(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 607 332 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
21.12.2005 Bulletin 2005/51

(51) Int Cl.[7]: **B65B 43/14**, B65G 69/00, B65D 25/38

(21) Application number: **05012935.2**

(22) Date of filing: **16.06.2005**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR LV MK YU

(30) Priority: **17.06.2004 JP 2004180203**

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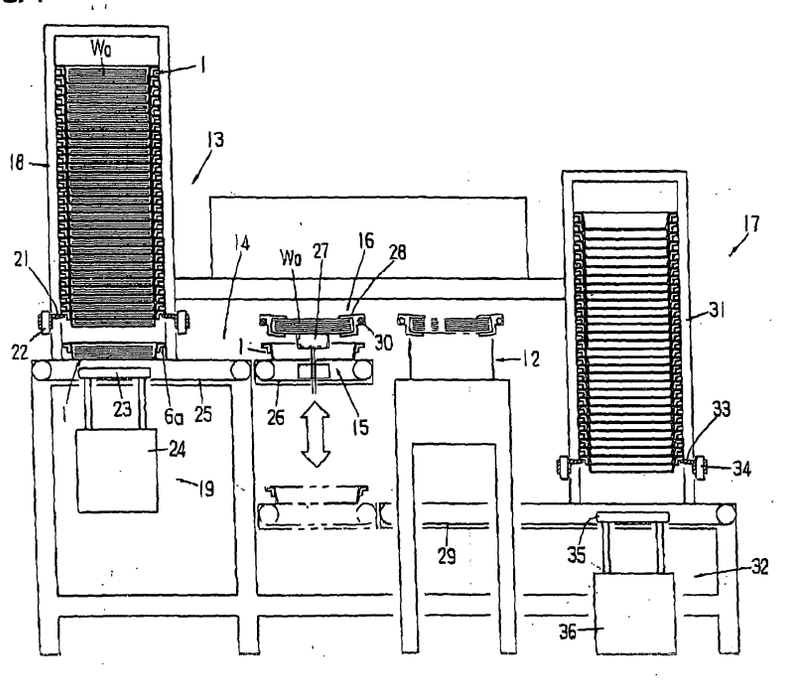
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(54) Empty-bag group accommodation tray, tray transporting container, empty-bag group conveying and supplying method and system

(57) An empty-bag group supply system in which at a bag maker, a plurality of empty bags (W) are placed in a stacked state in which these bags are shifted in the direction of length of a bag in a bag accommodation tray (1) whose width is substantially the same as the width of the empty bags and whose length is sufficiently longer than the length of the empty bags, and this bag accommodation tray (1) is sent to a package maker; and at the package maker, the stacked empty bags are removed from the bag accommodation tray (1) and placed "as is" on the conveyor (12) of a conveyor magazine type empty-bag supply apparatus. The bag accommodation tray (1) is formed with a rectangular hole (4) in the bottom plate (2); and upon taking out the empty-bags (W), an extraction member is raised from below via the hole (4) and lifts the empty bags (W) from the bag accommodation tray (1).

FIG. 4



EP 1 607 332 A1

Description

BACKGROUND OF THE INVENTION

1. Technical Field

[0001] The present invention relates to an empty-bag group accommodation tray that can be conveniently used in cases where empty bags manufactured by a bag maker, especially chuck-equipped bags or self-standing bags, are transported to a package maker, and supplied to the conveyor magazine type empty-bag supply apparatus of a bag-filling packaging machine, and to a tray transporting container which is suitable for accommodating a plurality of the empty-bag group accommodation tray during transportation, and further to an empty-bag group conveying method, to an empty-bag group supply method and to an empty-bag group supply system that uses the empty-bag group accommodation tray.

2. Description of the Related Art

[0002] As described in the Japanese Patent No. 2982643 and in the Japanese Patent Application Laid-Open (Kokai) No. 2000-191156, conveyor magazine type empty-bag supply apparatuses are apparatuses which are devised so that empty-bag groups are placed in a stacked and overlapped state on conveying means such as a conveyor or the like, the bags located in higher position in the stack in this case are shifted a small amount in the direction of length of the bag so that these bags are positioned on the forward side, and the bags located in the foremost positions are successively extracted and supplied to a bag-filling packaging machine while being fed forward by the conveying means. Such apparatuses are in themselves universally known apparatuses.

[0003] Conventionally, empty bags manufactured by a bag maker have generally been wrapped in bundles in which a specified number of bags (e.g.,100 bags) are stacked and overlapped; and then, numerous bundles of this type are packaged in cardboard and transported to a package maker in this state. Then, at the package maker, these packages of bags are opened by hand, the bundles of empty bags are extracted one bundle at a time and carried to a conveyor magazine type bag supply apparatus, the wrappers are opened and the bags are placed on the conveyor, after which the stacking and overlapping configuration is adjusted by shifting the bags located in higher positions a small amount in the direction of length of the bag so that the bags at a higher positions located on the forward side.

[0004] Alternatively, in the method described in the Japanese Patent No. 2982643, numerous bundles that have been wrapped are packed into bag transporting container, and are shipped to the package maker in this container; and then, at the package maker, the bundles of empty bags are extracted from the transporting container and placed in a bag bundle magazine. These bundles are extracted one bundle at a time from the bag bundle magazine and are accommodated in a bag conveying tray; and the wrappers are opened during the conveying process, and the bag bundles are extracted from the tray in the vicinity of the conveyor magazine type empty-bag supply apparatus. These bundles are placed on a conveyor, and the stacked configuration is adjusted by shifting the bags a small amount in the direction of length of the bag so that the higher bags are moved forward. In this method, the process in the package maker is all performed automatically.

[0005] However, the following problems have been encountered in the above-described conventional methods:

(1) A process in which wrappers are applied to the bag bundles is required in the bag maker, and a process in which these wrappers are opened is required in the package maker. In the Japanese Patent No. 2982643, an apparatus that automatically opens the wrappers is disclosed; however, with this automation, the empty-bag supply process and overall apparatus become more complicated.

(2) In cases where empty bags are supplied to a conveyor magazine type empty-bag supply apparatus, it is necessary to adjust the stacked configuration by shifting the higher bags a small amount in the direction of length of the bag so that these bags located on the forward side. However, performing this process manually is bothersome; and if this process is performed automatically as descried in the Japanese Patent No. 2982643, a special apparatus is required.

(3) In cases where the empty bags are chuck-equipped bags or self-standing bags, since the bag mouth portions and bag bottom portions have a different thickness, it is necessary to alternate the orientation of the bags when the bag bundles are packed in cardboard. On the other hand, when the bag bundles are extracted from the cardboard packaging, it is necessary to arrange the bags in the same direction. Such an operation is apparently bothersome. Furthermore, in the Japanese Patent No. 2982643, the orientation of the bag bundles is detected after the bag bundles are accommodated in the bag conveying tray, and if the orientation of a given bag bundle is reversed, the bag conveying tray is rotated 180 degrees, and the orientation of the bag bundles is automatically adjusted. As a result, however, the empty-bag supply process and the overall apparatus become more complicated.

BRIEF SUMMARY OF THE INVENTION

[0006] The present invention is to eliminate the problems encountered in the prior art.

[0007] The object of the present invention is to simplify the process of transporting empty bags manufactured by bag makers to package makers and supplying the empty bags to a conveyor magazine type empty-bag supply apparatus. In particular, the present invention is to eliminate problems with package makers.

[0008] More specifically, the present invention is made on the basis of a concept that if, at a package maker, empty-bag groups are placed on the conveyor of a conveyor magazine type empty-bag supply apparatus in a manner that these empty-bag groups are shifted a small amount in the direction of length of a bag, then it would be advisable to employ a configuration in which the empty-bag groups are set in this state at the time that the bags are shipped out from a bag maker, these empty-bag groups are conveyed to the package maker while this state is maintained, and these empty-bag groups are placed, at the package maker, on the conveyor of a conveyor magazine type empty-bag supply apparatus while still in this state.

[0009] Thus, the above object is first accomplished by a unique structure of the present invention for an empty-bag group accommodation tray which has a box form shape and is open at a top thereof, the bottom wall has a rectangular shape and the side walls are formed around the bottom wall, so that a plurality of empty bags are accommodated inside; and in the present invention,

the bottom wall of the tray has a width which is substantially the same as the width of the empty bags and has a length which is sufficiently longer than the length of the empty bags so that a plurality of empty bags are placed therein in a manner that the bags are stacked and overlapped while being shifted a small amount in the direction of length of the bag, and

a hole through which an extraction member that contacts the group of bags from below and lifts such group of bags is passed is formed in the bottom wall along the direction of length of the bottom wall.

[0010] In this structure, the length of the bottom wall is appropriately determined by the scale of the empty-bag groups (number of the empty bags) that are to be accommodated.

