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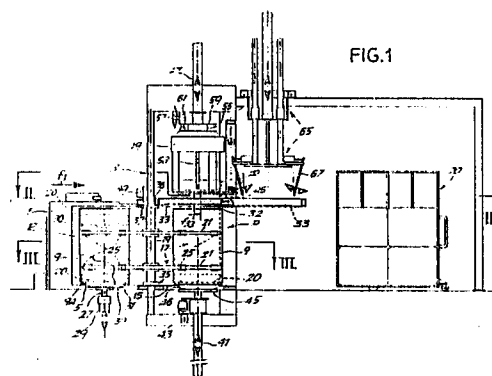
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54 Automated plant for the formation, pressing and handling of coiled packings of textile ribbon or rove, or the like.

57 An automated plant for the formation, pressing, binding and handling of coiled packings (bumps) of ribbon (or rove) of combed fibres, or the like, delivered by the coiler of a special machine (1), comprises in combination: at least a pair of containers (9,20) made up only of cylindrical walls (9) with a bottom plane of platform (20) capable of being raised and lowered, equal to each other; at the position in which a container is filled with coiled material, means (29,30) for the lifting and lowering of the container bottom platform (20) and for causing it to rotate in concomitance with the lowering; means (17) for simultaneously operating the change-over of a filled container (9,20) from the filling position (R) to the pressing position (P), and of the other already empty container (9,20) from the pressing position (P) to the filling position (R); a press (3) comprising means (41,45) for lifting said bottom (20) to determine the pressing against and in collaboration with an upper plate or dish (49) of the press (3) and for the successive lifting of the material from the cylindrical wall (9) of the container; on the press, means (47) for the vertical displacements of the upper dish (49) as well as means (50,53) for the binding of the material maintained in pressing condition and means (43,45,46) for the rotation thereof for successive bindings; and, furthermore, means (33) for withdrawing the bound material from the press and putting it below a gripping,

lifting and transfer equipment (65) which places it into a multiseat carriage container (70).



Description

"AUTOMATED PLANT FOR THE FORMATION, PRESSING AND HANDLING OF COILED PACKINGS OF TEXTILE RIBBON OR ROVE, OR THE LIKE"

The invention refers to an automated compact and substantially self-contained plant for the formation, pressing, binding and handling of coiled packings (so-called "bumps") of ribbon or rove of textile material, or the like, delivered by the coiler of a special machine located upstream of the same plant. Such plant comprises in combination: at least a pair of containers formed only by cylindrical walls with a bottom plane or platform capable of being raised and lowered, said containers being equal to each other; at the position in which a container is filled with coiled material, means for the lifting and lowering of the container bottom plane and for causing it to rotate in concomitance with the lowering; means for simultaneously operating the change-over of a filled container from the filling position to the pressing position and of the other already empty container from the pressing position to the filling position; a press comprising means for lifting said bottom to determine the pressing against and in collaboration with an upper plate or dish of the press and for the successive lifting of the material from the cylindrical wall of the container; on the press, means for the vertical displacements of the upper dish as well as means for the binding of the material maintained in pressing condition and means for the rotation thereof for successive bindings; and, further more, means for withdrawing the bound material from the press and locating it below a grip, lifting and transfer equipment which places it into a multiset carriage container.

Advantageously, the simultaneous exchange of the containers takes place by means of an equipment which rotates about a vertical axis interposed between the filling position and the pressing position, which causes the two containers to simultaneously perform respective rototranslation movements, in the course of which the traces of the containers axes on a horizontal plane move along opposite semicircumferences; said equipment comprises two pairs of horizontal and parallel arms embracing on opposite sides the containers thereby causing them to perform said movements. Horizontal smooth coplanar sliding surfaces are further provided for said displacements of containers below and laterally with respect to the filling and pressing positions.

The invention will be better understood by following the description and the attached drawing, which shows a practical non limitative exemplification of the same invention. In the drawings:

Fig. 1 shows a side view of the plant, according to the invention, predisposed for forming, pressing and binding "bumps" of greater diameter;

Figs. 2 and 3 show, respectively, sectional view on line II-II and III-III of Fig. 1;

Fig. 4 shows a side view similar to Fig. 1, but relative to the plant predisposed for forming, pressing and binding "bumps" of smaller

diameter;

Figs. 5 and 6 show, respectively, sectional views on lines V-V and VI-VI of Fig. 4;

Fig. 7 shows schematically an apparatus for the replacement of the binding dish when changing over from "bumps" of greater diameter to "bumps" of smaller diameter; and

Figs. 8A, 8B and 8C show the transfer phases of transferring "bumps" of small diameter from a case to a carriage.

As illustrated in the attached drawing, the plant according to the invention allows the phases for the preparation of pressed and bound "bumps", that is, reels of different diameters of textile ribbon or rove, to be carried out in a fully automated manner and according to an accurate programming, up to their placing inside special carriages or containers. A so-called "integrated" machine for the preparation of the textile rove, generally indicated by 1, (or other equivalent machine like those called "intersecting"), delivers said rove through a mobile outlet opening within "vessels", that is, containers 9 having cylindrical walls and lacking in a bottom of their own. Within each wall 9 a bottom 20 is freely slidable for the lifting and the progressive lowering during the filling, and which rests on an edge 9A of the wall 9 in the lower part thereof. In a known manner, the textile rove or ribbon delivered by the machine places itself on the bottom 20 in a coil-like configuration while said bottom rotates and moves down progressively by forming overlapping layers until the filling of cylinder defined by wall 9 is completed. The lowering of the rotating bottom 20 is driven by a "metres (or footage) indicator" installed on the machine 1, said metres indicator also determining the cutting of the rove upon completion of the filling.

Characteristically, in the plant according to the invention there is provided the use of two so-called "vessels" or containers formed by walls 9, identical to each other, which take it in turns to give rise to a coordinated succession of operations until the above mentioned arrangement in good order of the pressed and bound "bumps" (or reels of rove) within stacking carriages or containers located at the exit or final part of the plant is accomplished.

