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(54) **METHOD FOR MANUFACTURING A STRIP OF PACKAGES FOR STORING INDIVIDUAL PORTION  
OF FOOD OR BEVERAGE, AND STRIP OF PACKAGES THUS OBTAINED**

VERFAHREN ZUR HERSTELLUNG EINES STREIFENS VON VERPACKUNGEN ZUR  
AUFBEWAHRUNG INDIVIDUELLER PORTIONEN VON LEBENSMITTELEN ODER GETRÄNKEN  
UND DADURCH HERGESTELLTE VERPACKUNGEN

PROCÉDÉ DE FABRICATION D'UNE BANDE D'EMBALLAGE POUR STOCKER UNE PARTIE  
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## Description

### Field of the invention:

[0001] The invention relates to a method for manufacturing a strip of packages for storing individual portion of food or beverage precursor, such as roast-and-ground coffee compacted pieces, adapted for the preparation of a beverage in a beverage preparation apparatus.

[0002] Such package of a strip relates to a package for storing individual portion of food or beverage precursor protected from the ambient air and mechanical or physical constraints and which can be adapted to a dispensing device for dispensing the portion individually into a beverage preparation apparatus such as a coffee machine for in-home or professional use.

[0003] The invention also relates to such a package strip.

### Background of the invention

[0004] It is known that coffee is sold in airtight packages to protect it from contact with air that would cause quick oxidation and loss of aromas. The field of beverage closed capsules has developed tremendously essentially because each coffee portion can be well protected by a suitable gastight, functional package until coffee is extracted in a suitable coffee machine.

[0005] For example, document WO 2019/219524 discloses a package containing portions of beverage precursor in the form of a portioning band comprising a pair of packaging sheets sealed to one another for enclosing and sealing portions individually and separately in a substantially oxygen impervious manner by the sheets being sealed together about each portion, wherein the portions take the form of substantially spherical shapes which are covered on each side of the band by a sheet being formed with cavities to receive a part of each portion and wherein at least one of the sheet can be cut or torn at least partially about each portion for removal of each portion individually.

[0006] Document WO 2019/219523 discloses a beverage portion dispenser for receiving a portioning band containing a plurality of individually sealed beverage precursor portions for the preparation of a beverage wherein the dispenser comprises means for individually collecting and dispensing the beverage precursor portions to a dispensing area, wherein the collecting and dispensing means comprises a portion drive assembly arranged for receiving a part of the flexible portioning band and a separating assembly for individually separating the beverage precursor portions from the portioning band.

in addition, it is preferable to enable a reliable and effective opening of a package of one portion to properly dispense the individual portion into a beverage preparation device in an apparatus such as a coffee machine.

[0007] Furthermore, it is now preferable to provide packages which are at least recyclable and/or biodegrad-

able, and/or even possibly compostable.

[0008] To this end, packages are made, for example, of barrier paper-based material, often laminated or coated to protect against moisture and/or oxidizing.

5 [0009] But it appeared that traditional manufacturing methods, which usually comprise an embossing or thermoforming step of one of the sheets, are not satisfying for manufacture such paper-based or like packages strip. For example, pleats often appear around stamped portions of one package.

10 [0010] The present invention alleviates those problems by providing a method for manufacturing a strip of packages which is at least suitable to manufacture recyclable strips of packages, in particular made of paper-based material.

### Summary of the invention

20 [0011] In a first aspect, the invention relates to a method for manufacturing a strip of packages, the method comprising steps of:

- Providing a first shell comprising a first part of a first cavity comprising a rim, and a flange extending from the rim and surrounding the first part of the first cavity;
- 25 - Providing a second shell comprising a first part of a second cavity comprising a rim, and a flange extending from the rim and surrounding the first part of the second cavity;
- 30 - Positioning the first part of the first cavity aside the first part of the second cavity with one part of the flange of the first shell overlapping one part of the flange of the second shell; and
- 35 - Linking the part of the flange of the first shell to the part of the flange of the second shell.

[0012] Positioning the first part of the first cavity aside the first part of the second cavity means that they are shifted one from the other. In other words, the first part of the first cavity does not face the first part of the second cavity. The first part of one of the first and second cavity is not covered by the first part of the other of the first and second cavity.

[0013] Then, when the first cavity and the second cavity are formed, the first shell and the second shell are linked one to the other between the first cavity and the second cavity.

[0014] Such linking can be of any kind, for example sealing, gluing, mechanically attaching or fastening etc.

50 [0015] Such linking may be made on a plan or with a relief portion. For example a sealing with a relief portion will improve the sealing in case the first and/or second shell present wrinkles or pleats.

55 [0016] One shell can be made of at least a recyclable and/or recycled material. Additionally, or alternatively, the shell can be made of a biodegradable material, or even possibly of a compostable material, preferably bio-sourced compostable material.

**[0017]** The term "compostable" means that the material is substantially broken down within a few months or weeks. When it is industrially composted the material is at least about 90% composted under specific conditions within six months as determined by the method of ISO14855 or EN13432.

**[0018]** For example, one shell can be made of a paper-based structure material.

**[0019]** For example, the material comprises a laminated paper.

**[0020]** For example, the material comprises a coating.

**[0021]** For example, the material is made of a barrier paper. Such barrier paper is configured to form a barrier against oxygen and/or humidity (vapor) in order to better preserve a food or beverage item the package encloses, and is able to be sealed or glued in an airtight manner.

**[0022]** For example, at least a part of the package, or all, is formed of oxygen impervious material such as a laminate including at least one gas barrier layer.

**[0023]** For example, the material has a permeability to oxygen (OTR: oxygen transmission rate) which is lower than or equal to 2 mL/m<sup>2</sup>/day/bar for a shelf life of approximately twelve months.

**[0024]** For example, the material has a permeability to humidity (WTR: water transmission rate) which is lower than or equal to 2 g/m<sup>2</sup>/day for a shelf life of approximately twelve months.

**[0025]** Furthermore, it is preferably barrier to UV light.

**[0026]** Examples of materials are PBS, PLA, cellulose and combinations thereof.

**[0027]** The laminate may comprise a seal layer such as PLA, PBA, PBS, copolyester of adipic acid, 1, 4-butanediol and dimethyl terephthalate (PBAT), polylactic acid (PLA), polyvinyl butyral (PVB), poly(vinyl acetate-ethylene) (VAE), poly(ethylene-vinyl acetate) (EVA) and combinations thereof. It may comprise an oxygen barrier layer such as EVOH, PVOH, SiO<sub>x</sub>, cellophane, metal and combinations thereof. An example of laminate can be PLA/EVOH/PLA. In these examples, PLA may be replaced by PBA, PBS, PPS, copolyester of adipic acid, 1, 4-butanediol and dimethyl terephthalate (PBAT), polyvinyl butyral (PVB), poly(vinyl acetate-ethylene) (VAE), poly(ethylene-vinyl acetate) (EVA) and combinations thereof. EVOH may also be replaced by PVOH and/or SiO<sub>x</sub>.

**[0028]** For example, a thickness of the material may be comprised between 100 μm and 200 μm.

**[0029]** Such material is relatively stretchable, so it can be formed, for example embossed.

**[0030]** As one shell comprises one part of one cavity and a flange surrounding the part of the cavity, pleats are limited, or are not too disturbing, or even do not appear.

**[0031]** Then, shells are joined end to end.

**[0032]** According to one example embodiment, the first part of the first cavity is positioned aside the first part of the second cavity with one part of the flange of the first shell overlapping one part of the flange of the second shell.

**[0033]** So that a distance between a center of the first cavity and a center of the second cavity is equal to 47 mm +/- 0.5 mm.

**[0034]** One rim can be of any shape, for example round, oval, square, rectangular, triangular, or any other shape.

**[0035]** Thus, each cavity can be of any shape, for example spherical, ovoid, conical, square based, rectangular based or any other.

**[0036]** According to one example embodiment, the flange of each of the first shell and second shell comprises a front surface, and the front surface of the flange of the first shell is linked to the front surface of the flange of the second shell.

**[0037]** In such embodiment, the first shell and the second shell are facing each other but offset from each other. Such offset is configured to avoid covering the part of the cavity of each shell by the other. In other words, the shells are here on each side of a plane which would be defined by the front surface of the flanges. When shells are joined end to end in this manner, they are considered as in staggered rows.

**[0038]** According to one example embodiment, the flange of the first shell comprises a reverse surface, opposite the front surface, and the reverse surface of the flange of the first shell is linked to the front surface of the flange of the second shell.

**[0039]** In such embodiment, the first shell and the second shell are extending one from the other. In other words, the shells are on a same side of a plane which would be defined by the front surface of the flanges. When shells are joined end to end in this manner, they are considered as in one row.

