



US 20240359861A1

(19) **United States**(12) **Patent Application Publication**
Rousselet(10) **Pub. No.: US 2024/0359861 A1**(43) **Pub. Date: Oct. 31, 2024**(54) **PACKAGING CONTAINER FOR INSTANCE
FOR PHARMACEUTICAL PRODUCTS**(52) **U.S. Cl.**CPC *B65D 5/445* (2013.01); *B65D 5/0254*
(2013.01); *B65D 2301/10* (2013.01); *B65D*
2401/15 (2020.05)(71) Applicant: **Sanofi Winthrop Industrie, Antony**
(FR)(72) Inventor: **Guilhem Rousselet, Paris (FR)**

(57)

ABSTRACT(21) Appl. No.: **18/687,611**(22) PCT Filed: **Aug. 30, 2022**(86) PCT No.: **PCT/EP2022/073988**

§ 371 (c)(1),

(2) Date: **Feb. 28, 2024**(30) **Foreign Application Priority Data**

Sep. 1, 2021 (EP) 21306197.1

Publication Classification(51) **Int. Cl.***B65D 5/44* (2006.01)*B65D 5/02* (2006.01)

A packaging container has a substantially parallelepipedic shape extending globally longitudinally and defining an internal space. The packaging container includes a belt formed by first, second, third, and fourth main panels, the first and third main panels having first and second opposite longitudinal ends. The packaging container includes at least one closure panel joined to and extending from a respective first or second longitudinal end of the first and/or third main panel. The second and fourth main panels have first and second opposite transversal free edges. The at least one closure panel has first and second free side edges. The packaging container includes at least one reinforcing rib formed on at least one of the second main panel, the fourth main panel, or the closure panel and close to the respective first or second transversal free edges or side free edges. The at least one reinforcing rib extends transversally.

