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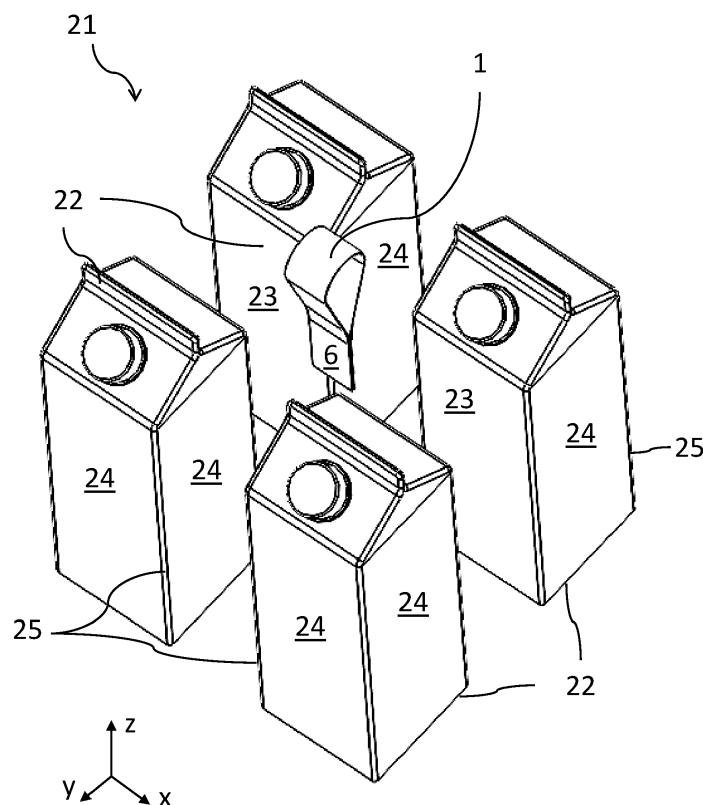
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(54) FOLDABLE ARTICLE CARRIER

(57) An article carrier for packaging a plurality of articles into a multipack of articles, the articles being arranged in at least one row extending in a first direction, the article carrier comprising: a handle section defining a handle opening; a carrier section foldably connected to said handle section along a second direction substan-

tially perpendicular to said first direction, said carrier section comprising at least one connector flap adapted to be disposed in between facing exterior surfaces of adjacent articles for providing an adhesively and detachable connection between said facing exterior surfaces of said adjacent articles to form said multipack of articles.

**FIG. 2**

Description

Field of the invention

[0001] The present invention generally relates to article packaging, and in particular to article carriers formed from foldable blanks for packaging a plurality of articles into a multipack of articles, and to methods thereof.

Background of the invention

[0002] It is desirable for many applications to combine a plurality of articles or containers into handy individual portable packages. Articles or containers, as referred to herein, are consumer goods or products containing food, beverages and so on, such as bottles, bricks and cans. It is typically required to group or unite such multiple (uniform) articles or containers with the use of appropriate strapping or shrink wrap-around packaging techniques to form multipacks of articles or containers. Such handy packages are particularly suitable for use in the trade, as well as for handling by end user thereof.

[0003] Bundling or packaging of articles into multipacks of articles may serve multiple purposes, for example, to create space for branding like a print on the bundling (transparent) film, box or tray, or to allow to build stable pallet loads. Indeed, quasi rigid bundles or multipacks of articles are very suitable as building blocks for pallet loads while individual items are very challenging as a starting point for stable pallet loads. Packages articles into a bundles or multipack of articles may also attract consumers to buy more articles a time.

[0004] For example, articles or containers may be packed or bundled using a (plastic) collation shrink film. The collation shrink film is wrapped around a number of articles, preferably held on a supporting cardboard base or supporting tray, and shrunk around said articles. This wrapping process typically involves a shrink oven or shrink tunnel in which the collation shrink film wrapped around the articles is briefly heated to cause the collation shrink wrapping to occur. The collation shrink film then collapses around the multiple containers and holds the units, disposed on the supporting tray, in place. Said supporting trays and boxes, when used, can be applied at reasonable high speed using machinery that is widely available worldwide.

[0005] Although packaging technologies using plastic materials are widely used for their stiff and tough bundling forces, one of its major drawbacks is the environmental impact associated with the use of plastic materials. Techniques have been developed to provide thinner films to cut on the manufacturing costs, however, down gauged films may only be beneficial to use when the other properties of the film as discussed above are maintained. The mechanical properties in particular need to be maintained. Another drawback on the use of packaging technologies using plastic materials, is that, during the heating of the packaging film, there is a high risk that plastic

articles may suffer from deformation or may become useless due to heat exposure. Additionally, the use of heat can present a fire risk, thus giving rise to serious safety concerns.

[0006] Thus, it is desirable to have a packaging technology that can overcome at least one of the aforementioned drawbacks in the art. Hence, there is a need for a more ecofriendly packaging technology alternative which is more cost efficient and which can efficiently be implemented into existing production lines.

Summary of the invention

[0007] It is an object of embodiments of the present invention to provide article carriers for packaging a plurality of articles into a multipack of articles, which may significantly reduce the amount of material required for packaging articles as well as its manufacturing complexity. It is a further object of the present invention to provide a multipack of articles.

[0008] In a first aspect, the invention relates to an article carrier for packaging a plurality of articles into a multipack of articles, the articles being arranged in at least one row extending in a first direction, the article carrier comprising: a handle section defining a handle opening; a carrier section foldably connected to said handle section along a second direction substantially perpendicular to said first direction, said carrier section comprising at least one connector flap adapted to be disposed in between facing exterior surfaces of adjacent articles for providing an adhesively and detachable connection between said facing exterior surfaces of said adjacent articles to form said multipack of articles. It is an advantage of an article carrier to only require a minimal amount of resource, hence to be cost effective, since the carrier section may be strip-shaped and/or only a limited amount of material, like glue or a coating needs to be applied locally to the article carrier to provide an adhesively and detachable connection between facing exterior surfaces of adjacent articles in the row. This efficiency translates to significant cost savings in the production process. It is a further advantage of the article carrier to be able to seamlessly integrate within existing production lines for producing a multipack of articles, eliminating the need for providing additional space or significant modifications to packaging equipment. It is a further advantage of article carrier according to the present invention to resolve any concerns regarding the interaction between ink on the bricks and the adhesive force, ensuring a reliable and durable bond without compromising the quality of the bricks. It is another advantage of the article carrier that an adhesive means can be applied precisely, either directly on the exterior surface of the articles or onto the carrier section of the article carrier just before fixation. This flexibility harnesses existing technology, minimizing the need for complex new equipment or processes. It is a further advantage of the article carrier to provide an efficient packaging

means. Indeed, by preventing the foldable sheet to have protrusions to receive articles, this invention optimizes packaging processes, reducing material wastage and ensuring a more compact, space-efficient solution.

[0009] According to a particular embodiment of the present invention, the article carrier is formed from a foldable blank.

[0010] According to a particular embodiment of the present invention, the article carrier is made of a flexible paper-based material.

[0011] According to a specific embodiment of the present invention, the flexible paper-based material having a stretchability according to ISO 1924-2 of at least 8% in a carrying direction substantially perpendicular to said first direction and said second direction, and a tensile strength per mm paper width according to ISO 1924-2 of at least 60N/mm.

[0012] According to a particular embodiment of the present invention, the grammage of said flexible paper-based material is in the range of 60 to 390 g/m², preferably 80 to 120 g/m², and more preferably equal to 100 g/m.

[0013] According to a specific embodiment of the present invention, the article carrier is at least partly coated.

[0014] According to a specific embodiment of the present invention, the article carrier being strip-shaped extending in the carrying direction, wherein said carrying direction being substantially perpendicular to said first direction and said second direction.

[0015] According to a particular embodiment of the present invention, the article carrier further comprising a plurality of connector flaps being lengthy strips extending normally to said first direction, and wherein adjacent connector flaps being detachably connected to each other.

[0016] According to a specific embodiment of the present invention, the number of said connector flaps corresponds to n , wherein n equals to $(z-1)$ times y , wherein z corresponds to the number of articles disposed in a row, and wherein y corresponds with the number of rows.

[0017] According to a specific embodiment of the present invention, the connector flaps of said plurality of connector flaps being arranged in an equal amount to opposite sides of said handle section.

[0018] According to a preferred embodiment of the present invention, the at least one connector flap substantially extends in said second direction having a width corresponding with the width of the handle section.

[0019] According to a specific embodiment of the present invention, the number of connector flaps corresponds with the number of rows defined by the plurality of articles.

[0020] According to another particular embodiment of the present invention, the carrier section further comprising a connector flap supporting panel having a connector flap supporting edge extending in the carrying direction perpendicular to said first direction and said second direction, and wherein said at least one connector flap

being foldably connected to said connector flap supporting edge.

[0021] According to a preferred embodiment of the present invention, the flap supporting panel having a square or rectangular shape.

[0022] According to another aspect of the invention, there is provided multipack of articles, wherein said articles being arranged side-by-side in first row and a second row parallel with said first row, and further comprising an article carrier according to any of the previous embodiments.

[0023] It is yet another advantage of the article carrier to provide a carrier without the need for plastic components is a significant environmental advantage. The handle is entirely paper-based, aligning with sustainable packaging trends and reducing the environmental footprint of the product. The paper can be coated by a water based coating of, without being limited thereto, a biological origin to increase its resistance to humidity.

[0024] Moreover, the inventors were surprised to see that applying a coated paper-based material allowed to achieve the objective of the present invention and that, consequently, the objective of the present invention could be achieved by the subject matter of the independent claims. The dependent claims further develop the idea of the present invention.

