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(54) **MACHINE FOR CARRYING OUT PALLETIZED PACKAGING**

(57) A machine for carrying out palletized package (P) comprising a load (C) supported by a support means (S) is provided with at least a wrapping device (100), a film rolling device (101) downstream the wrapping device (100) and, interposed between them (100, 101), an inserting device (102, 103) assigned to insert support means below a load.

The wrapping device (100) comprises a first wrapping means (3) for wrapping a load (C) in almost vertical packaging film coils (B) and it comprises at least a horizontal first ring conveyor means (7) and assigned to support and to move through the first wrapping means (3) and along a forward direction, the load (C). Said first ring conveyor means (7) has a fixed end (8) upstream the first wrapping means (3) end a mobile end (9) translating through the first wrapping means (3).

The inserting device (102, 103) comprises a transfer conveyor means (13) receiving from the first ring conveyor means (7) the wrapped load (C) and transferring

the latter (C) onto respective transport means (27, 33) transporting and inserting a support means (S) below said load (C) carrying out a palletized package (P).

The film rolling device (101) comprises a respective second wrapping means (17) similar to the wrapping device (3) and a forward conveyor means (21) receiving the palletized package (P) from the inserting device (102, 103) and sited close and upstream of the active zone of the second wrapping means (17). Said film rolling device (101) further comprises a translating conveyor means (24) sited downstream the forward conveyor means (21) and receiving from the latter (21) the palletized package (P). Said translating conveyor means (24) is connected to shift means moving it (24) between an adjacent condition where the translating conveyor means (24) is close to the forward conveyor means (21) and a spaced apart condition where said translating conveyor means (24) is spaced from the forward conveyor means (21).

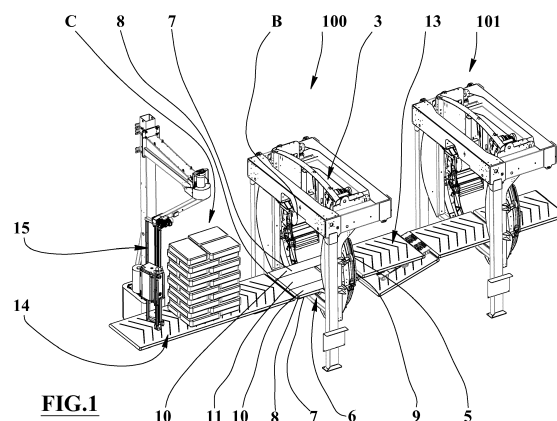


FIG.1

Description

[0001] The present invention refers to the field concerning the palletized packaging and in particular refers to a machine for carrying out palletized packagings.

[0002] There are known devices able to wrap the pallet load or a load for a pallet with horizontal coils of a packaging film or able to wrap the whole packaging complete of load and pallet with film.

[0003] A drawback of such known devices consists in that they are not able to carry out a packaging comprising a completely wrapped load and comprising a support means consists of a single pallet or of a multiple elements pallet, where said pallets are fixed to the mentioned load.

[0004] Another drawback of the known devices consists in that they are of great dimension and very expensive.

[0005] Further drawback of such known devices consists in that they don't allow the use of multiple pallets or pallets carried out with separated elements that make the pallet when they are fixed to the load.

[0006] Another drawback is that they don't allow the use of pallets of flexible type.

[0007] One object of the present invention is to propose a machine for carrying out in semiautomatic or automatic way palletized packaging completed of a fully wrapped load and of a support means consists of a single or in multiple elements pallet, fixed to the load.

[0008] Another object is to propose a relatively cumbersome and inexpensive machine.

[0009] Further object is to propose a machine which allows to use pallets of multiple type or rather carried out with separate elements that form the pallet when they are fixed to the load; and pallet in a single body or already assembled, or rigid or flexible pallets.

[0010] The characteristics of the invention are highlighted in the following with particular reference to the accompanying drawings in which:

- Figure 1 shows an axonometric view of the machine for carrying out palletized packaging object of the present invention in an inlet or formation condition of a parcels load at its inlet;
- Figure 2 shows an axonometric view from another point of view of Figure 1;
- Figure 3 shows an axonometric view of the machine of figure 1 in a starting condition of the first wrapping of a load;
- Figures 4 to 6 illustrate partial and enlarged views of a detail of figure 1 in conditions of progressive first wrapping;
- Figure 7 shows an axonometric view of the machine of figure 1 in an insertion starting condition of a support means under the load;
- Figure 8 illustrates a side view of Figure 7;
- Figures 9-11 show enlarged views of a detail of Figure 8 in conditions of progressive insertion of the support means;

- Figure 12 shows an axonometric view of the machine of figure 1 in a condition of almost complete insertion and starting toward the second wrapping;
- Figure 13 illustrates a side view of the machine of Figure 12 in a condition immediately prior to the second wrapping;
- Figures 14-17 illustrate enlarged views of a detail of Figure 13 in conditions of progressive second wrapping;
- Figure 18 shows an axonometric view of the machine of Figure 13 in an end condition of the second wrapping;
- Figures 19 and 20 illustrate axonometric views of a variant of the machine of Figure 1 in the respective insertion conditions of a support means;
- Figure 21 illustrates an enlarged view of a detail of Figure 20;
- Figure 22 shows an axonometric view of the variant of the machine of Figure 19 in an insertion end condition;
- Figure 23 illustrates an enlarged view of a detail of figure 22.

[0011] With reference to figures 1-18, 1 indicates the machine for carrying out palletized packaging, object of the present invention, starting from a load C consisting of a set of stacked or overlapped packages or the like and by support means S consisting of pallet constituted by multiple and flexible supports or rests. The machine 1 comprises at least a wrapping device 100, a film rolling device 101 placed downstream of the wrapping device 100 and an inserting device 102, 103 interposed between the wrapping device 100 and the film rolling device 101.

[0012] The load C consisting of a package or in a set of stacked packages, is formed, or rather stacked, on an inlet conveyor means 14 of the wrapping device 100, or upstream of such inlet conveyor means and transferred onto it.

[0013] The inlet conveyor means 14 can be associated with an optional wrapping arm device 15, for example of known type, for wrapping the load in horizontal coils of packaging film.

[0014] The wrapping device 100 comprises a wrapping means 3 placed downstream of the optional inlet conveyor means 14, which feed it with the set of packages possibly wrapped at horizontal coils.

[0015] The invention provides that, in absence of the optional inlet conveyor means 14, the set of wrapped or not wrapped packages C, can be fed and supplied to the wrapping means 3 by other means or machines, or that such set is directly formed at the inlet of the wrapping means 3.

[0016] As will be clarified later, the wrapping means 3 can move the set of packages C on a horizontal plane along its longitudinal direction in both feed directions, from the inlet toward the outlet, and vice versa in the withdrawal direction. In the following the terms upper and lower are referred to the horizontal moving plane; the

terms front and rear refer to the feed or forward direction and withdrawal or back refers to the backward direction, from the outlet to the inlet of the device.

[0017] The wrapping means 3 is provided with a wrapping machine, for example of known type, comprising a reel means 4 for the unwrapping of a coil of packaging film B and moved by annular rotation means 5 along an circular path that in the operating condition of the device it develops on a vertical or almost vertical geometric plane. The annular rotation means don't translate and said wrapping machine can wrap with vertical coils of film that passes through it in the active condition.

[0018] The wrapping device 100 comprises two synchronously operated first ring conveyor means 7 side by side, parallel, spaced apart placed and it 100 comprises a median ring conveyor means 11 interposed between the two first ring conveyor means 7.

[0019] The upper face of the median ring conveyor means 11 is coplanar with the upper faces of the two first ring conveyor means 7; these upper faces lie on a geometrical plane almost horizontal and perpendicular to the geometric plane of the annular path defined by the wrapping means 3. The first ring conveyor means 7 and median ring conveyor means 11 are assigned to support and move the load C, along its feed or forward direction, toward the wrapping means 3. Moreover, the first ring conveyor means 7 can carry the load C through the active zone, or rather the wrapping zone, of the wrapping means 3.

[0020] Each first ring conveyor means 7 comprises a fixed end 8 located before of the wrapping means 3 and a mobile end 9 that can translate through the active zone of the wrapping means 3 between two extreme front and rear positions. As clarified in the following, such fixed and mobile ends of the belt of the first ring conveyor means 7 are engaged with respective rollers and they are at the same height.

[0021] The median ring conveyors means 11 and the two first ring conveyor means 7 support the set of packages C and synchronously translate it by a coordinated or single and common operation of the respective motors.

[0022] The upper face of the median ring conveyor means 11 has a median ring ends almost aligned with the fixed ends 8 of the first ring conveyor means 7; the opposite end of the median ring conveyor means 11 is approximately aligned with the mobile ends 9 of the first ring conveyor means 7 in their respective minimum extension conditions.

[0023] The wrapping device 100 further comprises a plate means 12 immediately placed downstream of the median ring conveyor means 11 and interposed between two first ring conveyor means 7. The upper face of the median ring conveyor means 11 lies on the geometric plane of the upper faces of the first ring conveyor means 7 and of the median ring conveyor means 11 and slidably supports the load C.

[0024] The plate means 12 is fixed and it extends itself longitudinally in the action zone of the wrapping means

3 or rather interferes with the film that wraps it together with the above set of packages.

[0025] The upper face of the plate means 12 has one end approximately aligned with the mobile ends 9 of the first ring conveyor means 7 in their conditions of minimum extension; the opposite end of the plate means 12 is approximately aligned with or slightly protruding with respect to the mobile ends 9 of the first ring conveyor means 7 in their respective conditions of maximum extension.

[0026] Each first ring conveyor means 7 is preferably of belt type, for example of elastomeric type reinforced with canvas, smooth or provided with reliefs, engaged to a rear roller with transversal and fixed axis placed to the fixed end 8, engaged to a front roller with transversal axis and translating in the two opposite ways in the feed direction and placed to the movable end 9 at the same eight of the previous roller, and finally to a set of fixed and/or mobile transverse abutment rollers placed below to the upper portion 10 of the rest means 6 and assigned to maintain constant the belt tension to the extension and shortening of the respective first ring conveyor means 7.

