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(71) Applicant (for all designated States except US): **TETRA LAVAL HOLDINGS & FINANCE S.A.** [CH/CH]; Av. Général-Guisan 70, CH-1009 Pully (CH).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **MALMSTRÖM, Bengt** [SE/SE]; Betselvägen 24, S-235 92 Vellinge (SE).

(74) Agent: **FREDRIKSSON, Anders**; Ab Tetra Pak, Patent Department, Ruben Rausings gata, S-221 86 Lund (SE).

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(54) Title: PACKAGE ALIGNER FOR CONVEYOR TRANSPORTATION

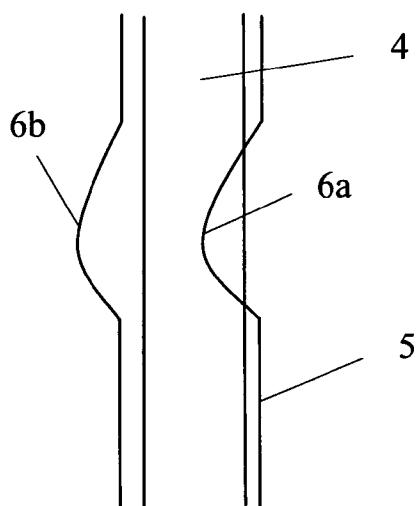


Fig 2

(57) Abstract: The present invention concerns a package aligner arranged at a conveyor belt (4). Packages (1) are transported on the conveyor belt (4) and are guided on the conveyor belt (4) by means of rails (5) placed on the sides of the conveyor belt (4). The rails (5) have an inner bend (6a) and an outer bend (6b), at which the packages (1) are partly lead off the conveyor belt (4). The packages (1) are lead that far off the conveyor belt (4) that they will be tilted. In the tilted position each package (1) is held between the conveyor belt (4) and the outer bend (6b) of the rails.

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PACKAGE ALIGNER FOR CONVEYOR TRANSPORTATION

Technical Field

5 The present invention concerns an aligner for packages on a conveyor belt.

Prior Art

 The packages are for example bottle-like packages of packaging material, such as paper-based packaging laminate, having a folded top.

10 Packages transported to a multipacker could get jammed during travel, in that they are not aligned in a proper way. Another potential drawback of previous transport systems is that a too high queue pressure will be built up. A high queue pressure means that there is a risk that the packages are pressed that hard against each other that they may break. For many automatized packers it is furthermore vital that the packages to be
15 handled are placed in a standardized orderly fashion. Previous attempts to solve these problems include equipment with some kind of vision system and servos to align packages before the packages reach a packer or packing machine.

Summary of the Invention

20 In view of the above one object of the present invention is to arrange a package aligner avoiding the above stated problems. Another object is to have a reliable aligner at a low cost.

 According to the invention a package aligner is arranged at a conveyor belt. Packages are transported on the conveyor belt and are guided by rails at the sides of the
25 conveyor belt. The rails have bends leading the packages partly off the conveyor belt. Thus, the flow of packages is forced to make its travel through a bended curve where each package leans toward a low friction railing, giving the package a natural position to be aligned. After the bend the packages are placed in a controlled way at the correct position on the conveyor belt for further actions, e.g. packing into multi packs.

30 The packages should each have a pre-defined position when being fed into a packer. In the present invention the pre-defined position means that the packages should have one side parallel with the rails after the bend. By means of the arrangement with bends of the rails it is also possible to release any pressure built-up in the queue of packages.

Even though the present invention here is mainly described as a package aligner for a packing machine, a person skilled in the art realises that the invention may be used whenever packages should be aligned or queue pressure should be released.

Further objects and advantages of the present invention will be obvious to a person skilled in the art when reading the detailed description below of embodiments of the invention.

Brief Description of the Drawings

The invention will be described further below by way of example and with reference to the enclosed drawings. In the drawings:

Fig. 1 is a side view of a conveyor for packages, at which conveyor a package aligner according to the present invention could be arranged,

Fig. 2 is a plan view of a package aligner according to the present invention,

Fig. 3 is cross sectional view of one example of a package to be received on a conveyor of Fig. 1 or 2, and

Fig. 4 is a sketch showing a package in a tilting position in the package aligner of Fig. 2.

Detailed description of Preferred Embodiments

The present invention is described in connection with transportation of packages 1 to a packer. In the packer the packages 1 are placed in some kind of multi pack. Normally the packages 1 are to be delivered to the packer in an orderly fashion. As the exact design of the packer as such is of no interest it will not be described here.

The packages 1 have a main part with two rounded sides 2 and two flat sides 3 as seen in cross section. A person skilled in the art realises that the aligner of the present invention may be used with packages of many different forms.

The packages 1 are transported on a conveyor belt 4 to the packer. The conveyor has rails 5 at both sides of the conveyor belt 4 to guide the packages 1. In the shown embodiment there are two rails 5 at each side of the conveyor belt 4, held by posts at the sides of the conveyor belt 4. A person skilled in the art realises that the form of the rails may vary. The rails 5 are positioned to keep the packages 1 on the conveyor belt 4. Normally, the rails 5 are arranged to be moveable in relation to the conveyor belt 4, for adaptation to the packages to be handled. The rails 5 may be moved up or down in relation to the conveyor belt 4 and closer or further away from the conveyor belt 4.