**[0040]** According to one example embodiment, the method also comprises a step of closing at least the first cavity.

**[0041]** To this end, the method comprises for example steps of:

- Providing a first complementary shell comprising a second part of the first cavity and comprising a rim, and a flange extending from the rim and surrounding the second part of the first cavity;
- Forming the first cavity by positioning the second part of the first cavity facing the first part of the first cavity; and
- Sealing the flange of the first complementary shell to the flange of the first shell.

**[0042]** Thus, the first part and the second part of the first cavity form the first cavity which, thereby, is sealed. At least such sealed first cavity forms one first package of the strip of packages.

**[0043]** Each of the first part and second part of the cavity can be one half of the cavity, or one of the first part and second part of the cavity can form a major part of the cavity and the other of the first and second part of the cavity can form a lid or a cover, and thereby can be

even flat.

**[0044]** Furthermore, the step of closing at least the first cavity of a first package can occur before, during or after the step of linking the part of the flange of the first shell to the part of the flange of the second shell of the first package.

**[0045]** According to one example embodiment, the step of positioning the second part of the first cavity facing the first part of the first cavity comprises a step of positioning a center of the second part of the first cavity facing a center of the first part of the first cavity within a tolerance of distance of less than 1 mm, or even 0.5 mm. Adequate tooling may be necessary.

**[0046]** The step of positioning and centering the second part of the first cavity on the first part of the first cavity may be facilitated by the beverage portion itself positioned in the first part of the first cavity, especially when the beverage portion is in relief vis à vis the rim of the first part of the first cavity. This is allowing correspondence of the sealing areas of both first and second part of the first cavity.

**[0047]** According to one example embodiment, the flange of the first complementary shell has a width smaller than a width of the flange of the first shell.

**[0048]** According to one example embodiment, the flange of the first shell comprises a ring surrounding the rim and at least one tab extending from the ring, and the step of linking the part of the flange of the first shell to the part of the flange of the second shell comprises a step of linking the tab of the flange of the first shell to the part of the flange of the second shell.

**[0049]** In an example embodiment in which both shells comprise a tab, the tabs should be aligned, one to the other, within a tolerance of angle of less than 1°, preferably less than 0.5°.

**[0050]** One ring may comprise a cutting area at least one part of a sealing area, as described below.

**[0051]** Owing to the method according to one example embodiment of the invention, it is possible for example to assemble bottoms (made by shells for example), and then covers (made by complementary shells for example), or a bottom and a cover to make one package, and then link packages together.

**[0052]** For example, the shells of one package are sealed together around the cavity by a sealing area surrounding the cavity, for example an annular seal. For example, the sealing area has a width of at least 1 mm, for example between 1 mm and 3 mm, for example about 2 mm.

**[0053]** For example, the sealing area is distant from the cavity, thus defining a cutting area between the cavity and the sealing area. Such cutting area preferably has a width of at least 1 mm, for example from 1 mm to 5 mm.

**[0054]** According to one example embodiment, the step of providing a first complementary shell comprises a step of providing a closing strip comprising at least the second part of the first cavity and a second part of the second cavity; and the method further comprises a step

of positioning the second part of the first cavity facing the first part of the first cavity and positioning the second part of the second cavity facing the first part of the second cavity, and a step of sealing the closing strip to the first shell and second shell at least around the first part of the first cavity and the first part of the second cavity.

**[0055]** In this case, the cavities of such a closing strip can be flatter, so that they can be formed in a strip although they are made of paper-based material.

**[0056]** Before sealing the cavities, the method may comprise a step of providing a portion of food or beverage precursor and placing the portion in the first part of the first cavity.

**[0057]** For example, the portion has a same shape as the cavity.

**[0058]** For example, the portion has a sphere shape. Such portion is possibly called a pearl.

**[0059]** According to one example embodiment, the method also comprises a step of cutting an edge along at least one side of the first cavity.

**[0060]** This helps ensuring a better-looking aspect of the package strip but also a better interaction with a dispenser of a beverage preparation device.

**[0061]** In a second aspect, the invention relates to a package strip comprising at least a first package and a second package which is linked to the first package, the first package comprising a first cavity and the second package comprising a second cavity, the first package comprising at least a first shell comprising a first part of the first cavity and a flange extending from the first part of the first cavity, and the second package comprising at least a second shell comprising a first part of the second cavity and a flange extending from the first part of the second cavity, the package strip further comprising at least a bond between the first package and the second package, linking the first package to the second package, the bond comprising one part of the flange of the first shell overlapping one part of the flange of the second shell.

**[0062]** For example, such a package strip is manufactured by a method as described above.

**[0063]** Such a strip can comprise several cavities, for example tens of cavities, for example between twenty and thirty cavities.

**[0064]** One shell can be made of at least a recyclable and/or recycled material. Additionally, or alternatively, the shell can be made of a biodegradable material, or even possibly of a compostable material, preferably bio-sourced compostable material.

**[0065]** The term "compostable" means that the material is substantially broken down within a few months or weeks. It can be home compostable or industrially compostable. When it is industrially composted the material is at least about 90% composted under specific conditions within six months as determined by the method of ISO14855 or EN13432.

**[0066]** For example, one shell can be made of a paper-based structure material.

**[0067]** For example, the material comprises a laminated paper and/or a coating.

**[0068]** For example, the material is made of a barrier paper. Such barrier paper is configured to form a barrier against oxygen and/or humidity in order to better preserve a food or beverage the package encloses, and is able to be sealed or glued in an airtight manner.

**[0069]** For example, at least a part of the package, or all, is formed of oxygen impervious material such as a laminate including at least one gas barrier layer.

**[0070]** For example, the material has a permeability to oxygen (OTR: oxygen transmission rate) which is lower than or equal to 2 mL/m<sup>2</sup>/day/bar for a shelf life of approximately twelve months.

**[0071]** For example, the material has a permeability to humidity (WTR: water transmission rate) which is lower than or equal to 2 g/m<sup>2</sup>/day for a shelf life of approximately twelve months.

**[0072]** Furthermore, it is preferably barrier to UV light.

**[0073]** Examples of materials are PBS, PLA, cellulose and combinations thereof.

**[0074]** The laminate may comprise a seal layer such as PLA, PBA, PBS, copolyester of adipic acid, 1, 4-butanediol and dimethyl terephthalate (PBAT), polylactic acid (PLA), polyvinyl butyral (PVB), poly(vinyl acetate-ethylene) (VAE), poly(ethylene-vinyl acetate) (EVA) and combinations thereof. It may comprise an oxygen barrier layer such as EVOH, PVOH, SiO<sub>x</sub>, cellophane, metal and combinations thereof. An example of laminate can be PLA/EVOH/PLA. In these examples, PLA may be replaced by PBA, PBS, PPS, copolyester of adipic acid, 1, 4-butanediol and dimethyl terephthalate (PBAT), polyvinyl butyral (PVB), poly(vinyl acetate-ethylene) (VAE), poly(ethylene-vinyl acetate) (EVA) and combinations thereof. EVOH may also be replaced by PVOH and/or SiO<sub>x</sub>.

**[0075]** Other barrier layer may be envisaged in the laminate, for example PEF (polyethylene furanoate).

**[0076]** For example, a thickness of the material may be comprised between 100 μm and 200 μm.

**[0077]** Each cavity can be of any shape, for example spherical, ovoid, conical, square based, rectangular based or any other.

**[0078]** According to one example embodiment, the first package comprises a first complementary shell comprising a second part of the first cavity and a flange extending from the second part of the first cavity, and the second package comprises a second complementary shell comprising a second part of the second cavity and a flange extending from the second part of the second cavity.

**[0079]** For example, the flange of the first complementary shell is sealed to the flange of the first shell.

**[0080]** For example, the flange of the second complementary shell is sealed to the flange of the second shell.

**[0081]** Each of the first part and second part of any cavity can be one half of the cavity, or one of the first part and second part of the cavity can form a major part of the cavity and the other of the first and second part of

the cavity can form a lid or a cover, and thereby can be even flat.

**[0082]** The geometry of each part of the cavity is preferably based on a half sphere.

**[0083]** According to one example embodiment, the flange of the first complementary shell has a width smaller than a width of the flange of the first shell.

**[0084]** According to one example embodiment, the flange of the second complementary shell has a width smaller than a width of the flange of the second shell.

**[0085]** For example, the shells of one package are sealed together around the cavity by a sealing area surrounding the cavity, for example an annular seal.

**[0086]** Thus, for example, one package comprises the sealing area, for example an annular seal, which has a width of at least 1 mm, for example between 1 mm and 3 mm, for example about 2 mm.

