



(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
27.02.2019 Bulletin 2019/09

(51) Int Cl.:
B65D 5/44 (2006.01)

(21) Application number: **16899313.7**

(86) International application number:
PCT/ES2016/070389

(22) Date of filing: **23.05.2016**

(87) International publication number:
WO 2017/182681 (26.10.2017 Gazette 2017/43)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD

(71) Applicant: **Genetic Pop, SL**
28022 Madrid (ES)

(72) Inventor: **REGO GARCÍA DE ALBA, Luis Felipe**
28023 Madrid (ES)

(74) Representative: **Sahuquillo Huerta, Jesús**
C/ Reverendo José Noguera 33-14
46017 Valencia (ES)

(30) Priority: **18.04.2016 ES 201630482**

(54) **REINFORCEMENT FOR CARDBOARD PACKAGING, REINFORCEMENT-EQUIPPED CARDBOARD PACKAGING SYSTEM, AND METHOD FOR THE PRODUCTION OF SAID REINFORCEMENT**

(57) The invention relates to a reinforcement (1) for cardboard packaging (2) supplied flat, said reinforcement comprising a longitudinal profile including two segments (5) and a central connecting zone (6) which can be bent to form an angle of between 180° and 0° between the segments. The longitudinal profile includes a first layer

(1) and a second layer (2) which are stacked on top of one another, and connecting means. The invention also relates to a reinforcement-equipped packaging system, which reinforcement (1) can be positioned at least along two parallel fold lines (3) of the packaging (2), each fold line (3) comprising at least two vertical edges

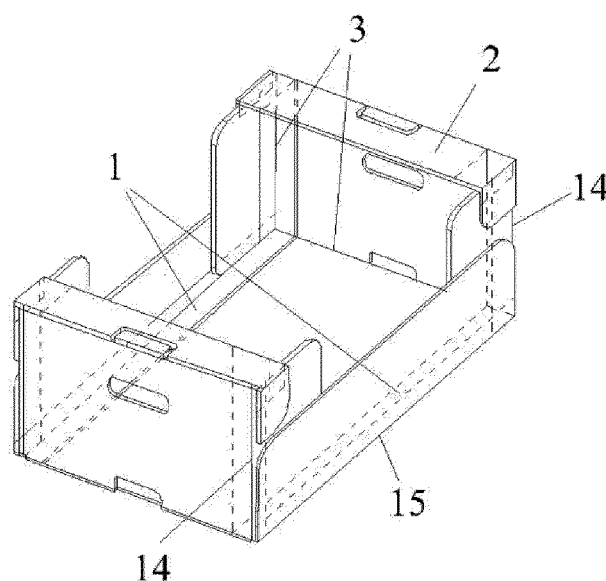


Fig. 5.6

Description

Technical Field of the Invention

[0001] The present invention relates to the technical field of reinforcement for carton packaging, such as boxes, trays and the like which are supplied in flatpack form for its later assembly by folding along the folding lines thereof.

Prior art

[0002] Currently, there is an enormous use of carton packaging, not only to transport products, but also to store them and including the exhibition of the same.

[0003] These carton packages may be enabled from simple carton or corrugated carton in order to form boxes, trays and other packaging modes.

[0004] Originally, the manufacture of these packages was enabled from simple carton, but the need to enable a greater loading capacity resulted in the use of other types of carton, such as corrugated carton formed by at least one layer of internal carton which forms a series of undulations or fluting, and which is included between two exterior layers of carton or paper.

[0005] The packages of corrugated carton may utilize one, two or more interior layers of corrugated carton.

[0006] In this manner, as the necessity for a greater loading capacity arose, packages were enabled with one or other type of carton, while varying certain factors, such as the thickness of the laminated carton forming it, or in the case of corrugated carton, the type of corrugation, with more or less density of flutes, in other words, of the waves of the corrugation, the number of layers of corrugation... , to obtain a greater loading capacity.

[0007] Nevertheless, when the products contained in these packages are heavy products, in addition to, as sometimes happens, these packages being piled one on top of another, the corners zones of the same are particularly exposed to heavy loads which may not withstand in the end and may fail. The use of corrugated carton, even if it increases the loading capacity compared with simple carton, does not solve the lack of resistance in the corners, in the case of heavy products, given that the option of further increasing the thickness of the carton to make the packages more resistant ceases to be economic after a certain thickness, such that corrugated carton packages also collapse. As a result, the usage of corrugated carton is not sufficient, and the use of some type of reinforcement in the problem zones, which are the corners, is necessary.

[0008] In order to exemplify the state-of-the-art, the following reference documents US8317671 and US8443975 may be cited, which attempt to resolve this problem in packages.

[0009] The reference document US8317671 refers to a method of manufacture of a piece of carton to form a carton box which has an upper wall, a lower wall, and

two lateral walls. This method comprises a first stage consisting of having a band of non-corrugated carton advance along the length of a trajectory, this band of non-corrugated carton configures a packaging box, on being folded along the folding lines.

[0010] The second stage comprises laminating at least a first band and a second band of reinforcing material over the first surface of the band of advancing non-corrugated carton. The first and the second bands have a lesser width than the width of the band of non-corrugated carton.

[0011] The first band is positioned and adheres substantially completely but not beyond a first portion of the longitudinally extended panel of the band of non-corrugated carton, and the second band is positioned on, and adhered to, substantially all, but not beyond a second portion of the longitudinal he extended panel of the band of non-corrugated carton. The first and second bands do not extend across the longitudinal folding lines.

[0012] The third stage comprises cutting the band of non-corrugated carton and the first and second laminated bands along their length into a carton box which has panels corresponding to the upper wall, the lower wall, and the two lateral walls of the carton box, such that the first band and the second band are situated in the interior of the carton box, when the piece of carton is folded to form the same, for the reinforcement thereof.

[0013] By so enabling, the invention consists in the enablement of the carton box and the reinforcement thereof in a single process. This complicates the manufacture thereof and is expensive, since a special machine is required to be able to complete the process.

[0014] Also, in this situation, the reinforcements are formed by equal layers adhered one atop the other without any sequence or order, which results in the laminate so generated being incapable of folding when in excess of a certain thickness of laminate. This presupposes the existence of a limitation on the thickness of the reinforcement.

[0015] That invention is focused on simple carton, which is non-corrugated, and as such excludes the option of reinforcement of packages enabled using corrugated carton, and that is currently one of the most frequently utilized.

[0016] Another inconvenience of that carton box enabled in that manner is that the reinforcements are disposed along the edges, and are used for vertical or horizontal support, but does not take into account the support point of said reinforcement.

[0017] The reference document US8443975 defines an edge protector, which comprises a first section formed from a laminate of layers of paper or carton. The first section is formed with an angular configuration which defines the first and second sides, defining a first vertex there between. The first vertex defines a first interior corner and a second exterior corner, and said first and second sides, as well as the first vertex which define a first width.

[0018] The protector comprises a second section formed from a laminate of layers of paper or carton which cover a central or nuclear element. This nucleus and the laminate are disposed in an angular configuration similar to the first section, defining the third and fourth sides, which define a second vertex there between.

[0019] The second vertex in turn defines a third interior corner and a fourth external corner, and the third and fourth sides and the second vertex defines a second width which is less than the first width, wherein the layers which cover the central or nuclear element wrap around the fourth external corner and extend inward towards the third interior corner. The first and second sections are mutually adhered with the first and third sides joined there between, as well as the second and fourth sides also been joined there between.