The operation next to the filling is the transfer of the "vessel" 9, 20 under the press 3, to be described later, by means of the above mentioned exchange operation. As shown in Figs. 1 and 2, a plate 5 projects horizontally from the machine 1 above the floor plane, said plate being smooth and having approximately the shape of an irregular pentagon, in the drawing, with the greater side 5M facing the press. This greater side has a recess 7 to embrace a first column 11 of the three columns 11, 12 and 13 of the press 3, a hollow shaft 19 being able to rotate about column 11. The press 3 is also equipped with an underlying rectangular smooth horizontal plate 15 at the same level of plate 5 and with the greater side matching in practice with the side 5M of plate 5 so as

to form a united sliding plane for "vessels" 9, 20.

The above mentioned alternation that is the shift of a vessel 9,20 - the filling of which has been completed - from the position R below the outlet opening of the machine 1 to position P below press 3, takes place through a "rototranslation" (which is followed by the change over between a filled "vessel" and the vessel which was under the press and by this time is empty) operated by an equipment 17 composed of parallel and opposite pairs of arms. More precisely, from the hollow shaft 19, two overlapping pairs of equal and opposite arms 23 radially project having a horizontal longitudinal arm 21 fixed at each end thereof, orthogonal to the arm 23, by which it is divided into two equal and opposite parts. A rotation of 180° of shaft 19 causes a rotation of 180° of said equipment, through which the changing over of said "vessels" or containers which move according to arrow f9 (or in opposite direction) takes place the vessels being supported by the suitably smooth plates 5, 15. The walls 9 have part suitably nylon shoes (not shown) in their lower part to make said sliding easy. The pairs of arms 21 - which are disposed at suitable levels - embrace the cylindrical outside of walls 9 which are engaged with said arms, in order to result properly positioned both upon the filling stage and under the press, by means of inner and outer wheels 25 with vertical axis and idly supported inside the arms 21.

As shown in particular in Figs. 3 and 6, for the plant allowing the preparation of "bumps" having diameters smaller than the one being considered - that is, the diameter of cylindrical walls 9 without fixed bottom - to the hollow shaft 19 pairs of arms 121 are anchored, orthogonal to arms 21 and disposed at the same level of the latter equidistant from the axis of shaft 19. The pairs of arms 121, inside which idle wheels 125 with vertical axis are supported, make up like and opposite parts 117 of a further equipment that is carrier, integral with carrier 17, intended to provide - through a 90° out-of-phase shift from the beginning of rotation of shaft 19, obtained by acting on the programming members - the alternation of "vessels" that is containers 109, 120 used for the preparation of "bumps" having diameter less than that of containers 9, 20. Substantially, the plant in question is provided for forming, pressing and binding "bumps" of two different diameters chosen, for example, among those having outer diameter of 1000, 800, 700, 600, 500, 400 mm, for which "vessels" are to be provided, like those indicated by 9, 20, or by 109, 120, having different inner diameter. In the example of the drawing, the vessels 109, 120 may be those able to form "bumps" of 400 mm diameter, while vessels 9, 20 may be those for "bumps" of 800 mm diameter. Obviously, the production of "bumps" of a predetermined diameter will be carried out separately since, for each diameter, the plant shall have to be differently equipped and predisposed. For example, carriers 17 and 117 shall have to be dimensioned for a given group of diameters by making reference to the largest diameter of each set: carrier 17 might be used for "bumps" of 800 and 700 mm diameter, while carrier 117 might be used for 600 and 400 mm

diameter, and both carriers will be predisposed for the vessels of greater diameter. For the smaller diameter(s), suitable adaptations shall be carried out every time, as for example, increasing the projection of supports for wheels 25 (or 125) inside arms 21 (or 121). It should be also necessary to take into account that the "bumps" of smaller diameter require different binding procedure with respect to those of greater diameter; moreover, the "bumps" of smaller diameter have, in general, a hole in the center and thus a different lifting member may be required at the press outlet, and their stacking arrangement may occur according to different procedures.

For the filling of the vessel 9, 20 located below the outlet opening of the machine 1, the bottom 20 must be able to rotate continuously as it gradually goes down starting from a position of maximum level, in which the filling begins, to a position as low as possible, in contact with the edge 9A, upon which the filling is complete. The rotation of bottom 20 is accomplished by simple friction by means of a discoidal plate 30 fixed on top of the rod 27 of a cylinder-piston system 29, said rod (or the end portion thereof) being driven into rotation through suitable means (not shown). The plate 30 has a diameter less than that of the mobile bottom 20 with which it comes into contact by going through a hole 31 provided on the plate 5, also of a diameter less than that both of the bottom 20 and of the inner one of the edge 9A. In this way it is ensured that the lower edges of the walls 9 (or the shoes which they are provided with) are always in contact with the plates 5 and 15 during their displacement on said plates upon the exchange of the containers which takes place when plate 30 is fully come back with its own upper surface to the same level as that of the upper surface of plate 5.

In case of filling vessels with small inner diameter, like those 109, 120, the coiler of the machine 1 (or the upper portion of said coiler-carrying machine) must be moved forward in the direction of arrow f1 so that its delivery action will take place in the vicinity of the inner wall (machine 1 side) of the vessel having smaller diameter. The coiler of machine 1 will provide for the distribution in the usual manner, through suitable adjustments according to the container diameters.

Likewise for vessels of greater diameter, also during the filling of a vessel 109, 120 of small diameter, bottom 120 must be able to continuously rotate while gradually lowering down as far as to rest onto the lower edge 109A of walls 109, that is when the corresponding maximum filling position is reached. With vessel 109, 120 in the position of Fig. 6, that is below the coiler of the machine 1 suitably moved forwards, the rotation of bottom 120 is accomplished merely by friction through the agency of same discoidal plate 30 which, when the plant is predisposed for the filling of vessels 9, 20 having large diameter, is intended to rotate the bottom 120.

