



PATENT SPECIFICATION

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(54) Title: A process and pack for packing potato crisps

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Title

A Process And Pack For Packing Potato Crisps.

Field of the Invention

[0001] The present invention relates to the process of packaging potato chips and a pack therefor.

Background to the Invention

[0002] This invention relates to the process for packing potato crisps into a container.

[0003] Generally, potato crisps are packaged into plastic tube bags in an upright position and sealed using a closure seam. Prior to sealing, the plastic tube bag is generally filled with nitrogen gas to both protect the product from being crushed and maintain the freshness of the product by preventing oxidation during storage. The inflated, sealed tube plastic bag acts like a pillow or cushion, which is capable of receiving a certain level of applied pressure without the bag bursting and without the product therein being crushed.

[0004] The problem associated with the packaging of potato crisps in this manner is that it is common for the product to be in the region of the closure portion of the bag. As such, it is difficult to apply to the closure seam by means of a thermal seal when such product lies across the closure portion of the bag.

[0005] A solution implemented to solve the problem associated with the above process includes the use of vibrations from air oscillations during the tube bag loading process. This results in a fast and convenient means to load the product into a tube bag, and ensures that residues from the product are removed from the closure seam region. Therefore, when the sealing means is applied to the product-loaded tube bag, the bag is successfully sealed and the absence of product residue at the sealing region ensures that the bag is correctly sealed.

[0006] However, when the potato crisps are dropped into the bag from a vertical position and/or the bag is vibrated, the product tends to congregate at the bottom of the bag, which results in a thicker and less uniformly spread volume of product within the bag. When the bag is inflated with nitrogen gas, the "cushion" formed therein will be less likely to protect the product from damage during packaging and storage as the

volume of the product is not uniform throughout the area of the inflated bag. As such, during the usual test procedure for packaged potato crisps, whereby the inflated sealed bag is compressed between two flat surfaces to determine if the bag is inflated to industry standards, the uneven distribution of the potato crisps leads to the product being crushed during testing.

[0007] A purpose of the present invention is to address some of the above problems and provide a more efficient and desirable process for filling a container with such products.

Summary of the Invention

[0008] According to the invention there is provided a process for packing potato crisps into a box with a base and side-walls, the process comprising the steps of:

- (i) dispensing potato crisps into the box through a delivery tube;
- (ii) shaking the box to settle the potato crisps in the box; and
- (iii) foil-wrapping the box.

The advantages of providing the above process is that the box protects the potato crisps from damage during storage and shipping, while wrapping the potato crisp-containing box with foil protects the potato crisps from damage by oxidation.

Furthermore, the use of the box in packing potato crisps negates the use of nitrogen gas to inflate the packaging which is generally used to both protect the product and prevent spoilage of the product therein. There is also substantially less empty space in the packaging meaning more product per unit area.

[0009] Another embodiment of the invention is wherein step (i) further comprises

- (a) moving a delivery tube for the potato crisps to a potato crisps-dispensing position in which the tube extends into the open box; and
- (b) retracting the tube from the dispensing position.

The movement of the delivery tube to a potato crisps-dispensing position and retracting the tube again permits accurate delivery of a precise quantity of potato crisps to the box. Retraction may be effected as dispensing takes place. Retraction of the tube in this way can allow for over-filling of the box. (Before the crisps are settled they generally will occupy a greater volume). During subsequent settlement the crisps will settle to a volume where they are accommodated within the box.

[0010] A further embodiment of the invention is wherein the delivery tube comprises a potato crisps-dispensing end that is substantially rectangular in cross-section. The rectangular shape of the potato crisps-dispensing end of the delivery tube ensures that the potato crisps are delivered within the boundaries of the box. The shape (and size) of the dispensing end matching that of the box ensures that there is an even delivery of the potato crisps within the internal volume of the box. It also prevents the potato crisps from being delivered outside the boundaries of the box and provides an efficient and fast process for filling a box with potato crisps.

[0011] An alternate embodiment of the invention is wherein the delivery tube is cylindrical in cross-section above the dispensing end. In such an embodiment the tube can taper into a rectangular delivery end.

