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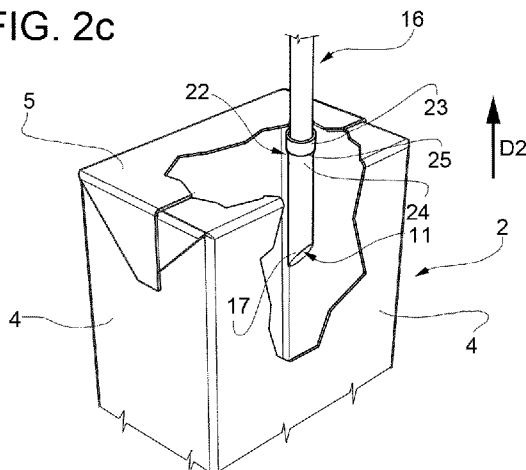
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(54) Title: DRINKING STRAW, PACKAGE ASSEMBLY AND METHOD FOR PRODUCING A DRINKING STRAW

FIG. 2c



(57) Abstract: There is described a drinking straw (3, 3') for a package (2) being filled with a pourable food product. The drinking straw (3, 3') comprises at least an inlet opening (11) for allowing the introduction of the pourable food product into the drinking straw (3, 3'), a tubular main portion (16) configured to be inserted, in use, into the package (2), having the inlet opening (11) and a sleeve (22, 22') superimposed on and/or surrounding at least a section of the tubular main portion (16). The sleeve (22, 22') is configured to allow for the insertion and/or introduction of the drinking straw (3, 3') into the package (2) and to impede and/or hinder and/or block a removal and/or separation of the drinking straw (3, 3') from the package (2) after introduction and/or insertion of the drinking straw (3, 3') into the package (2).

**DRINKING STRAW, PACKAGE ASSEMBLY AND METHOD FOR PRODUCING A
DRINKING STRAW**

TECHNICAL FIELD

The present invention relates to a drinking straw for
5 a package filled with a pourable food product.

The present invention also relates to a package assembly
having a package filled with a pourable food product and a
drinking straw.

The present invention also relates to a method for
10 producing a drinking straw.

BACKGROUND ART

As is known, many liquid or pourable food products,
such as fruit juice, UHT (ultra-high-temperature treated)
milk, wine, tomato sauce, etc., are sold in packages made of
15 sterilized packaging material.

A typical example is the parallelepiped-shaped package
for pourable food products known as Tetra Brik Aseptic
(registered trademark), which is made by sealing and folding
a laminated strip packaging material. The packaging material
20 has a multilayer structure comprising a carton and/or paper
base layer, covered on both sides with layers of heat-seal
plastic material, e.g. polyethylene. In the case of aseptic
packages for long-storage products, the packaging material
also comprises a layer of oxygen-barrier material, e.g. an
25 aluminum foil, which is superimposed on a layer of heat-seal
plastic material, and is in turn covered with another layer
of heat-seal plastic material forming the inner face of the
package eventually contacting the food product.

There are known package assemblies comprising a package
30 and a drinking straw, in particular for the consumption on-
the-go. The package comprises a main opening configured to
allow the introduction and/or insertion of the drinking straw

into the package. The package also comprises a separation membrane covering the main opening for separating the inner space of the package from an outer environment and which is configured to be pierced and/or opened by the drinking straw so as to allow the introduction of the drinking straw through the main opening and into the package and the subsequent extraction of the pourable food product through the drinking straw.

Each drinking straw is typically attached to the respective package within a closed plastic envelope. Prior to its use a consumer extracts the drinking straw from the envelope and introduces the drinking straw into the package by piercing and/or opening and/or rupturing at least partially the separation membrane.

A drawback of these packages is that the drinking straws may be littered independently (voluntarily or involuntarily) from the package after the complete or partial consumption of the pourable food product.

Therefore, a need is felt in the sector to improve the known drinking straws and the known package assemblies and the known method for producing drinking straws. In particular, so as to overcome at least one of the above-mentioned drawbacks.

DISCLOSURE OF INVENTION

It is therefore an object of the present invention to provide in a straightforward and low-cost manner an improved drinking straw solving the above-mentioned drawback.

It is a further object of the present invention to provide in a straightforward and low-cost manner an improved package assembly solving the above-mentioned drawback.

It is a further object of the present invention to provide in a straightforward and low-cost manner a method of

producing a drinking straw.

According to the present invention, there is provided a drinking straw according to the independent claim.

Further advantageous embodiments of the drinking straw
5 are specified in claims 2 to 12.

Furthermore, there is provided a packaging assembly according to claim 13.

Furthermore, there is provided a method for producing a drinking straw according to claims 14 and 15.

10 BRIEF DESCRIPTION OF THE DRAWINGS

Two non-limiting embodiments of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a package assembly
15 having a package and a drinking straw according to a first embodiment of the present invention, with parts removed for clarity;

Figure 2a is a perspective view of details of the package assembly of Figure 1 prior to a partial insertion of
20 the drinking straw into the package, with parts removed for clarity;

Figure 2b is a perspective views of details of the package assembly of Figures 1 after insertion of the drinking straw into the package, with parts removed for clarity;

25 Figure 2c is a perspective view of details of the package assembly of Figure 1 after an attempt of removing the drinking straw from the package, with parts removed for clarity;

Figure 3 is a perspective view of a package assembly
30 having a package and a drinking straw according to a second embodiment of the present invention, with parts removed for clarity;

Figure 4a is a perspective view of details of the package assembly of Figure 3 prior to a partial insertion of the drinking straw of Figure 3 into the package, with parts removed for clarity;

5 Figure 4b is a perspective view of details of the package assembly of Figure 3 after insertion of the drinking straw into the package, with parts removed for clarity; and

10 Figure 4c is a perspective view of details of the package assembly of Figure 3 after an attempt of removing the drinking straw from the package, with parts removed for clarity.

DETAILED DESCRIPTION OF THE EMBODIMENTS

Reference numeral 1 indicates as a whole a package assembly having a package 2, in particular a carton package, and a drinking straw 3. In particular, package assembly 1 is adapted for the consumption on-the-go.