When a vessel 9,20 or a vessel of small diameter 109,120 is completely filled with textile ribbon or rove, its relatively soft contents comes to project

from the vessel mouthpiece; for this reason, the filled vessel while performing the above mentioned exchange "rototranslation" with the empty vessel which was below the press, is made to pass under a mobile gate 33 which is at a level slightly higher with respect to the mouthpiece of the moving "vessels" and which may be provided with invitation that is flare edges to cause the lowering textile material projecting to a limited extent above the filled vessel. The displacements in horizontal direction of gate 33 sliding on suitable guides are obtained through a pair of lateral cylinder-piston systems 32. As hereinbefore mentioned, and as shown in Figs. 2 and 3, even though it can also be realized with four columns by suitable modifications, the press is of three-column type which makes the rototranslation movement of vessels in alternation easier as they rotate around column 11. The hollow shaft 19 is supported in its lower part at 35 by a suitable guide and thrust bearing and, in its upper part, by a further support 36 in the vicinity of the gear 37 through which it is driven into rotation by means of a motor reducer 39. The motor reducer 39 is driven by suitable programming members to cause the rotation of the equipment 17 and, with it, the equipment 117.

It will be now described the pressing operation of a "bump" of large diameter formed into a vessel 9, 20 which has been moved by the equipment 17 into the "P" position.

Press 3 has in its lower part a cylinder-piston system 41, with a motor reducer 43, solid with the press frame, apt to rotate the rod of the cylinder-piston system 41 and an element 45 of contact with the dish or plate 20 for its lifting within and along the wall of the "vessel" 9 at the position P. In the upper part of press 3 a second cylinder-piston system 47 is provided to move the upper dish or plate 49 of the press vertically in the two directions. By this arrangement it is possible to press the material contained inside the wall 9 at position P; this is obtained - after the gate 33 has moved in the direction of the arrow f33 as far as the completely clearing of the space inside the press columns - by determining the lowering of plate 49 until its lower surface is almost in contact with the upper edge of wall 9 and determining, through system 41, the lifting of element 45 and thus of bottom 20 to press the material within the wall 9. Once the material is pressed, the two cylinder-piston systems 41 and 47 are operated for lifting plates 45 and 49 up to the position shown in Fig. 1, in which the disc (or dish) 20, hatched in the drawing, finds itself at a position well above with respect to that occupied by the upper plane of gate 33 when the latter is inserted inside the press 3, while the dish or plate 49 is at the relative lowering position (as a consequence of the lifting again of the two dishes, which has taken place with the pressed "bump" being interposed therebetween) drawn with solid line in Fig. 1.

On the horizontal crosspieces of an ancillary frame fixed to the stanchions 12 and 13 of press 3, a binding machine 50 of known per se type is placed, capable of performing, especially automatically, a binding of the "bump" included between the two dishes. For the binding, a set of channels is

predisposed above disc 20 and on the lower surface of dish 49, while binder 50 comprises also a U-shaped guide 51 and a counterframe 53, with an analogous guide, for the ribbon-like, relatively solid element - as for example a plastics strap - utilized for the binding. The binder 50 and the elements associated thereto are predisposed to carry out more successive bindings, mostly diametral. For the bumps of large diameter all the bindings, which may be three or four, pass through the center of the bump, while for the bumps of smaller diameter to be used in dyeing plants or for those for which the central hole should be freely accessible, the four bindings are about tangent to the central hole (see Figs. 2 and 5). between one binding and the other the motor reducer 43 is operated to orient, each time in a different way, the dish 20 and the dish 49, so as to present the relevant channels lined up with the binder members and arranged on a same vertical plane. This channels alignment must be carried out with the maximum accuracy in order to avoid binder's jams. It is therefore essential that the angular displacements of discs 20 and 49 be equal: the one of disc 20 cannot differ from the rotation imposed to dish 45 as the latter has pins 46 which engage corresponding holes formed in the lower surface of disc 20 following an initial rotation before pressing. The plate 49, instead, rotates insofar as it is dragged along by friction by the pressed material, thereby its angular displacement may slightly differ from that of disc 20, because of limited slidings in its friction-operated rotation. The dish or plate 49 can rotate idly with respect to its hub 55 which, instead, cannot perform angular displacements. To obviate possible little differences between the rotation of dish 49 and that of disc 20, a pneumatic positioner member 57 is fixed to a flange 59 projecting from the hub 55 and solid thereto. The positioner member 57 comprises a cylinder-piston system 61 whose rod has a truncated-cone end towards the plate 49, able to be inserted into suitable seats, also of truncated-cone shape, circumferentially located at predetermined angular distances on the upper surface of plate 49. At the end of each angular displacement of disc 20, carried out prior to each binding operation, the positioner member 57 is operated so that the truncated-cone end of the relevant rod, by penetrating into seat of plate 49, which has come into alignment therewith as a consequence of the dragged rotation of dish 49, causes in this way the little additional rotation necessary for the binder channel of dish 49 to result exactly superimposed to the corresponding channel of disc 20.

On binding completion, the bound and pressed "bump" must be withdrawn from beneath the press to allow a further pressing and binding cycle to be performed for another "bump" which has been formed in the meantime within wall 9 at position R. Such withdrawal operation is carried out by the gate 33 which, by moving in the direction opposite to arrow f33 is brought back under the press. To render this transfer possible, the disc 20 - which was supporting the pressed bump during the binding - must be able to go back inside the wall 9 to be lowered down as far as the bottom thereof. In order

to prevent the bound and pressed "bump" from following disc 20 upon its lowering, radial support members 64 (Fig. 2) are made to intervene, each one being provided with a cylinder-piston system whose rod is made to project in centripetal direction so as to penetrate between the coils of the pressed "bump" thereby avoiding its lowering. When gate 33 is moved as far as to result below the "bump" being supported in this way, the rods of the support members 64 shift back thus allowing the "bump" to rest with its lower part onto the upper surface of gate 33. Successively, said gate moves again in the direction of arrow f33 as far as to position the "bump" below a grip, lifting, transfer and lowering equipment 65. It is thus evident that, in the pressing and binding operations, it is necessary, anyway, to take into account the different diameters of the "bumps" that may be formed within vessels 9, 20 or 109, 120, having different diameters and, in particular, smaller than the one considered in the previous description relative to the pressing and binding of "bumps" having large diameter. This also in relation to the characteristics and purposes of the "bumps" having smaller diameter.