[0012] The delivery tube may further comprise a trapdoor to hold the potato crisps (for example a one box fill amount of crisps) in the tube and which can be opened for dispensing the potato crisps into the box. The trapdoor provides a more controlled means of delivering the potato crisps thereto and may prevent overloading the box with potato crisps. The trapdoor ensures that only a predetermined weight of potato crisps is delivered to the box, thereby providing an efficient means of consistent delivery of a volume of potato crisps to a box.

[0013] The trapdoor may comprise at least one flap hingedly engaged with an inner wall of the tube.

[0014] Step (ii) may comprise mechanically shaking the potato crisps-containing box such so that all the potato crisps are within the box prior to step (iii). As potato crisps are a bulky product with a generally non-uniform shape, the initial delivery of a volume of potato crisps (for example from a weigh head via the delivery tube) to the box tend to be heaped up and outside the boundaries (in particular heaped above the top) of the side-walls of the box. When the box is moved to the shaking step the potato crisps are packed down into the box so that the volume of the delivered potato crisps is now within the boundaries of the box. This is advantageous in that it permits the potato crisps to settle into the box such that the potato crisps do not appear above the boundary of the box, thereby protecting the potato crisps from crushing during storage and shipping.

[0015] Another embodiment of the invention is wherein the potato crisps are weighed in a weigh head prior to step (i).

[0016] It is desirable that the box is rectangular in shape.

[0017] An alternate embodiment of the invention is wherein the tube is telescopic and can be telescopically extended for delivery of the potato crisps. The telescopic movement of the delivery tube provides the means to permit the filling of the box with a predetermined weight of potato crisps that initially will be outside the boundaries of the box, which are then settled (to a position within the boundaries of the box) using the settling step of the process. Furthermore, the telescopic movement of the delivery tube extending into and retracting from the box speeds up the process of packing the box when the box moves from step (ii) to step (iii) of the process. Telescopic extension allows the crisps to be delivered to the box from a dispensing position of the tube where a dispensing end of the tube is within the box. Telescopic retraction can allow the tube to be withdrawn so that the box can be moved on.

[0018] It will be appreciated that the filling/wrapping described above is efficiently carried out as a continuous line process where successive boxes are filled, settled and wrapped.

[0019] According to the present invention there is also provided a pack comprising a box having a base and side-walls, potato crisps held within the box, and a foil wrapper about the box to hermetically seal the potato crisps in a box. The advantage of having a pack comprising the above is that it negates the current problems of (tube) bag-packed potato crisps in regard to crushing of the product during packing, shipping and storage. The box provides extra protection to the potato crisps, while the foil wrapper provides a hermetic seal to preserve the potato crisps and also protect them from degradation for example by oxidation. It also prevents discolouration of the crisps due to exposure to light. Furthermore, the pack is also of a convenient shape that maximises the packaging volume in a storage container for the packs when said packs are being shipped to a client or being sent to storage prior to shipping.

[0020] An alternate embodiment of the invention is wherein the box further comprises a lid which is closed before the foil wrapper is applied. The advantage of the lid lies in

providing further protection to the potato crisps in the pack when said packs are being stored or shipped.

Brief Description of the Drawings

[0021] Figure 1 is a schematic of the process of the present invention.

[0022] Figure 2 is a schematic of the operation of the delivery tube used in the process of the present invention.

[0023] Figure 3 is a schematic of the delivery tube used in the process of the present invention.

[0024] Figure 4 is a schematic of the foil-wrapped pack of the present invention.

Detailed Description of the Drawings

[0025] One embodiment of the present invention will now be described with respect to the Figures. The Fig. 1 shows a schematic view of the process (1) of the present invention, wherein the process (1) comprises a box erection step (2), a box-filling (3) step, a box/product settling (4) step, a box foil wrapping (6) step, and a box/case packing (7) step.

[0026] The box-filling (3) step is further outlined in Fig. 2 and Fig. 3. Specifically, the box (12) is placed under the delivery tube (8). In general the delivery tube (8) may take the form of a funnel. The potato crisps, are weighed in weigh head (11), which is located above and over the potato crisps-receiving end (13) of the delivery tube (8). The weighed potato crisps from the weigh head (11) enter the delivery tube (8) via an (upper) potato crisps-receiving end (13) and are prevented from being dispensed to the box (12) by trapdoor (10).

