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

Automatische Anlage zur Bildung, Pressung und Behandlung aufgerollter Verpackungen, Textilbands oder Vorgarns oder dergleichen

Installation automatique pour la formation, le pressage et le traitement de paquets enroulés, de ruban de textile, de mèche ou similaire

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- **International Textile Service 1/83, Schlumberger & Cie., Machine GC 12, ITMA 83**

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Description

The invention refers to 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 from the coiler of a special machine, comprising: at least a pair of containers made up only of cylindrical walls with a movable bottom, 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 and for causing it to rotate in concomitance with the lowering; exchanging means for delivering a filled container from the filling position to the pressing position and an empty container from the pressing position to the filling position; a press comprising means for lifting said bottom and pressing the coiled material against an upper plate 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 displacement of the upper plate, means for the binding of the material maintained in pressing condition and means for the rotation thereof for successive bindings; and means for withdrawing the bound material from the press and locating it below a gripping, lifting and transfer equipment which places it into a multiseat carriage container, according to the preamble of claim 1. Such a plant is produced and sold by N.Schlumberger & Cie. (France) under the name GC12.

A pressing plant is known also from EP-A-0 133 422.

A plant of this kind is known from EP-A-0 133 422. In this known plant a plurality of rove producing machines are combined to a single press which provides for pressing of the material coming from each of the rove producing machines. A carriage running along a track is provided for moving the rove containers from each one of the rove producing machines toward the press and vice-versa. This known plant is rather complex and has large overall dimensions.

It is an object of the invention to provide a plant which is more compact and faster than the known plant, and which has an improved system for moving the containers for changing empty containers with full containers. This is obtained with a plant having the features of claim 1.

A device for moving containers from a filling position to a pressing position and therefrom to a discharging position is known from US-A-3 655 851. This device is designed for baling particulate synthetic elastomers, and provides for a vertical shaft on which a rotating equipment is mounted. The rotating equipment is formed by brackets solid to square containers where the particulate material is charged. The containers are supported by the vertical shaft. Such a device would however not be suitable for handling cylindrical containers of the kind used for collecting textile rove material dispensed by a rotating coiler.

Moreover, in International Textile Bulletins, 1/83, a plant comprising a rove feeding device and a press is disclosed, wherein two containers are simultaneously in use, the first one in a filling position and the second one in a pressing position. Means are provided for exchanging the positions of the two containers. These means are not described nor shown in detail. However, the container which can be handled by this known device has a fixed diameter. No means are described for handling containers of different diameters.

Further advantageous features of the invention are set out in the appended dependent claims.

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 socalled "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 suitable 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 property 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 carried 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 separetely 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 filing 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 ction 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 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 cylidner-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, comprising: at least a pair of containers (9, 20) made up only of cylindrical walls (9) with a movable bottom (20), 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 (20) and for causing it to rotate in concomitance with the lowering; exchanging means (17) for delivering a filled container (9, 20) from the filling position (R) to the pressing position (P) and an empty container from the pressing position (P) to the filling position (R); a press (3) comprising means (41, 45) for lifting said bottom and pressing the coiled material against an upper plate (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 displacement of the upper plate (49), 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 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;

wherein : said exchanging means (17) perform a simultaneous exchange of an empty container with a full container; said means comprise an equipment (17) which rotates about a vertical axis (11) interposed between the filling position (R) and the pressing position (P), which causes the two containers (9, 20) to simultaneously perform respective rotation 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 (9, 20) thereby causing them to perform said displacements; horizontal sliding surfaces (5, 15) being provided for said displacements of the containers; 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) of the container; 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).

2. Plant according to claim 1, characterized in that it is designed for handling bumps of different diameters by 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 a simultaneous exchange equipment which is suitably adjustable for moving containers of different diameters, by adaptations of the upper plate (49) of the press and of the bottom of the container, and by suitable movements of the means (50, 53) for the binding of the pressed material.

3. 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 range, less than that of the containers for which the or each pair of arms with no adaptations is provided.

4. Plant according to any preceding claim, characterized in that each horizontal arm (21, 121) of the pairs of arms of said equipment (17, 117), or the adaptation means applied thereto for handling containers of smaller diameter, have idle wheels (25, 125) with vertical axis which are in contact with the outer wall (9, 109) of the container inserted between said arms (21, 121) in order to engage the container for its rotation.

5. Plant according to any preceding claim, 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 multiseat carriage container (70, 170) or into a case (200).

6. Plant according to any preceding claim, characterized in that both the bottom (20, 120) of the containers and the upper plate (49) of the press are provided with channels for the passage of binding elements, and that for successive bindings, angularly shifted to one another, means (43, 45, 46) are provided for causing the rotation of said bottom, while the rotation of the upper plate (49) of the press (3) taken place by friction dragging operated by the pressed material.

7. Plant according to claim 6, characterized in that for the exact angular positioning of said upper plate (49) of the press (3), which can idly rotate around a hub (55), a positioner member (57) is provided, apt to determine the possible limited angular displacements of said plate (49), for accurate alignment of the channels of the bottom (20, 120) and the upper plate (49) in a common vertical plane for successive binding.

8. Plant according to claim 6, characterized in that the channels of both the bottom (20, 120) of the containers and the upper plate (49) of the press (3) are in diametral arrangement or arranged along pairs of parallel chords, the binder (50) and the counterframe (53) thereof being capable of moving close to or away from said bottom and said upper plate.