[0020] In this case, an edge protector is proposed which presents an angular shape and is formed from a series of mutually superimposed layers and constitutes two sections, one with longer sides than the other and both adhered by their respective two sides.

[0021] This edge protector is disposed on the corners of the packets and serves to improve the resistance thereof.

[0022] Nevertheless, while this type of protector is effective for the protection of the borders of the packages, it presents certain problems due principally to its right angular configuration, given that it defines a protector formed from two sections, both of which are disposed at right angles, with one adhered to the other and prepared for disposition in the corners of the package.

[0023] Thus, this is a significant fact when bearing in mind the fact that usually packages are presented in a dismantled state, in a flatpack with marked folding lines. By this means, the transportation thereof is easier and more economic because of their presentation as flatpacks up to the point of use, as well as facilitating the storage of the [empty] packages at their point of destination. Once delivered, the package is assembled quickly and easily using the folding lines when one of the packages is needed for use.

[0024] Bearing this in mind, the proposed edge protector does not facilitate its disposition in the unassembled packages, since the disposition thereof would involve the previous assembly of the package and the transportation thereof in the assembled state, since the protectors present a right angular shape and the configuration of the same based on sheets thereof being adhered along the length of the width of the sections which form them, and that disposition in a right angle being fixed and invariable.

[0025] Neither can the assembled package be folded by modifying the angle of its borders, resulting in the use of these packages being inconvenient and in reduced possibilities for the convenient modification of their shape.

[0026] This inevitably results in increased transport costs and storage space for the packages supplied with

these protectors and therefore already assembled.

[0027] As such, even if it is a protector which serves to reinforce the border zones of the packages, it is not practical or efficient for the packages which are supplied in flatpack for assembly at the destination, which corresponds to the vast majority at present, because of the immobile right angular shape of this protector.

[0028] Moreover, when this edge protector is applied to the edges of the packages, the support points of the base of the package do not present any type of reinforcement, such that this support of each protector presupposes a concentration of forces at said points of the base, resulting in the package possibly collapsing.

Summary of the invention

[0029] The reinforcement for carton packages, such as boxes, trays and the like, which are supplied in flatpack form, for their later assembly by folding along their fold lines which is presented here, comprises a longitudinal profile of reinforcement formed from two longitudinal segments disposed in the same horizontal forming an angle of 180° and a joining central zone of the same, which can be folded to form an angle of from 0 to 180° between the segments.

[0030] The longitudinal profile presents a laminated structure formed by at least a first and second superimposed layers and means for joining between the layers. Said first and second layers are formed by a first sheet of carton whose width is equal or greater than double the width of the longitudinal profile, while the first layer is formed by an intermediate zone of said first sheet which has a width equal to the width of the longitudinal profile, and the second layer is formed by folding lateral strips of the first sheet to both sides of the intermediate zone and folding over the same.

[0031] According to a preferred embodiment, each longitudinal profile segment comprises at least one additional layer disposed between the first and second layer, wherein said at least one additional layer is formed by a sheet of carton whose width is equal to the width of said profile segment, wherein both segments present the same number of additional layers.

[0032] According to a preferred embodiment, the longitudinal profile additionally comprises at least one intermediate layer, disposed between the first layer and the second layer, formed by a sheet of carton of a width equal to the sum of the values of the width of both profile segments and that of the central zone of the same.

[0033] In that case and according to a preferred embodiment, the at least one intermediate layer of the longitudinal profile is located over the central line of the transverse section of the same.

[0034] According to a preferred embodiment, the transverse section of the longitudinal profile comprises at least two intermediate layers, not only in the case where there is an intermediate layer over the central line of the transversal section of the longitudinal profile, but

also when that is not the case, wherein the intermediate layers are disposed in a symmetric manner with respect to the central line of said transversal section.

[0035] Moreover, according to a preferred embodiment, the reinforcing longitudinal profile is capable of been bent to both sides, both in the case where there is an intermediate layer with a longitudinal profile disposed over the central line of the transverse section of the same, or intermediate layers disposed in said section in a symmetrical manner, or better still intermediate layers disposed symmetrically about the central line of the section.

[0036] According to another preferential embodiment, the transverse section of the longitudinal profile comprises at least one intermediate layer disposed in an asymmetric manner with respect to the central line of said transverse section, proximal to the first or the second layer of the section, and the profile is capable of being bent to the opposite side to that in which the intermediate layers are disposed.

[0037] In accordance with another preferred embodiment, the width of the central zone of the joint of both longitudinal profile segments is equal to or greater than the thickness of the profile of said segments and less than double said thickness, as well as the longitudinal profile being capable of forming a minimum angle of 90° between the segments.

[0038] According to another preferred embodiment, the width of the central zone of the joint of both segments of the longitudinal profile is equal to or greater than double the thickness of said segments and is capable of forming a minimum angle of 0° between the segments.

[0039] In a preferred embodiment, the joint means between the layers of the longitudinal profile are formed by a glue or adhesive material.

[0040] This invention also comprises a carton package with reinforcement for packages, wherein the reinforcement is that defined in this invention and wherein the carton package is formed by a planar laminate of carton with folding lines for its later assembly by folding via said folding lines.

[0041] In this carton package with reinforcement for packaging, the reinforcement formed by each longitudinal profile is suited to the disposition thereof in at least two parallel folding lines of the packaging, wherein each folding line starts at the side of the laminate of planar carton, and the end thereof is in the opposite side of said laminate and wherein, in the folded position of the package, each of these folding lines comprises at least two vertical joint edges between the sides and the horizontal edge of the base of the package.

[0042] According to a preferred embodiment of the invention, the package is formed by a laminate of corrugated carton, which comprises two external layers of lining and at least one layer of corrugation there between, and each longitudinal profile of reinforcement is integrated in the interior of said laminate, on at least one of said layers of corrugation of the laminate of carton.

[0043] In accordance with another preferred embodi-

ment, no matter what type of laminate of carton of the package, each longitudinal profile of the reinforcement is situated over said laminate of carton of the package.

[0044] The disposition of the reinforcements may be enabled manually, by the adherence thereof over the folding lines, or in a mechanized manner in the case of corrugated carton packages, integrating the disposition of the reinforcements, enabled previously, in the same process of implementation of the corrugated carton laminate. In this manner, the reinforcement is introduced between the external layers of lining of the corrugated carton during the manufacture thereof.

[0045] A process of preparation of reinforcement for carton packages is also proposed in this invention, according to the reinforcement and the packages with reinforcement defined in this invention. This process comprises the following stages:

[0046] The first stage consists in the disposition of a first sheet of carton. This is followed by a second stage comprised of the folding of the lateral bands of the first sheet of carton, to form the second layer of longitudinal profile over the intermediate zone of said sheet which forms the first layer of said profile.

[0047] Finally, the third stage consists of the joining of the layers which form the profile by means of union.

[0048] According to a preferred embodiment, the process comprises an intermediate stage, situated between the first and the second stage, wherein at least a pair of additional layers are disposed on the first layer, wherein each additional layer is disposed on one of the longitudinal profile segments.

[0049] In this case, and in accordance with the preferred embodiment, the intermediate stage additionally comprises the disposition of at least one intermediate layer in a certain position with respect to the additional layers, and to the transverse section of the profile.

