provided, the path of the transmission belt 30 extends in such a way as to rotate all four uprights 13a simultaneously, two in one direction and the other two in the opposite direction. Obviously, it is possible to provide different types of transmissions, as alternatives to that shown, to achieve the same functions; or the uprights 13a could be rotated by respective motors, without any transmission.

**[0024]** As shown in figure 1, the products to be packaged are transferred to the station 4 when they have already been stacked. The stacks of products 2 are arranged inside one or more auxiliary containers 34, which may be informally called "baskets" or "canisters". The containers 34 are transferred by a transport device 35, defined for example by a conveyor (shown partially and in a simplified way), to be positioned in the station 4 in the plane 20. Each container 34 has one or more vertical seats 36 which have respective upper openings 37 and are each engaged by a respective stack of products 2, with a relatively small clearance in the radial direction. In particular, the contour of the seats 36 is at least partly complementary to the shape, in plan view, of the products, in such a way as to keep the products stacked and vertically guide them. Figure 1 shows an example with seats 36 of circular shape, separated from each another, while figure 5 shows a variant of the shape, with two diametrically opposed recesses 38 for each seat 36 (in order to facilitate insertion of the products into the seats 36 during a previous stacking step).

**[0025]** In particular, the number of seats 36 of each container 34 is equal to the number of devices 14 and/or housings 10 provided at the station 1.

**[0026]** When it is transferred to station 4 by the device 35 (figure 1), the container 34 is arranged, and preferably locked (in a manner not shown), in a reference position, between the plane 20 and the housings 10, in such a way as to align the seats 36 with the devices 14 and with the

housings 10 along the axes 11. In this reference position, as shown in figure 3, the openings 12 of the housings 10 are aligned and relatively close to the openings 37 of the seats 36. In other words, the robot 5 is controlled in such a way as to have a negligible gap vertically between the container 34 and the housings 10, which thus define an upward extension of the seats 36.

**[0027]** As shown in figure 2, the bottom of the seats 36 is defined by a perforated wall 39 of the container 34, on which the stacks of products 2 are placed. The holes of the walls 39 are designated by the reference number 40, pass vertically through the walls, and have number, dimensions and positions such as to be able to be traversed vertically by the rods 15 when the container 34 is arranged in the reference position. After container 34 has reached this position, and possibly has been locked, the rods 15 are operated so as to be raised. The heads 17 pass through an opening of the plane 20 and the holes 40, come into contact with the stack of products 2, and then cause the stack of products 2 to be raised so as to slide it along the seat 36 and insert it from below into the housing 10. During lifting, the device 24 is arranged in its retracted position.

**[0028]** As shown in figure 3, the lifting ends when the stack of products 2 lies entirely inside the corresponding housing 10, at a height that is at least equal to that of the device 24. Preferably, the stack of products 2 is raised to a height greater than that of the device 24.

**[0029]** With reference to figure 4, at this point, the device 24 is operated so as to be moved into the extended position. In this respect, as shown in figure 5, the shape and dimensions of the arms 27, as well as the shape, dimensions and positions of the heads 17, are designed so as to avoid interference between the various parts during movement into the extended position.

**[0030]** With reference to figure 7, after operation of the device 24, if the stack of products 2 is vertically spaced from the surface 26, the rods 15 are lowered by controlling the actuators 19 so as to move the stack of products 2 up to let it rest on the surface 26. As an alternative to or in combination with the lowering of the rods 15, the support of the stack of products 2 on the surface 26 can be obtained by lifting the frame 9, and therefore the device 24, by controlling the robot 5.

**[0031]** According to a variant not shown, during insertion into the housing 10, the stack of products 2 is raised to the same height as the device 24. In this case, after operation of the device 24, it is not necessary to lower the heads 17 and/or raise the frame to support the stacks of products 2 by means of the surfaces 26 of the device 24.

**[0032]** At this point, it is clear how the stacks of products 2 are supported only by the frame 9, and thus by the robot 5, which can be controlled to move the housings 10 into any position.

**[0033]** Preferably, the robot 5 is operated so as to move the stacks of products 2 to a packaging area separate from the area where the devices 14 and the plane 20 are

provided (i.e. separate from the area where the container 34 has been unloaded), and then to insert the stacks of products 2 into the bags 3. At the same time, the container 34 can be moved away from the station 1.

**[0034]** In particular, with reference to figure 8, the frame 9 is moved so as to vertically align the housings 10 with an upper opening 41 of the bag 3. The frame 9 is lowered so as to insert the uprights 13 from above into the opening 41, while the bag 3 is maintained in an open configuration by means of gripping devices 42 schematically illustrated, of known type and not described in detail, and while the stacks of products 2 are supported by the surfaces 26 of the arms 27 (i.e. in the same configuration as shown in figure 7).

**[0035]** Alternatively or in combination with the movements of the frame 9, a movement of the devices 42 can be provided, in a known and not shown manner, in order to arrange the bag 3 below the housings 10, and/or to align the opening 41 with the apertures 12 and/or to fit the bag 3 around the uprights 13 with an upward movement.

**[0036]** After insertion into the bag 3, the device 24 is moved into its retracted position by operating the actuator 25, to remove the lower support defined by the surface 26 of the arms 27, in a manner not shown. The stacks of products 2 are thus free to slide downwards under their own weight, along the housings 10. Thus, by lifting the frame 9 with the uprights 13, through the operation of the robot 5, and/or lowering the devices 42 and the bag 3, the uprights 13 are completely withdrawn from the bag 3, while the stacks of products 2 remain inside. At this point, the opening 41 is sealed (for example by means of heat sealing or by means of a zipper device, not shown, forming part of the bag 3) to complete the packaging.

**[0037]** The same procedure described above can also be applied if the stacks of products 2 are put into packages other than the bag 3, for example into boxes having a shape and size such as to allow the insertion and subsequent extraction of the uprights 13.

**[0038]** More generally with respect to what is shown in figure 8, it is also possible to arrange only a lower portion of the uprights 13, or even just the opening 12, into the packaging (bag, box, or other), thus letting the stack of products 2 drop towards the bottom of the packaging after moving the arms 27 into the retracted position, as long as there are no substantial risks to damage the products during their fall.

**[0039]** According to variations not shown, the frame 9 is supported and moved by a moving and positioning device other than the robot 5; or the frame 9 is arranged in a fixed position with respect to the structure 4 (in this case, the insertion of the stacks of products 2 into the bag 3 is carried out by moving only the bag 3 after having removed the container 34).

**[0040]** Figures 9 to 12 show a station 101, the parts of which are indicated, wherever possible, by using the same reference numbers used for the station 1 in figures 1 to 8.

**[0041]** The station 101 differs from the station 1 in some aspects. Firstly, the frame 9 is replaced by a different frame 109, which is devoid of the uprights 13 and the transmission 30 and, for example, is defined by a vertical plate.

**[0042]** In addition, according to a preferred aspect of this embodiment, the housings 10 are defined by respective packaging containers 103 which are coupled to the frame 109 in fixed positions by means of a releasable retaining device 110, of a type known per se and not described in detail. In particular, the containers 103 are defined by respective rigid or semi-rigid plastic tubes and are positioned so as to have the same interaxial spacing between the seats 36 of the container 34. In addition, the inside diameter of the containers 103 is approximately the same size but slightly larger than the outer diameter of the products to be packaged.

**[0043]** Each housing 10 has an axial end 112 which is opposite to the opening 12 along the corresponding axis 11 and is closed, for example by means of a wall 113 which constitutes part of the container 103 (figure 9). According to a variant not shown, the end 112 is closed by a wall forming part of the frame 109.

**[0044]** The device 24 differs from the solution of figures 1-8, in that it comprises a respective tab 127 for each housing 10, instead of the two rotating arms 27. The upper surface of the tabs is indicated by the reference number 126, and performs the same function as the surface 26 of the solution of figures 1-8.

