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(54) **Carton for granular materials with extra cover**

Pappschachtel mit zusätzlichem Deckel für körniges Gut

Carton à couvercle supplémentaire pour matériaux granulaires

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- **PATENT ABSTRACTS OF JAPAN vol. 097, no. 007, 31 July 1997 -& JP 09 066927 A (TOPPAN PRINTING CO LTD), 11 March 1997,**

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Description

Technical field

[0001] The invention relates to carton board containers for granular materials and more particularly to such cartons which are side-fill cartons.

Background of the invention

[0002] Various types of containers are formed from carton board. Typical containers made from carton board, also simply called cartons, have a substantially parallelepipedal shape with six sides and twelve edges, namely the top, bottom, back, front, left and right sides, the edges being defined by the two sides of which they are the intersection, for example the edge between the top and the back sides. For definition purposes, it will be considered in the following that when the carton is upright the top and bottom sides are in the horizontal plane, the four other sides being vertical. We will consider that if the front side of the upright carton is facing an observer, the left side is on to the left of the observer and the right side on to the right of the observer, the back side being invisible for the observer.

[0003] Cartons are usually folded and glued from a die cut. A die cut, or blank, is a flat structure which has not been folded or glued. At least three main steps appear in the folding-gluing-filling process. In a first main step, the die cut is folded and glued to form a sleeve. A sleeve is substantially a four sided structure structured like a six sided carton of which two opposite sides are not folded or glued. In the sleeve structure, four of the twelve edges of the carton have been folded, these four edges being in a parallel direction to each other. It should be noted that usually the remaining eight edges all have their direction in a plane perpendicular to the direction of the four folded ones. The sleeve structure has the advantage that it can be flattened. As a consequence, sleeves can be stored or shipped easily. In a second main step, the carton is erected from the sleeve, which means that one of the two opposite sides which were not folded and glued during the sleeve step is now folded, four more edges being consequently formed. At this stage, the carton cannot be flattened anymore. However, it can be filled through the last non folded side. In the last step, the last non folded side is folded and glued, so forming the four last edges. In summary, when preparing a carton, the structure goes through successive stages, namely the die cut, followed by the sleeve, which subsequently is formed into an erected carton, before the closed carton stage. Each of these stages is separated by one main folding-gluing step.

[0004] There are two alternative ways of forming the sleeve from the die cut, because a choice can be made of the two opposite sides which will be left unfolded and unglued. In a first way, these two side may be the top and bottom sides. In a second way the right and left

sides or the back and front sides will be left open. In theory, it is considered equivalent to choose back/front or left/right because these sides are differentiated only as a convention. However, the top/bottom sides are normally perpendicular to gravity when the carton is in its upright position.

[0005] In the first way of forming the sleeve, the sleeve will be formed of the front, left, back and right sides, or of any circular permutation of these, while the top and bottom sides will be left opened. In this case, the carton is usually erected by folding the bottom, and then by folding the top after filling. This way avoids having to turn the carton around after the filling process when the filling is made by means of gravity, because the carton is already upright when filled.

[0006] In the second way of forming the sleeve, the sleeve will be formed, for example, of the front, top, back and bottom sides, or of any circular permutation of these, while the left and right sides will be left opened. In this case, the carton is erected by folding indifferently the left or the right side, the left for example, the erected carton being filled through the right side, which should consequently be at the top of the carton during filling. Finally, the carton will be closed. After closing, the carton may have to be turned around in upright position, with the top side on the top.

[0007] As explained above, the eight edges which are not being folded to form the sleeve have their direction in a plane perpendicular to the direction of the four edges folded to form the sleeve. This means that in the die cut form, the four sleeve folded edges are in one direction and the eight others in the substantially perpendicular direction. By definition, the direction of the eight edges is called the main folding direction or axial direction because most of the folding is made along this direction. The other direction is the transverse direction. Normally, the four edges of the transverse direction should be the sleeve forming edges. As an example, in the first way for folding a sleeve, the front/left, left/back, back/right and right/front edges would be along the transverse direction, while in the second way of folding a sleeve, the front/top, top/back, back/bottom and bottom/front edges would be along the transverse direction.

[0008] A die cut is preferably made from a single piece. A die cut normally has a specific grain direction. This means that the material forming the die cut is not isotropic but has a preferred direction along which the die cut can be folded more easily. This direction is the grain direction. For easy folding, it is important that the main folding direction be in the grain direction.

[0009] For stiffness reasons, it is important that the grain direction is not horizontal, and preferably vertical, when the carton in its upright position. This means that the direction of gravity should be the grain direction for the front, back, left and right sides of the carton when the carton is upright, or that the edges front/left, left/back, back/right and right/front should follow the grain direction. Consequently, the edges front/left, left/back,

back/right and right/front should not be in the transverse direction on the die cut. This leads to choosing the second way of folding for stiffness reasons. Cartons folded in such a manner are usually called side fill cartons. It should be noted that this denomination is due to the folding method, and is not directly linked to the grain direction. Examples of side fill cartons are disclosed in the pending application JP-09066927 published on the 11th of March 1997, or in applicant pending application EP-890518 filed on the 10th of July 1997. Indeed, the other type of cartons obtained with the first way of folding the sleeve, so-called top fill cartons, usually require an internal liner for improving stiffness and strength, in particular in case of stacking.