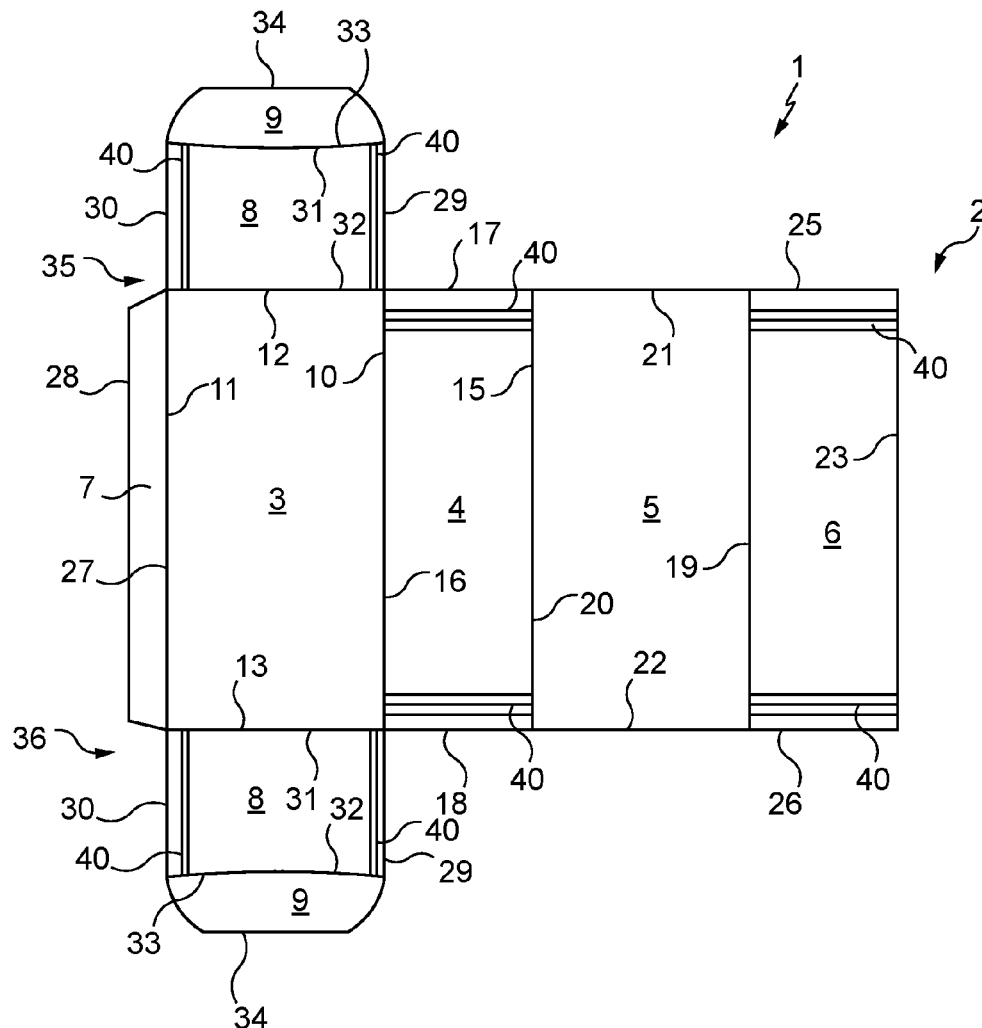


Fig. 1

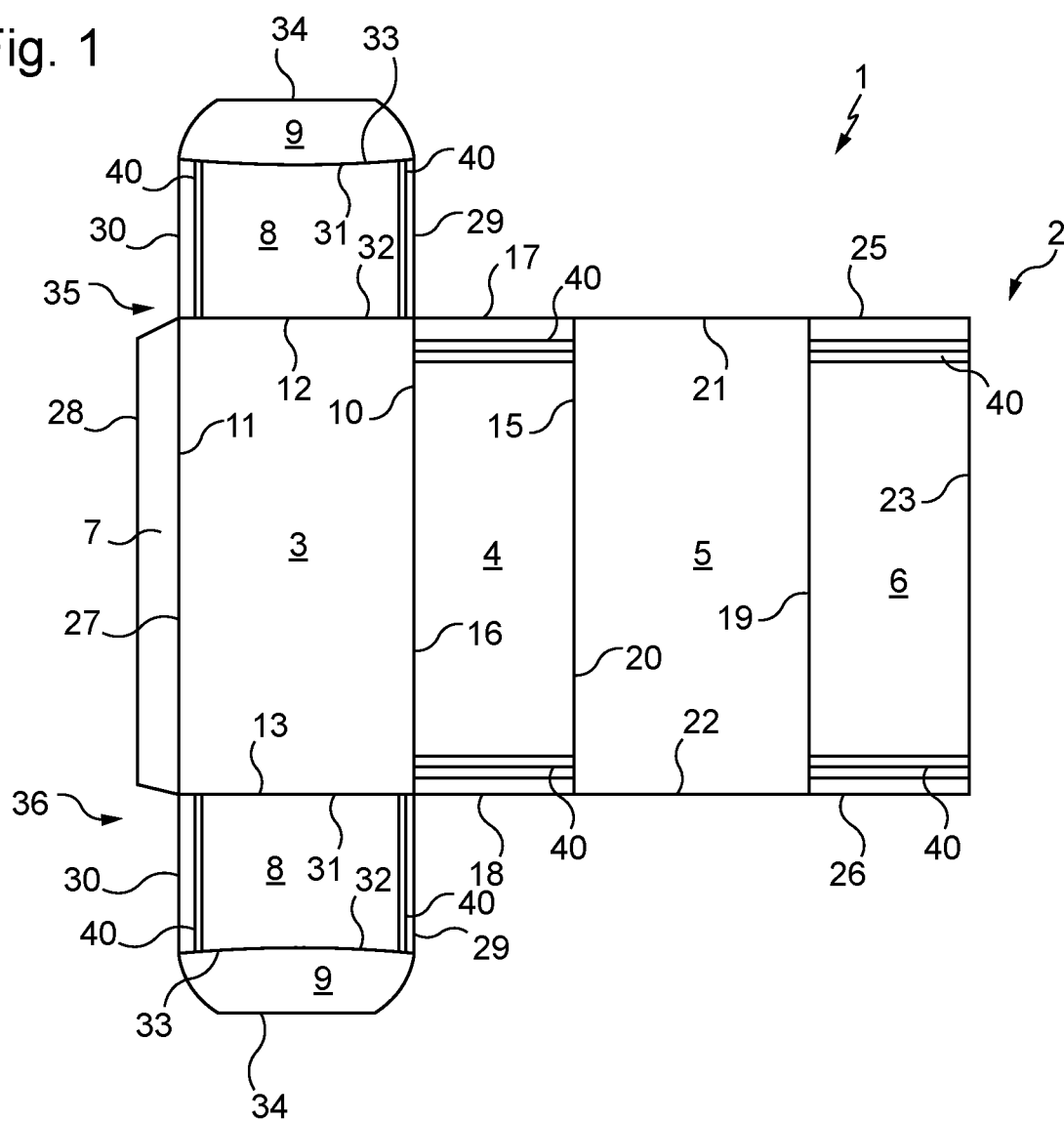


Fig. 2

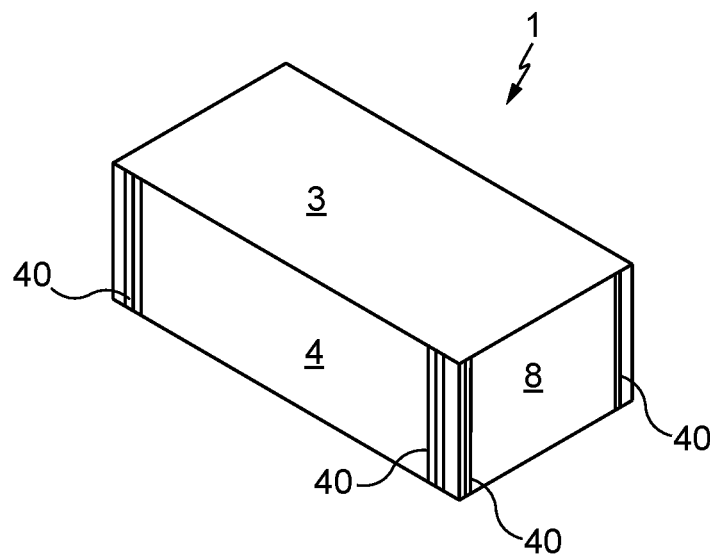