[0027] After receiving the potato crisps, the delivery tube (8) is telescopically extended in the direction of arrow A in Fig. 2a such that a (lower) potato crisps-dispensing end (14) of the delivery tube (8) dips into the opening of the box (12) (Fig. 2b). The trapdoor (10) is released, with the flaps (15,16) lying essentially flush with the inner wall (17) of the potato crisps-dispensing end (14) of the delivery tube (8), allowing the potato crisps to drop into the box (12) as indicated by the arrow B (Fig. 2c). To facilitate complete filling of the box (12), the delivery tube (8) is telescopically retracted

in the direction of arrow C (Fig. 2d), which further permits the box (12) to be conveyed to the next step of the process (1).

[0028] Typically overfill will occur as the product in the dispensed unsettled form is heaped above the top of the box. To ensure that the box (12) can securely wrapped in a foil wrapper, the box (12) is shaken at the box/product settling (4) step by mechanical means for example a motor powering an eccentric weight. The shaking of the box ensures that the volume/weight of potato crisps dispensed to the box do not interfere with the foil-wrapping (6) step of the process (1). The advantageous property of this step, in conjunction with the telescopic delivery tube (8), is that the box (12) can be initially filled with potato crisps beyond the boundaries of the box, and when shaken, the potato crisps are packed down to be within the boundaries of the box (12). This step ensures that the appropriate amount of potato crisps is packed within the box (12).

[0029] Following the box/product settling (4) step, the box (12) is conveyed onto the box foil wrapping (6) step. The box (12) is wrapped by conventional foil-wrapping techniques. The wrapped box (12) is then packaged into cases for storage and transport.

[0030] Looking now in more detail at the delivery tube (8) as shown in Fig. 3, the potato crisps-receiving end (13) is cylindrical in shape, while the potato crisps-dispensing end (14) is rectangular in shape to allow for a more efficient filling of the box (12). The potato crisps-dispensing end (14) is slidably engaged with the potato crisps-receiving end (13) such that the potato crisps-dispensing end (14) slides over and covers the outer wall (20) of the potato crisps-receiving end (13), as indicated by arrow D. This slidable engagement permits the dipping and retraction of the delivery tube (8) into and away from the open box (12) during the filling (3) step, as indicated by arrows E and F.

[0031] Within the potato crisps-dispensing end (14) of the delivery tube (8) is found a trapdoor (10), hingedly engaged with the inner wall (17) potato crisps-dispensing end (14). The trapdoor (10) holds the potato crisps in the delivery tube when released from the weigh head (11). When a predetermined weight of potato crisps are held by the trapdoor (10), the trapdoor (10) is opened to allow the potato crisps to drop, or be dispensed into the open-topped box (12).

[0032] Referring now to Fig. 4, there is described a pack (21) comprising a box (not shown) with side-walls and a base, potato crisps held within the box, and a foil wrapper (22) about the box to hermetically seal the potato crisps in a box. The hermetically sealed foil wrapper forms crimped seals (23) on either end of the pack (21). The box can optionally have a lid (not shown) in addition to the side-walls and base for providing extra protection for the potato crisps when held within the box and foil wrapper (22).

[0033] In the context of the above-described embodiment, the term "potato crisps" refers to a thin slice of potato, deep fried or baked until crisp, and also encompasses potato crisps made by extruding or pressing a dough made from ground potatoes into specific shapes before frying. Furthermore, it is also understood that the term "potato crisps", commonly used in Europe and elsewhere, and the term "potato chips", commonly used in the United States of America, are interchangeable in the context of the present invention.

[0034] The words "comprises/comprising" and the words "having/including" when used herein with reference to the present invention are used to specify the presence of stated features, integers, steps or components but do not preclude the presence or addition of one or more other features, integers, steps, components or groups thereof.

[0035] It is appreciated that certain features of the invention, which are, for clarity, described in the context of separate embodiments, may also be provided in combination in a single embodiment. Conversely, various features of the invention, which are, for brevity, described in the context of a single embodiment, may also be provided separately or in any suitable sub-combination.

