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(54) **A packing system for food products**

(57) An embodiment of the invention relates to a packing system (100) for food products, comprising: a continuous strip formed by a succession of preformed and sealed bags (105); movement means (155) able to advance the strip of bags (105) in a predetermined pathway; a tunnel (145) for containing a lateral edge (110) of the strip of bags (105) for an operating portion of the pathway, along the operating portion there being present, at least: injector means (190) able to inject a sterilising substance on the lateral edge (110) of the strip of bags

(105); first cutting means (195) able to cut the lateral edge (110) in a longitudinal direction so as to create an aperture along a margin of the bags (105); second cutting means (200) for cutting the strip of bags (105) in a transversal direction for separating the bags; filling means (205, 210, 220) able to dispense, internally of each bag (105), a food product through the respective opened aperture; and sealing means (266) of the aperture of the bag (105) after filling thereof.

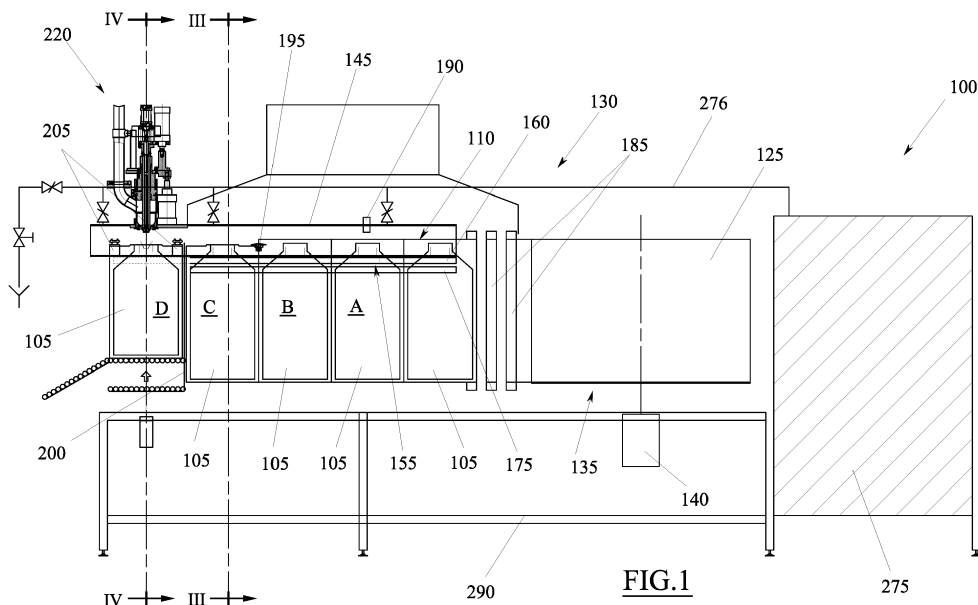


FIG.1

Description

[0001] The present invention relates in general to a packing system for food products, such as for example tomato concentrate, tomato paste, fruit juices or another other "pumpable" food product, for example in the fluid, paste, viscous, semi-solid, mixed (for example fluid containing solid parts) state, etc. In more detail, the present invention relates to a packing system by means of which the food products are packed aseptically internally of bags lacking a mouth opening.

[0002] As is known, one of the packing methodologies of the above-mentioned food products includes using aseptic bags of various formats realized in a plastic material. The aseptic bags generally comprise a rigid mouth which delimits an access opening, and a cap which is coupled and fixed to the aperture in such a way as to seal the food product internally of the bag.

[0003] The packing systems using these aseptic bags generally comprise an automatic system of movement which advances the bags through a plurality of operating stations, among which at least an opening station of the mouth by means of removal of the cap, a filling station of the bag through the open mouth and a closing station of the mouth by means of remounting the cap. Along the pathway between the operating stations, the portion of bag at the mouth is first sanitised by means of a sterilising solution and is successively maintained in an aseptic ambient, so as to guarantee that the food product is not attacked by germs, bacteria or other microbic agents during the successive filling step up to the complete closure of the bag.

[0004] A drawback of this solution consists however of the fact that the presence of the mouth and the closing cap implies a rather high cost for the bags and further leads to a high degree of complication of the packing system, which has to be provided with special automated devices for managing and manipulating the caps.

[0005] To tackle these drawbacks, packing systems have been disclosed in which the food products are packed internally of aseptic bags lacking a mouth. These bags are generally realised by superposing two strips of plastic material, which are specially heat-welded along the lateral edges and in a transversal direction, so as to obtain a sequence of bags joined to one another.

[0006] The forming steps of the bags are at present performed in the first part of a packing system, which also comprises cutting means able to separate the bags from one another, filling means for dispensing the food product in the bags and welding means for completely sealing the bags after filling.

[0007] These packing systems are therefore very complicated, as they require numerous apparatus for moving and numerous operating units that are different to one another, to the point that they are usually extremely large as well as difficult to set up due to the difficulty of synchronization of all the apparatus.

[0008] A further known drawback of these packing sys-

tems consists in the difficulty of guaranteeing the aseptic state of the bags. To do this, it is necessary to predispose systems of sterilization which are able to entirely sanitise the strips of plastic material used in the forming of the bags. Further, it is necessary for all the operating apparatus working on the strips and the bags, including the forming apparatus, filling and sealing apparatus, to be completely contained in an aseptic ambient, for example internally of a large cabin into which sterile air is supplied. These needs therefore combine to further increase the dimensions and the complication of the packing system, consequently increasing the cost too.

[0009] In the light of the foregoing, an aim of the present invention is to obviate or at least reduce the above-mentioned drawbacks, by disclosing a system for packing food products in bags lacking a mouth, which is overall simpler, more rational and economical with respect to already-known types.

[0010] These and other aims are attained by the characteristics of the invention as reported in independent claim 1. The dependent claims delineate preferred and/or particularly advantageous aspect of the invention.

[0011] In particular, an embodiment of the present invention provides a packing system comprising:

- a continuous strip formed by a succession of pre-formed and sealed bags,
- movement means able to advance the strip of bags in a predetermined pathway,
- a tunnel for containing a lateral edge of the strip of bags for an operating portion of the pathway, along the operating portion there being present, at least:
 - injector means able to inject a sterilising substance on the lateral edge of the strip of bags,
 - first cutting means able to cut the lateral edge (110) in a longitudinal direction for opening an aperture along a margin of the bags,
 - second cutting means for cutting the strip of bags in a transversal direction for separating the bags,
 - filling means able to dispense, internally of each bag, a food product through the respective open aperture, and
 - sealing means of the aperture of the bag after filling thereof.