Fig. 3

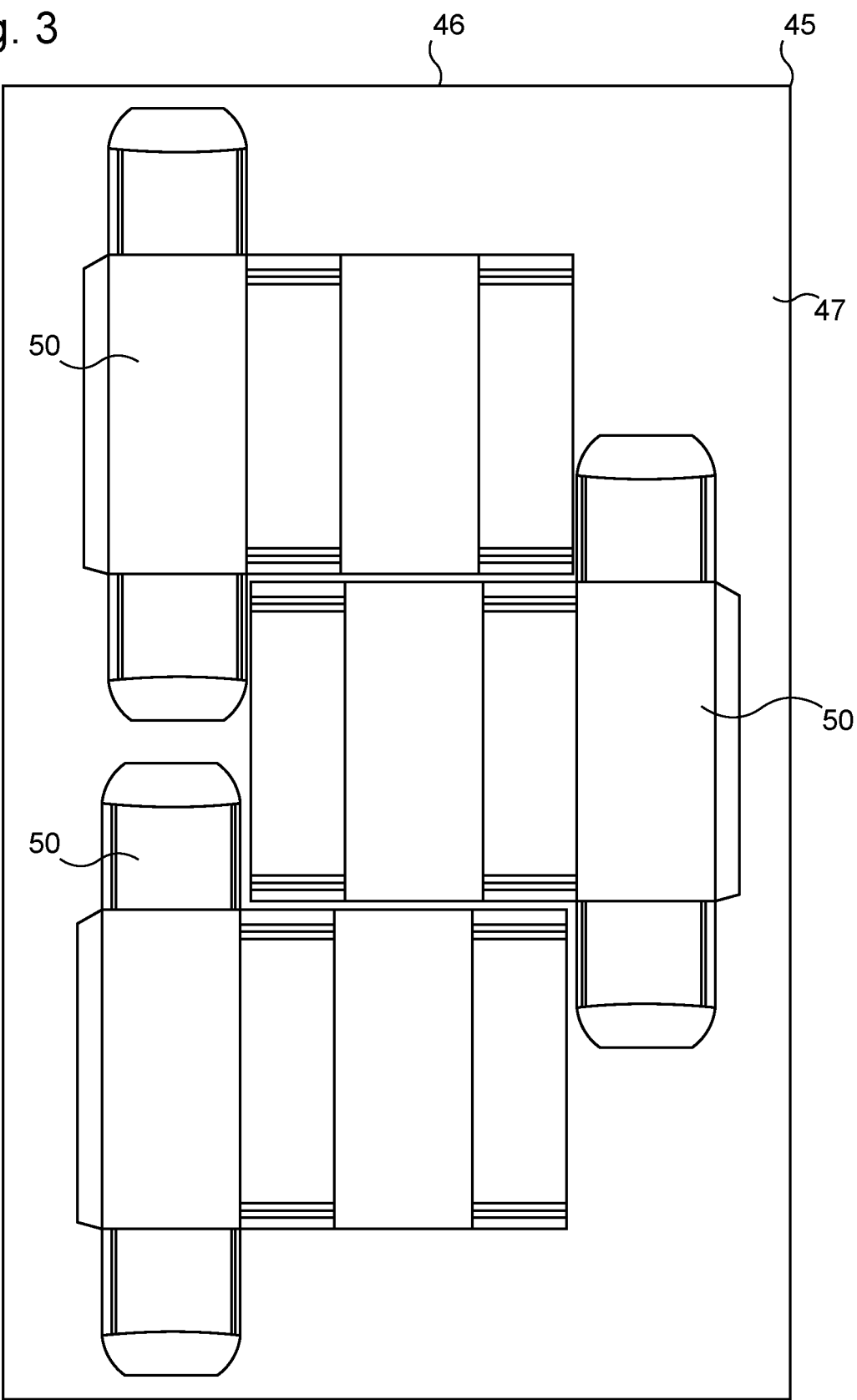


Fig. 4

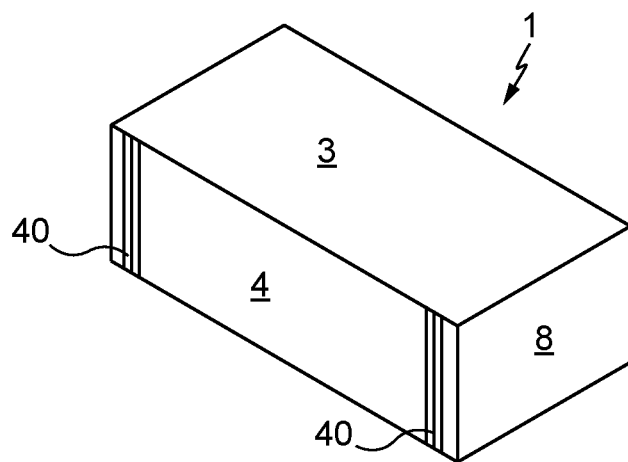
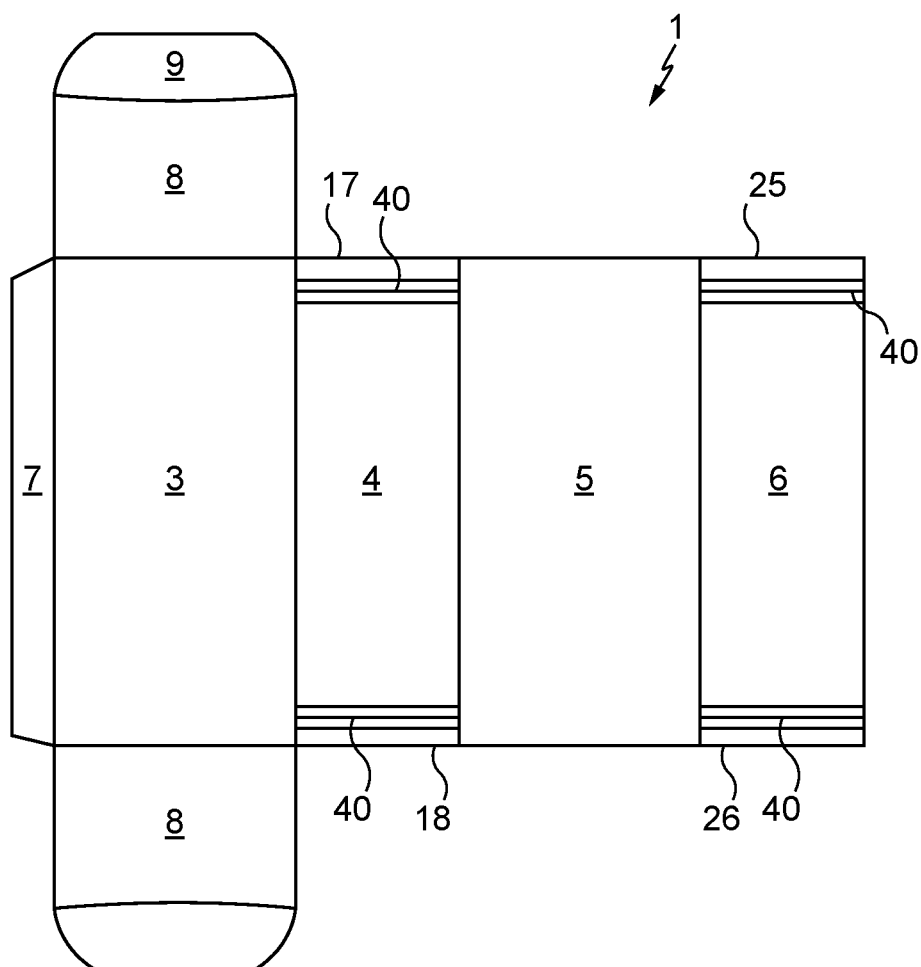