To align the packages 1 they are led partly out of the conveyor belt 4 in that the rails 5 have bends 6. The bends could be stated as one inner bend 6a, extending over a part of the conveyor belt 4, and an outer bend 6b, extending outside the conveyor belt 4. In the shown embodiment of Fig. 2, the inner bend 6a is placed on the right side and the outer bend 6b is placed at the left side of the conveyor. A person skilled in the art realises that it is of no importance on which side of the conveyor the inner and outer bends 6a, 6b are placed. At the bends 6 the packages 1 are brought that far out of the conveyor belt 4 that they will tilt, due to gravity. In the tilted position the packages 1 will lean on the outer bend 6b of the rails 5. The bends 6 should have a relatively low friction to let the packages 1 glide along the bends 6 after assuming the tilted positions caused by the gravity. At the bends the packages 1 are held between the conveyor band 4 and the outer bend 6b of the rails 5. Thus, the height of the rails 5 above the conveyor belt 4 should be adapted to give the packages 1 a suitable tilt at the bends 6.

In order for the packages 1 to tilt in the area of the bends 6 the packages 1 have to be brought that far to the side that more than half of the bottom areas of the packages 1 are outside the conveyor belt 4. The bends 6 of the rails 5 should be formed to give an orderly tilting of the packages 1. If the tilting movement is too quick there is a risk that the packages 1 will hit the bends 6 that hard that the packages 1 risk breaking. To control the tilting movement the form of the bends 6 may be altered, adapting how far to the side the packages 1 are brought and how far the packages 1 have to tilt before hitting the bends 6. As indicated above also the positions of the rails 5, and, thus, the bends 6, in relation to the conveyor belt 4 may be amended.

The packages 1 are normally transported on the conveyor belt 4 with the flat sides 3 of the packages 1 facing the rails 5. When the packages 1 approach the bends 6 they will first hit the right side of the bends 6, i.e. the inner bend 6a. Then the packages 1 will be guided by the inner bend 6a to the side and partly off the conveyor belt 4. During the tilting movement as the packages 1 are partly guided off the conveyor belt 4 they will automatically assume a position where each package 1 lies with a flat side 3 on the outer bend 6b of the rails 5. The package 1 will then keep that position as it is lead back onto the conveyor, i.e. with the flat sides 3 parallel with the rails 5 after the bends 6.

In another embodiment the package aligner of the present invention is used with packages having a rectangular cross section. As indicated above the aligner may be used with packages of many different forms. The aligner works in the same principle way irrespectively of the exact form of the packages.

CLAIMS

1. A package aligner of a conveyor belt (4) on which packages (1) are transported, whereby rails (5) are placed at the sides of the conveyor belt (4) to guide the packages (1), **characterized in** that the rails (5) each has a bend (6a, 6b) leading the packages (1) partly off the conveyor belt (4).
2. The package aligner of claim 1, wherein the bends (6a, 6b) are formed to lead more than half of the bottom surface of each package (1) off the conveyor belt (4).
3. The package aligner of claim 1 or 2, wherein the packages (1) each has two opposite rounded sides (2) and two opposite flat sides (3), as seen in cross section.
4. The package aligner of claim 1 or 2, wherein the packages (1) each has a rectangular cross section.
5. The package aligner of any of the previous claims, wherein the rails of the bends (6a, 6b) have a low friction against the packages (1).
6. The package aligner of any of the previous claims, wherein each package (1) is held in a tilted position between the conveyor belt (4) and one bend (6b) of the rails (5).
7. The package aligner of any of the previous claims, wherein the bends (6a, 6b) of the rails (5) are formed to bring the packages (1) back totally onto the conveyor belt (4) after the bends (6a, 6b).

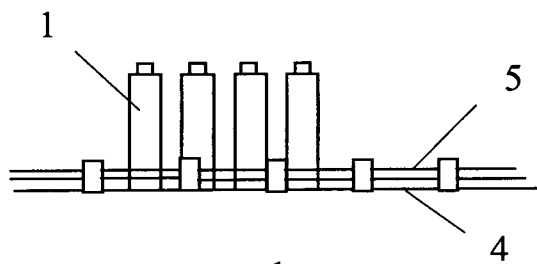


Fig 1

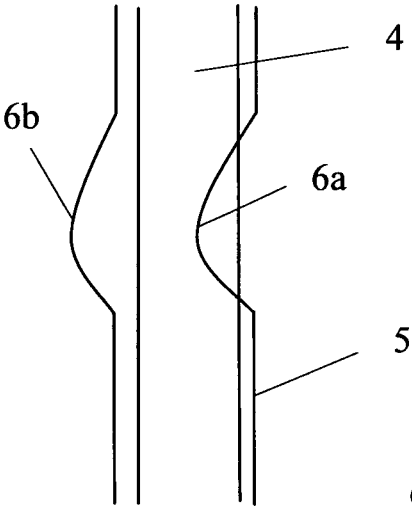


Fig 2

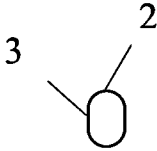


Fig 3

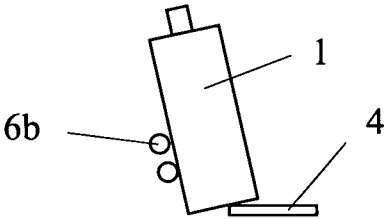


Fig 4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE2010/000005

A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: B65B, B65G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL, WPI DATA, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0283710 A1 (AB TETRA PAK), 28 Sept 1988 (28.09.1988), column 3, line 3 - line 45, figures 1,2 --	1-7
A	US 6244429 B1 (DREWITZ ET AL), 12 June 2001 (12.06.2001), figure 1, abstract --	1-7
A	WO 017073 A1 (MOORE, LESLIE, A.), 30 March 2000 (30.03.2000), figure 1, abstract -- -----	1-7



Further documents are listed in the continuation of Box C.



See patent family annex.

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Box 5055, S-102 42 STOCKHOLM

Facsimile No. +46 8 666 02 86

Authorized officer

Anette Hall / JA A

Telephone No. +46 8 782 25 00

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Cited literature, if any, will be enclosed in paper form.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

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