Claims

1. A process for packing potato crisps into a box with a base and side-walls, the process comprising the steps of:
 - (i) dispensing potato crisps into the box;
 - (ii) shaking the box to settle the potato crisps in the box; and
 - (iii) foil-wrapping the box.
2. A process according to Claim 1, wherein the step (i) further comprises
 - (a) moving a delivery tube for the potato crisps to a potato crisps-dispensing position in which position the tube extends into the open box, and
 - (b) retracting the tube from the dispensing position, and further optionally wherein the tube is telescopic and can be telescopically extended for delivery of the potato crisps.
3. A process according to Claim 1 or Claim 2, wherein the delivery tube comprises:
 - (a) a potato crisps-dispensing end that is substantially rectangular in cross-section; and/or
 - (b) a cylindrical cross-section above a potato crisps-dispensing end; and/or
 - (c) a trapdoor to hold the potato crisps in the tube and which can be opened for dispensing the potato crisps into the box, wherein the trapdoor optionally comprises at least one flap hingedly engaged with an inner wall of the tube.
4. A process according to any of the preceding Claims, wherein the potato crisps are weighed in a weigh head prior to step (i), and/or wherein step (ii) comprises mechanically shaking the potato crisps-containing box such so that all the potato crisps are within the box prior to step (iii), and further optionally wherein the box is rectangular in shape.
5. A pack comprising (i) a box having a base and side-walls; (ii) potato crisps held within the box, and (iii) a foil-wrapper about the box to hermetically seal the

potato crisps in a box and further optionally (iv) a lid which is closed before a foil wrapper is applied

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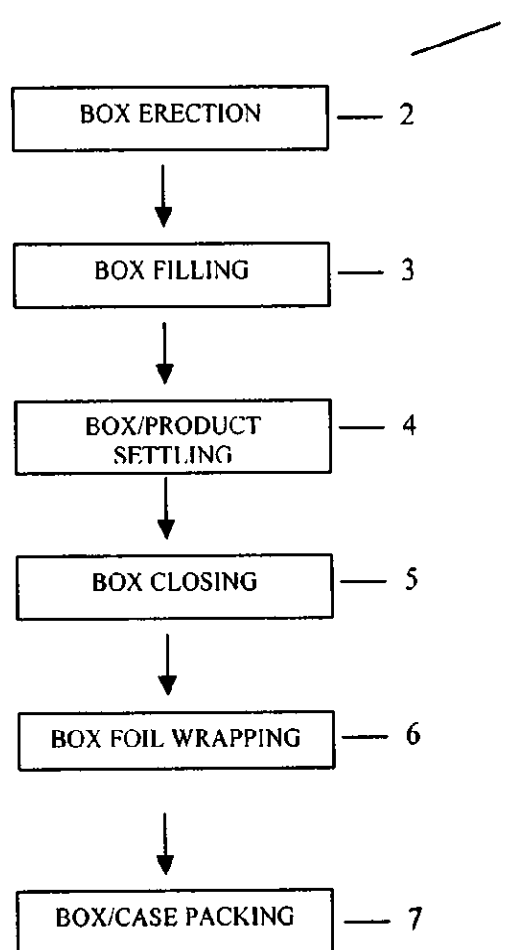