According to a preferred non-limiting embodiment, package assembly 1 also comprises an envelope or a pocket for housing the drinking straw 3 prior to its use.

20 Preferably but not necessarily, the envelope or the pocket is provided on and/or fixed to package 2.

According to a preferred non-limiting embodiment, package 2 is filled with a pourable food product, in particular a sterilized and/or a sterile-processed pourable food product, such as water, pasteurized milk, fruit juice, beverages with pulp or other beverages suitable for consumption on-the-go.

Package 2 may be obtained from a web of packaging material having a multilayer structure (not shown), and comprises at least a layer of fibrous material, such as paper or cardboard, and at least two layers of polymeric plastic material, e.g. polyethylene, interposing the layer of

fibrous material in between one another. One of these two layers of polymeric material defines the inner face of package 2 contacting the pourable food product in the filled package 2.

5 Preferably but not necessarily, the web of packaging material also comprises a layer of gas- and light-barrier material, e.g. aluminum foil or a film layer comprising ethylene vinyl alcohol (EVOH), in particular being arranged between one of the layers of the polymeric material and the
10 layer of fibrous material. Preferentially but not necessarily, the web of packaging material also comprises a further layer of polymeric material being interposed between the layer of gas- and light-barrier material and the layer of fibrous material.

15 With particular reference to Figures 1 to 2c, package 2 extends along a longitudinal axis A. In particular, package 2 comprises a first wall portion, in particular being transversal, even more particular perpendicular, to axis A, from which package 2 extends along axis A. Preferably but
20 not necessarily, the first wall portion defines a support surface of package 2, which, in use, can be put in contact with a support, such as a shelf, when, in use, being e.g. exposed within a sales point. In particular, when being
25 arranged on a support and/or, in use, during consumption of the pourable food product by a consumer from package 2 the first wall portion defines a bottom wall portion.

Preferably but not necessarily, package 2 also comprises a plurality of lateral walls 4 being (fixedly) connected to the first wall portion and extending, in
30 particular substantially parallel to axis A, from the first wall portion.

Preferably but not necessarily, package 2 also

comprises a second wall portion 5 opposite to the first wall portion and being (fixedly) connected to lateral walls 4. In other words, lateral walls 4 are interposed between the first wall portion and second wall portion 5. In particular, when
5 being arranged on a support and/or, in use, during consumption of the pourable food product by a consumer from package 2, second wall portion 5 defines a top wall portion.

According to a preferred non-limiting embodiment, the first wall portion and second wall portion 5 may be parallel
10 to one another.

According to a non-limiting alternative embodiment, the first wall portion and second wall portion 5 could be inclined with respect to one another.

Preferentially but not necessarily, package 2 is
15 parallelepiped-shaped.

With particular reference to Figures 1 to 2c, package 2 comprises a main opening allowing for the insertion and/or introduction of drinking straw 3 into package 2.

According to a preferred non-limiting embodiment,
20 package 2 also comprises a separation membrane 6 covering the main opening and being configured to be ruptured and/or opened and/or cut and/or pierced, in particular by drinking straw 3, so as to allow the insertion of drinking straw 3 (through the main opening) into package 2. In particular,
25 separation membrane 6 separates, prior to losing its integrity, an inner environment of package 2 containing the pourable food product from an outer environment. In this manner, the pourable food product is protected from the outer environment.

30 Preferentially but not necessarily, separation membrane 6 comprises a gas- and light-barrier material, e.g. aluminum foil or a film comprising ethylene vinyl alcohol (EVOH).

According to a preferred non-limiting embodiment, separation membrane 6 is defined by a portion of the web of packaging material, in particular a portion of the layers of the web of packaging material being different from the layer of fibrous material.

Preferentially but not necessarily, separation membrane 6 has a circular shape.

Preferentially but not necessarily, separation membrane 6 is provided on second wall portion 5.

According to a preferred non-limiting embodiment, the main opening is defined by a respective hole within the layer of fibrous material.

According to a preferred non-limiting embodiment, the extension of the main opening is delimited by a rim of the main opening itself. In particular, the rim has a circular shape.

According to a preferred non-limiting embodiment, the main opening has a transversal extension C. In particular, transversal extension C is determined with respect to axis A. Even more particular, transversal extension C is determined and/or measured considering the rim delimiting the main opening. According to the non-limiting embodiment disclosed in Figures 1 to 2c, transversal extension C corresponds to a diameter of the main opening.

With particular reference to Figures 1 to 2c, drinking straw 3 comprises at least a tubular body 10 defining and/or delimiting a passage for the pourable food product and an inlet opening 11 and an outlet opening 12 provided at opposite ends of drinking straw 3 itself. In particular, tubular body 10 comprises inlet opening 11 and outlet opening 12.

According to a preferred non-limiting embodiment, inlet

opening 11 is configured to allow for the introduction of the pourable food product into drinking straw 3 and in particular, outlet opening 12 is configured to allow for the outlet of the pourable food product from drinking straw 3 (i.e., in use, a consumer receives the pourable food product through outlet opening 12).

According to the non-limiting embodiment shown, tubular body 10 has a circular cross-section.

In an alternative embodiment not shown, tubular body 10 could have a rectangular or square cross-section or a more complex cross-section.

According to a preferred non-limiting embodiment, drinking straw 3, in particular tubular body 10, comprises

- a mouthpiece 15 having and/or carrying outlet opening 12; and

- a tubular main portion 16 having and/or carrying inlet opening 11 and being configured to be inserted and/or introduced, in use, into package 2.

According to a preferred non-limiting embodiment, tubular main portion 16 comprises an outer lateral surface.

According to a preferred non-limiting embodiment, at least a portion of tubular main portion 16 and/or tubular body 10 extends along a longitudinal axis B.