Brief description of the drawings

[0025] The invention will now be described further, by way of example, with reference to the accompanying drawings, wherein like reference numerals refer to like elements in the various figures.

FIG. 1 provides a perspective view of an article carrier according to a preferred embodiment of the present invention.

FIG. 2 illustrates an exploded view of a multipack of articles according to a preferred embodiment of the present invention, comprising the article carrier as described in relation to FIG. 1.

FIG. 3 depicts a multipack of articles according to a preferred embodiment of the invention.

FIG. 4 illustrated a plan view of an outer surface of a foldable blank for forming an exemplary embodiment of an article carrier according to the present invention.

FIG. 5 depicts a perspective view of an article carrier according to a specific embodiment of the present invention formed from a foldable blank as discussed in relation to FIG. 4.

FIG. 6a, 6b, 6c and 6d illustrate a perspective view on the different steps to form a multipack of articles

using an article carrier according to a preferred embodiment of the present invention.

FIG. 7a and 7b depict the use of an article carrier according to a preferred embodiment of the invention to form a multipack of articles.

FIG. 7c provides a perspective view of a multipack of articles according to a preferred embodiment of the present invention.

FIG. 8a illustrates a perspective schematic view of an article carrier according to a preferred embodiment of the present invention.

FIG. 8b, 8c and 8d depict an perspective view of the use of the article carrier as described in relation to FIG. 8a.

FIG. 9a illustrates a front perspective view of a foldable blank 90 to provide an article carrier according to a preferred embodiment of the present invention.

FIG. 9b illustrates a perspective view of an article carrier formed from a foldable blank as described in relation to FIG. 9a.

FIG. 9c provides a perspective view of an article carrier described in relation to FIG. 9b before being disposed in between a plurality of articles to form a multipack of articles.

Detailed description of illustrative embodiments

[0026] The present invention will be described with respect to particular embodiments and with reference to certain drawings but the invention is not limited thereto but only by the claims. The drawings described are only schematic and are non-limiting. In the drawings, the size of some of the elements may be exaggerated and not drawn on scale for illustrative purposes. Where the term "comprising" is used in the present description and claims, it does not exclude other elements or steps. Where an indefinite or definite article is used when referring to a singular noun e.g. "a" or "an", "the", this includes a plural of that noun unless something else is specifically stated. The term "comprising", used in the claims, should not be interpreted as being restricted to the means listed thereafter; it does not exclude other elements or steps. Thus, the scope of the expression "a device comprising means A and B" should not be limited to devices consisting only of components A and B. It means that with respect to the present invention, the only relevant components of the device are A and B. Furthermore, the terms first, second, third and the like in the description and in the claims, are used for distinguishing between similar elements and not necessarily for describing a sequential or chronological order. It is to be

understood that the terms so used are interchangeable under appropriate circumstances and that the embodiments of the invention described herein are capable of operation in other sequences than described or illustrated herein. Moreover, the terms top, bottom, over, under and the like in the description and the claims are used for descriptive purposes and not necessarily for describing relative positions. It is to be understood that the terms so used are interchangeable under appropriate circumstances and that the embodiments of the invention described herein are capable of operation in other orientations than described or illustrated herein. In the drawings, like reference numerals indicate like features; and, a reference numeral appearing in more than one figure refers to the same element.

[0027] The present disclosure provides a teaching for an article carrier for packaging a plurality of articles into a multipack of articles. The articles being arranged in at least one row extending in a first direction. The article carrier comprising a handle section defining a handle opening and a carrier section foldably connected to the handle section along a second direction substantially perpendicular to the first direction. The carrier section comprising at least one connector flap adapted to be disposed in between facing exterior surfaces of adjacent articles for providing an adhesively and detachable connection between the facing exterior surfaces of said adjacent articles to form said multipack of articles.

[0028] The article carrier may be formed from a foldable blank (e.g. substantially flat sheet) for packaging a plurality of articles into a multipack of articles. Unless indicated otherwise, when reference is made to "article" or "articles", reference may be made to articles or containers. The containers may be used for packaging food and beverage products, for example. The articles can be made from materials suitable in composition for packaging the particular food or beverage item, and the materials include, but are not limited to glass, plastics such as PET, LDPE, LLDPE, HDPE, PP, PVC, EVOH, and nylon, and the like, aluminium and/or other metals, or any combination thereof.

[0029] Unless indicated otherwise, when reference is made to "connector flap", reference may be made to a thin piece of material comprising a first major surface and a second major surface, opposite to the first major surface, wherein the first major surface may be adapted to securely attach to the outer or exterior surface of a first article and wherein the second major surface may be adapted to securely attach to the outer surface of a second article, adjacently disposed to the first article, such that the connector flap may provide an adhesively and detachable connection between the articles to form a multipack of articles. Hence, when reference is made to a "connector flap", reference may also be made to an interconnecting flap.

[0030] An article carrier according to embodiments of the present invention may comprise a handle section defining a handle opening and a carrier section foldably

connected to the handle section along a fold line extending in a second direction perpendicular to the first direction. The carrier section may comprise at least one connector flap adapted to be disposed in between facing exterior surfaces of adjacent articles for providing an adhesively and detachable connection between said facing exterior surfaces of said adjacent articles to form a multipack of articles.

[0031] In various disposed embodiments herein, the present invention reduces the amount of material required to provide a paper-based flexible packaging with barrier properties. Indeed, the article carrier may be made of a flexible paper-based material having a stretchability according to ISO 1924-2 of at least 8 % in a carrying direction, and a tensile strength per mm paper width according to ISO 1924-2 of at least 60N/mm, wherein said carrying direction is substantially parallel to said first fold line foldably connecting the handle section to the carrier section. In certain embodiments, such paper based flexible packaging provides a flexible food and snack packaging that is recyclable and/or compostable.

[0032] In some embodiments herein, the flexible paper-based material may have a grammage, i.e. the weight of a paper-based material expressed in grams per square meter, in the range of 60 to 390 g/m², preferably 80 to 120 g/m², and more preferably equal to 100 g/m². The inventors surprisingly found that this relatively small grammage still provides the required strength and rigidity to support the articles and to form a multipack of articles. This relatively small grammage also provides a cost-effective and environmental friendly solution to package a number of articles in comparison with state-of-the-art packaging solutions.

[0033] According to some embodiments of the present invention, the connector flap may at least partly be provided with a weldable coating. This coating may be a water-based or PE-based, or a combination thereof. Depending on the composition of the coating, heat or ultrasonic welding, or a combination thereof may be applied to provide a detachable connection of at least a portion of the connector flaps of the carrier section of the article carrier with an exterior surface of an article. Preferably, a coating may only be applied on the regions or surface of the connector flaps which will be subject to welding to connect the article carrier to the articles.

[0034] According to preferred embodiments of the present invention, the shape of the article carrier may be strip-shaped extending in a direction which is substantially perpendicular to the direction of the fold line between the handle section and the carrier section. This particular shape has the advantage of providing an article carrier which only require a limited amount of material and which may be disposed along a certain length or depth of the articles, guaranteeing a sufficient packaging force. Indeed, a strip-shaped article carrier can be designed to hold multiple beverage containers together securely. This minimizes the risk of containers bumping into each other and potentially causing damage during

transportation. Additionally, a strip-shaped article carrier may provide a comfortable grip, may reduce the risk of dropping or spilling the articles, which is especially helpful when carrying multiple items.

[0035] As shown for example in FIG. 1, which depicts a perspective view of an article carrier 1 according to a preferred embodiment of the present invention, the article carrier 1 comprises a handle section 2 defining a handle opening 3, and a carrier section 4 foldably connected to said handle section 2 along a first fold line 5 extending in second direction (x-direction). The second direction is substantially perpendicular to first direction (y-direction), i.e. the direction defined by the articles when being arranged in a row. The carrier section 4 of the article carrier 1 as depicted in FIG. 1, further comprises one connector flap 6 adapted to be disposed in between facing exterior surfaces of adjacent articles (not shown in FIG.1) for an adhesively and detachable connection between said facing exterior surfaces of the said adjacent articles to form the multipack of articles. The article carrier 1 may be formed from a foldable blank and may be provided unfolded or erected before disposing it in between a plurality of articles to form a multipack of articles. It is an advantage of the present invention that although the article carrier may be formed from a foldable blank, there is no need to connect erected panels or flaps to each other to form a packaging box. Hence, the article carrier can easily be implemented in existing packaging lines. Indeed, there is no need for adhesives, such as glues and tapes, as well as mechanical fasteners, such as staples, are used to affix the connector flaps to one another for the purpose of defining a rigid, box-like structure for the purposes herein described.

[0036] As further illustrated in FIG. 1, the connector flap 6 of the carrier section 4 may terminate at a first end at the first fold line 5, whereas a second end 7 of the connector flap 6, opposed to the first end 5, may define an end of the article carrier. Furthermore, the handle opening 3 of the article carrier 1 is adapted to be gripped by a person or enables a person's fingers to be inserted through the opening such that the person's fingers wrap around the handle opening 3 of the handle section 2.

[0037] FIG. 2 illustrates an exploded view of a multipack of articles 21 according to a preferred embodiment of the present invention, comprising the article carrier 1 as described in relation to FIG. 1. The multipack 21 comprises a plurality of four articles 22 disposed or standing side by side in a two times two (2 x 2) configuration. Each of the articles 22 defining an exterior surface 23 facing an exterior surface of an adjacent article. The article carrier 1 may be disposed in between adjacent articles 22 such that the connector flap 6 may provide an adhesively and detachable connection between said facing exterior surfaces 23 of said adjacent articles 22 to form said multipack of articles 21.

