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(54) **CASE**

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(52) **U.S. Cl.** **229/125.19**

(57) **ABSTRACT**

The invention relates to a case (**1'**) with or without a lid (**2**) and made from a substantially plane blank, which includes a central rectangular field (**18;18'**), to which e.g. via folding notches (**19;19'**and **20;20'**and **24;24'**and **25;25'**respectively), arranged on the inner side (**21;21'**), upwardly foldable side walls (**22;22'**and **23;23'**) and end walls (**26;26'**and **27;27'**) respectively are attached, whereas the corner areas between walls adjacent to each other are filled with folding lugs (**28;28', 29;29', 30;30', 31;31', 32;32', 33;33', 34;34', 35;35'**) which in pairs are mutually separated by means of substantially outwardly directed folding notches (**44;44', 45;45', 46;46', 47;47'**), which are designed to be folded in pairs to abut an adjacent wall and be fastened to it. According to the invention the folding lug pairs are folded on the outside of an adjacent end wall and a handle element (**17;17'**) is folded around such an end wall in order to exert a press action of two walls adjacent to each other towards each other, the folding lug pairs being folded away in this way being enclosed, and the handle element is fastened to the outside of these pairs of folding lugs, their total thickness, inherent elasticity and mutual distance being utilized to achieve an increased gripping depth and obtain additional gripping means jointly with the handle means.

