

(19)



(11)

EP 3 233 638 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:

31.10.2018 Bulletin 2018/44

(51) Int Cl.:

B65B 5/06 (2006.01)

(86) International application number:

PCT/EP2015/079731

(21) Application number: **15808654.6**

(22) Date of filing: **15.12.2015**

(87) International publication number:

WO 2016/096810 (23.06.2016 Gazette 2016/25)

(54) **PACKAGING SNACK FOOD CHIPS**

VERPACKUNG VON IMBISSCHIPS

EMBALLAGE DE CROUSTILLES À GRIGNOTER

(84) Designated Contracting States:

**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

(72) Inventor: **WORTH, Paul**

Leicester

Leicestershire LE4 1ET (GB)

(30) Priority: **17.12.2014 GB 201422515**

(74) Representative: **Jenkins, Peter David**

Page White & Farrer

Bedford House

John Street

London WC1N 2BF (GB)

(43) Date of publication of application:

25.10.2017 Bulletin 2017/43

(73) Proprietor: **Frito-Lay Trading Company GmbH**
3011 Berne (CH)

(56) References cited:

US-A- 4 052 838 US-A1- 2001 025 470

EP 3 233 638 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

[0001] The present invention relates to a method of and apparatus for packaging a plurality of snack food chips. The present invention particularly relates to the packaging of a stack of three-dimensionally shaped seasoned snack food chips.

[0002] The manufacture of snack food chips well known. A variety of different snack food chips is known having various shapes and configurations, and compositions.

[0003] There is a general need in the snack food art to provide consumers with new taste and aesthetic experiences associated with snack foods, and new ways to package snack foods.

[0004] It is known to provide three-dimensionally shaped snack food chips as a stack in a packaging tube or canister. A known packaging method for such a stack is illustrated in Figure 5.

[0005] As shown in Figure 5, three-dimensionally shaped snack food chips 70 exit a fryer. In this example the chips are saddle shaped. The chips are oriented to that a convex lower surface 72 is supported on a conveyor (not shown) which conveys the chips 70 successively to seasoning and packaging stations 74, 76. At the seasoning station 74, seasoning is dropped downwardly onto the upper concave surface 78 of the chips 70. Then the chips 70 are flipped over, or inverted, by a flipper mechanism (not shown) to enable the re-oriented chips to be shingled together to form a shingled assembly 80. Then the shingled assembly 80 is pushed into the open bottom end 82 of a packaging canister 84 sealed at its closed top end 86 by a lid 88. Then the canister 84 is sealed by fitting a base to the bottom end 82.

[0006] The seasoned snack chips are flipped over or inverted to enable the shingled assembly to be pushed in the same direction as the conveyor into the canister, and to provide that in the packaged canister the upper seasoned surface 78 faces the top end 86. The seasoned surfaces are oriented upwardly in the packaged stack. When the consumer removes a snack chip the seasoned surface is the upper surface so that the consumer sees the seasoned surface.

[0007] However, this known packaging method, and associated apparatus, suffer from the problem that the flipping over or inversion of the seasoned snack chips causes significant loss of seasoning from the snack chip as a result of the seasoned surface being reoriented so as to face downwardly. Typically, up to about 20 wt% of the applied seasoning is lost from the chip surface. Also, the dynamic flipping action tends to cause inadvertent chip breakage and/or spillage from the conveyor. The production efficiency is reduced and there is excessive product waste, both of seasoning and snack chips.

[0008] US-A-4052838 discloses an apparatus for inserting nested articles into a container such as a canister, including a plurality of hollow sleeve members to be filled with a charge of nested articles, which are subsequently

inserted into a canister placed over the sleeve member by rotation of the array of sleeve members.

[0009] There is a need in the art to provide a method of and apparatus for packaging a stack of three-dimensionally shaped snack food chips that can provide higher production efficiency and reduced product waste, both of seasoning and of snack chips, in the form of broken and/or spilled snack chips. There is also a need in the art to provide such a method and apparatus which can be implemented in a snack food chip manufacturing line in a cost-effective manner with regard to both capital costs and production costs.

[0010] The present invention aims at least partially to meet those needs.

[0011] The present invention accordingly provides a method of packaging snack food chips, the method comprising the steps of:

- a) conveying a plurality of snack food chips through a seasoning station at which a seasoning is deposited onto an upper surface of the snack food chips;
- b) conveying the seasoned snack food chips in a conveying direction to an assembly station downstream of the seasoning station to provide at the assembly station a linear series of a plurality of the seasoned snack food chips, the linear series extending in the conveying direction between rear and front snack food chips of the linear series;
- c) at the assembly station, shingling together snack food chips of the linear series to form a shingled assembly of the linear series in which the seasoned surface of the seasoned snack food chips is at least partly oriented towards a reverse direction substantially opposite to the conveying direction;
- d) inserting the shingled assembly into an open first end of a packaging container, which container is closed at an opposite second end thereof by an openable closure, so that the shingled assembly substantially fills the packaging container as a stack with the seasoning surfaces oriented towards the openable closure, in the insertion step the rear snack food chip of the linear series being the first snack food chip of the shingled assembly to enter the packaging container; and
- e) applying a base to close the first end and package the shingled assembly within the packaging container.

[0012] The present invention further provides an apparatus for packaging snack food chips according to claim 10 or claim 13.

[0013] Preferred features of these aspects of the present invention are defined in the dependent claims. The preferred embodiments of the present invention can provide a method and apparatus for packaging seasoned a stack of three-dimensionally shaped snack food chips into a container with reduced or minimal loss of seasoning which has been applied to the snack food chips. The

preferred embodiments of the present invention can further provide a low cost method and apparatus for packaging such a stack of three-dimensionally shaped snack food chips which has low production costs as well as low capital expenditure. The conveying and insertion apparatus may be retrofitted to an existing snack food chip packaging production line. Although the invention has particular application to the manufacture of shaped tortilla chips, the method or the present invention may be used to produce a variety of different snack food chip compositions, as well as shapes. For example, the snack food chip may comprise any cereal-based composition, and may comprise any of, any mixture of, or all of, maize, wheat, barley, rice or any other grain-derived product, as well as any seasoning, either within the cereal-based composition and/or applied as a topical seasoning. Alternatively, the snack food chip may comprise any vegetable-based composition, for example based on potato, either alone or in admixture with any other vegetable, or any cereal as described above.

[0014] The snack food chips may be provided with other product design features to improve eating quality, for example particular flavourings or texturizing components. The snack food chips are packaged so as to be provided in a consumer acceptable retail format, for example a packaging tube or carton, typically hermetically sealed, which is compatible with a retail sales environment.