[0010] Side fill cartons disclosed in JP-09066927 or EP-890518 also include an inner top panel together with a back flap associated with an edge to the inner top panel as well as an outer top panel. Such a structure with an inner and an outer panel allows to form a lid with the outer top panel, which can be re-closed, while having a robust top side with a double panel and improving sift proofness, for example for granular materials.

[0011] The invention relates to a carton, the carton comprising top and bottom sides opposing each other, left and right sides opposing each other, and front and back sides opposing each other, whereby:

- a) the top side comprises an outer top panel;
- b) the back side comprises a back panel associated with an edge to the outer top panel along a folding line;
- c) the bottom side comprises a bottom panel associated with an edge to the back panel along a folding line;
- d) the front side comprises a front panel associated with an edge to the bottom panel along a folding line;
- e) the left side comprises a first left flap associated with an edge to the front panel along a folding line, a second left flap associated with an edge to the bottom panel along a folding line and a third left flap associated with an edge to the back panel along a folding line;
- f) the right side comprises a first right flap associated with an edge to the front panel along a folding line, a second right flap associated with an edge to the bottom panel along a folding line and a third right flap associated with an edge to the back panel along a folding line;
- g) the top side further comprises an inner top panel;
- h) either of the back side or the top side further comprises an extra flap associated with an edge to the inner top panel along a folding line.

Such a carton is known from JP-09066927 or EP-890518

[0012] Among the advantage of such cartons is that they are side fill cartons having an extra inner panel,

thus being relatively sift proof and having a robust structure while using less material than a top fill carton as an inner liner is not required.

[0013] While having these and other advantages, side fill cartons having such an inner top panel have disadvantages. For example, such cartons require specific processes, particularly when being erected and closed. In addition, the inner top panel being part of the die cut and thus being made from the die cut material significantly participates to the quantity of material used, in particular due to extra waste during cutting of the die cut.

[0014] Accordingly, it is an object of the present invention to produce a robust carton which does not require a specific erecting and closing process while allowing use of a minimised amount of materials.

Summary of the invention

[0015] In accordance with the invention, this object is accomplished in a carton of the above kind characterised in that the inner top panel is a separate element and the front side further comprises a second extra flap associated with an edge to the inner top panel along a folding line.

[0016] A carton formed in accordance with the invention has a number of advantages. Since the carton has the structure of a side fill carton while the inner top panel is on the top side of the carton, the inner top panel can be placed prior to filling of the carton. This should be compared with a top fill carton with an inner top panel being formed from a membrane as disclosed for example in EP-A-679581, whereby the carton is filled through the top side and has a membrane applied on the same top side after filling. This means that the carton according to the present invention can have a packing process which is simplified when compared to such top fill cartons with membrane. Additionally, the carton according to the invention will be more robust than a top fill carton as it is a side fill carton which does not require a liner.

Brief description of the drawings

[0017] The invention will now be described by way of example and with reference to the accompanying drawings in which:

Figure 1 is a top plan view of a preferred embodiment of elements of a die cut for forming a carton according to the present invention.

Figure 2 is a perspective view of a partial sleeve made from the elements of Figure 1.

Figure 3 is a top plan view of a complete sleeve made from the partial sleeve of Figure 2.

Figure 4 is a top plan view of another preferred embodiment of elements of a die cut for forming a car-

ton according to the present invention.

Figure 5 is a perspective view of a partial sleeve made from the elements of Figure 4.

Figure 6 is a top plan view of a complete sleeve made from the partial sleeve of Figure 5.

Figures 7 a-c describe an example of opening of a carton according to the present invention with a sequence starting from the complete closed carton made for example from the die cut of Figure 1.

Figures 8 a-b are cross-sectional views of the carton of Figure 7a along a plane parallel to the front side (8-a) or parallel to the left side (8-b) showing the wall construction of the carton.

Figures 9 a-i describe an example of the erecting step of a carton according to the present invention with a sequence starting from the complete sleeve of Figure 3.

Figure 10 is a top plan view of a further preferred embodiment of elements of a die cut for forming a carton according to the present invention.

Figure 11 is a perspective view of a partial sleeve made from the elements of Figure 10.

Figure 12 is a further perspective view of a partial sleeve made from the partial sleeve of Figure 11.

Figure 13 is yet another perspective view of a partial sleeve made from the partial sleeve of Figure 12.

Figures 14 is a cross-sectional view of the carton made from the elements of Figure 10 along a plane parallel to the left side showing the wall construction of the carton.

Figure 15 is a top plan view of yet another preferred embodiment of elements of a die cut for forming a carton according to the present invention.

Figure 16 a-b are top plan views of two possible embodiments of an element of a die cut for forming a carton according to the invention.