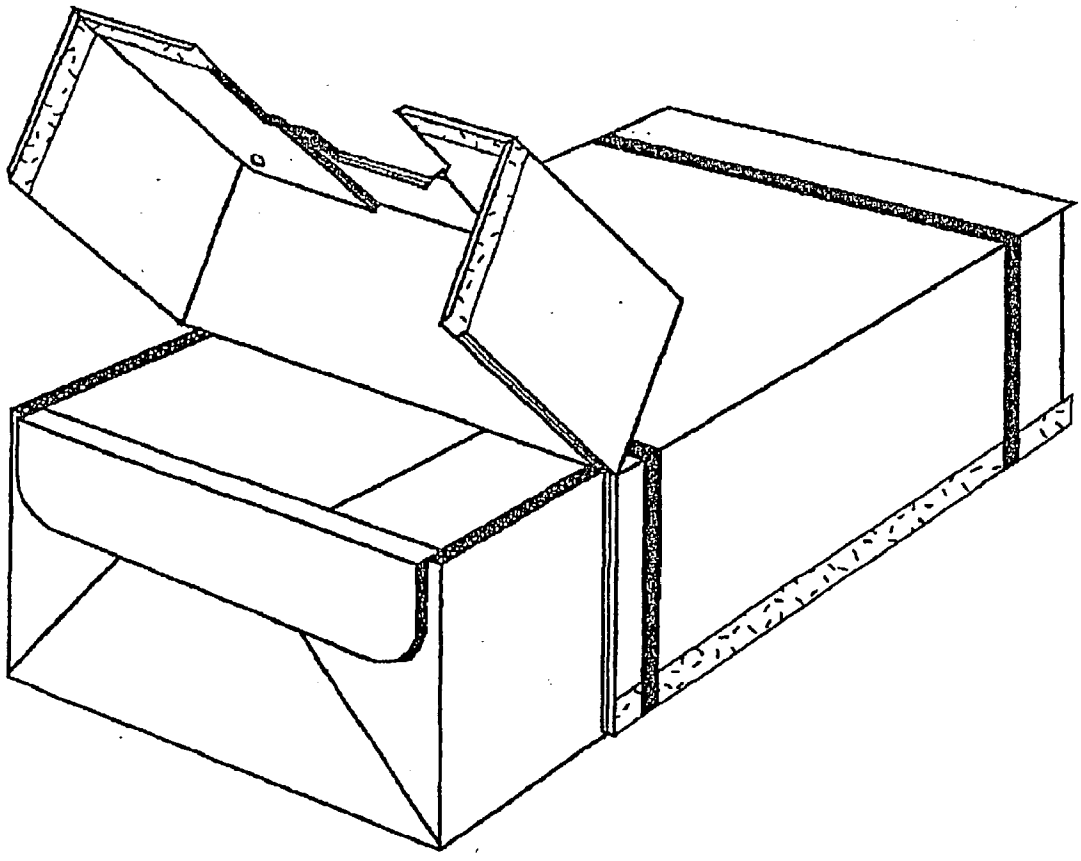


Fig 1

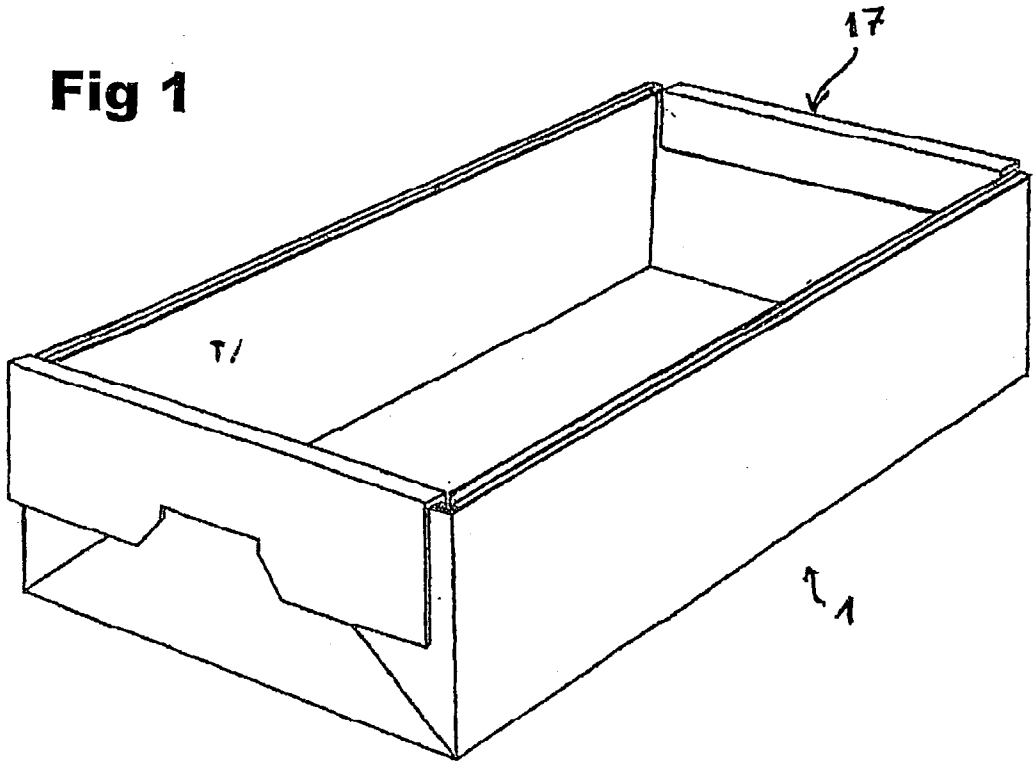
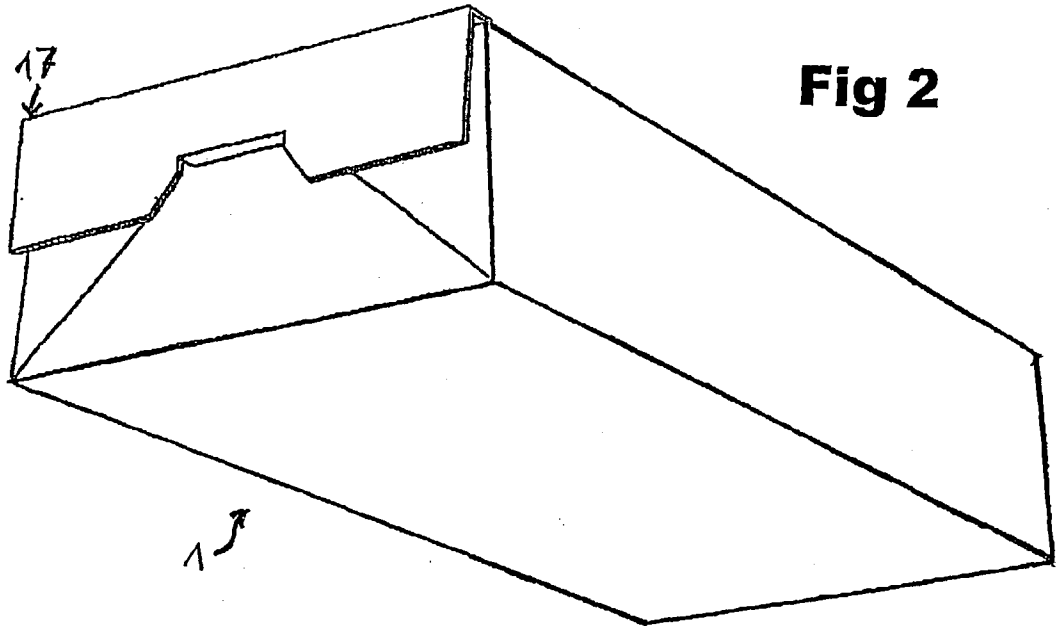