Fig. 5

Fig. 6

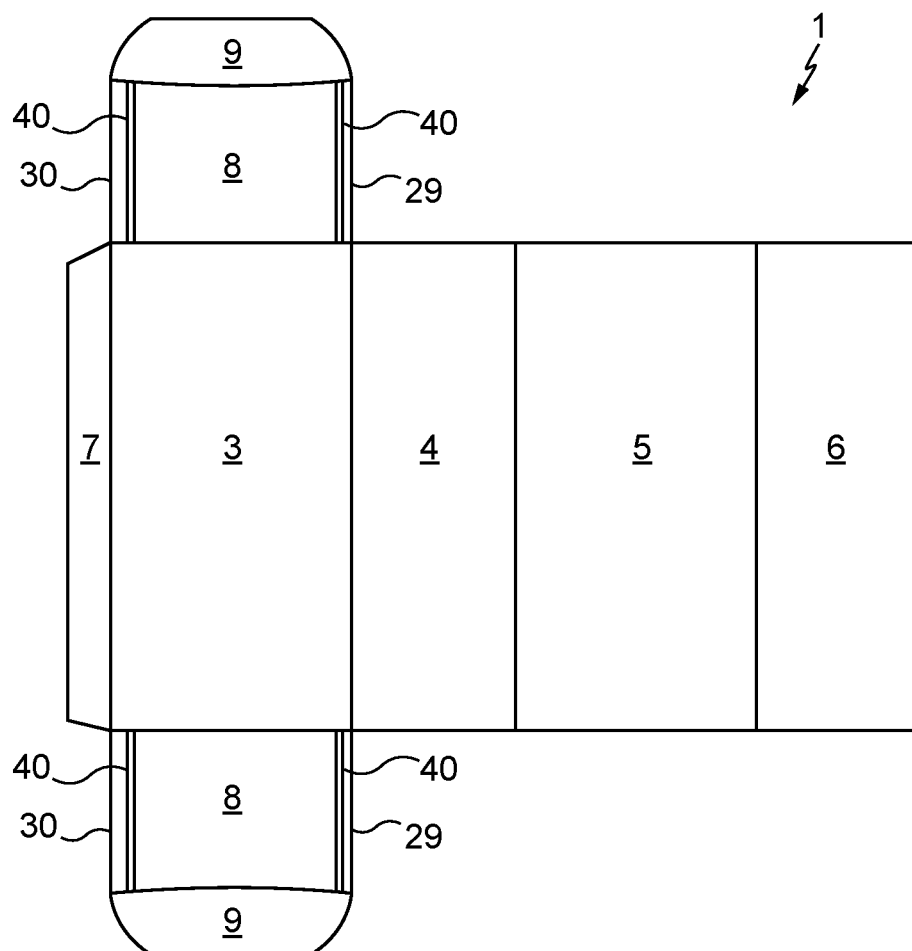


Fig. 7

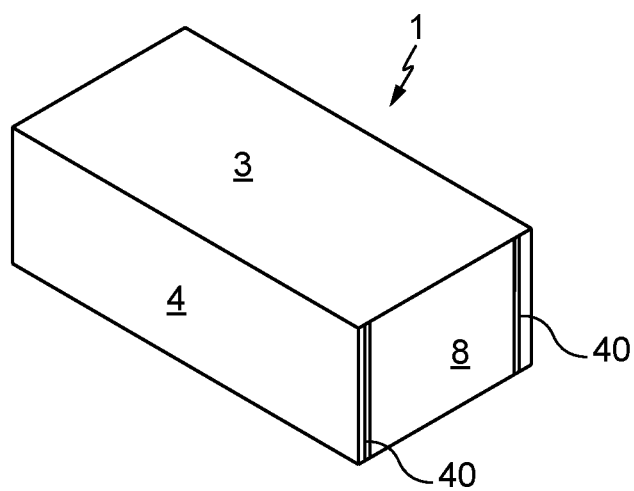


Fig. 8

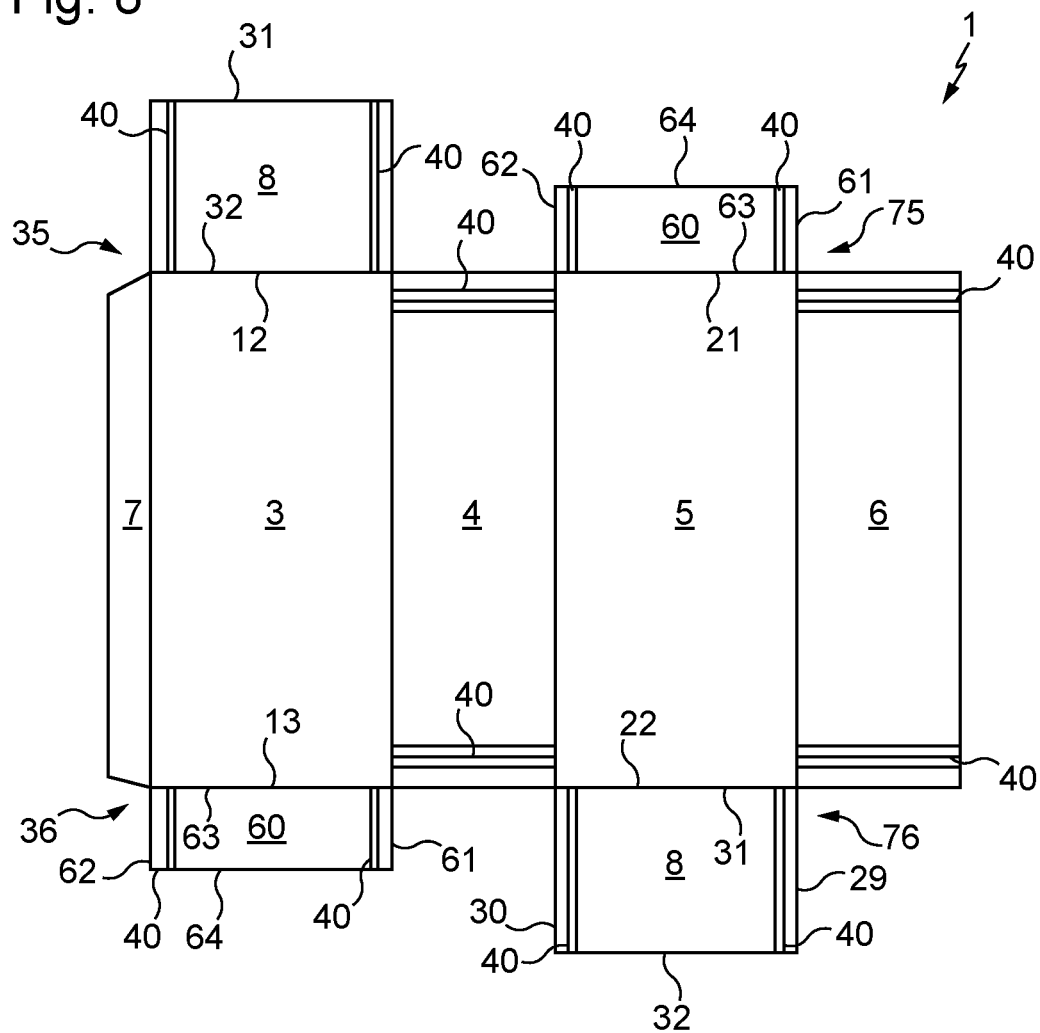
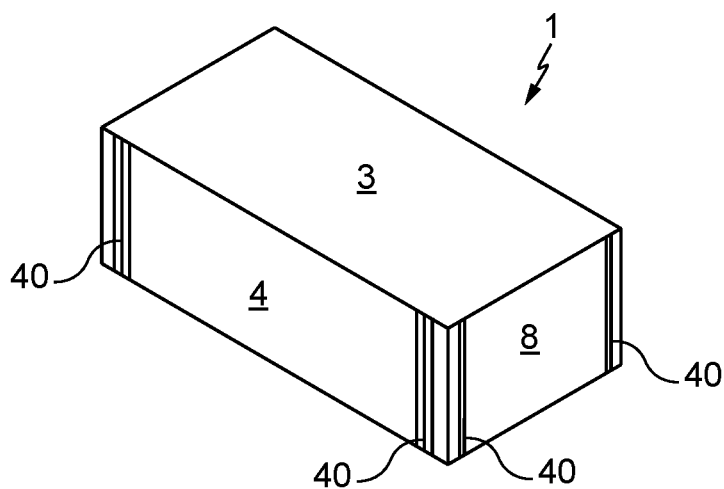


Fig. 9



PACKAGING CONTAINER FOR INSTANCE FOR PHARMACEUTICAL PRODUCTS

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] The present application is the national stage entry of International Patent Application No. PCT/EP2022/073988, filed on Aug. 30, 2022, and claims priority to application Ser. No. 21/306,197.1, filed on Sep. 1, 2021, the disclosures of which are incorporated herein by reference.

TECHNICAL FIELD

[0002] The disclosure relates to a packaging container for instance for pharmaceutical products.

[0003] The disclosure further relates to a method for manufacturing such a packaging container and also a blank sheet of material comprising a plurality of patterns configured to form such packaging containers.

BACKGROUND

[0004] Packaging containers, for instance, for pharmaceutical products are often made from cardboard and have a substantially parallelepipedic shape extending globally longitudinally and defining an internal space of the container. Such containers comprise a belt, or a net, formed by four main panels which are joined and folded. The four main panels have each two longitudinal ends which are opposite one to each other. In addition, such containers often comprises one or a plurality of closure panels joined to and extending from a respective longitudinal end of a respective main panel. Some of the closure panels may comprise a supplemental folded tongue which is introduced into the internal space of the container when the closure panel closes the container. In some implementations, some of the closure panels overlap and are glued to one another when the container is closed.

[0005] Furthermore, packaging containers also comprise additional dust flaps joined to and extending from the respective longitudinal ends of respective main panels. In such a configuration, the dust flaps at least partially close the container and a closure panel covers the dust flaps and close the container. Such dust flaps allow strengthening the container and in particular, they are able to reinforce the main panels from which no closure panel extends.

[0006] British patent GB 596,753 teaches to further reinforce a closure panel and dust flaps by providing thereon dedicated ribs, which align when the container is closed.

[0007] Japanese patent JP H 08 301266 teaches to reinforce two of the main panels by adding ribs which extend longitudinally thereon.

SUMMARY

[0008] The disclosure is directed to a packaging container for instance for pharmaceutical products, which is particularly convenient and economical.

[0009] The disclosure provides a packaging container, for instance, for pharmaceutical products, having a substantially parallelepipedic shape extending globally longitudinally and defining an internal space, the packaging container comprising a belt formed by a first main panel, a second main panel joined and folded relative to the first main panel, a third main panel joined and folded relative to the second main panel and a fourth main panel joined and folded relative to both

third main panel and first main panel; the first main panel and the third main panel have each a first longitudinal end and a second longitudinal end opposite to the first longitudinal end and the packaging container comprises at least one closure panel joined and folded relative to a respective first longitudinal end or second longitudinal end of the first main panel and/or third main panel; characterized in that the second main panel and the fourth main panel have each a first transversal free edge and a second transversal free edge opposite to the first transversal free edge; in that the at least one closure panel has a first free side edge and a second free side edge opposite to the first free side edge; and in that the packaging container further comprises at least one reinforcing rib formed on at least one of the second main panel, fourth main panel and closure panel and close to at least one of the respective first transversal free edge, second transversal free edge, first free side edge and second free side edge; the at least one reinforcing rib extending transversally.

[0010] In the packaging container according to the disclosure, the reinforcing rib is provided on one of the second and fourth main panels and/or on a closure panel at the vicinity of a respective free edge, that is to say an edge from which nothing extends.

[0011] Such a reinforcing rib extends transversally compared to the substantial longitudinal direction of extension of the packaging container. It is to be noted that transversally means not parallel to the longitudinal direction, and is not limited to a perpendicular direction compared to the longitudinal direction.