Preferentially but not necessarily, drinking straw 3, comprises a tip section 17 configured to rupture and/or open and/or cut and/or pierce, in use, separation membrane 6, in particular by means of a consumer arranging tip section 17 on separation membrane 6 (see Figure 2a) and exerting a force on drinking straw 3, in particular tip section 17, for directing at least tubular main portion 16 through separation membrane 6 and into package 2 (see Figure 2b), in particular towards the first wall portion.

Preferentially but not necessarily, tip section 17 is wedge-shaped.

According to a preferred non-limiting embodiment, drinking straw 3, in particular tubular body 10, comprises
5 a corrugated portion 18 interposed between mouthpiece 15 and tubular main portion 16.

Preferentially but not necessarily, corrugated portion 18 is configured to allow for a relative movement between mouthpiece 15 and tubular main portion 16. In particular,
10 corrugated portion 18 allows a consumer to arrange mouthpiece 15 according to the consumer's needs and/or preferences. In other words, corrugated portion 18 allows inclining mouthpiece 15 with respect to tubular main portion 16 and/or longitudinal axis B.

Advantageously, drinking straw 3 also comprises a
15 sleeve 22 superimposed on and/or surrounding at least a section of tubular main portion 16 (i.e. sleeve 22 and tubular main portion 16 are distinct from one another). In particular, sleeve 22 is configured to allow the insertion
20 and/or introduction of tubular main portion 16 together with sleeve 22 into package 2 and to impede and/or hinder and/or block the removal and/or separation of drinking straw 3 from package 2 after insertion and/or introduction of tubular main portion 16 into package 2.

According to a preferred non-limiting embodiment,
25 sleeve 22 is coupled and/or connected to tubular main portion 16, in particular in a non-removable manner, so that an insertion and/or introduction of tubular main portion 16 also results in the insertion and/or introduction of sleeve
30 22 into package 2.

Preferentially but not necessarily, sleeve 22 is non-removably coupled and/or connected to tubular main portion

16 by means of mechanical friction, gluing, (solvent) bonding, welding (e.g. ultrasonic, hot plate or laser welding), mechanical deformation (e.g. cold forming or hot forming (infrared heating, induction heating, flow of heated gas)).

According to a preferred non-limiting embodiment, tubular main tubular portion 16 together with sleeve 22 is configured to be inserted into package 2 through the main opening of package 2, thereby rupturing and/or cutting and/or piercing and/or opening separation membrane 6. In particular, tubular main portion 16 and sleeve 22 are configured to form, in use, during insertion and/or introduction of tubular main portion 16 into package 2, a hole within package 2 and/or separation membrane 6 having a size substantially corresponding to a maximum outer size, in particular a maximum outer diameter, of at least a portion of tubular main portion 16 and/or sleeve 22.

According to a preferred non-limiting embodiment, the maximum size and/or extension of this hole is limited by transversal extension C of the main opening covered by separation membrane 6. In particular, the size and/or extension of the hole may be smaller than transversal extension C of the main opening.

According to a preferred non-limiting embodiment, sleeve 22 comprises an abutment portion 23 configured to abut onto an inner surface of package 2 during a movement of tubular main portion 16 and sleeve 22 out of package 2 for impeding and/or hindering and/or blocking separation and/or removal of drinking straw 3 from package 2. In particular, sleeve 22 and abutment portion 23 are configured to pass through the main opening and abutment portion 23 is configured to impede and/or hinder and/or block the

extraction of sleeve 22 out of package 2 and consequently to impede and/or hinder and/or block the removal and/or separation of tubular main portion 16 and drinking straw 3 from package 2.

5 Preferentially but not necessarily, abutment portion 23 is configured to abut against the inner surface of package 2 in the area of, in particular at, the main opening, in particular the rim delimiting the main opening.

10 Preferentially but not necessarily, in use, during insertion and/or introduction of tubular main portion 16 together with sleeve 22 into package 2, drinking straw 3 is moved along a first direction D1 transversal to separation membrane 6 and/or the main opening and/or the first wall portion and/or second wall portion 5. In the ideal case, 15 after the complete or partial consumption of the pourable food product present within package 2, the consumer disposes of package 2 together with drinking straw 3 without the attempt to remove drinking straw 3 from package 2. In the non-ideal case that a consumer tried to remove and/or 20 separate drinking straw 3 from package 2 by moving drinking straw 3 along a second direction D2 opposite to first direction D1 and out of package 2, sleeve 22 would limit the possible extraction as sleeve 22, in particular abutment portion 23, abuts, at some degree of the extraction of 25 tubular main portion 16 and/or sleeve 22 out of package 2, against the inner surface of package 2.

30 According to a preferred non-limiting embodiment, sleeve 22 comprises a coupling portion 24 having an inner coupling surface being in contact with an outer coupling surface of tubular main portion 16 and/or the outer lateral surface of tubular main portion 16. In particular, coupling portion 24 and abutment portion 23 are connected to one

another.

Preferentially but not necessarily, coupling portion 24 is closer to inlet opening 11 than abutment portion 23. In other words, abutment portion 23 is closer to mouthpiece 15 than coupling portion 24.

According to a preferred non-limiting embodiment, sleeve 22 also comprises a transition portion 25 interposed between and connecting coupling portion 24 and abutment portion 22 with one another. In particular, transition portion 25 is configured to allow and/or allows a continuous transition between abutment portion 23 and coupling portion 24.

According to a preferred non-limiting embodiment, abutment portion 23 has a maximum transversal extension E, in particular determined and/or measured with respect to longitudinal axis B. In particular, maximum transversal extension E is determined and/or measured considering the cross-sectional extensions of abutment portion 23 with respect to longitudinal axis B.

According to the preferred non-limiting embodiment disclosed in Figures 1 to 2c, abutment portion 23 has a substantially circular cross-sectional profile and maximum transversal extension E equals the maximum outer diameter.

According to the preferred non-limiting embodiment shown, maximum transversal extension E is larger than transversal extension C.

According to a preferred non-limiting embodiment, coupling portion 24 also comprises a respective maximum transversal extension being smaller than maximum transversal extension E. In other words, sleeve 22 comprises a thickening defining abutment portion 23.