Patentansprüche

1. Automatische Anlage zum Bilden, Pressen, Binden und Handhaben von gewickelten Spulen ("Kopsen") aus gekämmtem Faserband oder -strang od.dgl., die vom Wickelteil einer Spezialmaschine zugeführt werden, umfassend: Mindestens ein Paar von untereinander gleichen Behältern (9,20), die nur aus zylindrischen Wänden (9) mit einem beweglichen Boden (20) bestehen; an der Stelle, an der ein Behälter mit gewickeltem Material gefüllt wird, angeordnete Mittel (29,30) zum Heben und Senken des Behälterbodens (20) und zum Drehen desselben gleichzeitig mit dem Absenken; eine Auswechseleinrichtung (17) zum Zuführen eines gefüllten Behälters (29) von der Füllposition (R) zur Preßposition (P) und eines leeren Behälters von der Preßposition (P) zur Füllposition (R); eine Presse (3) mit Mitteln (41,45) zum Heben des Bodens und zum Pressen des gewickelten Materials gegen eine obere Platte (49) der Presse (3) und für das anschließende Heben des Materials aus der zylindrischen Wand (9) des Behälters; an der Presse (3) angeordnete Mittel (47) zum vertikalen Verschieben der oberen Platte (49), Mitteln (50,53)

zum Binden des im Preßzustand gehaltenen Materials und Mitteln (43,45,46) zu dessen Drehung für aufeinanderfolgende Bindungen; und Mittel (33) zum Entnehmen des gebundenen Materials aus der Presse und zu dessen Ablage unter einem Greif-, Hebe- und Übergabegerät (65), die das Material in einen Behälter eines Sammelwagens ablegt; wobei die Auswechseleinrichtung (17) einen gleichzeitigen Austausch eines leeren Behälters gegen einen vollen Behälter durchführt und eine Baueinheit (17) aufweist, die um eine zwischen der Füllposition (R) und der Preßposition (P) angeordnete vertikale Achse (12) drehbar ist und gleichzeitige Drehbewegungen der beiden Behälter (9,20) bewirkt, bei denen die Spuren der Bahälterachsen auf einer Horizontalebene sich längs entgegengesetzten Halbkreisen bewegen, wobei die Baugruppe (17) zwei Paare von horizontalen und parallelen Armen (21) aufweist, welche die Behälter (9,20) von entgegengesetzten Seiten umgreifen und dadurch deren Verschiebung bewirken; wobei horizontale Gleitflächen (5,15) für diese Verschiebungen der Behälter vorgesehen sind, dadurch **gekennzeichnet**, daß Trägermittel (64) vorgesehen sind, die das gepreßte und gebundene Material angehoben halten können, nachdem der Boden (20,120) des Behälters abgesenkt wurde, und daß ein flacher Schieber (33), welcher horizontale Verschiebungen durchführt, unterhalb des Materials und oberhalb des Behälters (9,20;109,120), in welchem der Preßvorgang stattfindet, angeordnet ist, wobei das Material auf dem Schieber (33) zur Ruhe kommt, wenn es von den Trägermitteln (64) freigegeben wird und der Austausch der Behälter unterhalb des Schiebers (33) stattfindet; wobei die Verschiebung des Schiebers (33) außerhalb der Presse (3) die Entnahme des gepreßten und gebundenen Materials von der Presse (3) bewirkt.

2. Anlage nach Anspruch 1, dadurch **gekennzeichnet,** daß sie zur Handhabung von Kopsen unterschiedlichen Durchmessers ausgebildet ist durch eine Einrichtung, die ein Annähern oder Wegbewegen der strangzuführenden Wickeleinheit relativ zur Innenkante des an der Füllposition angeordneten Behälters ermöglichen; durch eine Simultanwechseleinrichtung, die zum Bewegen von Behältern unterschiedlicher Durchmesser verstellbar ist, durch entsprechende Anpassung der oberen Platte (49) der Presse und des Behälterbodens, und durch geeignete Bewegungen der Eintrichtungen (50,53) zum Binden des gepreßten Materials.

3. Anlage nach den vorhergehenden Ansprüchen, dadurch **gekennzeichnet,** daß durch Anpassungsmittel, wie z.B. Distanzstücke, Bügel od.dgl., das oder jedes Paar von Armen (21,121) Behälter aufnehmen kann, deren Durchmesser innerhalb eines bestimmten Bereiches kleiner als der der Behälter ist, für welche das oder jedes Paar von Armen ohne Anpassung vorgesehen ist.

4. Anlage nach einem vorhergehenden Anspruch, dadurch **gekennzeichnet,** daß jeder horizontale Arm (21,121) der Paare von Armen der Baueinheit (17,117) oder die daran vorgesehenen Anpassungsmittel zum Handhaben der Behälter mit kleinerem Durchmesser leerlaufende Räder (25,125) mit vertikalen Achsen aufweisen, die mit der Außenwand (9,109) des Behälters in Verbindung stehen und die zwischen den Armen (21,121) eingefügt sind, um am Behälter für seine Drehung anzugreifen.

5. Anlage nach einem vorhergehenden Anspruch, dadurch **gekennzeichnet,** daß ein Hebe- und Übergabegerät (65,165) vorgesehen ist, welches mit Klemmbacken zum Greifen und Freigeben des gebundenen und gepreßten Materials über dem flachen Schieber (33) angeordnet ist, wenn sich dieser außerhalb der Presse (3) befindet, um das Material in den Behälter eines Sammelwagens (70,170) oder in einen Kasten zu überführen.

6. Anlage nach einem vorhergehenden Anspruch, dadurch **gekennzeichnet,** daß sowohl der Boden (20,120) der Behälter als auch die obere Platte (49) der Presse mit Kanälen für den Durchlauf von Bindeelementen versehen sind, und daß für aufeinanderfolgende Bindungen, die winkelversetzt zueinander sind, Mittel (43,45,46) zum Bewirken der Drehung des Bodens vorgesehen sind, während die Drehung der oberen Platte (49) der Presse (3) durch Reibungsmitnahme, die durch das gepreßte Material bewirkt wird, stattfindet.

