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(54) **METHOD AND APPARATUS FOR PACKAGING FLAT BAGS, SACKS OR THE LIKE OBJECTS.**

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Description

The present invention relates to a method for packaging flat bags, sacks or the like objects, which are placed one after another, as seen in a direction perpendicular to their planes by bringing them into a collecting space in such a fashion that they come one after another in a queue, whereafter they are moved, when being in an upright position, in the direction of their planes into a packaging space by pushing by their sides, the objects being brought into the collecting space by pushing them by their sides in sets of a predetermined size into the collecting space from a conveyor, where they are held in upright position one after another, the objects being moved along a horizontal path into the collecting space at the same level with and adjacent to the conveyor, wherefrom they are moved directly in a single inserting movement into the packaging space.

The above-mentioned method and apparatus is used in packaging various bags, such as bags of sweets, into cartons in such a fashion that they come one after another, as seen in a direction perpendicular to their planes, for example on top of each other, whereafter the carton can be so turned, that the bags come in an upright position. The packaging process is usually performed by bringing the bags in suitable horizontal groups to a packaging machine, wherefrom each group in its turn is caused to fall down into the carton. After the carton has been filled it is closed. A drawback of the method is that the bags do not come in good order and further the packaging process is poorly controllable. In case of so-called retail packages it is important to get the bags in good order.

US-A 4,250,688 shows a packaging method, where the objects are first pushed with a first pusher into a collecting space, whereafter the bottom of the space is lifted so that the collecting space will rise to the height of the carton, whereafter a second pusher pushes the objects into the carton. US-A 4,250,688 shows the drawback that the first pusher moves always along a straight path across the conveyor. This means that the conveyor bringing the objects must always be stopped after the first pusher has pushed the previous sets of objects into the collecting space and retracts across the conveyor to begin a new pushing movement. The movements of the conveyor and the first pusher have not been considered more closely in the art of packaging technology, because the conveyor must in any case be always stopped before the pusher can push the objects into the collecting space. Keeping the conveyor at its rest position during the return movement of the pusher has not been regarded as a drawback, because it does not involve any addi-

tional starting or stopping operations that would require additional automation or instrumentation.

The purpose of the invention is to effect an improvement as regards the above-described drawbacks. For realising the purpose, the method according to the invention is mainly characterised by that a pushing member after having moved the objects from the conveyor into the collecting space is lifted up and then, moved back to the other side of the conveyor and lowered to the initial position for a next pushing movement. It has been found out that when the path of the pushing member is in this way changed from the conventional one, the capacity can be raised, even to more than double.

According to an advantageous embodiment, the objects are compressed against each other in a direction perpendicular to their planes before they are moved into the packaging space. In this case the objects can be more easily handled as they are loose from each other before they are moved into the carton and the actual tight packing is performed at the last stage before they are inserted into the carton.

The object of the invention is also to provide an apparatus by means of which the packaging operation can be carried out in a practical and space-saving manner. For realising the invention the first pushing member of the apparatus is provided for a movement along a path rising up after the pushing movement, moving thereafter to the other side of the conveyor and descending to the initial position for a next pushing movement.

Further according to an advantageous embodiment the apparatus comprises a compressing member being provided for a reciprocating movement in the direction of travel of the conveyor for compressing the objects against each other in a direction perpendicular to their planes. By means of the compressing member the objects can be packed more tight against each other before they are moved into the carton. According to an advantageous embodiment, the pushing members for moving the objects from the conveyor into the collecting space and from the collecting space into the packaging space can be mounted movable on a common carriage, which is provided for a vertical reciprocating movement. In this way the transferring movements of the pushing members and their returning movements taking place through an upper part to the their initial positions can be arranged in a constructionally simple and space-saving manner.

The invention will be described in the following more closely with reference to the accompanying drawings, wherein

Fig. 1 shows a packaging apparatus of the invention schematically, as seen from the top,

- Figs. 2a-d show the apparatus of the invention seen in the plane of line II-II and at various stages of the moving operation of the objects,
- Fig. 3 shows the apparatus of the invention as a schematical side-view at the location of the conveyor, seen in the plane of line III-III of Fig. 1, and
- Fig. 4 shows an alternative embodiment of the apparatus.

Fig. 1 shows the packaging apparatus seen from above. The apparatus comprises a conveyor 1, to which flat bags, sacks or the like objects 10 to be packaged are fed in such a fashion, that each of them will come into its respective compartment which is bounded by partitions 1a extending perpendicularly to the travelling direction of the conveyor 1. The conveyor travels horizontally in the direction of arrow A while the objects 10 are therein in an upright position supported by partitions 1a. Adjacent to the conveyor, at its right side in Fig. 1, there is an even base 2, which is situated approximately on the same level with the conveyor and is bounded towards the travelling direction of the conveyor by an upright wall 7 and on its side wherefrom the conveyor advances by a pressing means 5 and a guide plate 6, which are to be described later, also being situated in an upright position. The space 2 so formed being open at both ends in a direction perpendicular to the travelling direction A of the conveyor 1 is called collecting space, the purpose of which will be described later.

At the opposite side of the collecting space, as seen from the conveyor 1, the collecting space is bounded by handling assembly 8 for cartons, having the purpose of positioning cartons 3, for example cartons assembled from cardboard blanks, in turns next to the collecting space 2 in such a fashion that one side of the carton will be open and will face the collecting space 2. The cartons are later denoted "packaging space". The assembly 8 can be of any type used in packaging machines 8 and not being part of invention, it is not described here in more detail.

