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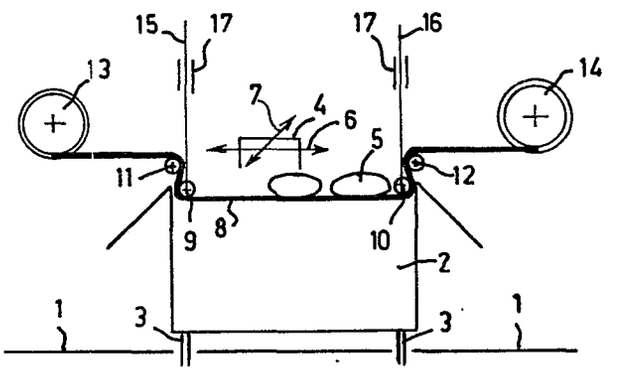
(54) Packing machine.

(57) Automatically collection of flexible articles into containers or boxes has amongst others the disadvantage that the stapling height depends of the number of layers which has already been stapled, and that the laying down of articles has to be intempted when the full container has to be replaced by an empty one.

These problems are solved by providing a provisional bottom which can comprise a band (8) having a width substantially corresponding to the width of the box (2), which band has ends which are attached to drums (13, 14) and can be rolled on and off said drums. The band preferably has an opening having substantially the same dimensions as the bottom plane of the box.



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PACKING MACHINE

The invention relates to a packing machine, comprising a frame with a guide track, over which opened containers are brought below the transport opening of the articles which are to be packed, the transport opening being movably positioned in at least one plane, to divide the articles that are to be packed over a plane parallel to the plane of the guide band.

Until recently the packing of articles was totally done by hand. Since a few years there are packing machines on the market, which automatically collect the articles in a container. Such a packing machine can be coupled to a vertical forming, filling and sealing machine, which produces the flexible packing.

A problem occuring herwith is that the flexible packing must be brought from the upper side of the container to the bottom or higher. This height varies depending from the number of layers which has already been piled up. With known machines the lowering of the flexible packing is done by a vacuum mouth, which moves downwardly, or by an upper plunger which has a larger downwardly speed than the flexible packing, so that the packing is pressed against the upper plunger.

A further disadvantages of the known machines is, that the laying

down of the articles has to be interrupted when the full container must be exchanged against an empty container.

The invention tends to improve the foregoing. According to the invention this is achieved by providing a provisional bottom for laying a next layer of articles that are to be packed in the container. The provisional bottom can comprise a band with a width substantially corresponding to the width of the containers, while a frame, which can be moved up and down is provided, which frame carries two guide pins having a mutual distance substantially corresponding to the length of the containers.

The band can be provided with ends attached to drums and which can roll on and off said drums. In the band preferably on opening is made, substantially having the same dimensions as the bottom plane of the containers.

The invention will be further elucidated hereunder according to the drawing, in which a packing machine according to the invention is schematically shown. The drawing shows:

fig. 1 a longitudinal section through the position of the machine in which a first layer of articles is brought into the container,

fig. 2 the same as in fig. 1 but now with the frame downwardly moved over a few layers of articles,

fig. 3 the same as in fig. 1 and 2 but now with a container completely filled with articles and with the opening of the provisional bottom coming to the bottom plane of the container,

fig. 4 removing the provisional bottom, and

fig. 5 replacing the containers.

In fig. 1 a guide track 1 is shown over which track a container 2 can be moved from left to right. Plungers 3 extend out of the guide track which plunger can place the containers in a proper position opposite a transport opening 4 for articles 5, over a small distance above the guide track. By the arrows 6 and 7 it is schematically indicated, that the transport opening can move itself in two mutual perpendicular planes to insert the articles 5 neatly and uniformly into the container 2.

The articles 5 are being positioned on a provisional bottom which here has the appearance of a band 8 and is guided along guide pins 9 and 10 which can move vertically up and down, and along rolls 11 and 12 which are solidly positioned. The ends of the belt 8 are here attached to drums 13 and 14, which are provided with (not shown) drive and braking means to keep the belt under the right tension during winding up and off and moving up and down the pins 9 and 10 which are positioned on the rods 15 and 16. The rods are being guided by guide tracks 17 and driven by (now shown) means.

One could however also imagine a frame without up and off winding drums and braking means. When there is made use of a belt without ends, than exept for the drive only a provision is necessary which makes it possible to vary the length of the belt between the pins 9 and 10. This provision can comprise one or more (not shown) pulleys which are incorporated elsewhere in the endless band.

However the order of movement of the drums 13 and 14 can be different also, the cycle of movement is further elucidated hereunder according to the figures 2-5.