7. Anlage nach Anspruch 6, dadurch **gekennzeichnet,** daß zur exakten Winkelpositionierung der oberen Platte (49) der Presse (3), die sich leerlaufend um eine Nabe (55) drehen kann, ein Positionierelement (57) vorgesehen ist, welches geeignet ist die möglichen, begrenzten Winkelbewegungen der Platte (49) zur genauen Einstellung der Kanäle des Bodens (20,120) und der oberen Platte (49) in einer gemeinsamen vertikalen Ebene für aufeinanderfolgende Bindungen festzulegen.

8. Anlage nach Anspruch 6, dadurch **gekennzeichnet,** daß die Kanäle dem Bodens (20,120) der Behälter sowie der oberen Platte (49) der Presse (3) sich in diametraler Anordnung befinden oder entlang Paaren von parallelen Kreissehnen angeordnet sind, wobei die Bindeelemente (50) und deren Gegenrahmen sich in die Nähe oder weg von dem Boden oder der oberen Platte bewegen können.

Revendications

1. Installation automatique pour la mise en forme, le pressage, la retenue et la manutention de matériaux enroulés (« tampons ») en rubans ou en mèches en fibres peignées, ou analogue, délivrés depuis la bobineuse d'une machine spéciale, comprenant : au moins deux conteneurs (9, 20) qui sont constitués seulement par des parois cylindriques (9) et par un fond mobile et qui sont identiques entre eux ; au niveau de la position à laquelle un conteneur est rempli avec un matériau enroulé, un moyen (29, 30) pour élever et abaisser le fond du conteneur (20) et pour le faire tourner en concomitance avec l'abaissement ; un moyen échangeur (17) pour faire passer un conteneur rempli (9, 20) de la position de remplissage (R) à la position de pressage (P) et un conteneur vide de la position de pressage (P) à la position de remplissage (R) ; une presse (3) comprenant un moyen (41, 45) pour élever ledit fond et pour presser le matériau enroulé contre une plaque supérieure (49) de la presse (3) et pour élever ensuite le matériau depuis la paroi cylindrique (9) du conteneur ; sur la presse (3), un moyen (47) pour le déplacement vertical de la plaque supérieure (49), un moyen (50, 53) pour la retenue du matériau maintenu dans une condition de pressage et un moyen (43, 45, 46) pour sa rotation lors de liages successifs ; et un moyen (33) pour retirer de la presse le matériau retenu et pour le placer au-dessous d'un équipement de saisie, d'élévation et de transfert (65) qui le place dans un conteneur de transport multiplaces ; ladite installation étant caractérisée en ce que ledit moyen échangeur (17) effectue un échange simultané d'un conteneur vide contre un conteneur plein et en ce que ledit moyen comprend un équipement (17) qui tourne autour d'un axe vertical (11), interposé entre la position de remplissage (R) et la position de pressage (P), qui force les deux conteneurs (9, 20) à effectuer simultanément des mouvements de rotation respectifs, au cours desquels les traces des axes des conteneurs sur un plan horizontal se déplacent à l'opposé de circonférences semi-circulaires, ledit équipement (17) comprenant deux paires de bras parallèles (21) qui embrassent depuis des côtés opposés les conteneurs (9, 20) et les amènent ainsi à effectuer lesdits déplacements ; des surfaces de glissement horizontales (5, 15) étant prévues pour lesdits déplacements des conteneurs ; caractérisée en ce que des éléments de support (64) sont prévus pour permettre le maintien du matériau pressé et retenu après l'abaissement de la base (20, 120) du conteneur ; et en ce qu'un élément de grille plate (33) qui effectue des déplacements horizontaux est interposé au-dessous du matériau et au-dessus du conteneur (9, 20 ; 109, 120) dans lequel le pressage a été effectué, ledit matériau venant au repos sur ledit élément (33) au moment où il est relâché par lesdits éléments de support (64) et l'échange des conteneurs s'effectuant au-dessous dudit élément de grille (33), le déplacement dudit élément de grille (33) jusqu'à l'extérieur de la presse (3) faisant en sorte que le matériau pressé et retenu soit enlevé de la presse (3).

2. Installation selon la revendication 1, caractérisée en ce qu'elle est conçue pour manipuler des tampons de différents diamètres à l'aide de moyens pour obtenir l'avancée ou le retrait de la bobineuse d'alimentation en mèche par rapport au bord interne du conteneur situé au niveau de la position de remplissage ; au moyen d'un équipement d'échange simultané qui peut être réglé de manière appropriée pour déplacer des conteneurs de différents diamètres, au moyen d'adaptations de la plaque supérieure (49) de la presse et du fond du conteneur et au moyen de mouvements appropriés du moyen (50, 53) pour la retenue du matériau pressé.

3. Installation selon les revendications précédentes, caractérisée en ce que l'aide de moyens d'adaptation - tels que des écarteurs, des étriers ou autres - la paire ou chaque paire de bras peut recevoir des conteneurs dont le diamètre est, à l'intérieur d'une certaine plage, inférieur à celui des conteneurs pour lesquels la paire ou chaque paire est prévue sans adaptation.

4. Installation selon l'une quelconque des revendications précédentes, caractérisée en ce que chaque bras horizontal (21, 121) des paires de bras dudit équipement (17, 117) ou les moyens d'adaptation qui lui sont adaptés pour manipuler les conteneurs de diamètre plus petit comprend des roues folles (25, 125) ayant des axes verticaux et qui sont en contact avec la paroi externe (9, 109) du conteneur inséré entre lesdits bras (21, 121) afin de venir en contact avec le conteneur pour assurer sa rotation.