[0011] Furthermore, in the above-described empty-bag group accommodation tray, flange portions that protrude in the horizontal direction can be formed on the upper ends of the side walls, the side walls can be formed so that they are inclined and spread outward in the upward direction, and step portions that regulate the mutual engagement depth in the case of vertical stacking by contacting the empty-bag group accommodation tray located above or below can be formed in the outer surface sides or inner surface sides of the side walls. In addition, the hole formed in the bottom wall can be designed so that it reaches the end portions of the bottom wall in the direction of length of the bottom wall and further extends into the side walls as well so that the hole formed in the bottom wall and the holes formed in the side walls are continuous to form an integrated hole.

[0012] The transportation of the empty-bag groups from a bag maker to a package maker is efficiently accomplished by vertically stacking a plurality of empty-bag group accommodation trays that accommodates empty-bag groups therein and by storing the stacked empty-bag group accommodation trays in the tray transporting container of the present invention.

[0013] In other words, the above-described object is further accomplished by a unique structure of the present invention for a tray transporting container, and

the tray transporting container of the present invention, which stores a plurality of empty-bag group accommodation trays, comprises a container main body, which has a box form shape that is open at a top thereof and which stores the empty-bag group accommodation trays in a vertically stacked manner, and a cover, which closes off an opening of the container main body; and

when the opening of the container main body is closed by the cover, the inner surface of the cover fits into the inner portion of the uppermost empty-bag group accommodation tray and presses the empty-bag group accommodated in the empty-bag group accommodation tray from above.

[0014] In this structure, a concrete configuration that presses the empty-bag groups from above is, for example, an elastic member that is attached to the inner surface of the cover so that this elastic member fits into the inside of the uppermost empty-bag group accommodation tray. This elastic member presses the empty-bag groups from above, so that disturbance of the stacked state of the empty-bag groups inside the uppermost empty-bag group accommodation tray is prevented during transportation.

[0015] Furthermore, the side walls of the empty-bag group accommodation tray can be designed so that they are inclined to open outward in the upward direction. In this structure, the trays at a higher position in the stack fit into the insides of the lower trays when the trays are stacked, and the bottom walls of the trays at a higher position press against the tops of the empty-bag groups inside the lower trays, so that the disturbance of the stacked state of the empty-bag groups is prevented during transportation. Furthermore, step portions that regulate the mutual engagement depth by contacting the higher or lower empty-bag group accommodation trays when the trays are stacked can be formed on the outer surface sides or inner surface sides of the side walls. With the structure, a horizontal orientation is maintained and the height can be fixed when a plurality of trays are stacked. Moreover, no excessive load is applied to the empty-bag groups accommodated inside the lower trays.

[0016] When empty bags are extracted from the empty-bag group accommodation trays in the package maker, an extraction member is caused to protrude upward from beneath an empty-bag group accommodation tray positioned in a specified position, through a hole formed in the bottom wall of this empty-bag group accommoda-

tion tray; as a result, the empty-bag group is raised from the empty-bag group accommodation tray while remaining in the stacked state; then, the empty-bag group is held by an appropriate holding means so that the stacked state is not disturbed. The empty-bag group thus held is fed onto a conveyor magazine type empty-bag supply apparatus and placed on the conveyor with the stacked state maintained.

[0017] Furthermore, the above object is accomplished by a unique structure of the present invention for an empty-bag group supply system that supplies empty-bag groups to a conveyor magazine type empty-bag supply apparatus of a bag-filling packaging machine using the above-described empty-bag group accommodation tray, and in the present invention, the empty-bag group supply system employs:

a fall-tray supply apparatus that includes a full-tray stocking means for accumulating a plurality of the empty-bag group accommodation trays in which a plurality of empty bags are accommodated so that the bags are stacked and overlapped white being shifted a small amount in a direction of length of a bag, and an extraction means for extracting the empty-bag group accommodation trays one at a time from the full-tray stocking means;

an empty-bag group extraction apparatus that is provided with an extraction member that can be raised and lowered and causes the extraction member to protrude upward through a hole formed in the bottom wall from beneath the empty-bag group accommodation tray positioned in a specified position, thereby causing the empty-bag group inside the empty-bag group accommodation tray to be raised from the empty-bag group accommodation tray while being maintained "as is" in the stacked and overlapped state;

an empty-bag group supply apparatus that includes a holding means for holding the raised empty-bag group and supplies the empty-bag group held by the holding means to the conveyor magazine type empty-bag supply apparatus of a bag filling packaging machine; and

an empty-tray collection apparatus that conveys out empty-bag group accommodation trays that have become empty.

[0018] In the above description, the term "full tray" refers to a tray that accommodates an empty-bag group, and the term "empty tray" refers to a tray from which the empty-bag group has been extracted.

[0019] In the full-tray supply apparatus of the above-described empty-bag group supply system, the full-tray stocking means comprises, for example, a stacking type stocker which stocks a plurality of empty-bag group accommodation trays in a vertically stacked manner and has an anchoring means that can support the lowermost tray by anchoring this tray and can release this lowermost tray. The extraction means that are combined with this stacking type stocker comprises a lifting means which supports and raises and lowers the lowermost tray among the plurality of empty-bag group accommodation trays stocked in the stacking type stocker, and the system is devised so that the successive lowermost trays are successively extracted from the stacking type stocker one at a time by the anchoring means and lifting means.

[0020] In the above structure, a stacking type stocker can be used; and in this case, anchoring portions that are engaged by the anchoring means (anchoring claws) are required on the outer peripheral side of the empty-bag group accommodation tray. Step portions that regulate the mutual engagement depth can be installed on the empty-bag group accommodation tray; and in this case, it is necessary to position the anchoring portions above the step portions.

[0021] The above-described full-tray stocking means can comprise a conveyor type stocker that can accumulate a plurality of sets of stacked empty-bag group accommodation trays (with each of these sets containing a plurality of vertically stacked empty-bag group accommodation trays) along the conveying direction. In this case, the sets of empty-bag group accommodation trays accumulated in the conveyor type stocker are fed into the stacking type stocker one set at a time.

[0022] In the empty-bag group extraction apparatus of the above-described empty-bag group supply system, it is preferable that the extraction member be able to suction-chuck the undersurface of the empty-bag group inside the empty-bag group accommodation tray. With this structure, disturbance of the stacked state of the empty-bag groups that are placed on the extraction member and lifted from the empty-bag group accommodation tray can be prevented. In cases where the undersurfaces of the empty-bag groups are suction-chucked by the extraction member, it is preferable that the undersurfaces of the empty-bag groups be suction-chucked over as broad a range as possible in the direction of length of the empty-bag groups, especially on the front side of the empty-bag groups (the side which is placed on the front side of the conveyor of the conveyor magazine type empty-bag supply apparatus, i.e., the side on which the higher bags are positioned). Accordingly, on the front side of the empty-bag groups, it is preferable that the hole formed in the bottom wall of the empty-bag group accommodation tray reach the end portion of the bottom wall in the direction of length of the bottom wall. If necessary, furthermore, holes can be formed in an integrated manner in the side walls, so that the extraction member passes through these holes when raised. Furthermore, a stopper which prevents positional deviation by anchoring the front end of the empty-bag group (end portion of the uppermost bag) can be provided on the upper surface of the end portion of the extraction member.

[0023] In addition, in the empty-bag group supply ap-

paratus of the above-described empty-bag group supply system, the holding means is comprised of a pair of holding members, which hold the empty-bag group from both sides, and a moving means, which moves the holding members. It is preferable that the holding members hold the empty-bag group and bend the empty-bag group along the direction of width of the bags. By thus bending the empty-bag group along the direction of width of the bags, the empty-bag group may have firmness, and the stability during conveying increases.

[0024] As seen from the above, according to the present invention, since empty-bag groups are accommodated inside an empty-bag group accommodation tray in a stacked state and are transported in this tray, there is no need for a process that applies a wrapper or a process that opens this wrapper. Furthermore, when the empty-bag groups are placed on the conveyor of a conveyor magazine type empty-bag supply apparatus, there is no need for extra work or a special apparatus to adjust the stacked state. In addition, by way of arranging the orientations of the empty-bag groups in all of the trays in the same direction, the work to re-arrange the orientations of the bag bundles at a package maker becomes unnecessary. Thus, the process of transporting empty bags manufactured by a bag maker to a package maker and the process of supplying these bags to a conveyor magazine type empty-bag supply apparatus are simple, and the amount of work required in both the bag maker and package maker can be reduced.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0025]

Figure 1A is a top view of the empty-bag group accommodation tray according to the present invention, Figure 1B is a sectional view taken along the lines 1B-1B in Figure 1A, and Figure 1C is a sectional view taken along the lines 1C-1C in Figure 1A;
Figure 2 is a front view of the tray transporting container shown in cross-section;
Figure 3 is a side view thereof shown in cross-section;
Figure 4 is a structural diagram of the empty-bag group supply system according to the present invention.
Figure 5A is a top view of another type of empty-bag group accommodation tray according to the present invention, and Figure 5B is a cross sectional view taken along the lines 5B-5B in Figure 5A, showing the empty-bag group accommodation tray and extraction member; and
Figure 6 is a structural diagram of another type of empty-bag group supply system according to the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0026] The present invention will be described in concrete terms with reference to Figures 1A through 6 below.