[0012] The at least one reinforcing rib allows the packaging container not to gape even if a relative force is applied on both first and third main panels. In other words, the presence of the at least one reinforcing rib extending transversally on at least one of the respective free edge of the second main panel, fourth main panel of closure panel, prevents the closure panel and the second and fourth main panels to move away one to each other and thus prevents the formation of passages there-between.

[0013] Thanks to the packaging container according to the disclosure, there is no need to dust flap joined and folded relative to the main panel and/or the closure panel on which is made the at least one reinforcing rib.

[0014] Such a packaging container without dust flap can be manufactured more quickly at least because there is no need to manipulate the dust flap.

[0015] Furthermore, the footprint of the packaging container, when in a blank state, can be reduced and, incidentally, the volume of material needed for manufacturing such packaging containers can be reduced.

[0016] Features which are preferred as being very simple, convenient and economical for embodying the packaging container according to the disclosure are described below.

[0017] The reinforcing rib may extend in a perpendicular direction to the longitudinal direction of the packaging container, that is to say with an angle of around 90° compared to the longitudinal direction, or more generally the reinforcing rib may extend with an angle comprised between around 45° and around 90° compared to the longitudinal direction, or optionally with an angle comprised between around 75° and around 90 compared to the longitudinal direction.

[0018] The packaging container may comprise at least one tamper evident member joined and folded relative to the closure panel and/or to at least one of the respective first

longitudinal end and second longitudinal end of the first main panel or third main panel.

[0019] Such a tamper evident member may be used in order to maintain in a closed position the at least one closure member and thus to prevent the packaging container to be opened without a dedicated force exerted thereon.

[0020] The packaging container may be made from a cardboard having a grammage, or weight, comprised between around 180 g/m² to around 450 g/m², and optionally between around 200 g/m² to around 350 g/m².

[0021] The packaging container may have a size defined by a width, a length and a height in millimeters and comprised between around 10 mm, 30 mm, 10 mm respectively to around 100 mm, 200 mm, 60 mm respectively, and optionally between around 30 mm, 70 mm, 17 mm respectively to around 50 mm, 120 mm, 40 mm respectively; so that the packaging container can be manipulated with one hand for regular use.

[0022] The packaging container may comprise a plurality of reinforcing ribs on at least one of the second main panel, fourth main panel and closure panel, for instance between 1 to 15 reinforcing ribs, such as between 1 to 5 reinforcing ribs on each panel.

[0023] The reinforcing ribs extend transversally, for example, not parallel to the longitudinal direction of the packaging container, as explained above.

[0024] The reinforcing ribs may extend with different angles depending on the panel on which they are formed, and/or successive ribs on a panel may extend with different angles compared to the longitudinal direction of the packaging container.

[0025] In other words, the reinforcing ribs may not be all parallel one to each other on the packaging container or on a panel of this packaging container.

[0026] In the packaging container, the at least one reinforcing rib may be formed at a predetermined distance of the respective one of the first transversal free edge, second transversal free edge, first free side edge and second free side edge, the predetermined distance being comprised between 2 mm and 25 mm.

[0027] The packaging container may comprise a plurality of reinforcing ribs formed on both second main panel and fourth main panel and close to both first transversal free edge and second transversal free edge thereof.

[0028] The packaging container may comprise a plurality of reinforcing ribs formed on the at least one closure panel and close to both first free side edge and second free side edge.

[0029] The packaging container may comprise a plurality of reinforcing ribs formed on the at least one closure panel and close to both first free side edge and second free side edge, and also on at least one of the second main panel and fourth main panel and close to both first transversal free edge and second transversal free edge thereof.

[0030] The packaging container may comprise at least one supplemental folded tongue joined and folded relative to a longitudinal end of the closure panel and configured to be introduced into the internal space of the packaging container and attached to the first main panel or the third main panel.

[0031] The packaging container may comprise at least one supplemental closure panel joined and folded relative to at least one of the respective first longitudinal end and second longitudinal end of the first main panel or third main panel,

and configured to come into contact with the at least one closure panel and to be attached therewith.

[0032] The disclosure is also directed to a method for manufacturing a packaging container as described above, comprising the steps of forming the packaging container in a blank state, including delimiting each of the first main panel, second main panel, third main panel, fourth main panel, and at least one closure panel thanks to folded lines and cutting lines, and of providing the at least one reinforcing rib on at least one of the second main panel, fourth main panel and closure panel.

[0033] The method further comprises the step of forming the packaging container in a raised state, including cutting along the cutting lines and folding along the folding lines in order to provide a belt with the first main panel, second main panel, third main panel, fourth main panel, and at least one closure panel, such belt defining the packaging container having a substantially parallelepipedic shape extending globally longitudinally and defining an internal space, with the at least one reinforcing rib which extends transversally.

[0034] The disclosure is also directed to a blank sheet of material comprising a plurality of patterns configured to form packaging containers as described above.

[0035] The blank sheet of material may be delimited by a peripheral outline defining an internal zone in which a plurality of patterns are at least partially nested.

BRIEF DESCRIPTION OF THE FIGURES

[0036] The description of the disclosure now continues with a detailed description of a preferred embodiment given hereinafter by way of non-limiting example and with reference to the appended drawings.

[0037] FIG. 1 is top view of a packaging container in a blank state, according to a first embodiment.

[0038] FIG. 2 is a perspective view of the packaging container shown in FIG. 1, in a raised state.

[0039] FIG. 3 is a top view of a blank sheet of material comprising a plurality of patterns configured to form packaging containers as shown in FIGS. 1 and 2.

[0040] FIGS. 4 and 5 are similar view as FIGS. 1 and 2, according to a first variant of the first embodiment.

[0041] FIGS. 6 and 7 are similar view as FIGS. 1 and 2, or FIGS. 3 and 4, according to a second variant of the first embodiment.

[0042] FIGS. 8 and 9 are similar view as FIGS. 1 and 2, showing a packaging container according to a second embodiment.

DETAILED DESCRIPTION

[0043] FIGS. 1 and 2 show a packaging container 1 according to a first embodiment.

[0044] In FIG. 1, the packaging container 1 is illustrated in a blank state or said otherwise in a flat configuration; while in FIG. 2, the packaging container 1 is illustrated in a raised state or said otherwise in a box configuration.

[0045] In its box configuration, the packaging container 1 has a substantially parallelepipedic shape extending globally longitudinally and defining an internal space.

[0046] In its box configuration, the packaging container 1 can be manipulated with one hand for regular use.

[0047] In particular, the packaging container 1 has a size defined by a width, a length and a height in millimeters and comprised between around 10 mm, 30 mm, 10 mm respec-

tively to around 100 mm, 200 mm, 60 mm respectively; and optionally between around 30 mm, 70 mm, 17 mm respectively to around 50 mm, 120 mm, 40 mm respectively.

[0048] The packaging container 1 can be used for storing pharmaceutical products.

[0049] For instance, the packaging container 1 can be filled with one or a plurality of blisters (not shown) and a notice.

[0050] In variant, other products can be stored in the packaging container 1, such as food supplement product for instance of the gum type.

[0051] In reference to FIGS. 1 and 2, the packaging container 1 comprises a belt 2 formed by a first main panel 3, a second main panel 4 joined and folded relative to the first main panel 3, a third main panel 5 joined and folded relative to the second main panel 4 and a fourth main panel 6 joined and folded relative to both third main panel 5 and first main panel 3. Each of these panels extends longitudinally.