Figure 17 is a perspective view of a partial sleeve made from the elements of Figure 1.

Figure 18 is a further perspective view of a partial sleeve made from the partial sleeve of Figure 17.

Description of the preferred embodiments

[0018] The carton of the present invention is prefera-

bly made of cardboard or corrugated board, but other materials could also be used. Such cartons are usually used for housing granular materials. The cartons normally have a parallelepipedal shape with six sides. The sides can be defined as a top, bottom, left, right, back and front sides. The top side is on the top of the carton when the carton is in its upright position, the bottom side being opposite to the top side. For the purpose of the description, the front and back sides are opposing sides and the left and right side are opposite sides as well. Each of these sides can be made of several layers of material. Each of the sides is usually of a substantially rectangular shape, each side being limited at its borders by four edges. The structure of the carton is due to links which can exist between different layers of different sides through the edges. For example, if the front side is made of a single layer, this layer may be linked to the left side through the edge between the two sides, the link and the edge being provided by a folded line or/and by glue. The layers which compose the sides of the carton may be of different sorts. If such a layer is covering a complete side, it is called a panel, and is said as corresponding to the side it covers. When a layer covers a side only partially, it is called a flap, and it is said that it corresponds to the side it covers. However, a flap may be extended up to the panel size, in which case it is a long flap. Long flaps are particularly used for contributing to the rigidity of the structure. Flaps and panels can also comprise cut outs allowing use of a minimum amount of materials. Panels or flaps can be said as associated to another layer, which means that they have a side in common with this layer through a folded line or score line, in doing so describing an edge of the carton. Each side may comprise one or more panels, one or more flaps, or a combination of these. In the present application, the panels may have in their denomination the name of the side of which they cover the surface, for example the bottom panel 3 corresponds to the bottom side, their position being given in their denomination if several panels are corresponding to one side, such as the outer top panel 1 and the inner top panel 2 in case of the top side, the inner panel being closer to the inside of the carton. In the present application the flaps may have in their denomination the name of the side with which they correspond once the carton is folded, followed of the name of the flap or panel with which they are associated. For example, the first left flap 7 associated with an edge to the front panel 4 is forming part of the left side in the folded carton and is physically attached the front panel 4 with a folding line. It should be noted that the side denomination, namely left, right, top, bottom, back and front, are conventional denominations which are introduced for ease of explanation, and should not be limiting. In order to complete the structure, some flaps and panels may be linked to each other not by folding lines but an adhesive. The adhesive can be applied in different ways. For example, cold water or solvent based glue can be used, applied with rollers or

glue guns, but also hot melt glue, whether applied with glue guns or other glue applicators.

[0019] The carton structure of the present invention is such that it can be easily made sift proof, or even air tight if a special glue pattern is applied, so as to prevent air from passing through the structure, particularly if it comprises a fourth left flap associated to the inner top panel with an edge along a folding line and a fourth right flap associated to the inner top panel with an edge along a folding line.

[0020] The structure should be sift proof both through the sides and through the edges. By sift proof, what is meant is that the content of the carton should not escape the carton in an undesired manner, for example in the form of dust or particles.

[0021] In order to be sift proof through the sides, and if the side comprises a panel, it has to be ensured that the panel does not accidentally burst. This is particularly important on the top side, which usually is more exposed to external intervention which can lead to bursting. For this reason, the top side of the present invention comprises two panels, the outer top panel 1 and the inner top panel 2. If the side is composed of flaps, it is important that the flaps co-operate with each other as expected to obtain a sift proof structure. Usually, it is obtained by gluing the flaps to each other.

[0022] The structure should equally be sift proof along the edges. This is usually not difficult, except in the presence of a lid arrangement. Indeed, if a carton did not have a specific lid arrangement, all edges could be made sift proof by applying a sufficient amount of glue. However, in our case, the carton should have a lid which can be lifted and re-closed without difficulty. This means that the lid should be glued only with a limited amount of glue. This usually has the consequence that the carton is not completely sift proof around the lid area, or that spillage occurs at opening of the carton. In the present invention, this can be prevented by using the inner top panel 2, the fourth left and right flaps 10, 10' and the extra and second extra flaps to seal with glue the carton in the lid area. As a consequence, the content will be kept away from the lid area by the inner top panel 2 arrangement, so that the lid can be lightly glued to be lifted easily. Because the outer top panel 1 can for example be glued directly onto the inner top panel 2 in such a manner that it forms a lid once lifted, extra flaps are not required. Therefore, a further object obtainable with a carton of the present invention is to produce a sift proof carton with a simple lid without extra flaps.

[0023] The carton may also comprise a snap lock mechanism 14 in the lid area, of any kind known of the man skilled in the art, for example composed of a snap flap and of a snap tab. Preferred here are audible snap lock mechanisms. The lid may also be lifted at opening by means of a de-laminated area (not indicated on the drawings) combined with perforations or with extra glue spots. The carton may also comprise a tear strip for facilitating opening of the lid.