**[0087]** For example, the sealing area is distant from the cavity, thus defining a cutting area between the cavity and the sealing area.

**[0088]** Thus, for example, one package comprises such cutting area, for example of annular shape.

**[0089]** Such cutting area preferably has a width of at least 1 mm, for example from 1 mm to 5 mm.

**[0090]** According to one example embodiment, the package strip comprises a closing strip comprising at least the second part of the first cavity and the second part of the second cavity.

**[0091]** In this case, the cavities of such a closing strip can be flatter, so that they can be formed in a strip although they are made of paper-based material.

**[0092]** Besides, for example, one package of the package strip comprises a portion of food or beverage precursor which is inside the cavity of the package.

**[0093]** For example, the portion has a same shape as the cavity.

**[0094]** For example, the portion has a sphere shape. Such portion is possibly called a pearl.

**[0095]** According to one example embodiment, the package strip has a wave shape edge.

**[0096]** The package strip therefore comprises a free part between two neighboring packages.

**[0097]** According to one example embodiment, a distance between a centre of the first cavity and a centre of the second cavity is equal to 47 mm +/- 0.5 mm.

**[0098]** Thus, the package strip can be arranged in a continuous manner in superimposed or wound layers with the portions being arranged in quincunx between two adjacent layers of the strip.

**[0099]** The storage of the packages in quincunx reduces the risk of free movement of individual portions since plays between the portions are limited or avoided when the layers of packages are stacked.

**[0100]** This results in a lower risk of damage (breaking, cracks, erosion ...) of the packages.

**[0101]** The compactness of the package strip is also improved.

**[0102]** More preferably, neighboring packages are

separated from each other by a free part of the sheets in such a manner that the ratio  $r$  of the distance between the center of the neighboring packages and the diameter of the packages is comprised between 1.7 and 2.0, preferably between 1.8 and 1.9, most preferably equal to 1.88.

**[0103]** The value of the ratio  $r$  may be obtained empirically by "trials and error" with the aim to ensure the band to be bent in several layers like a serpentine while the portions of two neighboring layers come precisely arranged in quincunx.

**[0104]** Such configuration of the package provides an individual protective packaging of food or beverage precursor's portions which can be conveniently handled by a dispensing apparatus as well as be easily opened for the dispensing of individual portions for easy positioning in the machine.

**[0105]** Thus, a package strip according to the invention provides at least one of the following advantages, or a combination of some of them:

- easy individual handling and dispensing of the portions,
- protection of the food or beverage precursor against external aggressions (e.g. air (oxygen, vapor), shocks, etc.),
- easy handling and insertion of a portion in a brewing chamber of a production device e.g. by avoiding pre-positioning,
- enables the collection of waste package after use for easier composting or recycling,
- easy disposal of the used organic and packaging materials (optionally, it offers a full compostable solution).

#### **Brief description of the drawings**

**[0106]** Additional features and advantages of the present invention are described in, and will be apparent from, the description of the presently preferred embodiments which are set out below with reference to the drawings in which:

Figure 1 is a perspective view of shells which are arranged to be linked one to each other according to one example embodiment of the invention;

Figure 2 is a cross sectional view of two packages linked together according to one example embodiment of the invention;

Figure 3 is a cross sectional view of a package strip comprising two packages linked together according to another example embodiment of the invention;

Figure 4 is a top view of packages linked together according to one example embodiment of the invention;

Figure 5 is a top view of a package strip according to one example embodiment of the invention;

Figure 6 is a top view of shells according to other

example embodiments of the invention;

Figure 7 is a perspective view of shells according to figure 6 which are arranged to be linked one to each other according to another example embodiment of the invention;

Figure 8 is a diagrammatical side view of a package strip which is wound with the portions arranged in quincunx between two adjacent layers of the package strip;

Figure 9 is a perspective view of a casing comprising a wound package strip as illustrated in figure 8; and Figure 10 shows an illustration of a food or beverage preparation apparatus receiving a casing as in figure 9, comprising a wound package strip for individually dispensing one portion from one package of the package strip.

#### **Detailed description of the drawings**

**[0107]** Food or beverage precursor's portions are packed into a primary packaging, also called "flowpack", which is a flexible strip comprising tens of packages, each comprising a cavity, for example between twenty and thirty packages, often about 24 packages, each cavity of them receiving one pearl of product, i.e. one portion of product (beverage precursor).

**[0108]** Hence the flowpack may be considered as a flexible strip comprising a plurality of individual packages.

**[0109]** Manufacturing such a package strip can raise difficulties, in particular when they are made of paper-based material, for example in order to provide at least recyclable packages.

**[0110]** To this end, figures 1 to 4 shows example embodiments of a manufacturing method according to the invention.

**[0111]** In figure 1, a first shell 10 and a second shell 20 are provided.

**[0112]** The first shell 10 comprises a first part 11 of a first cavity 31 comprising a rim 12, and a flange 13 extending from the rim 12 and surrounding the first part 11 of the first cavity 31.

**[0113]** In the illustrated embodiment, the first part 11 of the first cavity 31 is a part of a sphere, in particular a half-sphere, and as a consequence, the rim 12 has a circular shape.

**[0114]** In addition, the flange 13 has an annular shape, surrounding the first part 11 of the first cavity 31.

**[0115]** In a similar manner here, the second shell 20 comprises a first part 21 of a second cavity 41 comprising a rim 22, and a flange 23 extending from the rim 22 and surrounding the first part 21 of the second cavity 41.

**[0116]** In the illustrated embodiment, the first part 21 of the second cavity 41 is a part of a sphere too, in particular a half-sphere, and as a consequence, the rim 22 has a circular shape too.

**[0117]** In addition, the flange 23 has an annular shape too, surrounding the first part 21 of the second cavity 41.

**[0118]** In the illustrated embodiments, the geometry of

each cavity part is based on a half sphere. However, the rim may not be perfectly circular: a diameter along the main axis of the package strip can be a little greater than the diameter across, for example it is of about 24.3mm while the transverse diameter is of about 23.3 mm. The resulting shape is a slightly ovoid base of each half-sphere, aiming to facilitate a release of the pearl out of the cavity after a cutting step of the package to open it.

**[0119]** Here, the first shell 10 and the second shell 20 are identical.

**[0120]** Any of the first shell 10 and the second shell 20 can be formed from a paper-based material, preferably a barrier paper-based material.

**[0121]** For example, the material can be a stretchable paper-based structure with a thickness comprised between 100  $\mu\text{m}$  and 200  $\mu\text{m}$ , for example of about 162  $\mu\text{m}$ .

**[0122]** As the forming process of the base material induces a stretching of the material, it results an irregular decrease of the material thickness. Even if the decrease is difficult to predict, it can be estimated that the material can be 60% of its original thickness on the top a half-sphere and comes back progressively to its original thickness on the flat part of the shell, for example on the flange.

**[0123]** One shell can thus be formed, for example embossed, from a corresponding blank.

**[0124]** For example, one shell is formed of oxygen and/or vapor impervious material such as a laminate including at least one gas barrier layer. The material forming the shell (all films and layers) is preferably at least recyclable, for example it may be biodegradable, or even possibly compostable.

**[0125]** The term "compostable" means that the material is substantially broken down within a few months or weeks. When it is industrially composted, the material is at least about 90% composted under specific conditions within six months as determined by the method of ISO14855 or EN13432.

**[0126]** The laminate may comprise a seal layer such as PLA, PBA, PBS, copolyester of adipic acid, 1, 4-butanediol and dimethyl terephthalate (PBAT), polylactic acid (PLA), polyvinyl butyral (PVB), poly(vinyl acetate-ethylene) (VAE), poly(ethylene-vinyl acetate) (EVA) and combinations thereof. It may comprise an oxygen barrier layer such as EVOH, PVOH, SiOx, cellophane, metal and combinations thereof. An example of laminate can be PLA/EVOH/PLA. In these examples, PLA may be replaced by PBA, PBS, PPS, copolyester of adipic acid, 1, 4-butanediol and dimethyl terephthalate (PBAT), polyvinyl butyral (PVB), poly(vinyl acetate-ethylene) (VAE), poly(ethylene-vinyl acetate) (EVA) and combinations thereof. EVOH may also be replaced by PVOH and/or SiOx.

**[0127]** To manufacture a strip of packages on this basis, shells or individual packages made of shells assembled together are positioned end to end.

**[0128]** Such linking can be of any kind, for example sealing, gluing, mechanically attaching or fastening etc.

**[0129]** The linking of two items may be made on a plan

or with a relief portion in order to improve the link. This is clearly valuable when sealing or gluing the different parts.