Fig 2



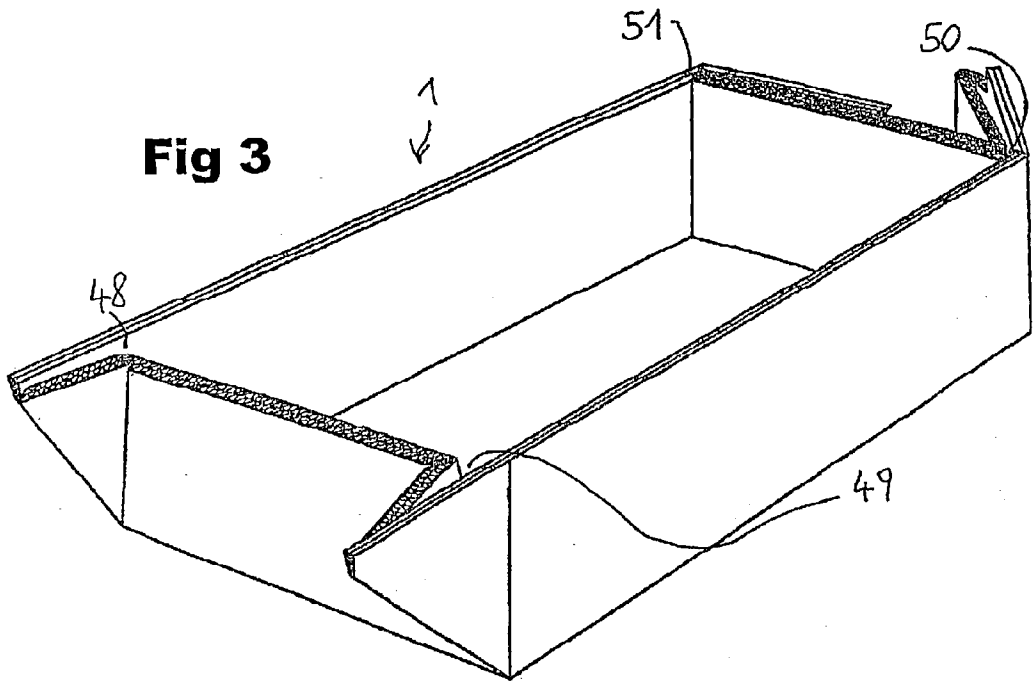


Fig 3

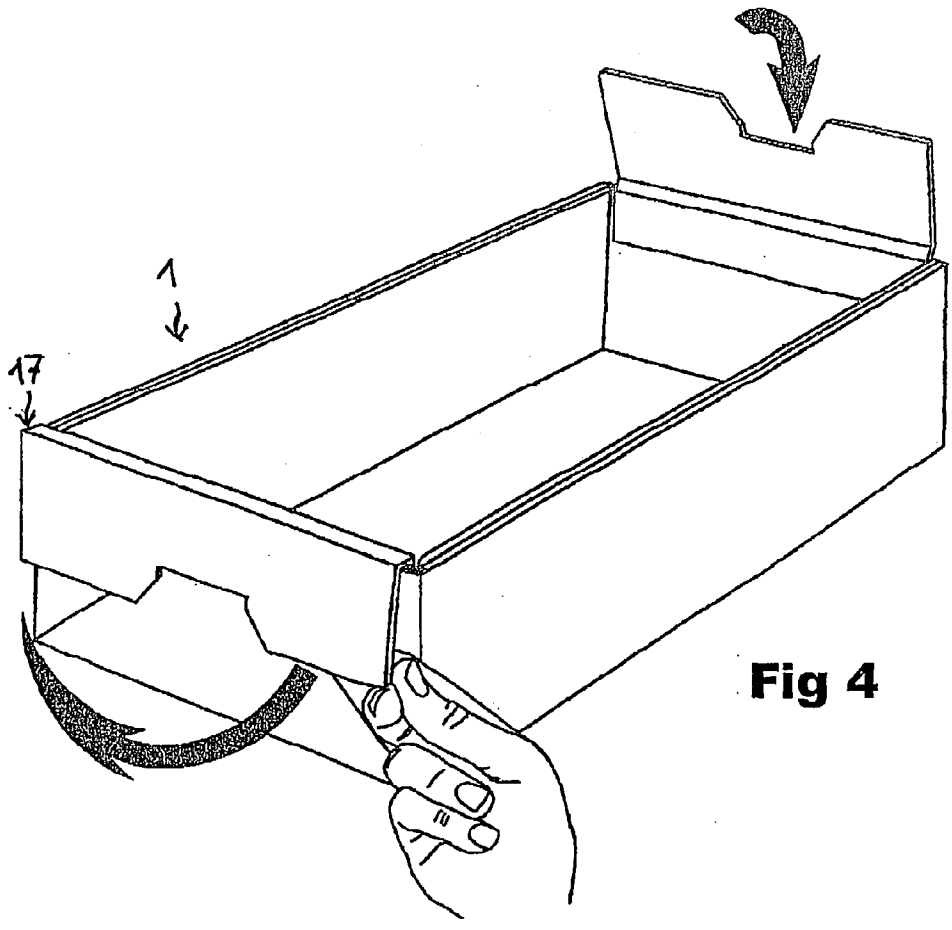


Fig 4