These operations for the pressing and binding of "bumps" having smaller diameter, although being fully similar to those for the "bumps" of greater diameters, require some adaptations and replacements which will be now described with reference to a "vessel" 109, 120 of relatively small diameter, which is assumed as being filled and transferred into pressing position P by means of carrier 117. In the considered case, it is necessary that the diameter of element 45, serving to push bottom 120 for the lifting and the pressing, be chosen of suitably small dimension in order to allow it to fit into the lower edge 109A of the cylindrical walls 109. Also dish 49 of the press shall have to be replaced, or anyway adapted, not as far as the diameter is concerned, as the pressing takes place when it finds itself almost in contact with the upper edge of wall 109, but as far as the binding channels are concerned. As it results from the above, the binding is carried out by means of the binder 50 after the "bump" - which has been pressed internally to wall 109 between the bottom 120 pushed by element 45 and the dish 49 - is lifted as far as to find itself at a position well above that occupied by the upper plane of gate 33 when this is inserted within the press 3. This lifting of the already pressed "bump" takes place by means of cylinder-piston systems 41 and 47 which determine the simultaneous lifting of dishes 45 and 49 which perform thereby an identical run, with the "bump" being interposed between dish 49 and bottom 120.

Since, as above mentioned, "bumps" of small diameter have a hole in the center which, as can be seen later, may also be utilized for the grip function, non-diametral bindings are preferred. Consequently, the bottom 120 shall exhibit a series of channels (generally in number of four) two-by-two parallel to respective orthogonal diameters, symmetrical to one another at a distance mid-way between the center of the dish and the periphery thereof. Also the dish 49 - which in the case of the pressing of large diameter "bump" exhibited diametral angularly

equidistant channels - shall thus have a series of channels shaped in the form of orthogonal chords like that of bottom 120. It is therefore convenient that dish 9, instead of having grooves or channels itself, be able to be replaced or realized so that its downwardly directed face, against which the pressing takes place, could be easily completed, through a plugging or other, by a discoidal plate having diameter corresponding to that of vessels 9, 20 or 109, 120 that are being used in the work, said plate downwardly presenting the binding channels one at a time or diametral, or disposed according to four chords equidistant from the center and two-by-two orthogonal to each other. Fig. 7 shows schematically a simple apparatus 66 for the application below the dish 49 of a discoidal plate 49' with diametral channels, or of another plate 49'', of less diameter with channels according to orthogonal chords, as well as for the exchange of said plates.

For "bumps" of small diameter and in order to perform bindings according to chords spaced from the center, also the binder 50 must be able to be brought close to the "bump" according to the centripetal direction of double arrow fA (Fig. 5) and carry out side displacements in the two directions of arrow fL. A binding by means of crossed strappings is thus obtained, as shown in Fig. 5, in which a series of tied up "bumps" are shown placed in a case or carriage 170 for the stacking thereof. Also in the execution of the binding through orthogonally crossed straps, as described above, precise rotations of bottom 120 and dish 49 have to be realized; to ensure that the rotations of the latter (accomplished by friction) are as wanted, the positioning member 57 is, of course, driven so as to operate according to the program established for the "bump" of small diameter which are being worked.

After the "bump" of small diameter has been pressed and bound, gate 33 must re-enter under the press by moving in opposite direction with respect to arrow f33 but, prior to this, the bottom 120 must move back inside wall 109 and then lower down to the bottom thereof. Also in this case, in order to prevent the pressed and bound "bump" from following bottom 120 in its lowering, it is provided the intervention of the above described support member 64 - each comprising a cylinder-piston system whose rod is made to move in centripetal direction - whose run towards the "bump" and inside the coils of the "bump" to be supported must be sufficiently long and able to be adjusted in relation to the "bump" diameter. Through a predetermined, somewhat prolonged run of the rod of members 64, "bumps" of large or small diameter, that the present plant is able to prepare, can be supported during this phase. Through the withdrawal of the rods of members 64, the released "bump" is thus made to rest onto the upper surface of the gate 33, which is already re-entered; on a successive phase, gate 33 is moved again in the direction of arrow f33 until it positions the "bump" outside of the press from which same "bump" is picked up (Fig. 4).

As for the picking up of a "bump" that has come out of the press while supported by gate 33, Fig. 1 shows the above mentioned carrier 65 exhibiting, in

a known manner, pneumatically actuated grip jaws 67, for gripping from the outside the pressed "bumps" of larger diameter and having diametral bindings. The carrier 65 comprises further means for lifting the "bump" to just an extent as necessary and transfer it above a carriage 70 within which it is placed by a lowering and piled up, the carriage being predisposed (in the example of the drawing) to hold two side-by-side piles. In Fig. 4 instead, a carrier 165 is shown for the gripping, lifting, transfer and lowering of "bumps" of small diameter with a hole in the center, which carrier 165 has a mandrel 167 which, by entering the inner hole of the "bump", causes the gripping thereof owing to the expansion in radial direction of jaws it is made up of. The carrier 165 picks up the "bump" of small diameter by means of mandrel 167 in order to place it by lifting, translation and lowering thereof into a case 200 shown in plan view in Fig. 5, wherein such "bumps" are put in such an arrangement as to form a layer C, spaced apart by spacers 172 (six "bumps", two-by-two in side-by-side relationship, in the example of the drawing). Outside of the plant, the group of said "bumps" having small diameter will be then picked up as a whole (by a suitable multiple grip device 201) from the case 200 to be introduced in the carriage 170, thereby forming more rows of "bumps" arranged in layers one above the other.

As it is apparent, the present plant will comprise, mounted on a same carriage 69 and separately operable, both the carrier 65 for the gripping of "bumps" of greater diameter from the outside, and the carrier 165 for the expansion-operated gripping of "bumps" of smaller diameter from the inside, as well as the multiple pick-up device 201 for layers of small "bumps" - individually shown in Figs. 1, 4, 8A, 8B and 8C and, according to the diameter of the "bumps" to be worked, the plant will be so programmed as to utilize one or the other of carriers 65, 165 or 201, by causing them to perform the suitable movements in horizontal and in vertical direction.