According to the preferred non-limiting embodiment

shown in Figures 1 to 2c, sleeve 22 comprises an enlarged end defining abutment portion 23.

According to a preferred non-limiting embodiment, transition portion 25 is configured to guarantee a
5 progressive transition between coupling portion 24 and abutment portion 23.

According to the preferred non-limiting embodiment shown in Figures 1 to 2c, sleeve 22 comprises a collar defining abutment portion 23. In particular, the collar is
10 rigid; i.e. during insertion of tubular main portion 16 and sleeve 22 into package 2, the collar does not substantially change shape. In alternative, the collar could be configured to be compressible so as to adapt to the main opening during insertion and/or introduction of tubular main portion 16 and
15 sleeve 22 into package 2 and to return to its initial configuration and/or shape after insertion and/or introduction of tubular main portion 16 and sleeve 22 into package 2.

According to a preferred non-limiting embodiment, sleeve 22, in particular coupling portion 24, and/or tubular
20 main portion 16 define tip section 17 and/or delimit inlet opening 11.

According to the non-limiting embodiment shown, sleeve 22 and tubular main portion 16 define in cooperation tip
25 section 17 (i.e. both sleeve 22 and tubular main portion 16 extend from inlet opening 11). In particular, in this manner the opening and/or cutting and/or perforation of the main opening, in particular separation membrane 6, is facilitated.

30 According to an alternative embodiment not shown, tubular main portion 16 carries and/or comprises tip section 17 and/or inlet opening 11; i.e. sleeve 22 does not extend

from inlet opening 11 towards mouth piece 15.

According to another alternative embodiment not shown, sleeve 22 carries and/or comprises tip section 17 and/or inlet opening 11; i.e. sleeve 22 extends away from tubular
5 main portion 16.

In use, during insertion and/or introduction of tubular main portion 16 and sleeve 22 into package 2 and through the main opening (i.e. movement of tubular main portion 16 and sleeve 22 along direction D1), the consumer must exert a
10 force sufficient to overcome the resistance due to abutment portion 23 (the collar) needing to pass through the main opening. In particular, the passing through of sleeve 22 as a whole is facilitated by the presence of transition portion 25. Even more particular, in use, during insertion and/or
15 introduction of tubular main portion 16 and sleeve 22 into package 2 at first coupling portion 24 and then abutment portion 23 enter into package 2.

Then upon movement of tubular main portion 16 out of package 2 (i.e. along direction D2) at some point abutment
20 portion 23 abuts against the inner surface of package 2. In particular, abutment portion 23 cannot be directed out of package 2 through the main opening.

A method for producing drinking straw 3 comprises at least the steps of:

- 25 - providing for tubular body 10;
 - providing for sleeve 22; and
 - coupling sleeve 22 onto tubular main portion 16 so that sleeve 22 surrounds and/or superimposes at least a section of tubular main portion 16.

30 In particular, during the step of coupling, sleeve 22 is non-removably coupled and/or connected to tubular main portion 16, even more particular by means of mechanical

friction, gluing, (solvent) bonding, welding (e.g. ultrasonic, hot plate or laser welding) or mechanical deformation (e.g. cold forming or hot forming (infrared heating, induction heating, flow of heated gas)).

5 According to an alternative, during the step of providing tubular body 10, an initial tubular body is provided having the double-length of tubular body 10 and during the step of providing sleeve 22, an initial sleeve is provided corresponding to two sleeves 22. During the step of
10 coupling, the initial sleeve is coupled to the initial tubular body at the center of the initial tubular body. In particular, after the step of coupling, a step of cutting is executed so as to form two drinking straws 3, each one having a corresponding sleeve 22.

15 With reference to Figures 3 and 4a to 4c, number 3' indicates an alternative embodiment of a drinking straw according to the present invention; as drinking straw 3' is similar to drinking straw 3, the following description is limited to the differences between them, and using the same
20 references, where possible, for identical or corresponding parts.

In particular, drinking straw 3' differs from drinking straw 3 in comprising sleeve 22'.

25 As sleeve 22' is similar to sleeve 22, the following description is limited to the difference between them, and using the same reference, where possible, for identical or corresponding parts.

According to a preferred non-limiting embodiment, sleeve 22' comprises a plurality of, in particular
30 elastically deformable, abutment elements 26, in the example shown four. In particular, abutment elements 26 define the respective abutment portion 23 of sleeve 22'.

Preferentially but not necessarily, abutment elements 26 are connected to the respective coupling portion 24 of sleeve 22'. In particular, abutment elements 26 transversally protrude from coupling portion 24. In other words, abutment elements 26 are inclined with respect to longitudinal axis B.

According to a preferred non-limiting embodiment, abutment elements 26 are moveable between:

- an initial position in which abutment elements 26 transversally protrude away from tubular main portion 16 and/or coupling portion 24; and

- an insertion position in which abutment elements 26 are approached to and/or lie against tubular main portion 16, in particular the outer lateral surface of tubular main portion 16.

In particular, each abutment element 26 forms and/or defines an acute angle with longitudinal axis B, the acute angle being larger when the abutment element 26 is arranged in the initial position than when the abutment element 26 is arranged in the insertion position.

According to a preferred non-limiting embodiment, abutment elements 26 are designed such that abutment elements 26 are biased into the initial position (in the absence of an external force acting on abutment elements 26).

In particular, prior to the insertion and/or introduction of tubular main portion 16 and sleeve 22' into package 2, abutment elements 26 are arranged in the initial position. During the movement of tubular main portion 16 (i.e. along direction D1) into package 2 and the movement of abutment portion 23, in particular abutment elements 26, through the main opening, abutment elements 26 are moved to the insertion position and move back to the initial position

after tubular main portion 16 and sleeve 22', in particular abutment portion 23, are arranged within package 2.