[0050] With this reinforcement for carton packages, a significant improvement on the state-of-the-art is obtained with respect to the packages with reinforcement and the process of production of reinforcement for packages which is proposed here.

[0051] Thus, reinforcement is enabled formed by two segments joined via a central zone which performs the hinging functions, in such a manner that the reinforcement does not present a fixed position of the segments and this facilitates the possible variation of the angle between the same, as well as the angle of the corners of the package where they are disposed.

[0052] This is enabled by combining layers whose width extends to all of the profile and with layers which are only found disposed in the zone of the segments, and not in the central zone. In this manner, said central zone presents a lesser thickness than the [other] segments and permits its folding in accordance with needs.

[0053] This reinforcement enabled in this manner permits varying the disposition of the additional and intermediate layers, to obtain a reinforcement capable of being bent to both sides, when the distribution of the inter-

mediate layers is symmetrical, or permitting bending only to one of the sides, when that distribution is asymmetric, in which case the bending is performed to the opposite side to that which presents greater presence of intermediate layers.

[0054] Similarly, depending on the width of the central zone of reinforcement, which functions as a hinge, and the bending of the same between 0 and 90°, or between 0 and 180° is enabled. This facilitates various options for the reinforcements, depending on the later needs in respect of the packages and the fate of the same.

[0055] In this manner, the possibilities for the use of these reinforcements are increased, and therefore the package is enabled therewith, since the reinforcements can be installed in the package which comes in the form of a flatpack laminate with folding lines, and later when it arrives at its destination, permits the folding thereof for the assembly of the package. Similarly, the later folding of the package after its use is enabled for its storage.

[0056] This enables an enormous facilitation of the logistics of packages, permitting the improvement of the resistance of zones thereof which are more subject to forces, such as the edges and corners, without inconvenience or increased cost of transport or later storage while maintaining the thickness of the packages in economical and acceptable values.

[0057] This therefore results in reinforcements for packages which are effective and versatile, which at the same time as increasing the resistance of the same, suppress the costs of transport and storage thereof and present a facilitation of the handling of the reinforcements in this manner enabling the variation of the folding of the packages as required.

[0058] In addition, the packages with the reinforcement of this type permits the disposition thereof in carton packages of all kinds, whether they be corrugated or simple carton.

[0059] Each of these types of reinforcement can be disposed on the surface of the carton laminate, in addition to in the case of corrugated carton, there is the option of locating the reinforcements in the interior of the laminate, on at least one of the layers of corrugation and between the two external layers of lining.

[0060] In this manner, the package presents a smooth continuous visual line which is more aesthetically pleasing than when the reinforcement is disposed on the exterior.

Brief description of the drawings

[0061] A series of figures are provided as follows as an integral part of the description, with the object of assisting a better understanding of the characteristics of the invention, in accordance with a preferred example of the practical embodiment thereof, for the purposes of illustration, but by no means limiting:

Fig. 1.1 and 1.2: Illustrations of the reinforcement for

carton packages, representing various transversal sections, with the second layer open and closed, respectively, in the first preferred embodiment of the invention.

Fig. 2: Illustrates a plan view of the reinforcement for carton packages, in the first preferred embodiment of the invention.

Fig. 3.1 and 3.2: Illustrations of the segments of the reinforcement with the maximum and minimum, respectively, angle positions therebetween of the reinforcement for carton packages, in the first preferred embodiment of the invention.

Fig. 4: Illustrates a profile view of the reinforcement for carton packages, in the first preferred embodiment of the invention.

Fig. 5.1 to 5.6: Respectively illustrate perspective views of a carton laminate for packages with reinforcement for carton packages in distinct stages of the assembly of the packages, in the first preferred embodiment of the invention.

Fig. 6: Represents an outline of the transverse section of a reinforcement for carton packages, in the second preferred embodiment of the invention.

Fig. 7.1 and 7.2: Illustrations of the segments of the reinforcement in the positions of the minimum angle and maximum angle, respectively, therebetween of the reinforcement for carton packages, in the second preferred embodiment of the invention.

Preferred mode of embodying the invention

[0062] In light of the figures presented, one can observe how in the first version of the preferred embodiment of the invention, the reinforcement 1 for packets 2 of carton, such as boxes, trays and the like, which are supplied in the form of flatpacks for their later assembly folding along the folding lines 3 which are proposed here, comprise a longitudinal profile of reinforcement formed by two longitudinal segments 5 disposed in the same horizontal forming an angle of 180° and a central joining zone 6 thereof, which is capable of being bent to form an angle between the segments of between 0 and 180°.

[0063] As illustrated in Figs. 1.1 and 1.2, the longitudinal profile presents a laminated structure formed by a first layer 7 and a second layer 8 which are superimposed, and a means of joining between layers. Said first layer 7 and second layer 8 are formed by a first sheet of carton whose width is greater than double the width of the longitudinal profile, wherein the first layer 1 is formed by an intermediate zone 4 of said first sheet, with the width equal to the width of the longitudinal profile, and the second layer 2 which is formed by folding sidebands 10 of the first sheet to both sides of the intermediate zone 4 and folding thereover.

[0064] As is illustrated in said Fig. 1, in this first version of the preferred embodiment of the invention, both segments 5 of the longitudinal profile comprise four additional layers 11 disposed between the first layer 1 and the

second layer 2, in a manner enabling that both segments 5 present the same number of additional layers 11. These additional layers 11 are each formed by a sheet of carton whose width is the same as the width of said segment 5 of the profile.

[0065] In this first version of the preferred embodiment of the invention, as can be observed in that same Fig. 1, the longitudinal profile additionally comprises three intermediate layers 12.1, 12.2, and 12.3, disposed between the first layer 1 and the second layer 2. The intermediate layers 12.1, 12.2 and 12.3 are each formed by a sheet of carton with a width equal to the sum of the width of both segments 5 of the profile and that of the central zone 6 of the same.

[0066] The disposition of the same in the transversal section of the profile in this first version of the preferred embodiment of the invention, comprises an intermediate layer 12.2 situated on the central line of the transverse section of the profile, and the other two intermediate layers 12.1 and 12.3 are situated in a symmetrical manner with respect to said central line.

[0067] Thus, in this first version of the preferred embodiment of the invention, the profile is capable of being bent towards both sides, because of the transversal section as defined above.

[0068] In this first version of the preferred embodiment of the invention, as illustrated in Figs. 2 and 3.1, in which the profile disposes both segments 5 forming an angle of 180° therebetween, the width of the central zone 6 of the joint of both segments 5 of the longitudinal profile is greater than double the thickness of said segments. Thus, in this first version of the embodiment, the thickness of the segments 5 is 0.3 cm, while the width of the central zone 6 is 1 cm, which is greater than the 0.6 cm which is double the thickness of the segments 5.

[0069] According to these conditions, and as illustrated in figure 3.2, the profile may form a minimum angle of 0° between the segments 5.

[0070] In this first version of the preferred embodiment of the invention, the means of joining between layers of the longitudinal profile are formed from adhesive material.

[0071] A second version of a preferred embodiment is now presented, in which the reinforcement 1 for carton packages 2 differs from the first version of the preferred embodiment of the invention in respect of the distribution of the layers existing between the first layer 1 and the second layer 2 in the transverse section of the profile.