As it is evident by the foregoing, the plant according to the invention makes up a system by which the "bumps" formed through the delivery of rove by the machine 1, are from time to time pressed, bound, transferred and stacked in a multi-seat carriage in an automated way, according to a suitably programmed cycle which breaks off only when the rove delivery has ceased. Such a plant results particularly compact, is supplied with all members necessary for its working and, once connected with a suitable programming device, is capable of functioning autonomously, without requiring the intervention of an operator except for the replacement of the carriage, within which the staking of "bumps" takes place, when it results completely filled up.

Claims

1. Automated plant for the formation, pressing, binding and handling of coiled packings

("bumps") of ribbon or rove of combed fibres, or the like, delivered from the coiler of a special machine, characterized in that it comprises in combination: at least a pair of containers (9,20) made up only of cylindrical walls (9) with a bottom plane or platform (20) capable of being raised and lowered, equal to each other; at the position in which a container is filled with coiled material, means (29,30) for the lifting and lowering of the container bottom plane or platform (20) and for causing it to rotate in concomitance with the lowering; means (17) for simultaneously operating the change-over of a filled container (9,20) from the filling position (R) to the pressing position (P) and of the other already emptied out container from the pressing position (P) to the filling position (R); a press (3) comprising means (41,45) for lifting said bottom to determine the pressing against and in collaboration with an upper plate or dish (49) of the press (3) and for the successive lifting of the material from the cylindrical wall (9) of the container; on the press (3), means (47) for the vertical displacements of the upper plate or dish (49) as well as means (50,53) for the binding of the material maintained in pressing condition and means (43, 45, 46) for the rotation thereof for successive bindings; and, further more, means (33) for withdrawing the bound material from the press and locating it below a gripping, lifting and transfer equipment (65) which places it into a multiseat carriage container.

2. Plant according to the preceding claim, characterized in that said simultaneous exchange of the containers takes place by means of an equipment (17) which rotates about a vertical axis interposed between the filling position (R) and the pressing position (P), which causes the two container (9,20) to simultaneously perform respective rototranslation movements, in the course of which the traces of the containers axes on a horizontal plane move along opposite semicircumferences, said equipment (17) comprising two pairs of horizontal and parallel arms (21) which embrace from opposite sides the containers, thereby causing them to perform said displacements; horizontal smooth coplanar sliding surfaces (5,15) being provided for said displacements of containers below and laterally with respect to the filling and pressing positions.

3. Plant according to claims 1 and 2, characterized in that: by use of pairs of containers equal one to the other - made up only of cylindrical walls (9, 109) with bottom (20, 120) that can be lifted and lowered - of different diameters, combined with means for obtaining the advancement or the withdrawal of the rove-feeding coiler with respect to the inner edge of the container located at the filling position; by suitable adaptations of the carrier (17) for operating the simultaneous exchange of a filled container (9, 20; 109, 120) from the filling position (R) to the pressing position (P)

and of the other already emptied-out carrier from the pressing position (P) to the filling position (R); and by adaptations of the dish (49) and of the bottom of the press container and by suitable movements of means (50, 53) for the binding of the pressed material, it is able to provide the formation, pressing, binding as well as final handling of "bumps" of different diameters, with or without inner hole.

4. Plant according to the preceding claims, characterized in that said carrier (17) may comprise further pairs (117) of horizontal and parallel arms (121) orthogonal with respect to the first (21), in order to embrace or grip, from opposite sides, containers (109, 120) having diameter significantly different from that of containers (9, 20), embraced by the first pairs, and that means are provided for outphasing the carrier so as to bring the containers having the considered diameter onto the active diameter for the alternation.

5. Plant according to the preceding claims, characterized in that by adaptation means - such as spacers, stirrups or other - the or each pair of arms (21, 121) can receive containers whose diameter is, within a certain groove or channel, less than that of the containers for which the or each pair of arms with no adaptations is provided.

6. Plant according to the preceding claims, characterized in that each horizontal arm (21, 121) of the pairs of arms of said carrier (17, 117), or even the adaptation means applied thereto for the exchange of containers of smaller diameter, have idle wheels (25, 125) with vertical axis and whose periphery is in contact with the outer wall (9, 109) of the container inserted between said arms (21, 121), with or without adaptations, in order to engage the container for its rotation as necessary.

7. Plant according to the preceding claims, characterized in that support members (64) are provided able to keep the pressed and bound material lifted after the lowering of the bottom (20,120) that has determined the pressing and that a flat gate member (33) performing horizontal displacements is interposed below the material and above the container (9,20;109,120) within which the pressing has taken place, on said member (33) said material coming to rest the moment it is released by said support members (64) and the exchange of the containers taking place below said gate member (33); the displacement of said gate member (33) outside the press (3) causing the withdrawal of the pressed and bound material from the press (3).