[0052] The first main panel 3 is delimited by a first longitudinal edge 10, a second longitudinal edge 11 opposite to the first longitudinal edge 10, a first transversal edge 12 joined to both first and second longitudinal edges 10 and 11, and a second transversal edge 13 opposite to the first transversal edge 12 and also joined to both first and second longitudinal edges 10 and 11.

[0053] The second main panel 4 is delimited by a first longitudinal edge 15, a second longitudinal edge 16 opposite to the first longitudinal edge 15, a first transversal free edge 17 joined to both first and second longitudinal edges 15 and 16, and a second transversal free edge 18 opposite to the first transversal free edge 17 and also joined to both first and second longitudinal edges 15 and 16.

[0054] The second main panel 4 is joined by its second longitudinal edge 16 to the first longitudinal edge 10 of the first main panel 3.

[0055] The third main panel 5 is delimited by a first longitudinal edge 19, a second longitudinal edge 20 opposite to the first longitudinal edge 19, a first transversal edge 21 which is free and joined to both first and second longitudinal edges 19 and 20, and a second transversal edge 22 which is free, opposite to the first transversal edge 21 and also joined to both first and second longitudinal edges 19 and 20.

[0056] The third main panel 5 is joined by its second longitudinal edge 20 to the first longitudinal edge 15 of the second main panel 4.

[0057] The fourth main panel 6 is delimited by a first longitudinal edge 23, a second longitudinal edge 24 which is free and opposite to the first longitudinal edge 23, a first transversal free edge 25 joined to both first and second longitudinal edges 23 and 24, and a second transversal free edge 26 opposite to the first transversal free edge 25 and also joined to both first and second longitudinal edges 23 and 24.

[0058] The fourth main panel 6 is joined by its second longitudinal edge 24 to the first longitudinal edge 19 of the third main panel 5.

[0059] The packaging container 1 further comprises a first supplemental folded tongue 7 having a first longitudinal edge 27 and a second longitudinal edge 28 which is free and opposite to the first longitudinal edge 27.

[0060] The first supplemental folded tongue 7 is joined and folded by its first longitudinal edge 27 relative to the second longitudinal edge 11 of the first main panel 3.

[0061] In the box configuration, the first supplemental folded tongue 7 is introduced into the internal space of the packaging container 1 and attached, for instance by glue, to fourth main panel 6 so that this latter is indirectly joined to the first main panel 3.

[0062] The packaging container 1 further comprises two closure panels 8 having each a first free side edge 29, a second free side edge 30 opposite to the first free side edge 29, a first transversal edge 31 joined to both first and second free side edges 29 and 30 and a second transversal edge 32 opposite to the first transversal edge 31 and also joined to both first and second free side edges 29 and 30.

[0063] Both closure panels 8 are here joined and folded relative to the first main panel 3 at the location of a first longitudinal end 35 and a second longitudinal end 36 of the first main panel 3.

[0064] In particular, one of the closure panels 8 is joined by its second transversal edge 32 to the first transversal edge 12 of the first main panel 3 and the other closure panel 8 is joined by its second transversal edge 32 to the second transversal edge 13 of the first main panel 3.

[0065] The closure panels 8 are thus opposite to each other.

[0066] The packaging container 1 further comprises two second supplemental folded tongues 9 having each a first transversal edge 33 and a second longitudinal edge 34 which is free and opposite to the first transversal edge 33. Each second supplemental folded tongue 9 is joined and folded relative by its first transversal edge 33 to the first transversal edge 31 of a respective closure panel 8.

[0067] In the box configuration, the two second supplemental folded tongues 9 are introduced into the internal space of the packaging container 1.

[0068] In the box configuration, each second supplemental folded tongue 9 can be attached to the first main panel 3.

[0069] The two second supplemental folded tongues 9 can each form a tamper evident member which is used in order to maintain in a closed position the closure panels 8 and thus to prevent the packaging container 1 to be opened without a dedicated force exerted thereon.

[0070] The packaging container 1 further comprises a plurality of reinforcing ribs 40 formed here in the second main panel 4, close to both respective first and second transversal free edges 17 and 18, in the fourth main panel 6, close to both respective first and second transversal free edges 25 and 26, and in each closure panel 8, close to both respective first and second free side edges 29 and 30.

[0071] In particular, each of the second and fourth main panels 4 and 6 has three reinforcing ribs 40 formed at a predetermined distance of the respective first and second transversal free edges 17, 25 and 18, 26; while each of the closure panels has two reinforcing ribs 40 formed at a predetermined distance of the respective first and second free side edges 29 and 30.

[0072] In the box configuration of the packaging container 1, all the reinforcing ribs 40 extend transversally.

[0073] FIG. 3 shows a blank sheet 45 of material, for instance a cardboard, comprising a plurality of patterns 50, each being configured to form a packaging container 1 as described above.

[0074] A pattern 50 differs from the packaging container 1 as shown in FIGS. 1 and 2 only in that the packaging container 1 is detached from the blank sheet 45.

[0075] The blank sheet of material 45 is here delimited by a peripheral outline 46 defining an internal zone 47 in which the plurality of patterns 50 are at least partially nested. Here, the blank sheet 45 comprises three patterns 50 which are arranged “head-to-tail”.

[0076] As shown in FIG. 3, the blank sheet of material 45 thus comprises a limited surface which is not used by the patterns 50.

[0077] Thus, the volume of material needed for manufacturing such packaging containers 1 is reduced.

[0078] FIGS. 4 and 5 are similar to FIGS. 1 and 2 and show a similar packaging container 1, except in that the closure panels 8 are devoid of reinforcing rib.

[0079] In other words, only the second and fourth main panels 4 and 6 are provided with reinforcing ribs 40 arranged close to the respective first and second transversal free edges 17, 25 and 18, 26 of these second and fourth main panels 4 and 6; and the reinforcing ribs 40 extend transversally in the box configuration.

[0080] The rest of the packaging container 1, including the first main panel 3, second main panel 4, third main panel 5, fourth main panel 6, closures panels 8, and first and second supplemental tongues 7 and 9 have similar features, reinforcing ribs omitted, and the description made above for FIGS. 1 and 2, and also for FIG. 3, thus applies to FIGS. 4 and 5.

[0081] FIGS. 6 and 7 are similar to FIGS. 1 and 2 and show a similar packaging container 1, except in that the second and fourth main panels 4 and 6 are devoid of reinforcing rib.

[0082] In other words, only the two closure panels 8 are provided with reinforcing ribs 40 arranged close to the respective first and second free side edges 29 and 30 of these two closure panels 8; and the reinforcing ribs 40 extend transversally in the box configuration.

[0083] The rest of the packaging container 1, including the first main panel 3, second main panel 4, third main panel 5, fourth main panel 6, closures panels 8, and first and second supplemental tongues 7 and 9 have similar features, reinforcing ribs omitted, and the description made above for FIGS. 1 and 2, and also for FIG. 3, thus applies to FIGS. 6 and 7.

[0084] FIGS. 8 and 9 show a packaging container also rather similar to the packaging container as shown in FIGS. 1, 2 and 4 to 7 except that the closures panels 8 differs in arrangement, that further supplemental closure panels 60 are provided so as to form, in cooperation with the closures panels 8, tamper evident members, and that the packaging container 1 is devoid of second supplemental folded tongue extending from the closures panels 8.

[0085] In particular, only one closure panel 8 extends from the first longitudinal end 35 of the the main first panel 3, and is joined by its second transversal edge 32 to the first transversal edge 12 of the first main panel 3.

[0086] The first transversal edge 31 of this closure panel 8, which is opposite to the second transversal edge 32, is here a free edge.