[0027] Figures 1A through 1C show the empty-bag group accommodation tray 1 of the present invention in which an empty-bag group W0 is accommodated. The empty-bag group accommodation tray 1 has a box form shape and is open at the top. The bottom wall 2 of the empty-bag group accommodation tray 1 is rectangular, and side walls 3 thereof are formed around this bottom wall. The overall body of the tray 1 is, for example, an integrated plastic molding.

[0028] The bottom wall 2 has substantially the same width as the width of empty bags W (the "width" of a bag is a direction parallel to the mouth of the bag), and it has a length that is sufficiently longer than the length of the empty bags W (the "length" of a bag is a direction perpendicular to the mouth (opening) of the bag) so that the empty-bag group W0 (an empty-bag group in which a plurality of empty bags W are placed in a stacked state in which these bags are shifted a small amount in the direction of length of the bag) can be carried (in the shown example, this length is approximately three times the length of the empty bags W). A rectangular hole 4 with a length that extends over substantially the entire length of the bottom wall 2 in the direction of length of the bottom wall 2 is formed in the central portion of the bottom wall 2.

[0029] The side walls 3 are inclined so that these side walls open outward in the upward direction. As a result of this inclination, a relationship is obtained in which the trays at a higher position in the stack are inserted into the lower trays when the empty-bag group accommodation trays 1 are stacked. Flange portions 5 which protrude in the horizontal direction are formed around the entire periphery on the upper ends of the side walls 3, and the outer peripheral edges of the flange portions 5 are bent downward to form edge flanges 5a. Projections 6 that have step portions 6a and 6b at two levels are formed in a plurality of locations on the outer peripheral sides of the side walls 3. The step portions 6a are anchoring portions which are anchored by anchoring claws 21 described later, and the vertical intervals between the step portions 6a and 6b constitute gaps that allow the insertion of these claw members 21.

[0030] Figures 2 and 3 show a state in which a plurality of empty-bag group accommodation trays 1 accommodating empty-bag groups W0 are stored by being stacked inside a tray transporting container 7.

[0031] When the empty-bag group accommodation trays 1 are stacked, the trays at a higher position in the stack fit inside the lower trays; and in this case, the lower step portions 6b contact the upper surfaces of the flange portions 5 of the lower trays, so that the depth of engagement is regulated, and so that a horizontal orientation and constant height of the respective empty-bag

group accommodation trays I are ensured at the same time. The height of the step portions 6b is set so that the bottom walls 2 of the trays at a higher position press against the tops of the empty-bag groups W0 accommodated in the lower trays (with some elastic depression of the empty-bag group W0), thus making it possible to prevent disturbance of the stacked state of the empty-bag groups W0 during transportation.

[0032] The tray transporting container 7 comprises a container main body 8, which has a box form shape that is open at the top, and a cover 9, which closes off the opening of the container main body 8. An elastic member 11 comprising a foamed synthetic resin or the like is fastened to the inner surface of the cover 9. When the opening of the container main body 8 is closed off by the cover 9, the elastic member 11 is fit into the inside of the uppermost empty-bag group accommodation tray 1, so that the empty-bag group W0 accommodated in this tray is pressed from above (with some elastic depression of the empty-bag group W0). As a result, the disturbance of the stacked state of this empty-bag group W0 during transportation is prevented.

[0033] The side plate 8a of the container main body 8 of the tray transporting container 7 is freely opened and closed, so that the plurality of stacked empty-bag group accommodation trays 1 can be put in or removed by opening this side plate 8a.

[0034] Figure 4 shows an empty-bag group supply system for supplying empty bags to the conveyor 12 of the conveyor magazine type empty-bag supply apparatus of a bag-filling packaging machine which is not shown in Figure 4, using the empty-bag group accommodation tray 1.

[0035] This empty-bag group supply system includes a full-tray supply apparatus 13, a full-tray conveying apparatus 14, an empty-bag group extraction apparatus 15, an empty-bag group supply apparatus 16, and a tray collection apparatus 17.

[0036] The full-tray supply apparatus 13 comprises a stacking type stocker 18 and a lifting device 19 which is provided beneath this stocker 18.

[0037] Anchoring claws 21 are installed in the vicinity of the lower end of the stacking type stocker 18. The anchoring claws 21 are fastened to shafts 22 that are rotatable. These anchoring claws 21 anchor the step portions 6a of the lowermost tray among the plurality of empty-bag group accommodation trays 1 stocked inside the stacking type stocker 18, so that the stacked empty-bag group accommodation trays 1 are supported. The lifting device 19 includes a tray support 23, which is raised and lowered, and a raising-and-lowering driver 24; and this lifting device 19 supports the lowermost tray, and raises and lowers this tray.

[0038] The procedure that extracts the lowermost tray from the stacking type stocker 18 is performed as follows:

(1) The tray support 23 is raised by the lifting device 19, so that the lowermost tray is supported thereon; and then this tray is pushed upward so as to be caused to float upward from the anchoring claws 21.

(2) The shafts 22 are rotated so that the anchoring claws 21 are retracted.

(3) The tray support 23 is lowered and stopped when the anchoring claws 21 are positioned between the upper and lower step portions 6a and 6b of the second tray from the lowermost position.

(4) The shafts 22 are rotated in reverse so that the anchoring claws 21 protrude inward.

(5) When the tray support 23 is lowered even further, the upper step portions 6a of the second tray from the lowermost position are anchored by the anchoring claws 21.

(6) The lowermost tray is lowered even further while being supported by the tray support 23 and placed on a first conveyor 25 (described later), and the tray support 23 is lowered even further and then stopped. This state is shown in Figure 4.

[0039] The full-tray conveying apparatus 14 comprises a first conveyor 25 and a second conveyor 26.

[0040] The first conveyor 25 is positioned in a lower position of the stacking type stocker 18, and the second conveyor 26 is disposed so that this conveyor is connected with the first conveyor 25. The second conveyor 26 can be raised and lowered. The empty-bag group accommodation tray 1 extracted from the stacking type stocker 18 is conveyed on the first conveyor 25 toward the second conveyor 26 from a position directly beneath the stacking type stocker 18; and this tray is transferred onto the second conveyor 26 and is positioned in a specified position on the second conveyor 26.

[0041] The empty-bag group extraction apparatus 15 has an extraction member 27 that is raised and lowered by means of a raising-and-lowering mechanism not shown in the figures.

[0042] The extraction member 27 is a hollow box with a rectangular shape as seen in a top view, which can pass through a rectangular hole 4 formed in the bottom plate 2 of the empty-bag group accommodation tray 1. The upper surface of this member is flat, and a plurality of or numerous holes are formed in this surface (see Figures 5A and 5B). The interior of this box is connected to a vacuum source via a switching valve which is not shown in Figure 4. When the empty-bag group accommodation tray 1 is positioned in a specified position on the second conveyor 26, the extraction member 27 positioned directly beneath the empty-bag group accommodation tray 1 is connected to the vacuum source; at the same time, the extraction member 27 begins to rise. The extraction member 27 rises through the hole 4, and the upper surface of this extraction member 27 contacts the undersurface of the empty-bag group W0 and suction-chucks this empty-bag group; and the extraction member 27 then lifts the empty-bag group W0 to a position above the empty-bag group accommodation tray

1. This state is indicated by a solid line in Figure 4.

[0043] The empty-bag group supply apparatus 16 comprises a moving means which is not shown in Figure 4 and a pair of holding members 28.

[0044] The holding members 28 approach and grasp the empty-bag group W0 raised by the extraction member 27 from both sides and then rotate in mutually opposite directions about the shaft 30 so as to bend the empty-bag group W0 along the direction of width of the bags (i.e., so that the bending line of this bending is in the direction of length of the bag group). The holding members 28 grasping the empty-bag group W0 are caused to move in the horizontal direction by the moving means and stop directly above the conveyor 12 (see the imaginary line in Figure 4); then, the holding members 28 are lowered so that the empty-bag group W0 is placed on the conveyor 12. When thus placed, the bending of the empty-bag group W0 is released, the grasping is released, the holding members 28 are separated and return to the original position (see the position indicated by the solid line in Figure 4). As a result, the empty-bag group W0 remains on the conveyor 12.

[0045] The holding members 28 have a length (length in the direction perpendicular to the plane of the drawing sheet for Figure 4) that can grasp all of the empty bags W that make up the empty-bag group W0 and also have a length that can grasp substantially the entire length of the empty-bag group W0.