[0038] The individual articles 22 as illustrated in FIG. 2 are substantially in the form of a rectangular parallelepiped each having four major side walls 23, 24 connected

along right-angled longitudinal edges 25. These four major side walls 23, 24 may also be referred to as exterior surfaces. When disposed in a side-by-side configuration to form a multipack of articles, each article defines an exterior surface 23 facing an exterior surface 23 of an adjacent article adapted to receive at least a portion of a connector flap 6 of an article carrier according to embodiments of the present invention.

[0039] FIG. 3 depicts a multipack of articles 31 according to a preferred embodiment of the invention, as described in relation to FIG. 2. The article carrier 1 is positioned in between facing exterior surfaces of the articles 22 so the carrier section is not visible in FIG. 3. The handle section of the article carrier 1 is erected upwards in the z-direction defining a handle opening 3 in the x-direction enabling a person or an apparatus to grip the multipack 22.

[0040] Referring to FIG. 4, there is illustrated a plan view of an outer surface of a foldable blank 41 for forming an exemplary embodiment of an article carrier according to the present invention. According to the present disclosure, the foldable blank 41 may also be referred to as a substantially flat foldable sheet, preferably made of a flexible paper-based material. The foldable blank 41 depicted in FIG. 4 illustrates the presence of a handle section 2 defining an handle opening 3, and an unfolded or to be erected carrier section 4 comprising a plurality of four connector flaps 6. The connector flaps 6 are adapted to be disposed in between facing exterior surfaces of adjacent articles for providing an adhesively and detachable connection between said facing exterior surfaces of said adjacent articles to form said multipack of articles.

[0041] Referring to FIG. 5, there is depicted a perspective view of an article carrier 51 according to a specific embodiment of the present invention formed from a foldable blank as discussed in relation to FIG. 4. The four connector flaps 6 are erected and adapted to be disposed in between facing exterior surfaces of adjacent articles (not shown) for providing an adhesively and detachable connection between said facing exterior surfaces of said adjacent articles to form said multipack of articles, as illustrated in FIG. 6a - 6d. Each of the four connector flaps 6 comprising a first part 8 and a second part 9, whereby the first part 8 of the connector flap 6 is connecting the handle section 2 with the second part 9 of the connector flap 6, and whereby the second part 9 of the connector flap 6 is adapted to be disposed in between facing exterior surfaces of adjacent articles for providing an adhesively and detachable connection between said facing exterior surfaces of said adjacent articles to form said multipack of articles. The second part 9 of the connector flap 6 comprising a first surface and a second surface, opposite to the first surface, so that the first surface may be attached to at least a portion of an exterior surface of first article, and the second surface may be attached to at least a portion of an exterior surface of an second article, whereby the first and second article are adjacent such that the exterior surface of the first article

faces the exterior surface of the second article. The connector flaps 6 being strip-shaped extending in a third direction (z-direction) substantially perpendicular to said first direction (x-direction), and wherein said handle section 2 being substantially rectangular shaped having the first direction as the long direction (x-direction).

[0042] FIG. 6a, 6b, 6c and 6d illustrate a perspective view on the different steps to form a multipack of articles using an article carrier according to a preferred embodiment of the present invention. FIG. 6a depicts an unfolded blank 61 as described in relation to FIG. 4 together with a plurality of articles 22 disposed in a three times two (3 x 2) configuration. As described before, the foldable blank 61 comprising a handle section 2 defining an handle opening 3, and an unfolded or to be erected carrier section 4 comprising a plurality of four to be erected connector flaps 6, wherein adjacent connector flaps 6 may be detachable connected to each other, without being limited thereto. Adjacent connector flaps 6 may also be loosely disposed next to each other before being erected to form an article carrier.

[0043] FIG. 6b illustrates an article carrier 62 as described in relation to FIG. 5 whereby the carrier section 4 comprises erected connector flaps 6 adapted to be disposed in between facing exterior surfaces of adjacent articles 22 for providing an adhesively and detachable connection between said facing exterior surfaces of said adjacent articles to form said multipack of articles. Each of the four erected connector flaps 6 comprising a first part 8 and a second part 9, whereby the first part 8 of the connector flap 6 is connecting the handle section 2 with the second part 9 of the connector flap 6, and whereby the second part 9 of the connector flap 6 is adapted to be disposed in between facing exterior surfaces of adjacent articles 22 for providing an adhesively and detachable connection between said facing exterior surfaces of said adjacent articles to form said multipack of articles.

[0044] Referring to FIG. 6c, the second part 9 of the connector flap 6 comprising a first surface and a second surface, opposite to the first surface, so that the first surface may be attached to at least a portion of an exterior surface 23 of first article, and the second surface may be attached to at least a portion of an exterior surface of an second article, whereby the first and second article are adjacent such that the exterior surface of the first article faces the exterior surface of the second article. The connector flap 6 may be provided to exterior surfaces of the articles 22 by providing a weldable coating or glue on the connector flap.

[0045] Referring to FIG. 6d, a multipack of articles 64 may be provided by moving the articles against each other such that a detachable connection may be formed between the connector flaps 6 and the exterior surfaces 23 of the articles 22. In order to move the articles together, pushing means may be used. The multipack of articles 64 comprising an article carrier 65 as described in relation to FIG. 5, 6b and 6c.

[0046] FIG. 7a and 7b depict the use of an article carrier

according to a preferred embodiment of the invention to form a multipack of articles. The articles 22 are arranged in an array configuration of two rows along the first direction (x-direction) and three columns along the second direction (y-direction). The article carrier 71 comprising a carrier section having two connector flaps 72. Each connector flap 72 having a first part 78 and a second part 79, wherein the first part 78 of the connector flap 72 is connecting the handle section 74 with the second part 79 of the connector flap 72, and whereby the second part 9 of the connector flap 6 is adapted to be disposed in between facing exterior surfaces of adjacent articles for providing an adhesively and detachable connection between said facing exterior surfaces of said adjacent articles to form said multipack of articles. The second part 9 of the connector flap 6 comprising a first surface and a second surface, opposite to the first surface, so that the first surface may be attached to at least a portion of an exterior surface of first article, and the second surface may be attached to at least a portion of an exterior surface of an second article, whereby the first and second article are adjacent such that the exterior surface of the first article faces the exterior surface of the second article. The connector flaps 6 being strip-shaped extending in a third direction (z-direction) substantially perpendicular to said first direction (x-direction), and wherein said handle section 2 being substantially rectangular shaped having the first direction as the long direction (x-direction).

[0047] Each connector flap 72 having a width w 75, measured along the fold line 73, which corresponds with the width of the handle section 74, wherein the width is measured along the x-direction. According to embodiments of the present invention, the width w may correspond with n times the width of an article 22, wherein n corresponds with the number of columns, typically equal to two. Hence, in order to provide an adhesively and detachable connection between the connector flaps 72 and facing exterior surfaces 23 of adjacent articles 22 to form a multipack of articles, the erected connector flaps 72 of the article carrier 71 are disposed between adjacent columns of the article array configuration separated along the second direction (y-direction), after which the columns of articles are pushed against each other to form a multipack of articles as illustrated in FIG. 7c.

[0048] FIG. 7c provides a perspective view of a multipack of articles 77 according to a preferred embodiment of the present invention. The articles 22 being arranged side-by-side in first row and a second row parallel with said first row, and further comprising an article carrier 72 as described in relation to FIG. 7a and FIG. 7b. The handle section 74 of the article carrier 72 is erected away from the multipack so that the handle opening 74a may easily be accessed by a gripping means or a person's hand to carry the multipack 77.

[0049] FIG. 8a illustrates a perspective schematic view of an article carrier 81 according to a preferred embodiment of the present invention. The article carrier 81 comprising a handle section 82 defining a handle open-

ing 83, and a carrier section 84 foldably connected to the handle section 82. The handle section 82 and carrier section 84 are foldable connected along a fold line 85 extending in a first direction (x-direction). The carrier section 84 further comprises a connector flap supporting panel 86 having a connector flap supporting edge 87 extending in a second direction (z-direction) substantially perpendicular to the first direction (x-direction). The carrier section 84 further comprises two pair connector flaps 88 connected to the connector flap supporting edges 87. The connector flaps of each pair of connector flaps are distributed at an opposite side of the connector flap supporting edge 87 forming an angle of around 180 degrees, whereas each connector flap is foldably connected with the connector flap supporting edge 87 and erected in an angle of around 90 degrees with respect the connector flap supporting panel 86. This allows an easy disposal of the article carrier 81 and its connector flaps 88 in between articles disposed in a predetermined row-column configuration. In addition, the connector flaps 88 erected in a similar direction at each connector flap supporting edge 87 of a corresponding of the connector flap supporting panel 86, together with the connector flap supporting panel 86 may form a channel to receive an article. This may increase the carrying force of the article carrier when forming a multipack of articles.

[0050] The article carrier 81 depicted in FIG. 8a may also be provided in an unfolded way as a foldable blank.

[0051] FIG. 8b, 8c and 8d depict a perspective view of the use of the article carrier 81 as described in relation to FIG. 8a, to form a multipack of articles according to a preferred embodiment of the present invention. The articles are disposed in a two by two configuration such that the carrier section 84 of the article carrier 82 can be disposed in between the exterior surfaces 23 of the articles 22 allowing the surfaces of the connector flaps 88 to provide an adhesively and detachable connection between the article carrier 81 and the exterior surfaces 23 of the articles 22 to form a multipack of articles 89, as illustrated in FIG. 8d.