[0024] The carton of the present invention should allow use of a minimised amount of material for various reasons. Firstly, such a carton would not require a liner for extra stiffness if the grain direction is oriented adequately. Secondly, it is possible to use short flaps versions as illustrated for example on Figure 15 because skewing due to drag back is limited, so that the flaps are co-operating with each other as expected and do not need to be made larger to ensure that the carton is sift proof. Indeed, skewing is not critical for this type of carton because the optional fourth right and left flaps (10, 10') would make the carton sift-proof. Furthermore short flaps can be used because the link between the outer top panel 1 and, for example, the left or right sides, is not critical, because the carton can be made sift proof even if the outer top panel 1 is not tightly pressed onto the extremity of the flaps, were glue cannot be applied, so the carton can be made sift proof if fourth left and right flaps 10, 10' are providing the sealing. Additionally, the content of the carton can be increased at fixed cardboard quality because there is limited skewing, so that the structure is more robust and maintains better. This contributes to an additional object of the present invention for producing a carton with a reinforced structure and to yet another object of the invention which is to produce an ecological carton using a minimised quantity of materials.

[0025] Indeed, the inner top panel is preferably part of a second part of the die cut for forming the carton, whereby it is a separated part. In such a case, the second element 30 of the die cut may be comprising the inner top panel as well as the extra and second extra flaps. The advantage of having such a separated element 30 is that it can be made from a different material, including paper, plastic materials or films for forming a membrane, aluminium foil carton board, metallized film or a combination of these.

[0026] Furthermore, the second element 30 preferably comprises a fourth left flap 10 associated with the inner top panel 2 with an edge along a folding line and a fourth right flap 10' associated with the inner top panel 2 with an edge along a folding line. With such a structure, the second element 30 allows to obtain a sift proof carton. Such a second element 30 can have various shapes, examples of which are illustrated in Figures 16-a and 16-b.

[0027] The carton of the present invention may comprise different sorts of lid. As an example, a hinged lid could be simply made of the outer top panel 1. Preferably, a full hinged lid can be made of the outer top panel 1, of part of the front flap 12 associated with the outer top panel with an edge along a folding line, and of other flaps so that the lid covers at least partially the front, left and right sides of the carton once closed. This can be achieved by means of a fifth left flap 11 associated with an edge along a folding line to the outer top panel 1, and a fifth right flap 11' associated with an edge along a folding line to the outer top panel 1, a sixth left flap 13 as-

sociated with an edge along a folding line to the front flap 12 or the fifth left flap 11 and a sixth right flap 13' associated with an edge along a folding line to the front flap 12 or the fifth right flap 11'. In this particular case, the fifth left and right flaps 11, 11' are linking the outer top panel 1 to the right and left side by being glued onto the left side for the fifth left flap 11 and on the right side for the fifth right flap 11', so that this link would also be achieved if the fifth flaps were attached with an edge along a folding line to the left and right sides respectively, and glued onto the outer top panel 1.

[0028] In a general manner, the carton of the invention may comprise features and variations of the existing cartons, such as for example the cartons disclosed in EP 0 588 789 B1 or in WO 92/20583.

[0029] Usually, die cuts used for cartons are preferably made of one piece only. This often leads to difficulties for integrating a lid to the structure while ensuring that the final carton is sift proof and the lid easy to open. In the present invention, such difficulties can be solved while fulfilling another object of the present invention which is to produce a carton using a minimum amount of material. This is achieved in the present invention as the inner panel together with the extra and the second extra flaps, as well as, optionally, the fourth left and right flaps, is normally a separated element of the die cut, so that it can be made from a different material. It should be mentioned that a die cut usually has a grain direction. The folding or cutting directions may be chosen so as to take account of the grain direction, considering that the cardboard is more foldable along the grain direction.

[0030] Extra parts may be added, such as extra flaps for the lid. Such a die cut can be used for making cartons as described in claim 1. Snap lock means known of the man skilled in the art can be integrated to the die cut.

[0031] In a preferred embodiment of the invention, presented in Figure 1, the carton is made from a die cut having two elements. The first element 20 comprises the outer top panel 1, the back panel 5, the bottom panel 3, the front panel 4 and the first 7, 7', second 8, 8' and third 9, 9' left and right flaps. The first element 20 also comprises a front flap 12 as well as fifth left 11 and right 11' flaps and sixth left 13 and right 13' flaps, although such flaps allowing forming of a complete lid are optional. The second element 30 comprises the inner top panel 2 as well as the extra 6 and second extra flaps 6'. The second element 30 also further comprises fourth left 10 and right 10' flaps, although such flaps allowing to improve sift proofness of the carton are optional. As illustrated on Figure 2, the second element 30 and the first element 20 can be firstly put together by gluing the extra flap 6 to the back panel 5. This can be done using various types of glue, pressure sensitive glue or an other easy release glue being preferred as it would render removal of the inner top panel 2 together with the flaps linked to it by folding lines easier. It should be noted that the extra flap 6 could alternatively be glued to the outer top panel 1 as illustrated on Figure 17. The first element 20 can

thereafter be folded in order to glue the second extra flap 6' of the second element 30 onto the outer face of the front panel 4 as shown on Figure 2, or on the inner surface of the front panel 4 as shown on Figure 18. Combinations of such gluing of the extra 6 and second extra 6' flaps can also be chosen. Once folding occurred as in Figure 2, a sleeve as illustrated in Figure 3 is obtained. It should be noted that in this example, not only the second extra flap 6' is glued, but also the front flap 12 which is part of the lid, so that the lid could be retained.