[0015] Embodiments of the present invention will now be described by way of example only with reference to the accompanying drawings, in which:

Figure 1 schematically illustrates an apparatus for use in a method for packaging snack food chips in accordance with a first embodiment of the present invention;

Figure 2 schematically illustrates an embodiment of the packaging method using the apparatus illustrated in Figure 1;

Figure 3 schematically illustrates an apparatus for use in a method for packaging snack food chips in accordance with a second embodiment of the present invention;

Figure 4 schematically illustrates an embodiment of the packaging method using the apparatus illustrated in Figure 3; and

Figure 5 schematically illustrates a known packaging method for packaging a stack of shingled snack food chips into a packaging tube.

[0016] Referring to Figure 1 of the accompanying drawings, there is schematically shown an apparatus for use in a method for packaging snack food chips, in particular tortilla chips, in accordance with an embodiment

of the present invention.

[0017] The snack chips may have any desired composition, and may include any cereal-based composition or vegetable-based composition suitable for making a snack food dough which may be subsequently cooked, for example by frying, baking, toasting, microwave cooking, or any other suitable cooking process, or any combination of cooking processes, to produce the desired taste and texture, for example a crispy texture, in the resultant chip. The dough may typically comprise a maize-based dough for the manufacture of snack food chips in the form of tortilla chips.

[0018] The snack chips may be regularly shaped, for example being triangular, square, rectangular, elliptical, etc., or be irregularly shaped. Typically, the snack chips have a surface area of from 1000 to 2500 mm² and a maximum dimension of from 30 to 100 mm.

[0019] The snack food chips packaged according to the present invention are three-dimensionally shaped snack food chips, and in particular may be shaped and dimensioned so as to be suitable for use together with a dip, such as a salsa composition, cream cheese, avocado composition, etc. which are well known in the snack food art.

[0020] The apparatus for packaging snack food chips, designated generally by reference numeral 2, comprises a conveying mechanism 4 for conveying a plurality of snack food chips in a conveying direction D. The conveying direction D is typically linear, i.e. straight, but may be curved or serpentine.

[0021] A seasoning station 6 is located above the conveying mechanism 4. At the seasoning station 6 a seasoning, which may be in powder and/or liquid form, is deposited downwardly onto an upper surface of a plurality of snack food chips on the conveying mechanism 4.

[0022] An assembly station 8 is downstream, in the conveying direction D, of the seasoning station 6. The conveying mechanism 4 is arranged to convey the seasoned snack food chips to the assembly station 8. The assembly station 8 comprises a shingling mechanism 10 arranged to shingle together a linear series of a plurality of the seasoned snack food chips. This shingling step forms a shingled assembly extending in the conveying direction D from rear to front snack food chips of the linear series.

[0023] A holding mechanism 12 is provided for holding a packaging tube 14. The tube may comprise a known canister, such as a cardboard tube covered at one end with sealing film which in turn is covered by a snap-fit removable lid, for example of polyethylene.

[0024] An insertion mechanism 16 arranged to insert the shingled assembly into an open first end 18 of the packaging tube 14 held by the holding mechanism 12 at an insertion station 20. The insertion mechanism 16 is adapted so that the rear snack food chip of the linear series is the first snack food chip of the shingled assembly to enter the packaging tube 14.

[0025] There is also provided a base applicator 22 for

applying a base (not shown) to close the first end 18 and package the shingled assembly within the packaging tube 14.

[0026] In the embodiment of Figure 1, during the insertion the holding mechanism 12 is arranged to be static and the insertion mechanism 16 is arranged to push the shingled assembly into the packaging tube 14. In an alternative embodiment, not illustrated, during the insertion the holding mechanism 12 is arranged to move towards the insertion mechanism 16 and the insertion mechanism 16 is arranged to push the shingled assembly into the packaging tube 14.

[0027] In the embodiment of the apparatus of Figure 1, the insertion mechanism 16 is adapted to move the shingled assembly from the assembly station 8 to the insertion station 20 in a reverse direction R relative to the conveying direction D.

[0028] An embodiment of the packaging method using the apparatus of Figure 1 will now be described with reference to Figure 2.

[0029] In a first step of the method a plurality of snack food chips 24 are conveyed in the conveying direction D by the conveying mechanism 4 through the seasoning station 6 at which the seasoning, which may be powder and/or liquid as described above, is deposited onto an upper surface 26 of the snack food chips 24. The snack food chips 24 are three dimensionally shaped and mutually stackable, preferably nestable, for example saddle shaped. In the illustrated embodiment the snack food chips 24 are substantially convex on a first side 28 and substantially concave on an opposite second side 30. The seasoning is applied to the substantially concave second side 30.

[0030] Thereafter the seasoned snack food chips 24 are conveyed by the conveying mechanism 4 in the conveying direction D to the assembly station 8 downstream of the seasoning station 6 to provide at the assembly station 8 a linear series 32 of a plurality of the seasoned snack food chips 24. The linear series 32 extends in the conveying direction D between rear and front snack food chips 34, 36 of the linear series 32.

[0031] At the assembly station 8, the shingling mechanism 10 shingles together the snack food chips 24 of the linear series 32 to form a shingled assembly 38 of the linear series 32 in which the seasoned surface 26 of the seasoned snack food chips 24 is at least partly oriented towards the reverse direction R, which is substantially opposite to the conveying direction D. In the shingled assembly 38, a rear side 30, which is the upper seasoned surface 26, of the snack food chips 24 receives therein a front side 28 of any snack food chip 24 which is adjacent thereto in the reverse direction R.

[0032] Then, the insertion mechanism 16 inserts the shingled assembly 38 into the open first end 18 of the packaging tube 14. The tube 14 is closed at an opposite second end 40 thereof by an openable closure 42, such as a sealing film covered by a snap-fit removable lid. After the insertion the shingled assembly 38 substantially fills

the packaging tube 14 with the seasoned surfaces 26 oriented towards the openable closure 42.

[0033] In the embodiment illustrated in Figure 2, the shingled assembly 38 is moved in the reverse direction R between the assembly and insertion steps. In the insertion step the rear snack food chip 34 of the linear series 32 is the first snack food chip 24 of the shingled assembly 38 to enter the packaging tube 14. Finally the base applicator 22 applies a base (not shown) to close the first end 18 and package the shingled assembly 38 within the packaging tube 14.