[0052] Referring to FIG. 9a, there is depicted a front perspective view of a foldable blank 90 to provide an article carrier according to a preferred embodiment of the present invention. The blank 90 comprises a connector flap supporting panel 96 having two connector flap supporting edges extending in a second direction (z-direction) substantially perpendicular to the first direction (x-direction), and to which a plurality of connector flaps 98 are connected. Each connector flap supporting edge provides support to four connector flaps 98. The connector flaps 98 are detachable connected to each other so that when being erected in an angle of around 90 degrees with respect to the connector flap supporting panel 96, adjacent connector flaps 98 are erected in opposite direction to form an alternating pattern, as depicted in FIG. 9b.

[0053] FIG. 9b illustrates a perspective view of an article carrier 91 formed from a foldable blank 90 as

described in relation to FIG. 9a. By providing a plurality of connector flaps 98 erected in an alternating way along the same direction, a stronger carrying force may be provided to each article of a multipack of articles. Indeed, compared to previous described embodiments of an article carrier according to the present invention wherein an exterior surface of an article is in direct contact with one connector flap, the article carrier 91 may provide a plurality of connector flaps to be in direct contact with the same exterior surface of an article.

[0054] FIG. 9c provides a perspective view of an article carrier 91 described in relation to FIG. 9b before being disposed in between a plurality of articles to form a multipack of articles.

Claims

1. An article carrier for packaging a plurality of articles into a multipack of articles, the articles being arranged in at least one row extending in a first direction, the article carrier comprising:

a handle section defining a handle opening;
a carrier section foldably connected to said handle section along a second direction substantially perpendicular to said first direction, said carrier section comprising at least one connector flap adapted to be disposed in between facing exterior surfaces of adjacent articles for providing an adhesively and detachable connection between said facing exterior surfaces of said adjacent articles to form said multipack of articles.

2. The article carrier according to claim 1, wherein said article carrier is formed from a foldable blank.
3. The article carrier according to claim 1 or 2, wherein said article carrier is made of a flexible paper-based material.
4. The article carrier according to the previous claim, wherein said flexible paper-based material having a stretchability according to ISO 1924-2 of at least 8% in a carrying direction substantially perpendicular to said first direction and said second direction, and a tensile strength per mm paper width according to ISO 1924-2 of at least 60N/mm.
5. The article carrier according to claim 3 or 4, wherein the grammage of said flexible paper-based material is in the range of 60 to 390 g/m², preferably 80 to 120 g/m², and more preferably equal to 100 g/m².
6. The article carrier according to any of the previous claims, wherein said article carrier is at least partly coated.

7. The article carrier according to any of the previous claims, wherein said article carrier being strip-shaped extending in the carrying direction, wherein said carrying direction being substantially perpendicular to said first direction and said second direction.
8. The article carrier according to any of the claims 1 to 6, further comprising a plurality of connector flaps being lengthy strips extending normally to said first direction, and wherein adjacent connector flaps being detachably connected to each other.
9. The article carrier according to the previous claim, wherein the number of said connector flaps corresponds to n, wherein n equals to (z-1) times y, wherein z corresponds to the number of articles disposed in a row, and wherein y corresponds with the number of rows.
10. The article carrier according to claim 8 or 9, wherein said connector flaps of said plurality of connector flaps being arranged in an equal amount to opposite sides of said handle section.
11. The article carrier according to any of the claims 1 to 6, wherein said at least one connector flap substantially extends in said second direction having a width corresponding with the width of the handle section.
12. The article carrier according to the previous claim, wherein the number of connector flaps corresponds with the number of rows defined by the plurality of articles.
13. The article carrier according to any of the claims 1 to 6, wherein said carrier section further comprising a connector flap supporting panel having a connector flap supporting edge extending in the carrying direction perpendicular to said first direction and said second direction, and wherein said at least one connector flap being foldably connected to said connector flap supporting edge.
14. The article carrier according to the previous claim, wherein said flap supporting panel having a square or rectangular shape.
15. A multipack of articles, wherein said articles being arranged side-by-side in first row and a second row parallel with said first row, and further comprising an article carrier according to any of the claims 1 to 14.