Fig. 1 also shows a first pushing member 4a, which serves in pushing objects 10 out of the conveyor 1 in the direction of the planes sideways to the collecting space 2, as well as a second pushing member 4b, which serves in pushing objects 10 from the collecting space 2 into the packaging space, that is into a carton 3 through the open side of the carton.

In Fig. 1 is denoted by a broken line a compression space 2a incorporated in the collecting space 2. The compression space is situated within the range of action of a compressing member 5 performing a horizontal, reciprocating movement

parallelly with the direction of travel A of the conveyor 1. The compressing member 5 has an upright pressing surface, which bounds the compression space 2a towards the direction wherefrom the conveyor 1 advances and has the purpose of compressing the objects 10 in the compression space 2a against each other.

The first pushing member 4a is provided for a horizontal movement across the conveyor 1 towards the compression space 2a, whereby it transfers the objects 10 from the conveyor 1 in the direction of their planes into the compression space, the bottom of which is situated substantially on the same level as the bottom of the conveyor 1. At this point the objects 10 are compressed tighter against each other in the direction perpendicular to the planes, whereafter they are transferred by means of the second pushing member 4b direct in a single inserting movement into the packaging space 3, either at once, or after they have been, while continuing to be on the same level, transferred by means of the second pushing member away from the compression space towards the packaging space, in order to be able to group more sets of objects to lie adjacent to each other in the collecting space 2.

In Figs. 2a-2d the pushing surfaces of the first pushing member 4a and the second pushing member 4b are situated substantially on the same height. The path of movement of the second pushing member 4b is substantially horizontal and in a way forms a prolongation for the movement path of the first pushing member 4a, for transferring the objects being compressed in the compression space 2a towards the packaging space 3 and for transferring the objects in a single inserting movement from the collecting space 2 into the packaging space 3. The work stroke length of the second pushing member 4b can be thus varied according to the need and this operation will be described later in more detail.

In the following the operation of the apparatus will be explained more closely with reference to Figs. 2a-d. The first pushing member 4a is suspended from a carriage 9 situated above the conveyor belt and the collecting space to be in an upright position and it is mounted for movement along a horizontal path in guides mounted in the carriage. Also the second pushing member 4b is suspended on the carriage in such a fashion that it forms an upright, downwardly extending plate on the height of the objects to be packaged. The second pushing member 4b is also mounted for movement along a horizontal path in guides in the carriage.

In Fig. 2a the first pushing member 4a is situated at the left side of the conveyor 1, that is, on its far side as seen from the collecting space 2.

The second pushing member 4b is situated on the other side of the compression space 2a farther from the conveyor 1. A set of uprightly positioned objects 10 has arrived on the conveyor 1 to the range of action of the first pushing member 4a, and the pushing member pushes them by their sides in the direction of their planes, that is, in a direction perpendicular to the travelling direction A of the conveyor, in a horizontal pushing movement B to the compression space 2a, where the compressing member 5 is in its retracted position shown in Fig. 1 by broken lines. The pushing member 4a is so dimensioned that the objects 10 are ejected within a length commensurate with the distance between the wall 7 and the retracted compressing member 5 into the compression space 2a, and this principle is best illustrated by Fig. 1. After the ejecting movement B the first pushing member 4a remains on the other side of the conveyor 1 and the side of the second pushing member 4b facing the compression space 2a ensures that the objects 10 are retained in the upright position within the space 2a and do not go further during the ejecting movement B.

After the movement B, the position shown by Fig. 2b is reached. The objects 10 situated one after another in the compression space 2a, that is, a set of objects of a predetermined size, is bounded on the side facing the conveyor 1 by the first pushing member 4a being at its end position, and on the opposite side it is bounded by the second pushing member 4b and an upright wall 6a following the pushing member 4b by continuing in the same direction next to the compression member 5. The wall is formed by an upright wall portion lying next to the compression member 5 in the guide plate 6 and being bent parallel with the direction of movement of the compression member 5. The set of objects is bounded in a direction perpendicular to the planes of the objects 10 by the wall 7 situated towards the travelling direction of the conveyor 1 and in opposite direction by the pressing surface of the retracted compression member 5.

As the set of objects is in the compression space 2a in the position shown by Fig. 2b, the compression member 5 is moved into the position shown by Fig. 1, causing the compression of the objects 10 against each other. The stroke length of the compression member 5 is such that its pressing surface will be flush with the guide plate 6. Thereafter the pushing members 4a and 4b are lifted up by lifting the carriage 9, whereafter they move left on the carriage 9, the first pushing member 4a coming again on the left side of the left edge of the conveyor 1 and the pushing member 4b coming on the right side of the right edge of the conveyor 1 in between the conveyor 1 and the set of objects situated in the compression space 2a,

after the carriage 9 has been lowered again to its original height. This moving stage is illustrated by Fig. 2a and the final situation by Fig. 2d. From this situation onwards the combination of the pushing members 4a and 4b is again returned to the position of Fig. 2a in such a fashion that the pushing member 4b moves horizontally in the direction of arrow C to the other side of the compression space 2a, pushing at the same time the set of objects in the compression space 2a towards the packaging space 3 and causing the set of objects to come between the guide plate 6 and the wall 7. The width of the pushing member 4b, that is, its extension in the longitudinal direction of the conveyor 1 is such that it will push the objects 10 as a uniform row to the space between the wall 7 and the guide plate 6. The next stage is again to move a set of objects from the conveyor 1 by means of the first pushing member 4a into the empty compression space 2a, where the compression member 5 has immediately after the transferring movement C of the second pushing member 4b returned to its retracted position.