[0032] In another embodiment of the carton according to the invention, the first element 20 of the die cut can also be provided with a snap lock flap 14 as illustrated on Figure 4. Folding of the die cut according to Figure 4 occurs in the same manner as with the die cut of Figure 1, except that the snap lock flap 14 is folded back as shown on Figure 5.

[0033] In yet another embodiment of a carton according to the invention which can be obtained from the die cut of Figure 10, the front side is provided with a second front flap 15. Indeed, in this embodiment, the front panel is provided with a pre-cut portion 16, the tearing of which being aimed at facilitating the opening of the carton by a user, so that the second front flap serves for maintaining sift-proofness when the pre-cut portion has been removed. Folding of such a structure is illustrated in Figures 11 to 13, whereby the second front flap 15 is folded back to cover at least the surface of the removable pre-cut part 16, glue being thereafter applied as in Figure 12 to accommodate onto the first element of the die cut the second element as shown on Figure 13. It should be noted that in this particular example, the second extra flap is preferably glued onto the outer face of the front panel over the pre-cut portion, the pre-cut portion extending at least partially beyond the second element as illustrated on Figure 13, whereby the structure obtained, as shown on Figure 14, is such that pulling away the pre-cut portion will allow to pull or tear off the second element of the die cut, thus giving access to the inside of the carton.

[0034] Forming of a sleeve as illustrated in Figure 3 or 6 is normally made by the carton supplier. Once folded and glued, the sleeve can be shipped and delivered easily because it can be flattened. The erection takes place afterwards, usually directly on a production line.

[0035] The sleeve of Figure 3 is normally placed as in the Figure 9-a position, so that the opposite sides which are still opened are in the vertical axis. This is due to the fact that standard processing lines are adapted to such a position. At first, the sleeve is unfolded as shown in 9-b, so that it is not a flat structure anymore. Following the moves indicated on Figure 9-b and 9-c, moves which can be achieved by means of standard folding rails or tucker wheels, the carton takes a rectangular cross section. Once opened up as illustrated with the above view of Figure 9d, folding of a first side can occur in a sequence. In the example, the first flap to be folded is the third left flap, however, it could equally be the first left

flap for example. Once folded as in Figure 9-e, glue can be applied as shown in Figure 9-f, with the advantage that gluing occurs in only one operation, thereafter allowing folding and gluing of all remaining flaps of this side, as evidenced in Figures 9-g, 9-h and 9-i. It should be noted that short flaps could also be used for using less material. A die cut with such short flaps is illustrated in Figure 15, whereby the left and right flaps each cover only a portion of the left or right sides, allowing to use less material. The glue patterns can be modified to obtain a sift proof carton, or to take account of other elements, such as use of short flaps. Once this is made, the carton may be turned around, the right side on top, so as to be filled. However, this is not necessary because on most carton folding lines the folding can take place either on the top or on the bottom, so that the carton does not require being turned around during folding and filling. Once filling is achieved, the right side is folded, the folding of the right side normally comprising the same steps as the folding of the left side. This leads to a filled and closed carton structure, such as the structure presented in Figure 7-a. It should be noted that this process allows use of standard machines, so that another object of the invention is to produce a carton which is easy to process. Additionally, it is an object of the present invention to produce a carton at lower costs. Indeed, the folding for erecting the carton would be the same in the absence of the second element, so that the carton of the invention has the benefits provided with the second element without involving change of the process of erecting the carton.

[0036] The carton structure is delivered to the user in the state described in Figure 7-a. Up to this point, the carton can be made sealed and sift proof, and may even be made air tight. The first action required by the user is to lift the lid, which can be easily done by means of minimised gluing, preferably combined with a partial cut de-lamination area to facilitate the opening, or by means of perforated lines to break when lifting the lid up. The lid presented in this example is a hinged lid, and is comprising the outer top panel 1, at least part of the front flap 12, the sixth left and right flaps 13,13', the fifth left flap 11 and the fifth right flap 11'. Such a lid has sides which partially cover the left, right and front sides of the carton once re-closed. Once opened, the user gains access to the inner top panel 2. Promotional items or others may have been inserted in a tamper proof location between the inner top panel 2 and the outer top panel 1, so that the user now has access to them. The user can easily access the content of the carton by removing the inner top panel 2 or part of it, from the position illustrated in Figure 7-c. Removal may be facilitated by various ways known in the art, using perforated lines, partial cuts, tear strip or tear tape, or by using easy release or easy peel glues around the edges for example. The inner top panel 2 may be only partially removable, in such a manner that part of the inner top panel 2 remains to avoid spillage of the content if, for example, the carton

is inclined once opened. The removable part may be used to display instructions or as a promotional voucher or other items of the sort. In a preferred embodiment of the invention, the inner top panel 2 is glued to the outer top panel 1, so that opening occurs in a single step when the lid is lifted for the first time while the inner top panel is at least partially torn opened along pre-cut lines of weakness. The carton can be re-closed with the lid. A snap lock mechanism 14 can be provided as known of the man skilled in the art, preferably of the audible snap lock kind, although it is possible to have a carton without snap lock, for example with the carton which would be obtained from the die cut described in Figure 1.