[0087] The packaging container 1 illustrated in FIGS. 8 and 9 comprises a supplemental closure panel 60 which extends from the second longitudinal end 36 of the main first panel 3. The supplemental closure panel 60 is thus opposite to the closure panel 8.

[0088] The supplemental closure panel 60 comprises a first free side edge 61, a second free side edge 62 opposite

to the first free side edge 61, a first transversal edge 63 joined to both first and second free side edges 61 and 62, and a second transversal edge 64 which is free, opposite to the first transversal edge 63 and also joined to both first and second free side edges 61 and 62.

[0089] The supplemental closure panel 60 is joined by its first transversal edge 63 to the second transversal edge 64 of the first main panel 3.

[0090] In addition, another closure panel 8 is provided and extends from the third main panel 5, and another supplemental closure panel 60 is provided and extends from the third main panel 5 at the opposite of the other closure panel 8.

[0091] The first and second transversal edges of the third main panel 5 are thus not free edges.

[0092] In particular, the other closure panel 8 comprises a first free side edge 29, a second free side edge 30 opposite to the first free side edge 29, a first transversal edge 31 joined to both first and second free side edges 29 and 30, and a second transversal edge 32 which is free, opposite to the first transversal edge 31 and also joined to both first and second free side edges 29 and 30.

[0093] The other closure panel 8 is joined by its first transversal edge 31 to the second transversal edge 22 of the third main panel 5.

[0094] In addition, the other supplemental closure panel 60 comprises a first free side edge 61, a second free side edge 62 opposite to the first free side edge 61, a first transversal edge 63 joined to both first and second free side edges 61 and 62, and a second transversal edge 64 which is free, opposite to the first transversal edge 63 and also joined to both first and second free side edges 61 and 62.

[0095] The other supplemental closure panel 60 is joined by its first transversal edge 63 to the first transversal edge 21 of the third main panel 5.

[0096] Both the other closure panel 8 and the other supplemental closure panel 60 are here joined and folded relative to the third main panel 5 at the location respectively of a first longitudinal end 75 and a second longitudinal end 76 of the third main panel 5.

[0097] As in FIGS. 1, 2, 4, 5, reinforcing ribs 40 are here formed on the second and fourth main panels 4 and 6.

[0098] In addition, reinforcing ribs 40 are here formed also on both closure panels 8 and supplemental closure panels 60, respectively close to both first and second free side edges 29, 30 and both first and second free side edges 61, 62.

[0099] The rest of the packaging container 1, including the first main panel 3, second main panel 4, fourth main panel 6, and first supplemental tongue 7 have similar features and the description made above for FIGS. 1 and 2, and also for FIG. 3, thus applies to FIGS. 6 and 7.

[0100] In the box configuration of the packaging container 1 illustrated in FIGS. 8 and 9, all reinforcing ribs 40 extend transversally.

[0101] Furthermore, the supplemental closures panels 60 are configured to come into contact with a respective closure panel 8, located on the side of the same first or second longitudinal end 35, 75 or 36, 76 of the respective first and third main panels 3, 5, and to be attached therewith.

[0102] In the packaging container 1 as described above in reference to FIGS. 1, 2 and 4 to 9, the reinforcing ribs 40 are provided on one of the second and fourth main panels 4, 6 and/or on closure panels 8 or supplemental closure panels

60, at the vicinity or immediate vicinity of a respective free edge, that is to say an edge from which nothing extends.

[0103] Such reinforcing ribs **40** extends transversally compared to the substantial longitudinal direction of extension of the packaging container **1**.

[0104] The reinforcing ribs allow the packaging container **1** not to gape even if a relative force is applied on both first and third main panels **3** and **5**.

[0105] In other words, the presence of the reinforcing rib **40** extending transversally prevents the closure panels **8**, supplemental closures panels **60**, and/or second and fourth main panels **4**, **6** to move away one to each other and thus prevents the formation of passages therebetween.

[0106] The packaging container **1** as described above is particularly simple and easy to manufacture.

[0107] In particular, the method for manufacturing such packaging containers comprises the steps of forming patterns in the blank sheet material, the patterns being optionally nested and arranged “head-to-tail”.

[0108] As explained above, patterns correspond to packaging containers in a blank state not yet detached from the blank sheet of material.

[0109] Forming such patterns includes, for each pattern, the steps of delimiting each of the first main panel, second main panel, third main panel, fourth main panel, closures panel(s), optional supplemental closure panel(s), and optional first and/or second tongue(s), thanks to folded lines and cutting lines which correspond to the respective edges described above, and of providing the reinforcing ribs on the second main panel and/or fourth main panel and/or closure panel(s) and/or supplemental closure panel(s).

[0110] The reinforcing ribs can be made with a similar marking tool as used for making the folded lines and/or cutting lines.

[0111] To be noted that reinforcing ribs are equated to reinforcing grooves.

[0112] The method further comprises the steps of cutting along the cutting lines the patterns in order to detach them from the blank sheet material and then obtain the packaging containers in flat configuration, and of folding along the folding lines each packaging container from its blank state or flat configuration to its raised state or box configuration.

[0113] In particular the first main panel, second main panel, third main panel, fourth main panel and/or the first supplemental folded tongue form the belt defining the packaging container having a substantially parallelepipedic shape extending globally longitudinally and defining an internal space, and at least the closure panel(s) and/or supplemental closure panel(s) and/or second supplemental folded tongue(s) close the longitudinal ends of the packaging container and form a tamper evident member.

[0114] In the box configuration of the packaging container, any reinforcing rib made as described above extends transversally.

[0115] It is to be noted that the reinforcing ribs **40** as shown in FIGS. **1** to **9** here extend transversally (for example, not parallel) to the longitudinal direction of the packaging container **1**, and in particular substantially perpendicularly, that is to say with an angle around 90° compared to the longitudinal direction. More generally:

[0116] the packaging container may be made from a cardboard having a grammage, or weight, comprised

between around 180 g/m^2 to around 450 g/m^2 , and optionally between around 200 g/m^2 to around 350 g/m^2 ;

[0117] the packaging container may have a size defined by a width, a length and a height in millimeters and comprised between around 10 mm, 30 mm, 10 mm respectively to around 100 mm, 200 mm, 60 mm respectively, and optionally between around 30 mm, 70 mm, 17 mm respectively to around 50 mm, 120 mm, 40 mm respectively;

[0118] the packaging container may comprise for instance between 1 to 15 reinforcing ribs and optionally between 1 to 5 reinforcing ribs on each panel; and/or

[0119] the reinforcing rib(s) may extend with an angle comprised between around 45° and around 90° compared to the longitudinal direction, or optionally with an angle comprised between around 75° and around 90° compared to the longitudinal direction;

[0120] the reinforcing rib(s) may extend with different angles depending on the panel on which they are formed, and/or successive ribs on a panel may extend with different angles compared to the longitudinal direction of the packaging container;

[0121] the reinforcing rib(s) may be formed at a predetermined distance of the respective one of the first transversal free edge, second transversal free edge, first free side edge and second free side edge, the predetermined distance being comprised between 2 mm and 25 mm.

[0122] Variants that are not illustrated are explained below.

[0123] The packaging container can comprise more or fewer closure panel(s) and/or supplemental closure panel(s).

[0124] Reinforcing ribs can be formed on only one closure panel and/or supplemental closure panel.

[0125] Reinforcing ribs can be formed close to only one of the transversal and/or side free edges of the respective second and/or fourth main panels and/or closure panel(s).

[0126] The packaging container can be devoid of first supplemental folded tongue.