**[0045]** In the extended position, the tabs 127 project along respective horizontal axes 128 at the opening 12, preferably without interference with the corresponding containers 103. In particular, the displacement of the tabs 127 between the retracted and extended positions is defined by a translational motion along the axes 128. In greater detail, all the tabs 127 are parts of a single plate supported and driven by a single actuator 25 (for example a linear actuator).

**[0046]** In the horizontal direction orthogonal to the axis 128, each tab 127 has a width less than the distance between the two heads 17 of the corresponding device 14, so as to avoid interference when it is located between the heads 17.

**[0047]** The steps performed to align the housings 10 with the seats 36, to raise the stacks of products 2 and to remove them from the container 34 (figure 10), to move the device 24 into the extended position (figure 11) and to support the stacks of products 2 on the surfaces 126 of the tabs 127, are achieved in a way that is similar to what has already been indicated above for the station 1, and hence is not repeated for reasons of conciseness.

**[0048]** It is however evident that the lifting of the stacks of products 2 into the housings 10 already corresponds to a packaging operation, without further steps that are instead necessary in the method described above for the station 1 (these steps essentially comprise the alignment between the bag 3 and the housings 10, the insertion of the uprights 13, with the stacks of products 2, vertically

into the bag 3, and the extraction of the uprights 13 vertically from the bag 3).

**[0049]** After the device 24 has been operated into the extended position (figure 11) and the stacks of products 2 have been rested on the surfaces 126 so as to support the stacks of products 2 in the respective housings 10, as shown in figure 12 the rods 15 are lowered to release the container 34 (and then if necessary the latter is moved away, in a manner not shown), and the frame 109 is rotated by the robot 5 by an angle of 180° about a horizontal axis 130, for example parallel to the axes 128, so as to turn the containers 103 upside-down, i.e. to arrange the openings 12 upwards and the end 112 downwards. Thanks to being thus turned over, the stacks of products 2 rest by their own weight on the walls 113, and release the surfaces 126 from their weight. The tabs 127 are now moved into the retracted positions (in a manner not shown) to free up the openings 12, which can then be closed, for example by coupling respective caps (not shown) onto the containers 103. In addition, before or after the closing of the openings 12, the containers 103 are decoupled from the frame 109, by releasing the device 110.

**[0050]** From the foregoing, it is evident that the described process, with reference to both the station 1 and the station 101, allows the stacks of products 2 to be packaged without the lateral edges of the products being pressed on. In fact, these pressures are exerted only at the lower surface of the stack of products 2 (i.e. at the upper surfaces 18 of the heads 17 and/or the upper surfaces 26, 126). The lateral edges of the products are subjected only to a possible rubbing against the lateral surfaces of the seats 36 and the housings 10, during the lifting step and the possible lowering and overturning steps.

**[0051]** It follows that the risks of breakage or deformation of the products during the packaging steps described above are extremely low when compared with the known solutions.

**[0052]** In addition, the bags 3 and the containers 103 are sized so as to house the stacks of products 2 with very little clearance, thus achieving a saving in packaging material and a reduction in the risks of damage in the case of jolts and shocks after packaging.

**[0053]** It is also apparent that the method described above is extremely simple and requires a relatively small number of parts. In addition, as abovementioned, the method can be adapted in order to package the stacks of products 2 in different types of packaging.

**[0054]** In addition, the position and size of the heads 17 (and therefore of the holes 40) as shown in figures 2 and 5 are such that they can equally be used either at station 1 or at station 101.

**[0055]** It is evident then from the foregoing that the method and the stations 1, 101 described above with reference to the attached figures may be subject to modifications and variants which do not depart from the protective scope of the present invention, as defined in the

accompanying independent claims.

**[0056]** In particular, as mentioned above, each container 34 can carry any number of stacks of products 2; in addition, it can carry stacks of products that are differently shaped and/or sized from each other to be packaged in different stations from each other (also at each station only one stack of products from among all those carried can be extracted from the container 34).

**[0057]** In addition, in the case of the station 1, the housing 10 may be defined by a different structure from the uprights 13.

**[0058]** In addition, the device 24 could consist of movable elements with different shapes and of a different number with respect to that indicated above for the tabs 127 and the arms 27.

## Claims

1. A packaging method for inserting stacks of products (2) into packaging containers (3; 103), **characterised by** comprising the steps of:
  - providing at least one stack of products (2) in a position that is vertically aligned and below a vertical housing (10), which ends at the bottom with an inlet opening (12);
  - lifting said stack of products (2) so as to insert the said stack of products (2) through said inlet opening (12) into said vertical housing (10);
  - moving a support device (24) from a retracted position into an advanced position, below the raised stack of products (2), so as to engage said inlet opening (12) and/or a lower portion of said vertical housing (10), after the lifting step;
  - resting the stack of products (2) onto the support device (24) .
2. The method according to claim 1, **characterised in that** the stack of products (2) is lifted in said vertical housing (10) to a height greater than the said support device (24), and is supported on the support device (24) by allowing the stack of products (2) to be lowered and/or by lifting the vertical housing (10) with the support device (24).
3. The method according to claim 1, **characterised in that** the stack of products (2) is raised in said vertical housing (10) to the same height as the support device (24), and rests on the support device during the movement of the support device into the advanced position.
4. The method according to any one of the preceding claims, **characterised in that** the stack of products (2) is raised by pushing the stack of products (2) from below by the use of at least one vertical rod (15).
5. The method according to any one of the preceding claims, **characterised in that** the said stack of products, before lifting, is arranged in an auxiliary container (34) of transportable type.
6. The method according to any one of the preceding claims, **characterised in that** said vertical housing (10) is defined by a structure (13) which projects downwards from a frame (9) and supports said support device (24); and **in that** it comprises the steps of inserting at least said inlet opening (12) into said packaging container (3), while the stack of products (2) rests on the support device (24) and, afterwards, taking the support device (24) back to the retracted position.
7. The method according to claim 6, **characterised in that** the structure (13) is removed from the packaging container by vertically moving said structure (13) and said packaging container (3) with respect to one another, after having taken the support device (24) back to the retracted position.
8. The method according to any one of claims 1 to 5, **characterised in that** said vertical housing (10) is defined by said packaging container (103).
9. The method according to claim 8, **characterised in that** said packaging container is closed at one end that is opposite to said inlet opening (12).
10. The method according to claim 9, **characterised in that** said packaging container (103) is turned upside-down, with the support device (24), while the support device (24) is placed in the advanced position, and subsequently said support device (24) is taken back to the retracted position.
11. A packaging station (1; 101) for carrying out the method according to any one of the preceding claims, the station comprising:
  - support means (9; 109);
  - at least one vertical housing (10) which is supported by said support means (9; 109) and ends at the bottom with an inlet opening (12);
  - lifting means (14) which can be operated to insert said stack of products (2) through said inlet opening (12) into said vertical housing (10);
  - a support device (24) supported by said support means 9; 109) and movable between a retracted position, wherein said vertical housing (10) and said inlet opening (12) are free, and an advanced position, in which said support device (24) engages said inlet opening (12) and/or a lower portion of said vertical housing (10), in order to allow the resting of the stack of products on an upper surface (26) of the support device

(24) after the insertion into said vertical housing (10).