5. Installation selon l'une quelconque des revendications précédentes, caractérisée en ce qu'un élément de levage et de transfert (65, 165) muni de mâchoires pour saisir et relâcher le matériau pressé et lié est localisé sur ledit élément de grille plat (33) lorsque celui-ci est situé à l'extérieur de la presse (3) afin de transférer ledit matériau dans ledit conteneur de transport multi-place (70, 170) ou dans un casier (200).

6. Installation selon l'une quelconque des revendications précédentes, caractérisée en ce que le fond (20, 120) des conteneurs et la plaque supérieure (49) de la presse sont toutes deux munies de canaux pour le passage d'éléments de liaison et pour des liaisons successives, ces canaux étant

décalés d'un certain angle l'un par rapport à l'autre, et en ce que des moyens (43, 45, 46) sont prévus pour amener en rotation ledit fond tandis que la rotation de la plaque supérieure (49) de la presse (3) s'effectue au moyen d'un effet d'entraînement par frottement provoqué par le matériau pressé.

7. Installation selon la revendication 6, caractérisée en ce que, pour assurer le positionnement angulaire exact de ladite plaque supérieure (49) de la presse (3) qui peut tourner librement autour d'un moyeu (55), un élément de positionnement (57) est prévu et permet de déterminer les déplacements angulaires limités possibles de ladite plaque (49) pour assurer un alignement précis des canaux du fond (20, 120) et de la plaque supérieure (49) dans un plan vertical commun lors d'une retenue suivante.

8. Installation selon la revendication 6, caractérisée en ce que les canaux à la fois du fond (20, 120) des conteneurs et de la plaque supérieure (49) de la presse (3) sont selon un agencement diamétral ou sont agencés le long de paires de cordes parallèles, les moyens de retenue (50) et les contre-châssis (53) de celles-ci pouvant se rapprocher ou s'éloigner dudit fond et de ladite plaque supérieure.