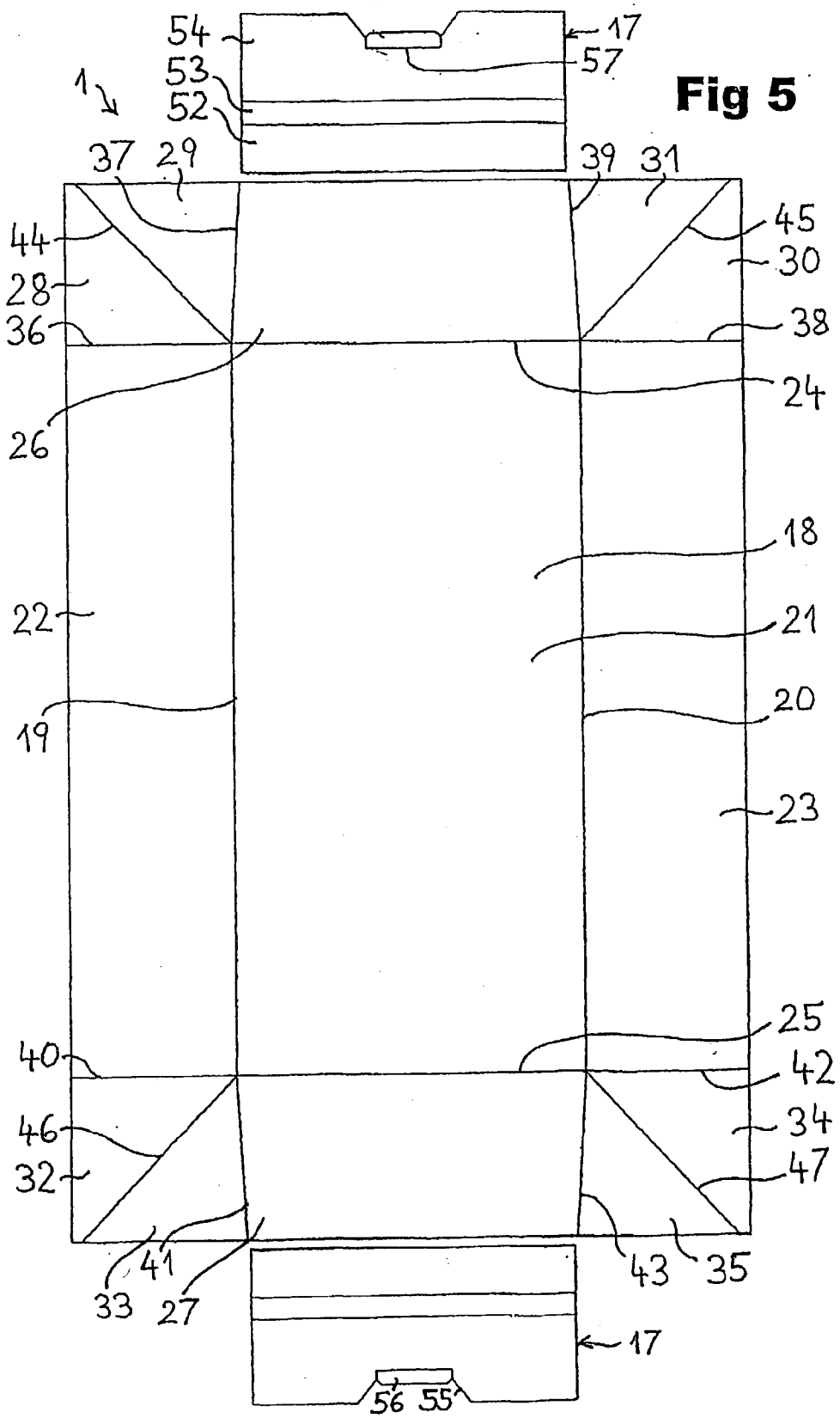

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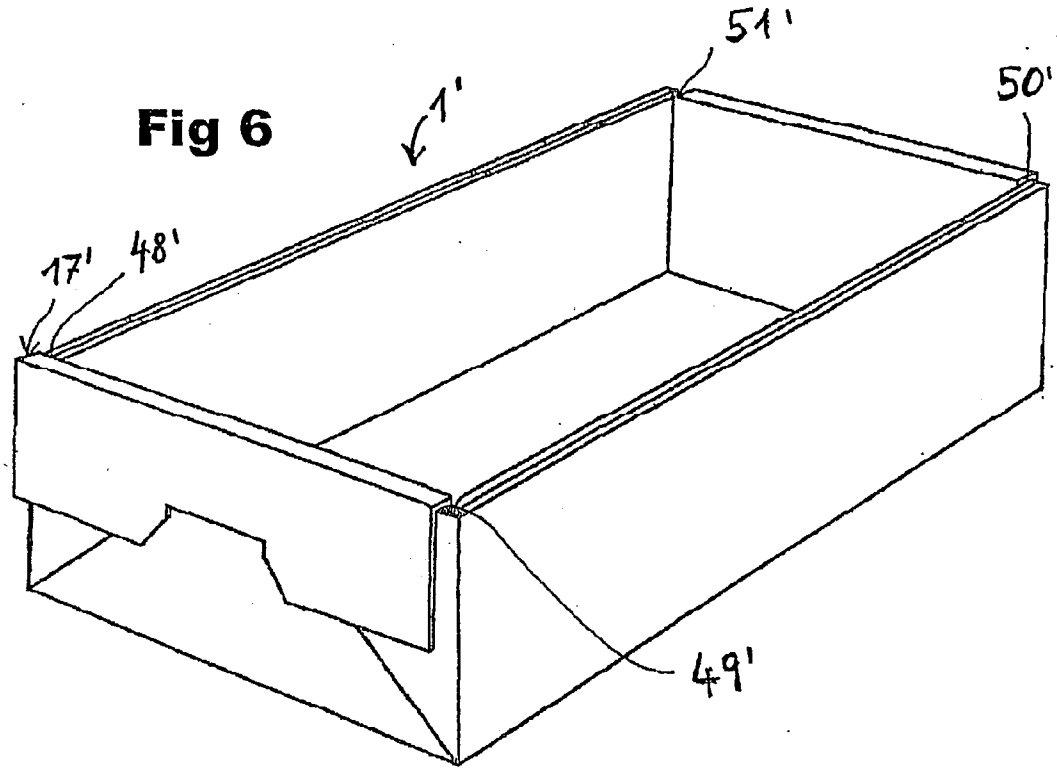
Fig 5