According to a preferred non-limiting embodiment, each abutment element 26 comprises an engagement surface
5 configured to abut against the inner surface of package 2 during movement of tubular main portion 16 and sleeve 22' out of package 2 for impeding and/or hindering and/or blocking the separation and/or the removal of drinking straw 3 from package 2.

10 Preferentially but not necessarily, abutment elements 26 are also movable to an abutment position in which the engagement surfaces are pressed onto the inner surface of package 2. In particular, in use, upon movement of tubular main portion 16 and sleeve 22' out of package 2 (i.e. along
15 direction D2), at some degree of extraction abutment elements 26 start to contact the inner surface of package 2. Upon further movement out of package 2, abutment elements 26 move due to the interaction with the inner surface of package 2 to the abutment position. Thereby, the effective interaction
20 area between the engagement surfaces and the inner surface of package 2 increases. Preferably but not necessarily, once a consumer releases, in use, the extraction movement and/or force, abutment elements 26 return to their respective initial positions.

25 According to a preferred non-limiting embodiment, each abutment element 26 defines and/or forms a respective acute angle with longitudinal axis B. Preferentially but not necessarily, the respective acute angles are smaller with abutment elements 26 being arranged in the respective initial
30 positions than with abutment elements 26 being arranged in the abutment position.

The method for producing drinking straw 3' is similar

to the production of drinking straw 3. Therefore, we refer to the description provided with respect to drinking straw 3.

The advantages of drinking straws 3 and 3' according to the present invention will be clear from the foregoing description.

In particular, by providing for sleeve 22 or 22' superimposing and/or surrounding at least a section of tubular main portion 16 a simple and efficient mechanism is offered, allowing to impede the separation and/or release of drinking straws 3 and 3' from the respective package 2 after its insertion into the respective package 2. In this way, littering of drinking straws 3 and 3' is avoided.

Clearly, changes may be made to drinking straws 3 and 3' and the method for producing these as described herein without, however, departing from the scope of protection as defined in the accompanying claims.

CLAIMS

1.- Drinking straw (3, 3') for a package (2) being filled with a pourable food product; the drinking straw (3, 3') comprises at least:

5 - an inlet opening (11) for allowing the introduction of the pourable food product into the drinking straw (3, 3');

10 - a tubular main portion (16) configured to be inserted, in use, into the package (2), having the inlet opening (11); and

 - a sleeve (22, 22') superimposed on and/or surrounding at least a section of the tubular main portion (16);

 wherein the sleeve (22, 22') is configured to allow for the insertion and/or introduction of the drinking straw (3, 3') into the package (2) and to impede and/or hinder and/or block a removal and/or separation of the drinking straw (3, 3') from the package (2) after introduction and/or insertion of the drinking straw (3, 3') into the package (2).

2.- Drinking straw according to claim 1, wherein the sleeve (22, 22') comprises an abutment portion (23, 26) configured to abut onto an inner surface of the package (2) during a movement of the tubular main portion (16) out of the package (2) for impeding and/or hindering and/or blocking a separation and/or removal of the drinking straw (3, 3') from the package (2).

3.- Drinking straw according to claim 2, wherein the package (2) comprises a main opening allowing for the introduction of the drinking straw (3, 3') into the package (2);

30 wherein the abutment portion (23, 26) is configured to abut against a section of the inner surface arranged in the area of a rim of the main opening.

4.- Drinking straw according to claim 3, wherein a maximum transversal extension (E) of the abutment portion (23, 26) is larger than a transversal extension (C) of the main opening.

5 5.- Drinking straw according to any one of the preceding claims, wherein the sleeve (22, 22') also comprises a coupling portion (24) having an inner coupling surface being in contact with an outer coupling surface of the section of the tubular main portion (16).

10 6.- Drinking straw according to claim 5, wherein the sleeve (22) comprises a collar (23) connected to the coupling portion (24) and having a maximum external transversal extension (E) being larger than a maximum external transversal extension of the coupling portion (24).

15 7.- Drinking straw according to any one of the preceding claims, wherein the sleeve (22, 22') comprises a thickening (23, 26).

20 8.- Drinking straw according to any one of claims 1 to 5, wherein the sleeve (22') comprises a plurality of abutment elements (26);

wherein the abutment elements (26) are moveable between an initial position in which the abutment elements (26) protrude away from the tubular main portion (16) and an insertion position in which the abutment elements (26) are approached to and/or lie against the tubular main portion (16).

25 9.- Drinking straw according to claim 8, wherein each abutment element (26) comprises an engagement surface configured to abut against the inner surface of the package (2) during a movement of the tubular main portion (16) out of the package (2) for impeding and/or hindering and/or blocking the separation and/or the removal of the drinking

straw (3') from the package (2).

10.- Drinking straw according to any one of the preceding claims, wherein the sleeve (22, 22') at least partially delimits the inlet opening (11).

5 11.- Drinking straw according to claim 10, wherein, the sleeve (22, 22') at least partially defines a tip section (17) of the drinking straw (3) comprising the inlet opening (11).

10 12.- Drinking straw according to claim 11, wherein the sleeve (22, 22') and the tubular main portion (16) define in cooperation the tip section (17).

13.- Package assembly (1) comprising a package (2) filled with a pourable food product and a drinking straw (3, 3') according to any one of the preceding claims.

15 14.- Method for producing a drinking straw (3, 3') according to any one of claims 1 to 12, comprising at least the steps of:

- providing for the tubular body (10);
- providing for the sleeve (22, 22'); and
- 20 - coupling the sleeve (22, 22') onto the tubular main portion (16) of the tubular body (10).

15 15.- Method according to claim 14, wherein during the step of coupling, the sleeve (22) is non-removably coupled and/or connected to the tubular main portion (16), in particular by means of mechanical friction, gluing, bonding, welding or mechanical deformation.