[0012] With this solution, the strip of bags can be realised separately, using specific forming plants which guarantee internal aseptic conditions therein. Being sealed, the bags remain internally aseptic even during the following transport and movement steps. Therefore, at the inlet of the packing system it is not necessary to entirely sterilise the bags, but only the part contained in the tunnel, i.e. the part where the aperture is created for filling. In this way, the packing system is advantageously less voluminous and significantly simpler to make and manage with respect to those of the prior art, with a conse-

quent reduction in costs.

[0013] In an aspect of the invention, the packing system can comprise a generator of sterile air connected to the tunnel.

[0014] With this solution it is advantageously possible to dispense sterile air into the tunnel to create a condition of (at least slight) overpressure which, by opposing the inlet of dusts and/or other more or less contaminating particles, guarantees the aseptic state of the volume in which the opening of the bags occurs, and the filling thereof.

[0015] In an aspect of the invention, the tunnel can be dimensioned so as to contain a limited portion of the strip of bags and exhibits a longitudinal aperture through which a remaining portion of the strip of bags projects externally.

[0016] In this way, the tunnel closes the upper edge of the strip of bags in a very small volume, which can be maintained in aseptic conditions by means of less powerful devices and therefore more economical with respect to those used for large volumes in the prior art.

[0017] In a further aspect of the invention, the packing system can further comprise a cabin able to completely contain the strip of bags along the operating portion of the pathway, which is in communication with the tunnel via the longitudinal aperture and is provided with at least an air filter.

[0018] In this way, the air filter guarantees a high degree of hygiene of the air internally of the cabin, which thus functions as a further barrier against possible contaminations of the volume internally of the tunnel.

[0019] In a further aspect of the invention, the movement means comprise a stepped activating system able to advance the strip of bags intermittently.

[0020] This activating system has the advantage of being adequate for the purpose, while remaining a relatively simple, and economical solution that is effectively integrable in a small-dimension tunnel such as the one included in the disclosed packing system.

[0021] In a further aspect of the invention, the filling means comprise a dispensing nozzle of the food product, and movement means able to move the dispensing nozzle selectively nearingly and distancingly with respect to the aperture of the bags to be filled.

[0022] With this solution, the dispensing aperture can be selectively inserted in the aperture of the bag to be filled, so as to tip the food product with precision internally of the bag. In particular, the dispensing nozzle prevents the flaps of the aperture from being fouled by drips or sprays of food product which otherwise might compromise the successive sealing step.

[0023] In a particular aspect of the invention, the dispensing nozzle can be tapered towards the aperture of the bag to be filled (for example it can substantially have a funnel shape) with an ogival passage section.

[0024] This shape of the nozzle has the advantage of being complementary to the shape of the bag aperture, thus facilitating the insertion of the nozzle internally there-

of and making the filling thereof more effective.

[0025] In a further aspect of the invention, the filling means comprise first gripping means (for example plier means) able to grip opposite ends of the cut margin of each bag to be filled, and movement means for reciprocally nearing/distancing the first gripping means in a longitudinal direction with respect to the aperture.

[0026] These first gripping means have an advantageous double function. The first function is to support the bag before and during the filling. The second function is that thanks to the reciprocal nearing thereof in a longitudinal direction, they facilitate the opening of the aperture in a transversal direction, thus creating the space required for the passage of the food product, possible after insertion of the dispensing nozzle.

[0027] In a further aspect of the invention, the filling means can also comprise second gripping means (for example suction cups) able to grip the opposite flaps of the aperture of each bag to be filled, and movement means able to reciprocally near/distance the second gripping means in a transversal direction with respect to the aperture.

[0028] By reciprocally distancing them the second gripping means have the advantage of ensuring a correct opening in a transversal direction of the aperture of the bag to be filled, with the aim of creating the passage for the food product. By reciprocally nearing them, the second movement means can further press the flaps of the aperture so that they adhere against the dispensing nozzle, thus further reducing the risk of sprays or leakages of product.

[0029] In a further aspect of the invention, the filling system can comprise a support platform able to support each bag to be filled during filling thereof, and movement means able to lift/lower the platform.

[0030] With this solution, the platform can be progressively raised in such a way as to aid the deformation of the bag during the filling step, while continuing to support the weight thereof.

[0031] Further characteristics and advantages of the invention will emerge from a reading of the description that follows, provided by way of non-limiting example, with the aid of the figures of the accompanying tables.

Figure 1 is a schematic side view of a packing system according to an embodiment of the present invention.

Figure 2 is a larger-scale detail of figure 1.

Figure 3 is section III-III of figure 1 shown in a simplified form and in a larger scale.

Figure 4 is the section IV-IV of figure 1 shown in a simplified form and in a larger scale.

Figure 5 shows a strip of bags of the type used in the system of figure 1.

Figure 6 shows larger-scale view of the section of the dispensing nozzle as shown in figure 4.

Figure 7 is section VII-VII of figure 6.

Figure 8 is a schematic view of an example of appli-

cation of the system of figure 1.

[0032] The figures illustrate a system 100 for aseptic packing of food products, such as tomato concentrate, tomato paste, fruit juices or any other "pumpable" food product i.e. that can be pumped, for example in the fluid, pasty, viscous, semisolid mixture state (e.g. fluid containing solids), etc.

[0033] The packing system uses a continuous strip formed by a plurality of preformed and sealed bags 105, which are joined together in succession as shown in figure 5. The individual bags 105 are identical to one other and can have a capacity of 3, 5 or 10 litres. This succession of bags 105 can be obtained by superposing two flat strips of plastic for foodstuffs, which are heat-welded together at least along the longitudinal edges 110 and 115 thereof, and at narrow transversal portions 120 that are reciprocally spaced apart. In this way, a flat central and sealed area is defined between two consecutive transversal portions 120, in which the flat strips are simply superposed but mutually separable. This central area defines the internal volume of the single bag 105, the capacity of which depends on the width of the strips. The strip of bags 105 can be manufactured using specific forming plants which ensure the internal sterility of the bags 105, and can be provided in the form of spools or rolls. Being sealed, the aseptic bags 105 are internally aseptic during the successive steps of handling and transporting them towards the packing system 100.