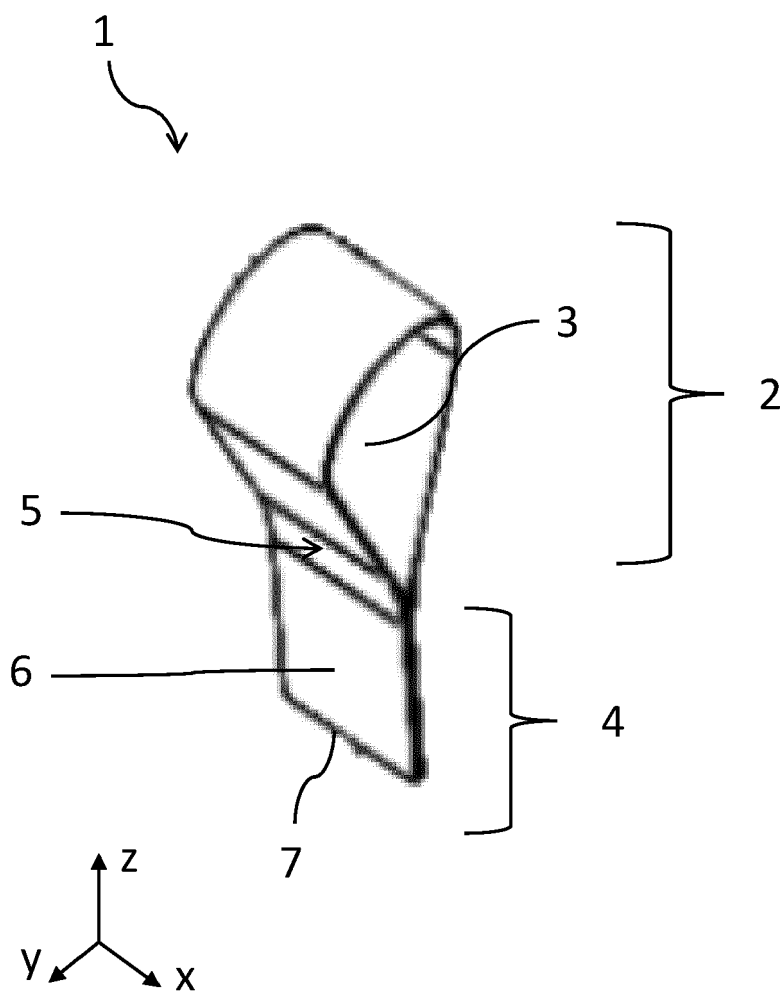


FIG. 1

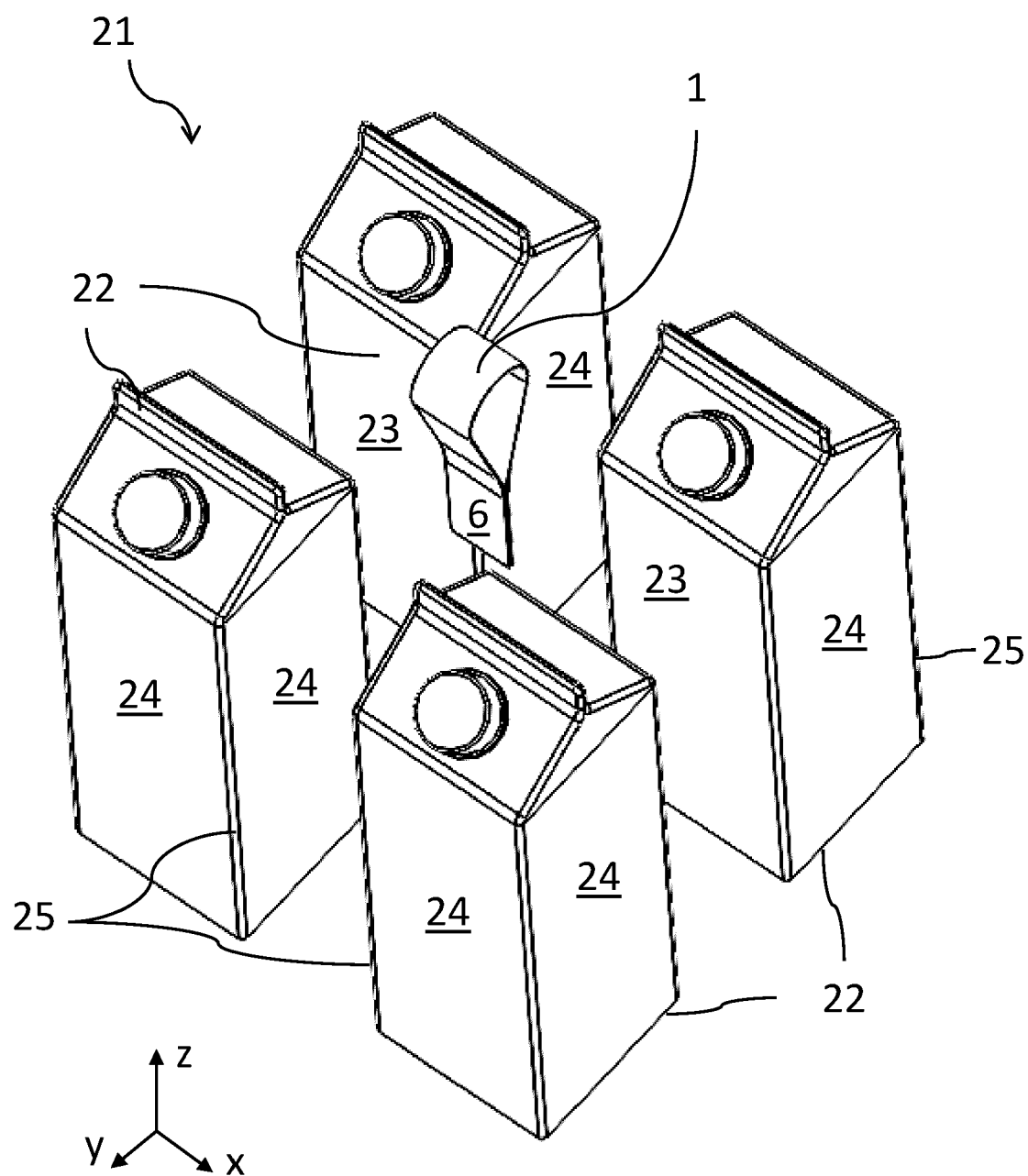


FIG. 2

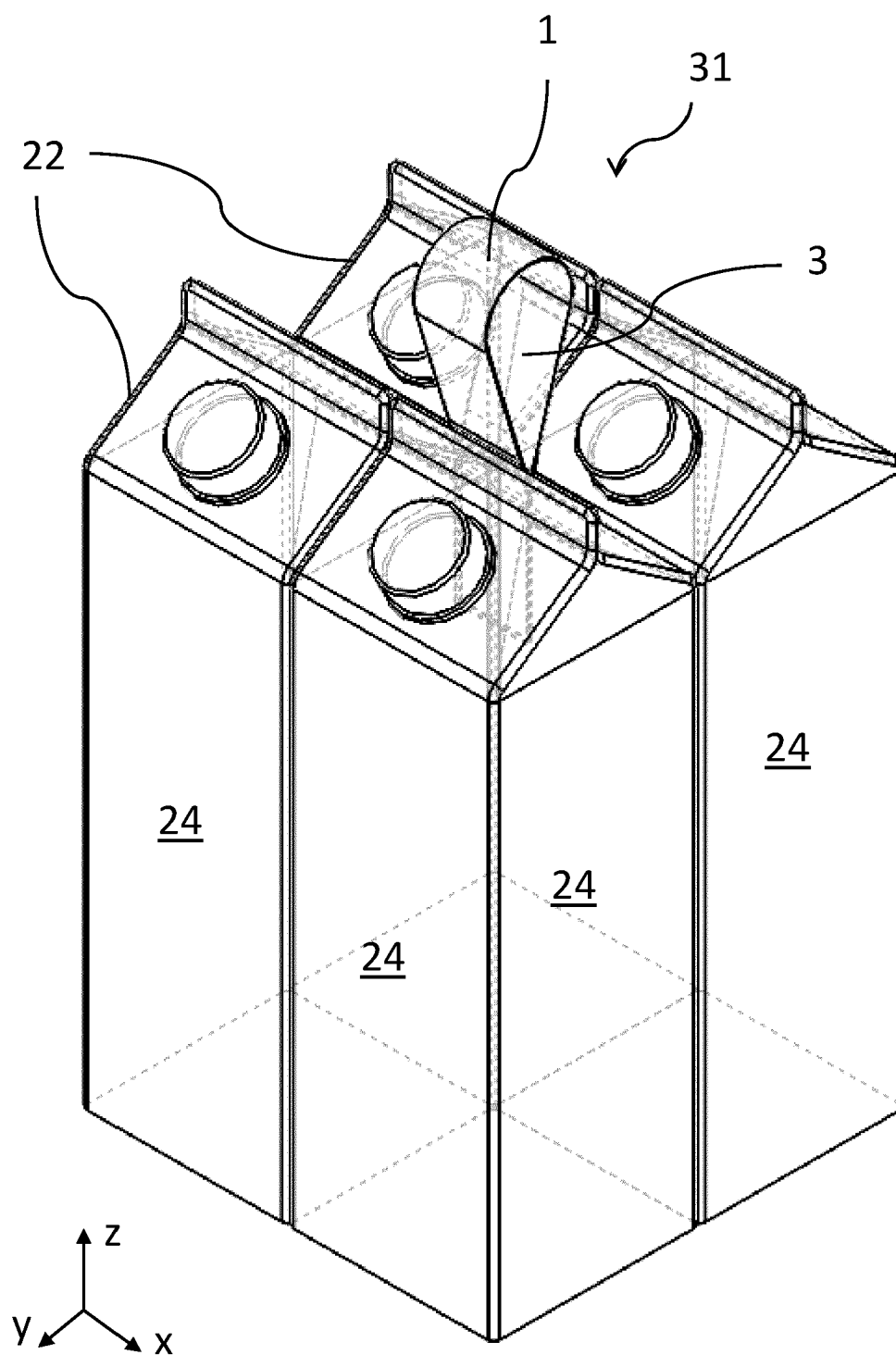


Fig. 3

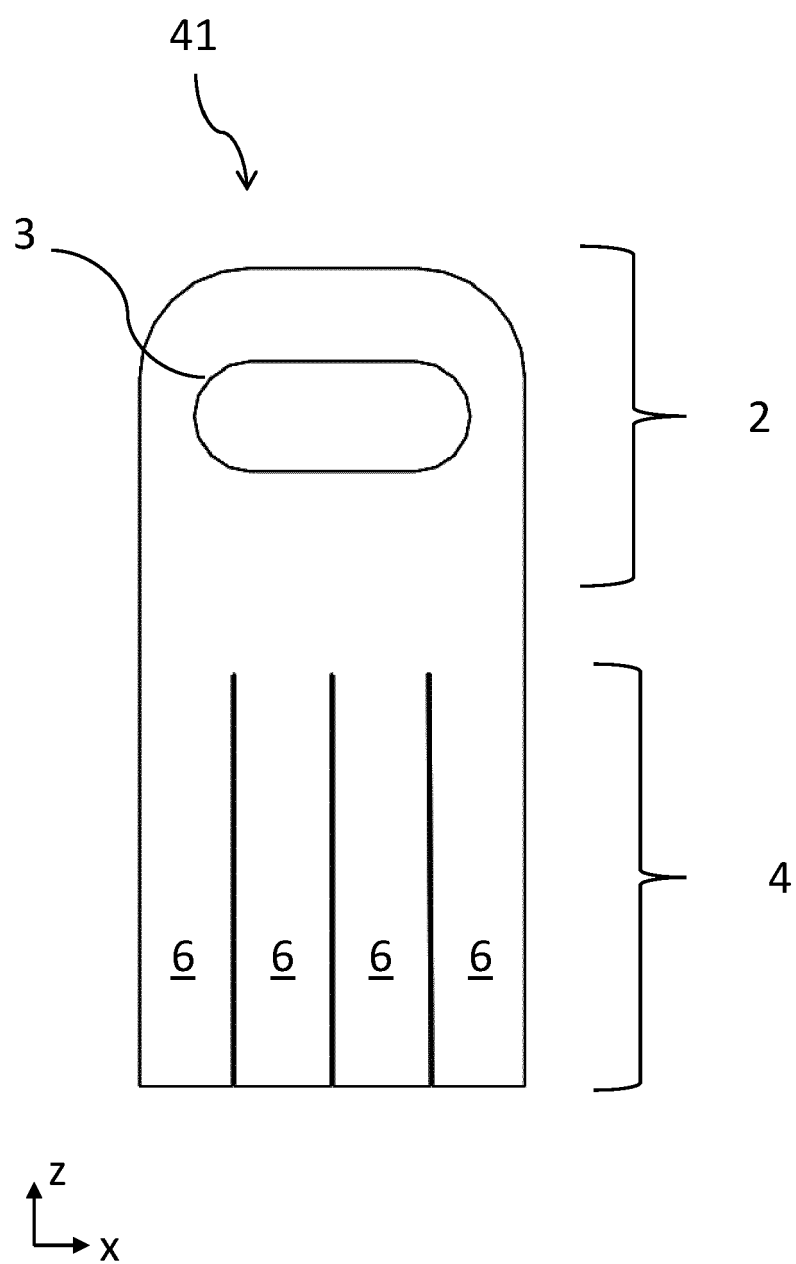


FIG. 4