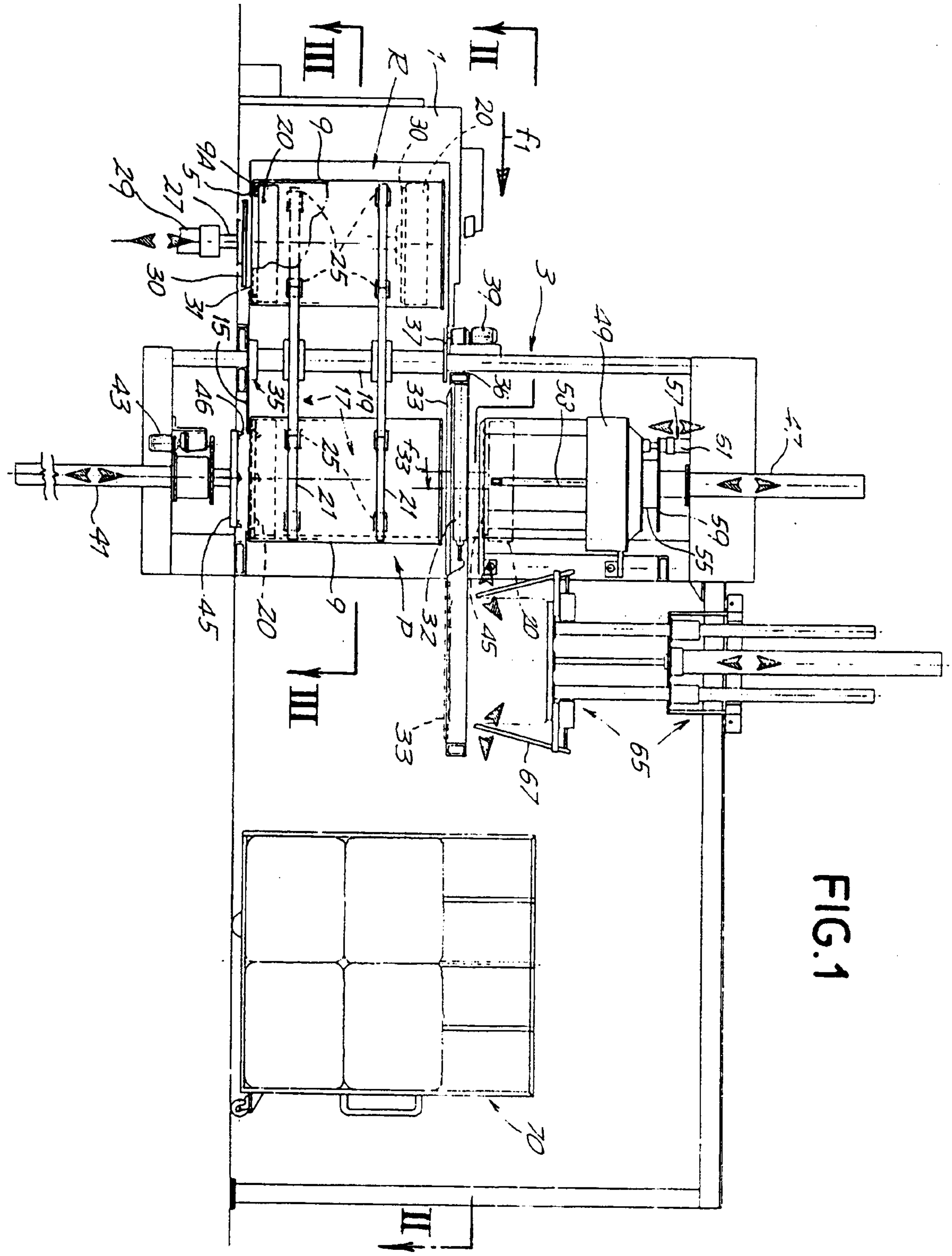
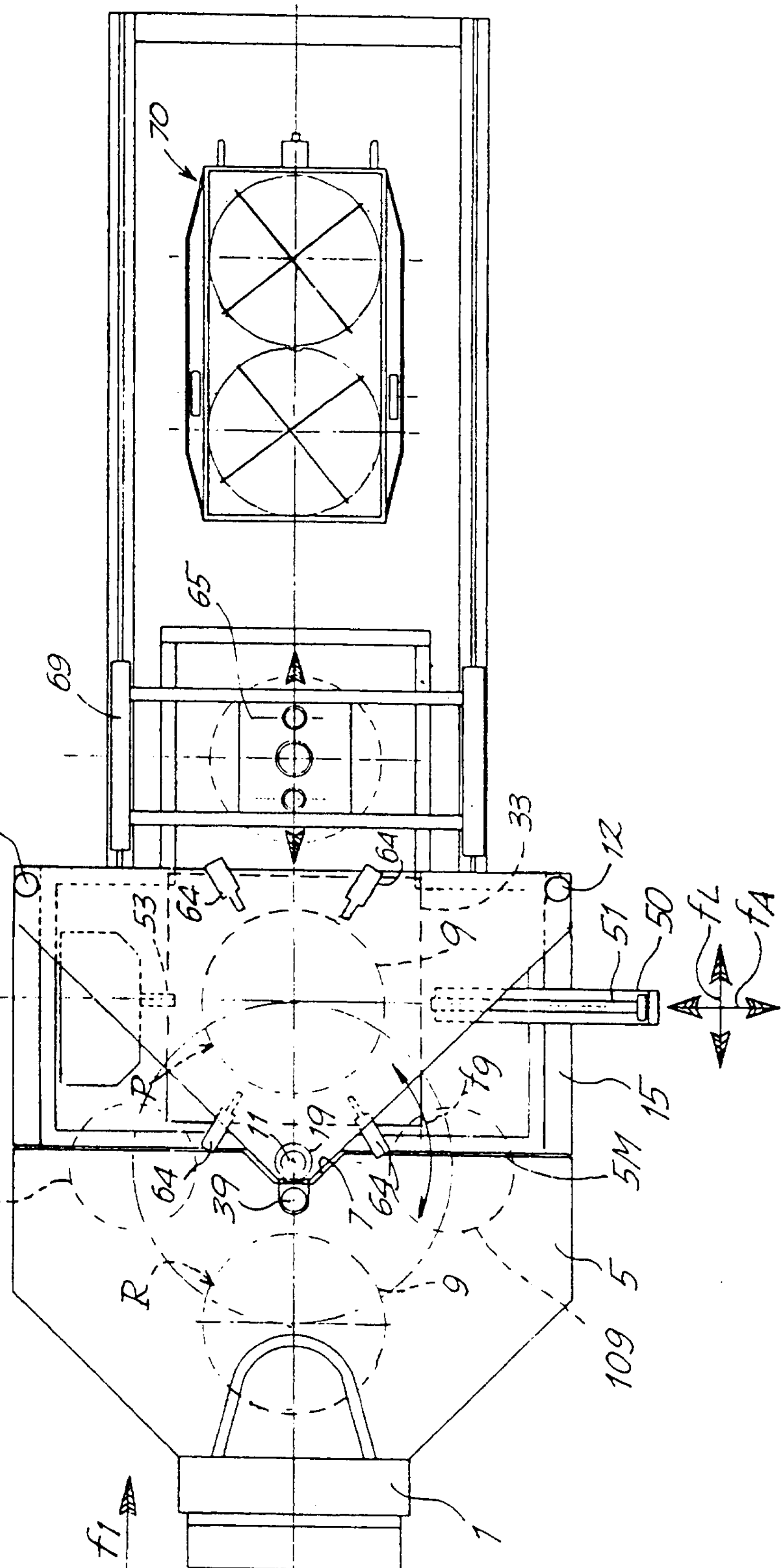