[0072] Thus, as illustrated in figure 6, the second version of enablement of the transverse section comprises three additional layers 11 in each of the segments 5 of the profile, which are formed by a sheet of carton whose width is equal to the width of each segment five, and wherein both segments 5 present the same number of additional layers 11. The transverse section additionally comprises an intermediate layer 12.4 situated asymmetrically in respect of the centerline of said section. Specifically, this intermediate layer 12.4 is disposed proximal to the

first layer 1 of the section.

[0073] Therefore, with this specific transverse section, the reinforcement 1 of this second version of the preferred embodiment of the invention is capable of being bent to one of the sides, specifically towards the opposite side to that in which the intermediate layers are disposed, which in this case is the only intermediate layer 12.4.

[0074] Figure 7.1 illustrates the segments 5 with the maximum angle of 180°. In this second version of the preferred embodiment of the invention, the width of the segments 5 of the profile have a value of 0.3 cm, while the width of the central zone is 0.5 cm, which is less than the 0.6 cm corresponding to double the thickness of the segments 5. In these circumstances, the longitudinal profile can form a minimum angle between said segments 5 of 90°, as is illustrated in figure 7.2.

[0075] Carton packets 2 with reinforcement 1 for the packets is also proposed in this invention, with the reinforcement 1 being that defined in the first version of the preferred embodiment of the invention proposed in this invention, and wherein the carton packet 2 is formed by a laminate of carton in flatpack form with folding lines 3, as illustrated in figure 5.1, for its later assembly by folding along said folding lines 3.

[0076] As is illustrated in said figure 5.1, in this first version of the preferred embodiment of the invention, the reinforcement 1 formed by each longitudinal profile, as defined in the first version of the embodiment, is suited for disposition into parallel folding lines 3 of the packet 2.

[0077] Each of the folding lines 3 of this packet 2 starts in the side 13.1 of the laminated flatpack carton, and terminate in the opposite side 3.2 of said laminate.

[0078] Once the reinforcements 1 are disposed therein, the folding of the packet 2 along the folding lines 3 of the same can begin, as illustrated in figures 5.2 to 5.6. As can be seen from the same figures, each of these folding lines 3 comprises at least two vertical edges 14 of joints between sides of the packet 2, and a horizontal edge of the base of the packet 2, when the packet 2 is in the folded state.

[0079] In this manner, as well as reinforcing the zone of the corners of the packet 2, these reinforcements 1 also simultaneously support the zone of the base which can be seen to be reinforced, in such a manner that the zones which are the nexus of the forces which support the reinforcements 1 of the corners are capable of supporting said forces transmitted by the reinforcements 1, preventing the collapse of the packet either from the corners or from the base thereof.

[0080] In this first version of the preferred embodiment of the invention, the laminated carton which forms the packet 2 is of corrugated carton, formed by a sheet of corrugated carton, which comprises two exterior layers of lining 16 and two layers of corrugation 9 there between. As is illustrated in figure 4, the longitudinal profile of the reinforcement in every one of the folding lines 3 is integrated in the interior of the laminated carton, on one of said layers of corrugation 9 thereof, but for the purposes

of clarity, the longitudinal profiles are illustrated as being on the laminated carton as represented in figures 5.1 to 5.6.

[0081] In this first version of the preferred embodiment of the invention, the process of disposition of the reinforcements is enabled mechanically, disposing the previously enabled profiles between the two outer layers of lining 16 of the laminated corrugated carton during the preparation thereof. By enabling in this manner, the finish of the packet 2 is more aesthetically pleasing and with more visual continuity.

[0082] A process for the preparation of reinforcement 1 for carton packets 2 is also proposed in this invention, according to the reinforcement and the packets with reinforcement defined in the first version of the preferred embodiment of the invention presented herein.

[0083] This process presents a first stage of disposition of a first sheet of carton.

[0084] Once said first sheet has been disposed, a second stage consisting of the folding of the sidebands 10 of said first sheet of carton occurs, to form the second layer 8 of the longitudinal profile on the intermediate zone 4 of said sheet which forms the first layer 7 of said profile.

[0085] The third and final stage is comprised of the joining of said layers which form the profile by the joining means, which in this first version of the preferred embodiment of the invention is formed by adhesive material.

[0086] In this first version of the preferred embodiment of the invention, the process also comprises an intermediate stage between the first and second stage.

[0087] This intermediate stage comprises the disposition of the four pairs of additional layers 11 on the first layer 7, wherein each one of the additional layers 11 of each pair are disposed, respectively, on one of the segments 5 of the longitudinal profiles.

[0088] In the same manner, in this first version of the preferred embodiment of the invention, said intermediate stage also comprises the disposition of the three intermediate layers 12.1, 12.2 and 12.3 in a certain position with respect to the additional layers, and in the transverse section of the profile. In this first version of the preferred embodiment of the invention, these intermediate layers, as already described, situate one of them on the center-line of the transverse section of the profile, and the other two are situated in a symmetric manner with respect thereto.

[0089] The embodiment described barely constitutes an example of the present invention, and therefore, the details, terms and specific phrases utilized in this invention should not be considered limiting, but should be understood solely as a basis for the claims, and as a basic representation which provides an understandable description, as well as sufficient information for the person skilled in the art to apply the present invention.

[0090] With the reinforcement for carton packages, the packages with reinforcement and the process of preparation of the reinforcement for packets presented here constitute important improvements with respect to the

state-of-the-art.

[0091] Thus, the reinforcement so enabled, presents a central zone which acts as a form of hinge and allows the segments which configure the profile of the reinforcement to vary the angle existing there between.

[0092] This facilitates the disposition of the reinforcements when the packet has yet to be assembled, when it is in the form of a horizontal laminate of carton, such that when later, on assembling the packet, by folding along the folding lines thereof, the reinforcements are capable of allowing the folding thereof.

[0093] This is enabled thanks to the distribution of the layers in the interior of the profile of the reinforcement, in a manner which also presents the advantage that resulting from the distribution enabled, the reinforcement may present some or other characteristics, such as enabling folding to only one side or folding towards two sides, or to vary the minimum angle achievable between segments.

[0094] All of this amounts to a very versatile reinforcement which is also simple and effective in withstanding the forces to which the corners of the packets are exposed, while enabling modulation of the resistance of these reinforcements, depending on the loading forces envisaged, enabling reinforcements with segments of greater or lesser thickness. In this manner, the resistance of the packets may be augmented significantly, such as are specified, without having to augment the thickness of the laminate which forms said packet, resulting in a significant economic saving.

[0095] The packets with this reinforcement are also suited to any type of carton, without being limited in any way to a particular type.

[0096] This type of packet with reinforcement takes into consideration the reinforcement of the corners of the packets, as well as the reinforcement of the zone which support said corner reinforcements, which is also a zone which concentrates forces. This is enabled by reinforcements formed from continuous longitudinal profiles which are disposed on a folding line which integrates two vertical sides, from one side of the packet towards the other side.

[0097] On the other hand, the process of enabling the reinforcement is a simple procedure, which simply consists in the disposition of additional and intermediate layers between the first and second layers and the adhesion thereof, which simultaneously forms a central zone which acts as a hinge and enables the outstanding advantages of the reinforcement which have been described above.