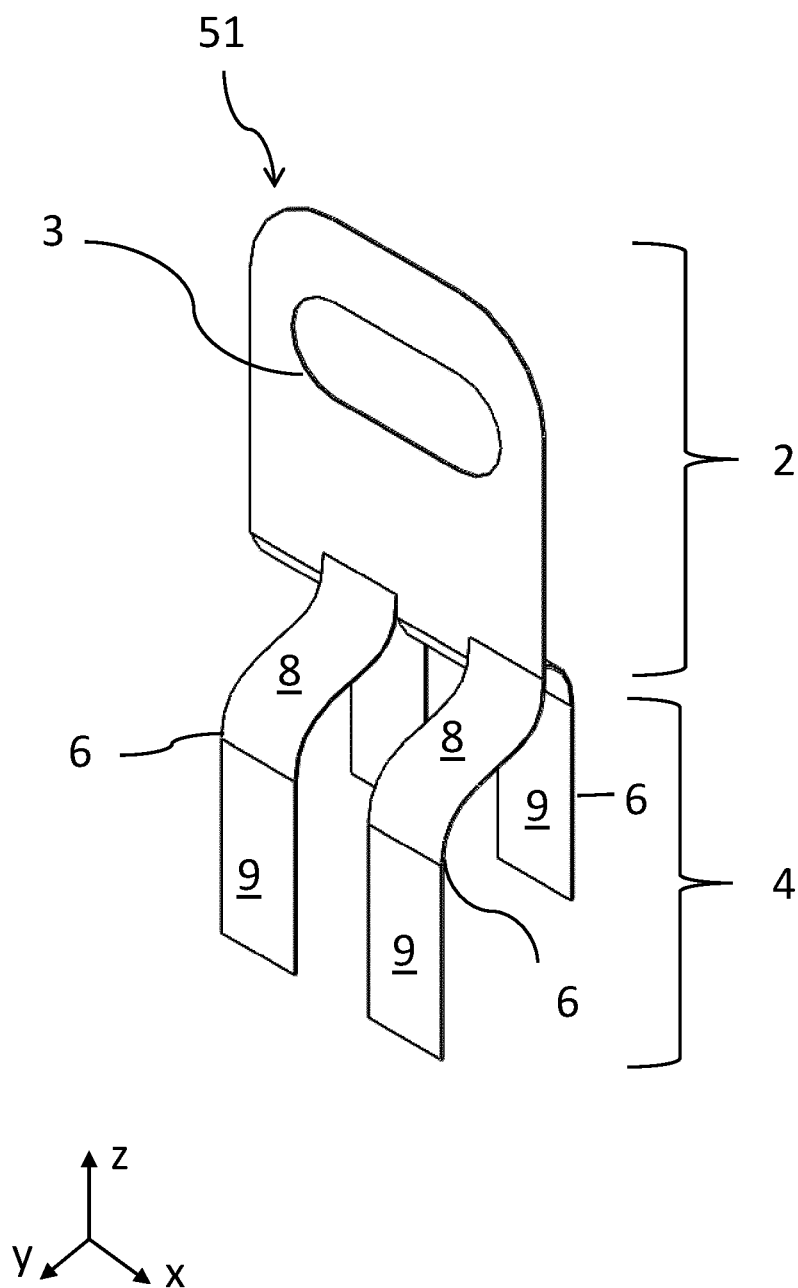
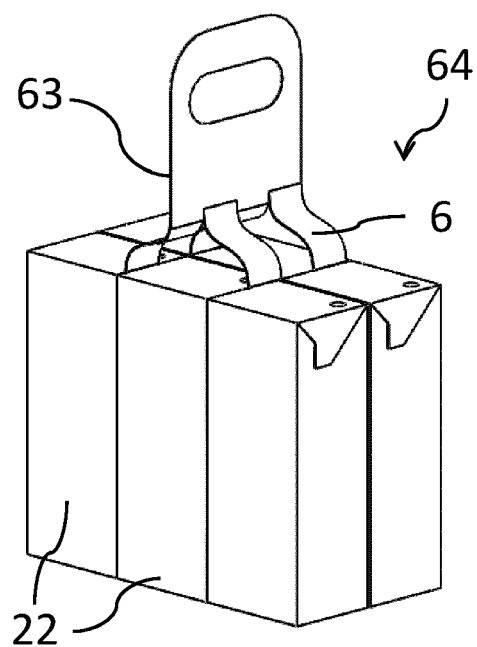
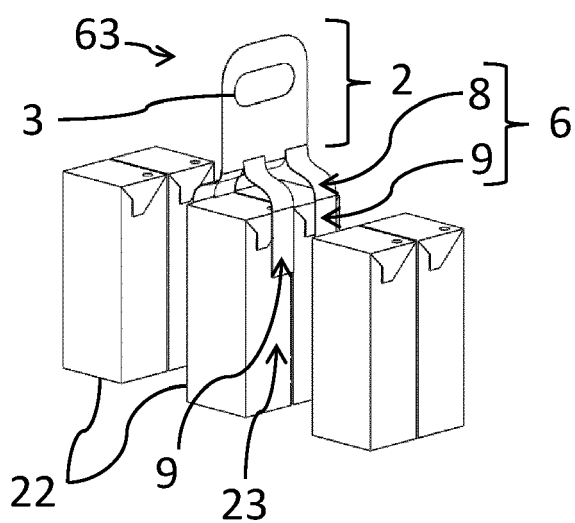
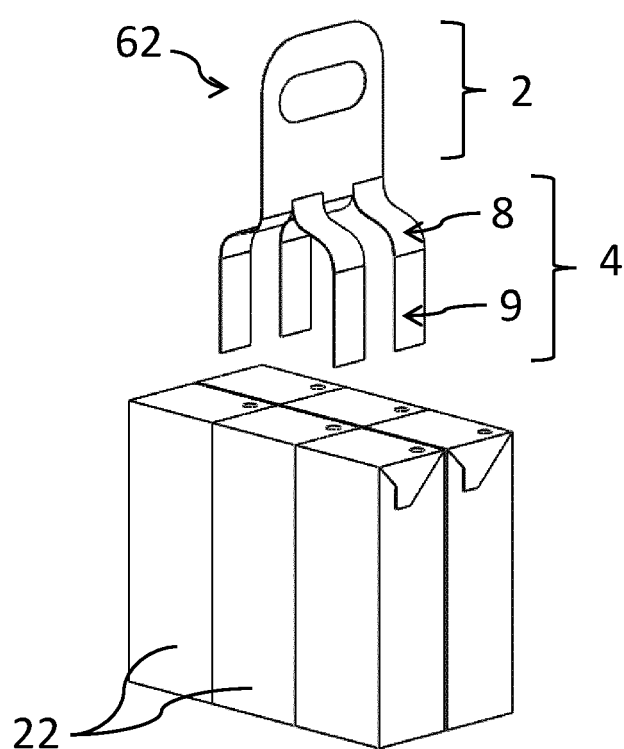
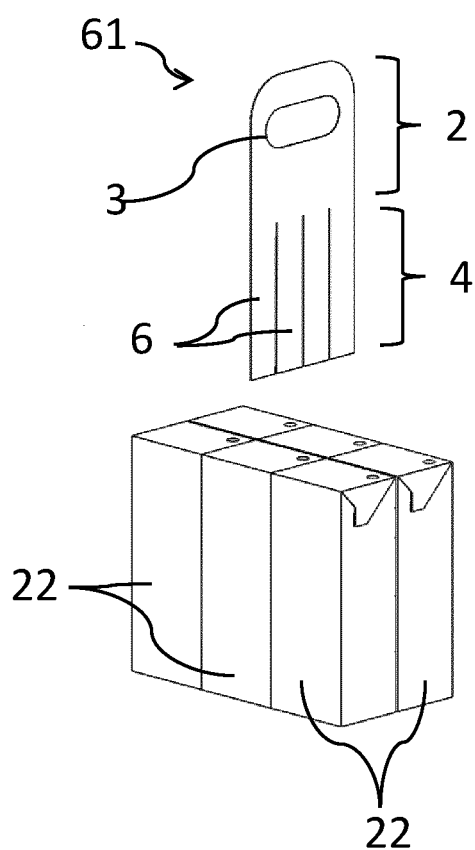


