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

(11) Publication number: **0 248 463**
A1

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **87200896.6**

(51) Int. Cl.[4]: **B65B 5/06**

(22) Date of filing: **14.05.87**

(30) Priority: **06.06.86 NL 8601480**

(43) Date of publication of application:
09.12.87 Bulletin 87/50

(84) Designated Contracting States:
AT BE CH DE ES FR GB GR IT LI LU NL SE

(71) Applicant: **Prakken, Bouwe**
Spijkerlaan 9
NL-3471 EG Kamerik(NL)

(72) Inventor: **Prakken, Bouwe**
Spijkerlaan 9
NL-3471 EG Kamerik(NL)

(74) Representative: **van der Beek, George Frans et al**
Nederlandsch Octrooibureau Johan de Wittlaan 15 P.O. Box 29720
NL-2502 LS 's-Gravenhage(NL)

(54) Device for packing filled bags in boxes.

(57) For packing bags filled with product in the upright position into boxes, use is made of a machine which is provided with means (3) for tilting the bags fed in horizontally and collecting them into a row, while by means of a pusher cylinder (7) the row formed is pushed into a cassette which is provided with an openable or removable bottom. By opening or removing the bottom of the cassette, the contents of the cassette can fall into a box placed underneath the cassette. This machine is simple in design and is very reliable.

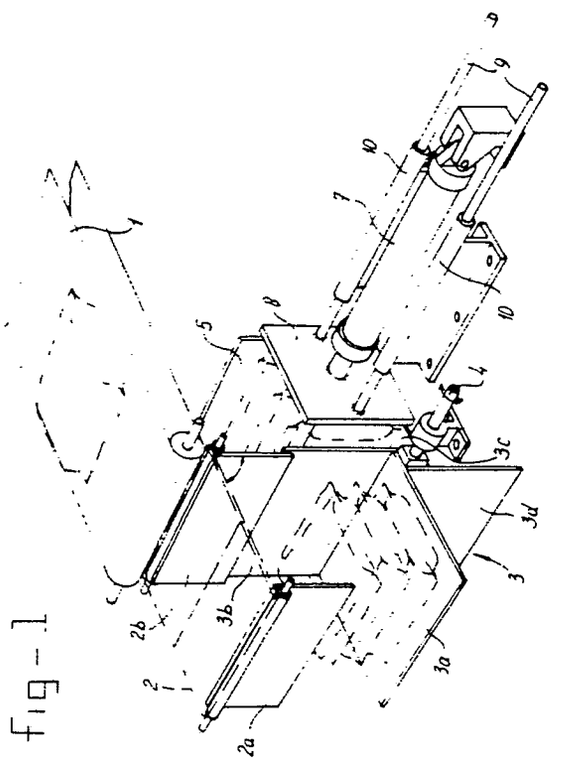

Fig. 1

EP 0 248 463 A1

Device for packing filled bags in boxes

The invention relates to a device for packing filled bags in boxes, provided with means of conveyance for bringing in the bags in a horizontal position.

Packing bags filled with product, for example chips, in a horizontal position is a generally known process, but for various reasons packing the filled bags in the upright position is often preferred. One of these reasons can be that during stacking of horizontal bags the product in the bag at the bottom runs a high risk of being damaged. Another reason can be that the display function is better if the bags are packed upright.

In a known packing machine for packing filled bags in the upright position, bags stacked horizontally on top of each other are pushed into a tilted box. This machine is fairly complex, in particular due to the fact that it has to be possible to tilt the box and move it to various height positions.

The object of the invention is to eliminate this disadvantage and produce a device of the type mentioned in the preamble which is simpler and more reliable than known machines for packing filled bags upright in boxes.

According to the invention, the device is to this end characterized by tilting and collection elements for tilting the bags to the upright position and collecting them into a row, a cassette provided with a removable or openable bottom for taking rows of tilted bags, a pusher cylinder for pushing each row of bags into the cassette, and means for opening or removing the cassette bottom and allowing the contents of the cassette to fall into a box placed underneath the cassette.

The filled bags tilted into the upright position are pushed per row into the cassette and fall into the box when the bottom of the cassette is open.