[0034] The packing system 100 generally comprises a machine 130 for aseptic filling of the bags 105. This machine 130 first comprises a store 135 for the strip of empty bags 105. In the illustrated example, the store 135 includes support means 140 for a roll 125 of the bags 105, which is supported so as to be able to rotate about the axis thereof which is suitably vertically oriented. Alternatively, the strip of bags 105 can be supplied folded in bellows fashion.

[0035] The machine 130 further includes movement apparatus (which will be described in detail in the following), which are able to unwind the strip of bags 105 from the roll 125, advancing it in a predetermined pathway, along which the strip of bags 105 remains orientated vertically. In the terminal portion of this pathway, the top edge of the strip of bags 105 inserts and is contained in a horizontal tunnel 145. This tunnel 145 can develop longitudinally in a straight line and can have a rectangular transversal section, in this case substantially square (see figure 3). The tunnel 145 has a height that is smaller than the width of the strip of bags 105, so that it is not able to completely contain the strip of bags 105 but only a narrow portion thereof located at the upper edge. In particular, the tunnel 145 exhibits an open axial end, for the insertion of the upper portion, and a longitudinal aperture 150 formed in the lower wall of the tunnel 145, through which the remaining portion of the strip of bags 105 projects in a downward direction.

[0036] The movement means that enable the unwind-

ing of the strip of bags 105 and its advance along the tunnel 145 can include a stepped activating system 155. In the present case, this activating system comprises a pair of opposite bars 160, which are positioned below the tunnel 145 on opposite sides with respect to the portion of the strip of bags 105 that projects from the longitudinal slot 150 (see figure 3). In particular, these bars 160 are orientated parallel to the tunnel 145 and extend longitudinally, starting from the open end thereof, over a length that is such as to be facing at least three consecutive bags 105 of the tape (see figure 1). Each bar 160 is borne by a group of hydraulic or pneumatic cylinders 165, which can move the bars towards/away from one another, in a transversal direction to the strip of bags 105 which is located at the tunnel 145. These cylinders 165 can in turn be mounted on-board special motorised slides 170, which are provided with a simultaneous back and forth movement in a parallel direction to the axis of the tunnel 145. In this way, the bars 160 can be initially neared to one another in the transversal direction, so as to grip the strip of bags 105, after which they can be simultaneously displaced in the longitudinal direction, so as to advance the strip of bags 105 along the tunnel 145 (see the broken line in figure 1). Once this advancement has been completed, the bars 160 can be removed in the transversal direction so as to release the strip of bags 105, and be made to retreat towards the initial position.

[0037] During these final steps, the strip of bags 105 can be supported by a second pair of opposite bars 175, which are located beneath the bars 160, orientated parallel thereto. The bars 175 are also located on opposite sides with respect to the portion of the strip of bags 105 that projects from the longitudinal slot 150 of the tunnel 145, the bars 175 extend longitudinally, starting from the open end of the tunnel 145, for a length that is such that it faces at least three consecutive bags 105 of the tape. Each bar 175 is borne by a respective group of hydraulic or pneumatic cylinders 180, which can move them towards/away from one another, in the transversal direction to the strip of bags 105. The cylinders 180 are, however, installed on a fixed structure, so that the bars 175 cannot move in the longitudinal direction. In this way, the bars 175 are neared to one another in the transversal direction, so as to grip and support the strip of bags 105 before opening thereof and during the retreating run of the bars 160, and can be reciprocally distanced in the same direction, so as to release the strip of bags 105 after closure thereof and during the advancing stroke of the bars 160.

[0038] In order for the bags 105 to be stretched at the tunnel 145, the machine 130 can include a group of fixed and/or mobile tensioning rollers 185, which are located so as to act on the strip of bags 105 in the pathway comprised between the roll 125 and the tunnel 145.

[0039] With the stepped activating system defined by the bars 160, the machine 130 is able to unwind the strip of bags 105 from the roll 125, while simultaneously advancing the strip intermittently along the tunnel 145. In particular, the tunnel 145 is dimensioned so that internally

thereof each bag 105 can transit in four successive operating positions, respectively indicated by A, B, C and D.

[0040] In the first operating position A, the machine 130 comprises means that are able to inject a sterilising substance, for example a solution of peracetic acid such as oxonia. These means can comprise essentially one or more injectors 190 located directly inside the tunnel 145 and suitably connected with a supply plant of the sterilising substance (not illustrated). In this way, each bag 105 reaching the first operating position A is sterilized only at the upper edge thereof which is located inside the tunnel 145.

[0041] Between the second operating position B and the third operating position C, the machine 130 comprises first cutting means that can cut the lateral edge 110 of the strip of bags 105 in the longitudinal direction, in this case horizontal. In the example shown, the first cutting means comprise a small horizontal circular blade 195 with a vertical axis, which is located in a fixed position inside the tunnel 145 and can rotate around the axis thereof, powered by a suitable motor. In this way, each bag 105 that passes between the first operating position A and the second operating position B travels with respect to the circular blade 195 which, by separating the upper edge 110 of the strip, can also open an aperture along the upper margin of the previously-sterilized bag 105.

[0042] In the fourth operating position D, the machine 130 lastly comprises a plurality of apparatuses, including second cutting means able to cut the strip of bags 105 in the transversal direction, in this case vertical, so as to separate the last bag 105 of the line, filling means for dispensing the food product to be packed internally of the separated bag 105, and sealing means for closing the bag 105 after filling thereof.

[0043] The second vertical cutting means can comprise a linear blade 200 orientated vertically and having a cutting motion in the transversal direction to the strip of bags 105. In particular, this linear blade 200 can be positioned between the last bag 105 located in the fourth operating position and the penultimate bag 105 which is located in the third operating position. In this way, the linear blade 200 can cut the welded transversal portion 120 connecting the two consecutive bags 105, completely separating the last bag 105 of the line. In other embodiments, the linear blade 200 could be replaced by a circular blade able to rotate on itself and having a vertical movement with respect to the strip of bags 105, or by any other cutting system suitable for the purpose. In any case, this vertical cutting step generally occurs after the bars 160 of the stepped activating system have opened and are returned into the retracted position.