[0046] The tray collection apparatus 17 comprises a third conveyor 29 that is provided in connection with the lower end position (see imaginary line) of the second conveyor 26 that is raised and lowered, a stacking type stocker 31 provided in a position above this conveyor, and a lifting device 32 provided underneath. This tray collection apparatus 17 stacks and collects the empty-bag group accommodation trays 1 that have become empty. The second conveyor 26 also forms a part of the tray collection apparatus 17.

[0047] Anchoring claws 33 are provided in,the vicinity of the bottom end of the stacking type stocker 31. The anchoring claws 33 are fastened to shafts 34 that are rotatable, and they anchor the step portions 6a of the lowermost tray among the plurality of empty-bag group accommodation trays 1 (empty trays) that are stocked inside the stacking type stocker 31, thus supporting the stacked empty-bag group accommodation trays 1. The lifting device 32 comprises a tray support 35 that can be raised and lowered and a raising-and-lowering driver 36; and the lilting device 32 supports the lowermost tray and raises and lowers this tray.

[0048] The procedure that stacks the empty-bag group accommodation trays 1 that have become empty in the stacking type stocker 31 is performed as follows:

(1) The second conveyor 26 carrying an empty-bag group accommodation tray 1 that has become empty is lowered to the position where this conveyor is connected with the third conveyor 29 (see the imaginary line in Figure 4).

(2) The empty-bag group accommodation tray 1 is conveyed by the second conveyor 26 and third conveyor 29, and this empty-bag group accommodation tray 1 is stopped and positioned in a specified position on the third conveyor 29.

(3) The tray support 35 is lifted by the lifting device 32, so that the empty-bag group accommodation tray 1 is lifted. As a result of this lifting of the tray support 35, the empty-bag group accommodation tray 1 contacts the lowermost tray 1 that is already located inside the stacking type stocker 31, so that all of the trays inside this stacker 31 are subsequently lifted together with the empty-bag group accommodation tray 1.

(4) When the trays inside the stacking type stocker 31 have been slightly lifted, the shafts 34 are rotated so that the anchoring claws 33 are retracted.

(5) When the step portions 6a of the empty-bag group accommodation tray 1 remaining on the tray support 35 (the lowermost tray) is raised slightly from the position of the anchoring claws 33, the raising of the tray support 35 is stopped.

(6) The shafts 34 are rotated in the opposite direction so that the anchoring claws 33 protrude inward.

(7) The tray support 35 is lowered. In this process, the step portions 6a of the lowermost tray on the tray support 35 are anchored by the anchoring claws 33.

(8) When a predetermined number of empty-bag group accommodation trays 1 have been stacked inside the stacking type stocker 31, these trays are collected.

[0049] The empty-bag group accommodation tray 1 is formed in several places on its outer periphery with projections 6. These projections 6 have step portions 6a and 6b, and the step portions 6a function as anchoring portions for the anchoring claws 21 and 33. However, it is possible to omit these step portions 6a and to caused the flange portions 5 themselves to function as such step portions 6a, i.e., to cause these flange portions 5 to function as engaging parts for the engaging claws. As long as there are anchoring portions that are anchored by the anchoring claws in positions that are located a specified distance above the step portions 6B, such may have the function of the step portions 6a.

[0050] The hole 4 in the empty-bag group accommodation tray 1 is not formed over the entire length of the bottom wall 2; accordingly, the extraction member 27 does not suction-chuck the entire length of the of the undersurface of the empty-bag group W0. Consequently, several empty bags W that are not suction-chucked are present in the vicinity of the front end of the empty-bag group W0, and there is a possibility that these empty bags W may undergo a positional deviation when the extraction member 27 is raised. In order to securely prevent such a positional deviation, it is desirable to suc-

tion-chuck the undersurfaces of all of the empty bags W constituting the empty-bag group W0.

[0051] Positional deviation of the empty bags near the front end of the empty-bag group W0 can be prevented by means of empty-bag group accommodation tray 41 and extraction member 47 shown in Figures 5A and 5B.

[0052] In the empty-bag group accommodation tray 41, the hole 44 formed in the bottom wall 42 reaches the end portion of the bottom wall 42 on the from side of the empty-bag group W0 (i.e., on the side located on the front side of the conveyor of the conveyor magazine type empty-bag supply apparatus or on the side on which the uppermost empty bag W is positioned), and a hole 44a is also formed from the lower end to the upper end in the side wall 43 as well; and these hole 44 and hole 44a communicate to each other to form a single integrated hole. The positions of the projections 46 are also shifted to both sides of the hole 44a. The empty-bag group accommodation tray 41 of Figures 5A and 5B differs from the empty-bag group accommodation tray 1 shown in Figures 1A to 1C only in those structures descried above.

[0053] Furthermore, the extraction member 47 differs from the extraction member 27 in that the extraction member 47 is extended to the front side of the empty-bag group W0 and in that a stopper 48 that protrudes upward is formed on the tip end of this extraction member 47. In Figures 5A and 5B, the reference number 49 is an upper surface plate in which a plurality of holes are formed, 51 is a raisirfg-and-lowering shaft, and 52 is a vacuum piping.

[0054] In Figure 5B, the positional relationship between the extraction member 47 and the empty-bag group W0 is set so that the upper surface plate 49 of the extraction member 47 covers the area up to the front end of the empty-bag group WO, When the extraction member 47 is connected to the vacuum source, and lifting is initiated, the extraction member 47 rises through the hole 44 (and hole 44a), and the upper surface of the upper surface plate 49 contacts and suction-chucks the undersurface of the empty-bag group W0; and the extraction member 47 further lifts the empty-bag group W0 to a position above the empty-bag group accommodation tray 1. When the empty-bag group W0 is thus lifted, all of the empty bags W in the empty-bag group W0 are suction-chucked by the extraction member 47, and thus positional deviation of the empty-bag group W0 tends not to occur on the extraction member 47.

[0055] Even if the suction chucking of the first few empty bags W at the front end of the empty-bag group W0 is insufficient, the stopper 48 prevents positional deviation of the empty bags.

[0056] Figure 6 shows another empty-bag group supply system utilizing the same empty-bag group accommodation tray 1 of the present invention.

[0057] This empty-bag group supply system supplies empty-bag groups W0 to the conveyors 12 of conveyor magazine type empty-bag supply apparatuses installed in a plurality of locations; and it includes a full-tray supply apparatus 53, an empty-bag group extraction apparatus not shown in Figure 6, an empty-bag group supply apparatus which is also not shown in Figure 6, and a tray collection apparatus 54.

[0058] The full-tray supply apparatus 53 comprises a conveyor type stocker 55 that acts as a conveyor for the empty-bag group accommodation trays 1, fourth conveyors 56, a stacking type stocker 57 (only its position is shown by the reference number 57) that is provided beneath this conveyor 56, and a lifting device 58. In addition, anchoring claws 59 are provided in the vicinity of the lower ends of the stacking type stocker 57.

[0059] Three sets T0 each comprising a plurality of stacked empty-bag group accommodation trays (hereafter referred to as stacked full trays T0) are accumulated on the conveyor type stocker 55. The stacked full trays T0 are supplied in the direction indicated by arrow X1 via the upstream side fourth conveyors 56 and another conveyor type stocker 55.

[0060] The fourth conveyors 56 can assume two positions, i.e., a horizontal state and a vertical state (which is indicated by an imaginary line). The fourth conveyors 56 assume a horizontal state when conveying stacked full trays T0 forward, and they take a vertical state when supplying trays to the stacking type stocker 57 below.

[0061] The stacking type stocker 57 is substantially the same as the stacking type stocker 18 illustrated in Figure 4.

[0062] The lifting device 58 comprises a tray support 61 that can be raised and lowered, and a raising-and-lowering driver 62. The lifting device 58 supplies stacked full trays T0 to the stacking type stocker 57, supports empty-bag group accommodation trays 1 that accommodate empty-bag groups W0 in a specified position, and further sends empty-bag group accommodation trays 1 that have become empty to the tray collection apparatus 54. A roller 61a is attached to the tip end of the tray support 61.

[0063] The lifting device 58 operates as follows:

(1) When there are no longer any empty-bag group accommodation trays 1 inside the stacking type stocker 57 or on the tray support 61, the fourth conveyors 56 assume a vertical state as shown by arrow X2, the tray support 61 is raised, and the tray support 61 stops at a position where the tip end roller 61a coincides with the conveying surface of the conveyor type stocker 55.

(2) The conveyor type stocker 55 operates so that the leading stacked full tray T0 is moved onto the roller 61a of the tray support 61.

(3) The tray support 61 is lowered, and it temporarily stops at the position of the stacking type stocker 57; and then the anchoring claws 59 anchor the step portions 6a (not shown) of the empty-bag group accommodation tray 1 that is second from the lowermost position.