FIG. 5



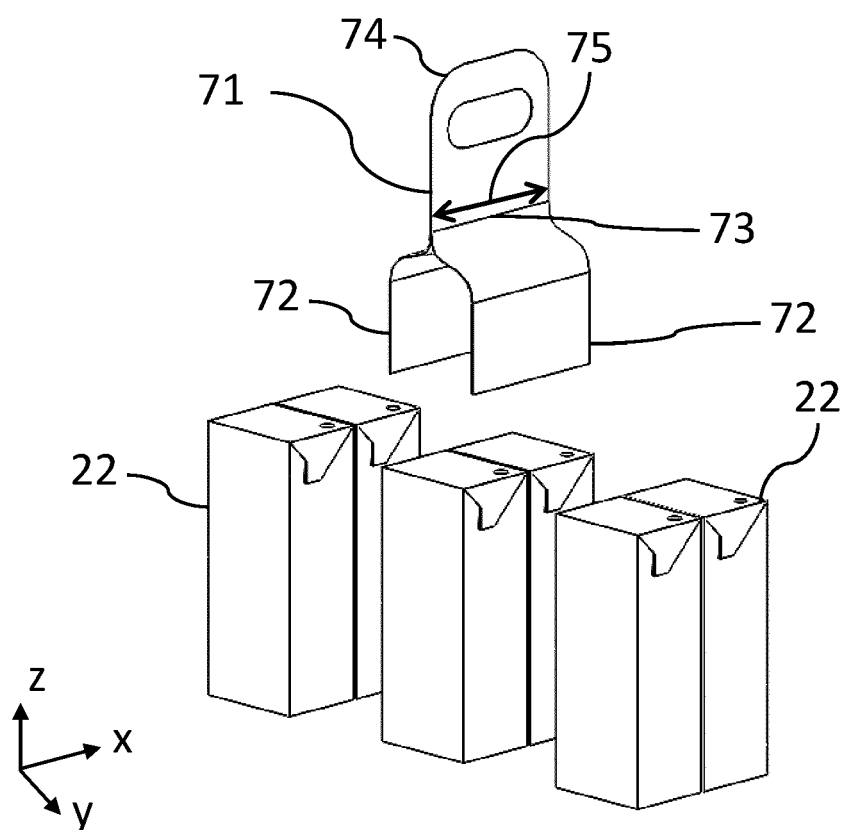


FIG. 7a

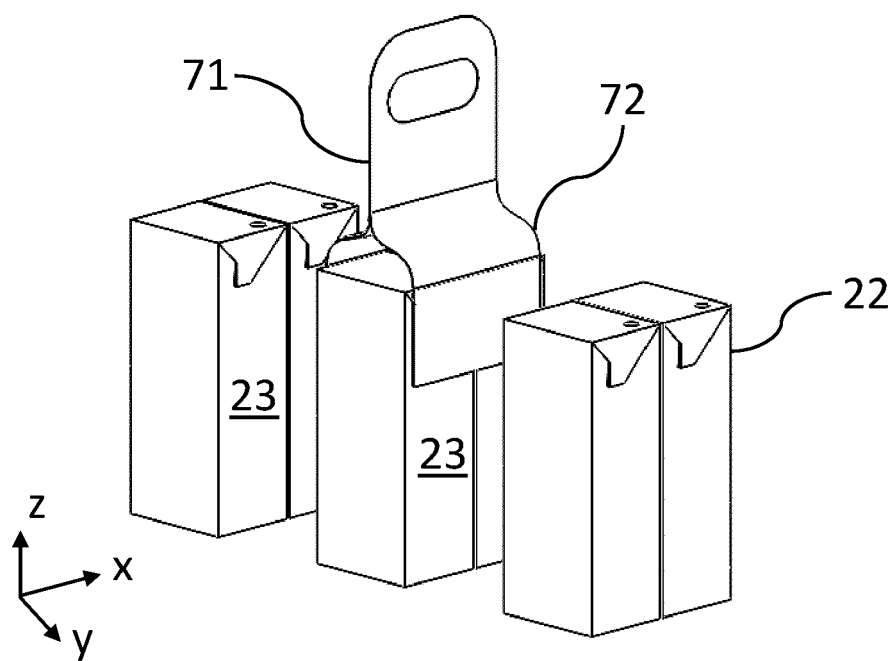


FIG. 7b

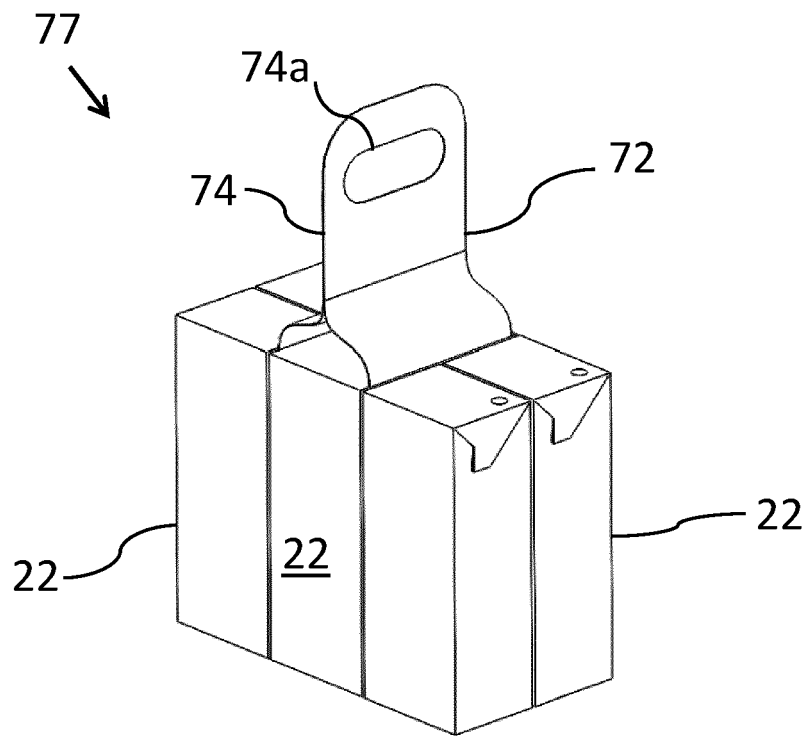


FIG. 7c

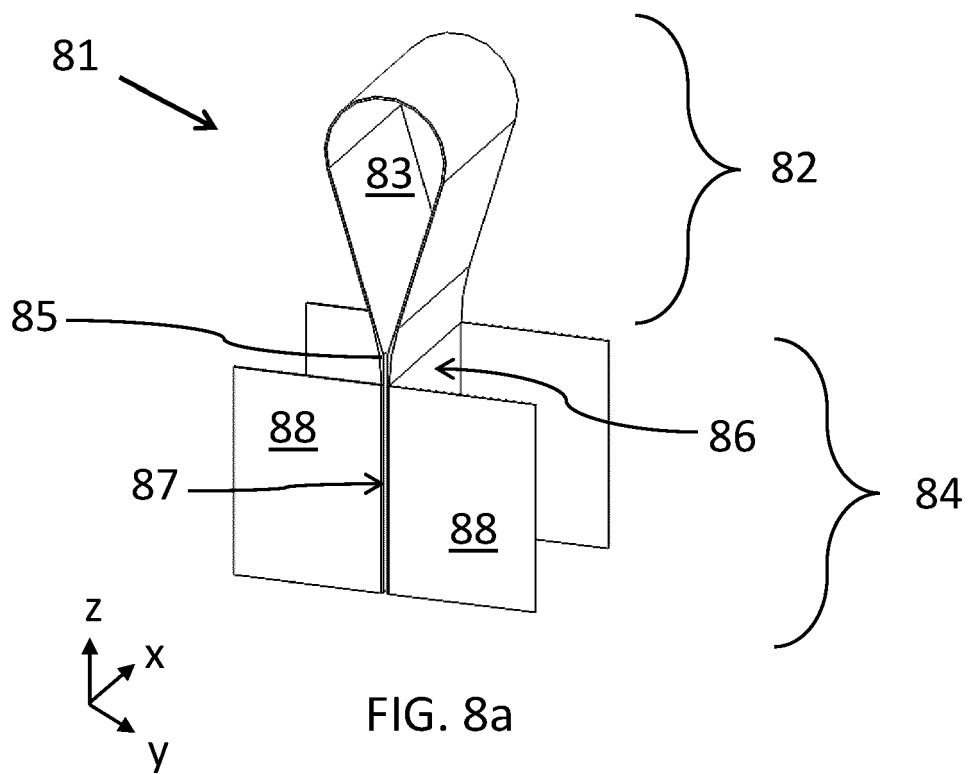


FIG. 8a

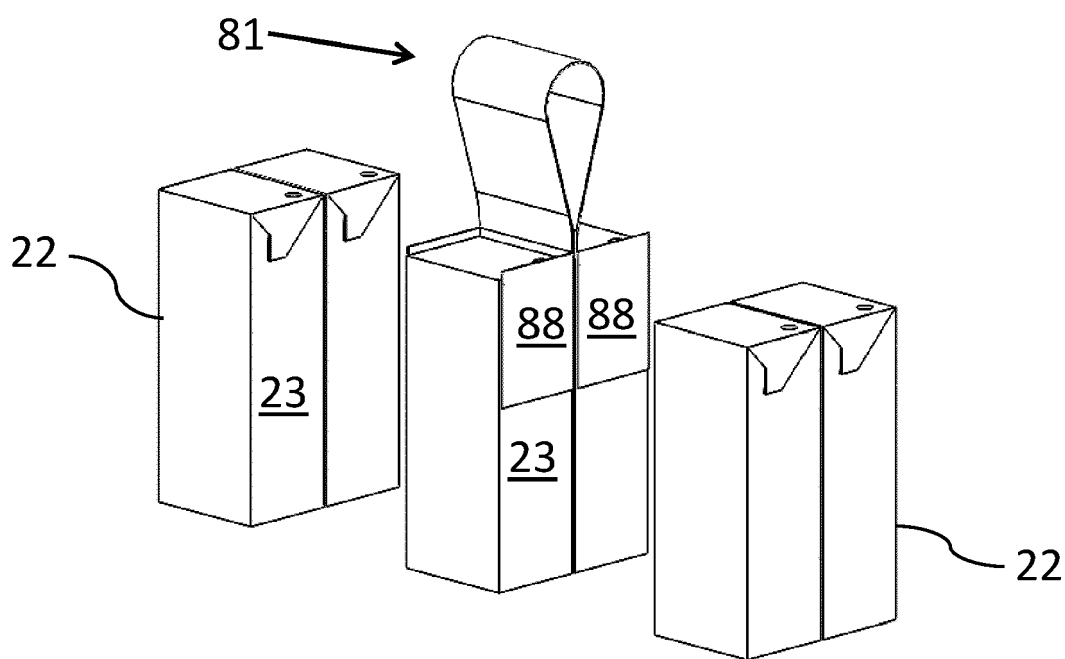
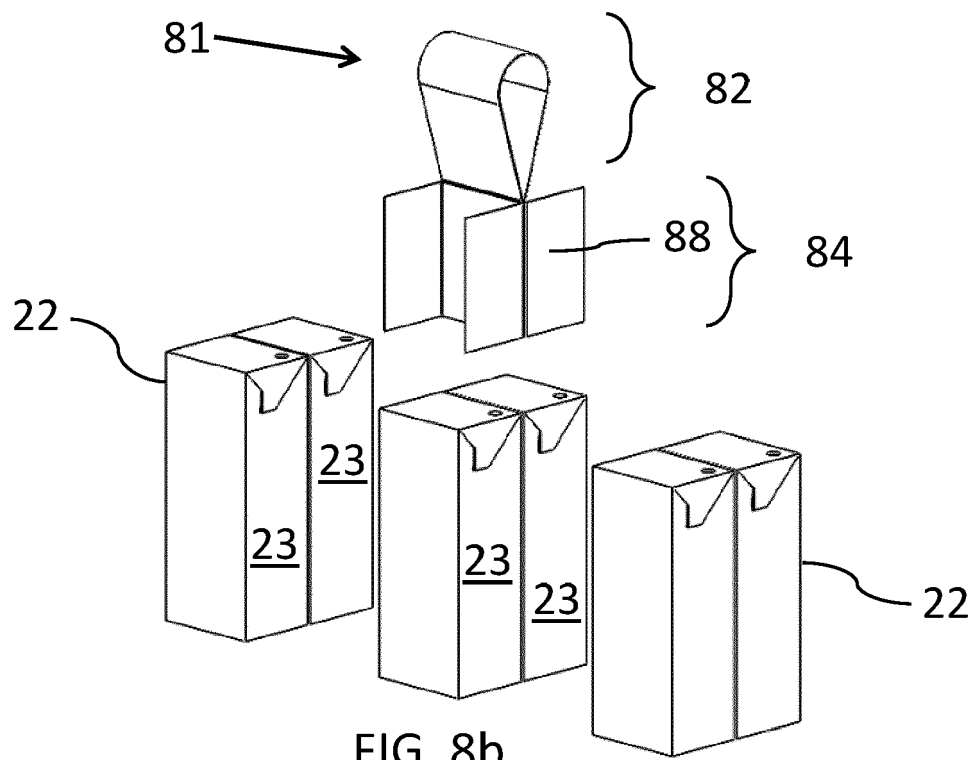