12. The station (1; 101) according to claim 11, **characterised in that** it comprises at least one auxiliary container (34) of transportable type, defining at least one vertical seat (36) which has an upper opening (37) and is configured so as to accommodate and support said stack of products (2). 5  
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13. The station according to claim 12, **characterised in that** the bottom of said vertical seat (36) is defined by a perforated wall (39) of the auxiliary container (34). 15
14. The station according to any one of claims 11 to 13, **characterised in that** said lifting means (14) comprise at least one vertical rod (15) movable between a lowered position and a raised position. 20
15. The station according to any one of claims 11 to 14, **characterised in that** said vertical housing (10) is defined by a structure (13) which projects downwards from said support means (9) and carries said support device (24). 25
16. The station according to claim 15, **characterised in that** said structure (13) consists of a plurality of vertical uprights (13). 30
17. The station according to claim 16, **characterised in that** said vertical uprights (13) comprise at least one upright which can rotate about a vertical axis (28); said support device (24) comprising at least one horizontal arm (27) fixed with respect to said rotatable upright (13a). 35
18. The station according to any one of claims 11 to 14, **characterised in that** said vertical housing (10) is defined by said packaging container (103). 40
19. The station according to claim 18, **characterised in that** said support means (109) can rotate about a horizontal axis so as to turn said packaging container (103) upside-down. 45