(4) The tray support 61 is further lowered, and it stops when the tray support 61 becomes to be level with the conveyor 12. Next, an empty-bag group extraction apparatus and an empty-bag group supply apparatus which are not shown in Figure 6 are operated, so that the empty-bag group in the empty-bag group accommodation tray 1 is supplied to the conveyor 12 as shown by arrow X3. The empty-bag group extraction apparatus and empty-bag group supply apparatus used here have basically the same functions as the empty-bag group extraction apparatus 15 and empty-bag group supply apparatus 16 described above,

(5) The tray support 61 is lowered as shown by arrow X4, and the empty-bag group accommodation tray 1 that has become empty is placed on the conveyor of the tray collection apparatus 54. The tray collection apparatus S4 moves the empty-bag group accommodation tray 1 in the direction as shown by arrow X5 and collect them.

(6) After the empty-bag group accommodation tray 1 on the conveyor of the tray collection apparatus 54 are moved from the upper position of the tray support 61, the tray support 61 is raised, and it removes the lowermost empty-bag group accommodation tray 1 from the stacking type stocker 57. The operating procedure in this case is the same as the operating procedure using the stacking type stocker 18 and lifting device 19.

[0064] In the empty-bag group supply system shown in Figure 6, the sets (stacked full trays) T0 that comprise a plurality of stacked empty-bag group accommodation trays are accumulated on the conveyor type stocker 55; however, it is possible to accumulate empty-bag group accommodation trays 1 without stacking these trays. In this case, the stacking type stocker 57 is unnecessary, and the tray support 61 receives the empty-bag group accommodation trays 1 one at a time from the conveyor type stocker 55.

Claims

1. An empty-bag group accommodation tray which has a box form shape and is open at a top thereof and in which a bottom wall thereof has a rectangular shape and side walls thereof are formed around said bottom wall, so that a plurality of empty bags are accommodated inside of said tray, wherein:

said bottom wall has a width which is substantially the same as a width of the empty bags and has a length which is sufficiently longer than a length of the empty bags so that a plurality of empty bags are placed in a manner that said bags are stacked and overlapped while being shifted in a direction of length of a bag, and

a hole through which an extraction member that contacts a group of bags from below and lifts said group of bags is passed is formed in said bottom wall along a direction of length of said bottom wall.

2. The empty-bag group accommodation tray according to Claim 1, wherein said side walls are formed on upper ends thereof with flange portions that protrude in a horizontal direction.

3. The empty-bag group accommodation tray according to Claim 1 or 2, wherein said side walls are inclined so as to spread outward in an upward direction.

4. The empty-bag group accommodation tray according to Claim 3, wherein said side walls are formed in outer surface sides or inner surface sides thereof with step portions that regulate a mutual engagement depth in a case of vertical stacking by contacting the empty-bag group accommodation tray located above or below.

5. The empty-bag group accommodation tray according to any one of Claim 1 through 4, wherein the hole formed in said bottom wall reaches end portions of said bottom wall in a direction of length of said bottom wall and further extend to said side walls as well, thus forming an integrated hole in said bottom wall and side walls.

6. A tray transporting container that stores therein a plurality of the empty-bag group accommodation trays according to any one of Claims I through 5, wherein

said tray transporting container comprises

a container main body which has a box form shape that is open at a top thereof and which stores a plurality of empty-bag group accommodation trays in a vertically stacked manner, and

a cover which closes off an opening of said container main body; and

wherein when said cover closes said opening of said container main body, an inner surface of said cover fits into an inner portion of an uppermost empty-bag group accommodation tray, thus pressing the empty-bag group accommodated in said empty-bag group accommodation tray from above.

7. The tray transporting container according to Claim 6, wherein said inner surface of said cover is provided with an elastic member, and said elastic member fits into an inside of said uppermost empty-bag group accommodation tray, thus pressing the emp-

ty-bag group accommodated in said empty-bag group accommodation tray from above.

8. An empty-bag group accommodation tray conveying method, comprising the steps of:

placing a plurality of empty bags in the empty-bag group accommodation tray according to any one of Claims I through 5 so that said bags are stacked and overlapped while being shifted in a direction of length of a bag,
stacking a plurality of empty-bag group accommodation trays, and
conveying said stacked plurality of empty-bag group accommodation trays.

9. An empty-bag group supply method wherein
an extraction member is caused to protrude upward from beneath the empty-bag group accommodation tray according to any one of Claims 1 through 5, in which a plurality of empty bags are accommodated so that said bags are stacked and overlapped while being shifted,
said member being caused to protrude through a hole formed in a bottom wall of said empty-bag group accommodation tray,
the empty-bag group is therefore lifted from said empty-bag group accommodation tray "as is" in said stacked and overlapped state, and
the empty-bag group is held and supplied to a conveyor magazine type empty-bag supply apparatus of a bag filling packaging machine.

10. An empty-bag group supply system that supplies an empty-bag group to a conveyor magazine type empty-bag supply apparatus of a bag filling packaging machine utilizing the empty-bag group accommodation tray according to any one of Claims 1 through 5, wherein said system comprises:

a full-tray supply apparatus which includes:

a full-tray stocking means for accumulating a plurality of the empty-bag group accommodation trays in which a plurality of empty bags are accommodated so that said bags are stacked and overlapped while being shifted in a direction of length of a bag, and an extraction means for extracting said empty-bag group accommodation trays one at a time from said full-tray stocking means;

an empty-bag group extraction apparatus which is provided with an extraction member that can be raised and lowered and causes said extraction member to protrude upward through a hole formed in the bottom wall from beneath the empty-bag group accommodation tray positioned in a specified position, thereby causing the empty-bag group inside said empty-bag group accommodation tray to be raised from said empty-bag group accommodation tray while being maintained "as is" in said stacked and overlapped state;
an empty-bag group supply apparatus which includes a holding means for holding said raised empty-bag group and supplies the empty-bag group held by said holding means to said conveyor magazine type empty-bag supply apparatus of a bag filling packaging machine; and
an empty-tray collection apparatus which conveys out empty-bag group accommodation trays that have become empty.

11. The empty-bag group supply system according to Claim 10, wherein in said full-tray supply apparatus,
said full-tray stocking means comprises a stacking type stocker which stocks therein a plurality of empty-bag group accommodation trays in a vertically stacked manner and has an anchoring means that can support the lowermost tray by anchoring said tray and can release said lowermost tray;
said extraction means comprises a lifting means which supports and raises and lowers a lowermost tray among the plurality of empty-bag group accommodation trays stocked in said stacking type stocker; and
said anchoring means and said lifting means successively extract lowermost trays from said stacking type stocker one at a time.

12. The empty-bag group supply system according to Claim 11, wherein said full-tray stocking means further comprises a conveyor type stocker that can accumulate a plurality of sets of stacked empty-bag group accommodation trays with each of said sets containing a plurality of vertically stacked empty-bag group accommodation trays along a conveying direction, so that the sets of empty-bag group accommodation trays accumulated in said conveyor type stocker are fed into said stacking type stocker one set at a time.

13. The empty-bag group supply system according to any one of Claims 10 through 12, said extraction member of said empty-bag group extraction apparatus can suction-chuck an undersurface of the empty-bag group inside said empty-bag group accommodation tray.

14. The empty-bag group supply system according to any one of Claims 10 through 13, said holding means of said empty-bag group supply apparatus is provided with a pair of holding members, which

hold the empty-bag groups from both sides, and a moving means, which moves said holding members.

15. The empty-bag group supply system according to Claim 14, wherein said holding members hold the empty-bag group and cause said empty-bag group to bend along a bag width direction.