FIG. 2a

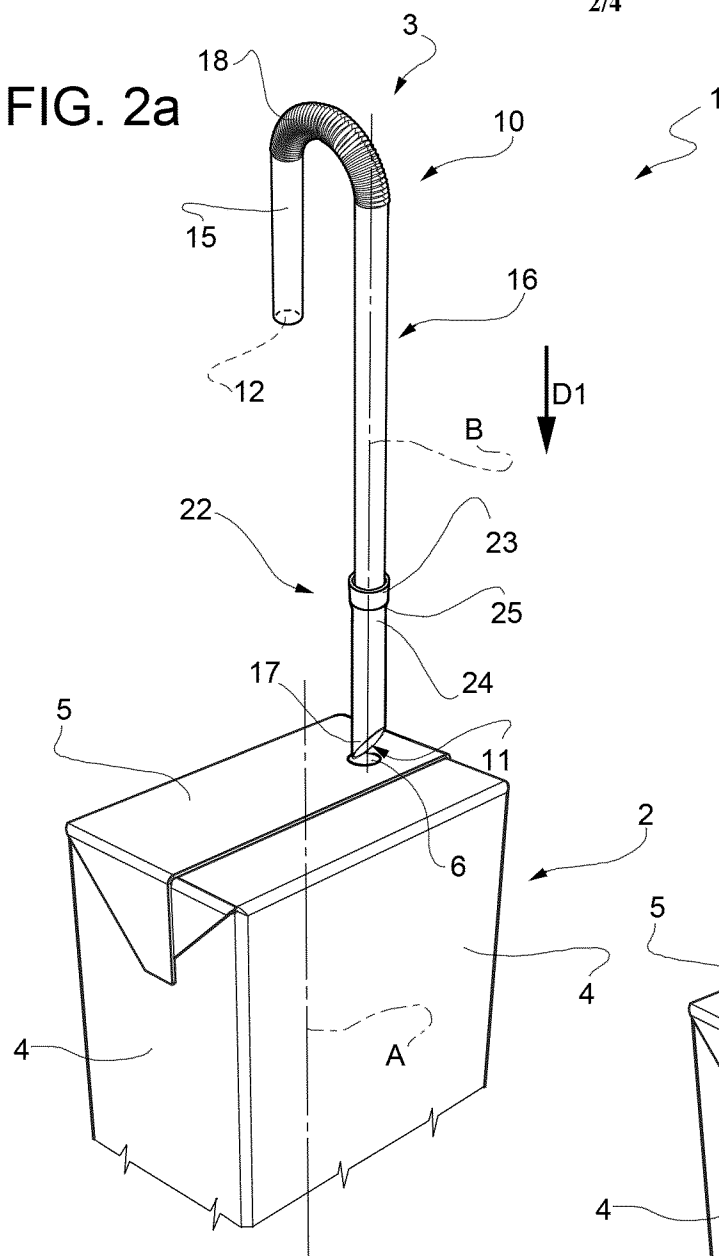


FIG. 2b

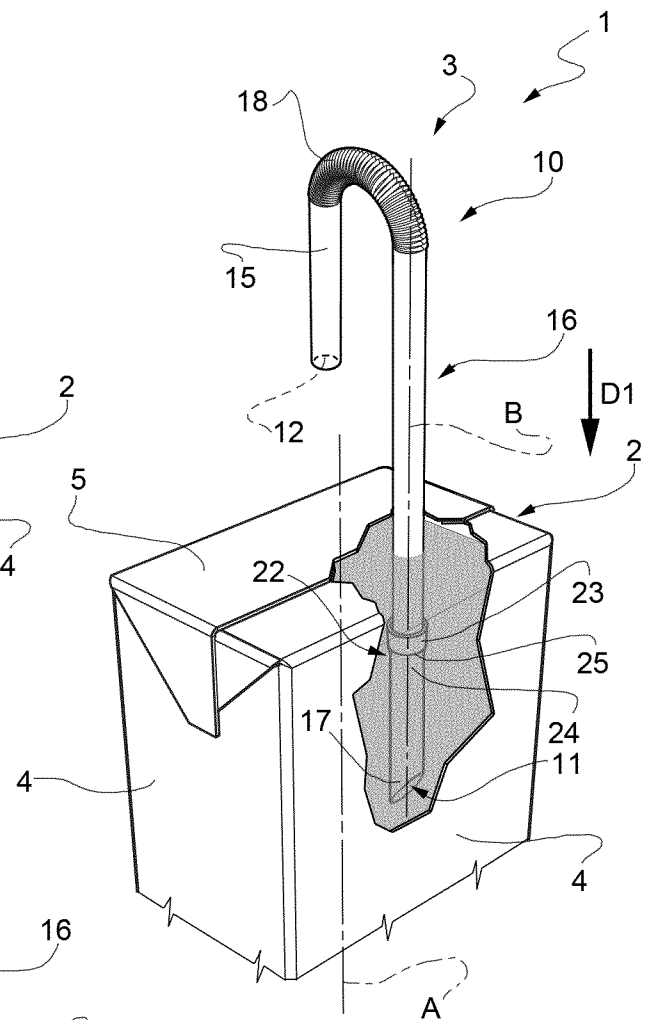


FIG. 2c

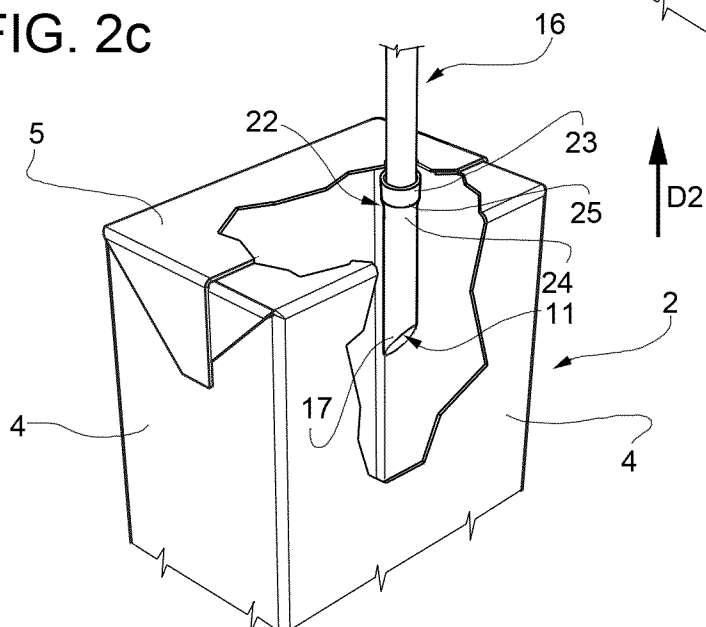


FIG. 3

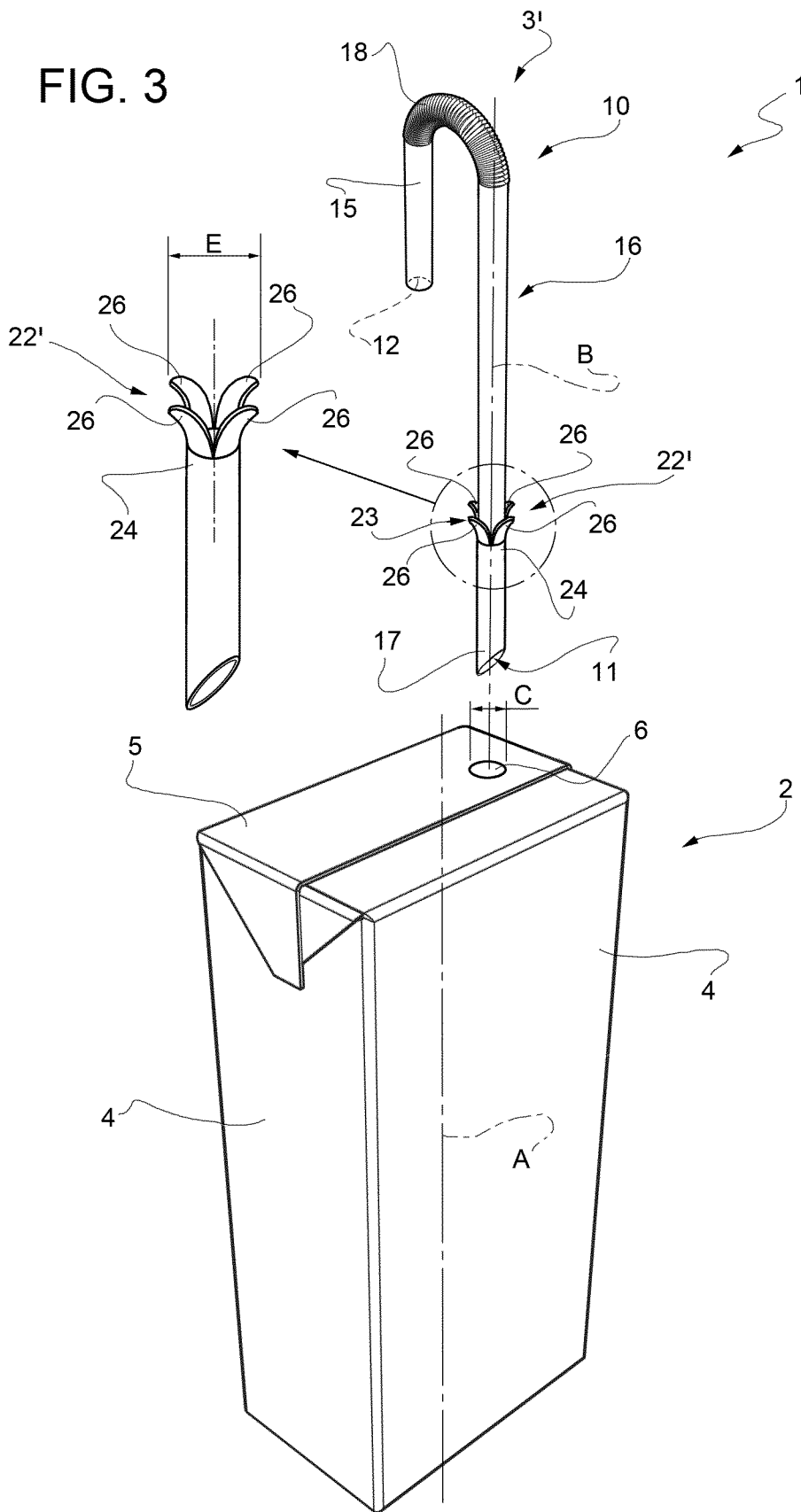


FIG. 4a

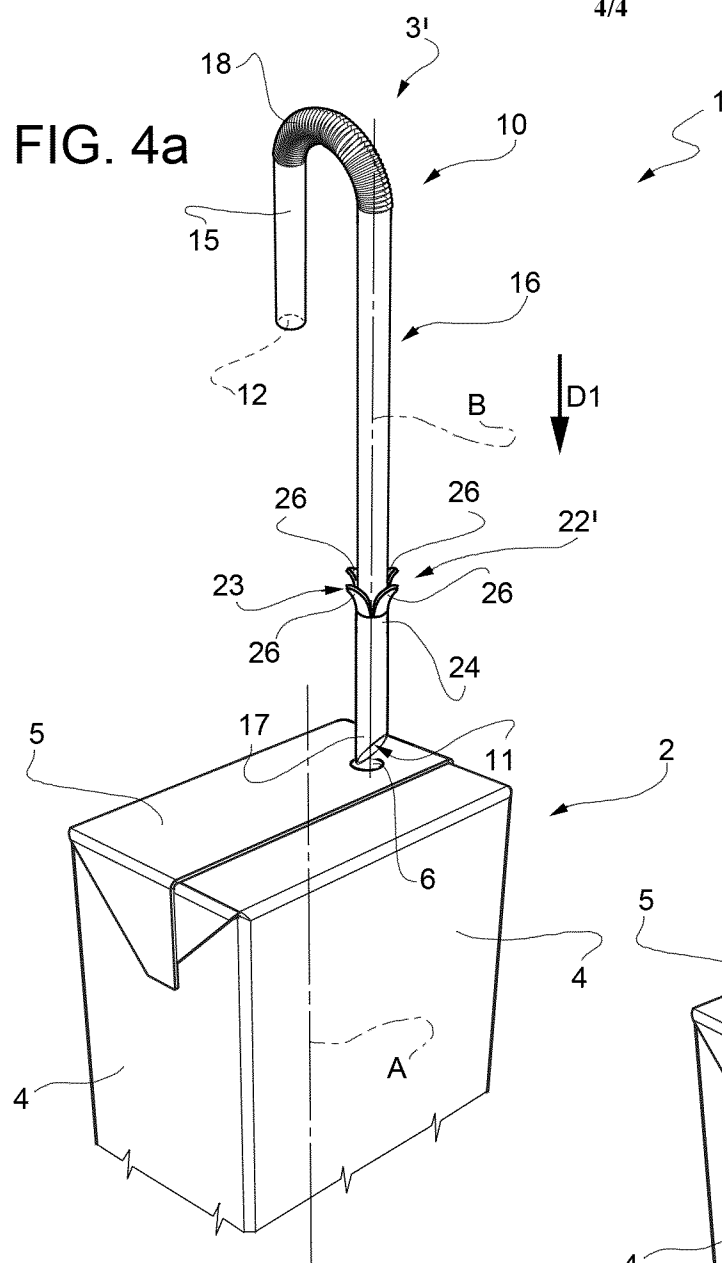


FIG. 4b

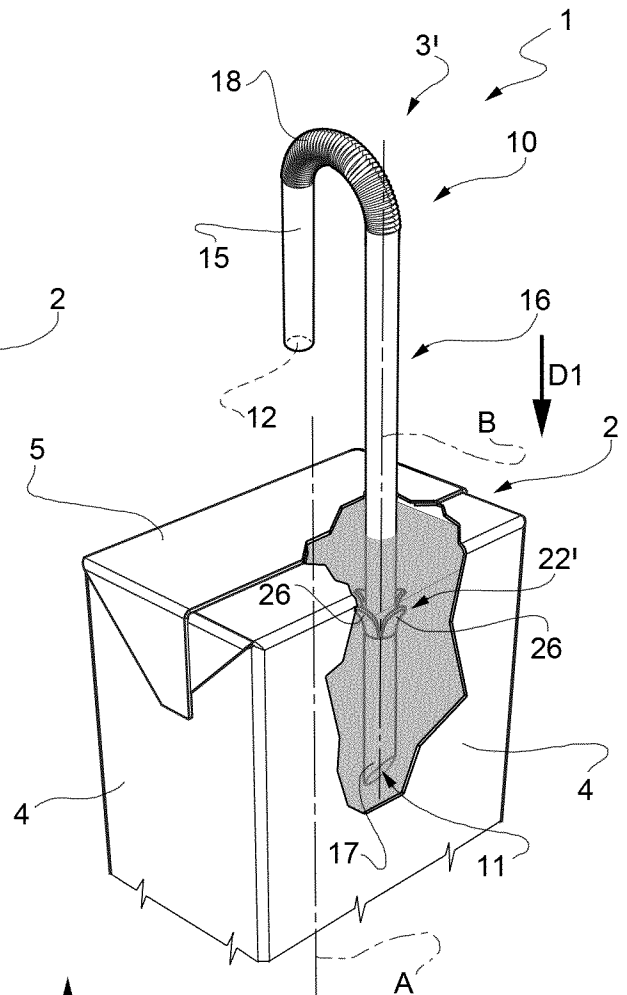
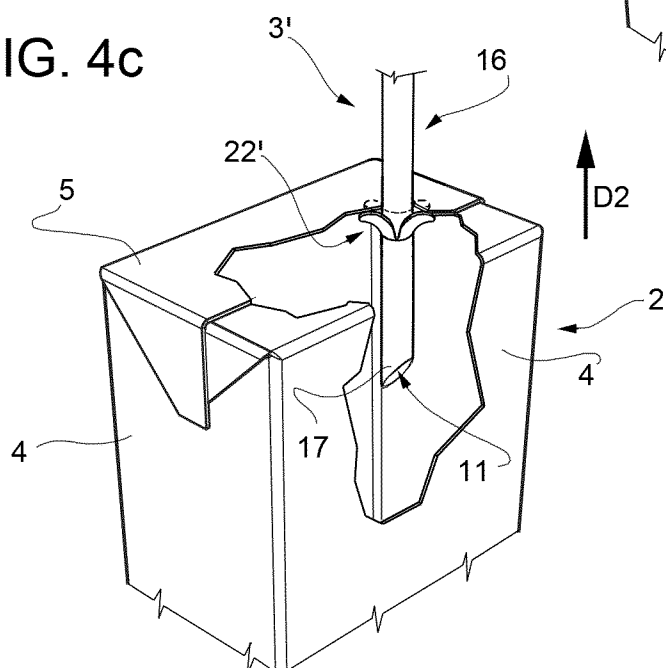


FIG. 4c



INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2020/052204

A. CLASSIFICATION OF SUBJECT MATTER
INV. A47G21/18 B65D77/28
ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A47G B65D

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

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

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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X	US 2009/256000 A1 (WALLACE JAMIE M [US]) 15 October 2009 (2009-10-15) paragraph [0023] - paragraph [0038]; figures	1-15
X	WO 2005/018390 A1 (LAWRENCE DENNIS PETER [GB]) 3 March 2005 (2005-03-03) page 8, line 11 - page 13, last line; figures	1-15
X	NL 2 007 236 C2 (BIN INNOVATIONS BV) 12 February 2013 (2013-02-12) page 7, line 3 - page 10, line 9; figures	1-15
X	JP 2009 149329 A (TETRA PAK JAPAN) 9 July 2009 (2009-07-09) the whole document	1-7, 10-15
	-/--	



Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search

2 April 2020

Date of mailing of the international search report

17/04/2020

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Vistisen, Lars

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2020/052204

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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INTERNATIONAL SEARCH REPORT

Information on patent family members

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