By the above-described procedure it is possible to collect two or more sets of objects in the collecting space 2, depending of course on how many sets adjacent to each other the packaging space 3 can receive. The length of the collecting space 2 in the direction of movement of the pushing members shall of course be arranged in compliance therewith. When a desired number of sets of objects have been positioned adjacent to each other, their insertion takes place into the packaging space 3 under the influence of the second pushing member 4b, which when situated in the position shown by Fig. 2d between the conveyor 1 and the compression space 2a pushes all sets of objects in the collecting space 2 in one long inserting movement into the packaging space 3. The open side of the packaging space 3 can thereafter be closed and the next packaging space can be transferred by the assembly 8 to lie next to the collecting space 2.

Another alternative for arranging two or more sets of objects adjacent to each other in the packaging space 3 is to insert them in separate sets doing so that a set in the compression space 2a is at once inserted from the position of Fig. 2d in a single long movement of the pushing member 4b into the packaging space 3, whereafter the work cycle of Figs. 2a-2d takes place again and a new set of objects 10 is again in the compression space 2a ready to be inserted into the same packaging space 3 to lie next to the preceding set. After the packaging space 3 has been so filled up, the new packaging space can be changed in place of the preceding one.

The number of objects 10 to be collected in the collecting space 2 shall of course be deter-

mined according to the capacity of the packaging space 3 to receive them when they are inserted by their sides when being in an upright position one after another. The packaging spaces 3 may have varying sizes, and this can be compensated by adjusting the width of the collecting space 2 by changing the location of the guide plate 6 and correspondingly by changing the length of the compression movement of the compression member 5. This possibility of adjustment is schematically illustrated by arrow D in Fig. 1.

The number of objects 10 to be transferred from the conveyor in its turn can also be adjusted by replacing the first pushing member 4a with pushing members of varying widths. In this event, of course, the situation of the retracted position of the compression member 5 must be changed accordingly. This possibility of adjustment is designated by arrow E in Fig. 1. The number of objects 10 to be transferred from the conveyor must of course be in right proportion to the capacity of the packaging space 3 to receive them in a state where they are compressed lying one after another.

Fig. 4 shows another alternative for transferring the objects 10 from the compression space 2a direct in a single inserting movement into the packaging space. In this case one set of objects is transferred from the conveyor 1 into the compression space 2a in the same manner as above and the bottom of the compression space 2a is situated substantially on the same level as the bottom of the conveyor 1. The bottom of the compression space 2a is constituted of the second pushing member 4b, which lifts and inserts the objects being compressed by the compression member 5, the movement taking place along an arcuate path in a single inserting movement into the packaging space 3. For accomplishing this operation the pushing member 4b is fixed on the end of an arm 14 which is mounted for pivotal movement in a vertical plane about a support point 15. The range of the pivoting movement is ca. 90°, and by virtue of this movement the objects 10 can be simultaneously turned 90° in the direction of their planes so that their bottom sides come on the open side of the packaging space. After the pushing member 4b has inserted the objects 10 into the packaging space, it returns back to be ready to receive a new set of objects which will be pushed on top of it. Fig. 4 also show an arcuate supporting plate 16 which can be provided for supporting the objects on the side of their path of movement facing the supporting point 15.

It will be understood that the movements performed by various members may be synchronized with respect to each other so that the packaging operation can continue without interruptions or at

least without disturbances. The feeding rate of the cartons 3 adjacent to the collecting space 2 can be timed according to the feeding rate of the objects 10, that is, according the rate of transfer of objects 10 by the conveyor 1 wherefrom the pushing member 4a seizes them. Further, the work cycle shown in Figs. 2a-d may be synchronized with the conveyor 1 in such a fashion that the first pushing member 4a returns to its initial position for a new push at the latest at a stage where a new set of objects 10 in its entirety has been conveyed next to the pushing member.

Fig. 3 shows the apparatus in longitudinal section at the location of the conveyor 1. The objects 10 are fed onto the conveyor 1 from a preceding belt conveyor 11 on which they lie parallel with the plane of the belt conveyor. At the end of the belt conveyor they fall guided by a glide plate 13 directed to the conveyor 1 in such a fashion that they reach the conveyor 1 by gliding with their bottoms ahead and come in an upright position, each object to its own compartment bounded by the upright partitions 1a. In the practice this kind of operation has been realised by arranging the movement of the conveyor 1 to take place with jerks of a predetermined length. A sensor 12, such as a photocell, is provided at the end of the conveyor 11. The sensor, on detecting an object 10 falling into a compartment, gives an order to the conveyor 1 to move ahead by one compartment. A new empty compartment is thus moved to a place where the next object 10 can fall. It can be thus ensured that no vacant spaces are left in the conveyor 1, because in case of interruptions in the function of the conveyor 11 the conveyor 1 will not move.

Also more objects positioned one after another can be collected in each compartment of the conveyor 1, depending on their thicknesses. In this case the glide plate 13 and a compartment located beneath are so situated that the next object will always fall on top of the preceding one. The photocell or the like sensor at the glide plate 13 is connected to a counter which gives an order to the conveyor 1 to move ahead by one compartment after the number corresponding to the capacity of the compartment has been reached.