Claims

1. Reinforcement (1) for carton packages(2), such as boxes, trays and the like, which are supplied in flat-pack form, for their later assembly by folding along their fold lines (3), **characterized by** comprising a longitudinal profile of reinforcement formed from two

- longitudinal segments (5) disposed in the same horizontal forming an angle of 180° and a joining central zone (6) of the same, which can be folded to form an angle of from 0° to 180° between the segments, wherein the longitudinal profile presents a laminated structure formed by at least a first (1) and second (2) superimposed layers, wherein said first (1) and second (2) layers are formed by a first sheet of carton whose width is equal to or greater than double the width of the longitudinal profile, while the first (1) layer is formed by an intermediate zone (4) of said first sheet which has a width equal to the width of the longitudinal profile, and the second layer (2) is formed by taking lateral strips (10) of the first sheet to both sides of the intermediate zone (4) and folding over the same, and joining means between layers.
2. Reinforcement (1) for carton packages (2), according to claim 1, **characterized in that** each segment (5) of the longitudinal profile comprises at least one additional layer (11) disposed between the first (1) and the second (2) layers, wherein said at least one additional layer (11) is formed by a sheet of carton whose width is the same as the width of said segment (5) of the profile, wherein both segments (5) present the same number of additional layers (11).
 3. Reinforcement (1) for carton packages (2), according to claim 2, **characterized in that** the longitudinal profile additionally comprises at least one intermediate layer (12.1, 12.2, 12.3) disposed between the first layer (1) and the second layer (2), formed by a sheet of carton with a width equal to that of the sum of the width of both segments (5) of the profile and that of the central zone (6) of the same.
 4. Reinforcement (1) for carton packages (2), according to claim 3, **characterized in that** at least one intermediate layer (12.2) of the longitudinal profile is situated over the central line of the transversal section of the same.
 5. Reinforcement (1) for carton packages (2), according to either one of claims 3 and 4, **characterized in that** the transversal section of the longitudinal profile comprises at least two intermediate layers (12.1, 12.3), wherein the intermediate layers (12.1, 12.3) are situated in a symmetrical manner with respect to the central line of said transversal section.
 6. Reinforcement (1) for carton packages (2), according to either one of claims 4 and 5, **characterized in that** the longitudinal profile is capable of being bent towards both sides.
 7. Reinforcement (1) for carton packages (2), according to either one of claims 3 and 4, **characterized in that** the transversal section of the longitudinal profile comprises at least one intermediate layer (12.4) situated in an asymmetrical manner with respect to the central line of said transversal section, proximal to the first (1) or the second layer (2) of the section and the profile is capable of being bent towards the opposite side to that in which the intermediate layers (12.4) are disposed.
 8. Reinforcement (1) for carton packages (2), according to any one of previous claims, **characterized in that** the width of the central zone (6) of the joint of both segments (5) of the longitudinal profile is equal to or greater than the thickness of the profile of said segments (5) and less than double said thickness, and the longitudinal profile is capable of forming an angle of at least 90° between the segments.
 9. Reinforcement (1) for carton packages (2), according to any one of claims 1 to 7, **characterized in that** the width of the central zone (6) of the joint of both segments (5) of the longitudinal profile is equal to or greater than double the thickness of said segments (5), and is capable of forming an angle of at least 0° between the segments.
 10. Reinforcement (1) for carton packages (2), according to any one of previous claims, **characterized in that** the means of joining between layers of the longitudinal profile are formed by glue or adhesive material.
 11. A packaging system (2) of carton with reinforcement (1), as defined in claims 1 to 10, wherein the package (2) is formed by a laminate of carton in flatpack form with folding lines (3), for its later assembly by folding along said folding lines (3), **characterized in that** the reinforcement (1) formed in each longitudinal profile is suited for disposition in at least two parallel folding lines (3) of the package (2), wherein each folding line (3) starts in the side (13.1) of the laminate of flatpack carton and the end of the same is in the opposite side (13.2) of said laminate, and wherein, in a folded position of the package (2), each of these folding lines (3) comprises at least two vertical joint edges (14) between the sides and a horizontal edge (15) of the base of the package.
 12. A packaging system (2) of carton with reinforcement (1), as defined in claim 11, **characterized in that** the package (2) is formed by a laminate of corrugated carton, which comprises two external layers of lining (16) and at least one layer of corrugation (9) there between, and each longitudinal profile of the reinforcement (1) is integrated in the interior of said laminate, on at least one of said layers of corrugation (9) of the carton laminate.
 13. A packaging system (2) of carton with reinforcement

(1), as defined in claim 11, **characterized in that** each longitudinal profile of reinforcement (1) is situated over the laminate of carton of the package (2).

14. The process of preparation of reinforcement (1) for packages (2), as defined in claims 1 to 13, **characterized by** comprising the following stages:

- a. disposition of the first sheet of carton;
- b. folding of the lateral bands (10) of the first sheet of carton, which form the second layer (8) of the longitudinal profile, over the intermediate zone (4) of said sheet, which forms the first layer (7) of said profile;
- c. joining of the layers which form the profile via the joining means.

15. The process of preparation of reinforcement (1) for packages (2), as defined in claim 14, **characterized by** comprising an intermediate stage, situated between the first and second stages, in which at least a pair of additional layers (11) are disposed on the first layer (7), wherein each additional layer (11) is disposed on one of the segments (5) of the longitudinal profile.

16. The process of preparation of reinforcement (1) for carton packages (2), as defined in claim 15, **characterized in that** the intermediate stage additionally comprises the disposition of at least one intermediate layer (12.1, 12.2, 12.3) in a certain position with respect to the additional layers (11) and in the transversal section of the profile.

Amended claims under Art. 19.1 PCT

1. Reinforcement (1) for carton packages(2), such as boxes, trays and the like, which are supplied in flat-pack form, for their later assembly by folding along their fold lines (3), **characterized by** comprising a longitudinal profile of reinforcement formed from two longitudinal segments (5) disposed in the same horizontal forming an angle of 180° and a joining central zone (6) of the same, which can be folded to form an angle of from 0° to 180° between the segments, wherein the longitudinal profile presents a laminated structure formed by at least a first (1) and second (2) superimposed layers, wherein said first (1) and second (2) layers are formed by a first sheet of carton whose width is equal to or greater than double the width of the longitudinal profile, while the first (1) layer is formed by an intermediate zone (4) of said first sheet which has a width equal to the width of the longitudinal profile, and the second layer (2) is formed by taking lateral strips (10) of the first sheet to both sides of the intermediate zone (4) and folding over the same, and joining means between layers.

2. Reinforcement (1) for carton packages (2), according to claim 1, **characterized in that** each segment (5) of the longitudinal profile comprises at least one additional layer (11) disposed between the first (1) and the second (2) layers, wherein said at least one additional layer (11) is formed by a sheet of carton whose width is the same as the width of said segment (5) of the profile, wherein both segments (5) present the same number of additional layers (11).

3. Reinforcement (1) for carton packages (2), according to claim 2, **characterized in that** the longitudinal profile additionally comprises at least one intermediate layer (12.1, 12.2, 12.3) disposed between the first layer (1) and the second layer (2), formed by a sheet of carton with a width equal to that of the sum of the width of both segments (5) of the profile and that of the central zone (6) of the same.

4. Reinforcement (1) for carton packages (2), according to claim 3, **characterized in that** at least one intermediate layer (12.2) of the longitudinal profile is situated over the central line of the transversal section of the same.