Fig 6



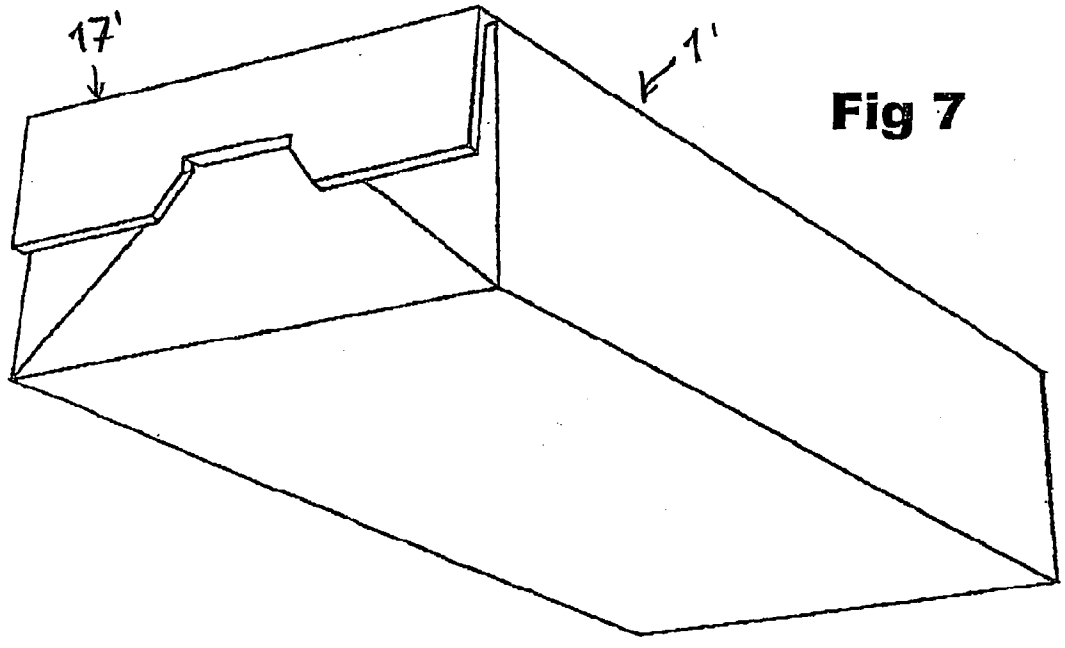


Fig 7

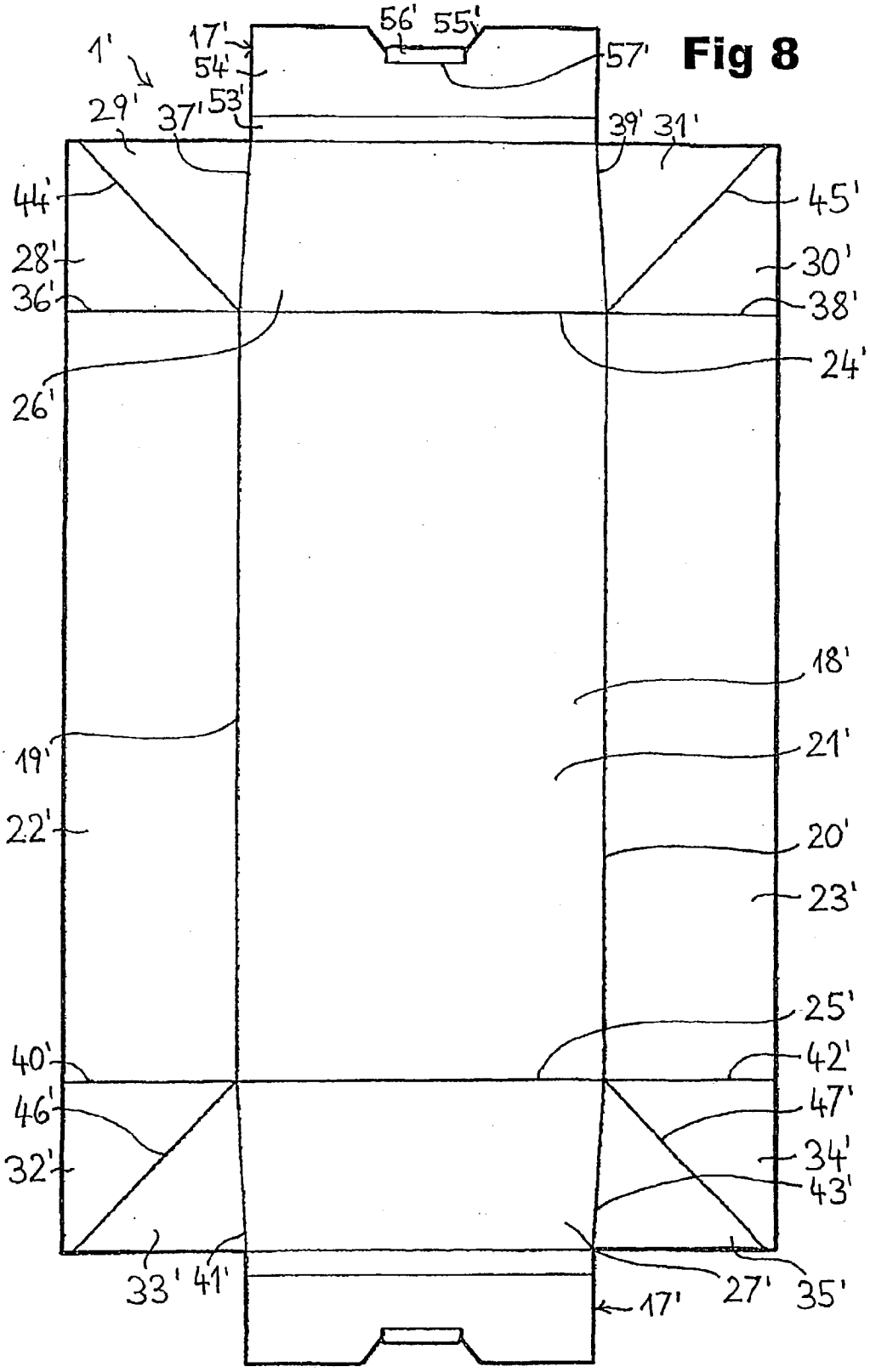

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