FIG.1

FIG. 2



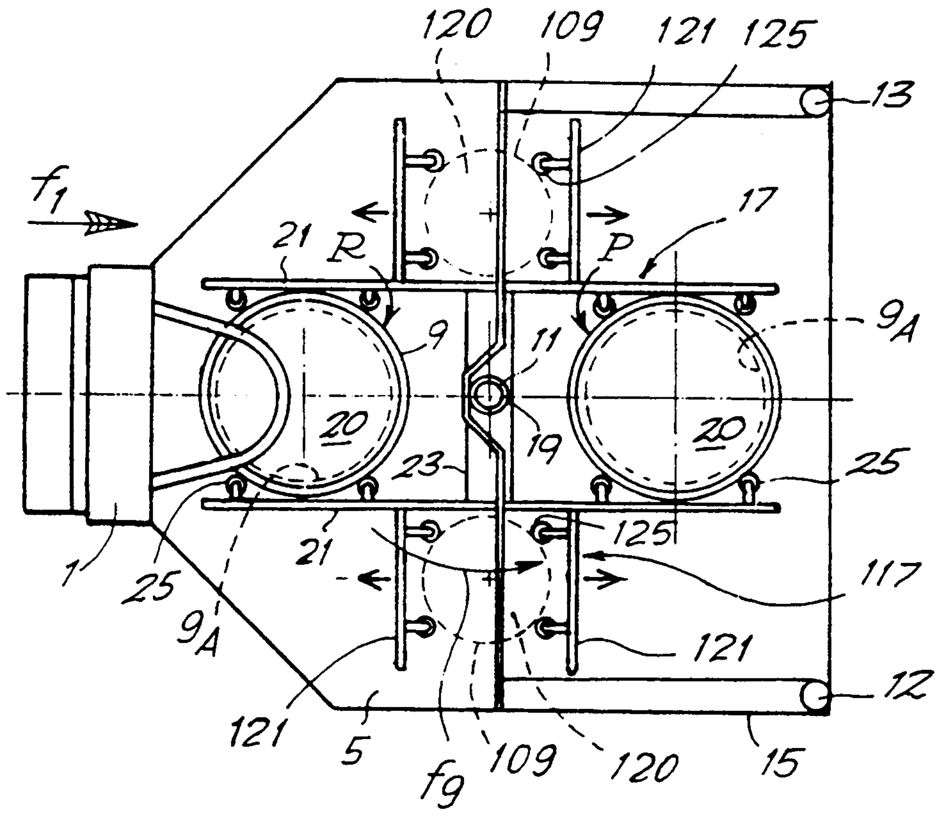

120
109
121
125
13
f1
17
21
R
P
9A
9
11
19
20
20
23
25
125
21
117
1
25
9A
121
12
121
5
f9
109
120
15

FIG.3

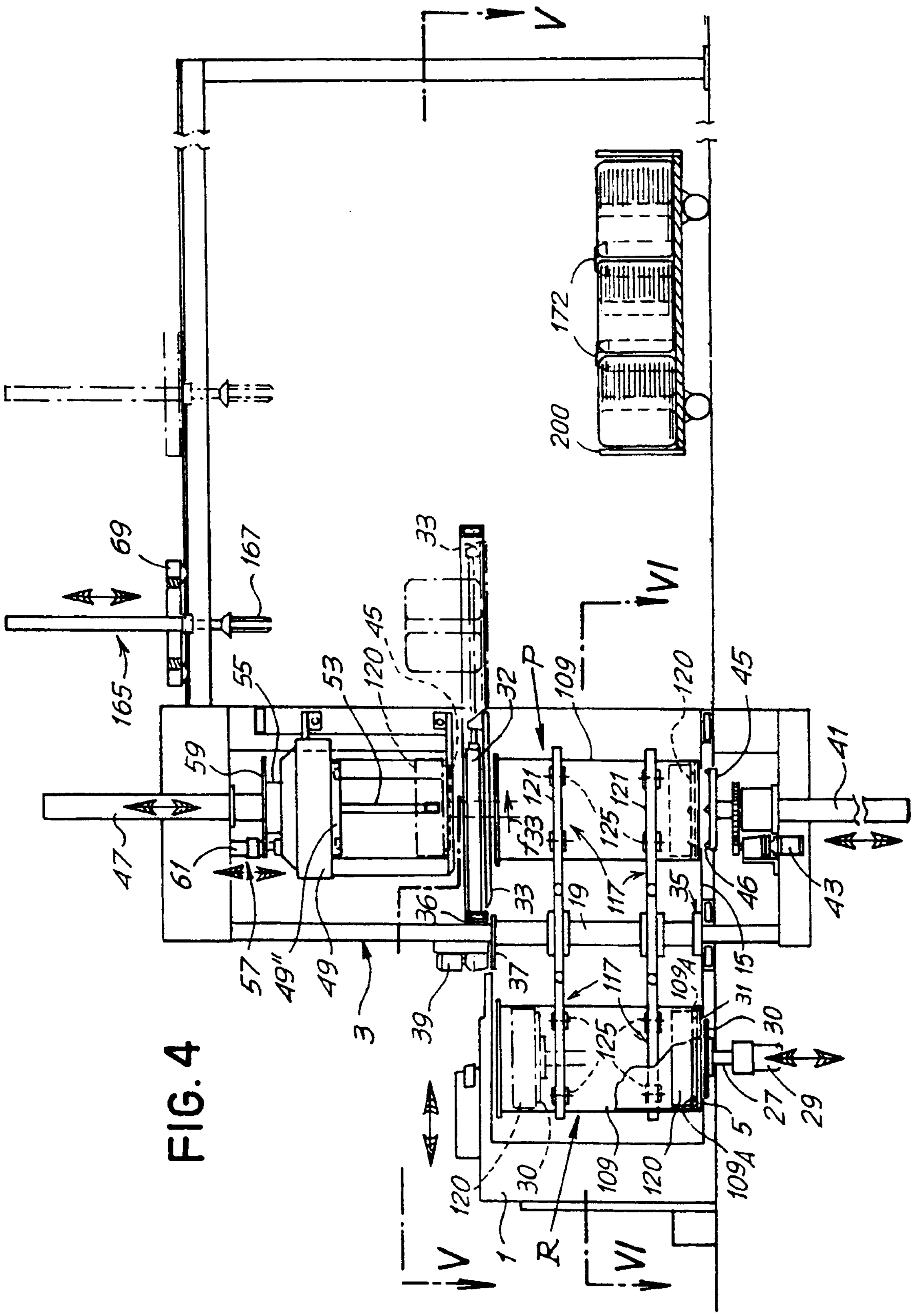

V
V
VI
VI
P
R
1
3
5
15
19
27
29
30
31
32
33
35
36
37
39
41
43
45
46
47
49
49''
53
55
57
59
61
69
109
109A
117
120
121
125
165
167
172
200