[0044] The filling means comprise two gripping devices 205, which can grip the top edge of the bag 105 located in the fourth operating position D. Each of these gripping devices 205 can comprise a pair of opposite jaws, positioned internally of the tunnel 145 on opposite sides with respect to the margin of the bag 105, and hydraulic or

pneumatic activating means which reciprocally near/distance each of the jaws in a transversal direction to the advancement direction of the bags 105. The jaws of the two gripping devices 205 have small dimensions, so as to grip only the opposite ends of the top margin of the bag 105, substantially leaving the central portion free, in which the cut aperture is located. These gripping devices 205 clamp together before the bars 160 of the stepped system open, so as also to support the bag 105 during the vertical cutting step. Each gripping device 205 is also movable towards/away from the other gripping device, along a parallel direction to the axis of the tunnel 145 (see the arrows in figure 2). This movement can be obtained by mounting the gripping devices 205 on appropriate motorized slides. In this way, following the vertical cutting step, the gripping devices 205 supporting the bag 105 can be neared to one another, enabling the aperture, which had been opened during the step of horizontal cutting, to be spread out in a transversal direction.

[0045] This spreading is obtained using further gripping means which adhere to the opposite edges of the bag 105 located in the fourth operating position D, and moves them away from one another in the transversal direction. The gripping means can comprise a pair of opposite suction cups 210 on opposite sides (see figure 4), which are positioned inside the tunnel 145, in the space between the two gripping devices and reciprocally located on opposite sides with respect to the upper margin of the bag 105.

[0046] Each suction cup 210 is borne by a respective hydraulic or pneumatic cylinder 215, which can move them towards/away from one another in the transversal direction with respect to the bag that is located in the fourth operating position. In this way, when the bag 105 is still stretched out, the suction cups 210 are neared to one another until each adheres to a respective flap of the opened aperture. After the vertical cut of the bag 105, while the gripping devices 205 are neared in the longitudinal direction, the suction cups 210 can be distanced in the transversal direction, appropriately widening the aperture 105 of the bag in order to allow the introduction of the food product.

[0047] The introduction of the food product is done using a dosing head 220, which is fixed on the tunnel 145 above the bag 105 in the fourth operating position D. As shown in figure 4, the dosing head 220 comprises a cylinder 225 having a vertical axis, which is aligned with the aperture of the bag 105 and is inserted into a sleeve guide 230 solidly constrained to the upper wall of the tunnel 145. At the external portion thereof, the cylinder 225 exhibits an inlet conduit 235 for the product to be packed. The lower end of the cylinder 225 exhibits instead a dispensing nozzle 240, which is located inside the tunnel 145 and through which the product is poured into the bag 105. The cylinder 225 can slide axially inside the sleeve guide 230, alternately downwards and upwards, driven by the hydraulic or pneumatic cylinder 245. In this way, the dispensing nozzle 240 can be moved between a

raised position and a lowered position. When it is in the raised position, the dispensing nozzle 240 is high enough not to interfere with the advancement of the strip of bags 105.

[0048] When a bag 105 is located in the fourth operating position D, the dispensing nozzle 240 is moved into the lowered position, so that it will penetrate into the aperture of the bag 105, after the aperture has been enlarged with the use of the gripping devices 205 and of the suction cups 210. To facilitate this penetration, the dispensing nozzle 240 is tapered (like a funnel) in a downwards direction, i.e. towards the opened aperture of the bag 105 to be filled, and is conformed so as to exhibit a passage section of ogival shape (for example, shaped like an olive) that complements the shape in plan view of the opened aperture (see figures 6 and 7). After the dispensing nozzle 240 has been inserted into the aperture of the bag 105, the suction cups 210 can be neared to each other up until the edges of the aperture adhere against the external lateral surface of the dispensing nozzle 240. In this way, any drips or splashes of the dispensed product can be prevented from fouling the edges of the bag 105, compromising the subsequent sealing step.

[0049] The dispensing of the product to be packed is controlled by an obturator body 250, which is coaxially received internally of the cylinder 225. The obturator body 250 is movable together with the cylinder 225 by the action of the cylinder 245, but is also further movable with respect to the cylinder 225 between a lowered position, in which it closes the dispensing nozzle 240, and a raised position, in which opens the dispensing nozzle 240 to release the product to be packed. The movement of the obturator body 250 is delegated to a second hydraulic or pneumatic cylinder 255. In this way, the obturator body 250 is normally maintained in the lowered closed position and is raised only when the dispensing nozzle 240 is positioned inside the aperture of the bag 105, leaving it open for a calibrated time interval in order for a dosed quantity of product to be measured out.

[0050] During filling, the weight of the bag 105 can be at least partially supported by a lower platform 260, which is connected to suitable actuating means 265 which enable it to be vertically moved. Thanks to these actuator means 265, the height from the ground of the lower platform 260 can be adjusted according to the size of the bag 105, i.e. the capacity thereof. During filling, the platform 260 can also be gradually raised, so as to accommodate the shortening of the bag 105 due to the contemporaneous transversal bulge. After completion of the dispensing, the dispensing nozzle 240 is closed and removed from the bag 105, while the suction cups 210 are commanded to release the flaps of the aperture, to enable final sealing to take place. The sealing means (shown only schematically in figure 4) can for example include a pair of heated rods 266 associated to the dosing head 20 or other suitable support structure, which can grip on the upper margin of the bag 105, causing localized heat

welding of the two flaps which delimit the aperture. In order not to interfere with the suction cups 210, the welding rods 266 can grip on the edge of the bag 105 by a reciprocal counter-rotating movement, substantially a gull-wing motion.

[0051] Following the welding step, the gripping devices 205 release the bag 105, which remains resting on the lower platform 260 from where it can be picked up and moved away. To facilitate this step, the bottom platform 260 can be made in the form of a roller conveyor equipped with an inclined slide portion 270. At this point, the strip of bags 105 is made to advance by one step and the filling cycle is repeated identically for the next bag 105 and so on.

[0052] To ensure sterility during the filling of the bags 105, the machine 130 also includes a sterile air generator 275, which is connected via a conduit 276 to the tunnel 145 so as to deliver sterile air internally thereof. The sterile air generator 275 is substantially a compressor, the delivery of which is provided with appropriate filters guaranteeing a very high degree of cleanliness and sterility of the air emitted. In this way, the sterile air generator 275 maintains the tunnel 145 at a certain degree of over-pressure which, as it opposes the entry of dust and/or other more or less contaminating particles, guarantees the sterility of the volume in which the bags 105 are opened and filled. To further improve this aseptic ambient, the machine 130 can further comprise a cabin 280 completely containing the strip of bags 105 which runs along the tunnel 145 and possibly also the tensioning rollers 185. In this way, the internal volume of the tunnel 145 does not communicate directly with the outside atmosphere but, through the longitudinal aperture 150, with the internal space of the cab 280 acting as an additional protection against external contaminants. In particular, the cabin 280 can be equipped with an air filter 285, such as a HEPA filter, which ensures a high degree of cleanliness of the air internally of the cabin 280. The above-described machine 130 can be advantageously mounted on a single and easily-transportable support frame 290. In this way, the machine 130 may be advantageously used in stand-alone mode, for example by connecting the inlet conduit 235 of the dosing head 220 with an aseptic tank containing the product to be packed, or it can be used in combination with existing systems. For example, the inlet conduit 235 of the machine 130 can be connected directly to an aseptic sterilizer (also branching off from existing circuits) or, via a special flexible hose kit, with the dispensing head of an aseptic filling machine for drums, such as the one denoted by 300 and illustrated in figure 8, which substantially becomes an appendage. Obviously a technical expert in the sector might make numerous modifications of a technical-applicative nature to the packing system described herein above, without forsaking the scope of the invention as claimed in the following.