[0034] The seasoned upper surface 26 of the snack food chips 24 is oriented upwardly during the insertion step. Between the seasoning step and the insertion step the seasoned upper surface 26 of the snack food chips 24 is not inverted so as to be oriented downwardly. This means that seasoning is not inadvertently lost from the seasoned surfaces by inversion of the seasoned snack food chips as in the known packaging process described hereinabove.

[0035] In the illustrated embodiment, during the insertion the packaging tube 14 is static and the shingled assembly 38 is pushed into the packaging tube 14. Alternatively, during the insertion the shingled assembly 38 is inserted by relative movement between the packaging tube 14 and the shingled assembly 38.

[0036] Figures 3 and 4 schematically show an alternative embodiment of the packaging apparatus and method of the present invention. In this embodiment, prior to the insertion station 20 a rotation mechanism 50 is provided for rotating the shingled assembly 38 about a vertical axis X orthogonal to the conveying direction D. Such rotation orients the shingled assembly 38 in a third direction. In the illustrated embodiment, the rotation mechanism 50 is adapted to rotate the shingled assembly about an angle of about 180° and the third direction is the same as the conveying direction D. The insertion mechanism 16 inserts the shingled assembly 38 into the open first end 18 along the third direction.

[0037] In an alternative embodiment, the shingled assembly 38 is rotated about an angle of other than about 180°, for example 90°, and the third direction is inclined to the conveying direction D.

[0038] Various other modifications to the apparatus and method of the present invention will be readily apparent to those skilled in the art.

Claims

1. A method of packaging snack food chips, the method comprising the steps of:
 - a) conveying a plurality of snack food chips (24) through a seasoning station (6) at which a seasoning is deposited onto an upper surface (26) of the snack food chips;
 - b) conveying the seasoned snack food chips in

- a conveying direction (D) to an assembly station (8) downstream of the seasoning station to provide at the assembly station a linear series (32) of a plurality of the seasoned snack food chips, the linear series extending in the conveying direction between rear and front snack food chips (34, 36) of the linear series;
- c) at the assembly station, shingling together snack food chips of the linear series to form a shingled assembly (38) of the linear series in which the seasoned surface of the seasoned snack food chips is at least partly oriented towards a reverse direction (R) substantially opposite to the conveying direction;
- d) inserting the shingled assembly into an open first end (18) of a packaging container (14), which container is closed at an opposite second end (40) thereof by an openable closure (42), so that the shingled assembly substantially fills the packaging container as a stack with the seasoning surfaces oriented towards the openable closure, in the insertion step the rear snack food chip of the linear series being the first snack food chip of the shingled assembly to enter the packaging container; and
- e) applying a base to close the first end and package the shingled assembly within the packaging container.
2. A method according to claim 1 wherein in inserting step d) the shingled assembly (38) is inserted by relative movement between the packaging container (14) and the shingled assembly, optionally wherein the packaging container is static and the shingled assembly is pushed into the packaging container.
 3. A method according to claim 2 wherein in inserting step d) the packaging container is static and the shingled assembly is moved in the reverse direction (R).
 4. A method according to claim 1 or claim 2 wherein prior to inserting step d) the shingled assembly (38) is rotated about an axis (X) orthogonal to the conveying direction (D) so as to orient the shingled assembly in a third direction and in inserting step d) the shingled assembly is inserted in the third direction, optionally wherein the axis is vertical.
 5. A method according to claim 4 wherein in inserting step d) the packaging container (14) is static and the shingled assembly (38) is moved in the third direction.
 6. A method according to claim 4 or claim 5 wherein: the shingled assembly (38) is rotated about an angle of about 180° and the third direction is the same as the conveying direction (D); or the shingled assembly is rotated about an angle of other than about 180° and the third direction is inclined to the conveying direction.
 7. A method according to any one of claims 1 to 6 wherein the snack food chips (24) are three dimensionally shaped and mutually stackable, optionally nestable, further optionally wherein the snack food chips are substantially convex on a first side (28) and substantially concave on an opposite second side (30), yet further optionally wherein the seasoning is applied to the substantially concave second side.
 8. A method according to claim 7 wherein in the shingled assembly (38) formed in step c) a rear side (30) of the snack food chips receives therein a front side (28) of any snack food chip (24) which is adjacent thereto in the reverse direction (R).
 9. A method according to any foregoing claim wherein: the seasoned upper surface (26) of the snack food chips (24) is oriented upwardly during the insertion step; and/or between the seasoning step and the insertion step the seasoned upper surface (26) of the snack food chips (24) is not inverted so as to be oriented downwardly.
 10. An apparatus for packaging snack food chips (2), the apparatus comprising: a conveying mechanism (4) for conveying a plurality of snack food chips in a conveying direction (D); a seasoning station (6), located above the conveying mechanism, for depositing a seasoning onto an upper surface of a plurality of snack food chips on the conveying mechanism; an assembly station (8) downstream of the seasoning station, the conveying mechanism being arranged to convey the seasoned snack food chips to the assembly station, the assembly station comprising a shingling mechanism (10) arranged to shingle together a linear series of a plurality of the seasoned snack food chips to form a shingled assembly extending in the conveying direction from rear to front snack food chips of the linear series; a holding mechanism (12) for holding a packaging container (14); and an insertion mechanism (16) arranged to insert the shingled assembly as a stack into an open first end (18) of a packaging container held by the holding mechanism at an insertion station (20), with the rear snack food chip of the linear series being the first snack food chip of the shingled assembly to enter the packaging container, **characterised in that** the insertion mechanism is adapted to move the shingled assembly from the assembly station to the insertion station in a reverse direction (R) relative to the conveying direction.
 11. An apparatus (2) according to claim 11 further comprising a base applicator (22) for applying a base to close the first end (18) and package the shingled

assembly within the packaging container (14).