The first pushing member 4a can of course be adapted to the above-mentioned advancing pace of the conveyor 1 in such a manner, that after a predetermined number of jerks, corresponding as such or as a certain multiplied number to the number of the objects 10 fed onto the conveyor 1, the work cycle shown in Figs. 2a-d is started. The duration of the work cycle and the feeding rate of the conveyor 11 can be arranged with respect to each other so that the pushing member 4a has sufficient time to reach its initial position before a

new set of objects which it will transfer has come up. Fig. 1 also shows the comb-like construction of the pushing member 4a. The pushing member 4a is an upright plate-like member disposed parallel to the conveyor and having downwardly extending projections or "tines", the width of which is commensurate to the distance from each other of the walls 1a bounding the compartments of the conveyor 1 so that the projections can push the objects 10 by their sides into the collecting space 2 by passing between the walls 1a.

The automation of the apparatus can of course be provided using known solutions in automation technique, by various sensors and switches. As a power source for the moving parts can be used e.g. electricity, hydraulic fluid or pressurized air. In two last-mentioned cases different pushing movements (the movements of the pushing member 4a and 4b and the compression member 5) and lifting movements (the movement of carriage 9 up and down) can be provided by means of cylinder-piston-actuators and the stroke length thereof can be adjusted to a predetermined value by well-known control means. The actuators can be moved according to a preprogrammed packaging program. If the apparatus is to be used for packaging bags, sacks or the like which contain food products, it is advisable to have a pneumatic power transmission for effecting the movements of the compression member 5, the pushing members 4a and 4b and the carriage 9 in order to make sure that the packaging method is hygienic enough for food products.

Claims

1. Method for packaging flat bags, sacks or the like objects (10), which are placed one after another, as seen in a direction perpendicular to their planes, by bringing them into a collecting space (2) in such a fashion that they come one after another in a queue, whereafter they are moved, when being in an upright position, in the direction of their planes into a packaging space (3) by pushing by their sides, the objects (10) being brought into the collecting space (2) by pushing them by their sides in sets of a predetermined size into the collecting space from a conveyor (1), where they are held in upright positions one after another, the objects (10) being moved along a horizontal path (B) into the collecting space (2) at the same level with and adjacent to the conveyor, wherefrom they are moved directly in a single inserting movement into the packaging space (3), **characterised** in that a pushing member (4a) after having moved the objects from the conveyor into the collecting space (2) is lifted

up and then moved back to the other side of the conveyor (1) and lowered to the initial position for a next pushing movement.

2. Method as claimed in claim 1, **characterised** in that the collecting space (2) adjacent to the conveyor (1) there is a compression space (2a), where the objects (10) are compressed against each other in a direction perpendicular to their planes before they are moved into the packaging space (3).
3. Method as claimed in claims 1 or 2, **characterised** in that two or more adjacent queues are collected in the collecting space (2), whereafter they are moved in a single inserting movement into the packaging space by pushing by the side of the queue lying farthest from the packaging space.
4. Method as claimed in claim 3, **characterised** in that the set of objects which has been just moved from the conveyor (1) into the collecting space (2) is moved towards the packaging space (3) by means of a second pushing member (4b), which after the moving operation remains, as seen from the conveyor (1), on the opposite side of the space (2a) whereto said set of objects had been moved from the conveyor (1).
5. Apparatus for packaging flat bags, sacks or the like objects (10), comprising means for placing the objects one after another, as seen in a direction perpendicular to their planes, the apparatus comprising a collecting space (2), means (4b,5,6,7) for supporting the objects being in an upright position one after another in the collecting space, as well as a pushing member (4b) which is provided in the collecting space (2) for a movement in a direction of the planes of the objects for moving the objects into the packaging space (3), the apparatus comprising adjacent to the collecting space (2) a conveyor (1) having supporting means (1a) for retaining the objects in an upright position during conveying, the apparatus further comprising a pushing member (4a) provided for a movement perpendicular to the travelling direction of the conveyor (1) across the conveyor (1) for moving the objects from the conveyor (1) into the collecting space (2), a first pushing member (4a) being provided for moving the objects (10) along a horizontal path (B) into the collecting space (2) at the same level with and adjacent to the conveyor, a second pushing member (4b) being provided for moving the objects from said collecting

space directly in a single inserting movement into the packaging space (3), **characterised** in that the first pushing member (4a) is provided for a movement along a path rising up after the pushing movement, moving thereafter to the other side of the conveyor and descending to the initial position for a next pushing movement.

6. Apparatus as claimed in claim 5, **characterised** in that it comprises a compression member (5) in the collecting space (2), the compression member being provided for a reciprocating movement in the direction of travel of the conveyor (1) for compressing the objects against each other in a direction perpendicular to their planes.

7. Apparatus as claimed in of claim 5 or 6, **characterised** in that the first pushing member (4a) is of a comb-like construction the distance between the void gaps corresponding to that between the supporting means (1a) of the conveyor.

8. Apparatus as claimed in any of claims 5-7, **characterised** in that the first and second pushing members (4a, 4b) are mounted movably on a common carriage (9), which is provided for a vertical reciprocating movement.