[0027] At least one of such rear, front and lower rollers, can be operated in rotation in the two directions by a connected motor controlled for the feed, the withdrawal and the stopping of the belt rotation around said rollers for the controlled moving of the load C.

[0028] The front and rear ends of the median ring conveyor means 11 are engaged in respective transverse rollers placed at the same or similar eights, of the rollers of the first ring conveyor means 7.

[0029] At least one of the rollers of the median ring conveyor means 11 is operable in rotation in the two directions by a connected motor.

[0030] The motor or motors of the first ring conveyor means 7 of the median ring conveyor means 11 are interconnected or synchronized or only constituted by a single motor element or by a gearmotor.

[0031] The plate means 12 is constituted by a metal plate, for example of steel or composite material whose upper and lower faces have a low coefficient of friction.

[0032] The rear side of the plate bears an attack, for example of "L" type, fixed to and overhang to a rigid structure of the device.

[0033] The lower face of the plate means 12 is optionally provided with a specific coating for the low-friction sliding of the packaging film.

[0034] The inserting device 102 of pallet for packaging is assigned to enter, under the base of the load C already wrapped in the film, the support means consisting, for example, in a pallet of single or assembled in a single body type or a pallet of multiple type, or rather consisted of more distinct support elements, preferably of flexible type. The inserting device 102 therefore allows to realize a palletized package P comprising a load C constituted by the set of overlapped or stacked packages and comprising the support means S, such as monolithic or multiple pallet, below the load and assigned to support it.

[0035] The inserting device 102 comprises, at the inlet,

a motorized and flat transfer conveyor means 13, assigned to move the load C wrapped in film coming from the wrapping device 100, on a moving geometrical plane in the feed direction.

[0036] Such inserting device 102 comprises a motorized inclined plane transport means 27 which is placed under the moving geometric plane of said transfer conveyor means 13.

[0037] The inclined plane transport means 27 is assigned to receive, for example from a manual or motorized or automated loading system, a single support means S, for example of multiple or pallet type, for example, consists of three support elements, and to move said single or multiple support means S in a respective insertion direction.

[0038] The feed and insertion directions have the same way and they converge in the direction of the geometric intersection of the moving planes of the inclined plane transport means 27 and of the transfer conveyor means 13. Such intersection is placed at the height of the transfer conveyor means 13 and front with respect to the transfer conveyor and inclined plane transport means.

[0039] The geometric line of said mutual intersection of the planes of the transfer conveyor means 13 and of the inclined plane transport means 27 is horizontal and perpendicular to said feed and insertion directions.

[0040] The inclined plane transport means 27 has a front end 28 placed at an upper height than that of its corresponding rear end 29.

[0041] The front end 28 of the inclined plane transport means 27 is placed in front with respect to the fore end 30 of the transfer conveyor means 13.

[0042] The minimum distance between the fore end 30 of the transfer conveyor means 13 and the inclined plane transport means 27 is approximately equal to or greater than the thickness of the support means S where the thickness is the distance between the supporting faces to the ground and the support face for the load of the support means S of pallet or bed or multiple pallet type.

[0043] The inserting device 102 also comprises a motorized forward conveyor means 21, almost horizontal and parallel to the transfer conveyor means.

[0044] The vertical distance between the planes of the transfer conveyor means 13 and the forward conveyor means 21 is equal to or slightly bigger than said thickness of the support means S.

[0045] The back end 31 of the forward conveyor means 21 is adjacent or nearly in abutment with the front end 28 of the inclined plane transport means 27.

[0046] The front end 28 of the inclined plane transport means 27 and the back end 31 of the forward conveyor means 21 are at the same height or almost at the same height.

[0047] The front end 28 of the inclined plane transport means 27 is lower than the height of the fore end 30 of the transfer conveyor means 13 of a height equal to or slightly upper than the thickness of the support means S.

[0048] The flexible support means S bend in corre-

spondence of the junction between the inclined plane transport means 27 and the forward conveyor mean 21 facilitating the insertion operation and minimizing the stresses and the vertical displacements of the load C.

[0049] As seen, the transfer conveyor means 13 and the forward conveyor means 21 are preferably horizontal and mutually parallel; the inclined plane transport means 27 forms, with a horizontal plane, an angle ranging from 0° to 50° preferably less than 40°. In the preferred case of support means S of flexible type, said angle can be of higher entity than the optimal one for rigid pallets.

[0050] To adapt the device at the characteristics of the various types of support means S, such as multiple flexible or rigid, with thicknesses and different widths, the device can be provided with adjustment means of the height of the front end 28 of the inclined plane transport means 27 and of the forward conveyor means 21; furthermore the device can be provided with adjustment means of the height of the inclined plane transport means 27.

[0051] The inclined plane transport means 27 and possibly also the forward conveyor means 21, can be provided with hollow seats having a shape and reciprocal distances complementary and corresponding to those of the support feet of the multiple support means to removably house such feet, in order to maintain the correct position of said multiple elements, assigned to form the support means, before and after the insertion under the set of packages C.

[0052] The film rolling device 101 receives the palletized package P from the inserting device 102 on the forward conveyor means 21 shared between such devices 101, 102.

[0053] The film rolling device 101 comprises a respective wrapping means 17, for example of the same type as that of the wrapping device 100, and provided with a reel means 18 for a packaging film of the roll BB and moved along a vertical annular path.

[0054] The forward conveyor means 21 is of chains, straps, belt motorized type or the like, and has a rear end 22 placed upstream of the wrapping means 17 spaced from it for example by a distance comparable with the longitudinal development of the pallet of the packaging P. The front end 23 of the forward conveyor means 21 is placed immediately upstream of the active zone of the wrapping means 17 or rather the zone affected by the packaging film of the reel in an active condition of wrapping. The upper portion of the forward conveyor means 21, interposed between said ends 22, 23, lies on a horizontal geometrical plane, perpendicular to the wrapping means 17 and such portion is assigned to move and support, at least partially, the packaging P.

[0055] The forward conveyor means 21 also comprises a translating conveyor means 24 assigned to move and support, at least partially, the package P.

[0056] The translating conveyor means 24 is placed downstream of the forward conveyor means 21 and the upper portions of said conveyor means 21, 24 are copla-

nar.

[0057] The device 101 also comprises translating conveyor means 24, provided with horizontal sliding guides and at least one linear translation actuator of the translating conveyor means 24 itself.

[0058] Such translation means translate, with rectilinear motion parallel to the feed direction, the translating conveyor means 24 between condition in which its rear end 26 is adjacent or nearly in contact with the front end 23 of the forward conveyor means 21 and a condition in which such rear end 26 of the translating conveyor means 24 is spaced of a predetermined distance from the front end 23 of the forward conveyor means 21.

[0059] Said predetermined distance between the rear end 26 of the translating conveyor means 24 and the front end 23 of the forward conveyor means 21 is approximately equal to or greater than the width of the packaging film of the roll BB; in such way the film can be wrapped between the forward conveyor means 21 and the translating conveyor means 24 without interfering with them.

[0060] In the preferred eventuality of package P equipped with a base pallet provided with transversal support feet F, the predetermined distance between the rear end 26 of the translating conveyor means 24 and the front end 23 of the forward conveyor means 21 is approximately equal to or slightly less than the distance between the adjacent transversal support feet F of the base pallet of the package P; In general such a distance determined by the space between the supporting transversal feet is greater than the width of the packaging film of the roll BB.

[0061] Each of the forward conveyor 21 and translating conveyor 24 is of ring belt kind engaged in respective rollers placed at least at the ends of said conveyors; at least one of said rollers is motorized by a motor or gear-motor of preferably electric type.

[0062] The belt of each forward conveyor means 21 and translating conveyor means 24 is provided with projections or reliefs, preferably "V" shaped oriented according to the feed direction.

[0063] The variant of the machine of figures 19-23 provides a different and alternative embodiment of the inserting device 103 of the support means for packages which comprises, downstream of the transfer conveyor means 13 three motorized horizontal and vertical movement transport means 33, of tape or belt type, mutually coplanar, parallel and spaced apart; and two horizontal translation means 34 mutually parallel and spaced, coplanar or nearly coplanar with the transfer conveyor means 13 and placed immediately upstream of the forward conveyor means 21.

[0064] The horizontal and vertical movement transport means 33 are associated with vertical actuators means, for example of hydraulic cylinder or electric type, which translate the latter 33 between an upper condition, in which they 33 are coplanar with the transfer conveyor means 13 and are alternated and side by side to the horizontal translation means 34 and they can be actuated

for the transport in the feed direction of the load C that these means 33, 34 receive from the transfer conveyor means 13, and a lower condition in which they 33 are below the horizontal translation means 34 and are coplanar and aligned to feeding conveyor means 35 assigned, in such condition, to provide to the horizontal and vertical movement transport means 33 respective support means S.

[0065] There is one horizontal and vertical movement transport means 33 for each element of the support means S; the number of the horizontal and vertical movement transport means 33 is then determined by the number of the individual separate elements that must form the pallet of multiple type or form the support of load C so their number can be lower or higher than three. The number of horizontal translation means 34 is equal to the spaces between the horizontal and vertical movement transport means 33, and then is equal to their number minus one.

[0066] The horizontal and vertical movement transport means 33 and the horizontal translation means 34 are shown and above described parallel to the feed direction and then to the longitudinal development of the variant of the machine but the invention alternatively provides, that they are transverse.

[0067] The inserting device 102, 103 of the main embodiment and of the variant it is not limited to insert the pallet under the load but also forms it starting from its three distinct elements placing them in the correct position and orientation under the base of the load.

[0068] The machine is provided with control and operation means, of programmable digital type with inputs connected to sensors and to detectors of the various conditions and positions of the load machine, of the support means, of the coils, etc. and having outputs for the operative control of the various motors, actuators, and operation means of the machine itself for its semi-automatic or completely automatic operation.