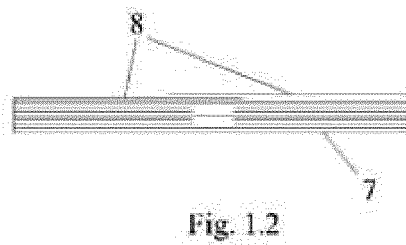
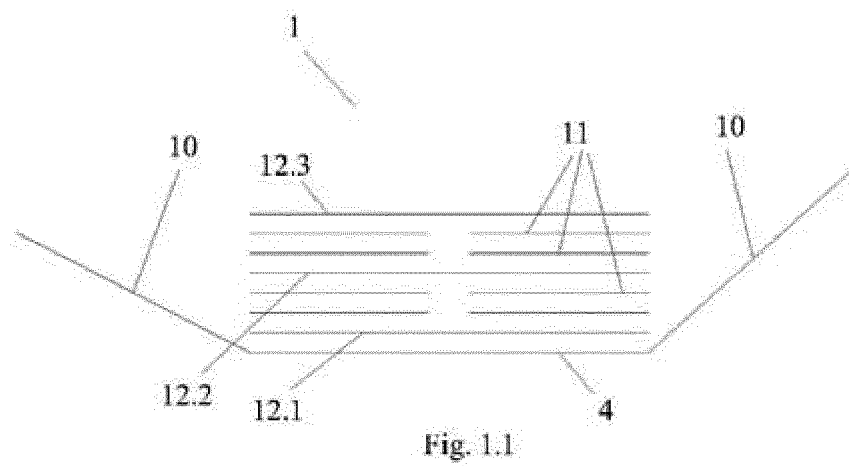
5. Reinforcement (1) for carton packages (2), according to either one of claims 3 and 4, **characterized in that** the transversal section of the longitudinal profile comprises at least two intermediate layers (12.1, 12.3), wherein the intermediate layers (12.1, 12.3) are situated in a symmetrical manner with respect to the central line of said transversal section.

6. Reinforcement (1) for carton packages (2), according to either one of claims 4 and 5, **characterized in that** the longitudinal profile is capable of being bent towards both sides.

7. Reinforcement (1) for carton packages (2), according to either one of claims 3 and 4, **characterized in that** the transversal section of the longitudinal profile comprises at least one intermediate layer (12.4) situated in an asymmetrical manner with respect to the central line of said transversal section, proximal to the first (1) or the second layer (2) of the section and the profile is capable of being bent towards the opposite side to that in which the intermediate layers (12.4) are disposed.

8. Reinforcement (1) for carton packages (2), according to any one of previous claims, **characterized in that** the width of the central zone (6) of the joint of both segments (5) of the longitudinal profile is equal to or greater than the thickness of the profile of said segments (5) and less than double said thickness, and the longitudinal profile is capable of forming an angle of at least 90° between the segments.

9. Reinforcement (1) for carton packages (2), according to any one of claims 1 to 7, **characterized in that** the width of the central zone (6) of the joint of both segments (5) of the longitudinal profile is equal to or greater than double the thickness of said segments (5), and is capable of forming an angle of at least 0° between the segments. 5
10. Reinforcement (1) for carton packages (2), according to any one of previous claims, **characterized in that** the means of joining between layers of the longitudinal profile are formed by glue or adhesive material. 10
11. Package (2) of carton with reinforcement (1), as defined in claims 1 to 10, wherein the package (2) is formed by a laminate of carton in flatpack form with folding lines (3), for its later assembly by folding along said folding lines (3), **characterized in that** the reinforcement (1) formed in each longitudinal profile is suited for disposition in at least two parallel folding lines (3) of the package (2), wherein each folding line (3) starts in the side (13.1) of the laminate of flatpack carton and the end of the same is in the opposite side (13.2) of said laminate, and wherein, in a folded position of the package (2), each of these folding lines (3) comprises at least two vertical joint edges (14) between the sides and a horizontal edge (15) of the base of the package. 15
20
25
30
12. Package (2) of carton with reinforcement (1), as defined in claim 11, **characterized in that** the package (2) is formed by a laminate of corrugated carton, which comprises two external layers of lining (16) and at least one layer of corrugation (9) there between, and each longitudinal profile of the reinforcement (1) is integrated in the interior of said laminate, on at least one of said layers of corrugation (9) of the carton laminate. 35
40
13. Package (2) of carton with reinforcement (1), as defined in claim 11, **characterized in that** each longitudinal profile of reinforcement (1) is situated over the laminate of carton of the package (2). 45
14. The process of preparation of reinforcement (1) for carton packages (2), as defined in claims 1 to 13, **characterized by** comprising the following stages: 50
- a. disposition of the first sheet of carton; 50
 - b. folding of the lateral bands (10) of the first sheet of carton, which form the second layer (8) of the longitudinal profile, over the intermediate zone (4) of said sheet, which forms the first layer (7) of said profile; 55
 - c. joining of the layers which form the profile via the joining means.
15. The process of preparation of reinforcement (1) for packages (2), as defined in claim 14, **characterized by** comprising an intermediate stage, situated between the first and second stages, in which at least a pair of additional layers (11) are disposed on the first layer (7), wherein each additional layer (11) is disposed on one of the segments (5) of the longitudinal profile.
16. The process of preparation of reinforcement (1) for packages (2), as defined in claim 15, **characterized in that** the intermediate stage additionally comprises the disposition of at least one intermediate layer (12.1, 12.2, 12.3) in a certain position with respect to the additional layers (11) and in the transversal section of the profile.