There are various ways of tilting the bags. For example, the bags slide from a steep chute onto a support or into the cassette. However, more precise results are obtained if the tilting and collection elements contain four plates arranged in the shape of a cross on a rotatable shaft.

In order to make filled bags land in a controlled manner in a horizontal position on a horizontal plate of the rotating cross, the feed conveyance means open out into a removable or openable supporting plate directly above a horizontal plate of the tilting and collection elements.

The boxes can be placed by hand under the cassette, but it is more efficient if the device has a feed conveyor for empty boxes and a forcing cylinder for a box disposed directly underneath the cassette, near the end of said conveyor.

Each box can now be placed directly underneath the cassette. The correct position of each box relative to the cassette is ensured if the cassette is provided at its bottom end with locators which fit into a box.

The invention will now be explained in greater detail with reference to the figures, which show - schematically an example of an embodiment.

Fig. 1 shows a perspective view of the device.

Fig. 2 shows a perspective view of the same device seen from another side.

The device shown comprises a feed conveyor 1 for bringing in the bags in the horizontal position, filled with product such as chips. At the discharge end of the conveyor is a supporting plate 2 in the form of two hinged flaps 2a, 2b which can be moved between a horizontal and a vertical position, for example by means of a hydraulic cylinder (not shown).

Underneath the supporting plate 2 is a tilting mechanism 3 in the form of four plates 3a, 3b, 3c, 3d, which are arranged in the form of a cross and are fastened to a shaft 4 which can turn stepwise through 90 degrees.

The bags brought in by the conveyor 1 come to rest in succession on the supporting plate 2 and, when the parts 2a, 2b are flapped, on a horizontal plate of the tilting mechanism. A predetermined number of bags are collected on the said horizontal plate. This number can be counted in a manner known per se by a photoelectric cell or the like.

Once the predetermined number of bags has collected lying on top of each other on a horizontal plate of the tilting mechanism 3, the motor (not shown) of the shaft 4 is given the command to turn the shaft through 90 degrees. The bags consequently end up in an upright position. In order to prevent the bags from falling off, a vertical plate 5 is provided near the tilting mechanism.

Viewed in the longitudinal direction of the shaft 4, a cassette 6 is placed behind the tilting mechanism. It is designed as a box with open front side, closed rear wall and closed side walls, and a bottom which can be opened or removed. In the example shown the cassette bottom consists of two hinged parts which can be compared with parts 2a, 2b of the supporting plate 2.

In order to push a row of tilted bags out of the tilting device 3 into the cassette 6, the device has a hydraulic or pneumatic pusher cylinder 7 with pusher plate 8. In order to guide the pusher plate, use is made of guide rods 9, which can move in guide sleeves 10.

Underneath the cassette is a box support 11 which can be moved up and down by means of a forcing cylinder 12. In the lowest position of the support 11 it is positioned in front of a box feed conveyor 13 in such a way that a box fed in can land on the support 11. In the highest position of the support 11 a box in position on said support is pressed against the bottom side of the cassette, and trapezoidal locators 14 disposed on the bottom side of the cassette project into the box and position it relative to the cassette.

It will be clear that a row of bags pushed by the cylinder 7 with plate 8 out of the tilting device 3 into the cassette 6 can fall into a box by opening or removing the cassette bottom.

In the case of boxes whose length is much greater than their width the cassette can be made correspondingly longer, while the lengthwise direction coincides with the pushing direction of the cylinder 7. The pusher plate 8 fixed on the piston rod of said cylinder then has two positions: a position in which the first row of tilted bags is pushed into the rear part of the cassette, and a position in which a second row of tilted bags is pushed in front of this first row into the cassette. The box is, of course, fed in with its lengthwise direction parallel to the pushing direction of the cylinder 7. By means of a control unit, which is not shown, the functioning of the cylinder 7 will have to be controlled in such a way that the pusher plate 8 is taken successively into the two above-mentioned positions.

Various other modifications and additions are possible within the scope of the invention. The cross-shaped tilting device shown is preferred, but could be replaced by another tilting mechanism, for example by a slanting chute. The supporting plate 2 and the bottom of the cassette 6 could be horizontally slidable, instead of being made up of two hinged parts.

Essential for the invention is the use of a cassette with a bottom which can be opened or removed.