**[0130]** For example, the first shell 10 and the second shell 20 are positioned such that the first part 11 of the first cavity 31 is aside the first part 21 of the second cavity 41 with one part of the flange 13 of the first shell 10 overlapping one part of the flange 23 of the second shell 20, as illustrated by a dotted line in Figure 1.

**[0131]** In addition, in this figure, a front surface of the flange 13 of the first shell 10 is facing a front surface of the flange 23 of the second shell 20.

**[0132]** Thus, the first shell 10 and the second shell 30 are facing each other but their cavity parts are offset from each other, i.e. they are not forming one same cavity, but are arranged to define two different cavities 31, 41.

**[0133]** The shells 10, 20 are here considered to be on each side of a plane which would be defined by the front surface of the flanges 13, 23.

**[0134]** When shells are joined end to end in this manner, they are considered as in staggered rows.

**[0135]** When providing a first shell 10 and a second shell 20 as described above, the method can then comprise a step of linking a part of the front surface of the flange 13 of the first shell 10 to a part of the front surface of the flange 23 of the second shell 20.

**[0136]** The shells are then arranged as illustrated in Figure 2.

**[0137]** According to another arrangement, a reverse surface, opposite the front surface, of the flange 13 of the first shell 10 is facing the front surface of the flange 23 of the second shell 20.

**[0138]** In such embodiment, the first shell and the second shell are extending one from the other. In other words, the shells are on a same side of a plane which would be defined by the front surface of the flanges.

**[0139]** When shells are joined end to end in this manner, they are considered as in one row.

**[0140]** When providing a first shell 10 and a second shell 20 as described above, the method can then comprise a step of linking a part of the reverse surface of the flange 13 of the first shell 10 to a part of the front surface of the flange 23 of the second shell 20.

**[0141]** The shells are then arranged as illustrated in Figure 3.

**[0142]** The method may also comprise a step of closing one cavity of one package.

**[0143]** Referring again to Figure 1, the method according to an example embodiment of the invention, can also comprise a step of providing a first complementary shell 14 which comprises, in a similar manner, a second part 15 of the first cavity 31 and a rim 16, and a flange 17 extending from the rim 16 and surrounding the second part 15 of the first cavity 31.

**[0144]** The first cavity 31 can then be formed by positioning the complementary shell 14 such that second part 15 of the first cavity 31 faces the first part 11 of the first cavity 31.

**[0145]** Then, the flange 17 of the first complementary shell 14 can be sealed to the flange 13 of the first shell 10, thus forming one first package 30 of a package strip.

**[0146]** In this embodiment, the second part 15 of the first cavity 31 is a half-sphere too, so that the rim 16 has a same shape as the rim 12 of the first shell 10.

**[0147]** In the illustrated embodiment, the flange 17 of the first complementary shell 14 has a width smaller than a width of the flange 13 of the first shell 10.

**[0148]** As better illustrated in figures 2 and 3, this enables to avoid additional layer thickness in a junction portion between two packages linked to each other.

**[0149]** In these figures, a second package 40 is thus formed by linking the second shell 20 to a second complementary shell 24 which comprises, in a similar manner, a second part 25 of the second cavity 41 and a rim 26, and a flange 27 extending from the rim 26 and surrounding the second part 25 of the second cavity 41.

**[0150]** For example, the shells of one package 30, 40 are sealed together around their corresponding cavity 31, 41 by a sealing area surrounding the cavity 31, 41, for example an annular seal.

**[0151]** Thus, for example, one package comprises the sealing area.

**[0152]** The shape of each sealing area is here a ring with an inner diameter of about 36mm with a width of 2 mm.

**[0153]** Each sealing ring is preferably centered with the center of each cavity with an accuracy of +/- 0.5 mm.

**[0154]** A gap between the outer shape of a cavity, the rim, and the inner line of the sealing area is defined as a cutting area of the package, which should stay clear for the travel of the dispenser's blade.

**[0155]** The cutting area has here an inner diameter comprised between 28 mm and 31 mm, for example it is of 29.36 mm, and an outer diameter comprised between 30 mm and 38 mm, for example it is of about 34 to 36 mm.

**[0156]** Such cutting area preferably has a width of at least 1 mm, for example from 1 mm to 5 mm.

**[0157]** As shown in figures 2 to 5 for example, the package strip comprises half-cavities sealed together around each cavity, aiming to encapsulate in a tight manner beverage precursors (pearls) into the cavities.

**[0158]** Before sealing, each package 30; 40 encloses one portion of food or beverage precursor.

**[0159]** Each portion may contain a few grams of food or beverage precursors, for example, in the case of a beverage precursor, 5 to 6 grams, corresponding to at least one serving of beverage. The beverage precursor is preferably a compacted beverage precursor made of compacted powder. Preferably, the beverage precursor contains essentially roast-and-ground coffee. The beverage precursor may also comprise a mix of roast-and-ground coffee and soluble coffee or a mix of roast-and-ground coffee and milk powder. The beverage precursor may also comprise soluble coffee, milk powder or a chocolate based compacted powder. For example, one portion may be suitable for preparing one cup of coffee.

**[0160]** The portions are preferably spherical. In the present description, the term "spherical" encompasses also designs such as multiple facets (e.g. like a "football" shape) or a sphere having truncated faces of diameter less than the diameter of the sphere or slightly ovoid or oval or egg shapes. A preferred shape is however a ball with circular cross-sections.

**[0161]** Other shape may be envisaged for the portions like a square or a diamond shape, a parallelepipedal shape, a triangular shape, an ovoid etc.....

**[0162]** In the proposed example, an inner nominal diameter of one cavity is comprised between 22 mm and 25 mm, for example here about 23.3 mm which corresponds to the outer nominal diameter of the packed portion.

**[0163]** Packages 30, 40 are bonded together in order to create the full strip, as shown in figures 4 and 5.

**[0164]** In figure 4, packages 30 and 40 are closed (after insertion of a beverage precursor portion) and linked to each other, either as illustrated in figure 2 or in figure 3.

**[0165]** However, to ensure a better-looking aspect of the package strip and a better interaction with the beverage preparation device, the method may also comprise a step of cutting an edge along at least one side of the packages 30, 40.

**[0166]** As shown in figure 5, a cutting footprint of the package strip corresponds to a "wave" shape which helps to save the material usage and to ensure a good-looking aspect of the packaging.

**[0167]** For example, the distance in between two pearls (from center to center) is comprised between 45 mm and 49 mm, for example about 47 mm +/- 0.5 mm.

**[0168]** For example, an overall length of the package strip having 24 pearls (individual portions) is comprised between 1000 mm and 1250 mm, for example it is about 1128 mm.

**[0169]** For example, a maximum width of the package strip is comprised between 35 mm and 40 mm, for example it is about 38mm.

**[0170]** Figure 6 shows another example of embodiment of shells according to the invention.

**[0171]** The shells of figure 6 differs in particular from the previous ones in the form of the flange.

**[0172]** For example, a shell can comprise a flange which comprises ring 13\_1 and one tab 13\_2 extending from the ring, or even a ring 13\_1 with two tabs 13\_2, for example diametrically aligned one to the other, for example along a longitudinal direction of the strip once the shell is assembled to a complementary shell to form a package.

**[0173]** For example, during assembling of the shells, the tabs should be aligned, one to the other, within a tolerance of angle of less than 1°, preferably less than 0.5°.

**[0174]** Figure 7 shows a possible assembling of a first shell 10\_1 with a first complementary shell 14\_1 before assembling with a second shell 20\_3. In view of the preceding disclosure, one can envisage various options in

the assembling process of these shells having at least one tab.

[0175] According to another example embodiment which is not illustrated the package strip may comprise a closing strip comprising at least the second part of the first cavity and the second part of the second cavity.

[0176] In this case, the cavities of such a closing strip can be flatter, so that they can be more easily formed in a strip although they are made of paper-based material.

[0177] Therefore, the packages may have a flatter shape, for example a half sphere shape.

[0178] Figure 8 shows a package strip 100 comprising tens of packages 30, 40 as described above.

[0179] As shown in Figure 8, a package strip 100 as described above can be easily wound in superimposed layers, with the portions of one package 30, 40 arranged in quincunx between two adjacent layers of the package strip 100.

[0180] In an advantageous embodiment, the distance d between two neighboring packages 30, 40 may be larger than a diameter of one cavity, so that a folding of two layers is eased.

[0181] Such wound package strip 100 can then be packed in a casing 200 as diagrammatically shown in Figure 9.

[0182] The casing 200 is generally made of a paper-based material.

[0183] It is usually relatively rigid to protect the package strip 100 received therein.