After the provisional bottom 8 has totally been covered with

articles, the rods 15 and 16 are moved down over a distance corresponding to the height of the articles 5, to which end the drum 14 is kept in position and the drum 13 rotates counter-clockwise. The transport opening 4 subsequently delivers a new layer of articles. This will repeat itself until the band 8 in fig. 3 touches the bottom.

It shows in fig. 3, that the part of the band in which an opening 18 is made, is to be found at both sides of the pin 9, at the moment that the container is almost full. When the drum 14 is moved in counter-clockwise direction, the opening 18 will completely coincide with the bottom of the container.

In fig. 4 the pins 9 and 10 are moved upwardly, because the drums 13 and 14 are turned with equal angle speed in opposed direction, so that the length of the band between the rolls 11 and 12 is again shorter and the provisional bottom is removed from the container. The plungers3 are going down again and the filled container can be guided away.

It shows in fig. 5, that the transport opening 4 already starts positioning the next articles on the provisional bottom while the full container is not yet replaced by a next one. From this moment on the rotation of the pins 9 and 10 and drums 13 and 14 is carried out in opposed direction in order to get the opening at last at the other side of the drum 13 again, after which the third filling cycle can start.

Although the machine, which is just described, is preferably suited for packing flexible articles, such as delivered by a vertical form, fill and seal machine the machine can also be used for packing less flexible articles, such as boxes. In the last case one has to count with extra space between the boxes and the

container in order to be able to move the provisional bottom out of the container. When this would be an objection, than one can imagine that it is cheaper to detach the band 8 from the drums 13 or 14 by turn, so that in any case in one direction no extra space is needed.

Also other embodiments than shown in the drawing are within the scope of the claims.

CLAIMS:

1. Packing machine, comprising a frame with a guide track, over which opened containers are brought below the transport opening of the articles which are to be packed, the transport opening being movably positioned in at least one plane, to devide the articles that are to be packed over a plane parallel to the plane of the guide band, characterized in that, a provisional bottom (8) is provided to lay a next layer of articles (5), which are to be packed, in the containers.

2. Machine according to claim 1, characterized in that, the provisional bottom comprises a band (8) with a width substantially corresponding to the width of the containers (2), while a frame (15, 16) is provided which can be moved up and down and carries two guide pins (9, 10) having a mutual distance substantially corresponding to the length of the containers (2).

3. Machine according to claim 1 or 2, characterized in that, the band is provided with ends attached to drums and which can roll on and off said drums.

4. Machine according to one of the claims 1-3, characterized in that, the band has an opening (18) substantially having the same dimensions as the bottom plane of the container.

5. Machine as shown in the drawing and/or discussed at the hand thereof.

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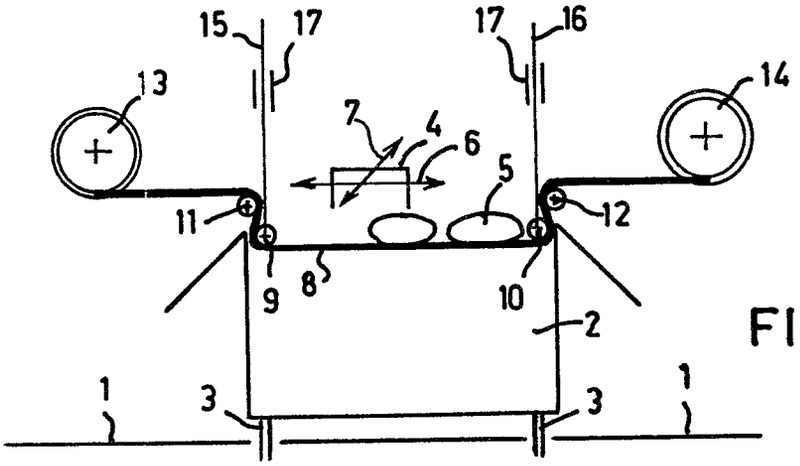