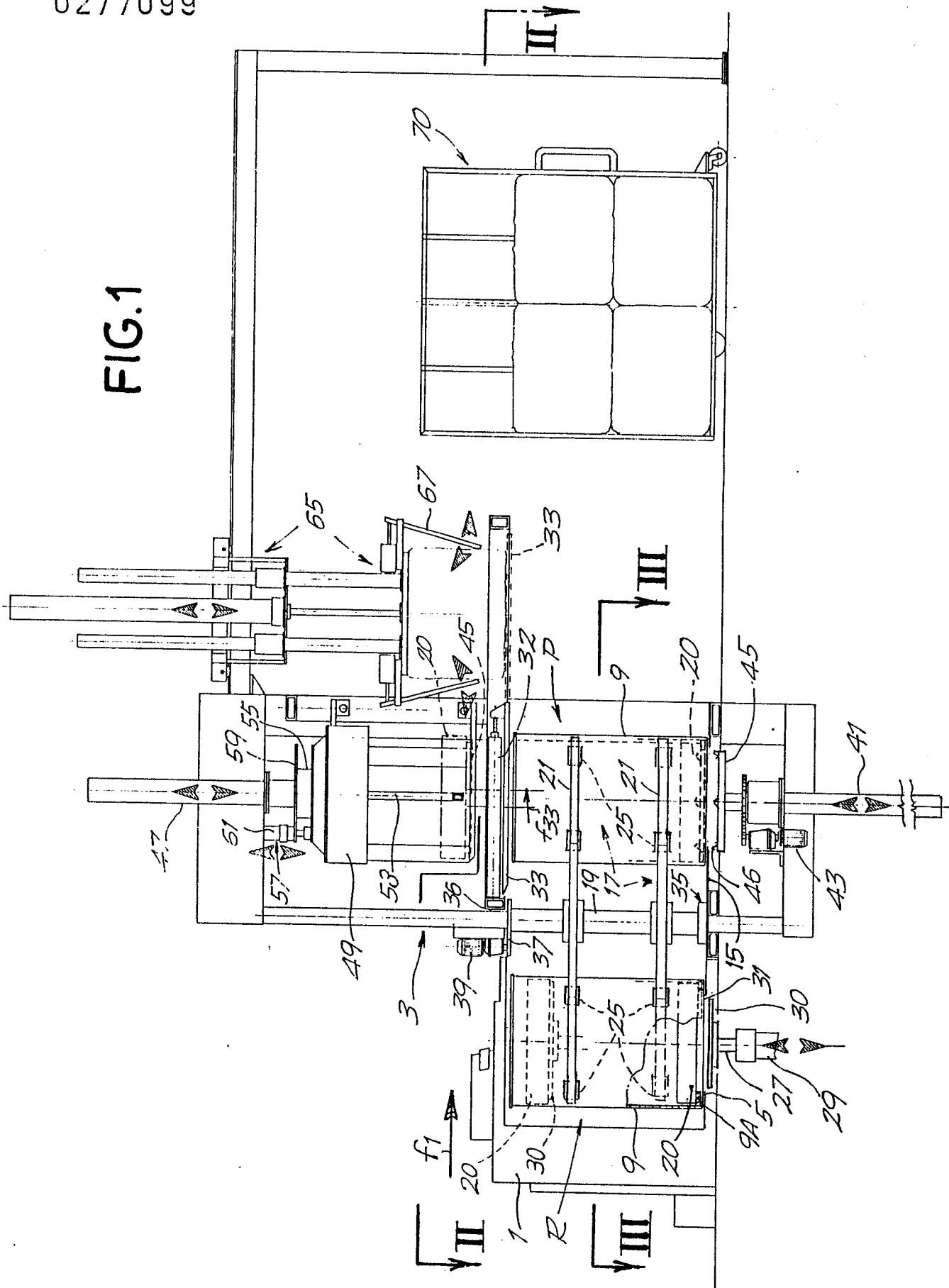
8. Plant according to preceding claims, characterized in that a lifting and transfer equipment (65,165) provided with jaws for gripping and releasing the bound and pressed material is located over said flat gate member (33), when this is outside the press (3), to transfer said material into said multi-seat carriage container (70,170) or in the case (200).

9. Plant according to preceding claims, characterized in that both the bottom (20,120) of the containers and the upper plate or dish (49) of the press through which and against which the pressing occurs exhibit slots for the passage of the element used by the binder (50) and that for the successive bindings, angularly shifted between them, means (43,45,46) are provided for causing the rotation of said bottom platform, while the rotation of the upper plate or dish (49) of the press (3) takes place by friction dragging operated by the pressed material.

10. Plant according to preceding claims, especially claim 9, characterized in that for the exact angular positioning of said upper plate or dish (49) of the press (3), which can idly rotate around a hub (55), a positioner member (57) is provided, especially of the conical pin type, apt to determine the possible limited angular displacements of said plate (49), necessary for the accurate disposition on a same vertical plane (in which the center lines of the binder channels lie) of the channels of the bottom platform (20,120) and the above mentioned plate (49).

11. Plant according to the preceding claims, especially claim 8, characterized in that the grooves or channels of both the bottom plane (20, 120) of the containers and the upper dish (49) of the press (3), for the passage of the binding element, are in diametral arrangement or arranged along pairs of parallel chords, the binder (50) and the counter-frame (53) thereof being capable of moving close to or away from said dishes to adapt themselves to the diameters and to the side movements so as to carry out transverse bindings.

FIG. 1



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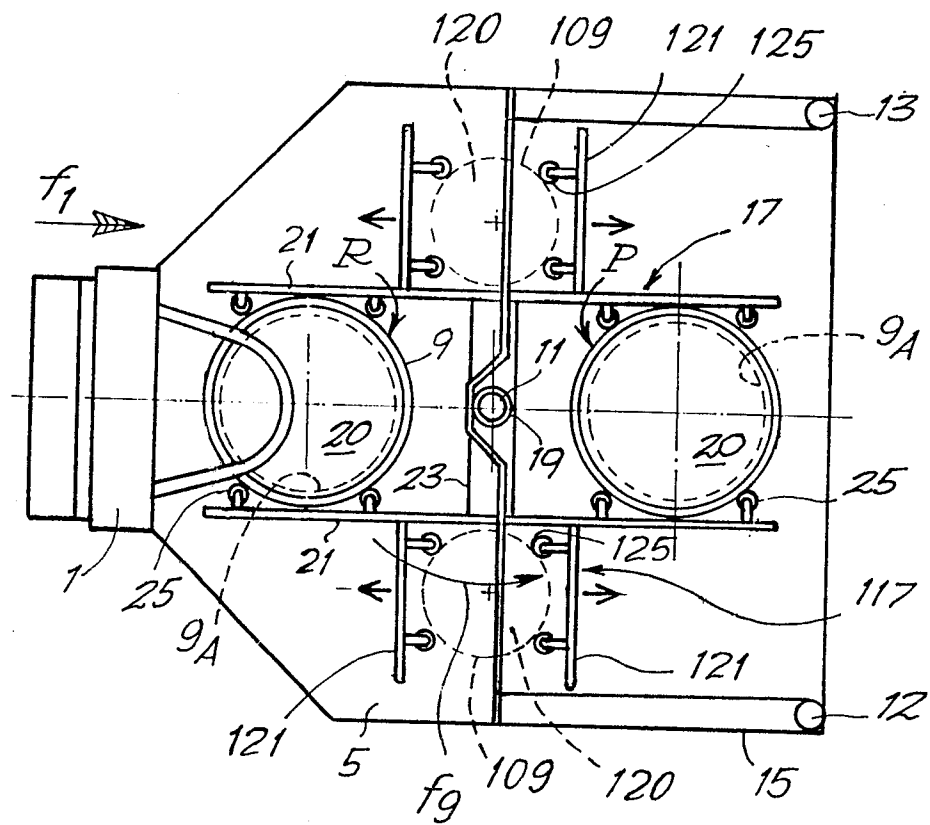