[0184] The casing 200 may be shaped as a box with an overall parallelepipedal form. For example, it has a narrow rectangular bottom and top, two large side walls and narrower front and rear walls.

[0185] The casing 200 may optionally comprise a transparent window provided on at least one of the large sidewall and/or top to enable to visualize the band of portions inside.

[0186] The casing 200 may further comprise at least one openable gate which forms an opening for allowing the package strip to be progressively withdrawn from the casing during dispensing, e.g. delayed or unwound, with one portion at a time.

[0187] The openable gate may be positioned in a corner or nearby, said top front corner of the casing 200.

[0188] Figure 10 shows an example embodiment of a food or beverage preparation apparatus 300.

[0189] Such apparatus may be mainly as one described in WO 2019/219523 or WO 2019/219524.

[0190] The apparatus comprises a seat to receive a casing 200 as described in connection with figure 9, with the opening of the casing close to a portion removing assembly of the apparatus.

[0191] The portion removing assembly preferably comprises a portion capturing rotary drum 301 driven in rotation in a stepwise fashion by a driving assembly.

[0192] The portion capturing rotary drum comprises a plurality of receiving holes 302 formed in an outer annular wall 303 of the drum 301.

[0193] The receiving holes 302 are individually dimensioned and arranged at distance one another so as to match with the distance d between neighboring packages 30, 40 of the package strip 100.

5 [0194] As the portions are captured by the receiving cavities moving stepwisely, the package strip 100 is progressively withdrawn from the casing 200.

[0195] The apparatus 300 further comprises package opening means 304 such as a cutting tool arranged for opening the cavities of one package by cutting along one cutting line in at least one side of one package to remove each portion individually. The cutting tool may be driven by a linear motorized actuator configured for moving the cutting tool reciprocally between a retracted position and a cutting position. The cutting tool may be formed as a cylinder of diameter slightly larger than the diameter of one beverage portion and may comprise at least one blade arranged circumferentially on the free edge of the cylinder. Preferably, the cutting tool is arranged to cut the strip 100 on at least 200° or preferably between 300 and 340° about the portion to provide sufficient opening of the cavity and facilitate ejection of the portion while keeping the package material in one piece.

[0196] The apparatus 300 may further comprise portion ejection means 305 for expulsing the portion from the cavity after the package is cut open. The portion ejection means 305 may take various forms. In the illustrated example, the portion ejection means 305 comprises a cam which is stationary arranged on an internal bearing which is arranged co-centrally relative to the rotary drum 301. The cam is preferably positioned angularly, e.g. an angle of 50-80 degrees after the cutting tool, to push the portion outside the corresponding cavity as the drum 301 rotates (as illustrated in Figure 10 in clockwise direction R).

[0197] The apparatus 300 may further comprise a chute or the like, arranged for gently receiving and transporting by gravity or otherwise (e.g. air pressure), the portion to a food or beverage preparation device to prepare the food or beverage.

[0198] Then, the apparatus 300 preferably comprises at least one container to receive the used package material on one side and the organic residue (food or beverage precursor portion after use) on another side, which eases recycling and composting of waste.

## Claims

1. Method for manufacturing a strip (100) of packages (30, 40), the method comprising steps of:

- Providing a first shell (10) comprising a first part (11) of a first cavity (31) comprising a rim (12), and a flange (13) extending from the rim (12) and surrounding the first part of the first cavity;
- Providing a second shell (20) comprising a first

- part (21) of a second cavity (41) comprising a rim (22), and a flange (23) extending from the rim (22) and surrounding the first part of the second cavity; **characterized in that** it further comprises:
- Positioning the first part (11) of the first cavity aside the first part (21) of the second cavity with one part of the flange (13) of the first shell overlapping one part of the flange (23) of the second shell; and
  - Linking the part of the flange (13) of the first shell to the part of the flange (23) of the second shell.
2. Method according to claim 1, in which the flange of each of the first shell (10) and second shell (20) comprises a front surface, and the front surface of the flange (13) of the first shell is linked to the front surface of the flange (23) of the second shell.
  3. Method according to claim 1, in which the flange (13) of the first shell (10) comprises a reverse surface, and the reverse surface of the flange (13) of the first shell is linked to a front surface of the flange (23) of the second shell (20).
  4. Method according to anyone of claims 1 to 3, further comprising a step of closing at least the first cavity (31).
  5. Method according to claim 4 in which the step of closing at least the first cavity comprises steps of:
    - Providing a first complementary shell (14) comprising a second part (15) of the first cavity (31) and comprising a rim (16), and a flange (17) extending from the rim and surrounding the second part (15) of the first cavity;
    - Forming the first cavity (31) by positioning the second part (15) of the first cavity facing the first part (11) of the first cavity; and
    - Sealing the flange (17) of the first complementary shell (14) to the flange (13) of the first shell (10).
  6. Method according to anyone of claims 1 to 5, in which the flange (13) of the first shell (10) comprises a ring (13\_1) surrounding the rim (12) and at least one tab (13\_2) extending from the ring, and the step of linking the part of the flange of the first shell to the part of the flange of the second shell comprises a step of linking the tab (13\_2) of the flange of the first shell to the part of the flange (23) of the second shell.
  7. Method according to anyone of claims 5, in which the step of providing a first complementary shell comprises a step of providing a closing strip comprising at least the second part of the first cavity (31) and a second part of the second cavity (41); and the method further comprises a step of positioning the second part of the first cavity facing the first part of the first cavity and positioning the second part of the second cavity facing the first part of the second cavity, and a step of sealing the closing strip to the first shell (10) and second shell (20) at least around the first part (11) of the first cavity (31) and the first part (21) of the second cavity (41).
  8. Method according to anyone of claims 1 to 7, comprising a step of providing a portion of food or beverage precursor, and placing the portion in the first part (11) of the first cavity (31).
  9. Package strip (100) comprising at least a first package (30) and a second package (40) which is linked to the first package (30), the first package (30) comprising a first cavity (31) and the second package (40) comprising a second cavity (41), the first package (30) comprising at least a first shell comprising a first part of the first cavity (31) and a flange extending from the first part of the first cavity (31), and the second package (40) comprising at least a second shell comprising a first part of the second cavity (41) and a flange extending from the first part of the second cavity (41), the package strip (100) further comprising at least a bond between the first package (30) and the second package (40), linking the first package (30) to the second package (40), the bond comprising one part of the flange of the first shell overlapping one part of the flange of the second shell.
  10. Package strip (100) according to claim 9, in which the first package (30) comprises a first complementary shell comprising a second part of the first cavity (31) and a flange extending from the second part of the first cavity, and the second package (40) comprises a second complementary shell comprising a second part of the second cavity (41) and a flange extending from the second part of the second cavity.
  11. Package strip (100) according to anyone of claims 9 or 10, in which the package strip (100) comprises a closing strip comprising at least the second part of the first cavity and the second part of the second cavity.
  12. Package strip (100) according to anyone of claims 9 to 11, in which one package (30, 40) of the package strip (100) comprises a portion of food or beverage precursor which is inside the cavity (31, 41) of the package (30, 40).
  13. Package strip (100) according to anyone of claims 9 to 12, in which one shell is made of a paper-based structure material.