[0037] Figure 8-a and 8-b are examples of a cross section of a carton according to the present invention, in a plane parallel to the front or back side for 8-a, and in a plane parallel to the right or left side in 8-b. In Figure 8-a, it is clear that the assembly composed of the left side, the inner top panel 2 the right side and the bottom side can be rendered sift proof by gluing a fourth left flap 10 and a fourth right flap 10'. The lid is also clearly seen, composed of the outer top panel 1, of sixth left and right flaps 13,13', of fifth left and right flaps 11,11' and of at least part of a front flap 12.

[0038] Care should be taken while designing such die cuts that the grain direction is suitable, so that it ensures robustness and easy folding of the carton. For example, in the die cut of Figure 1, the grain direction should be vertical because it would allow easier folding of the left and right flaps and because the front and back side will participate more efficiently to supporting the structure if the grain direction of the panels of which they are composed is aligned with gravity.

[0039] In a preferred embodiment of the invention, the die cut of the carton is provided with a transparent window, for example on the left, right or front side of the carton, whereby the user can evaluate the quantity of content remaining in the carton. Evaluation could be facilitated by providing graduation lines.

Claims

1. A carton, the carton comprising top and bottom sides opposing each other, left and right sides opposing each other, and front and back sides opposing each other, whereby:

- a) the top side comprises an outer top panel (1);
- b) the back side comprises a back panel (5) associated with an edge to the outer top panel (1) along a folding line;
- c) the bottom side comprises a bottom panel (3) associated with an edge to the back panel (5) along a folding line;
- d) the front side comprises a front panel (4) associated with an edge to the bottom panel (3) along a folding line;

e) the left side comprises a first left flap (7) associated with an edge to the front panel (4) along a folding line, a second left flap (8) associated with an edge to the bottom panel (3) along a folding line and a third left flap (9) associated with an edge to the back panel (5) along a folding line;

f) the right side comprises a first right flap (7') associated with an edge to the front panel (4) along a folding line, a second right flap (8') associated with an edge to the bottom panel (3) along a folding line and a third right flap (9') associated with an edge to the back panel (5) along a folding line;

g) the top side further comprises an inner top panel (2);

h) either of the back side or the top side further comprises an extra flap (6) associated with an edge to the inner top panel along a folding line;
characterised in that

i) the inner top panel is a separate element, and

j) the front side further comprises a second extra flap (6') associated with an edge to the inner top panel (2) along a folding line.

2. The carton according to claim 1, whereby the left side comprises a fourth left flap (10) associated to the inner top panel (2) with an edge along a folding line and the right side comprises a fourth right flap (10') associated to the inner top panel (2) with an edge along a folding line.
3. The carton according to either of claim 1 or claim 2, whereby the carton comprises a fifth left flap (11) associated to the outer top panel (1) with an edge along a folding line and a fifth right flap (11') associated to the outer top panel (1) with an edge along a folding line.
4. The carton according to claim 3, whereby the carton comprises a front flap (12) associated with an edge along a folding line to the outer top panel (1), a sixth left flap (13) associated with an edge along a folding line to the front flap (12) or to the fifth left flap (11) and a sixth right flap (13') associated with an edge along a folding line to the front flap (12) or to the fifth right flap (11').
5. The carton according to claims 3 and 4, whereby it comprises a hinged lid, the hinged lid comprising at least a portion of the outer top panel (1), at least a portion of the fifth left flap (11), at least of a portion of the fifth right flap (11'), at least of a portion of the sixth left flap (13), at least of a portion of the sixth right flap (13') and at least of a portion of the front flap (12).
6. The carton according to either of claims 1, 2 or 3,

whereby the carton further comprises a snap lock (14) mechanism.

7. The carton according to claim 1, whereby the inner top panel (2) comprises means for opening, preferably partial cuts, reversed cuts, perforations, tear tapes or a combination of these.
8. The carton according to claim 1, whereby the part of the inner top panel (2) can be used as an advertising item, preferably as a tear off coupon, or to communicate usage instructions.
9. The carton as in claim 1, whereby the extra flap (6) and the second extra flap (6') are glued using pressure sensitive glue.
10. The carton as in claim 1, whereby the inner top panel (2) is made from a plastic film, carton board, metallized film, aluminium foil, paper or a combination of these.