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FIG. 1

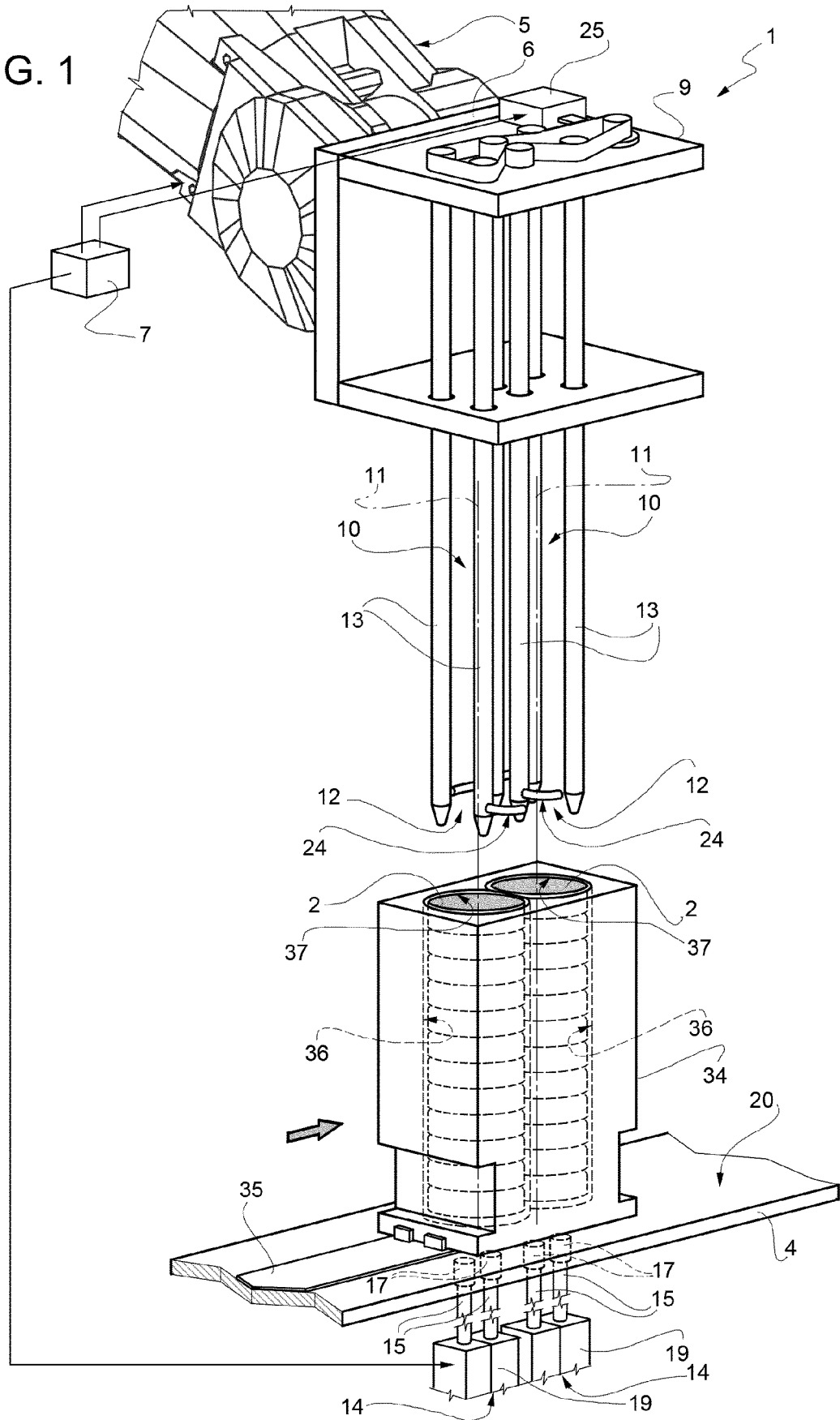


FIG. 2

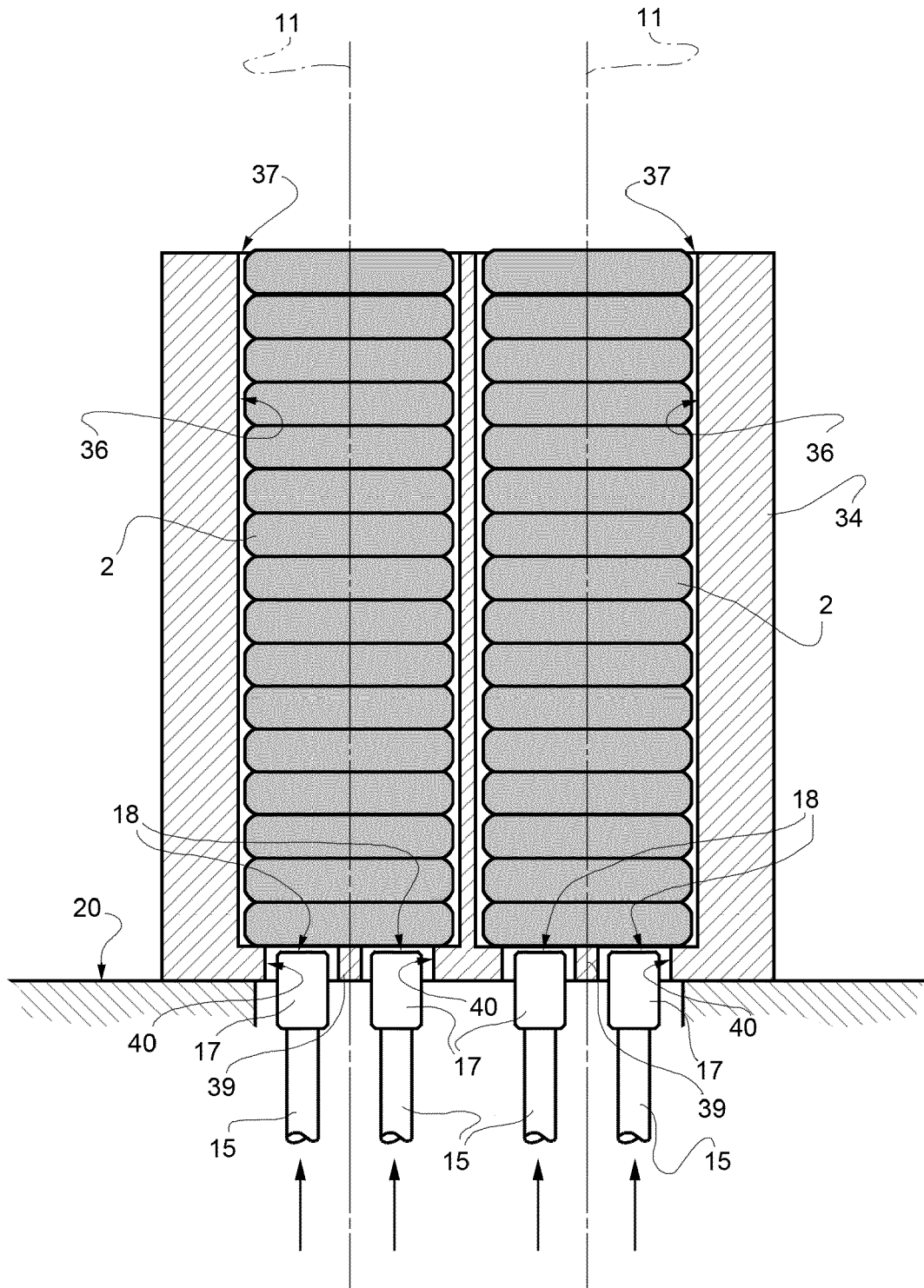
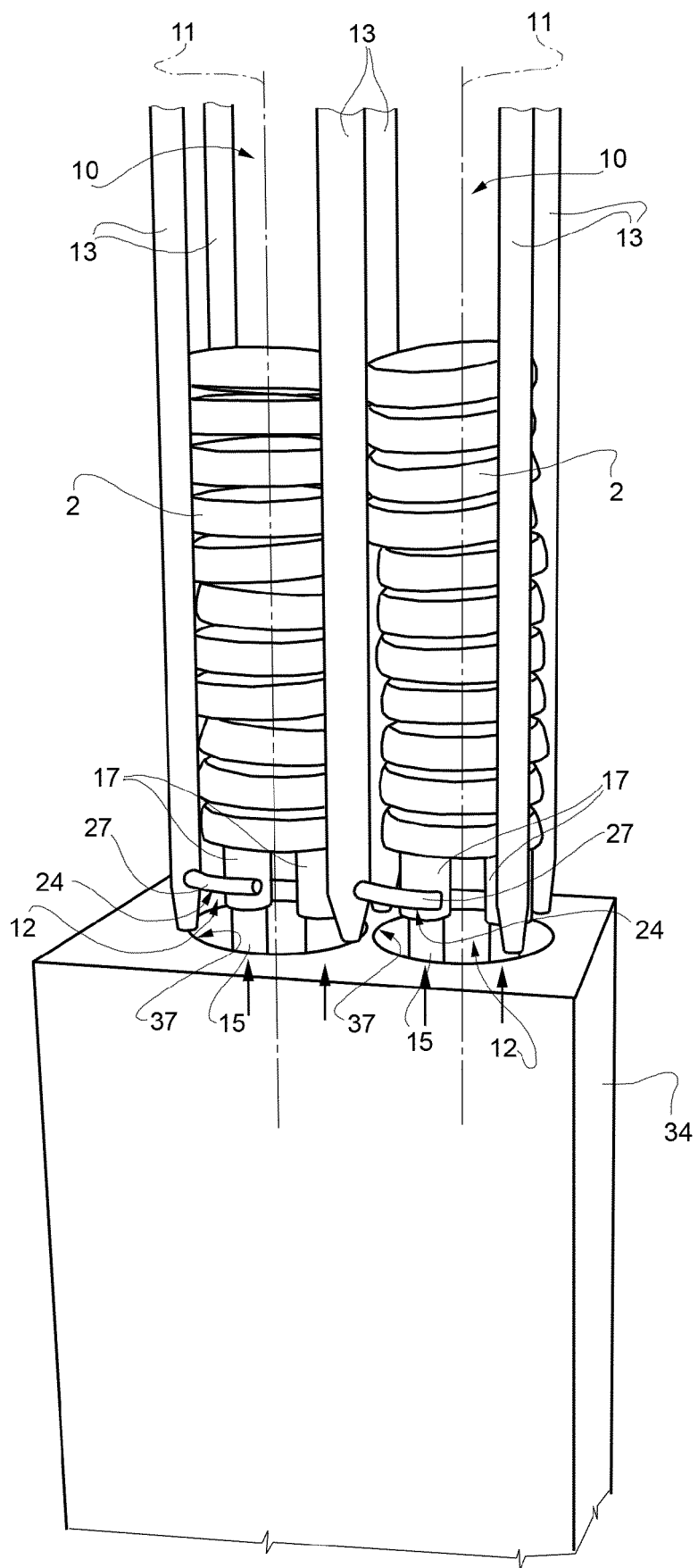