Claims

1. A packing system (100) for food products, comprising:

- a continuous strip formed by a succession of preformed and sealed bags (105),
- movement means (155) able to advance the strip of bags (105) in a predetermined pathway,
- a tunnel (145) for containing a lateral edge (110) of the strip of bags (105) for an operating portion of the pathway, along the operating portion there being present, at least:

- injector means (190) able to inject a sterilising substance on the lateral edge (110) of the strip of bags (105),
- first cutting means (195) able to cut the lateral edge (110) in a longitudinal direction for opening an aperture along a margin of the bags (105),
- second cutting means (200) for cutting the strip of bags (105) in a transversal direction for separating the bags,
- filling means (205, 210, 220) able to dispense, internally of each bag (105), a food product through the respective open aperture, and
- sealing means (266) of the aperture of the bag (105) after filling thereof.

2. The system (100) of claim 1, comprising a generator of sterile air (275) connected to the tunnel (145).

3. The system (100) of claim 1 or 2, wherein the tunnel (145) is able to contain a limited portion of the strip of bags (105) and exhibits a longitudinal aperture (150) through which a remaining portion of the strip of bags projects externally.

4. The system (100) of claim 3, comprising a cabin (280) able to completely contain the strip of bags (105) along the operating portion of the pathway, which is in communication with the tunnel (145) via the longitudinal aperture (150) and is provided with at least an air filter (285).

5. The system (100) of any one of the preceding claims, wherein the movement means comprise a stepped activating system (155) able to advance the strip of bags (105) intermittently.

6. The system (100) of any one of the preceding claims, wherein the filling means comprise a dispensing nozzle (240) of the food product, and movement means (245) able to move the dispensing nozzle selectively nearingly and distancingly with respect to the aperture of the bags (105) to be filled.

7. The system (100) of claim 6, wherein the dispensing nozzle (240) is tapered towards the aperture of the bag to be filled with an ogival passage section.

8. The system (100) of any one of the preceding claims, wherein the filling means comprise first gripping means (205) able to grip opposite ends of the cut margin of each bag (105) to be filled, and movement means for reciprocally nearing/distancing the first gripping means (205) in a longitudinal direction with respect to the aperture.

9. The system (100) of any one of the preceding claims, wherein the filling means comprise second gripping means (210) able to grip the opposite flaps of the aperture of each bag (105) to be filled, and movement means (215) able to reciprocally near/distance the second gripping means (210) in a transversal direction with respect to the aperture.

10. The system (100) of any one of the preceding claims, comprising a support platform (260) able to support each bag (105) to be filled during filling thereof, and movement means (265) able to lift/lower the platform.