Patentansprüche

1. Verfahren zum Verpacken flacher Beutel, Säcke und ähnlicher Gegenstände (10), welche, in einer Richtung senkrecht zu ihrer Ebene gesehen, nacheinander angeordnet werden, indem sie derart in einen Sammelraum (2) gebracht werden, daß sie nacheinander in einer Schlange ankommen, woraufhin sie, wenn sie sich in einer aufrechten Position befinden, in der Richtung ihrer Ebene in einen Packraum (3) befördert werden, indem sie an ihren Seiten geschoben werden, wobei die Gegenstände (10) in den Sammelraum (2) gebracht werden, indem sie an ihren Seiten von einer Fördereinrichtung (1) in Sätzen vorbestimmter Größe in den Sammelraum geschoben werden, wo sie aufeinander folgend in einer aufrechten Position gehalten werden, wobei die Gegenstände (10) entlang eines horizontalen Weges (B) in den Sammelraum (2) auf dem gleichen Niveau wie und angrenzend an die Fördereinrichtung bewegt werden, von wo sie in einer Einzeleinsetzbewegung direkt in den Packraum (3) bewegt werden, **dadurch gekennzeichnet**, daß ein Schiebeelement (4a), nachdem dieses die Gegenstände

de von der Fördereinrichtung in den Sammelraum (2) bewegt hat, angehoben und zurückbewegt wird zur anderen Seite der Fördereinrichtung (1) und in seine Ausgangsposition abgesenkt wird für eine nächste Schiebee Bewegung.

2. Verfahren gemäß Anspruch 1, **dadurch gekennzeichnet**, daß in dem Sammelraum (2) angrenzend an die Fördereinrichtung (1) ein Verdichtungsraum (2a) vorhanden ist, in dem Gegenstände (10) in einer zu ihrer Ebene senkrechten Richtung zusammenge drückt werden bevor sie in den Packraum (3) bewegt werden.

3. Verfahren gemäß Anspruch 1 oder 2, **dadurch gekennzeichnet**, daß zwei oder mehrere aneinander angrenzende Schlangen in dem Sammelraum (2) gesammelt werden, woraufhin sie in einer Einzeleinsetzbewegung in den Packraum bewegt werden mittels einer Einsetzbewegung von der Seite der Schlange, die am entferntesten vom Packraum liegt.

4. Verfahren gemäß Anspruch 3, **dadurch gekennzeichnet**, daß der Satz der Gegenstände, der soeben von der Fördereinrichtung (1) in den Sammelraum (2) befördert worden ist, in Richtung des Packraumes (3) mittels eines zweiten Schiebeelements (4b) bewegt wird, welches nach dem Bewegungsvorgang, von der Fördereinrichtung (1) aus gesehen, auf der gegenüberliegenden Seite des Raumes (2a) verbleibt, wohin der Satz der Gegenstände von der Fördereinrichtung (1) aus hinbewegt worden war.

5. Gerät zur Verpackung flacher Beutel, Säcke und ähnlicher Gegenstände (10) mit Mitteln zum Hintereinanderanordnen der Gegenstände in einer zu ihren Ebenen gesehenen senkrechten Richtung, wobei das Gerät sowohl einen Sammelraum (2), Mittel (4b, 5, 6, 7) zum Tragen der sich einer nach dem anderen in einer aufrechten Position in dem Sammelraum befindenden Gegenstände, als auch ein Schiebeelement (4b) umfaßt, welches in dem Sammelraum (2) für eine Verschiebung in Richtung der Ebenen der Gegenstände vorgesehen ist zum Bewegen der Gegenstände in den Packraum (3), wobei das Gerät angrenzend an den Sammelraum (2) eine Fördereinrichtung (1) mit Haltermitteln (1a) enthält, um die Gegenstände während der Förderung in einer aufrechten Lage zu halten, wobei das Gerät desweiteren ein Schiebeelement (4a) aufweist, das für eine Bewegung senkrecht zur Förderrichtung

tung der Fördereinrichtung und über die Fördereinrichtung (1) vorgesehen ist zum Bewegen der Gegenstände von der Fördereinrichtung (1) in den Sammelraum (2), wobei das erste Schiebeelement (4a) vorgesehen ist zum Bewegen der Gegenstände entlang eines horizontalen Weges (B) in den Sammelraum (2) auf dem gleichen Niveau wie und angrenzend an die Fördereinrichtung, und das zweite Schiebeelement (4b) vorgesehen ist zum Bewegen der Gegenstände direkt von diesem Sammelraum in einer Einzeleinsetzbewegung in den Packraum (3),

dadurch gekennzeichnet, daß das erste Schiebeelement (4a) vorgesehen ist für eine Bewegung entlang eines Weges, welcher sich nach der Verschiebewegung nach oben bewegt, wobei es sich anschließend auf die andere Seite der Fördereinrichtung bewegt und sich in seine Ausgangsposition absenkt für eine nächste Schiebewegung.

6. Gerät gemäß Anspruch 5,
dadurch gekennzeichnet, daß der Sammelraum (2) ein Verdichtungselement (5) aufweist, wobei das Verdichtungselement vorgesehen ist für eine Hin- und Herbewegung in der Laufrichtung der Fördereinrichtung (1) zum gegenseitigen Aneinanderdrücken der Gegenstände in einer zu ihrer Ebene senkrechten Richtung.
7. Gerät gemäß Anspruch 5 oder 6.
dadurch gekennzeichnet, daß das erste Schiebeelement (4a) eine kammartige Konstruktion aufweist, wobei die zwischen den freien Lücken vorhandenen Abstände denjenigen zwischen den Halterungsmitteln (1a) der Fördereinrichtung entsprechen.
8. Gerät gemäß einem der Ansprüche 5 bis 7,
dadurch gekennzeichnet, daß das erste und zweite Schiebeelement (4a, 4b) bewegbar auf einen gemeinsamen Wagen (9) befestigt sind, welcher für eine vertikale Hin- und Herbewegung vorgesehen ist.