Fig 8

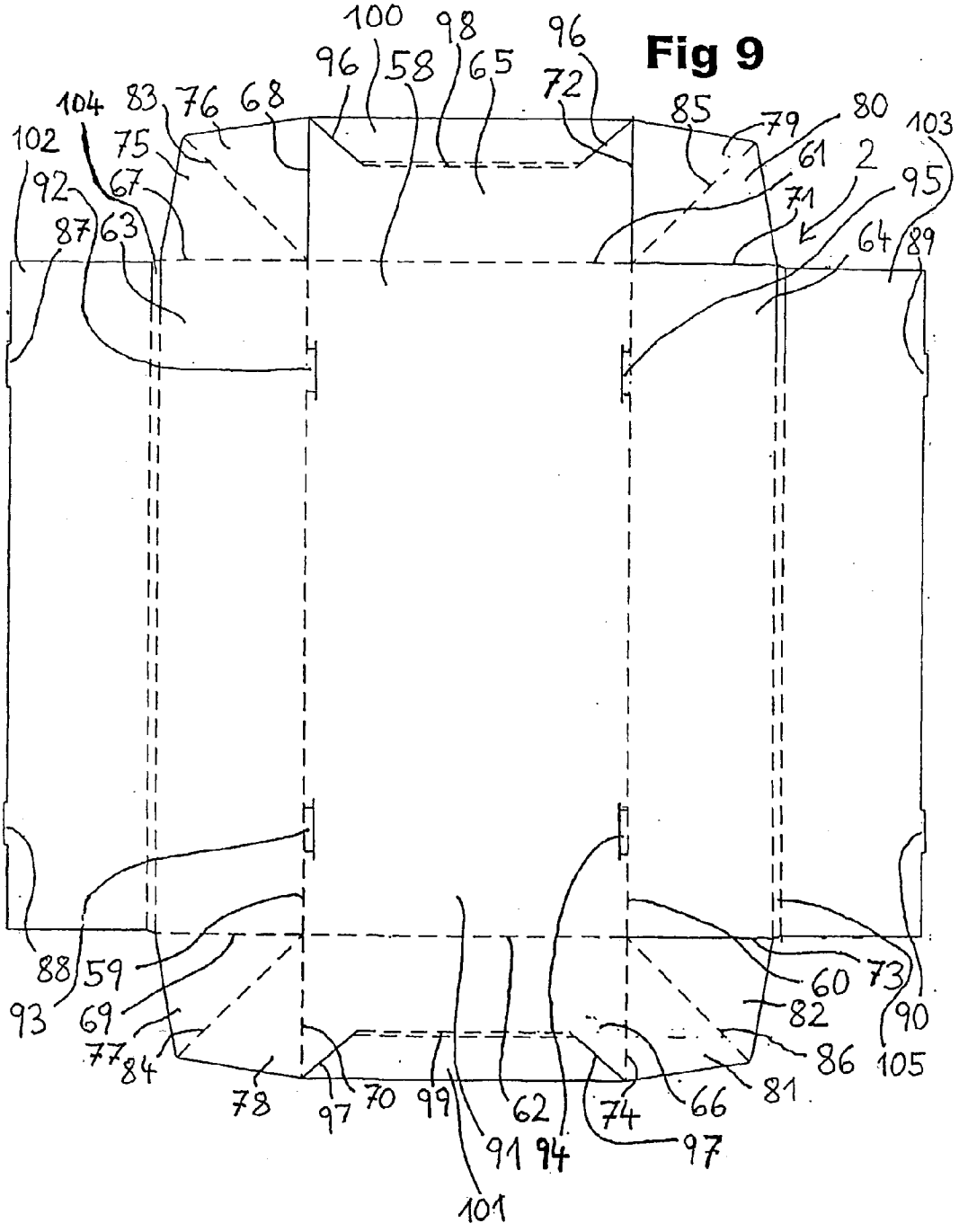
Fig 9
100
98
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101