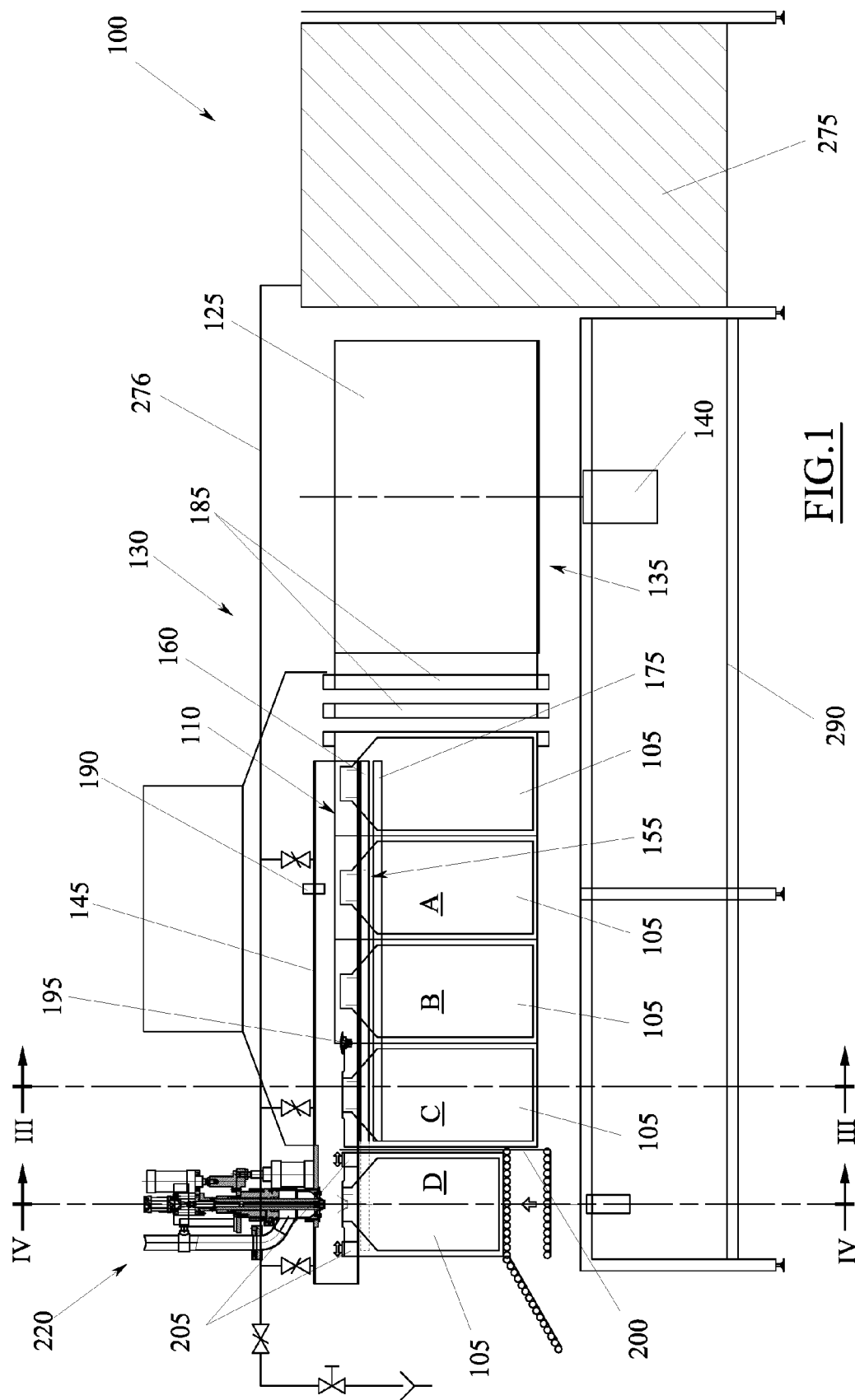
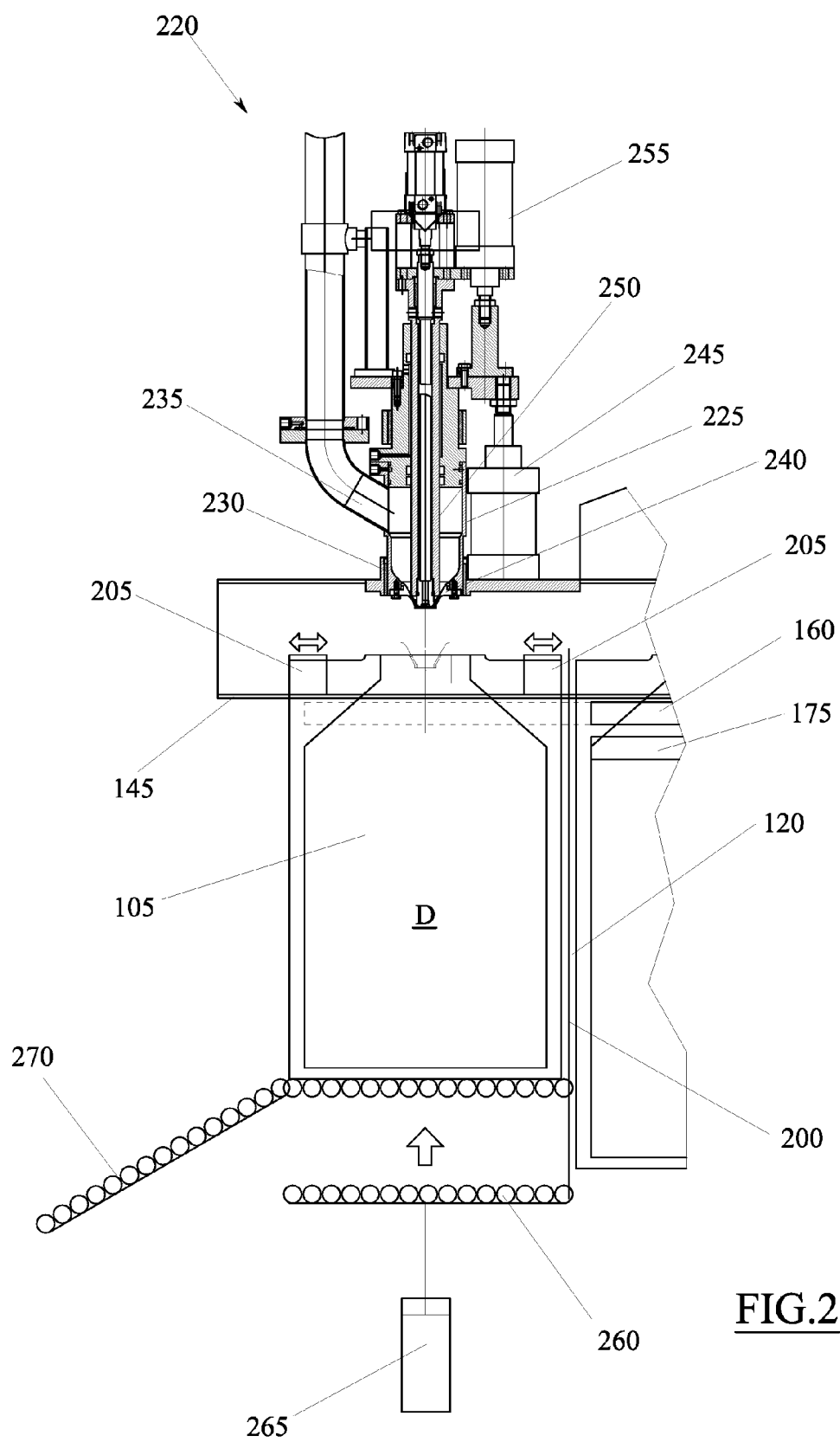