Patentansprüche

1. Karton, der einander gegenüberliegende Ober- und Unterseiten, einander gegenüberliegende rechte und linke Seiten und einander gegenüberliegende Vorder- und Rückseiten umfaßt, wobei:
 - a) die Oberseite eine äußere Deckplatte (1) umfaßt;
 - b) die Rückseite eine Rückplatte (5) umfaßt, die mit einer Kante entlang einer Faltlinie mit der äußeren Deckplatte (1) verbunden ist;
 - c) die Unterseite eine Bodenplatte (3) umfaßt, die mit einer Kante entlang einer Faltlinie mit der Rückplatte (5) verbunden ist;
 - d) die Vorderseite eine Frontplatte (4) umfaßt, die mit einer Kante entlang einer Faltlinie mit der Bodenplatte (3) verbunden ist;
 - e) die linke Seite eine erste linke Klappe (7), die mit einer Kante entlang einer Faltlinie mit der Frontplatte (4) verbunden ist, eine zweite linke Klappe (8) die mit einer Kante entlang einer Faltlinie mit der Bodenplatte (3) verbunden ist, und eine dritte linke Klappe (9), die mit einer Kante entlang einer Faltlinie mit der Rückplatte (5) verbunden ist, umfaßt;
 - f) die rechte Seite eine erste rechte Klappe (7'), die mit einer Kante entlang einer Faltlinie mit der Frontplatte (4) verbunden ist, eine zweite rechte Klappe (8'), die mit einer Kante entlang einer Faltlinie mit der Bodenplatte (3) verbunden ist, und eine dritte rechte Klappe (9'), die mit einer Kante entlang einer Faltlinie mit der Rückplatte (5) verbunden ist, umfaßt;
 - g) die Oberseite außerdem eine innere Deck-

platte (2) umfaßt;

h) entweder die Rückseite oder die Oberseite außerdem eine zusätzliche Klappe (6) umfaßt, die mit einer Kante entlang einer Faltlinie mit der inneren Deckplatte verbunden ist;

dadurch gekennzeichnet, daß

i) die innere Deckplatte ein separates Element ist und

j) die Vorderseite außerdem eine zweite zusätzliche Klappe (6') umfaßt, die mit einer Kante entlang einer Faltlinie mit der inneren Deckplatte (2) verbunden ist.

2. Karton nach Anspruch 1, bei dem die linke Seite eine vierte linke Klappe (10), die mit einer Kante entlang einer Faltlinie mit der inneren Deckplatte (2) verbunden ist, und die rechte Seite eine vierte rechte Klappe (10'), die mit einer Kante entlang einer Faltlinie mit der inneren Deckplatte (2) verbunden ist, umfaßt.

3. Karton nach Anspruch 1 oder 2, wobei der Karton eine fünfte linke Klappe (11), die mit einer Kante entlang einer Faltlinie mit der äußeren Deckplatte (1) verbunden ist, und eine fünfte rechte Klappe (11'), die mit einer Kante entlang einer Faltlinie mit der äußeren Deckplatte (1) verbunden ist, umfaßt.

4. Karton nach Anspruch 3, wobei der Karton eine Vorderfrontklappe (12), die mit einer Kante entlang einer Faltlinie mit der äußeren Deckplatte (1) verbunden ist, eine sechste linke Klappe (13), die mit einer Kante entlang einer Faltlinie mit der Vorderfrontklappe (12) oder mit der fünften linken Klappe (11) verbunden ist, und eine sechste rechte Klappe (13'), die mit einer Kante entlang einer Faltlinie mit der Vorderfrontklappe (12) oder mit der fünften rechten Klappe (11') verbunden ist, umfaßt.

5. Karton nach den Ansprüchen 3 und 4, der eine Verschlussklappe umfaßt, die wenigstens einen Teil der äußeren Deckplatte (1), wenigstens einen Teil der fünften linken Klappe (11), wenigstens einen Teil der fünften rechten Klappe (11'), wenigstens einen Teil der sechsten linken Klappe (13), wenigstens einen Teil der sechsten rechten Klappe (13') und wenigstens einen Teil der Vorderfrontklappe (12) umfaßt.

6. Karton nach einem der Ansprüche 1, 2 oder 3, der ferner einen Schnappverschlussmechanismus (14) umfaßt.

7. Karton nach Anspruch 1, bei dem die innere Deckplatte (2) Mittel zum Öffnen, vorzugsweise Aufreiß-Ritz-Perforationen, umgefaltete Zuglaschen, Perforationen, Aufreißstreifen oder eine Kombination davon umfaßt.

8. Karton nach Anspruch 1, bei dem der Teil der inneren Deckplatte (2) als Werbeträger, vorzugsweise als Abreißkupon, oder um Anwendungsvorschriften zu übermitteln, verwendet werden kann.

9. Karton wie in Anspruch 1, bei dem die zusätzliche Klappe (6) und die zweite zusätzliche Klappe (6') unter Verwendung eines Haftklebstoffes verklebt sind.