FIG.3

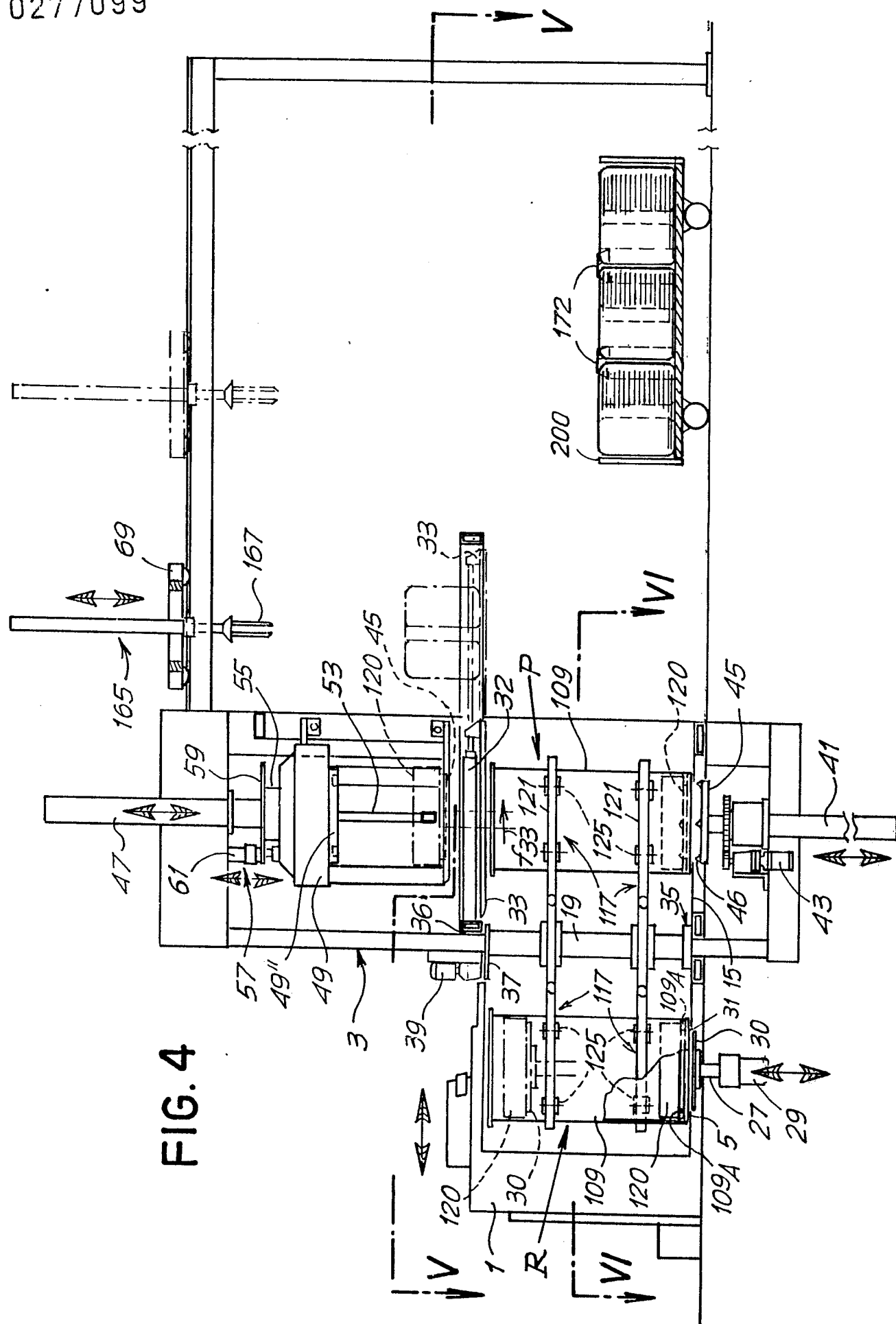


FIG. 6

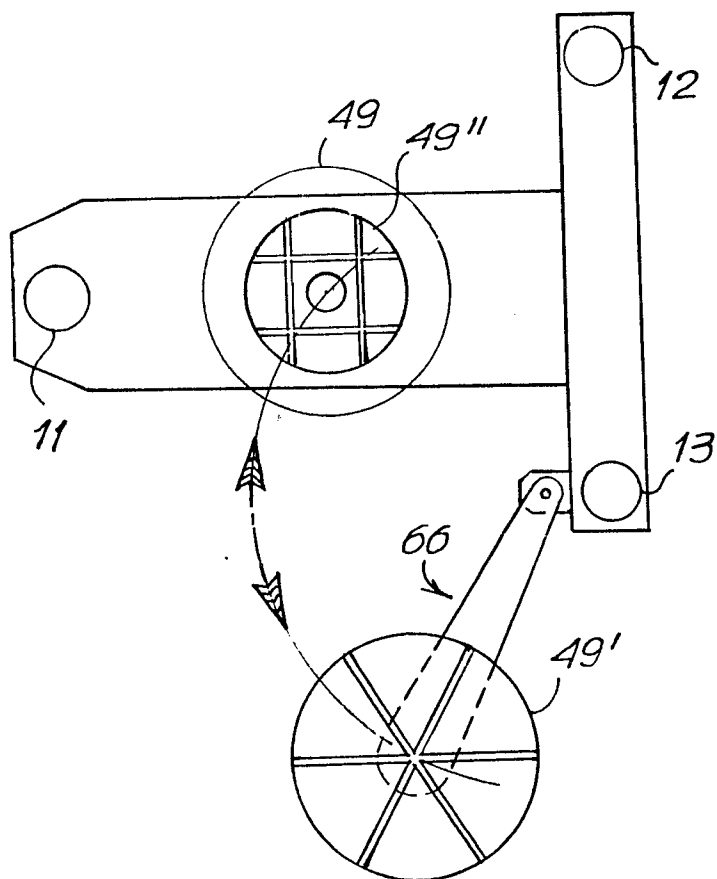
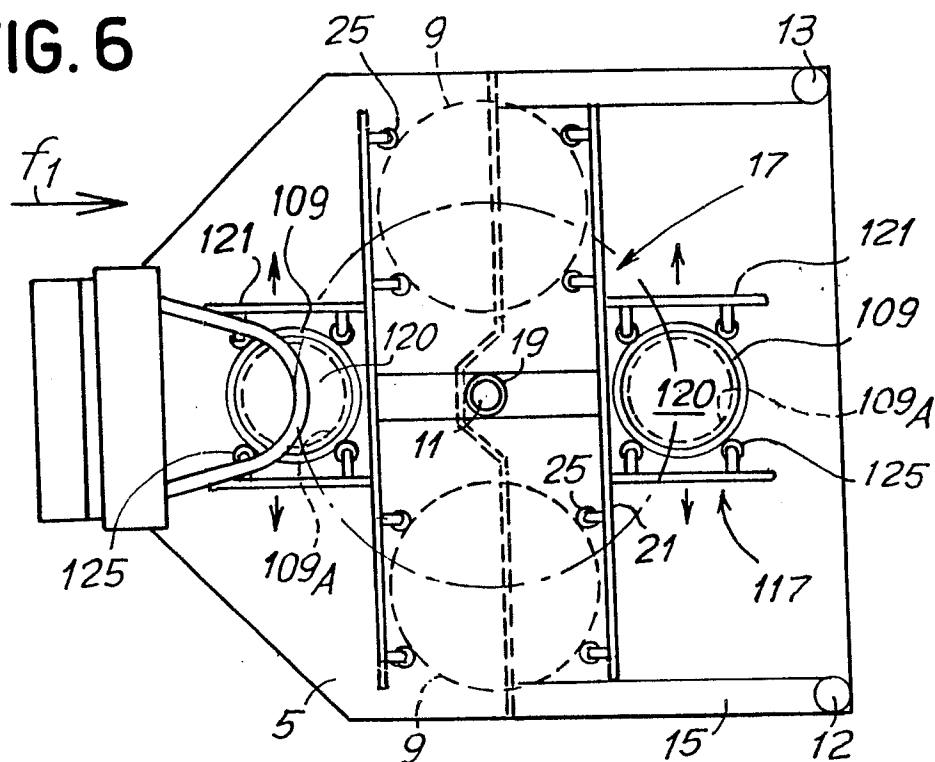