[0069] The operation of the machine provides that a load C placed or set up on the inlet conveyor means 14 is before and optionally wrapped with packaging film in horizontal coils from the optional wrapping arm device 15 and it is wrapped in vertical coils from the wrapping means 3 of the wrapping device 100. In the preferred case of horizontal and vertical wrappings, all the six faces of the load are covered by the film. Downstream of the wrapping device 100 the inserting device of the main embodiment of the machine 102 or in its variant 103, inserts the three flexible elements of the multiple pallet under the base of the load C making the palletized package P. Downstream of that inserting device 102, 103 the wrapping means 17 of the film rolling device 101 wraps the load C and the respective support means S in film coils passing between the transverse foot of the support means S firmly fixing the latter S to the load C consolidating, in this way, the palletized package P which comes out from the car to go to its destination.

[0070] An advantage of the present invention is to pro-

vide a machine for producing palletized package, in semiautomatic or automatic manner, complete with a load fully wrapped and with a support means consists of a pallet, of single or multiple elements type, fixed to the load itself.

[0071] Other advantage is to provide a machine relatively not much cumbersome and inexpensive.

[0072] Further advantage is to provide a machine which allows to use pallets of multiple type or rather made with separate elements that form the pallet when they are fixed to the load and pallet in a single body or already assembled.

[0073] Other advantage is to provide a machine which allows to use rigid or flexible pallet.

Claims

1. Machine for carrying out palletized packages (P) each comprising a load (C) supported by support means (S); said machine (1) being **characterized in that** it comprises at least a wrapping device (100), a film rolling device (101) downstream the wrapping device (100) and, interposed between them (100, 101), an inserting device (102, 103) assigned to insert a support means below a load (C); the wrapping device (100) comprises a first wrapping means (3) for wrapping a load (C) in almost vertical packaging film coils (B) and it comprises at least a horizontal first ring conveyor means (7) and assigned to support and to move through the first wrapping means (3) and along a forward direction, the load (C); such first ring conveyor means (7) has a fixed end (8) upstream the first wrapping means (3) end a mobile end (9) translating through the first wrapping means (3); the inserting device (102, 103) comprises a transfer conveyor means (13) receiving from the first ring conveyor means (7) the wrapped load (C) and transferring the latter (C) onto respective transport means (27, 33) transporting and inserting a support means (S) below said load (C) carrying out a palletized package (P); the film rolling device (101) comprises a respective second wrapping means (17) similar to the first wrapping means (3) and a forward conveyor means (21) receiving the palletized package (P) from the inserting device (102, 103) and sited close and upstream of the active zone of the second wrapping means (17); said film rolling device (101) further comprises a translating conveyor means (24) sited downstream the forward conveyor means (21) and receiving from the latter (21) the palletized package (P), said translating conveyor means (24) is connected to shift means moving it (24) between an adjacent condition where the translating conveyor means (24) is close to the forward conveyor means (21) and a spaced apart condition where said translating conveyor means (24) is spaced from the forward conveyor means (21).

2. Machine according to claim 1 **characterized in that** the wrapping device (100) comprises at least two first ring conveyor means (7), side by side placed, mutually parallel and spaced, coplanar each with the other, and synchronously operated and it (100) comprises at least a median ring conveyor means (11) interposed between, and coplanar with the two first ring conveyor means (7) and assigned to translate and to support the load (C) synchronously with said first ring conveyor means (7); said median ring conveyor means (11) has an end almost aligned with the fixed ends (8) of the first ring conveyor means (7) and the opposed end approximately aligned to the mobile ends (9) of the first ring conveyor means (7) in their respective conditions of minimum extension.

3. Machine according to claim 1 or 2 **characterized in that** the wrapping device (100) comprises a plate means (12) interposed between two first ring conveyor means (7) and coplanar with the latter (7) and assigned to slidably support the load (C); said plate means (12) has an end approximately aligned to the mobile ends (9) of the first ring conveyor means (7) in their (9) conditions of minimum extension and has the opposed end approximately aligned or slightly protruding outward the mobile ends (9) of the first ring conveyor means (7) in their (9) conditions of maximum extension.

4. Machine according to claim 2 or 3 **characterized in that** each first ring conveyor means (7) is of belt kind engaged to a transversal and fixed axis roller sited at the fixed end (8) and it (7) is further engaged to a transversal axis roller translating in the forward direction and in the opposite direction and sited at the mobile end (9) at the same height of the fixed roller, and engaged to a set of fixed and/or mobile transversal rollers sited below in respect to the upper portion of the first ring conveyor means (7) and assigned to keep constant the tension of the belt during the lengthening and shortening of the respective first ring conveyor means (7).

5. Machine according to any of the preceding claims **characterized in that** the maximum distance between a rear end (26) of the translating conveyor means (24) of the film rolling device (101) and a front end (23) of the forward conveyor means (21) of said film rolling device (101) is approximately equal or bigger than the wideness of the packaging film of the roll (BB).

6. Machine according to any of the preceding claims **characterized in that** the inserting device (102) for support means (S) for packages comprises a motorized inclined plane transport means (27) that, in an operative condition of the machine (1), is sited below

the translation geometrical plane of the transfer conveyor means (13) and it is assigned to move at least a support means (S) in a respective inserting direction that converges toward said forward direction; said inclined plane transport means (27) has a front end (28) higher than the corresponding rear end (29), were the minimum distance between the fore end (30) of the transfer conveyor means (13) and the inclined plane transport means (27) is equal or longer of the thickness of the support means (S); the front end (28) of the inclined plane transport means (27) is adjacent or almost in contact with and at the same height of a back end (31) of the forward conveyor means (21).

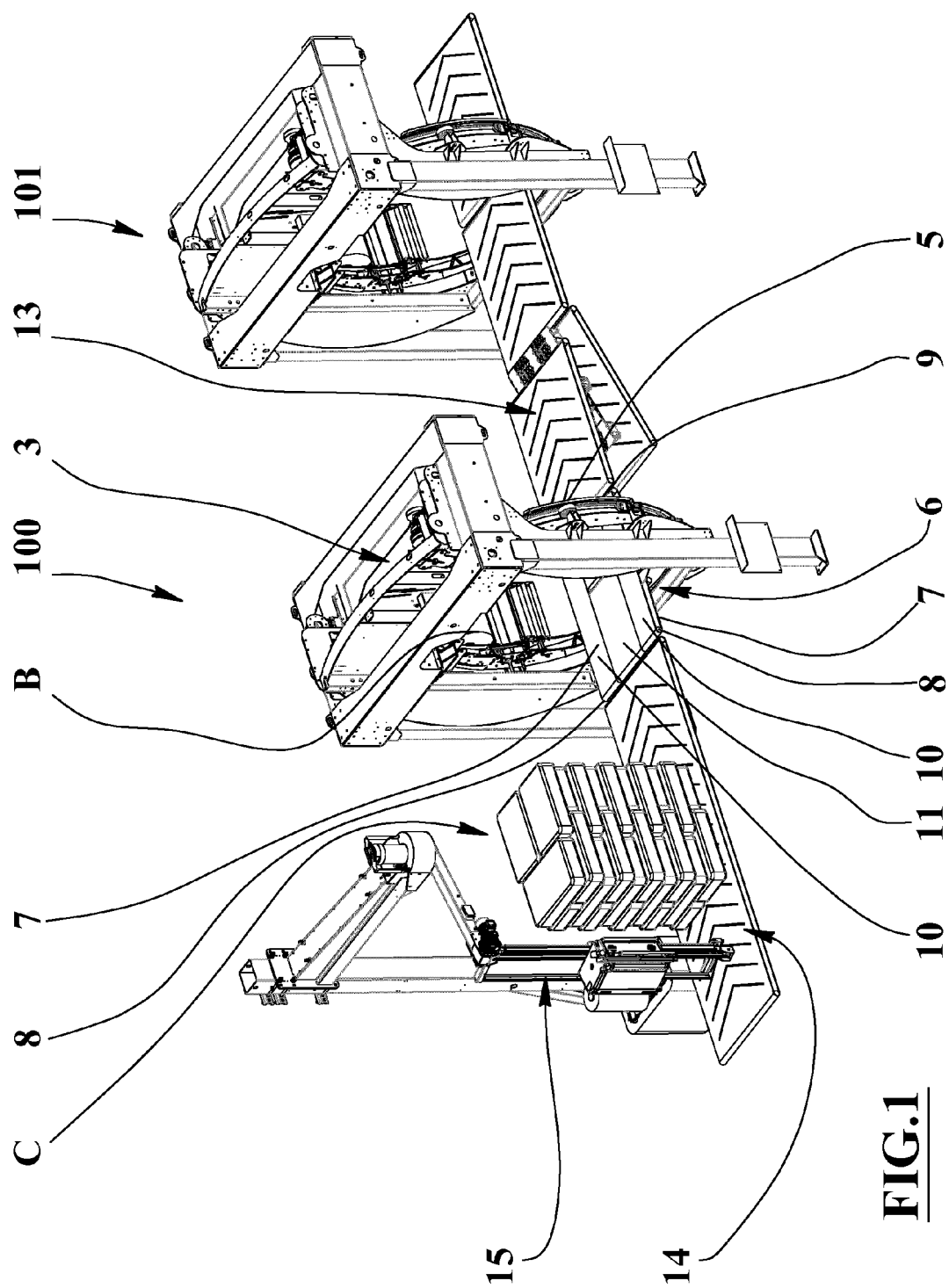
7. Machine according to claim 5 **characterized in that** the height of the front end (28) of the inclined plane transport means (27) is of the fore end (30) of the transfer conveyor means (13) of an amount equal or slightly bigger than the thickness of the support means (S).