10. Karton wie in Anspruch 1, bei dem die innere Deckplatte (2) aus Kunststoffolie, Karton, metallisierter Folie, Aluminiumfolie, Papier oder einer Kombination davon hergestellt ist.

Revendications

1. Carton, le carton comportant des côtés supérieur et inférieur opposés l'un à l'autre, des côtés gauche et droit opposés l'un à l'autre, et des côtés avant et arrière opposés l'un à l'autre, de sorte que :

a) le côté supérieur comporte un panneau supérieur extérieur (1),

b) le côté arrière comporte un panneau arrière (5) associé à l'aide d'un bord au panneau supérieur extérieur (1) le long d'une ligne de pliage,

c) le côté inférieur comporte un panneau inférieur (3) associé à l'aide d'un bord au panneau arrière (5) le long d'une ligne de pliage,

d) le côté avant comporte un panneau avant (4) associé à l'aide d'un bord au panneau inférieur (3) le long d'une ligne de pliage,

e) le côté gauche comporte un premier rabat gauche (7) associé à l'aide d'un bord au panneau avant (4) le long d'une ligne de pliage, un deuxième rabat gauche (8) associé à l'aide d'un bord au panneau inférieur (3) le long d'une ligne de pliage et un troisième rabat gauche (9) associé à l'aide d'un bord au panneau arrière (5) le long d'une ligne de pliage,

f) le côté droit comporte un premier rabat droit (7') associé à l'aide d'un bord au panneau avant (4) le long d'une ligne de pliage, un deuxième rabat droit (8') associé à l'aide d'un bord au panneau inférieur (3) le long d'une ligne de pliage et un troisième rabat droit (9') associé à l'aide d'un bord au panneau arrière (5) le long d'une ligne de pliage,

g) le côté supérieur comporte de plus un panneau supérieur intérieur (2),

h) l'un ou l'autre du côté arrière ou du côté supérieur comporte de plus un rabat supplémentaire (6) associé à l'aide d'un bord au panneau supérieur intérieur le long d'une ligne de pliage,

caractérisé en ce que

- i) le panneau supérieur intérieur est un élément séparé, et
j) le côté avant comporte de plus un second rabat supplémentaire (6') associé à l'aide d'un bord au panneau supérieur intérieur (2) le long d'une ligne de pliage. 5
2. Carton selon la revendication 1, dans lequel le côté gauche comporte un quatrième rabat gauche (10) associé au panneau supérieur intérieur (2) à l'aide d'un bord le long d'une ligne de pliage et le côté droit comporte un quatrième rabat droit (10') associé au panneau supérieur intérieur (2) à l'aide d'un bord le long d'une ligne de pliage. 10
3. Carton selon la revendication 1 ou 2, dans lequel le carton comporte un cinquième rabat gauche (11) associé au panneau supérieur extérieur (1) à l'aide d'un bord le long d'une ligne de pliage et un cinquième rabat droit (11') associé au panneau supérieur extérieur (1) à l'aide d'un bord le long d'une ligne de pliage. 15 20
4. Carton selon la revendication 3, dans lequel le carton comporte un rabat avant (12) associé à l'aide d'un bord le long d'une ligne de pliage au panneau supérieur extérieur (1), un sixième rabat gauche (13) associé à l'aide d'un bord le long d'une ligne de pliage au rabat avant (12) ou au cinquième rabat gauche (11) et un sixième rabat droit (13') associé à l'aide d'un bord le long d'une ligne de pliage au rabat avant (12) ou au cinquième rabat droit (11'). 25 30
5. Carton selon les revendications 3 et 4, dans lequel il comporte un couvercle articulé, le couvercle articulé comportant au moins une partie du panneau supérieur extérieur (1), au moins une partie du cinquième rabat gauche (11), au moins une partie du cinquième rabat droit (11'), au moins une partie du sixième rabat gauche (13), au moins une partie du sixième rabat droit (13') et au moins une partie du rabat avant (12). 35 40
6. Carton selon l'une quelconque des revendications 1, 2 ou 3, dans lequel le carton comporte de plus un mécanisme de blocage à déclic (14). 45
7. Carton selon la revendication 1, dans lequel le panneau supérieur intérieur (2) comporte des moyens d'ouverture, de préférence des découpes partielles, des découpes inversées, des perforations, des rubans d'arrachage ou une combinaison de ceux-ci. 50
8. Carton selon la revendication 1, dans lequel la partie du panneau supérieur intérieur (2) peut être utilisée en tant qu'élément publicitaire, de préférence sous forme d'un coupon arrachable, ou pour communiquer des instructions d'utilisation. 55
9. Carton selon la revendication 1, dans lequel le rabat supplémentaire (6) et le second rabat supplémentaire (6') sont collés en utilisant une colle sensible à la pression.
10. Carton selon la revendication 1, dans lequel le panneau supérieur intérieur (2) est constitué d'un film plastique, d'une plaque de carton, d'un film métallisé, d'une feuille d'aluminium, d'un papier ou d'une combinaison de ceux-ci.