FIG. 7

Fig. 8A

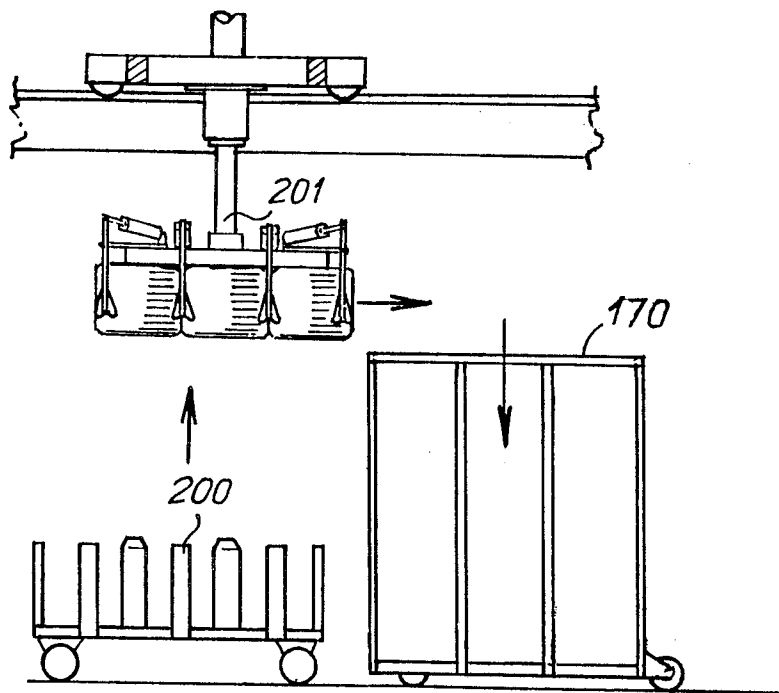


Fig. 8B

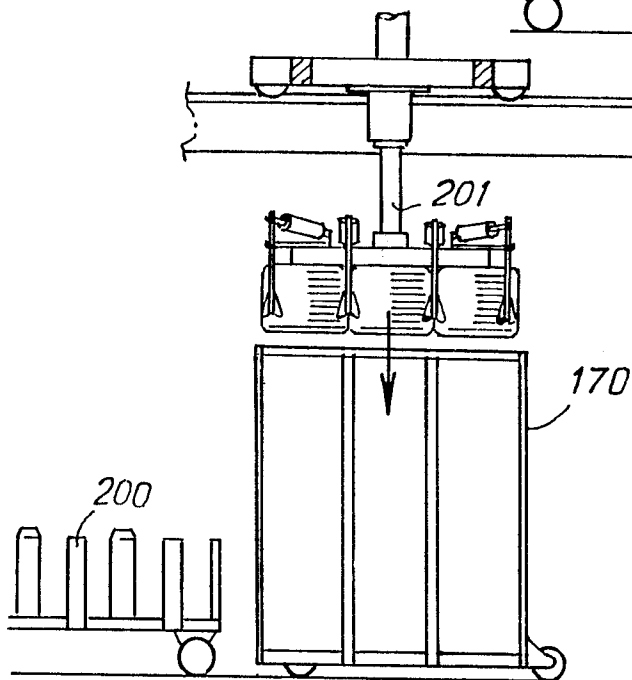


Fig. 8C