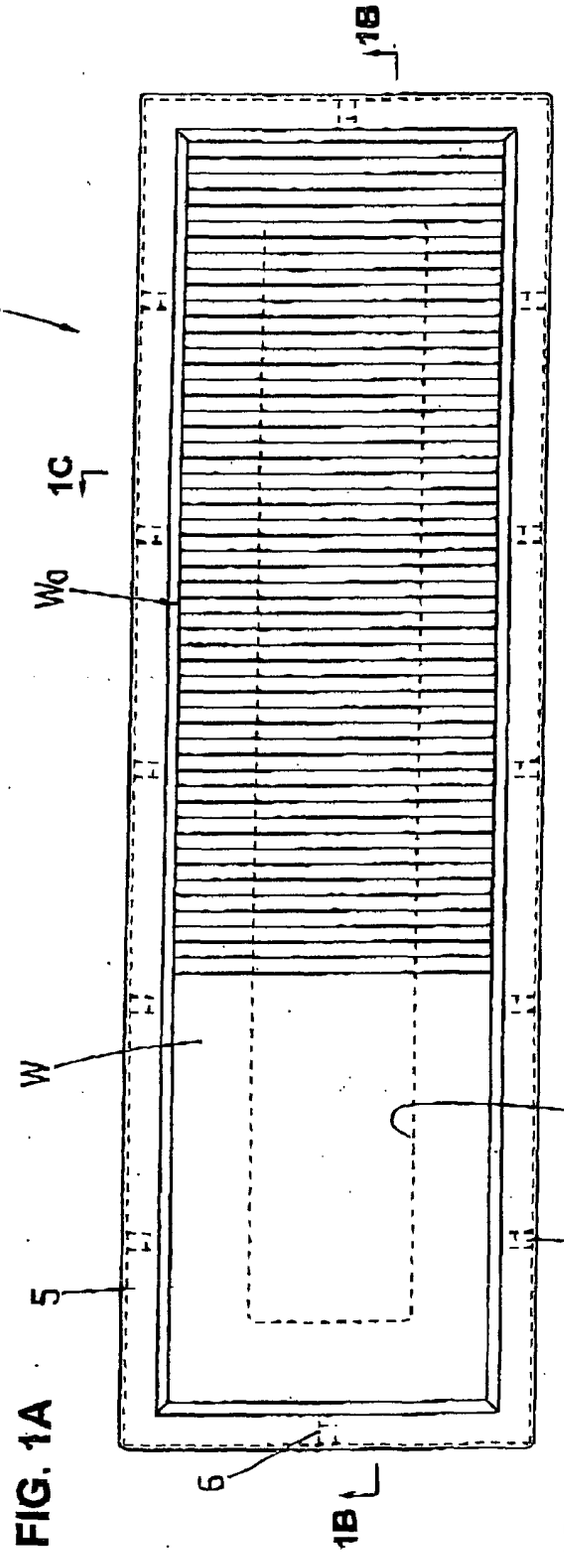


FIG. 1A

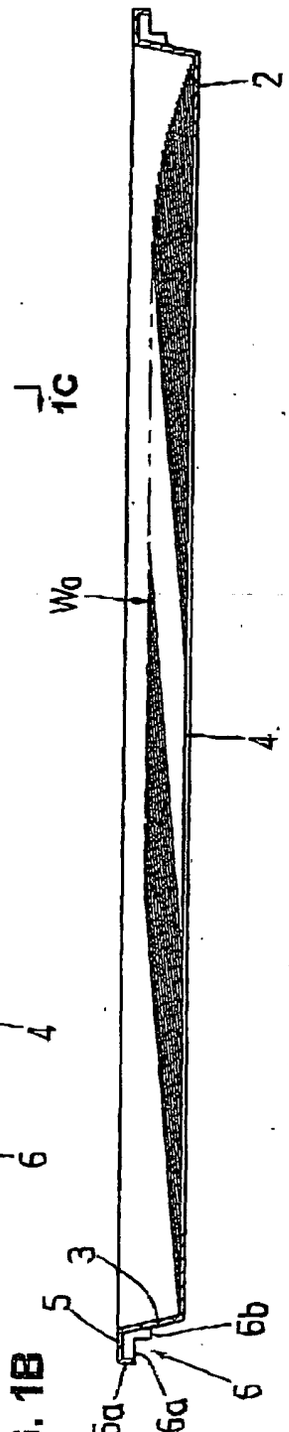


FIG. 1B

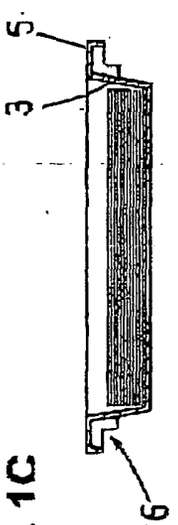


FIG. 1C

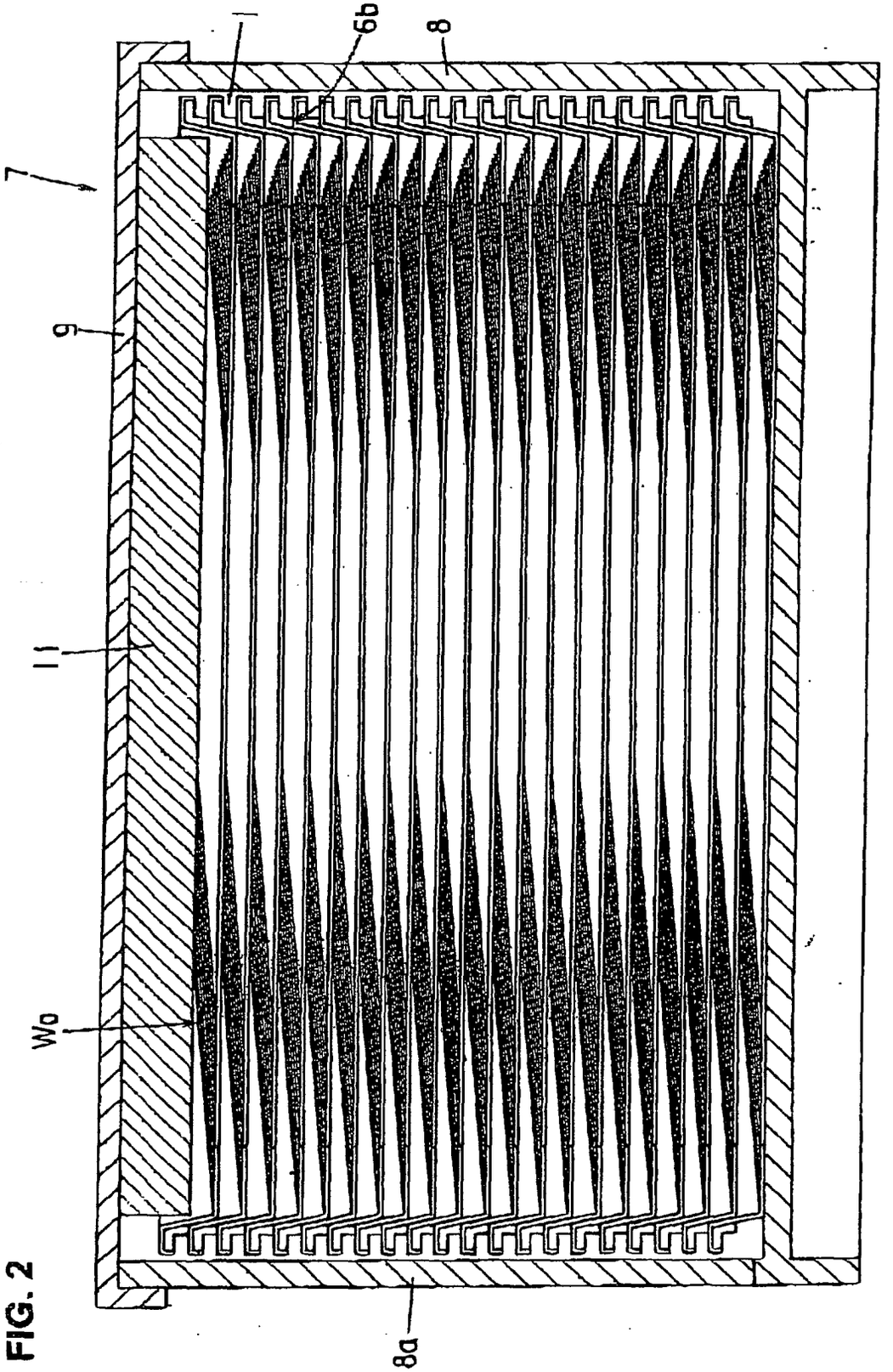


FIG. 2

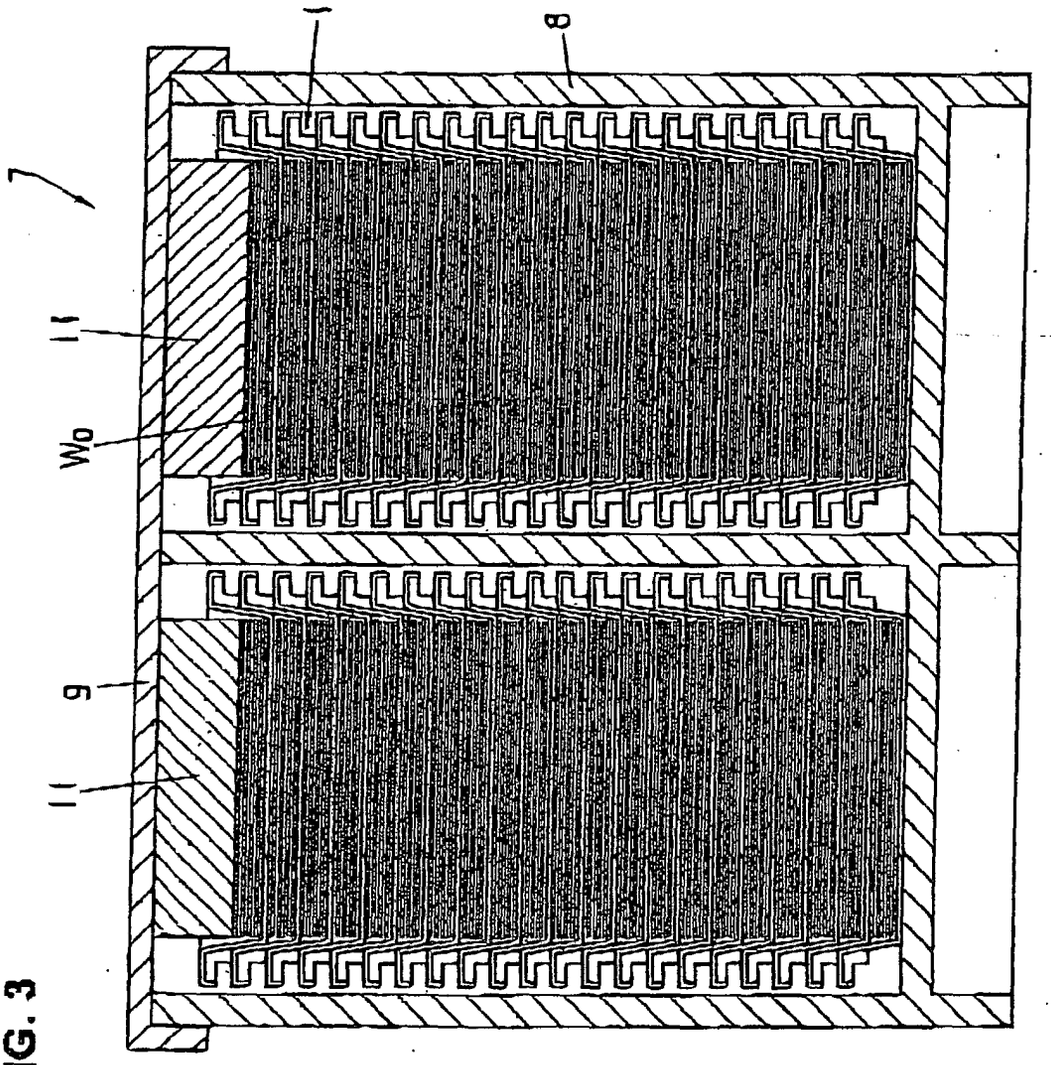


FIG. 3

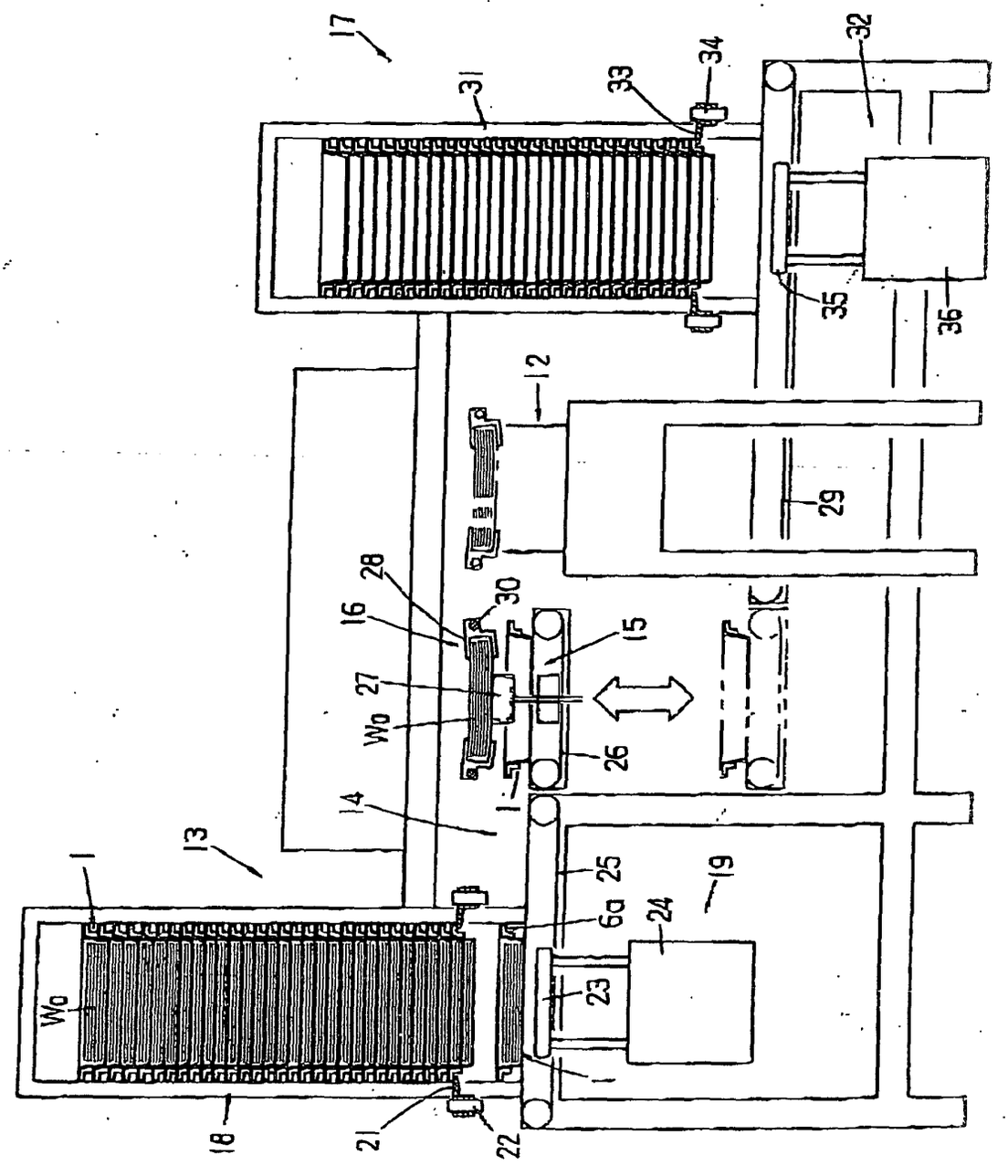

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FIG. 4

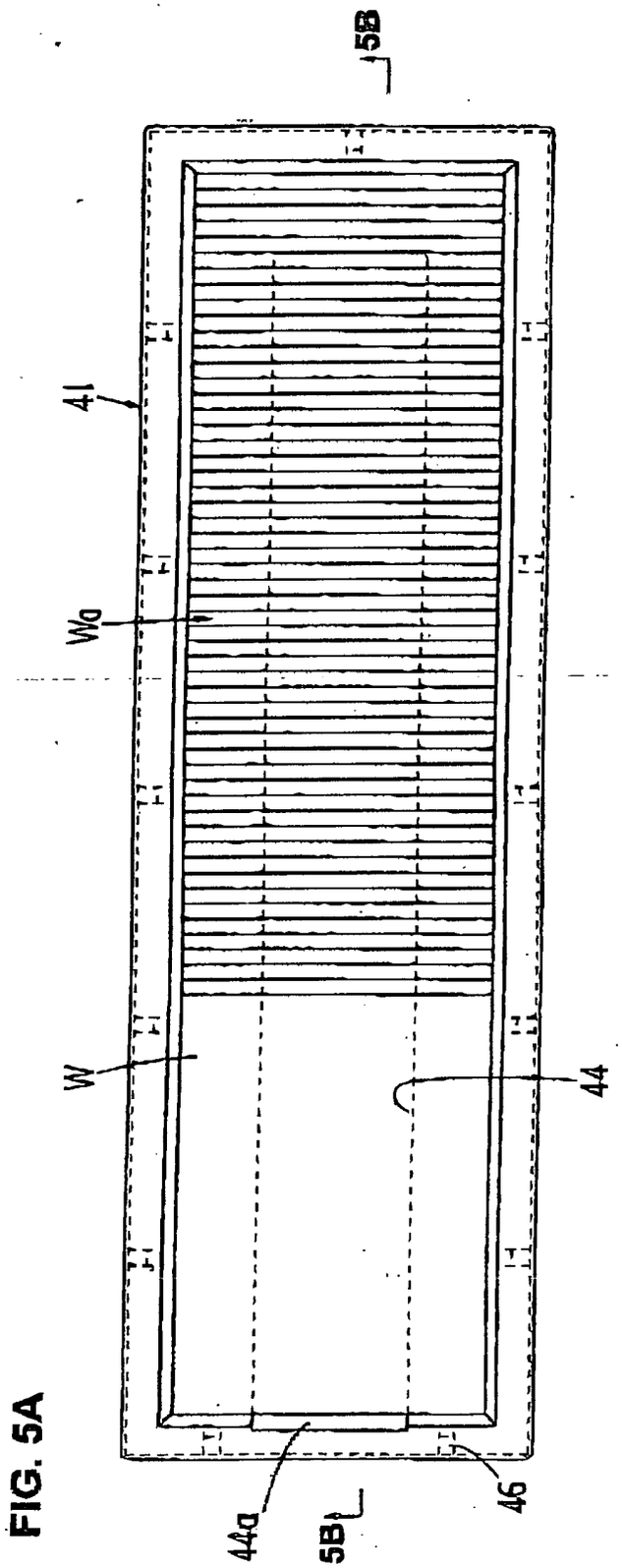


FIG. 5A

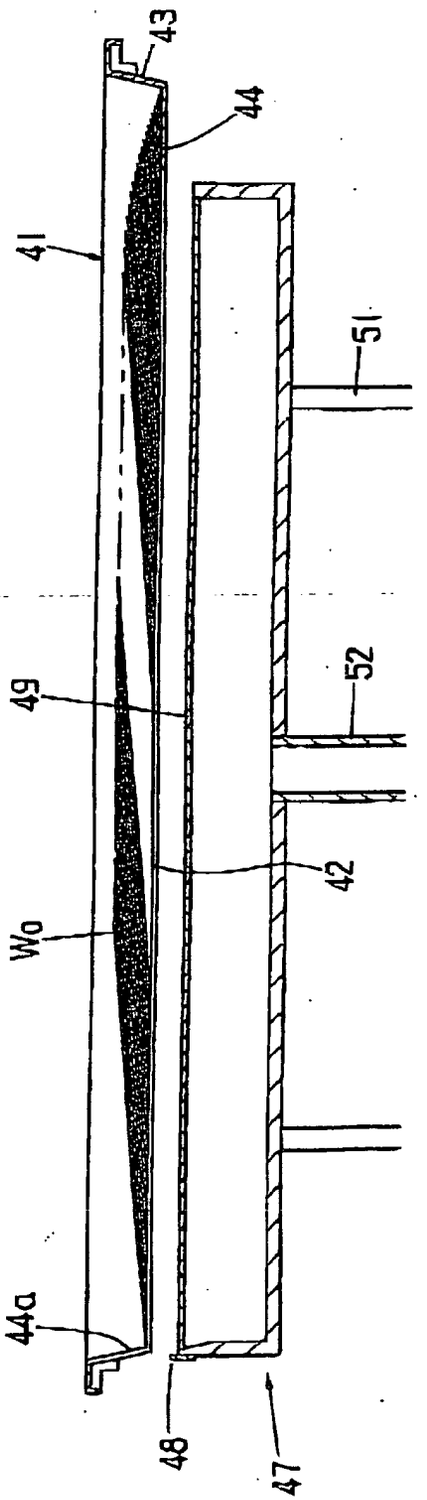


FIG. 5B

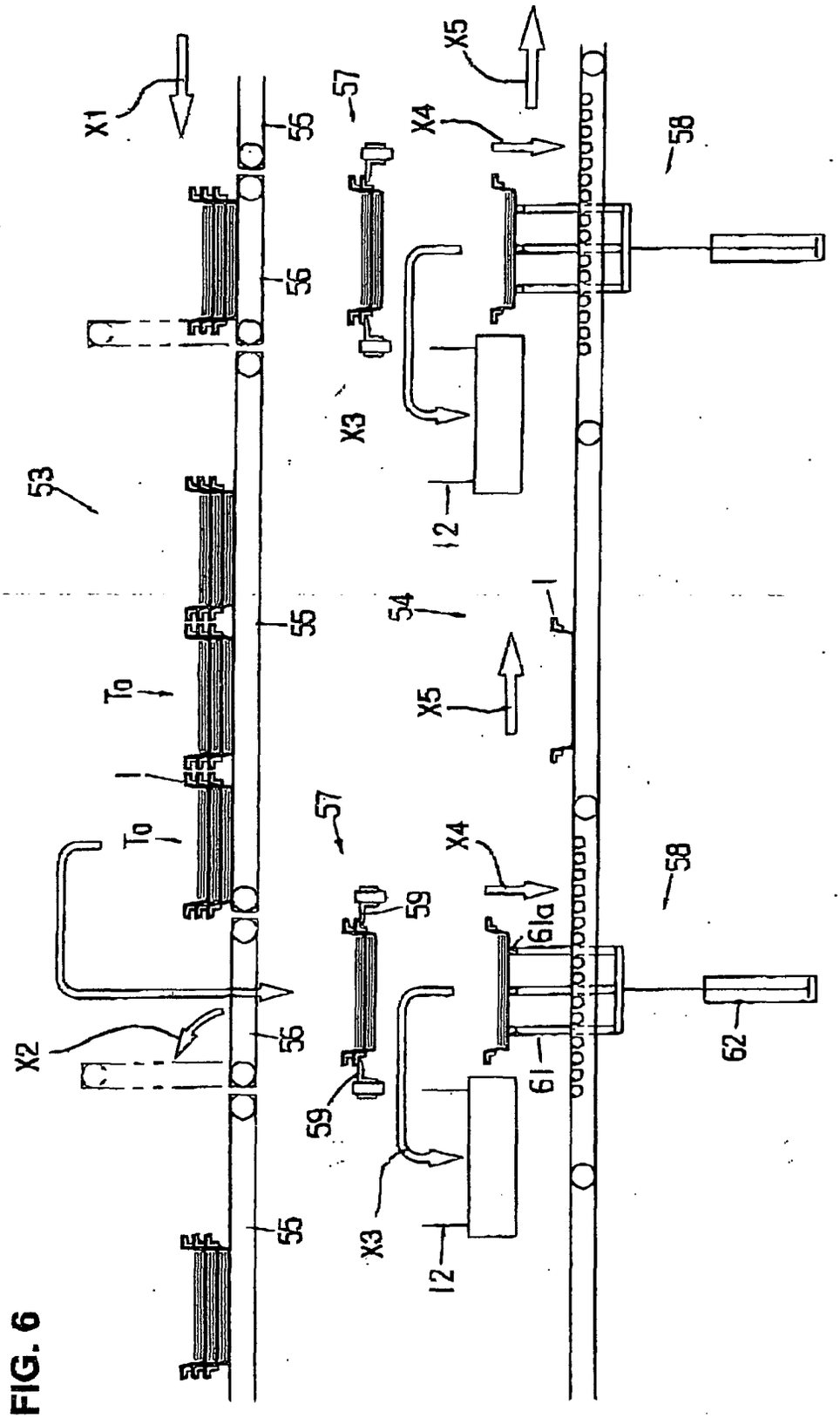


FIG. 6

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 05 01 2935

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	PATENT ABSTRACTS OF JAPAN vol. 1996, no. 12, 26 December 1996 (1996-12-26) -& JP 08 217236 A (TOYO SEIKAN KAISHA LTD), 27 August 1996 (1996-08-27)	1,8,9	B65B43/14 B65G69/00 B65D25/38