FIG. 1



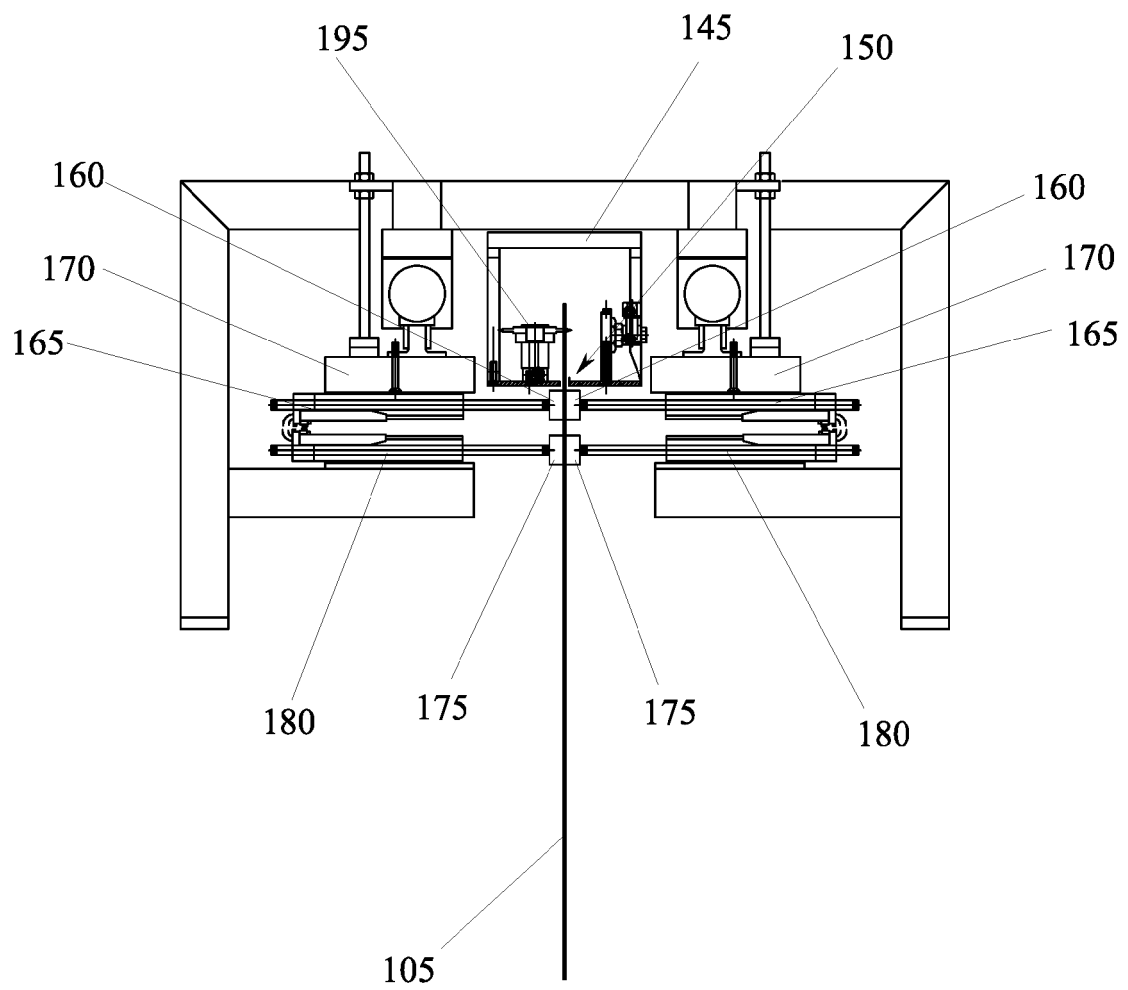


FIG.3

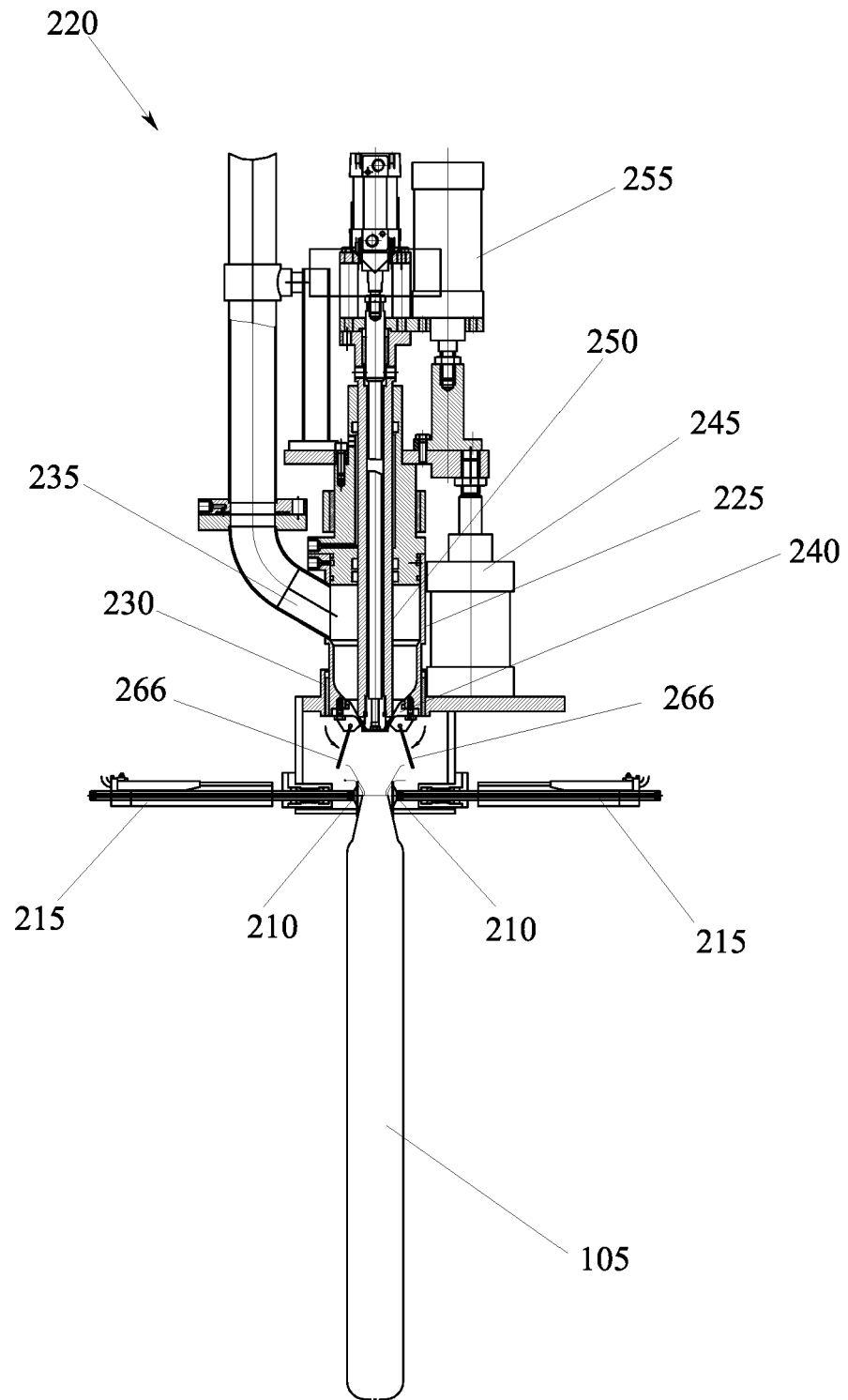


FIG.4

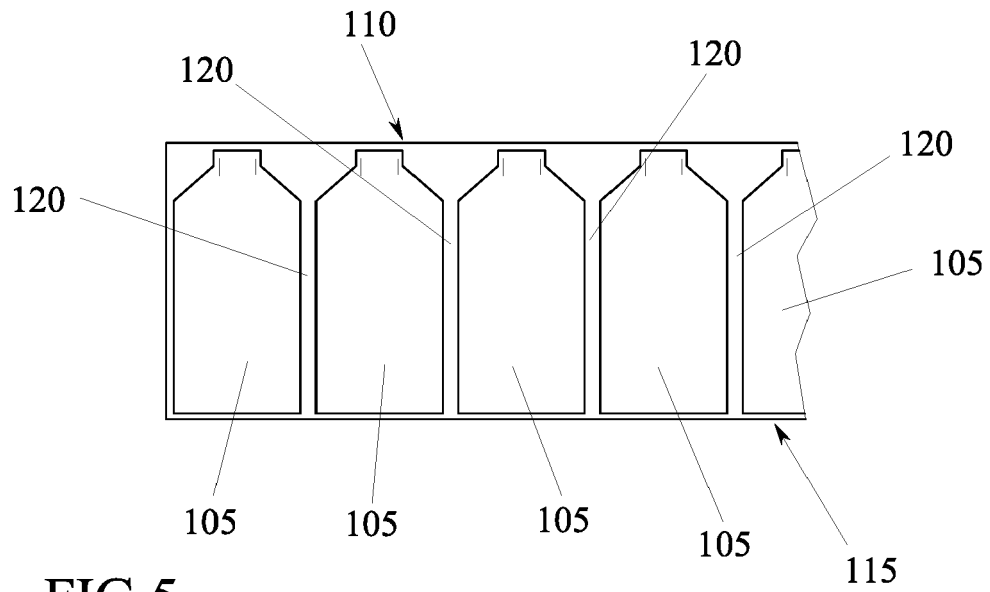


FIG. 5

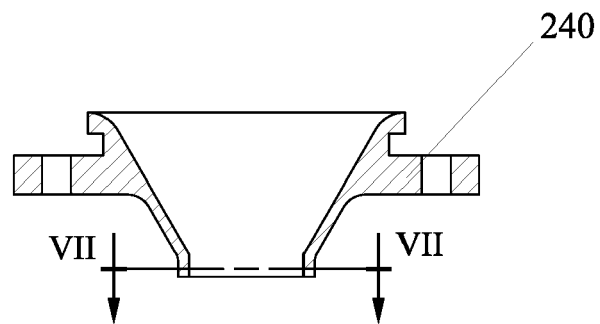