12. An apparatus (2) according to claim 11 or claim 12 wherein during the insertion: the holding mechanism (12) is arranged to be static and the insertion mechanism (16) is arranged to push the shingled assembly into the packaging container (14); or the holding mechanism is arranged to move towards the insertion mechanism and the insertion mechanism is arranged to push the shingled assembly into the packaging container.
13. An apparatus (2) for packaging snack food chips, the apparatus comprising: a conveying mechanism (4) for conveying a plurality of snack food chips in a conveying direction (D); a seasoning station (6), located above the conveying mechanism, for depositing a seasoning onto an upper surface of a plurality of snack food chips on the conveying mechanism; an assembly station (8) downstream of the seasoning station, the conveying mechanism being arranged to convey the seasoned snack food chips to the assembly station, the assembly station comprising a shingling mechanism (10) arranged to shingle together a linear series of a plurality of the seasoned snack food chips to form a shingled assembly extending in the conveying direction from rear to front snack food chips of the linear series; a holding mechanism (12) for holding a packaging container (14); and an insertion mechanism (16) arranged to insert the shingled assembly as a stack into an open first end (18) of a packaging container held by the holding mechanism at an insertion station (20), with the rear snack food chip of the linear series being the first snack food chip of the shingled assembly to enter the packaging container, **characterised by** a rotation mechanism (50) for rotating the shingled assembly about a vertical axis (X) orthogonal to the conveying direction so as to orient the shingled assembly in a third direction, wherein the insertion mechanism inserts the shingled assembly into the open first end along the third direction.
14. An apparatus (2) according to claim 14 further comprising a base applicator (22) for applying a base to close the first end (18) and package the shingled assembly within the packaging container (14).
15. An apparatus (2) according to claim 14 or claim 15 wherein during the insertion: the holding mechanism (12) is arranged to be static and the insertion mechanism (16) is arranged to push the shingled assembly into the packaging container (14); or the holding mechanism is arranged to move towards the insertion mechanism and the insertion mechanism is arranged to push the shingled assembly into the packaging container.

16. An apparatus (2) according to any one of claims 14 to 16 wherein: the rotation mechanism (50) is adapted to rotate the shingled assembly about an angle of about 180° and the third direction is the same as the conveying direction (D); or wherein the rotation mechanism is adapted to rotate the shingled assembly about an angle of other than about 180° and the third direction is inclined to the conveying direction.

Patentansprüche

1. Verfahren zum Verpacken von Imbisschips, wobei das Verfahren die folgenden Schritte beinhaltet:
- a) Befördern einer Mehrzahl von Imbisschips (24) durch eine Würzstation (6), in der ein Gewürz auf eine Oberseite (26) der Imbisschips abgesetzt wird;
 - b) Befördern der gewürzten Imbisschips in einer Förderrichtung (D) zu einer Konfektionierungsstation (8) unterhalb der Würzstation, um an der Konfektionierungsstation eine lineare Serie (32) aus einer Mehrzahl der gewürzten Imbisschips bereitzustellen, wobei die lineare Serie in der Förderrichtung zwischen hinteren und vorderen Imbisschips (34, 36) der linearen Serie verläuft;
 - c) Zusammenschindeln, an der Konditionierungsstation, von Imbisschips der linearen Serie zum Bilden einer geschindelten Gruppe (38) der linearen Serie, in der die gewürzte Oberfläche der gewürzten Imbisschips wenigstens teilweise in einer Umkehrrichtung (R) im Wesentlichen entgegengesetzt zur Förderrichtung orientiert ist;
 - d) Einführen der geschindelten Gruppe in ein offenes erstes Ende (18) eines Verpackungsbehälters (14), wobei der Behälter an einem gegenüberliegenden zweiten Ende (40) davon durch einen offenbaren Verschluss (42) verschlossen ist, so dass die geschindelte Gruppe den Verpackungsbehälter als Stapel mit den gewürzten Oberflächen in Richtung des offenbaren Verschlusses im Wesentlichen füllt, wobei in dem Einführungsschritt der hintere Imbisschip der linearen Serie der erste Imbisschip der geschindelten Gruppe ist, der in den Verpackungsbehälter eintritt; und
 - e) Anbringen einer Basis zum Schließen des ersten Endes und Verpacken der geschindelten Gruppe in den Verpackungsbehälter.
2. Verfahren nach Anspruch 1, wobei die geschindelte Gruppe (38) in dem Einführungsschritt (d) durch eine relative Bewegung zwischen dem Verpackungsbehälter (14) und der geschindelten Gruppe eingeführt wird, wobei der Verpackungsbehälter optional statisch ist und die geschindelte Gruppe in den Verpa-

ckungsbehälter geschoben wird.

3. Verfahren nach Anspruch 2, wobei der Verpackungsbehälter in dem Einführungsschritt d) statisch ist und die geschindelte Gruppe in Umkehrrichtung (R) bewegt wird. 5
4. Verfahren nach Anspruch 1 oder Anspruch 2, wobei vor dem Einführungsschritt d) die geschindelte Gruppe (38) um eine Achse (X) orthogonal zur Förderrichtung (D) gedreht wird, um die geschindelte Gruppe in einer dritten Richtung zu orientieren, und im Einführungsschritt d) die geschindelte Gruppe in der dritten Richtung eingeführt wird, wobei die Achse optional vertikal ist. 10
5. Verfahren nach Anspruch 4, wobei im Einführungsschritt d) der Verpackungsbehälter (14) statisch ist und die geschindelte Gruppe (38) in der dritten Richtung bewegt wird. 15
6. Verfahren nach Anspruch 4 oder Anspruch 5, wobei: die geschindelte Gruppe (38) um einen Winkel von etwa 180° gedreht wird und die dritte Richtung dieselbe ist wie die Förderrichtung (D); oder die geschindelte Gruppe um einen anderen Winkel als etwa 180° gedreht wird und die dritte Richtung zur Förderrichtung geneigt ist. 20
7. Verfahren nach einem der Ansprüche 1 bis 6, wobei die Imbisschips (24) dreidimensional geformt und zusammen gestapelt, optional vernestet werden können, wobei ferner optional die Imbisschips auf einer ersten Seite (28) im Wesentlichen konvex und auf einer gegenüberliegenden zweiten Seite (30) im Wesentlichen konkav sind, wobei jedoch ferner optional das Gewürz auf die im Wesentlichen konkave zweite Seite aufgebracht wird. 25
8. Verfahren nach Anspruch 7, wobei in der in Schritt c) gebildeten geschindelten Gruppe (38) eine Rückseite (30) der Imbisschips eine Vorderseite (28) eines in Rückwärtsrichtung (R) daneben befindlichen Imbisschips (24) darin aufnimmt. 30
9. Verfahren nach einem vorherigen Anspruch, wobei: die gewürzte Oberseite (26) der Imbisschips (24) während des Einführungsschritts nach oben orientiert ist; und/oder zwischen dem Würzschrift und dem Einführungsschritt die gewürzte Oberseite (26) der Imbisschips (24) nicht umgekehrt wird, so dass sie nach unten orientiert ist. 35
10. Vorrichtung zum Verpacken von Imbisschips (2), wobei die Vorrichtung Folgendes umfasst: einen Fördermechanismus (4) zum Befördern einer Mehrzahl von Imbisschips in einer Förderrichtung (D); eine Würzstation (6), die sich über dem Fördermecha-