## Patentansprüche

1. Verfahren zum Herstellen eines Streifens (100) von Packungen (30, 40), das Verfahren umfassend die Schritte:
  - Bereitstellen einer ersten Schale (10), umfassend einen ersten Teil (11) eines ersten Hohlraums (31), umfassend einen Rand (12) und einen Flansch (13), der sich von dem Rand (12) erstreckt und den ersten Teil des ersten Hohlraums umgibt;
  - Bereitstellen einer zweiten Schale (20), umfassend einen ersten Teil (21) eines zweiten Hohlraums (41), umfassend einen Rand (22) und einen Flansch (23), der sich von dem Rand (22) erstreckt und den ersten Teil des zweiten Hohlraums umgibt; **dadurch gekennzeichnet, dass** es ferner umfasst:
    - Positionieren des ersten Teils (11) des ersten Hohlraums neben dem ersten Teil (21) des zweiten Hohlraums mit einem Teil des Flansches (13) der ersten Schale, der einen Teil des Flansches (23) der zweiten Schale überlappt; und
    - Verbinden des Teils des Flansches (13) der ersten Schale mit dem Teil des Flansches (23) der zweiten Schale.
2. Verfahren nach Anspruch 1, wobei der Flansch von jeder der ersten Schale (10) und der zweiten Schale (20) eine vordere Oberfläche umfasst, und die vordere Oberfläche des Flansches (13) der ersten Schale mit der vorderen Oberfläche des Flansches (23) der zweiten Schale verbunden ist.
3. Verfahren nach Anspruch 1, wobei der Flansch (13) der ersten Schale (10) eine gewendete Oberfläche umfasst, und die gewendete Oberfläche des Flansches (13) der ersten Schale mit einer vorderen Oberfläche des Flansches (23) der zweiten Schale (20) verbunden wird.
4. Verfahren nach einem der Ansprüche 1 bis 3, ferner umfassend einen Schritt des Schließens mindestens des ersten Hohlraums (31).
5. Verfahren nach Anspruch 4, wobei der Schritt des Schließens mindestens des ersten Hohlraums die folgenden Schritte umfasst:
  - Bereitstellen einer ersten komplementären Schale (14), umfassend einen zweiten Teil (15) des ersten Hohlraums (31) und umfassend einen Rand (16) und einen Flansch (17), der sich von dem Rand erstreckt und den zweiten Teil (15) des ersten Hohlraums umgibt;
  - Ausbilden des ersten Hohlraums (31) durch Positionieren des zweiten Teils (15) des ersten Hohlraums, der dem ersten Teil (11) des ersten Hohlraums zugewandt ist; und
  - Abdichten des Flansches (17) der ersten komplementären Schale (14) zu dem Flansch (13) der ersten Schale (10).
6. Verfahren nach einem der Ansprüche 1 bis 5, wobei der Flansch (13) der ersten Schale (10) einen Ring (13\_1), der den Rand (12) umgibt, und mindestens eine Lasche (13\_2) umfasst, die sich von dem Ring erstreckt, und der Schritt des Verbindens des Teils des Flansches der ersten Schale mit dem Teil des Flansches der zweiten Schale einen Schritt des Verbindens der Lasche (13\_2) des Flansches der ersten Schale mit dem Teil des Flansches (23) der zweiten Schale umfasst.
7. Verfahren nach einem der Ansprüche 5, wobei der Schritt des Bereitstellens einer ersten komplementären Schale einen Schritt des Bereitstellens eines Verschlussstreifens umfasst, umfassend mindestens den zweiten Teil des ersten Hohlraums (31) und einen zweiten Teil des zweiten Hohlraums (41); und das Verfahren ferner einen Schritt des Positionierens des zweiten Teils des ersten Hohlraums, der dem ersten Teil des ersten Hohlraums zugewandt ist, und Positionieren des zweiten Teils des zweiten Hohlraums, der dem ersten Teil des zweiten Hohlraums zugewandt ist, und einen Schritt des Abdichtens des Verschlussstreifens mit der ersten Schale (10) und der zweiten Schale (20) mindestens um den ersten Teil (11) des ersten Hohlraums (31) und des ersten Teils (21) des zweiten Hohlraums (41) umfasst.
8. Verfahren nach einem der Ansprüche 1 bis 7, umfassend einen Schritt des Bereitstellens eines Abschnitts eines Lebensmittel- oder Getränkevorläufers und Platzieren des Abschnitts in dem ersten Teil (11) des ersten Hohlraums (31).
9. Packungsstreifen (100), umfassend mindestens eine erste Packung (30) und eine zweite Packung (40), die mit der ersten Packung (30) verbunden ist, die erste Packung (30) umfassend einen ersten Hohlraum (31) und die zweite Packung (40) umfassend einen zweiten Hohlraum (41), die erste Packung (30) umfassend mindestens eine erste Schale, umfassend einen ersten Teil des ersten Hohlraums (31) und einen Flansch, der sich von dem ersten Teil des ersten Hohlraums (31) erstreckt, und das zweite Paket (40) umfassend mindestens eine zweite Schale, umfassend einen ersten Teil des zweiten Hohlraums (41) und einen Flansch, der sich von dem ersten Teil des zweiten Hohlraums (41) erstreckt, der Packungsstreifen (100) ferner umfasst

send mindestens eine Bindung zwischen der ersten Packung (30) und der zweiten Packung (40), die die erste Packung (30) mit der zweiten Packung (40) verbindet, die Bindung umfassend einen Teil des Flansches der ersten Schale, der einen Teil des Flansches der zweiten Schale überlappt.

10. Packungsstreifen (100) nach Anspruch 9, wobei die erste Packung (30) eine erste komplementäre Schale umfasst, umfassend einen zweiten Teil des ersten Hohlraums (31) und einen Flansch, der sich von dem zweiten Teil des ersten Hohlraums erstreckt, und wobei die zweite Packung (40) eine zweite komplementäre Schale umfasst, umfassend einen zweiten Teil des zweiten Hohlraums (41) und einen Flansch, der sich von dem zweiten Teil des zweiten Hohlraums erstreckt.
11. Packungsstreifen (100) nach einem der Ansprüche 9 oder 10, wobei der Packungsstreifen (100) einen Verschlussstreifen umfasst, umfassend mindestens den zweiten Teil des ersten Hohlraums und den zweiten Teil des zweiten Hohlraums.
12. Packungsstreifen (100) nach einem der Ansprüche 9 bis 11, wobei eine Packung (30, 40) des Packungsstreifens (100) einen Abschnitt eines Lebensmittel- oder Getränkevorläufers umfasst, der im Inneren des Hohlraums (31, 41) der Packung (30, 40) ist.
13. Packungsstreifen (100) nach einem der Ansprüche 9 bis 12, wobei eine Schale aus einem papierbasierten Strukturmaterial hergestellt ist.

## Revendications

1. Procédé de fabrication d'une bande (100) de conditionnements (30, 40), le procédé comprenant les étapes consistant à :
  - fournir une première coque (10) comprenant une première partie (11) d'une première cavité (31) comprenant un rebord (12), et une bride (13) s'étendant à partir du rebord (12) et entourant la première partie de la première cavité ;
  - fournir une seconde coque (20) comprenant une première partie (21) d'une seconde cavité (41) comprenant un rebord (22), et une bride (23) s'étendant à partir du rebord (22) et entourant la première partie de la seconde cavité ;**caractérisé en ce qu'il** comprend en outre :
  - le positionnement de la première partie (11) de la première cavité à côté de la première partie (21) de la seconde cavité avec une partie de la bride (13) de la première coque chevauchant une partie de la bride

(23) de la seconde coque ; et  
- la liaison de la partie de la bride (13) de la première coque à la partie de la bride (23) de la seconde coque.

2. Procédé selon la revendication 1, dans lequel la bride de chacune parmi la première coque (10) et la seconde coque (20) comprend une surface avant, et la surface avant de la bride (13) de la première coque est reliée à la surface avant de la bride (23) de la seconde coque.
3. Procédé selon la revendication 1, dans lequel la bride (13) de la première coque (10) comprend une surface arrière, et la surface arrière de la bride (13) de la première coque est reliée à une surface avant de la bride (23) de la seconde coque (20).
4. Procédé selon l'une quelconque des revendications 1 à 3, comprenant en outre une étape consistant à fermer au moins la première cavité (31).
5. Procédé selon la revendication 4, dans lequel l'étape consistant à fermer au moins la première cavité comprend des étapes consistant à :
  - fournir une première coque complémentaire (14) comprenant une seconde partie (15) de la première cavité (31) et comprenant un rebord (16), et une bride (17) s'étendant à partir du rebord et entourant la seconde partie (15) de la première cavité ;
  - former la première cavité (31) en positionnant la seconde partie (15) de la première cavité en face de la première partie (11) de la première cavité ; et
  - sceller la bride (17) de la première coque complémentaire (14) sur la bride (13) de la première coque (10).
6. Procédé selon l'une quelconque des revendications 1 à 5, dans lequel la bride (13) de la première coque (10) comprend une bague (13\_1) entourant le rebord (12) et au moins une languette (13\_2) s'étendant depuis la bague, et l'étape consistant à relier la partie de la bride de la première coque à la partie de la bride de la seconde coque comprend une étape consistant à relier la languette (13\_2) de la bride de la première coque à la partie de la bride (23) de la seconde coque.
7. Procédé selon la revendication 5, dans lequel l'étape consistant à fournir une première coque complémentaire comprend une étape consistant à fournir une bande de fermeture comprenant au moins la seconde partie de la première cavité (31) et une seconde partie de la seconde cavité (41) ; et le procédé comprend en outre une étape consistant à position-

ner la seconde partie de la première cavité en face de la première partie de la première cavité et positionner la seconde partie de la seconde cavité en face de la première partie de la seconde cavité, et une étape consistant à sceller la bande de fermeture sur la première coque (10) et la seconde coque (20) au moins autour de la première partie (11) de la première cavité (31) et de la première partie (21) de la seconde cavité (41).