FIG. 3



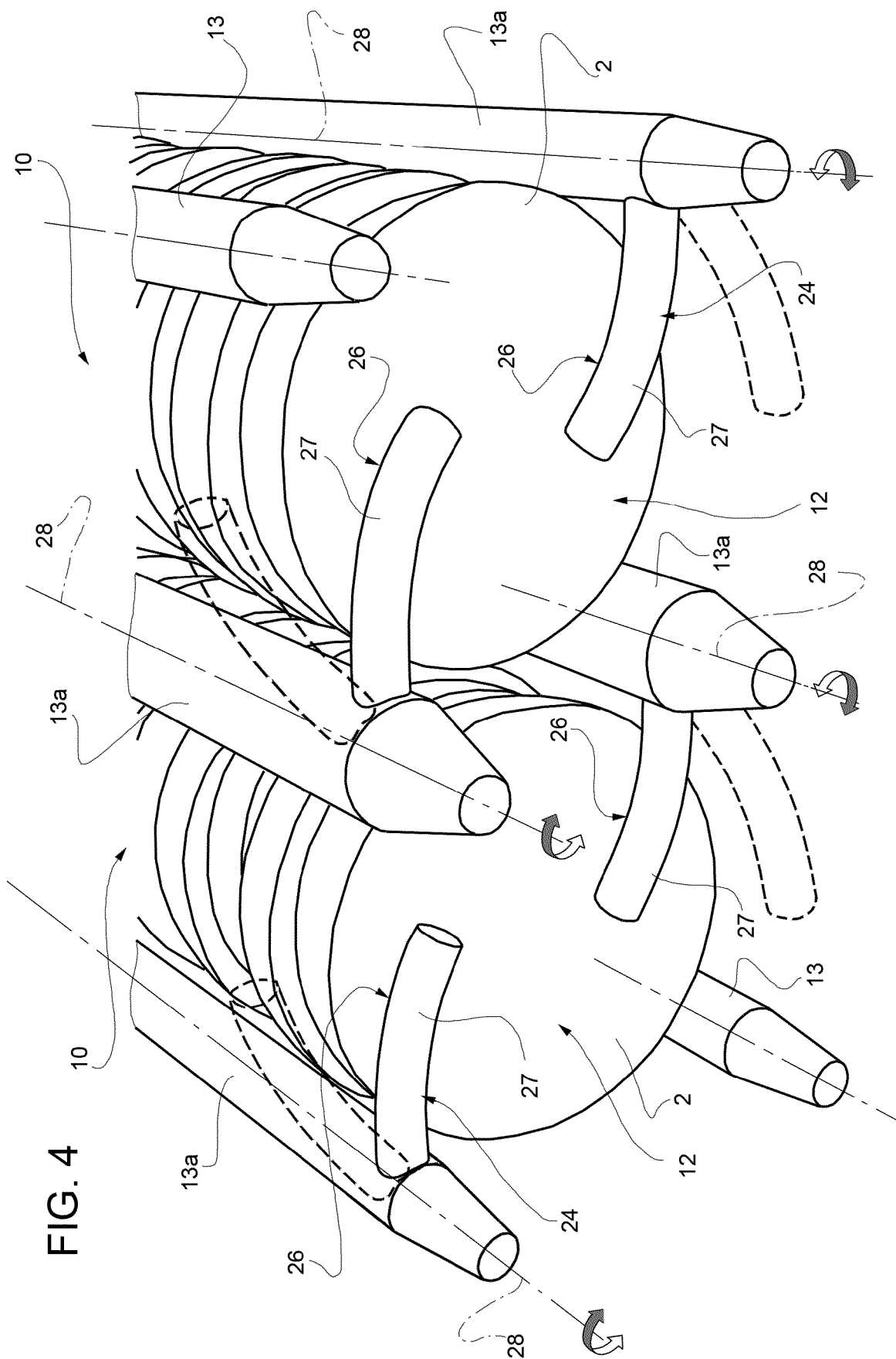


FIG. 4

FIG. 5

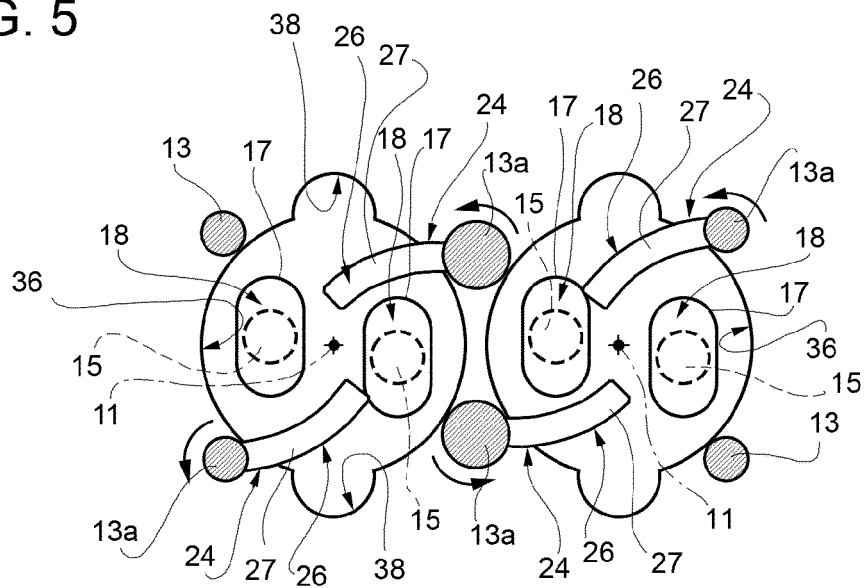


FIG. 6

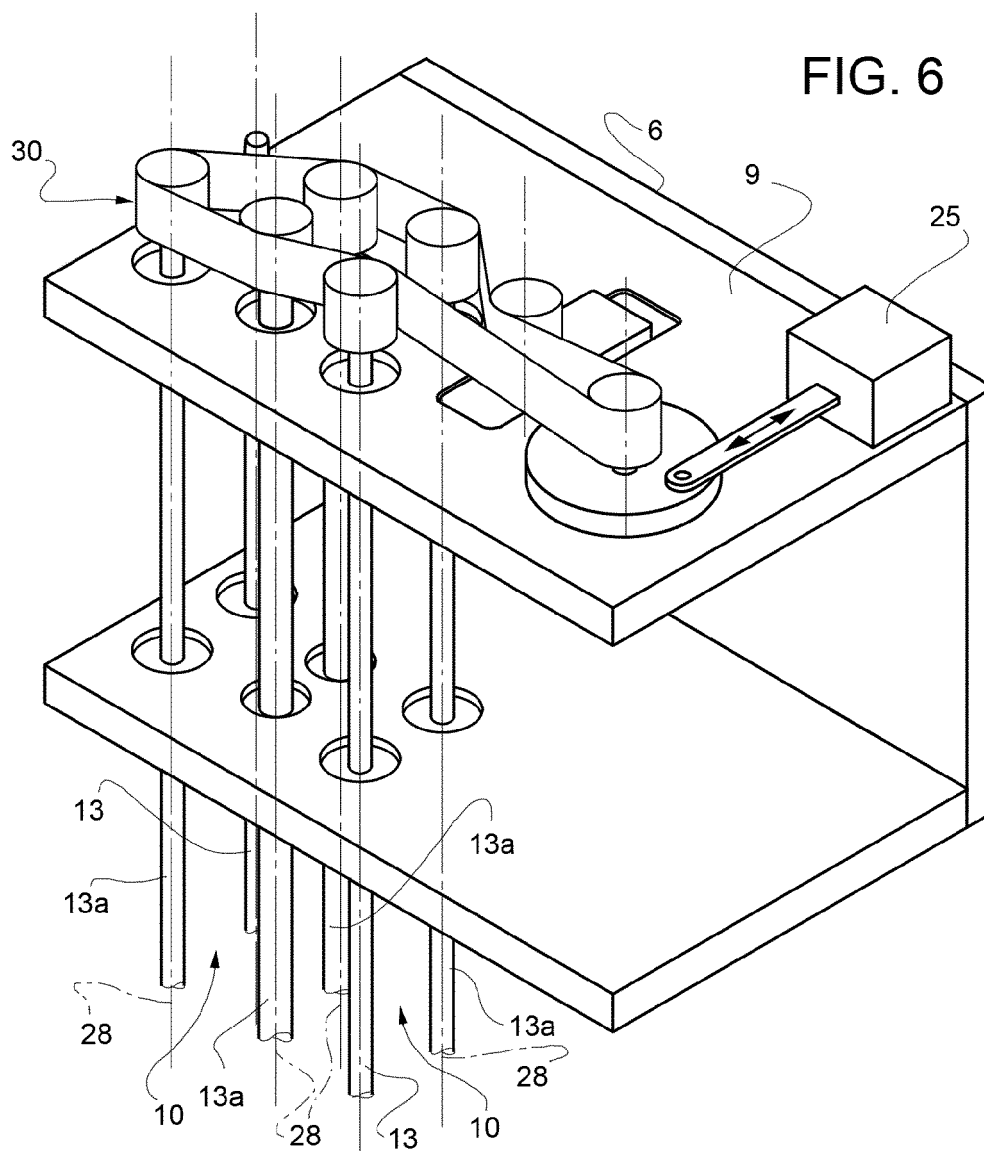


FIG. 7

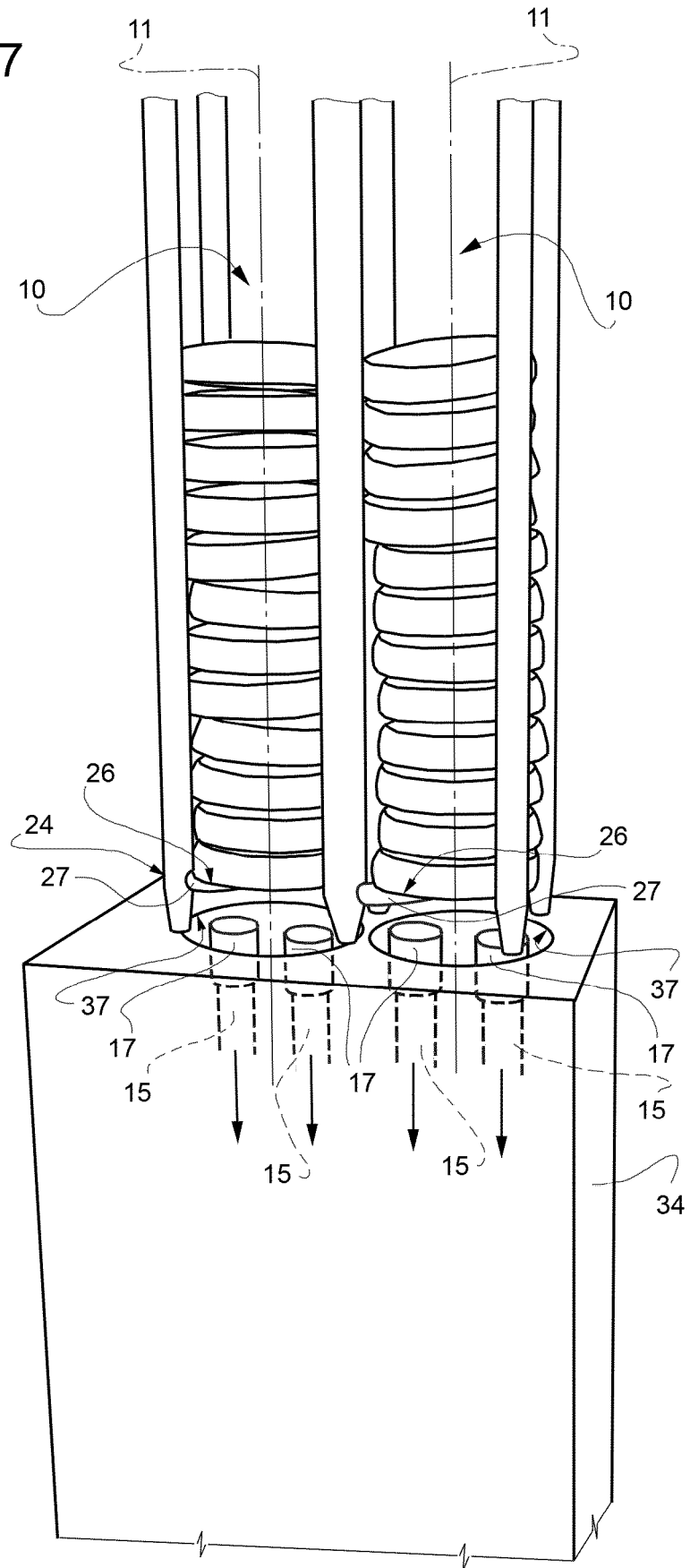


FIG. 8

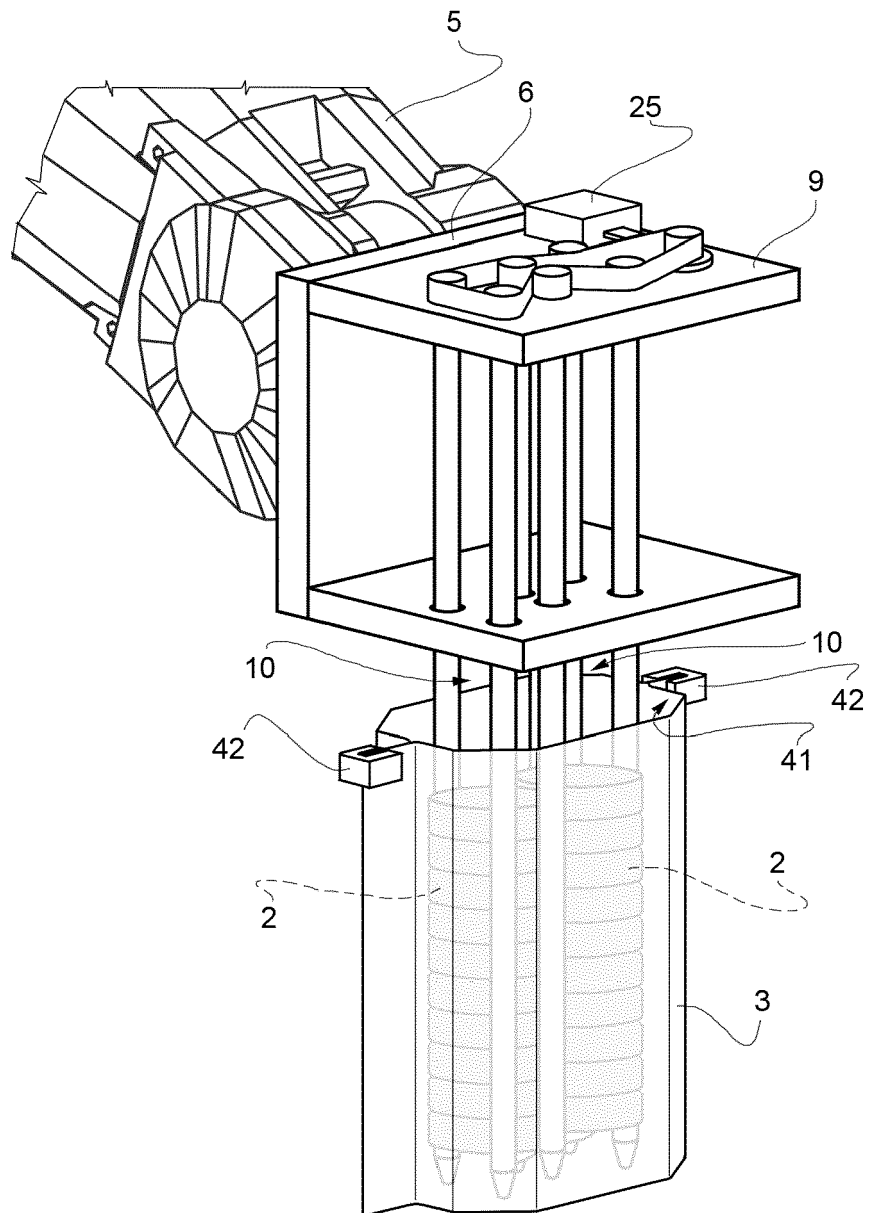


FIG. 9

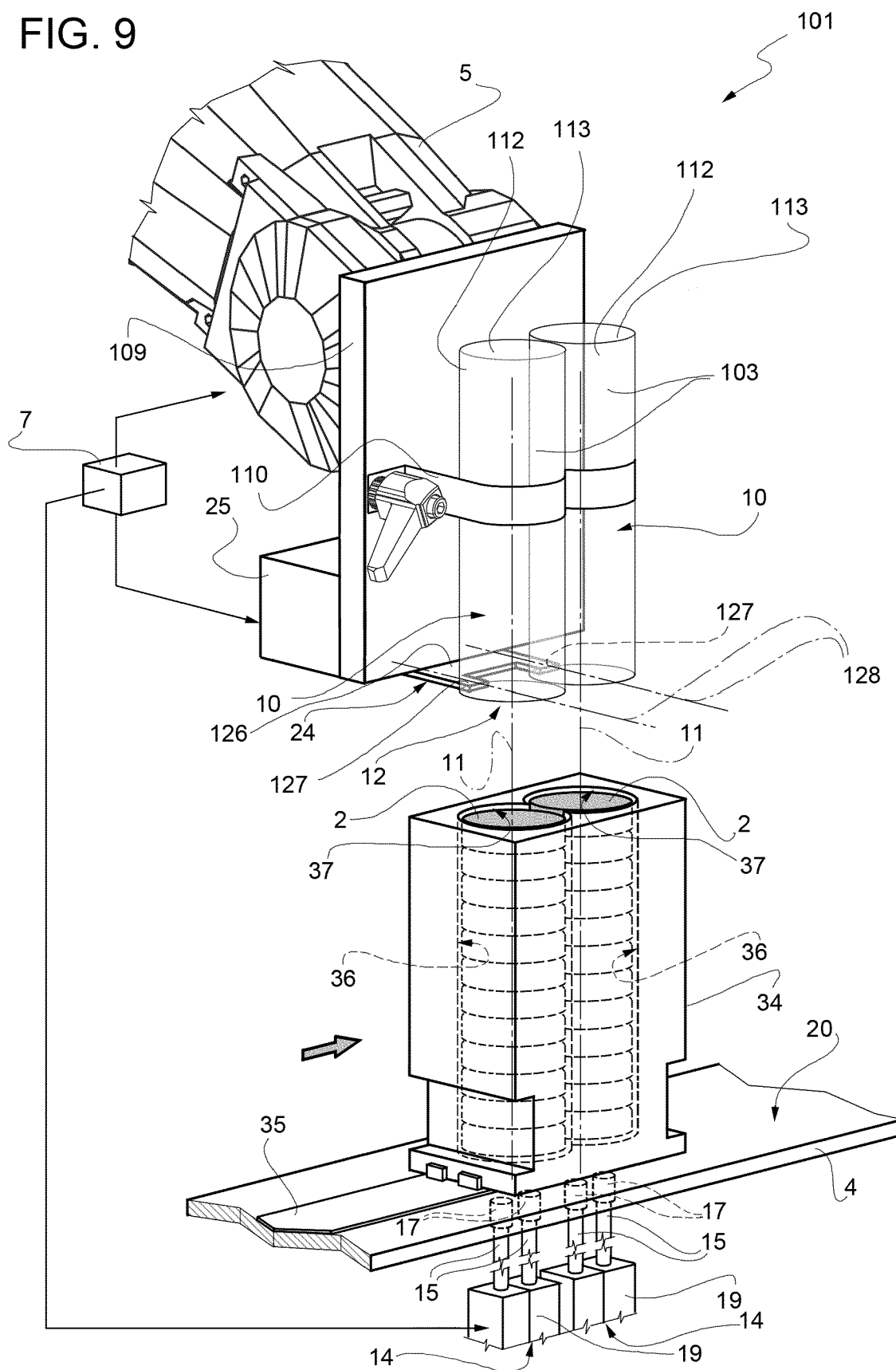


FIG. 10

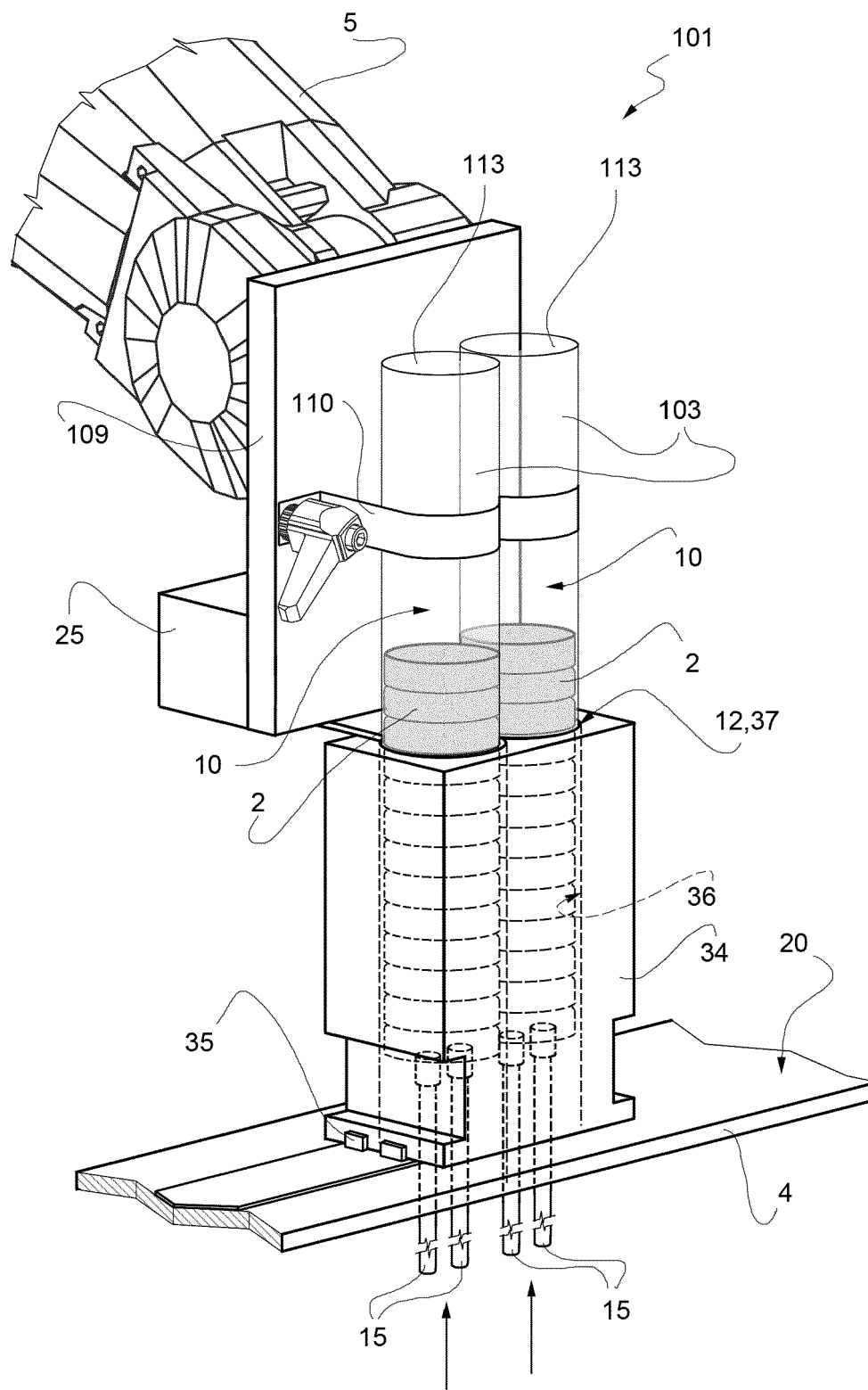


FIG. 11

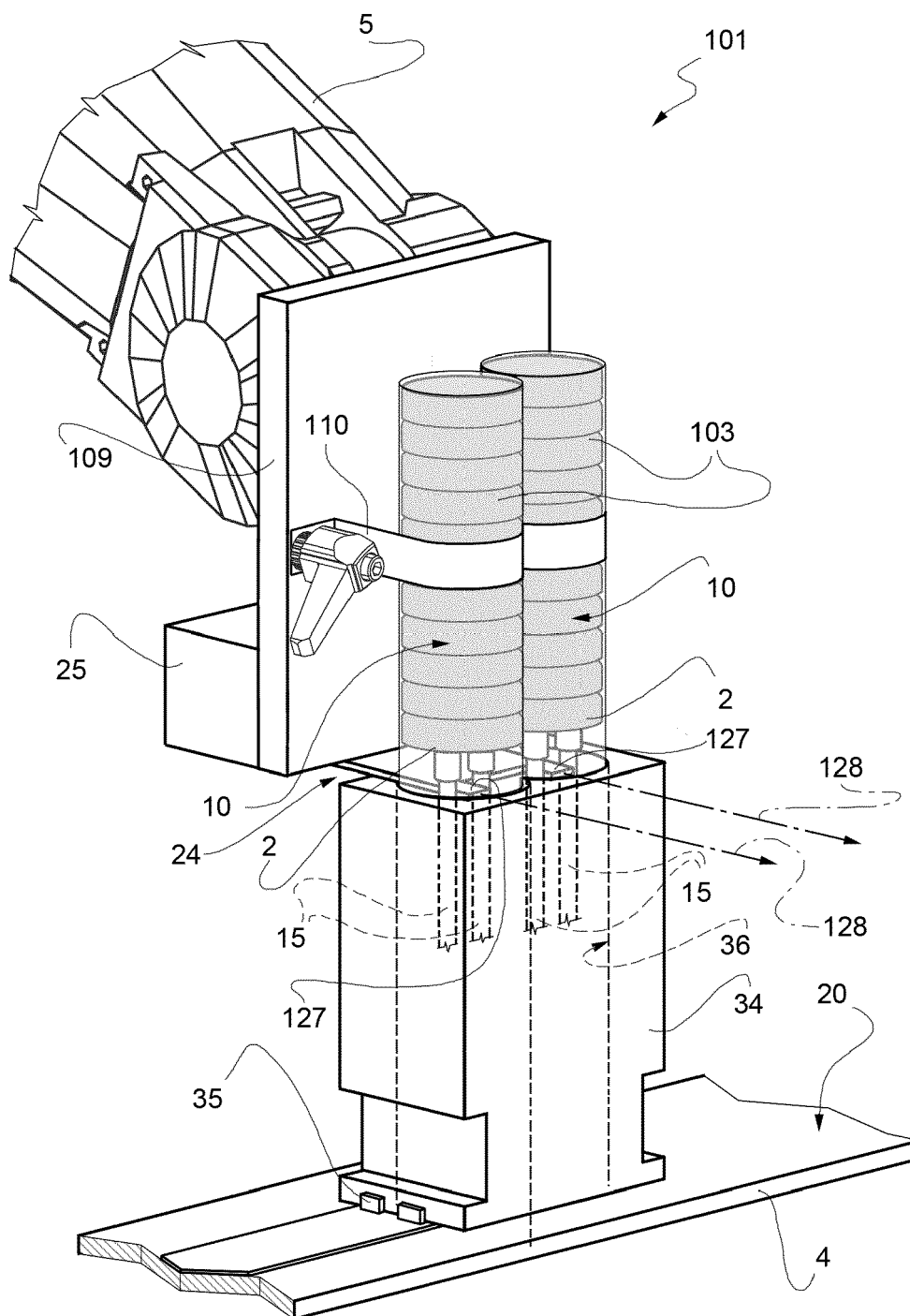
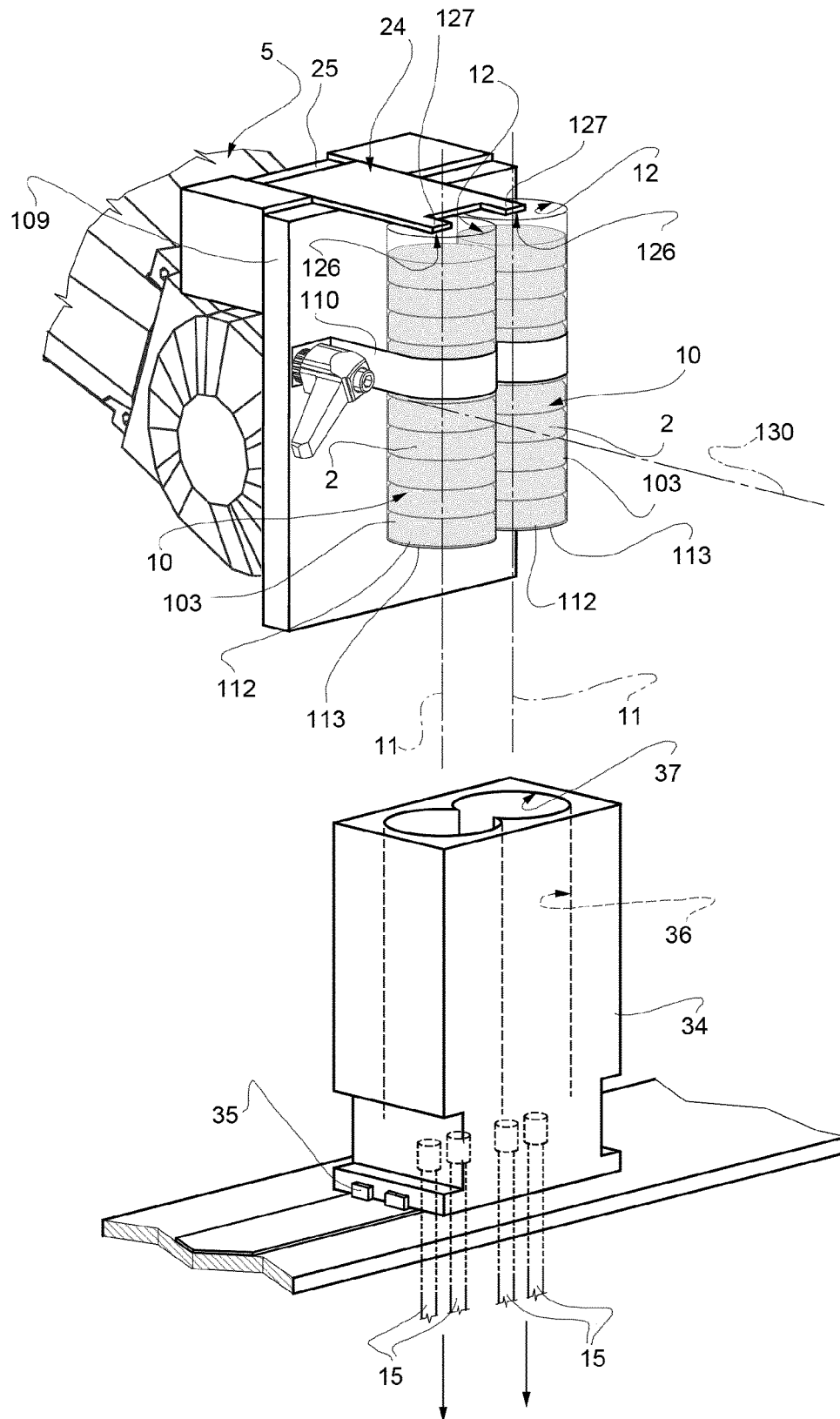


FIG. 12





## EUROPEAN SEARCH REPORT

Application Number  
EP 18 18 3269

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| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                    |                                                                                                                                                                |                                                                                                                                                                                                                                                                                       |                                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Category                                                                                                                                                                                                                                               | Citation of document with indication, where appropriate, of relevant passages                                                                                  | Relevant to claim                                                                                                                                                                                                                                                                     | CLASSIFICATION OF THE APPLICATION (IPC)    |