nismus befindet, zum Absetzen eines Gewürzes auf eine Oberseite einer Mehrzahl von Imbisschips auf dem Fördermechanismus; eine Konfektionierungsstation (8) unterhalb der Würzstation, wobei der Fördermechanismus zum Befördern der gewürzten Imbisschips zu der Konfektionierungsstation ausgelegt ist, wobei die Konfektionierungsstation einen Schindelungsmechanismus (10) umfasst, ausgelegt zum Zusammenschindeln einer linearen Serie aus einer Mehrzahl der gewürzten Imbisschips zum Bilden einer geschindelten Gruppe, die in der Förderrichtung von hinteren zu vorderen Imbisschips der linearen Serie verläuft; einen Haltemechanismus (12) zum Halten eines Verpackungsbehälters (14); und einen Einführungsmechanismus (16), ausgelegt zum Einführen der geschindelten Gruppe als einen Stapel in ein offenes erstes Ende (18) eines Verpackungsbehälters, der vom Haltemechanismus an einer Einführungsstation (20) gehalten wird, wobei der hintere Imbisschip der linearen Serie der erste Imbisschip der geschindelten Gruppe ist, der in den Verpackungsbehälter eintritt, **dadurch gekennzeichnet, dass** der Einführungsmechanismus zum Bewegen der geschindelten Gruppe von der Konfektionierungsstation zur Einführungsstation in einer Umkehrrichtung (R) relativ zur Förderrichtung ausgelegt ist.

11. Vorrichtung (2) nach Anspruch 11, die ferner einen Basisapplikator (22) zum Aufbringen einer Basis zum Verschließen des ersten Endes (18) und zum Verpacken der geschindelten Gruppe im Verpackungsbehälter (14) umfasst. 30
12. Vorrichtung (2) nach Anspruch 11 oder Anspruch 12, wobei während des Einführens: der Haltemechanismus (12) so ausgelegt ist, dass er statisch ist, und der Einführungsmechanismus (16) zum Schieben der geschindelten Gruppe in den Verpackungsbehälter (14) ausgelegt ist; oder der Haltemechanismus so ausgelegt ist, dass er sich in Richtung des Einführungsmechanismus bewegt, und der Einführungsmechanismus so ausgelegt ist, dass er die geschindelte Gruppe in den Verpackungsbehälter schiebt. 35
13. Vorrichtung (2) zum Verpacken von Imbisschips, wobei die Vorrichtung Folgendes umfasst: einen Fördermechanismus (4) zum Befördern einer Mehrzahl von Imbisschips in einer Förderrichtung (D); eine Würzstation (6), die sich über dem Fördermechanismus befindet, zum Absetzen eines Gewürzes auf eine Oberseite einer Mehrzahl von Imbisschips auf dem Fördermechanismus; eine Konfektionierungsstation (8) unterhalb der Würzstation, wobei der Fördermechanismus zum Befördern der gewürzten Imbisschips zu der Konfektionierungsstation ausgelegt ist, wobei die Konfektionierungsstation einen Schin-

delungsmechanismus (10) umfasst, ausgelegt zum Zusammenschindeln einer linearen Serie aus einer Mehrzahl der gewürzten Imbisschips zum Bilden einer geschindelten Gruppe, die in der Förderrichtung von hinteren zu vorderen Imbisschips der linearen Serie verläuft; einen Haltemechanismus (12) zum Halten eines Verpackungsbehälters (14); und einen Einführungsmechanismus (16), ausgelegt zum Einführen der geschindelten Gruppe als einen Stapel in ein offenes erstes Ende (18) eines von dem Haltemechanismus an einer Einführungsstation (20) gehaltenen Verpackungsbehälters, wobei der hintere Imbisschip der linearen Serie der erste Imbisschip der geschindelten Gruppe ist, der in den Verpackungsbehälter eintritt, **gekennzeichnet durch** einen Drehmechanismus (50) zum Drehen der geschindelten Gruppe um eine vertikale Achse (X) orthogonal zur Förderrichtung, um die geschindelte Gruppe in einer dritten Richtung zu orientieren, wobei der Einführungsmechanismus die geschindelte Gruppe in das offene erste Ende in der dritten Richtung einführt.

14. Vorrichtung (2) nach Anspruch 14, die ferner einen Basisapplikator (22) zum Aufbringen einer Basis zum Verschließen des ersten Endes (18) und zum Verpacken der geschindelten Gruppe in dem Verpackungsbehälter (14) umfasst.
15. Vorrichtung (2) nach Anspruch 14 oder Anspruch 15, wobei während des Einführens: der Haltemechanismus (12) so ausgelegt ist, dass er statisch ist, und der Einführungsmechanismus (16) zum Schieben der geschindelten Gruppe in den Verpackungsbehälter (14) ausgelegt ist; oder der Haltemechanismus zum Bewegen in Richtung des Einführungsmechanismus ausgelegt ist und der Einführungsmechanismus zum Schieben der geschindelten Gruppe in den Verpackungsbehälter ausgelegt ist.
16. Vorrichtung (2) nach einem der Ansprüche 14 bis 16, wobei: der Drehmechanismus (50) zum Drehen der geschindelten Gruppe um einen Winkel von etwa 180° ausgelegt ist und die dritte Richtung dieselbe ist wie die Förderrichtung (D); oder wobei der Drehmechanismus zum Drehen der geschindelten Gruppe um einen anderen Winkel als etwa 180° ausgelegt ist und die dritte Richtung zur Förderrichtung geneigt ist.

Revendications

1. Procédé pour emballer des croustilles à grignoter, le procédé comprenant les étapes consistant à :
 - a) transporter une pluralité de croustilles à grignoter (24) vers une station d'assaisonnement

(6) où un assaisonnement est déposé sur une surface supérieure (26) des croustilles à grignoter ;

b) transporter les croustilles à grignoter dans une direction de transport (D) vers une station d'assemblage (8) en aval de la station d'assaisonnement, pour fournir, à hauteur de la station d'assemblage, une série linéaire (32) d'une pluralité de croustilles à grignoter assaisonnées, la série linéaire s'étendant dans le sens du transport entre les croustilles à grignoter postérieures et antérieures (34, 36) de la série linéaire ;

c) à hauteur de la station d'assemblage, en faisant chevaucher des croustilles à grignoter de la série linéaire, pour former un ensemble chevauché (38) de la série linéaire dans lequel la surface assaisonnée des croustilles à grignoter assaisonnées est au moins en partie orientée vers une direction inverse (R) sensiblement opposée à la direction de transport ;

d) insérer l'ensemble chevauché dans une première extrémité ouverte (18) d'un récipient d'emballage (14), lequel récipient est fermé à une deuxième extrémité opposée (40) de celui-ci par une fermeture ouvrable (42), de sorte que l'ensemble chevauché remplit sensiblement le récipient d'emballage sous forme de pile, les surfaces d'assaisonnement étant orientées vers la fermeture ouvrable, à l'étape d'insertion la croustille à grignoter postérieure de la série linéaire étant la première croustille à grignoter de l'ensemble chevauché à entrer dans le récipient d'emballage ; et

e) appliquer une base pour fermer la première extrémité et emballer l'ensemble chevauché dans le récipient d'emballage.