8. Procédé selon l'une quelconque des revendications 1 à 7, comprenant une étape consistant à fournir une portion de précurseur d'aliment ou de boisson, et mettre en place la portion dans la première partie (11) de la première cavité (31). 5
9. Bande de conditionnements (100) comprenant au moins un premier conditionnement (30) et un second conditionnement (40) qui est relié au premier conditionnement (30), le premier conditionnement (30) comprenant une première cavité (31) et le second conditionnement (40) comprenant une seconde cavité (41), le premier conditionnement (30) comprenant au moins une première coque comprenant une première partie de la première cavité (31) et une bride s'étendant de la première partie de la première cavité (31), et le second conditionnement (40) comprenant au moins une seconde coque comprenant une première partie de la seconde cavité (41) et une bride s'étendant de la première partie de la seconde cavité (41), la bande de conditionnements (100) comprenant en outre au moins un lien entre le premier conditionnement (30) et le second conditionnement (40), reliant le premier conditionnement (30) au second conditionnement (40), le lien comprenant le chevauchement d'une partie de la bride de la première coque sur une partie de la bride de la seconde coque. 10
10. Bande de conditionnements (100) selon la revendication 9, dans laquelle le premier conditionnement (30) comprend une première coque complémentaire comprenant une seconde partie de la première cavité (31) et une bride s'étendant depuis la seconde partie de la première cavité, et le second conditionnement (40) comprend une seconde coque complémentaire comprenant une seconde partie de la seconde cavité (41) et une bride s'étendant depuis la seconde partie de la seconde cavité. 15
11. Bande de conditionnements (100) selon l'une quelconque des revendications 9 ou 10, dans laquelle la bande de conditionnements (100) comprend une bande de fermeture comprenant au moins la seconde partie de la première cavité et la seconde partie de la seconde cavité. 20
12. Bande de conditionnements (100) selon l'une quel-

conque des revendications 9 à 11, dans laquelle un conditionnement (30, 40) de la bande de conditionnements (100) comprend une portion de précurseur d'aliment ou de boisson qui est à l'intérieur de la cavité (31, 41) du conditionnement (30, 40). 25

13. Bande de conditionnements (100) selon l'une quelconque des revendications 9 à 12, dans laquelle une coque est constituée d'un matériau de structure à base de papier. 30