Revendications

1. Procédé de conditionnement de sacs plats, de sachets et d'autres objets similaires (10), qui sont placés l'un après l'autre, tel qu'observé dans une direction perpendiculaire à leur plan, en les amenant dans un espace de collecte (2) de telle façon qu'ils viennent l'un après l'autre selon une queue d'attente, après quoi ils sont déplacés, tandis qu'ils sont en position verticale, dans la direction de leur plan, jusque dans un espace de conditionnement (3) en les pous-

sant par leur côté, les objets (10) étant amenés dans l'espace de collecte (2) en les poussant par leur côté, selon des jeux d'une taille prédéterminée, dans un espace de collecte depuis un convoyeur (1) où ils sont maintenus en position verticale l'un après l'autre, les objets (10) étant déplacés le long d'une voie horizontale (B) jusque dans l'espace de collecte (2) au même niveau que le convoyeur et au voisinage de celui-ci, convoyeur depuis lequel les objets sont déplacés directement selon un mouvement d'insertion unique dans l'espace de conditionnement (3), caractérisé en ce qu'un élément poussoir (4a) après avoir déplacé les objets depuis le convoyeur jusque dans l'espace de collecte (2), est élevé puis ramené sur l'autre côté du convoyeur (1) et abaissé vers la position initiale pour un nouveau mouvement de poussée.

2. Procédé selon la revendication 1, caractérisé en ce que l'espace de collecte (2) voisin du convoyeur (1) comporte un espace de compression (2a) où les objets (10) sont comprimés les uns contre les autres dans une direction perpendiculaire à leur plan avant d'être déplacés jusque dans l'espace de conditionnement (3).
3. Procédé selon la revendication 1 ou 2, caractérisé en ce que deux queues voisines ou davantage sont collectées dans l'espace de collecte (2), après quoi elles sont déplacées selon un mouvement d'insertion unique jusque dans l'espace de conditionnement par poussée depuis le côté de la queue située la plus loin de l'espace de conditionnement.
4. Procédé selon la revendication 3, caractérisé en ce que le jeu d'objets qui a juste été déplacé depuis le convoyeur (1) jusque dans l'espace de collecte (2), est déplacé en direction de l'espace de conditionnement (3) au moyen d'un second élément poussoir (4b) qui, après l'opération de déplacement reste, tel qu'observé depuis le convoyeur (1), sur la côté opposé de l'espace (2a) où ledit jeu d'objets a été déplacé depuis le convoyeur (1).
5. Appareil pour conditionner des sacs plats, des sachets ou des objets analogues (10), comprenant des moyens pour placer les objets l'un après l'autre, tel qu'observé selon une direction perpendiculaire à leur plan, l'appareil comprenant un espace de collecte (2), des moyens (4b, 5, 6, 7) pour supporter les objets en position verticale l'un après l'autre dans l'espace de collecte, ainsi qu'un élément poussoir