Fig. 1

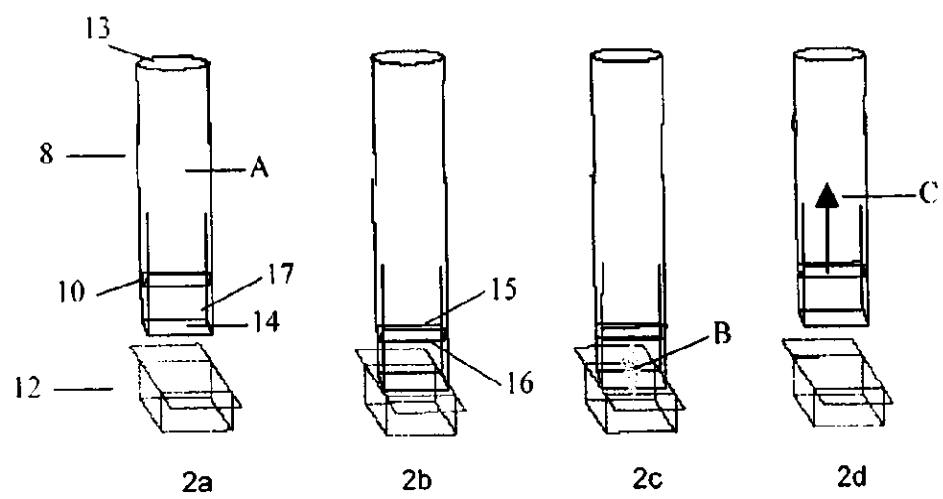


Fig. 2

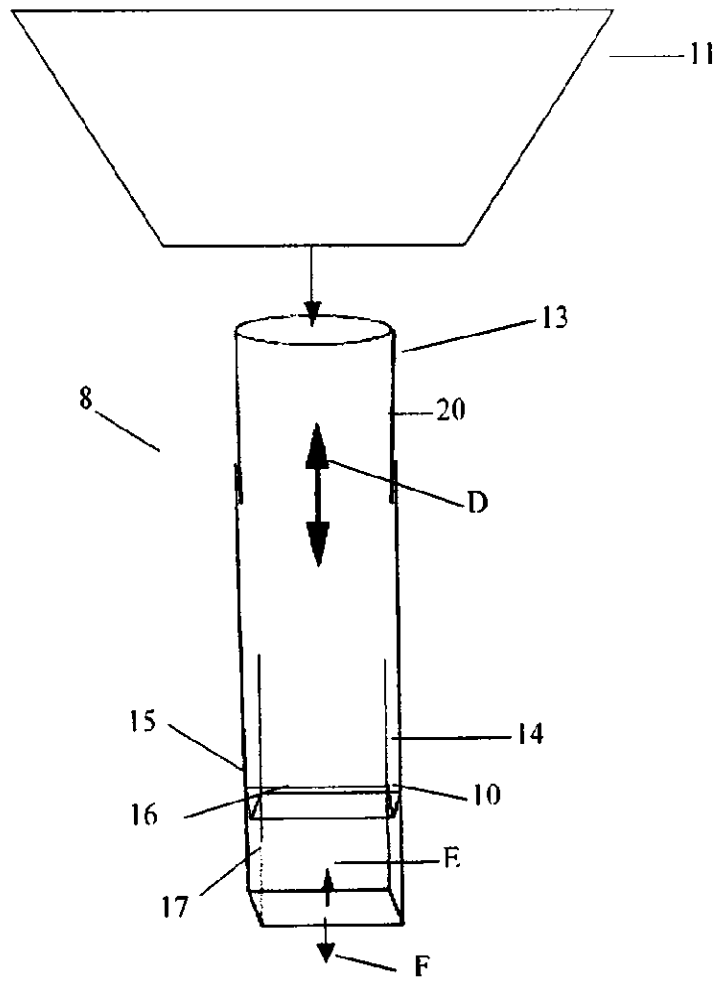


Fig. 3

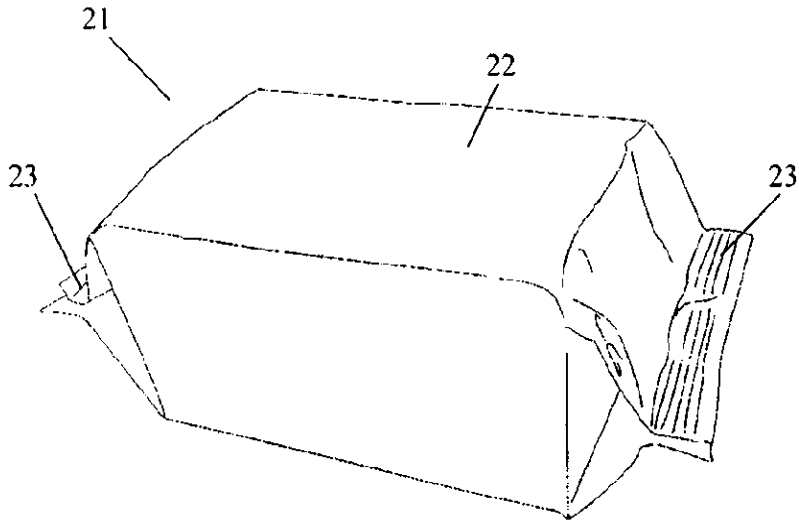


Fig. 4

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