[0127] It should be noted more generally that the disclosure is not limited to the examples described and represented.

The invention claimed is:

1-15. (canceled)

16. A packaging container for pharmaceutical products, the packaging container having a substantially parallelepipedic shape extending longitudinally and defining an internal space, the packaging container comprising:

a belt formed by a first main panel, a second main panel joined and folded relative to the first main panel, a third main panel joined and folded relative to the second main panel, and a fourth main panel joined and folded relative to both the third main panel and the first main panel, wherein the first main panel and the third main panel each have a first longitudinal end and a second longitudinal end opposite to the first longitudinal end, and the second main panel and the fourth main panel each have a first transversal free edge and a second transversal free edge opposite to the first transversal free edge;

at least one closure panel joined and folded relative to at least one of the first longitudinal end of the first main

panel, the first longitudinal end of the third main panel, the second longitudinal end of the first main panel, or the second longitudinal end of the third main panel, wherein the at least one closure panel has a first free side edge and a second free side edge opposite to the first free side edge; and

at least one reinforcing rib formed on at least one of the second main panel, the fourth main panel, or the closure panel and close to at least one of the first transversal free edge, the second transversal free edge, the first free side edge, or the second free side edge, the at least one reinforcing rib extending transversally.

17. The packaging container according to claim 16, comprising at least one tamper evident member joined and folded relative to the closure panel, the first longitudinal end of the first main panel, the first longitudinal end of the third main panel, the second longitudinal end of the first main panel, or the second longitudinal end of the third main panel.

18. The packaging container according to claim 17, wherein the at least one tamper evident member is joined and folded relative to the closure panel and at least one of the first longitudinal end of the first main panel, the first longitudinal end of the third main panel, the second longitudinal end of the first main panel, or the second longitudinal end of the third main panel.

19. The packaging container according to claim 16, wherein the packaging container is made from a cardboard having a grammage of 180 grams per square meter (g/m^2) to 450 g/m^2 .

20. The packaging container according to claim 19, wherein the cardboard has a grammage of 200 g/m^2 to 350 g/m^2 .

21. The packaging container according to claim 16, wherein the packaging container has a width between 10 millimeters (mm) and 100 mm, a length between 30 mm and 200 mm, and a height between 10 mm and 60 mm.

22. The packaging container according to claim 21, wherein the width is between 30 mm and 50 mm, the length is between 70 mm and 120 mm, and a height between 17 mm and 40 mm, wherein the packaging container is configured to be manipulated with one hand.

23. The packaging container according to claim 16, comprising a plurality of reinforcing ribs on at least one of the second main panel, the fourth main panel, and the at least one closure panel, the plurality of reinforcing ribs comprising the at least one reinforcing rib.

24. The packaging container according to claim 23, wherein the plurality of reinforcing ribs comprises between two and 15 reinforcing ribs.

25. The packaging container according to claim 16, wherein the at least one reinforcing rib is formed at a predetermined distance from the at least one of the first transversal free edge, the second transversal free edge, the first free side edge, or the second free side edge, the predetermined distance being between 2 mm and 25 mm.

26. The packaging container according to claim 25, comprising a plurality of reinforcing ribs formed on the second main panel and the fourth main panel and close to the first transversal free edge of the second main panel, the first transversal free edge of the fourth main panel, the second transversal free edge of the second main panel, and the second transversal free edge of the fourth main panel, the plurality of reinforcing ribs comprising the at least one reinforcing rib.

27. The packaging container according to claim 26, wherein the plurality of reinforcing ribs are further formed on the at least one closure panel and close to the first free side edge and the second free side edge.

28. The packaging container according to claim 16, comprising a plurality of reinforcing ribs formed on the at least one closure panel and close to the first free side edge and the second free side edge.

29. The packaging container according to claim 28, wherein the plurality of reinforcing ribs are further formed on at least one of the second main panel or the fourth main panel and close to at least one of the first transversal free edge of the second main panel and the second transversal free edge of the second main panel or the first transversal free edge of the fourth main panel and the second transversal free edge of the fourth main panel.

30. The packaging container according to claim 16, further comprising at least one supplemental folded tongue joined and folded relative to the at least one closure panel and configured to be introduced into the internal space of the packaging container and attached to the first main panel or the third main panel.

31. The packaging container according to claim 16, comprising at least one supplemental closure panel joined and folded relative to at least one of the first longitudinal end of the first main panel, the second longitudinal end of the first main panel, the first longitudinal end of the third main panel, or the second longitudinal end of the third main panel, the at least one supplemental closure panel configured to come into contact with the at least one closure panel and to be attached therewith.

32. A method for manufacturing a packaging container having a substantially parallelepipedic shape extending longitudinally and defining an internal space, the packaging container comprising:

a belt formed by a first main panel, a second main panel joined and folded relative to the first main panel, a third main panel joined and folded relative to the second main panel, and a fourth main panel joined and folded relative to both third main panel and first main panel, wherein the first main panel and the third main panel have each a first longitudinal end and a second longitudinal end opposite to the first longitudinal end, and the second main panel and the fourth main panel have each a first transversal free edge and a second transversal free edge opposite to the first transversal free edge;

at least one closure panel joined and folded relative to at least one of the first longitudinal end of the first main panel, the first longitudinal end of the third main panel, the second longitudinal end of the first main panel, or the second longitudinal end of the third main panel, and the at least one closure panel has a first free side edge and a second free side edge opposite to the first free side edge; and

at least one reinforcing rib formed on at least one of the second main panel, the fourth main panel, or the closure panel and close to at least one of the first transversal free edge, the second transversal free edge, the first free side edge, or the second free side edge, the at least one reinforcing rib extending transversally,

the method comprising:

forming the packaging container in a blank state, including delimiting each of the first main panel, the

second main panel, the third main panel, the fourth main panel, and the at least one closure panel due to folding lines and cutting lines, and of providing the at least one reinforcing rib on at least one of the second main panel, the fourth main panel, or the at least one closure panel.

33. The method according to claim **32**, comprising:

forming the packaging container in a raised state, including cutting along the cutting lines and folding along the folding lines in order to provide the belt with the first main panel, the second main panel, the third main panel, the fourth main panel, and the at least one closure panel.

34. A blank sheet of material comprising a plurality of patterns configured to form a plurality of packaging containers, each packaging container having a substantially parallelepipedic shape extending longitudinally and defining an internal space, and each packaging container comprising:

a belt formed by a first main panel, a second main panel joined and folded relative to the first main panel, a third main panel joined and folded relative to the second main panel, and a fourth main panel joined and folded relative to both third main panel and first main panel, wherein the first main panel and the third main panel have each a first longitudinal end and a second longi-

tudinal end opposite to the first longitudinal end, and the second main panel and the fourth main panel have each a first transversal free edge and a second transversal free edge opposite to the first transversal free edge;

at least one closure panel joined and folded relative to at least one of the first longitudinal end of the first main panel, the first longitudinal end of the third main panel, the second longitudinal end of the first main panel, or the second longitudinal end of the third main panel, and the at least one closure panel has a first free side edge and a second free side edge opposite to the first free side edge; and

at least one reinforcing rib formed on at least one of the second main panel, the fourth main panel, or the closure panel and close to at least one of the first transversal free edge, the second transversal free edge, the first free side edge, or the second free side edge, the at least one reinforcing rib extending transversally.

35. The blank sheet of material according to claim **34**, the blank sheet of material being delimited by a peripheral outline defining an internal zone in which the plurality of patterns are at least partially nested.

* * * * *