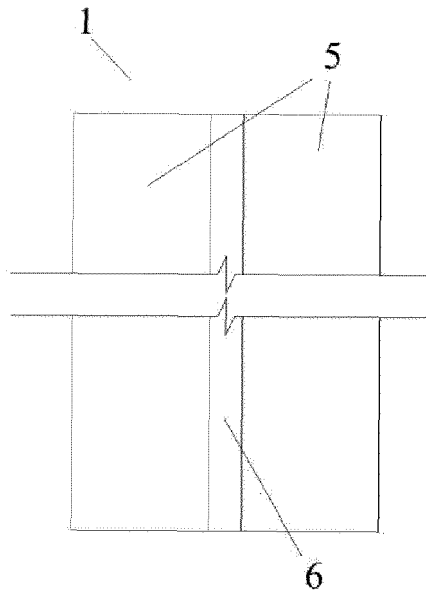


Fig. 2

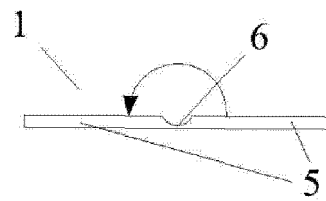


Fig. 3.1

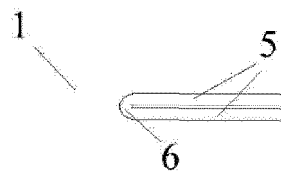


Fig. 3.2

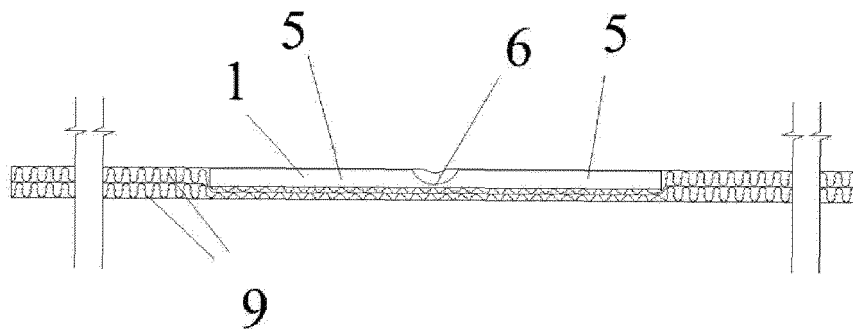


Fig. 4

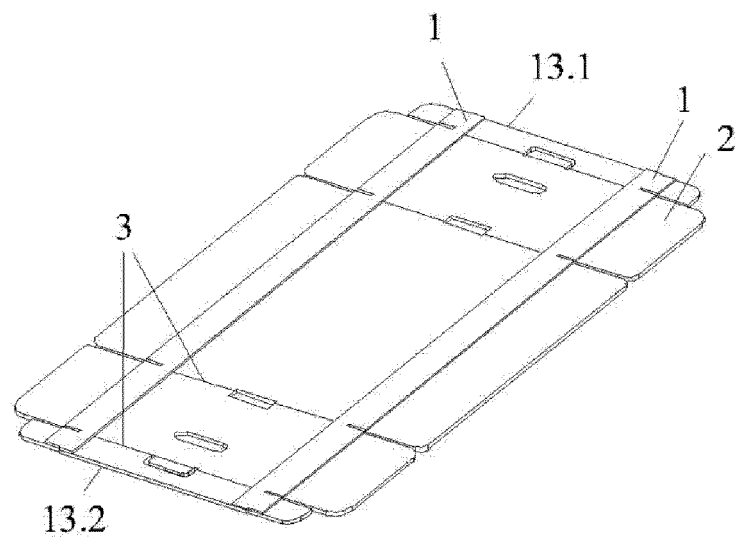


Fig. 5.1

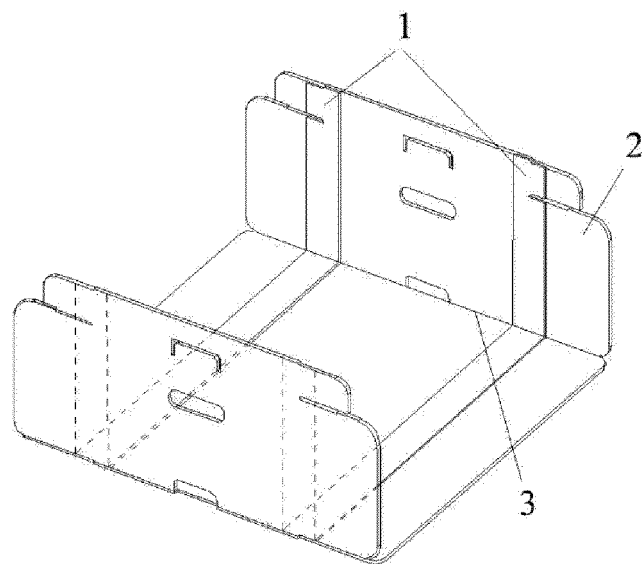


Fig. 5.2

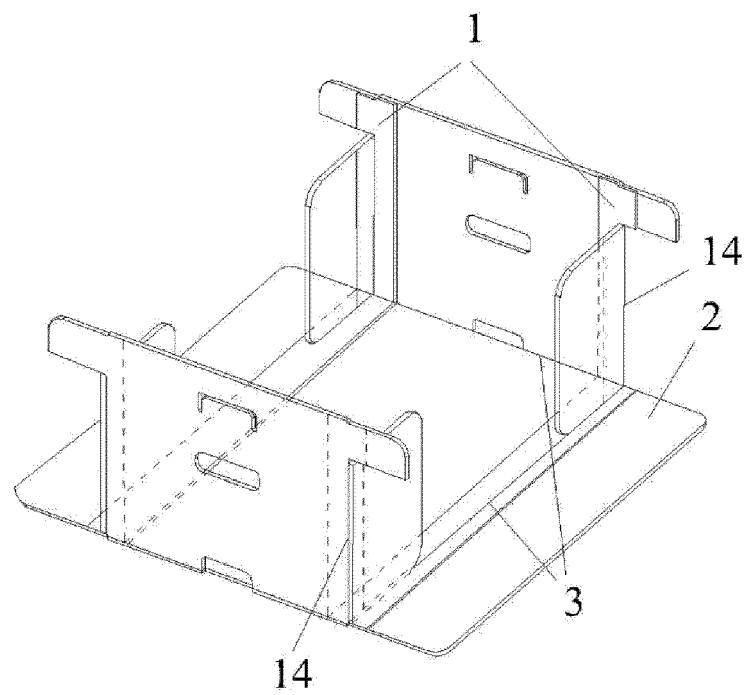


Fig. 5.3

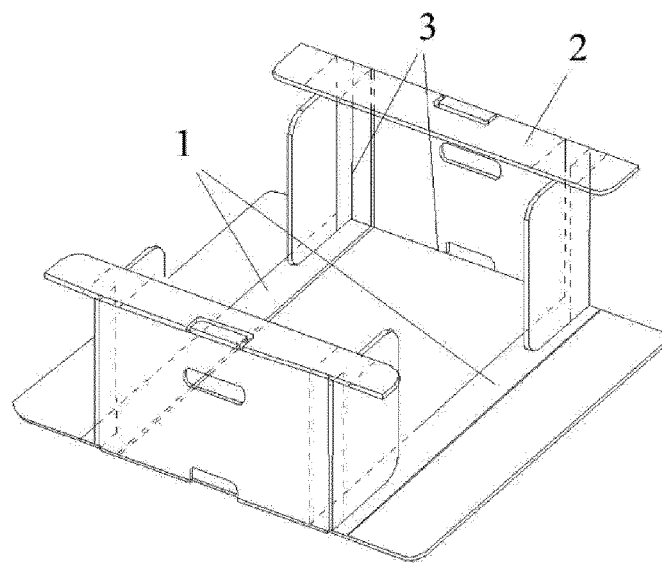


Fig. 5.4

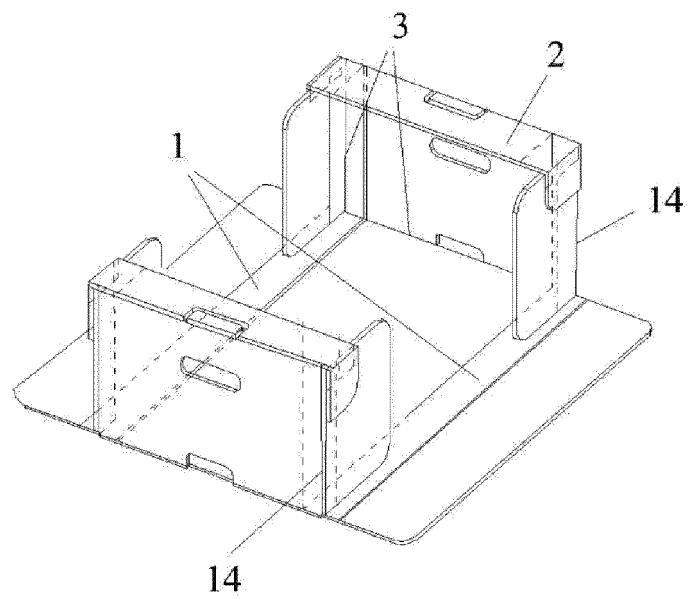


Fig. 5.5

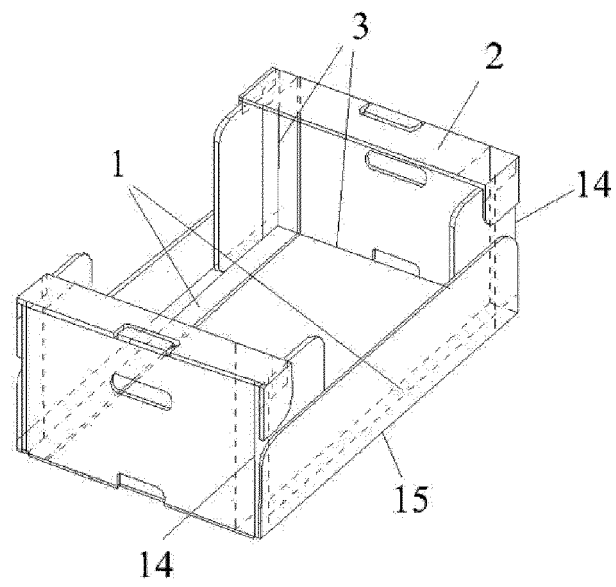


Fig. 5.6

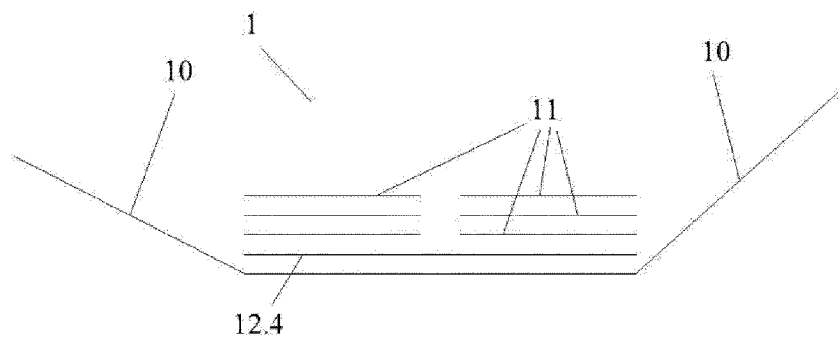


Fig. 6

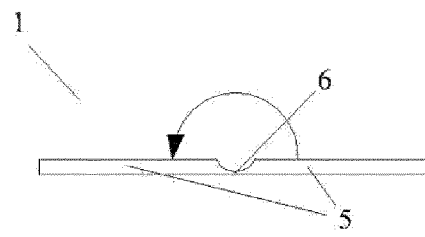


Fig. 7.1

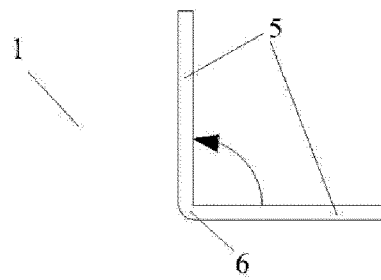


Fig. 7.2

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2016/070389

A. CLASSIFICATION OF SUBJECT MATTER

See extra sheet

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B65D, B31B

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

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

EPODOC, INVENES

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 8317671 B1 (ZOECKLER) 27/11/2012, the whole document (cited in the application)	1-16
A	US 5944252 A (CONNELLY ET AL.) 31/08/1999, Abstract; figures 1, 2, 8-11	1-16
A	US 5211618 A (STOLTZ) 18/05/1993, Abstract; figures	1-16
A	US 3913822 A (HEAPS JR.) 21/10/1975, Abstract; figures	1-16
A	US 8443975 B2 (BUTCH JR. ET AL.) 21/05/2013, Abstract; figures (cited in the application)	1-16

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance.	
"E" earlier document but published on or after the international filing date	
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"O" document referring to an oral disclosure use, exhibition, or other means.	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other documents, such combination being obvious to a person skilled in the art
"P" document published prior to the international filing date but later than the priority date claimed	"&" document member of the same patent family

Date of the actual completion of the international search
29/09/2016

Date of mailing of the international search report
(30/09/2016)

Name and mailing address of the ISA/

OFICINA ESPAÑOLA DE PATENTES Y MARCAS
Paseo de la Castellana, 75 - 28071 Madrid (España)
Facsimile No.: 91 349 53 04

Authorized officer
F. Monge Zamorano

Telephone No. 91 3495541

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2016/070389