FIG. 4

FIG. 5

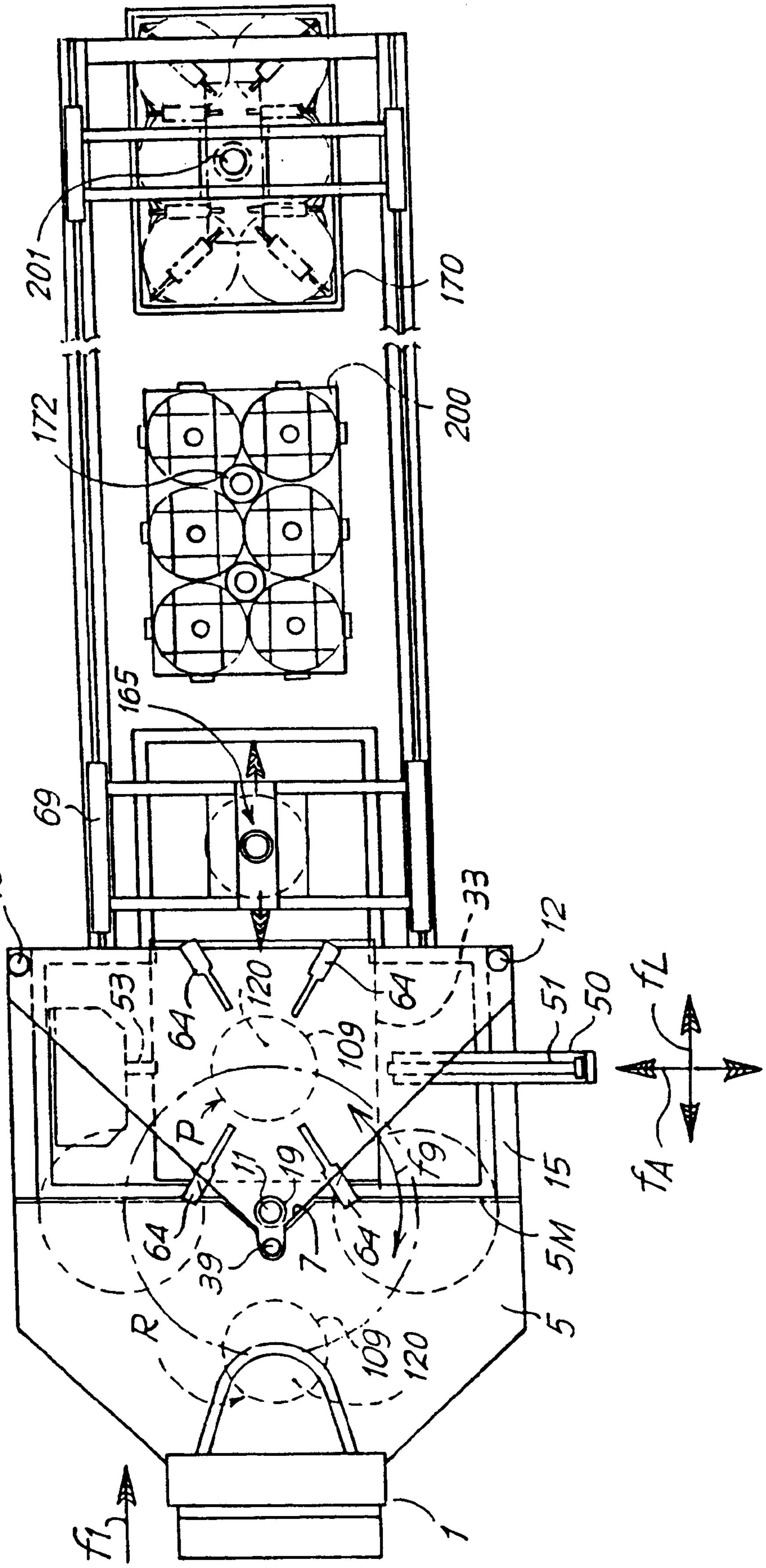
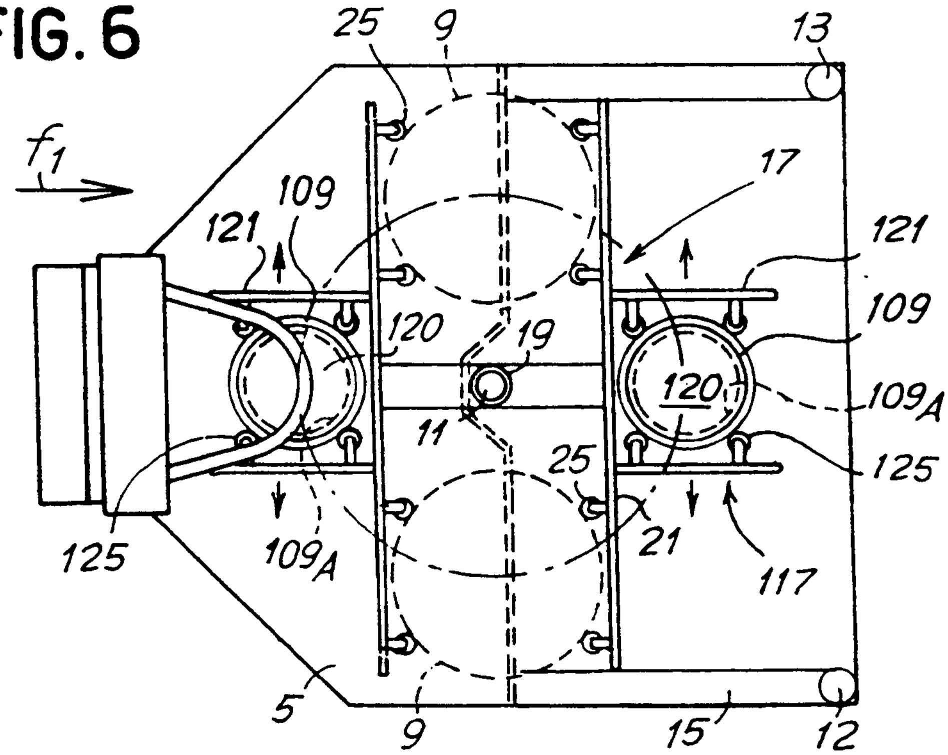