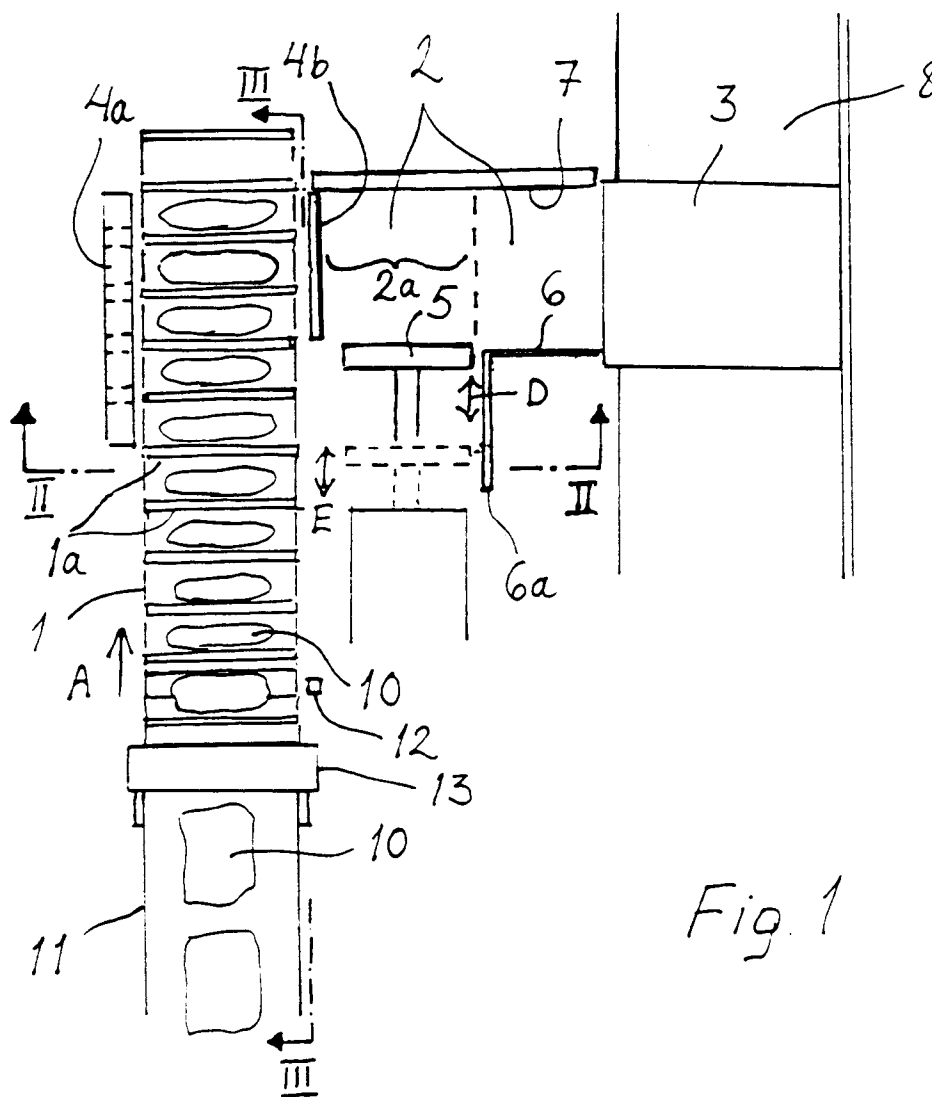
(4b) qui est prévu dans l'espace de collecte (2) pour avoir un mouvement en direction du plan des objets pour déplacer les objets jusque dans l'espace de conditionnement (3), l'appareil comprenant, au voisinage de l'espace de collecte (2), un convoyeur (1) ayant des moyens support (1a) pour retenir les objets en position verticale pendant le transport, l'appareil comprenant en outre un élément poussoir (4a) prévu pour exercer un mouvement perpendiculaire à la direction de déplacement du convoyeur (1) d'un côté à l'autre du convoyeur (1) pour déplacer les objets depuis le convoyeur (1) jusque dans l'espace de collecte (2), un premier élément poussoir (4a) étant prévu pour déplacer les objets (10) le long d'une voie horizontale (B) jusque dans l'espace de collecte (2) au même niveau que le convoyeur et au voisinage de celui-ci, un second élément poussoir (4b) étant prévu pour déplacer les objets depuis ledit espace de collecte directement selon un mouvement d'insertion unique jusque dans l'espace de conditionnement (3), caractérisé en ce que le premier élément poussoir (4a) est prévu pour avoir un mouvement le long d'une voie s'élevant après le mouvement de poussée, se déplaçant ensuite vers l'autre côté du convoyeur et descendant vers la position initiale pour le prochain mouvement de poussée.

6. Appareil selon la revendication 5, caractérisé en ce qu'il comprend un élément de compression (5) dans l'espace de collecte (2), l'élément de compression étant prévu pour avoir un mouvement alternatif dans la direction de déplacement du convoyeur (1) pour comprimer les objets les uns contre les autres, dans une direction perpendiculaire à leur plan.

7. Appareil selon la revendication 5 ou 6, caractérisé en ce que le premier élément poussoir (4a) a une construction en forme de peigne, la distance entre les vides correspondant à celle prévue entre les moyens support (1a) du convoyeur.

8. Appareil selon l'une quelconque des revendications 5 à 7, caractérisé en ce que les premier et second éléments poussoirs (4a, 4b) sont montés mobiles sur un chariot commun (9) qui est prévu pour avoir un mouvement alternatif vertical.

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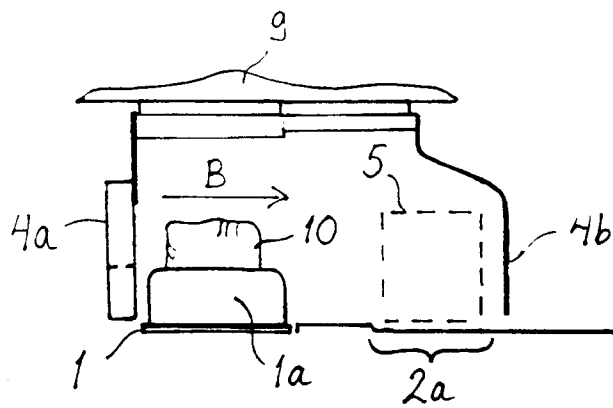