C (continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of documents, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 1989794 A (J. DUVALL) 05/02/1935, the whole document	1-16

Form PCT/ISA/210 (continuation of second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2016/070389

Information on patent family members

Patent document cited in the search report	Publication date	Patent family member(s)	Publication date
US8317671 B1	27.11.2012	US2013029823 A1 US2002022560 A1 US7201714 B2 US2001048022 A1 US2007137771 A1 US8403819 B2 US2008119343 A1 US8403820 B2 WO0183204 A1 SK19052001 A3 RU2001131415 A PL351472 A1 PL198835B B1 NO20016265 A MXPA01011150 A JP2003531753 A JP4268780B B2 HU0203022 A2 CZ20014474 A3 CN1366487 A CA2376836 A1 CA2376836 C BR0103669 A BR0103669 B1 AU4977901 A AU776736B B2 EP1206345 A1 EP1206345 A4	31.01.2013 21.02.2002 10.04.2007 06.12.2001 21.06.2007 26.03.2013 22.05.2008 26.03.2013 08.11.2001 04.04.2002 10.09.2003 22.04.2003 31.07.2008 20.12.2001 20.03.2002 28.10.2003 27.05.2009 28.01.2003 17.04.2002 28.08.2002 08.11.2001 22.12.2009 23.04.2002 09.02.2010 12.11.2001 23.09.2004 22.05.2002 19.03.2008
US5944252 A	31.08.1999	WO9841392 A1 AU6468498 A	24.09.1998 12.10.1998
US5211618 A	18.05.1993	WO9403325 A1 JPH07509415 A JP3428992B B2 GR3030640T T3 ES2132248T T3 EP0656829 A1 EP0656829 A4 DK0656829T T3 DE69324693T T2 CA2141593 A1 CA2141593 C AT179367T T	17.02.1994 19.10.1995 22.07.2003 29.10.1999 16.08.1999 14.06.1995 13.03.1996 25.10.1999 30.09.1999 17.02.1994 16.02.1999 15.05.1999
US3913822 A	21.10.1975	NONE	
US2012000815 A1	05.01.2012	MX2013000312 A CA2738558 A1 CA2738558 C US8443975 B2	21.02.2013 02.01.2012 18.03.2014 21.05.2013

Form PCT/ISA/210 (patent family annex) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2016/070389

Information on patent family members

Patent document cited in the search report	Publication date	Patent family member(s)	Publication date
----- US1989794 A -----	----- 05.02.1935 -----	WO2012003054 A1 ----- NONE -----	05.01.2012 ----- -----

Form PCT/ISA/210 (patent family annex) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2016/070389

5

CLASSIFICATION OF SUBJECT MATTER

B65D5/44 (2006.01)

B31B1/25 (2006.01)

B31B1/90 (2006.01)

10

15

20

25

30

35

40

45

50

55

Form PCT/ISA/210 (extra sheet) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

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

Patent documents cited in the description

- US 8317671 B [0008] [0009]
- US 8443975 B [0008] [0017]