FIG. 6

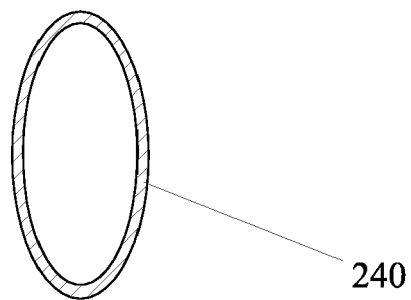


FIG. 7

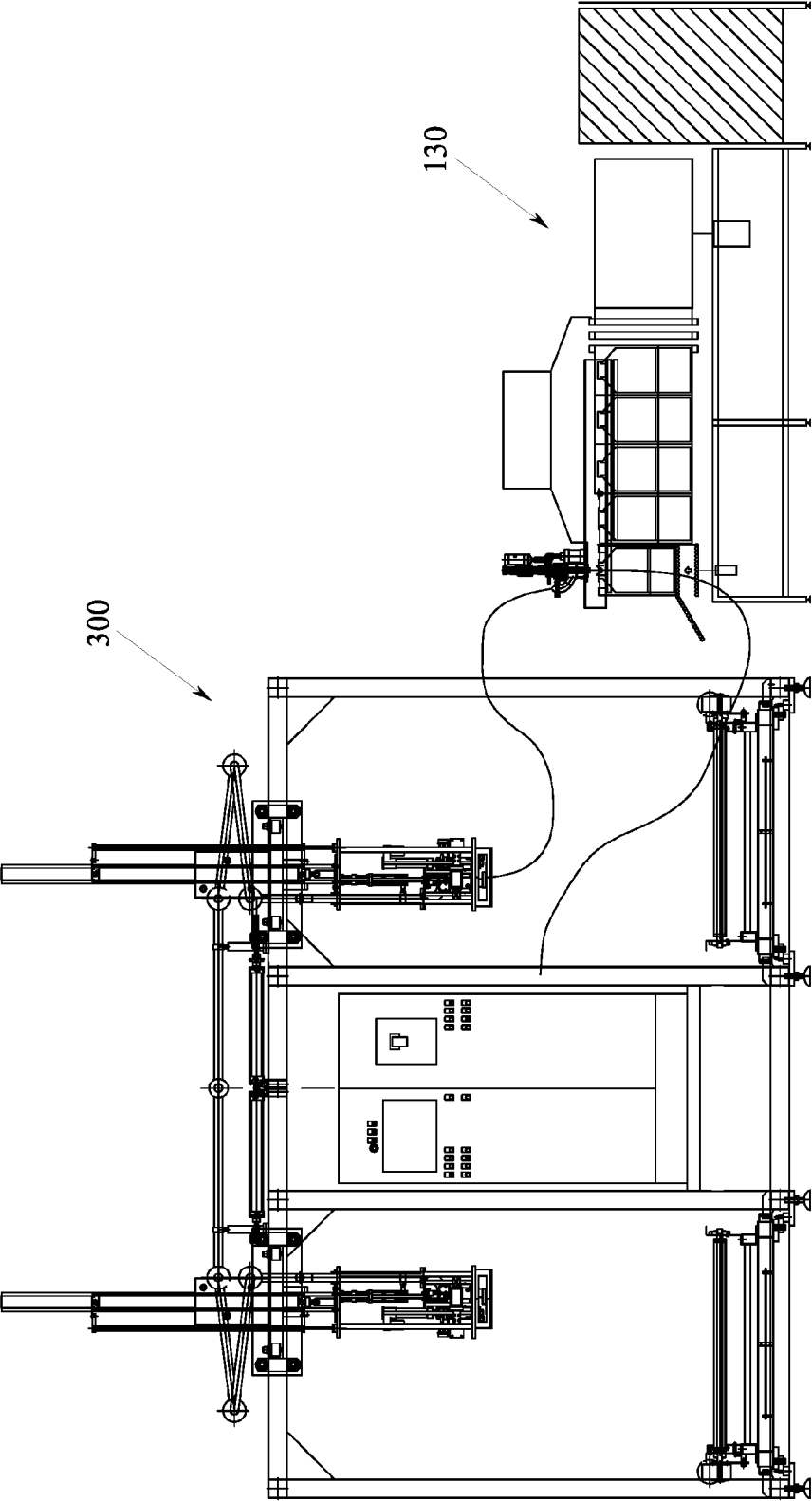


FIG.8



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