FIG. 8c

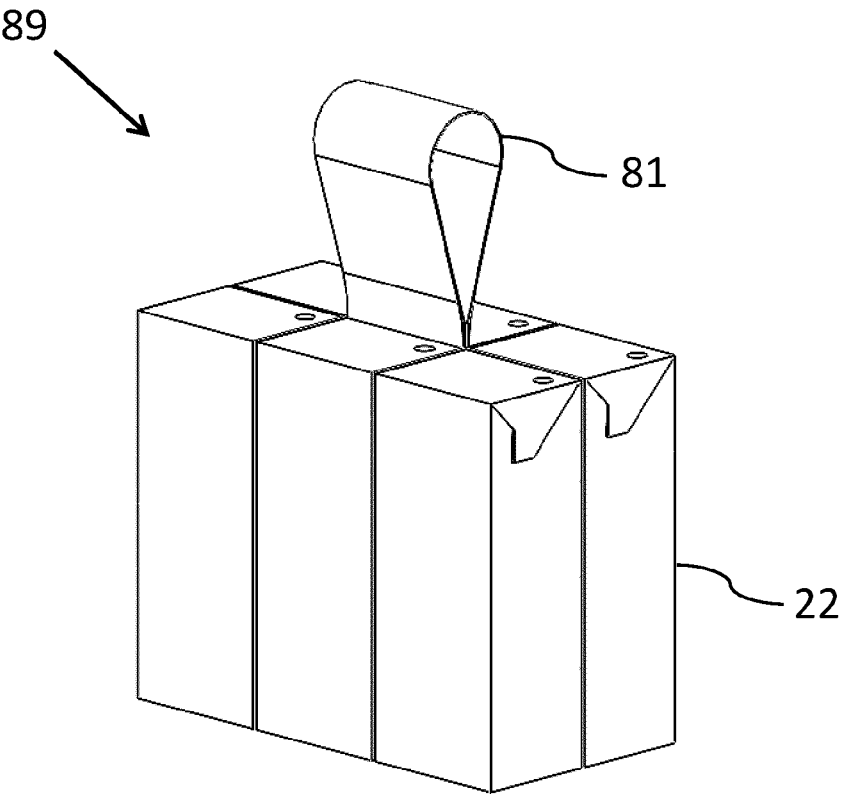


FIG. 8d

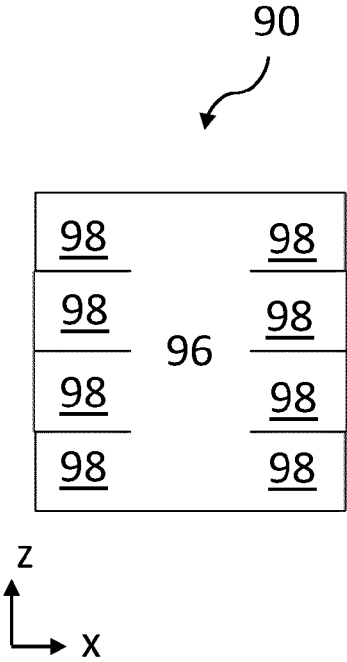


FIG. 9a

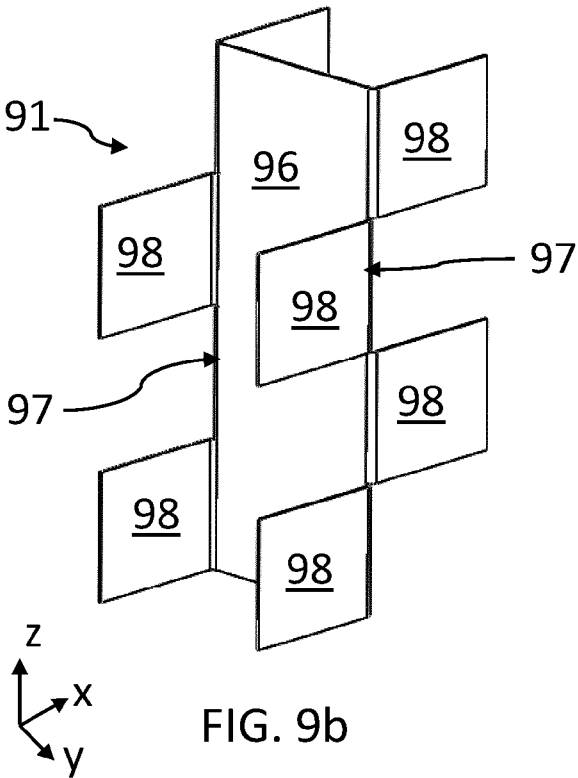


FIG. 9b

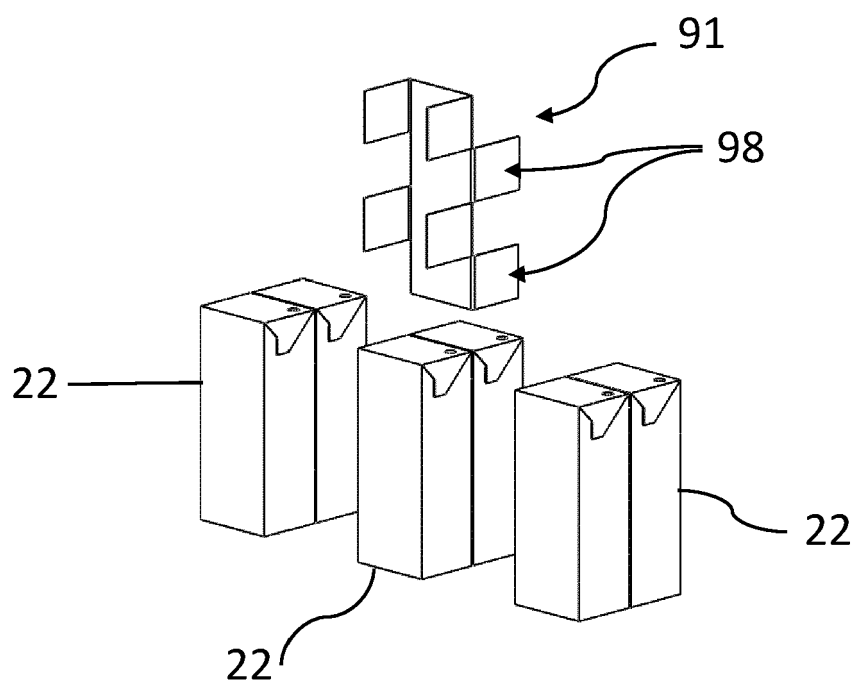


FIG. 9c



EUROPEAN SEARCH REPORT

Application Number

EP 23 21 2717

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2021/067121 A1 (WESTROCK PACKAGING SYSTEMS LLC [US]) 8 April 2021 (2021-04-08)	1-7, 11-15	INV. B65D71/00
A	* abstract; figures 1-3, 5A * * page 7, line 7 * * page 7, line 11 - line 22 * -----	8-10	
X	DE 21 2020 000687 U1 (GAMPAK S R L [IT]) 7 March 2022 (2022-03-07)	1-5, 7, 11, 12, 15	
A	* abstract; figures 1, 2 * * paragraphs [0007], [0010] * -----	6, 8-10, 13, 14	
X	EP 3 842 360 A1 (GRAPHIC PACKAGING INT LLC [US]) 30 June 2021 (2021-06-30)	1-7, 11, 12, 15	
A	* abstract; figures 3-8, 10 * * paragraph [0081] * -----	8-10, 13, 14	
X	EP 0 060 504 A2 (MULTI PACKAGING SERVICES MPS [IT]) 22 September 1982 (1982-09-22)	1-5, 7-12, 15	
A	* abstract; figures 1, 1a, 2 * * page 4, line 18 - line 20 * -----	6, 13, 14	TECHNICAL FIELDS SEARCHED (IPC)
			B65D A45F
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 6 April 2024	Examiner Tempels, Marco
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

EP 23 21 2717

5

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2021067121 A1	08-04-2021	AR 120125 A1	02-02-2022
		AU 2020359410 A1	21-04-2022
		CN 114728724 A	08-07-2022
		JP 2022550197 A	30-11-2022
		KR 20220070230 A	30-05-2022
		WO 2021067121 A1	08-04-2021

DE 212020000687 U1	07-03-2022	AT 17854 U1	15-05-2023
		DE 212020000687 U1	07-03-2022
		PL 130626 U1	06-06-2022
		WO 2021014402 A1	28-01-2021

EP 3842360 A1	30-06-2021	BR 112020015268 A2	13-09-2022
		EP 3842360 A1	30-06-2021
		US 2021188511 A1	24-06-2021
		WO 2021133424 A1	01-07-2021

EP 0060504 A2	22-09-1982	AT E10474 T1	15-12-1984
		EP 0060504 A2	22-09-1982
		ES 276892 U	16-06-1984
		IT 1136923 B	03-09-1986
		US 4441611 A	10-04-1984
		ZA 821599 B	23-02-1983

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82