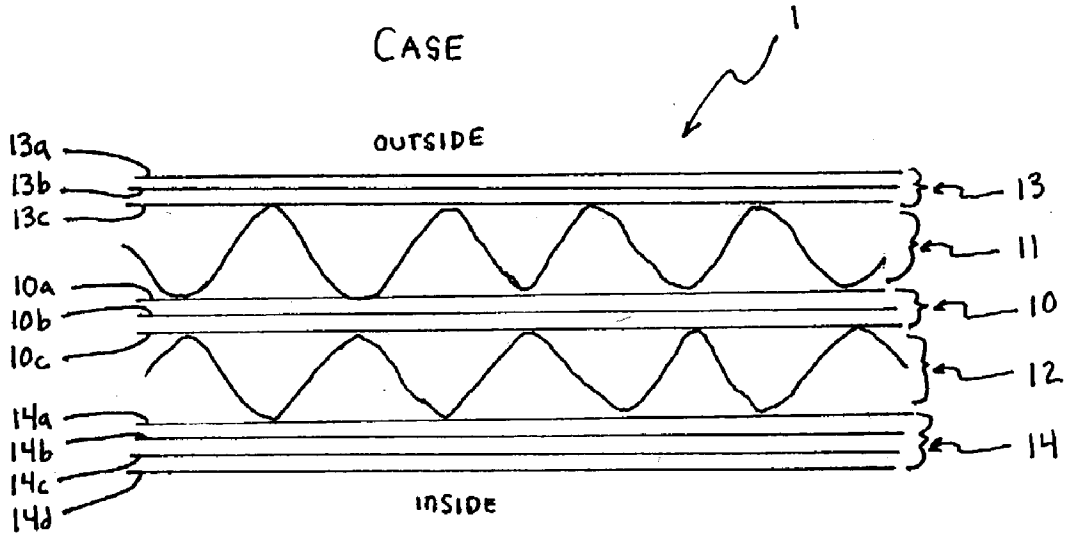
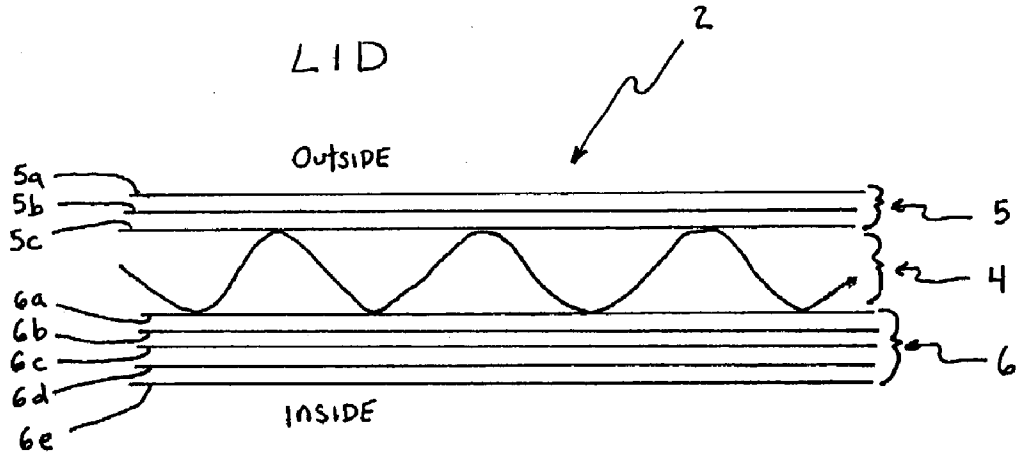