2. Procédé selon la revendication 1, dans lequel à l'étape d'insertion d) l'ensemble chevauché (38) est inséré par un mouvement relatif exercé entre le récipient d'emballage (14) et l'ensemble chevauché, éventuellement dans lequel le récipient d'emballage est statique et l'ensemble chevauché est poussé dans le récipient d'emballage.

3. Procédé selon la recommandation 2, dans lequel à l'étape d'insertion d) le récipient d'emballage est statique et l'ensemble chevauché est déplacé dans la direction inverse (R) .

4. Procédé selon, soit la recommandation 1, soit la recommandation 2, dans lequel précédant l'étape d'insertion d) l'on fait tourner l'ensemble chevauché (38) sur un axe (X) perpendiculairement à la direction de transport (D), de sorte à orienter l'ensemble chevauché vers une troisième direction et, à l'étape d'insertion d) l'ensemble chevauché est inséré dans la troisième direction, éventuellement dans lequel l'axe

est vertical.

5. Procédé selon la revendication 4, dans lequel à l'étape d'insertion d) le récipient d'emballage (14) est statique et l'ensemble chevauché (38) est déplacé dans la troisième direction.
6. Procédé selon, soit la recommandation 4, soit la recommandation 5, dans lequel : on fait tourner l'ensemble chevauché (38) sur un angle d'environ 180° et la troisième direction est la même que la direction de transport (D) ; ou l'on fait tourner l'ensemble chevauché sur angle autre que l'angle d'environ 180° et la troisième direction est inclinée dans la direction de transport.
7. Procédé selon l'une quelconque des revendications de 1 à 6, dans lequel les croustilles à grignoter (24) ont une forme tridimensionnelle et sont mutuellement empilables, éventuellement emboîtables, en outre éventuellement dans lequel les croustilles à grignoter sont sensiblement convexes sur un premier côté (28) et sensiblement concave sur un deuxième côté opposé (30), encore en outre éventuellement dans lequel l'assaisonnement est appliqué sur le deuxième côté sensiblement concave.
8. Procédé selon la revendication 7, dans lequel dans l'ensemble chevauché (38) formé à l'étape c) un côté postérieur (30) des croustilles à grignoter y reçoivent un côté antérieur (28) de toute croustille à grignoter (24) voisine à celui-ci dans la direction inverse (R).
9. Procédé selon l'une quelconque des revendications précédentes, dans lequel : la surface supérieure assaisonnée (26) des croustilles à grignoter (24) est orientée vers le haut au cours de l'étape d'insertion ; et/ou entre l'étape d'assaisonnement et l'étape d'insertion la surface supérieure assaisonnée (26) des croustilles à grignoter (24) n'est pas inversée de sorte à être orientée vers le bas.
10. Appareil pour emballer des croustilles à grignoter (2), l'appareil comprenant : un mécanisme d'alimentation (4) pour transporter une pluralité de croustilles à grignoter dans une direction de transport (D) ; une station d'assaisonnement (6), située au-dessus du mécanisme d'alimentation, pour déposer un assaisonnement sur une surface supérieure d'une pluralité de croustilles à grignoter sur le mécanisme d'alimentation ; une station d'assemblage (8) en aval de la station d'assaisonnement, le mécanisme d'alimentation étant agencé de sorte à transporter les croustilles à grignoter assaisonnées vers la station d'assemblage, la station d'assemblage comprenant un mécanisme de chevauchement (10) agencé de sorte à faire chevaucher une série linéaire d'une pluralité des croustilles à grignoter assaisonnées pour

former un ensemble chevauché s'étendant dans la direction de transport des croustilles à grignoter postérieures aux croustilles à grignoter antérieures de la série linéaire ; un mécanisme de préhension (12) pour saisir un récipient d'emballage (14) ; et un mécanisme d'insertion (16) agencé de sorte à insérer l'ensemble chevauché sous la forme d'une pile dans une première extrémité ouverte (18) d'un récipient d'emballage saisi par le mécanisme de préhension à hauteur d'une station d'insertion (20), la croustille à grignoter postérieure de la série linéaire étant la première croustille à grignoter de l'ensemble chevauché à entrer dans le récipient d'emballage,

caractérisé en ce que

le mécanisme d'insertion est adapté de sorte à déplacer l'ensemble chevauché, de la station d'assemblage à la station d'insertion, dans une direction inverse (R) par rapport à la direction de transport.

11. Appareil (2) selon la revendication 11, comprenant en outre un applicateur de base (22) pour appliquer une base afin de fermer la première extrémité (18) et emballer l'ensemble chevauché dans le récipient d'emballage (14).
12. Appareil (2) selon, soit la revendication 11, soit la revendication 12, dans lequel au cours de l'insertion : le mécanisme de préhension (12) est agencé de sorte à être statique et le mécanisme d'insertion (16) est agencé de sorte à pousser l'ensemble chevauché dans le récipient d'emballage (14) ; ou le mécanisme de préhension est agencé de sorte à se déplacer vers le mécanisme d'insertion et le mécanisme d'insertion est agencé de sorte à pousser l'ensemble chevauché dans le récipient d'emballage.
13. Appareil (2) pour emballer les croustilles à grignoter, l'appareil comprenant : un mécanisme d'alimentation (4) pour transporter une pluralité de croustilles à grignoter vers une direction de transport (D) ; une station de transport (6), située au-dessus du mécanisme d'alimentation, pour déposer un assaisonnement sur une surface supérieure d'une pluralité de croustilles à grignoter sur le mécanisme d'alimentation ; une station d'assemblage (8) en aval de la station d'assaisonnement, le mécanisme d'alimentation étant agencé de sorte à transporter les croustilles à grignoter assaisonnées vers la station d'assemblage, la station d'assemblage comprenant un mécanisme de chevauchement (10) agencé de sorte à faire chevaucher une série linéaire d'une pluralité des croustilles à grignoter assaisonnées, pour former un ensemble chevauché s'étendant dans la direction de transport des croustilles à grignoter postérieures aux croustilles à grignoter antérieures de la série linéaire ; un mécanisme de préhension (12) pour saisir un récipient d'emballage (14) ; et un mé-

canisme d'insertion (16) agencé de sorte à insérer l'ensemble chevauché sous la forme d'une pile dans une première extrémité ouverte (18) d'un récipient d'emballage saisi par le mécanisme de préhension à hauteur d'une station d'insertion (20), la croustille à grignoter postérieure de la série linéaire étant la première croustille à grignoter de l'ensemble chevauché à entrer dans le récipient d'emballage, **caractérisé par** un mécanisme de rotation (50) pour faire tourner l'ensemble chevauché sur un axe vertical (X), perpendiculairement à la direction de transport de sorte à orienter l'ensemble chevauché dans une troisième direction, dans lequel le mécanisme d'insertion insère l'ensemble chevauché dans la première extrémité ouverte le long de la troisième direction.