Y	* abstract; figures *	2-4,6,7, 10-15	
A		5	

Y	EP 0 614 823 A (DOLCIARIA ZAGHIS S.R.L) 14 September 1994 (1994-09-14) * column 2, lines 33-47; figures 2-4 *	2-4	

Y	US 6 345 718 B1 (MINOGUE GERARD R) 12 February 2002 (2002-02-12) * column 5, lines 13-22 * * column 7, lines 1-5; figure 8 *	6,7	

Y	US 5 180 277 A (PEARCE ET AL) 19 January 1993 (1993-01-19) * column 4, line 11 - column 6, line 25; figures 1-5 *	10-15	
	-----		TECHNICAL FIELDS SEARCHED (Int.Cl.7)
A	WO 99/15415 A (LINPAC PLASTICS LIMITED; GROENE, HORST-DITMAR) 1 April 1999 (1999-04-01) * figure 5 *	1-4	B65B B65D B65G

A	US 3 780 892 A (FRANK E,US) 25 December 1973 (1973-12-25) * column 3, lines 32-58; figure 3 *	1,10	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	26 September 2005	Philippon, D

CATEGORY OF CITED DOCUMENTS

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1 EPO FORM 1503 03.82 (P04C01)

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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26-09-2005

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 08217236 A	27-08-1996	JP 2982643 B2	29-11-1999
EP 0614823 A	14-09-1994	CA 2101498 A1	10-09-1994
		IT 1266396 B1	30-12-1996
US 6345718 B1	12-02-2002	AT 264791 T	15-05-2004
		AU 3496601 A	20-08-2001
		CA 2402138 A1	16-08-2001
		DE 60102896 D1	27-05-2004
		EP 1255677 A2	13-11-2002
		TW 593071 B	21-06-2004
		WO 0158765 A2	16-08-2001
US 5180277 A	19-01-1993	NONE	
WO 9915415 A	01-04-1999	AU 1146599 A	12-04-1999
		DE 29716844 U1	11-12-1997
		ZA 9808401 A	15-03-1999
US 3780892 A	25-12-1973	NONE	

EPO FORM P0459

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