| X                                                                                                                                                                                                                                                      | US 4 750 317 A (VRANA JOSEF F [CA])<br>14 June 1988 (1988-06-14)<br>* column 4, lines 18-32; figures 1, 2, 4, 5, 7 *<br>* column 7, lines 41-47 *<br>-----     | 1-4,11,<br>14,15                                                                                                                                                                                                                                                                      | INV.<br>B65B23/16<br>B65B35/40<br>B65B5/06 |
| X                                                                                                                                                                                                                                                      | DE 10 17 078 B (ROSE BROTHERS LTD)<br>3 October 1957 (1957-10-03)<br><br>* column 4, lines 44-56; figure 4 *<br>* column 5, lines 17-37 *<br>-----             | 1,4,5,8,<br>9,11-16,<br>18                                                                                                                                                                                                                                                            |                                            |
| A                                                                                                                                                                                                                                                      | EP 0 476 301 A1 (NATEC REICH SUMMER GMBH CO KG [DE]) 25 March 1992 (1992-03-25)<br>* page 4, lines 11-34; figures 1-8, 17 *<br>* page 5, lines 9-19 *<br>----- | 1,6,7,<br>11,17                                                                                                                                                                                                                                                                       |                                            |
| A                                                                                                                                                                                                                                                      | EP 1 179 476 A2 (SIG PACK SYSTEMS AG [CH])<br>13 February 2002 (2002-02-13)<br>* paragraphs [0009] - [0012]; figure 8 *<br>-----                               | 6,10,17,<br>19                                                                                                                                                                                                                                                                        |                                            |
| A                                                                                                                                                                                                                                                      | US 3 273 300 A (WATROUS HOWARD N ET AL)<br>20 September 1966 (1966-09-20)<br>* column 10, lines 38-56; figure 1 *<br>-----                                     | 10,19                                                                                                                                                                                                                                                                                 | TECHNICAL FIELDS<br>SEARCHED (IPC)<br>B65B |
| The present search report has been drawn up for all claims                                                                                                                                                                                             |                                                                                                                                                                |                                                                                                                                                                                                                                                                                       |                                            |
| Place of search<br><b>Munich</b>                                                                                                                                                                                                                       |                                                                                                                                                                | Date of completion of the search<br><b>25 July 2018</b>                                                                                                                                                                                                                               | Examiner<br><b>Garlati, Timea</b>          |
| CATEGORY OF CITED DOCUMENTS<br>X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document |                                                                                                                                                                | T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>.....<br>& : member of the same patent family, corresponding document |                                            |

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 18 18 3269

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
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25-07-2018

10

| Patent document<br>cited in search report | Publication<br>date | Patent family<br>member(s)                       | Publication<br>date                    |
|-------------------------------------------|---------------------|--------------------------------------------------|----------------------------------------|
| US 4750317 A                              | 14-06-1988          | CA 1291733 C<br>US 4750317 A                     | 05-11-1991<br>14-06-1988               |
| DE 1017078 B                              | 03-10-1957          | NONE                                             |                                        |
| EP 0476301 A1                             | 25-03-1992          | DE 4029359 A1<br>EP 0476301 A1<br>JP H04279417 A | 19-03-1992<br>25-03-1992<br>05-10-1992 |
| EP 1179476 A2                             | 13-02-2002          | NONE                                             |                                        |
| US 3273300 A                              | 20-09-1966          | NONE                                             |                                        |

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EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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**Patent documents cited in the description**

- LU 100336 [0001]