FIG. 1

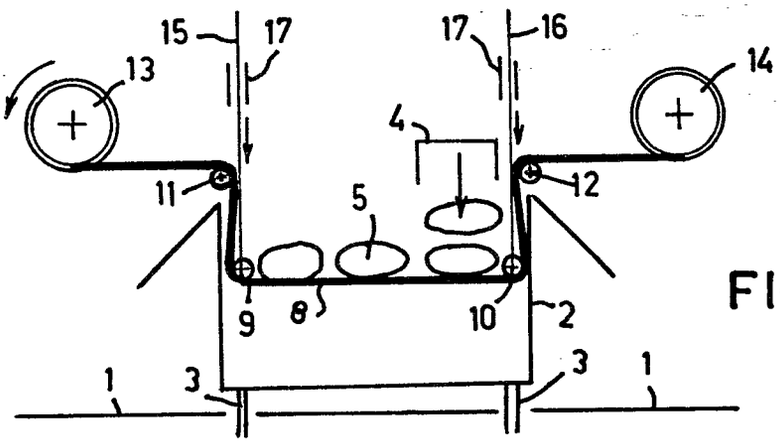

FIG. 2

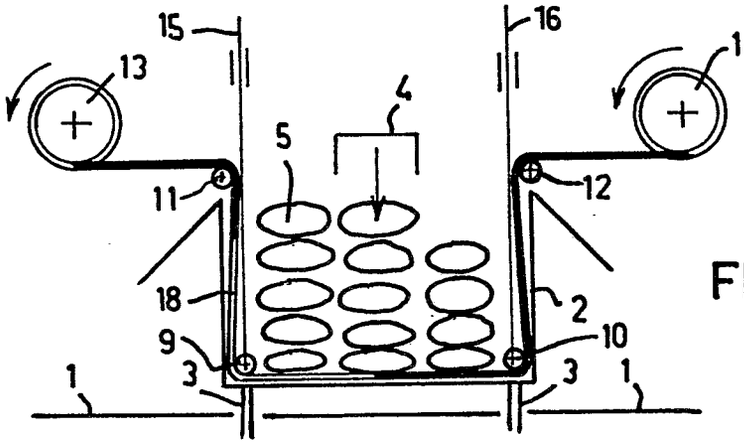

FIG. 3

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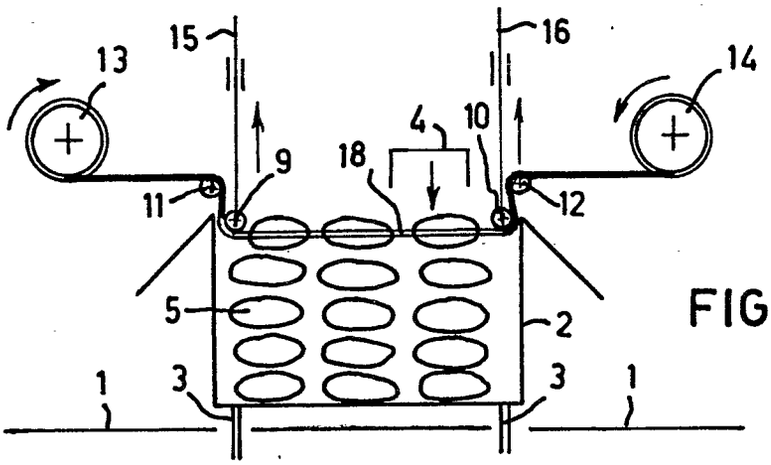

FIG. 4

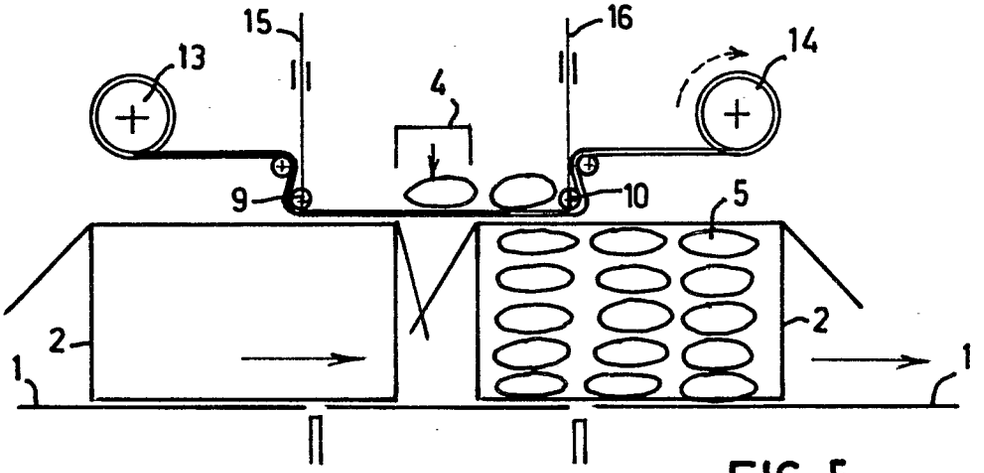

FIG. 5

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EUROPEAN SEARCH REPORT

0042199
Application number
EP 81 20 0666

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
X	US - A - 3 683 582 (SEGUIN) * Column 5, lines 9-63; figures 1,2,4-7 *	1

CLASSIFICATION OF THE APPLICATION (Int. Cl.³)

B 65 B 5/10

TECHNICAL FIELDS SEARCHED (Int. Cl.³)

B 65 B
B 65 G

CATEGORY OF CITED DOCUMENTS

X: particularly relevant
A: technological background
O: non-written disclosure
P: intermediate document
T: theory or principle underlying the invention
E: conflicting application
D: document cited in the application
L: citation for other reasons

&: member of the same patent family, corresponding document

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	20-09-1981	CLAEYS

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