8. Machine according to claim 5 or 6 **characterized in that** the transfer conveyor means (13) and the forward conveyor means (21) are horizontal and parallel and the inclined plane transport means (27) forms with a horizontal plane, an angle ranging from 0° to 50°; the geometrical straight line formed at the intersection of the planes of the transfer conveyor means (13) and of the inclined plane transport means (27) is perpendicular to said forward and inserting directions; the front end (28) of the inclined plane transport means (27) is sited in front of the fore end (30) of the transfer conveyor means (13) in respect to said forward direction.

9. Machine according to any of claims 1-5 **characterized in that** the inserting device (103) for the support means (S) for packages comprises downstream the transfer conveyor means (13) a plurality of motorized horizontal and vertical movement transport means (33) each coplanar, parallel and spaced apart to the other and it (103) comprises a plurality of horizontal translation means (34) each parallel and spaced apart to the other and coplanar or almost coplanar with the transfer conveyor means (13) and sited close and upstream of the forward conveyor means (21); the horizontal and vertical movement transport means (33) are associated with vertical actuator means translating the latter (33) between an upper condition, in which they (33) are coplanar with the transfer conveyor means (13) and they are interposed between and side by side to the horizontal translation means (34) and they are operable for transport in the forward direction at least the load (C) said means (33, 34) receive said load (C) from the transfer conveyor means (13), and a lower condition in which they (33) are below the horizontal translation

means (34) and are coplanar and aligned to feeding conveyor means (35) assigned, in said condition, to feed the respective support means (S) to the horizontal and vertical movement transport means (33).

10. Machine according to claim 9 **characterized in that** the horizontal and vertical movement transport means (33) are in number of three, one for each element of the support means (S) of multiple kind and the horizontal translation means (34) are in number of two and, in the upper condition, they are interposed between the horizontal and vertical movement transport means (33).



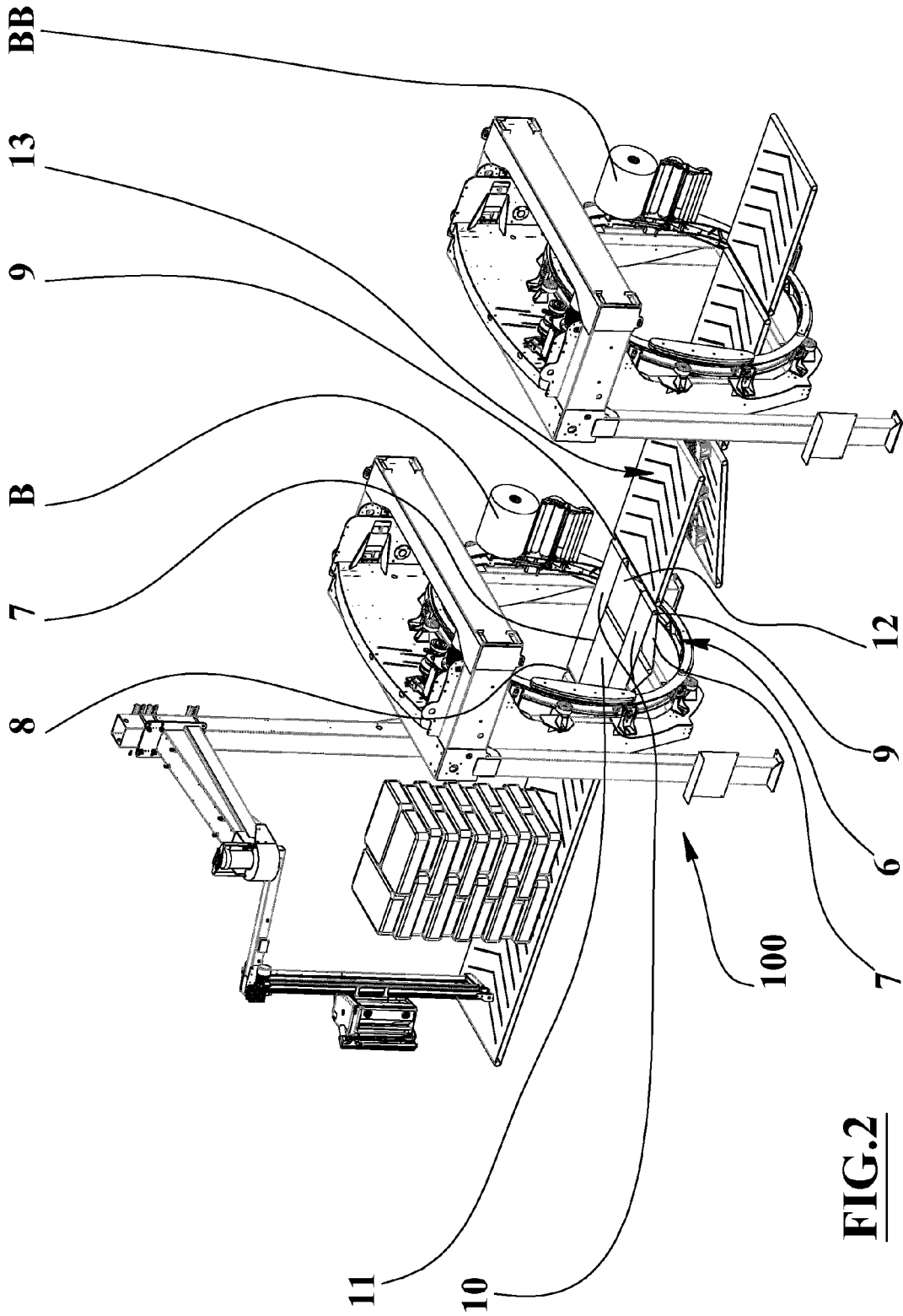
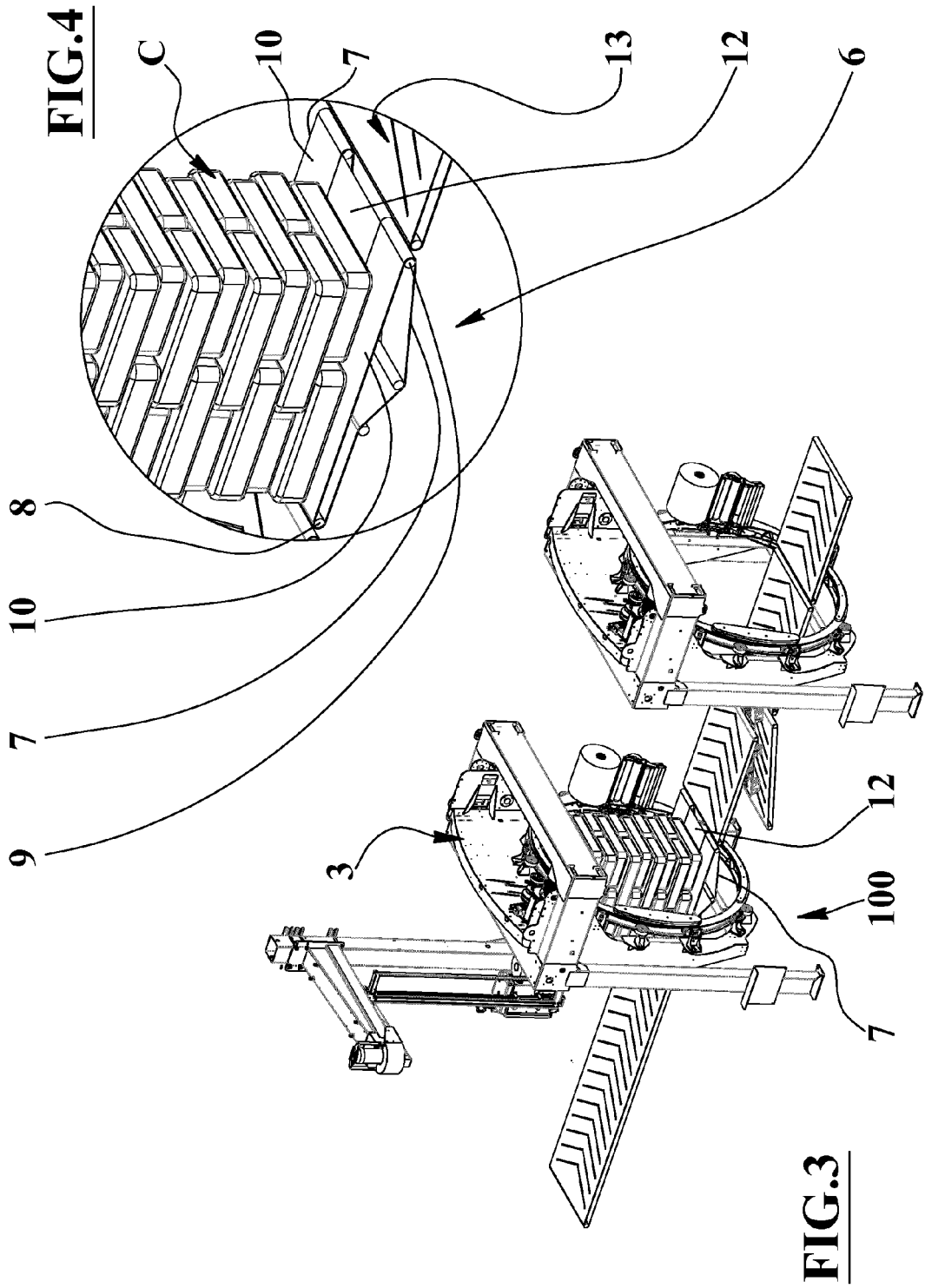
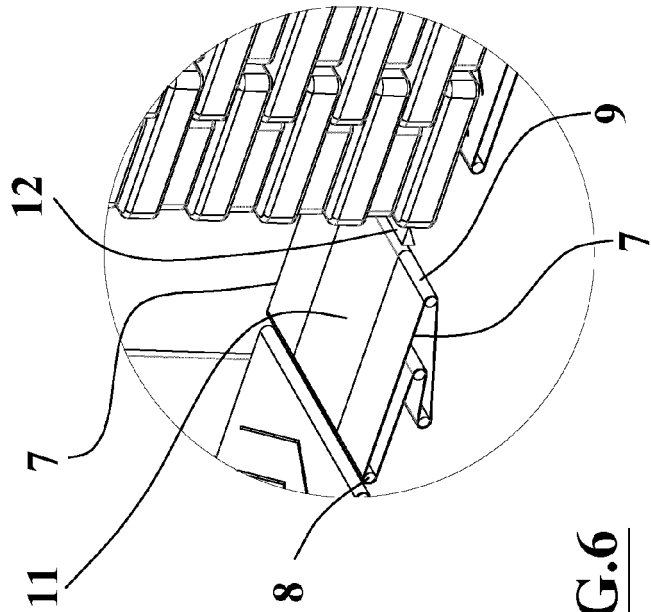
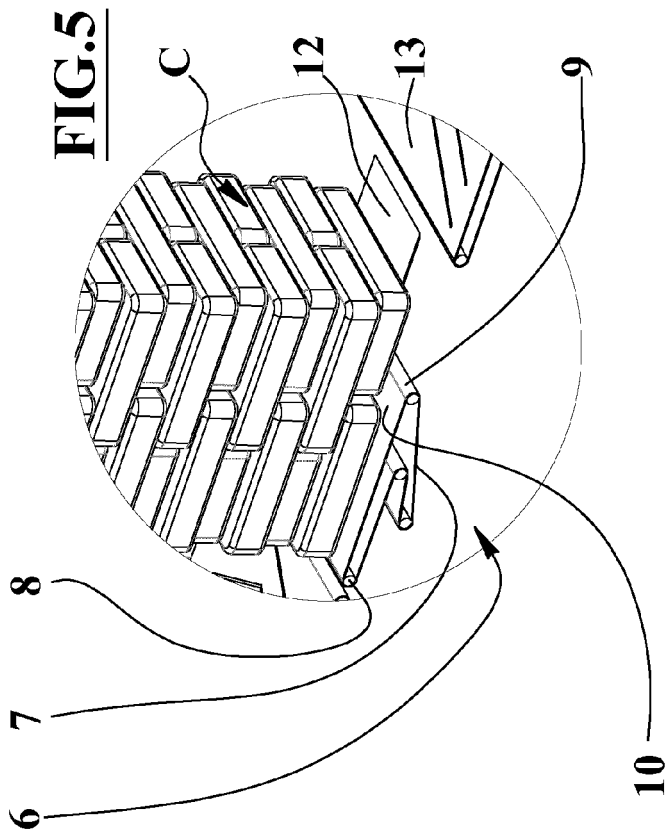