Fig. 2a

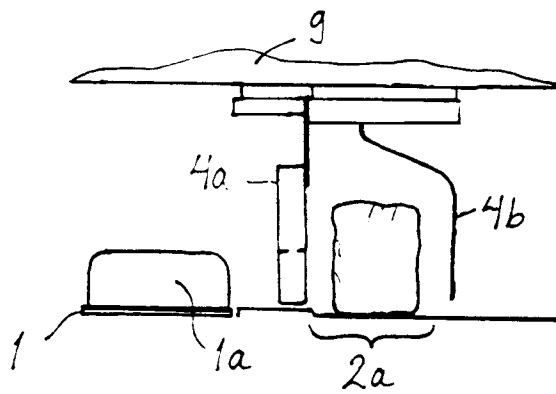


Fig. 2b

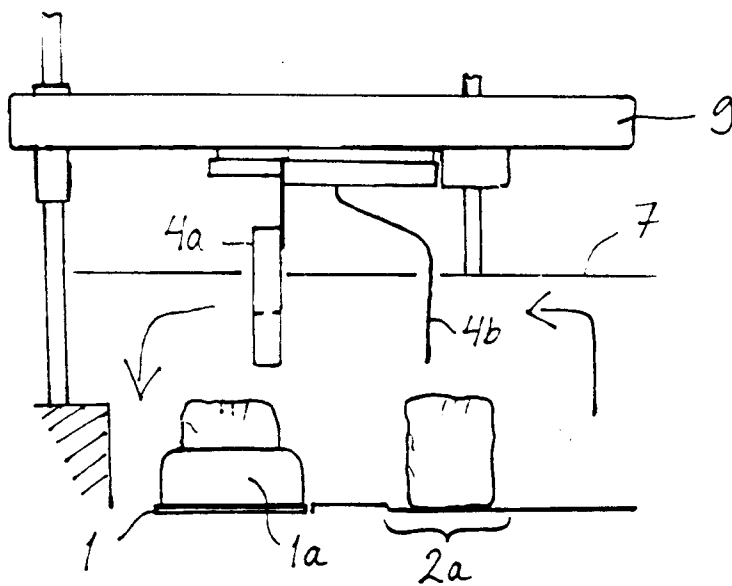


Fig. 2c

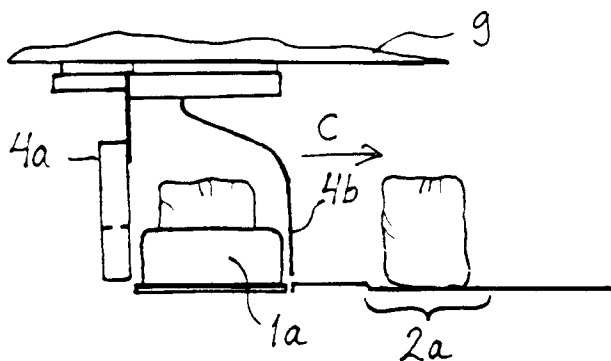
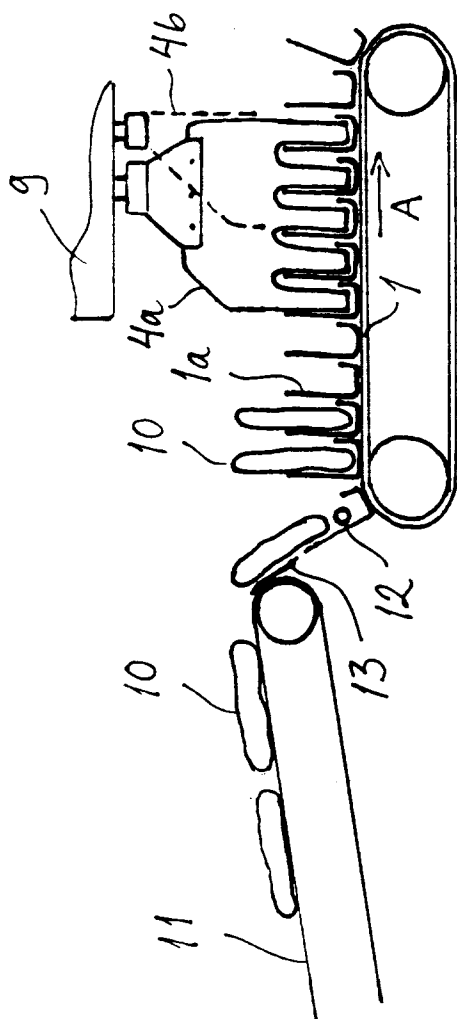


Fig. 2d



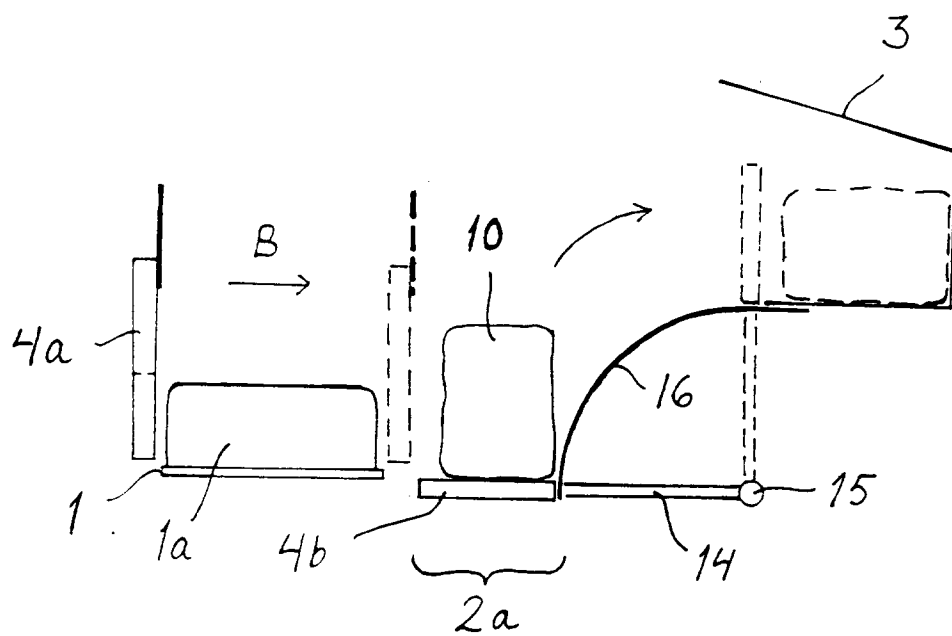


Fig. 4