201
170
172
200
165
69
13
33
12
53
120
64
109
51
50
fL
P
11
19
79
15
fA
39
7
5M
R
109
120
5
f1
1

FIG. 6


25
9
13
f_1
17
109
121
121
109
120
19
120
109_A
11
25
125
125
109_A
21
117
5
9
15
12

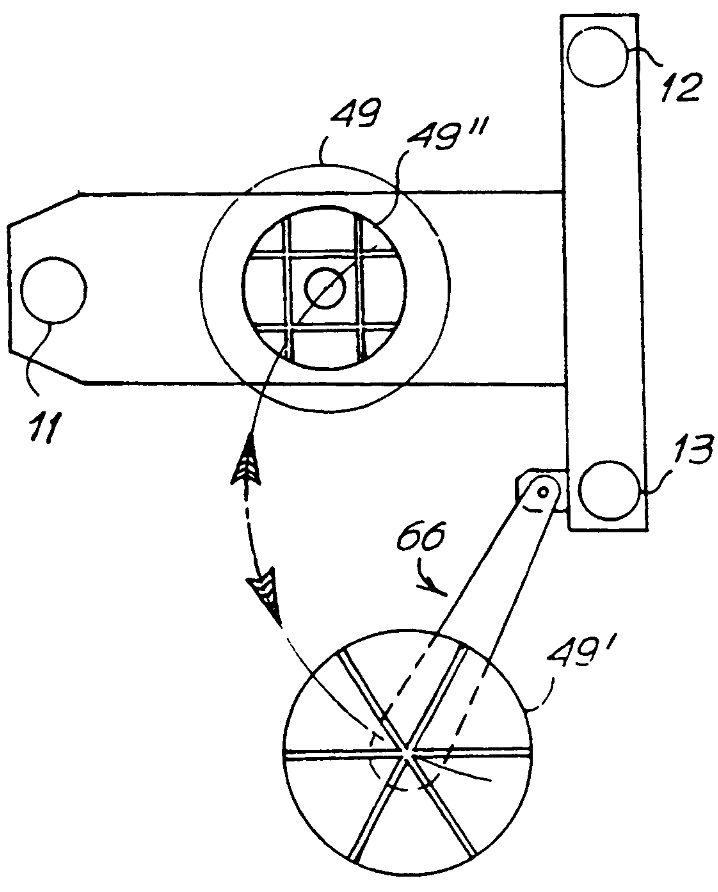

12
49
49''
11
13
66
49'

FIG. 7

Fig.8A

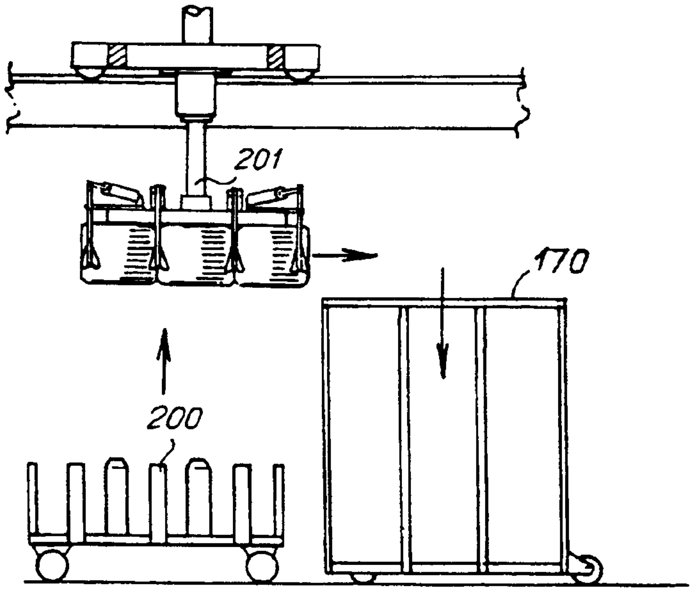


Fig.8B

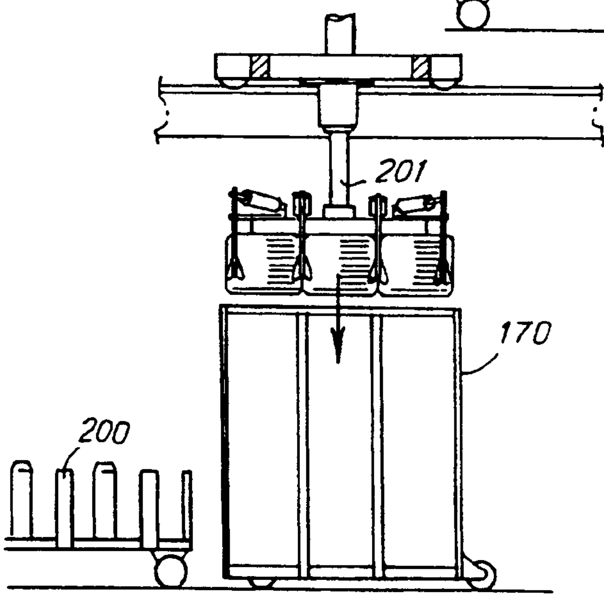


Fig.8C