Claims

1. Device for packing filled bags in boxes, provided with means of conveyance for bringing in the bags in a horizontal position, characterized by tilting and collection elements for tilting the bags to the upright position and collecting them into a row, a cassette provided with a removable bottom for taking rows of tilted bags, a pusher cylinder for pushing each row of bags into the cassette, and means for opening or removing the cassette bottom and allowing the contents of the cassette to fall into a box placed underneath the cassette.

2. Device according to Claim 1, characterized in that the tilting and collection elements comprise four plates arranged in the shape of a cross on a rotatable shaft.

3. Device according to Claim 2, characterized in that the feed conveyance means open out into a removable or openable supporting plate directly above a horizontal plate of the tilting and collection elements.

4. Device according to one of the preceding claims, characterized in that the device has a feed conveyor for empty boxes and a forcing cylinder for a box disposed directly underneath the cassette, near the end of said conveyor.

5. Device according to Claim 4, characterized in that the cassette is provided at its lower end with locators which fit into a box.

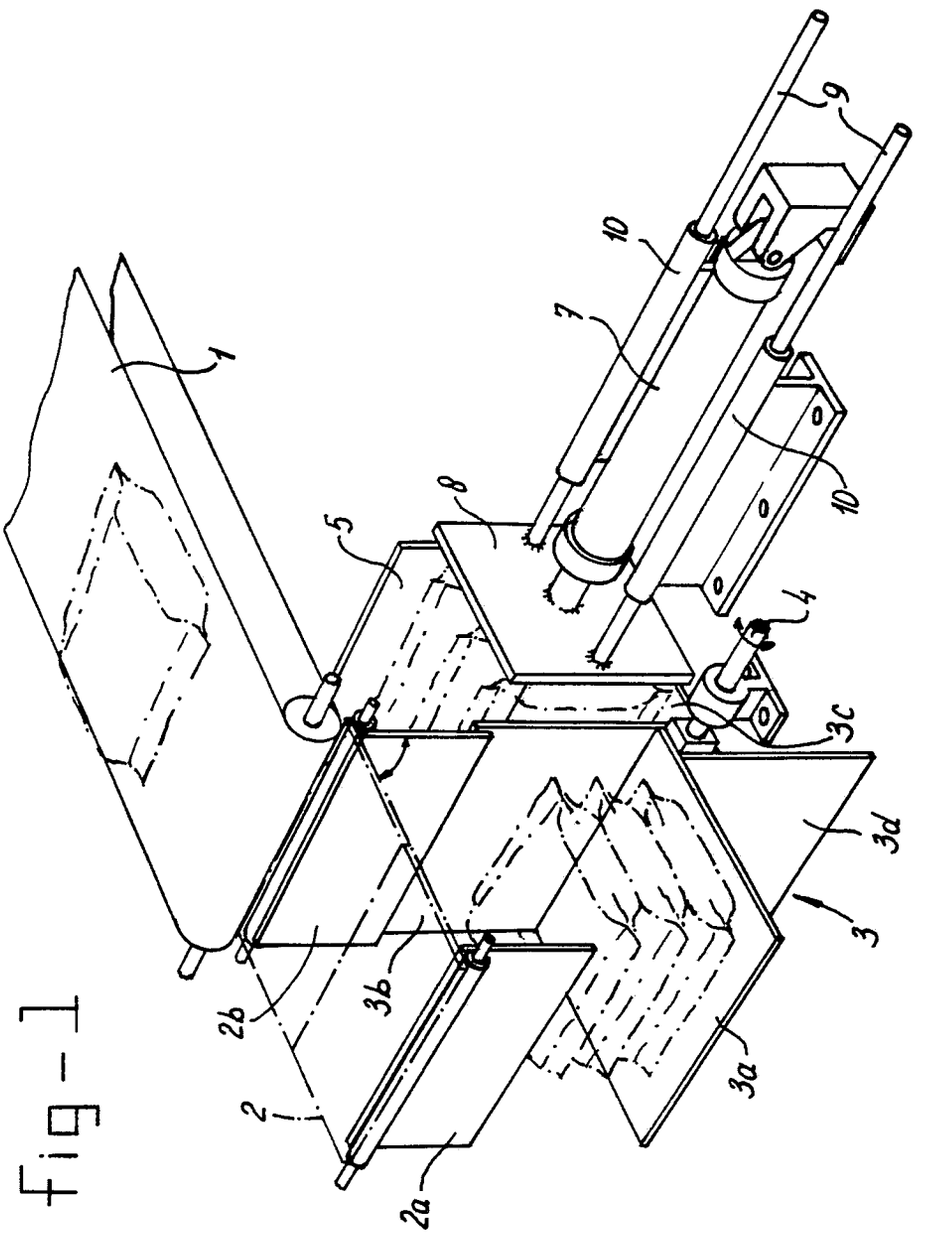

Fig-1

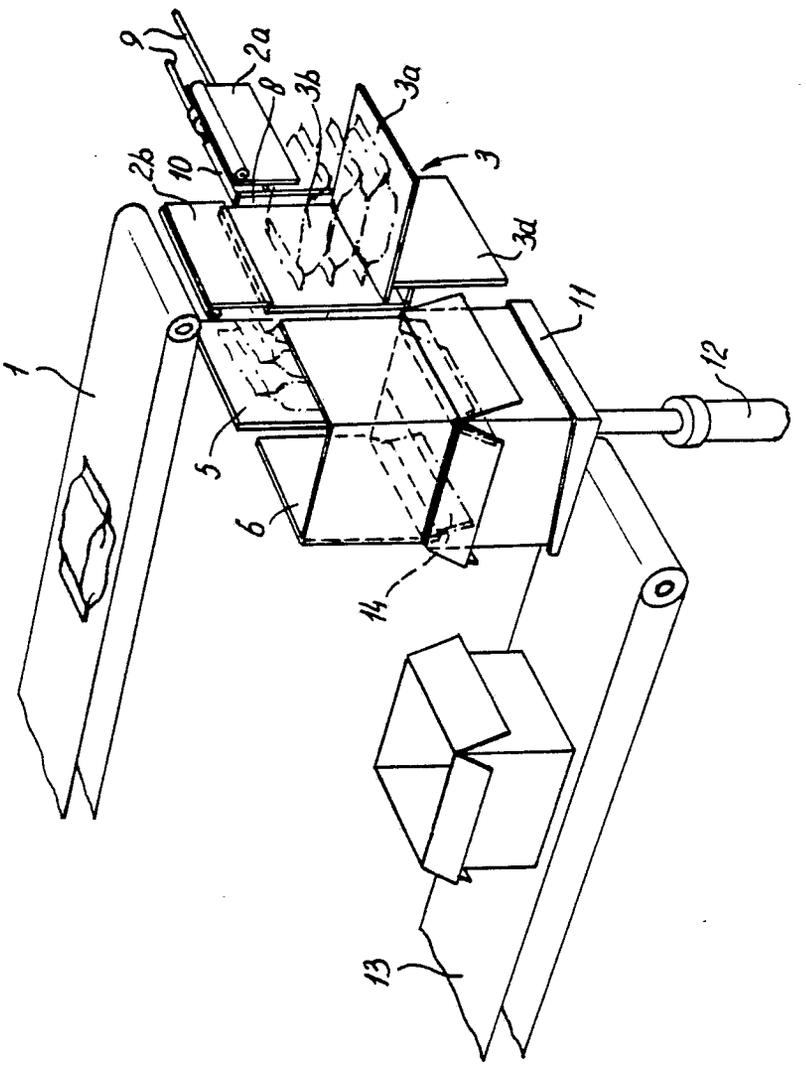

fig-2

European Patent Office

EUROPEAN SEARCH REPORT

Application number

EP 87 20 0896

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.4)
A	NL-A-8 001 469 (BOUWE PRAKKEN) * Page 3, line 12 - page 5, line 6; figures 1-5 *	1	B 65 B 5/06
A	US-A-3 778 972 (CHLIPALSKI) * Column 2, line 11 - column 3, line 23; figures 5-7 *	1	
A	GB-A-2 128 162 (LORSCH) * Abstract; figure 1 *	1,2	
A	EP-A-0 036 398 (PATTAROZZI) * Page 6, line 26 - page 7, line 20; figures 1,2,6,7 *	3	

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

B 65 B
B 65 G

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	14-09-1987	CLAEYS H.C.M.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO Form 1503 03 82