FIG.2





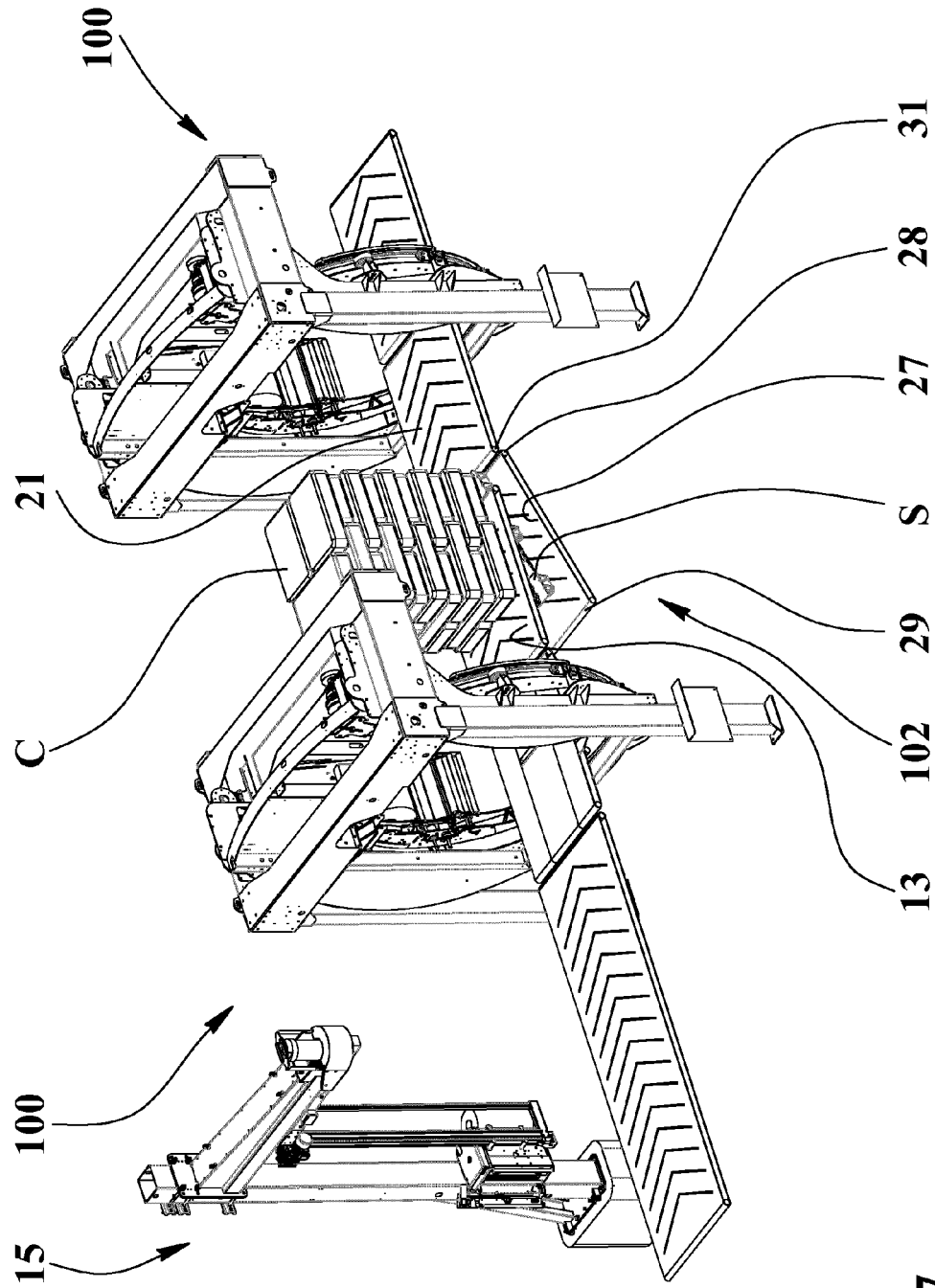
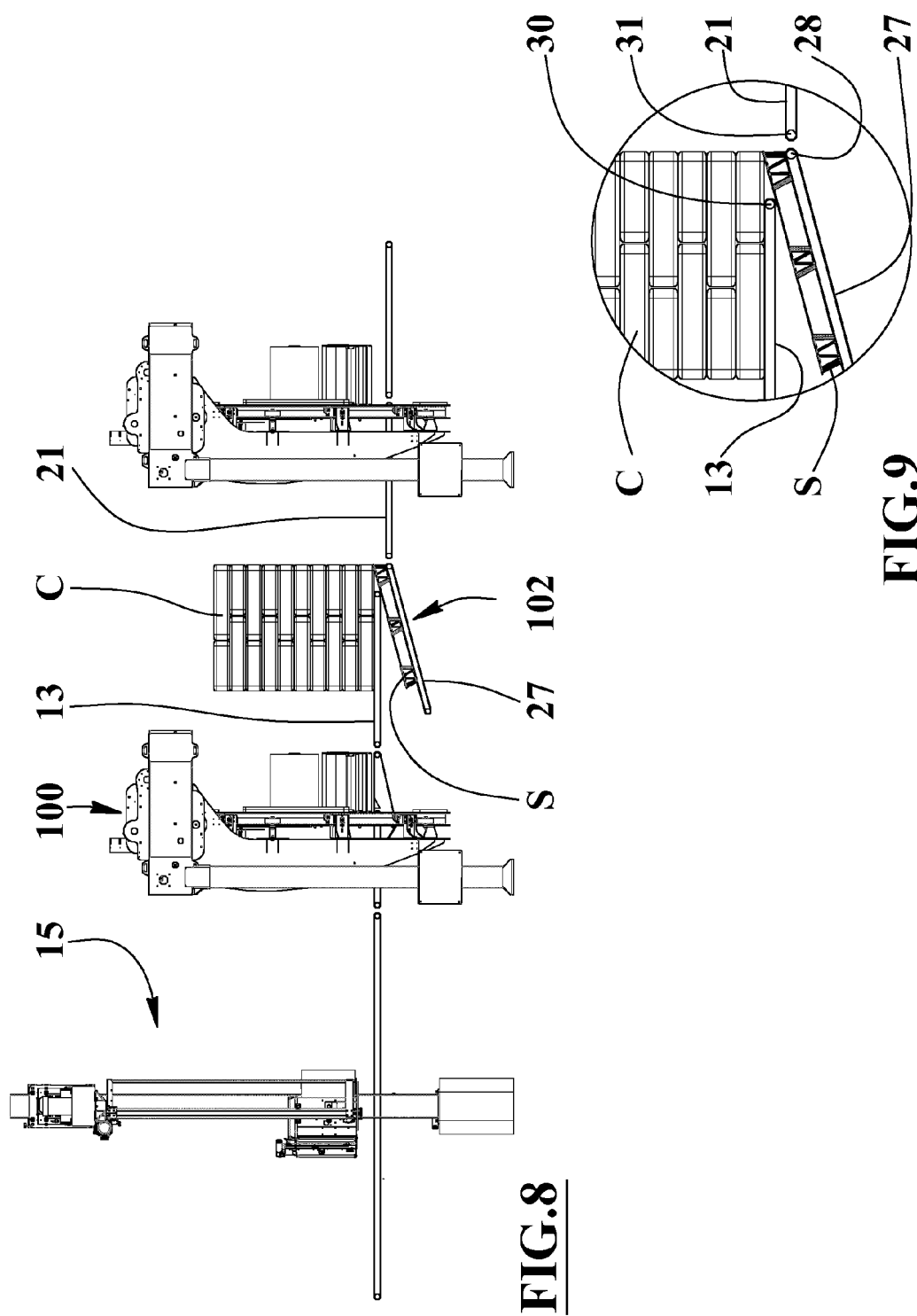
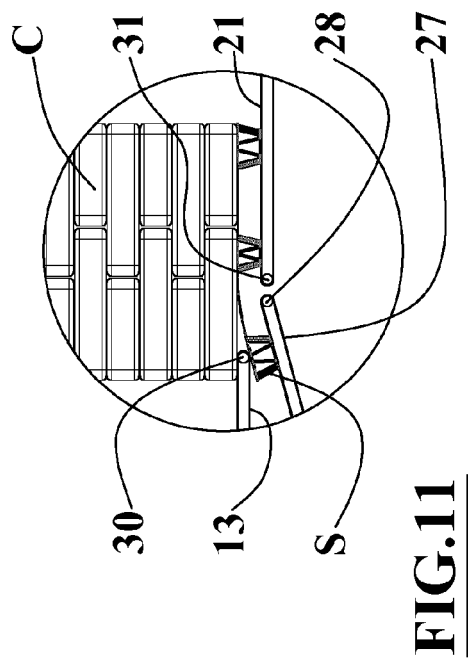
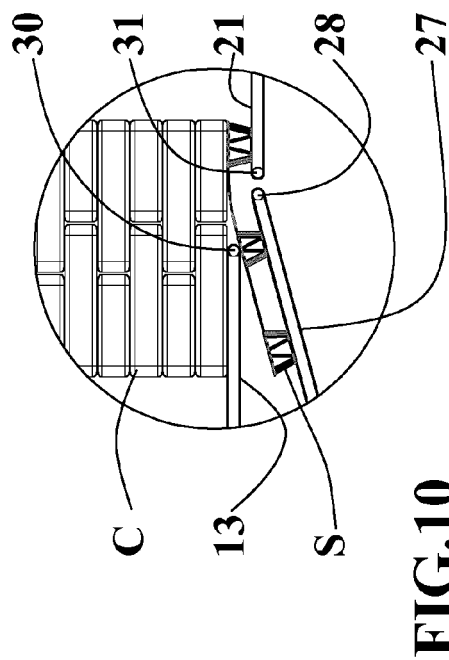