14. Appareil (2) selon la revendication 14, comprenant en outre un applicateur de base (22) pour appliquer une base afin de fermer la première extrémité (18) et emballer l'ensemble chevauché dans le récipient d'emballage (14).
15. Appareil (2) selon, soit la revendication 14, soit la revendication 15, dans lequel au cours de l'insertion : le mécanisme de préhension (12) est agencé de sorte à être statique et le mécanisme d'insertion (16) est agencé de sorte à pousser l'ensemble chevauché dans le récipient d'emballage (14) ; ou le mécanisme de préhension est agencé de sorte à se déplacer vers le mécanisme d'insertion et le mécanisme d'insertion est agencé de sorte à pousser l'ensemble chevauché dans le récipient d'emballage.
16. Appareil (2) selon l'une quelconque des revendications 14 à 16, dans lequel : le mécanisme de rotation (50) est adapté pour faire tourner l'ensemble chevauché sur un angle d'environ 180° et la troisième direction est la même que la direction de transport (D) ; ou dans lequel le mécanisme de rotation est adapté pour faire tourner l'ensemble chevauché sur un angle autre que l'angle d'environ 180° et la troisième direction est inclinée dans la direction de transport.

50

55

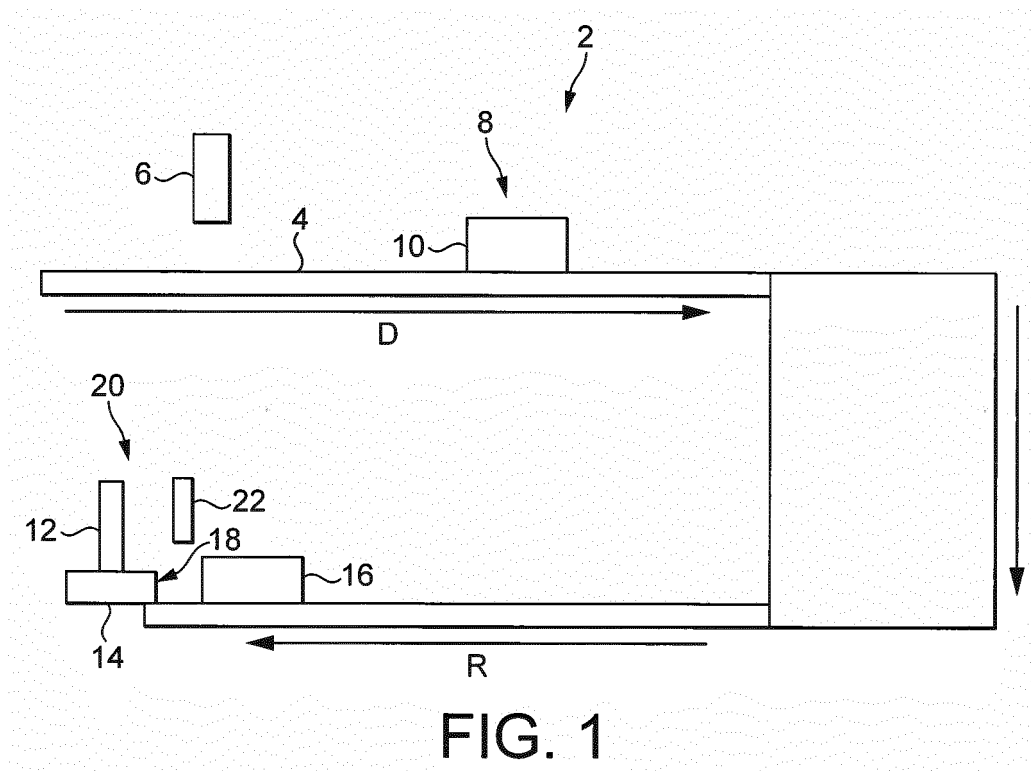


FIG. 1

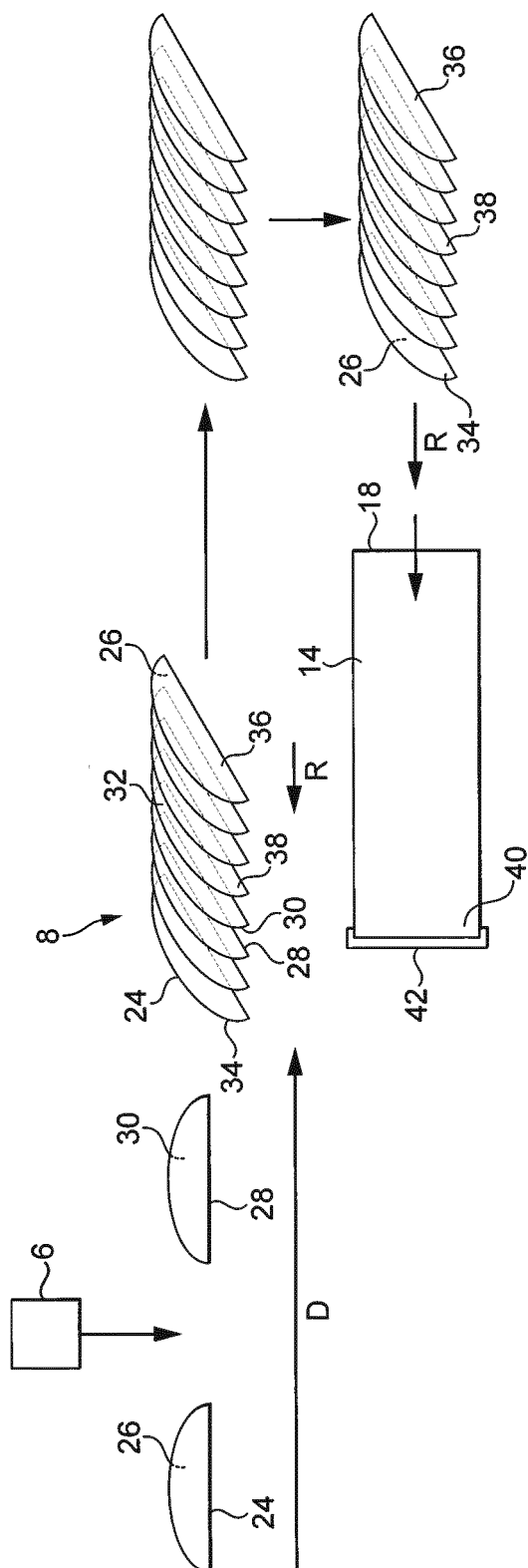
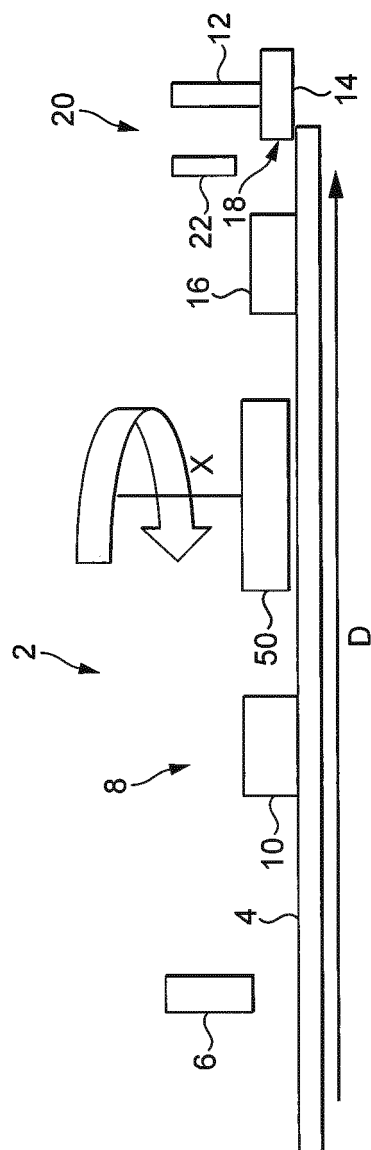
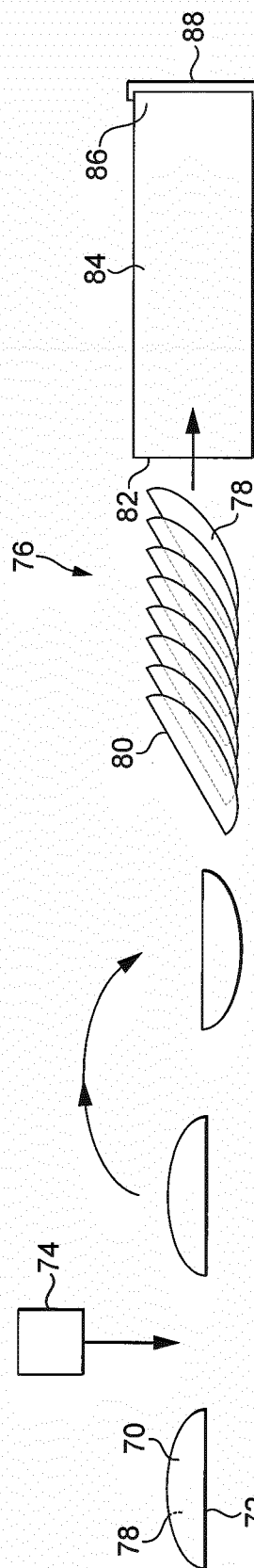
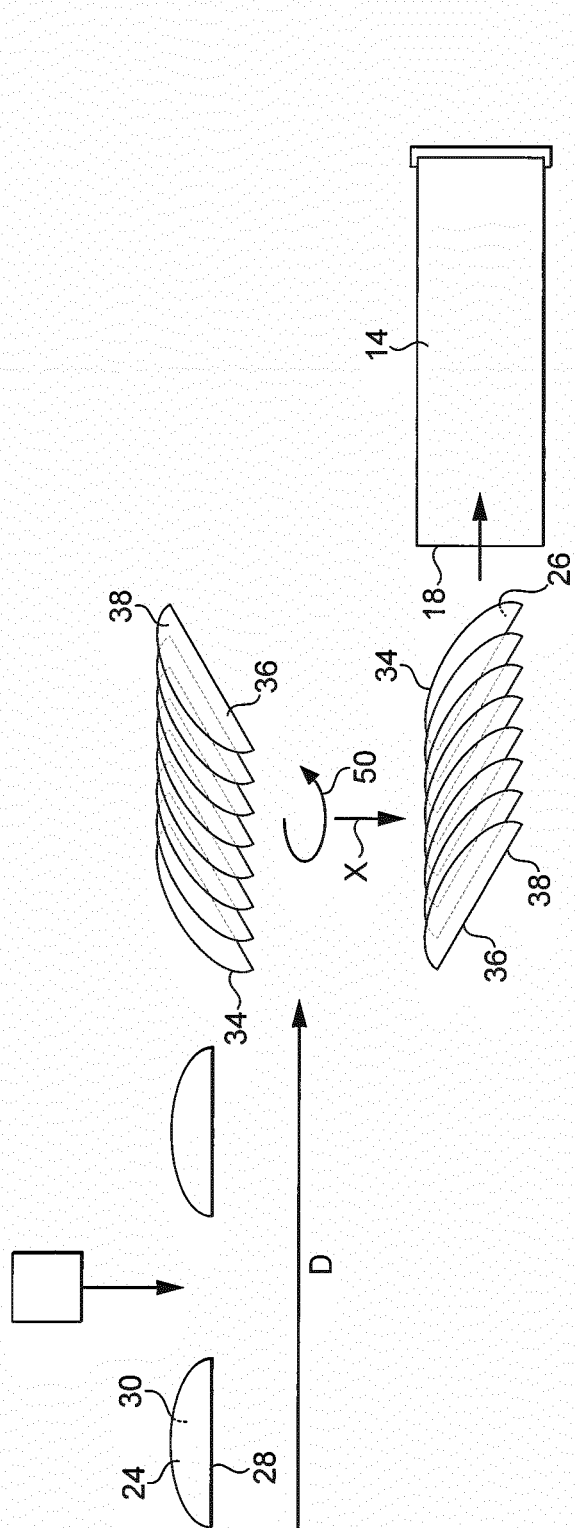


FIG. 2



மேல்



REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 4052838 A [0008]