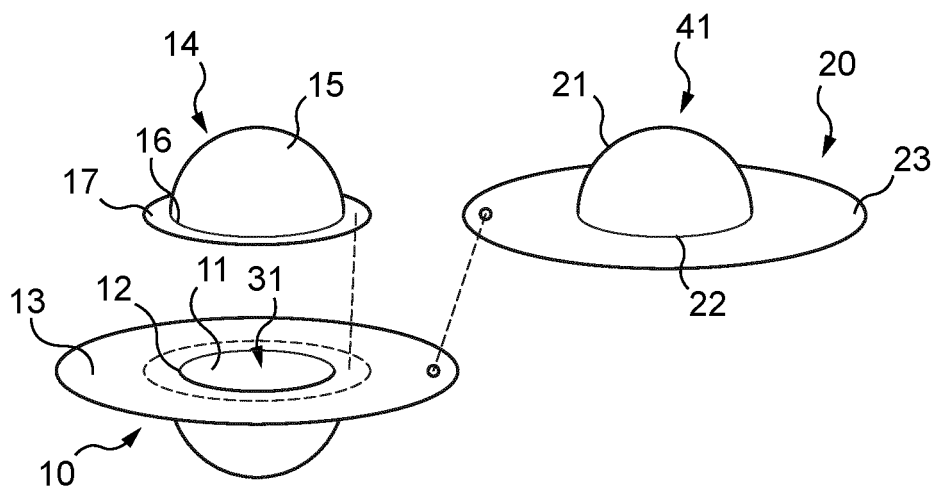


Fig.1

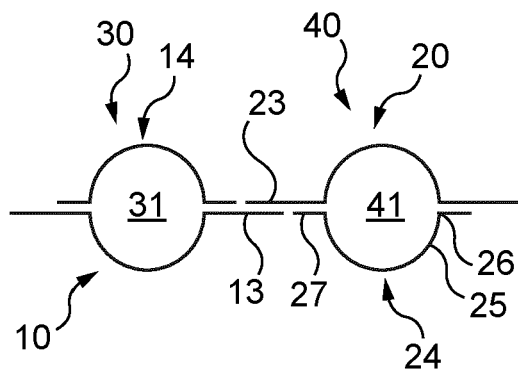


Fig.2

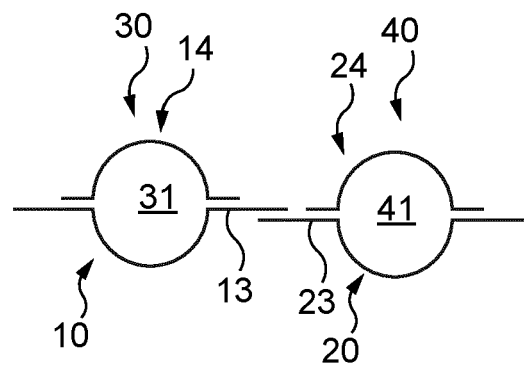


Fig.3

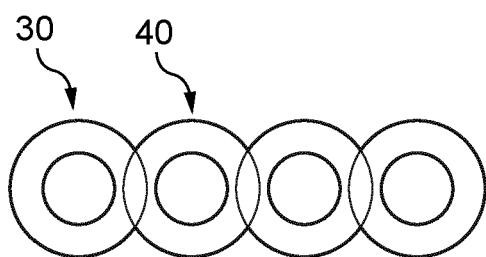


Fig.4

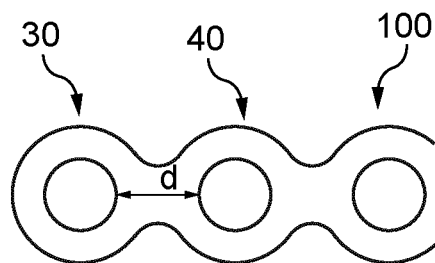


Fig.5

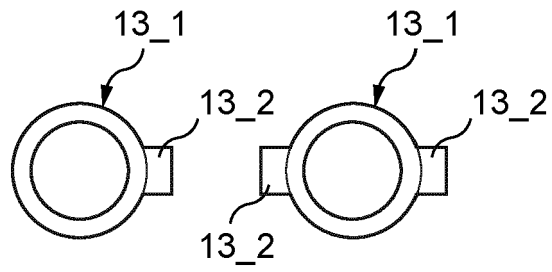


Fig.6

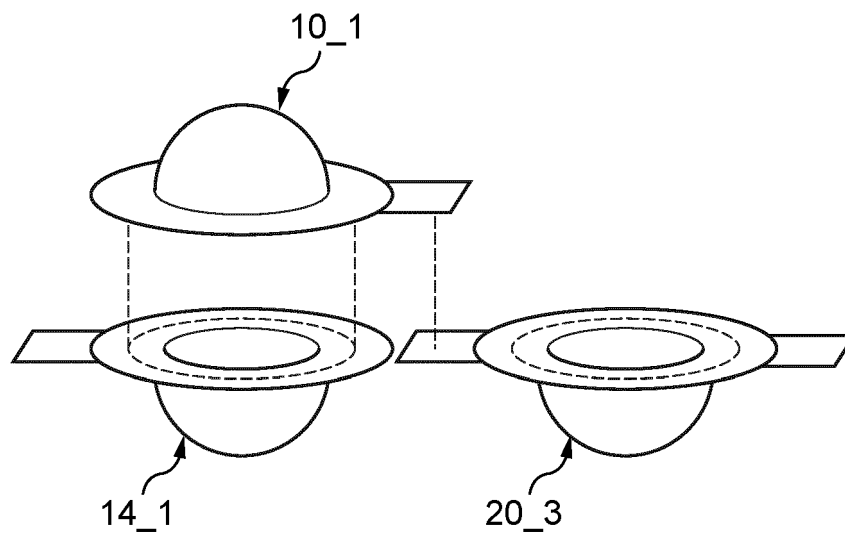


Fig.7

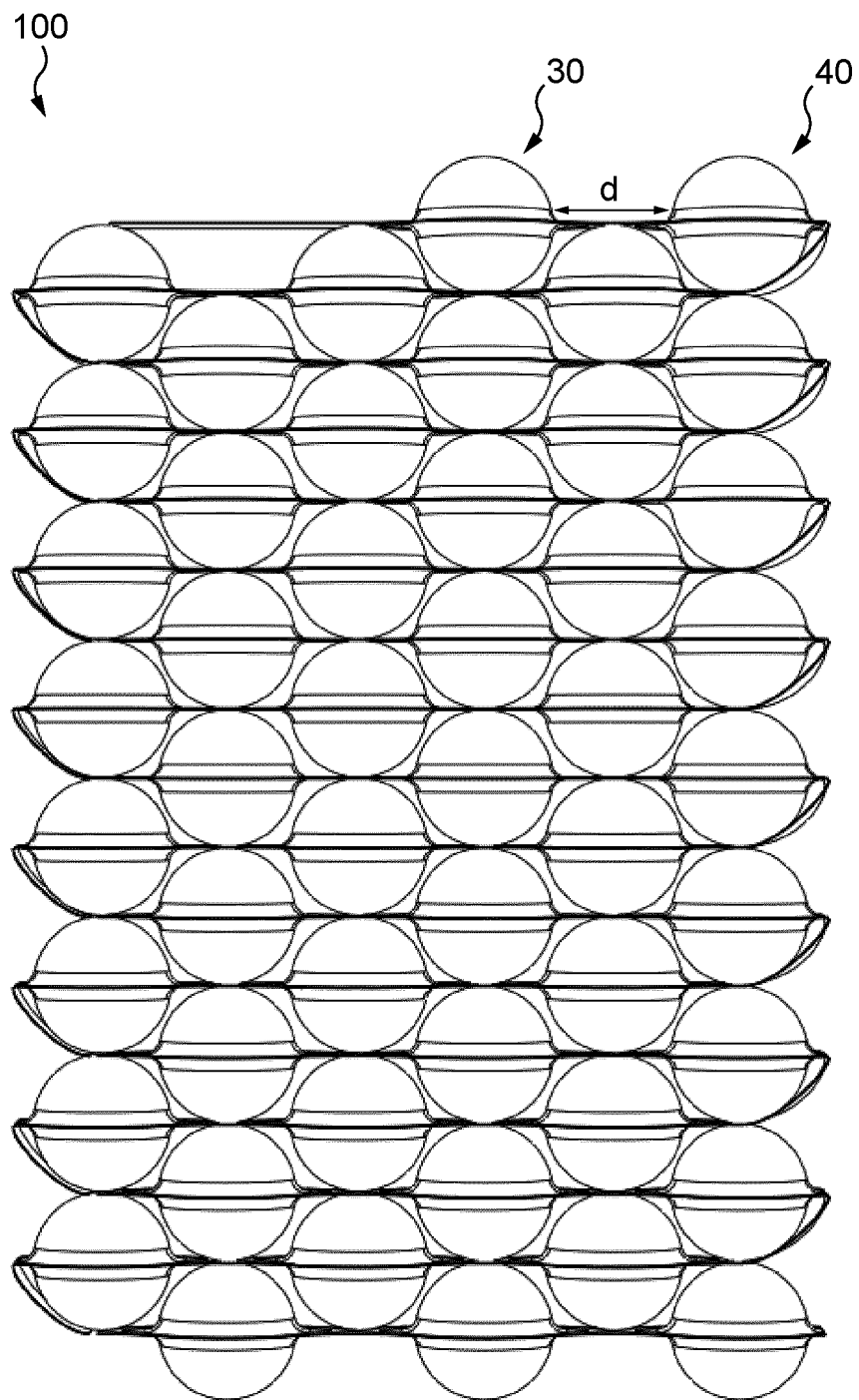


Fig.8

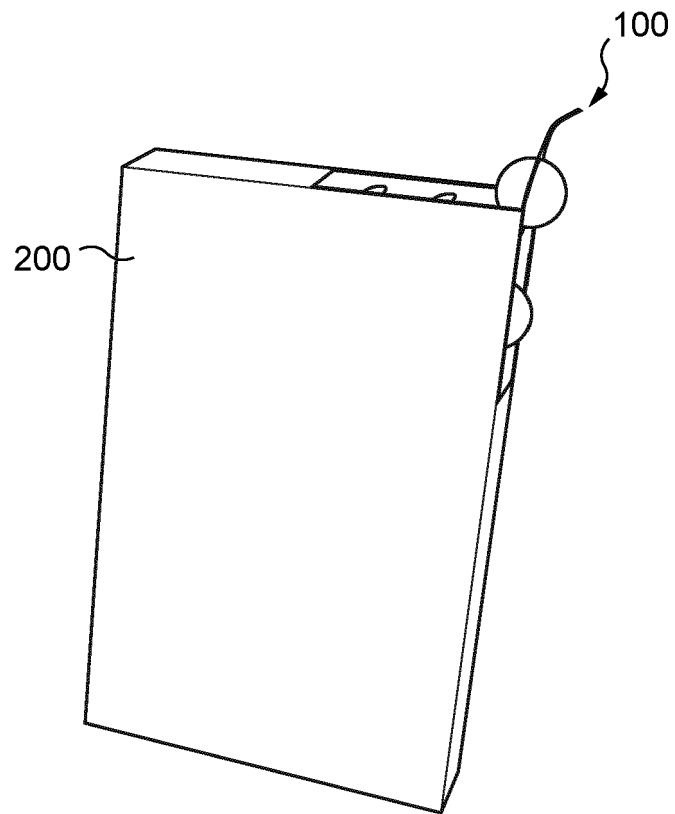


Fig.9

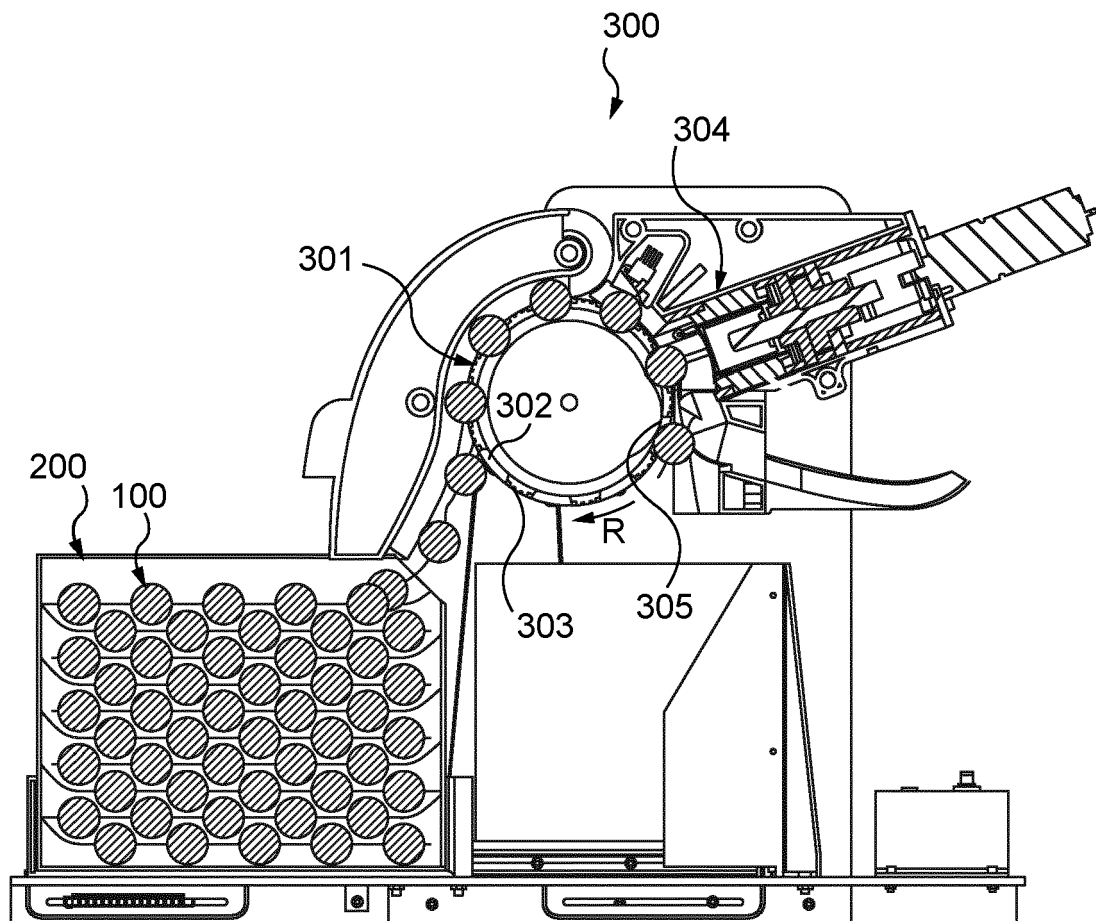


Fig.10

**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

- WO 2019219524 A [0005] [0189]
- WO 2019219523 A [0006] [0189]