FIG. 7





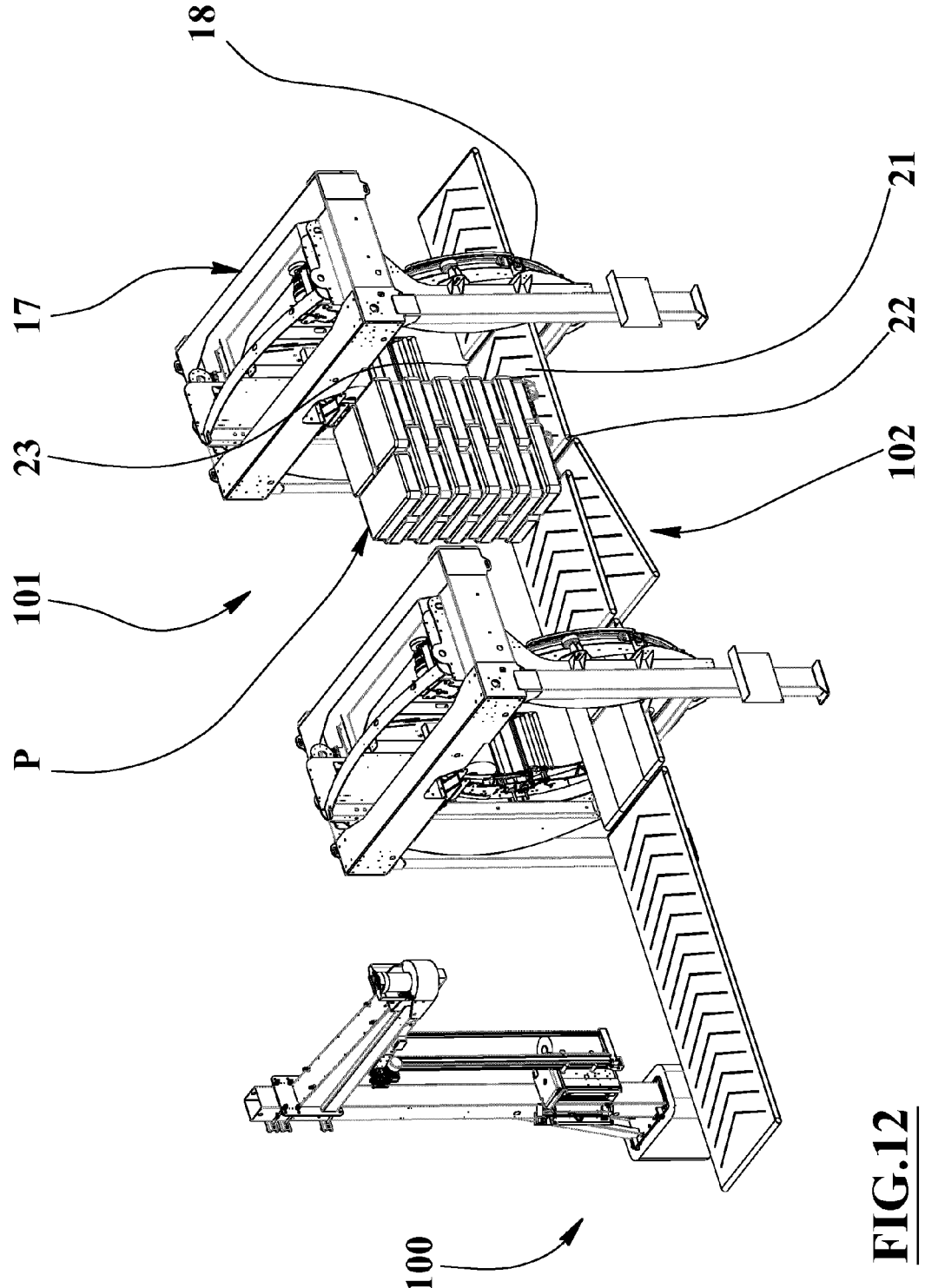


FIG.12

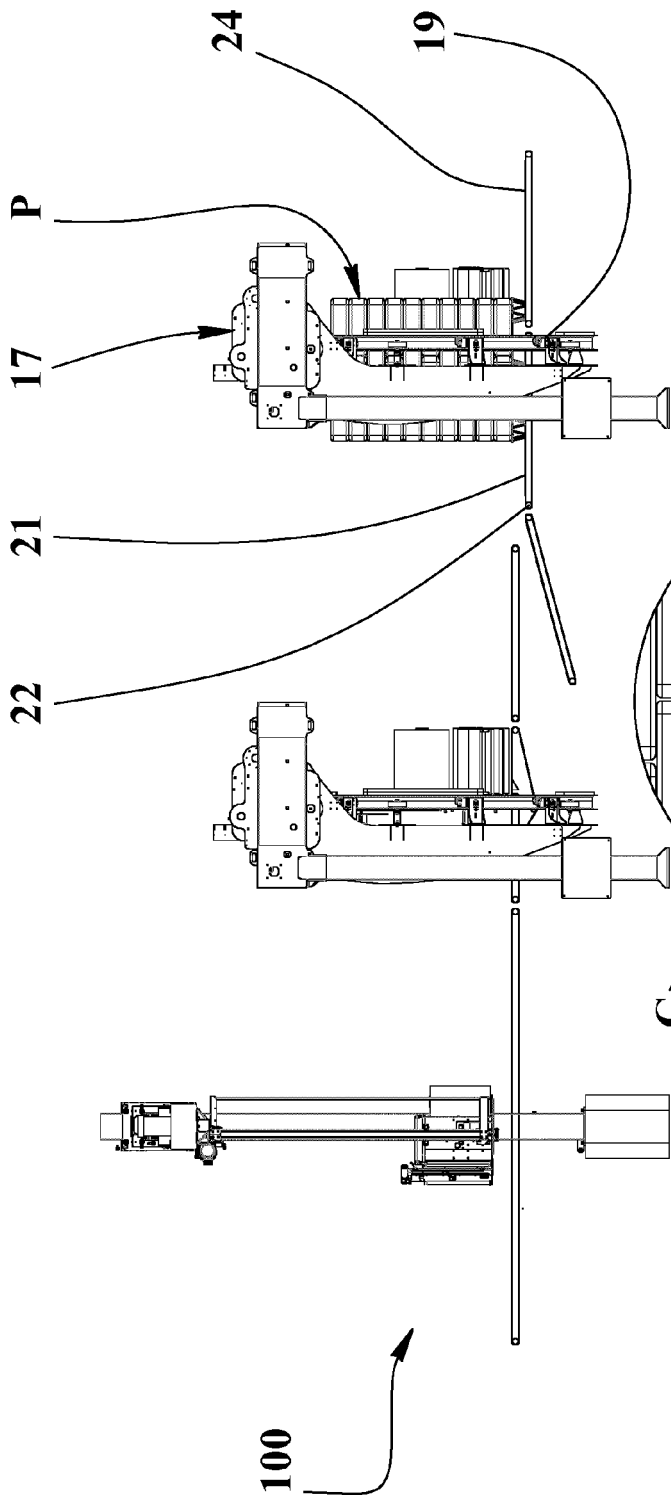


FIG. 13

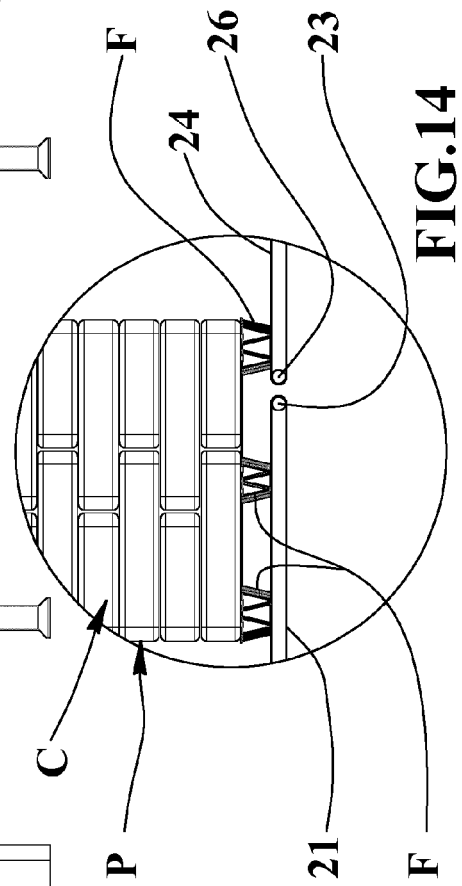
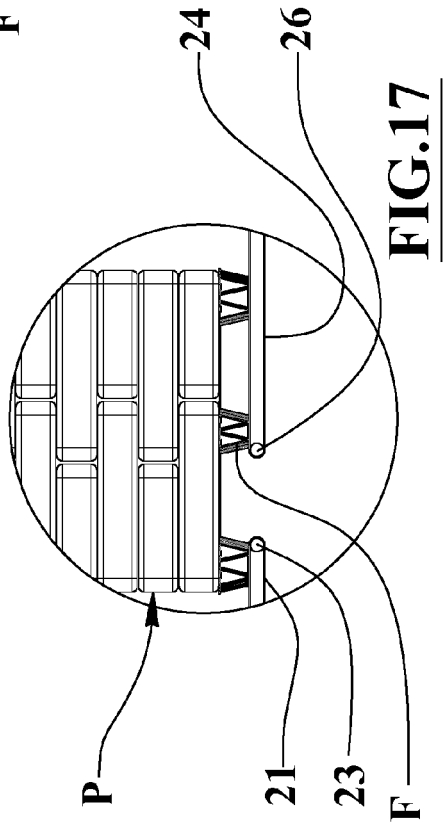
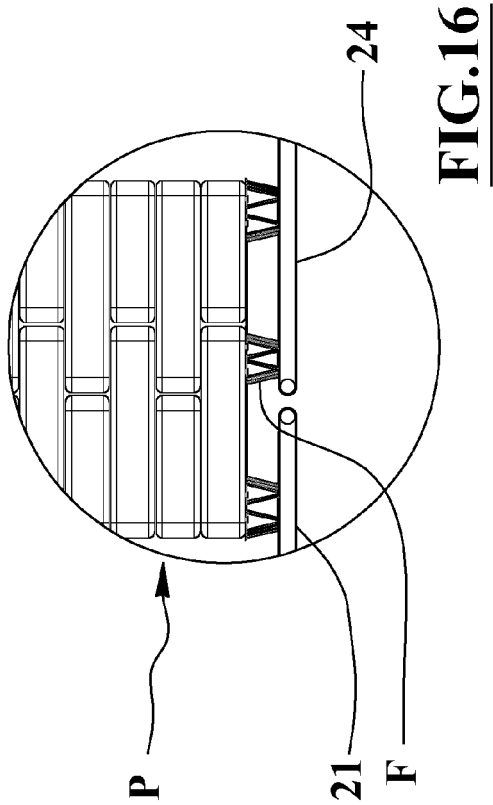
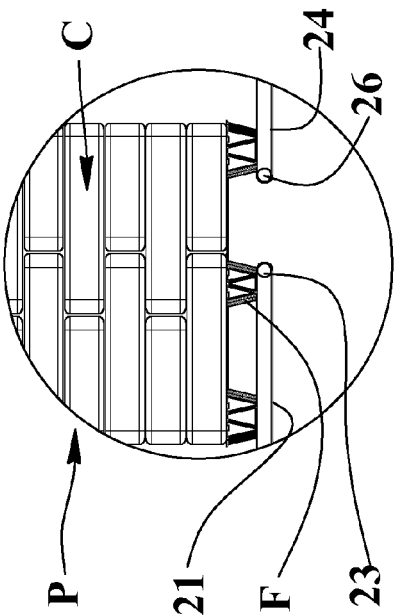


FIG. 14



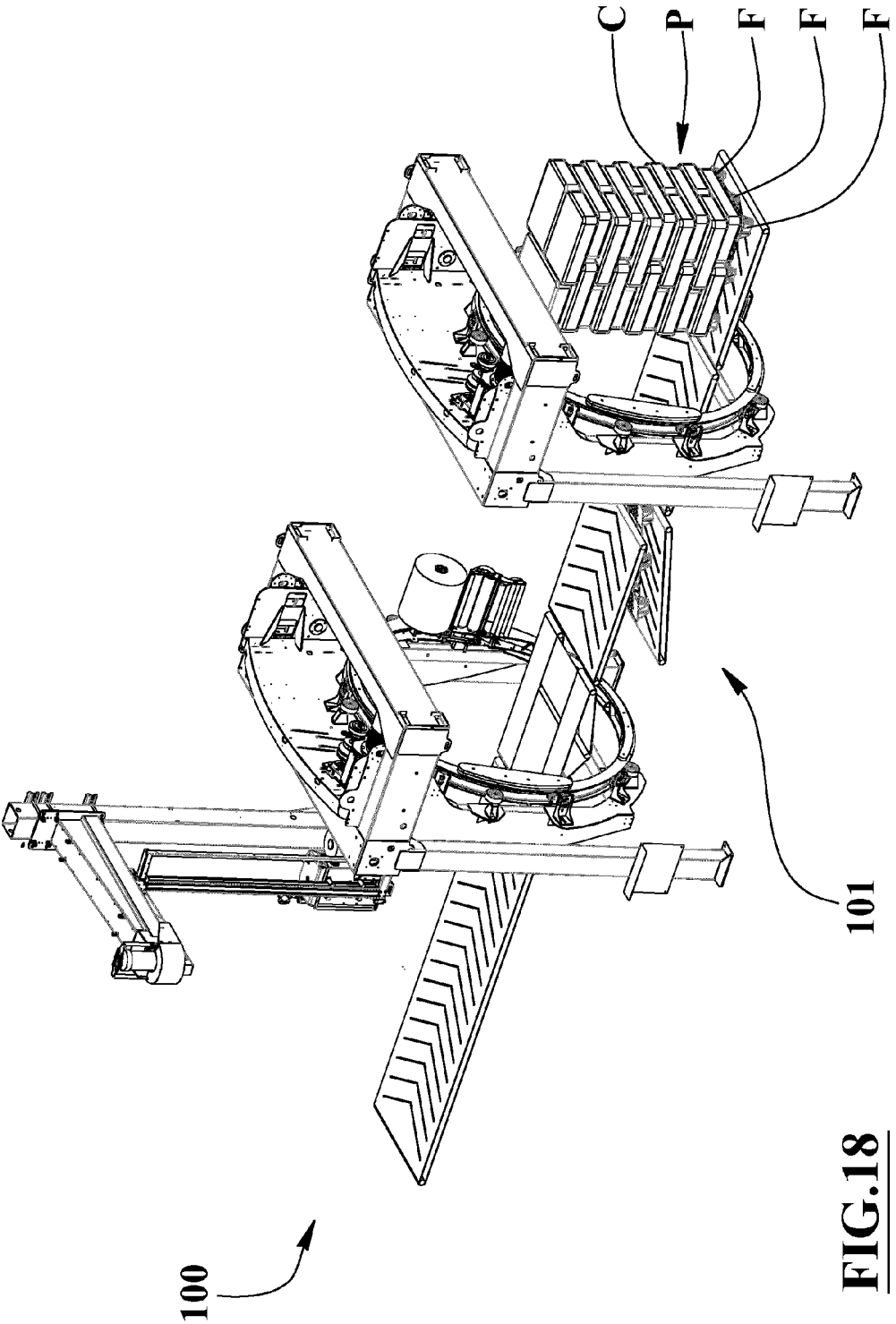


FIG.18

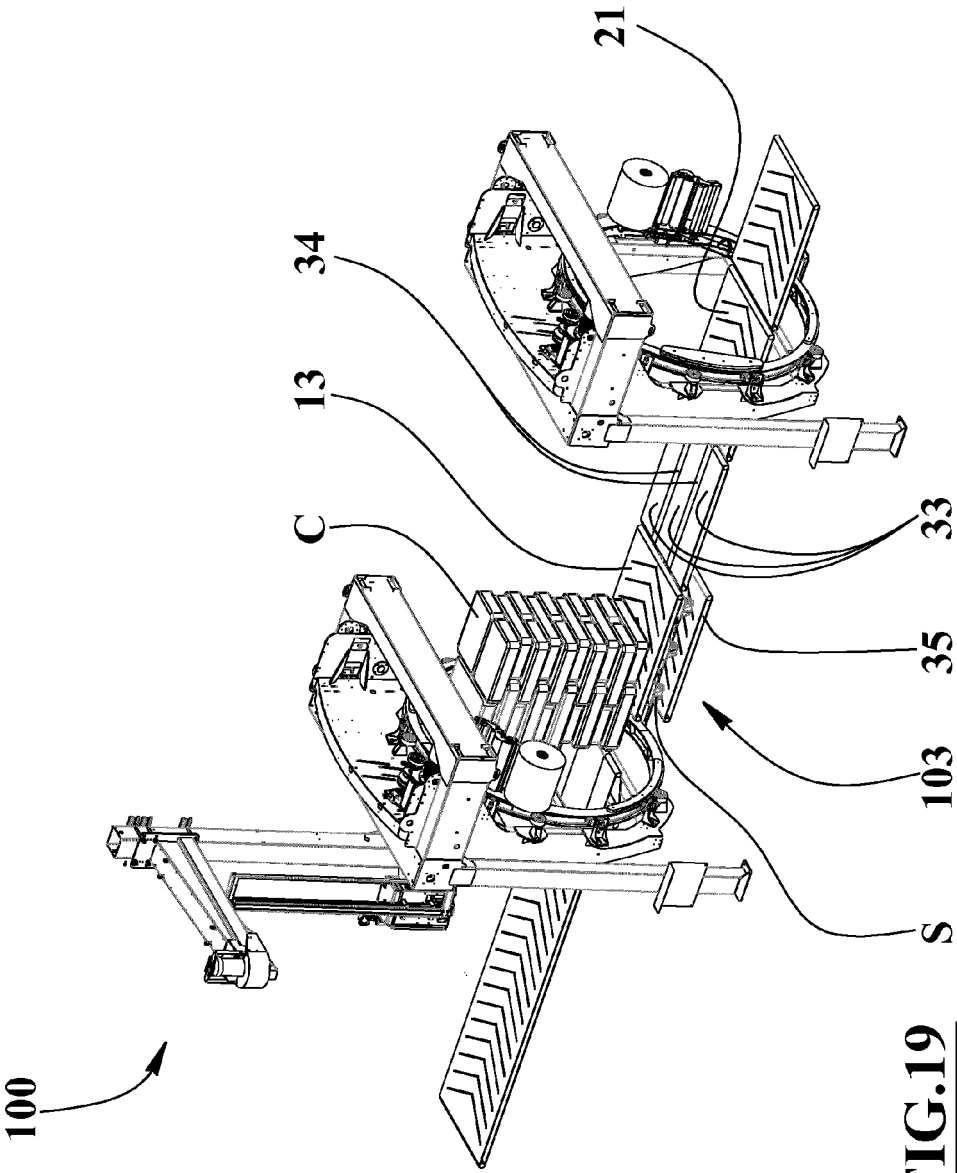


FIG.19

FIG.21

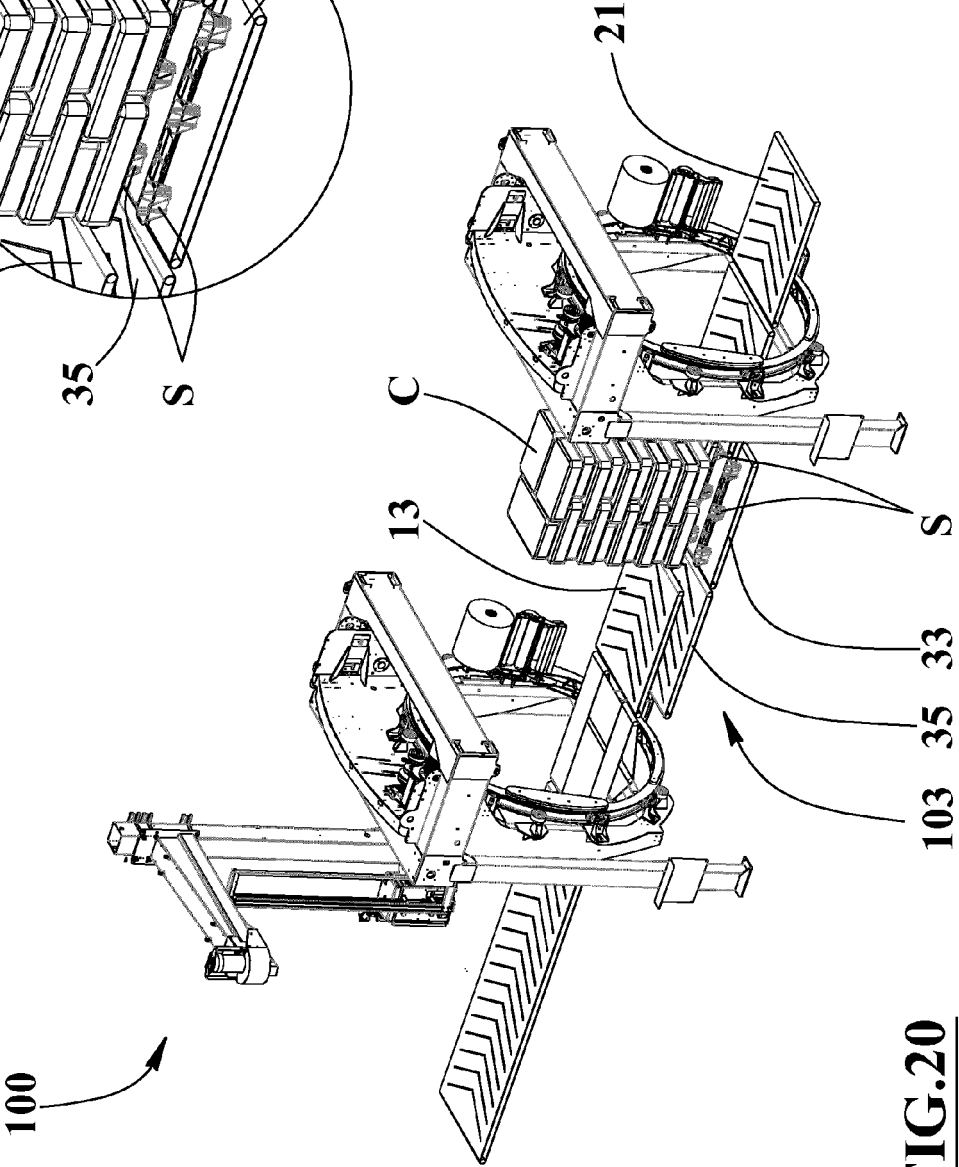
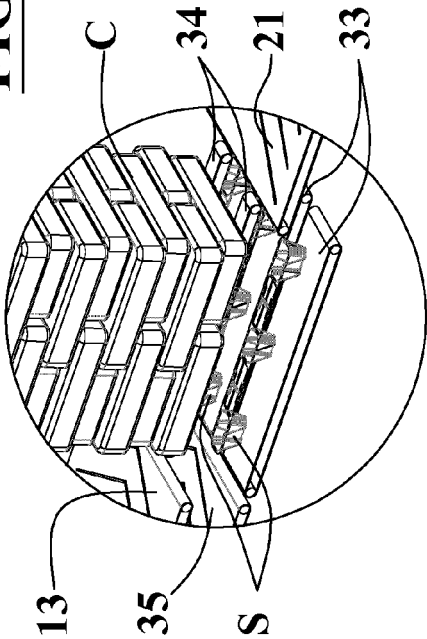
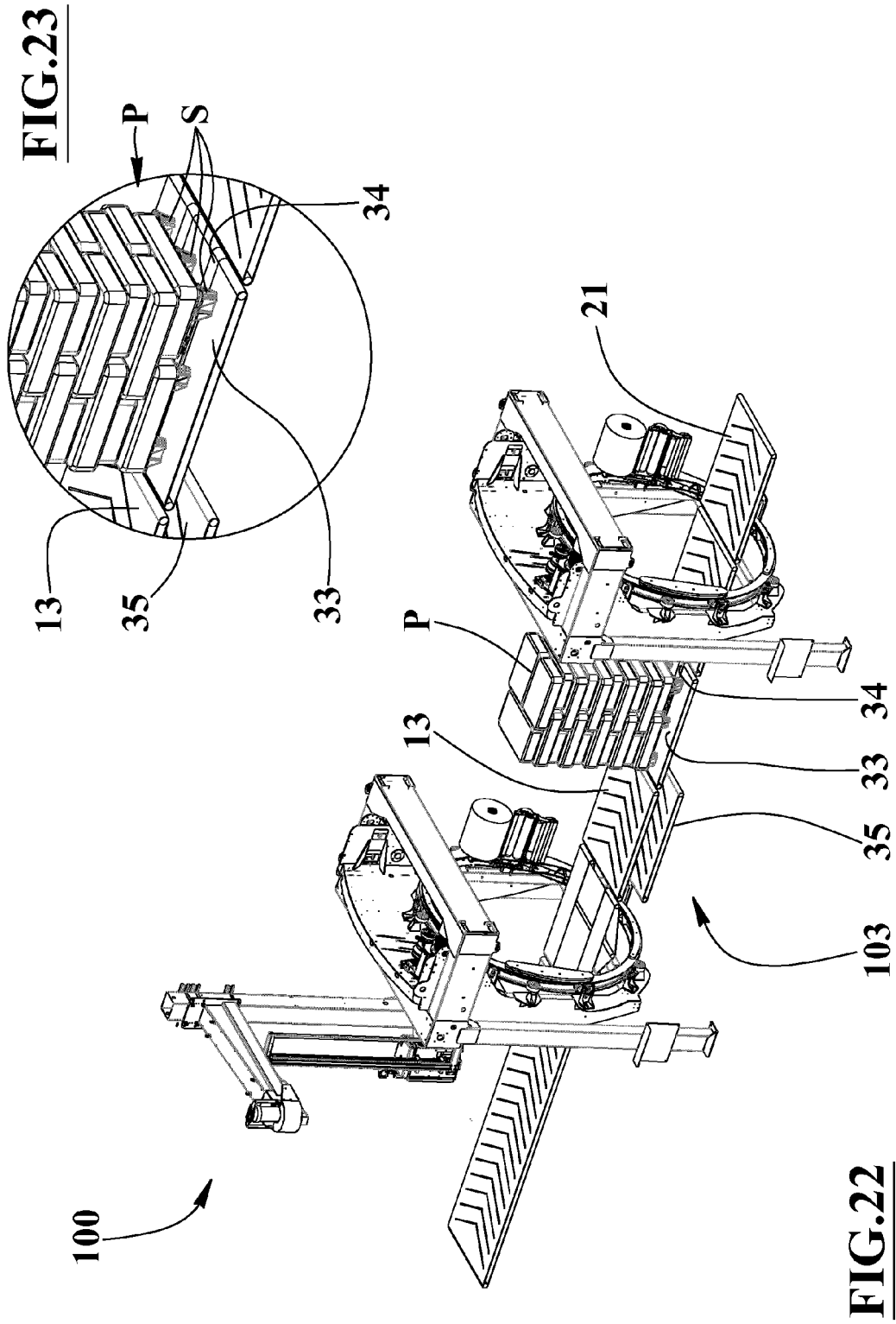


FIG.20





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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 28 May 2015	Examiner Kulhanek, Peter
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