CASE
1
OUTSIDE
13a
13b
13c
13
11
10a
10b
10c
10
12
14a
14b
14c
14d
14
INSIDE

FIG 10


LID
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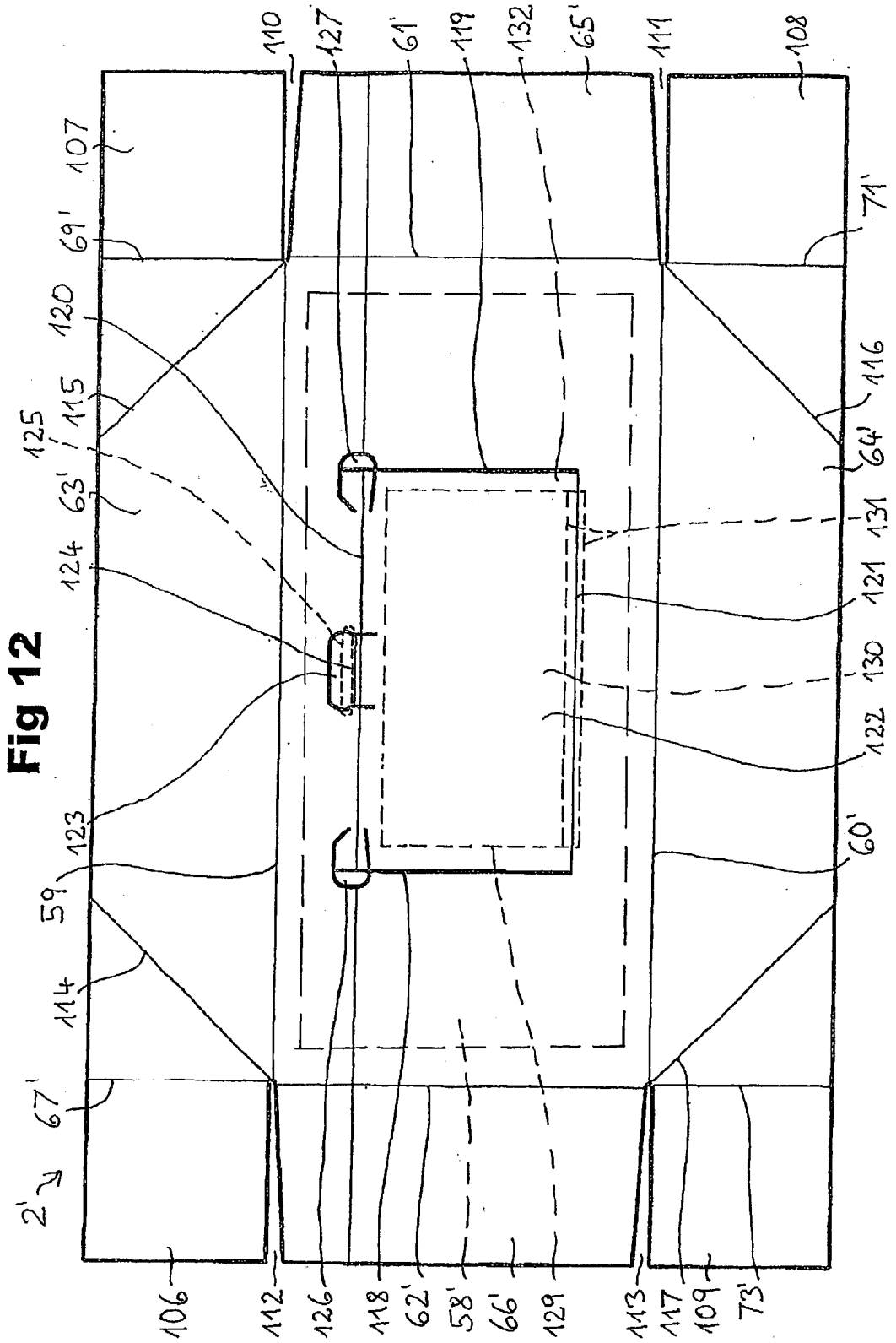
Outside
5a
5b
5c
5
4
6a
6b
6c
6d
6e
6
INSIDE

FIG 11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119
132
65'
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107
69'
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64'
63'
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121
130
122
123
60'
59
114
67'
2'
106
112
126
118
62'
58'
66'
129
113
117
109
73'

Fig 12

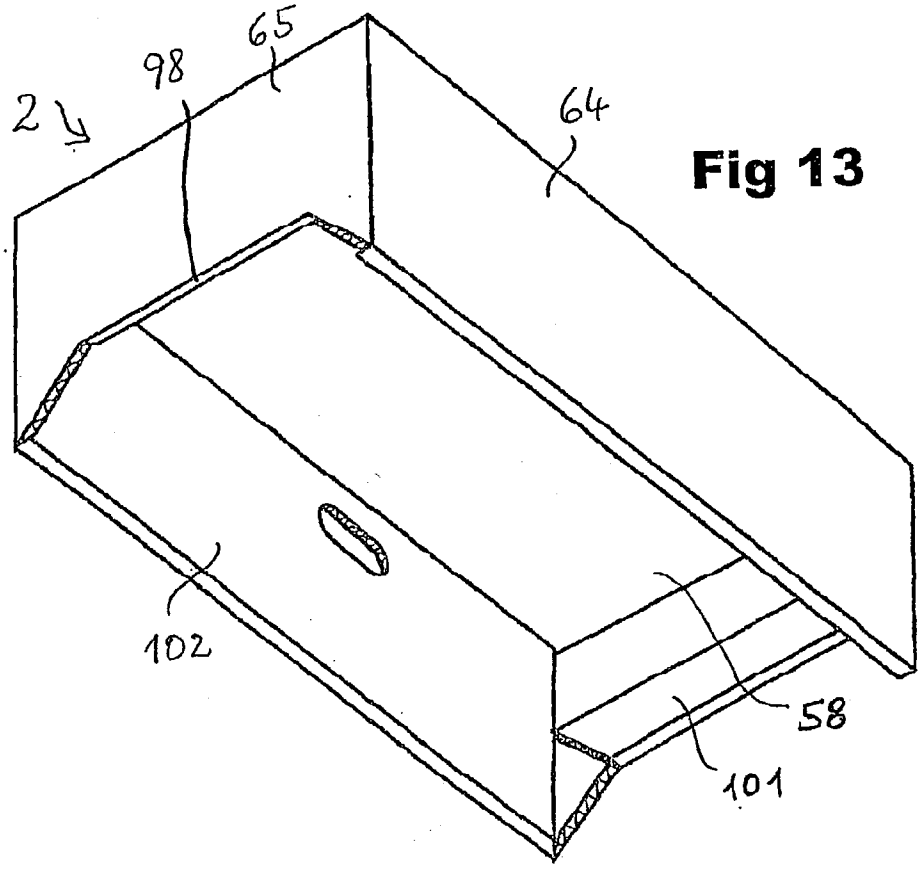
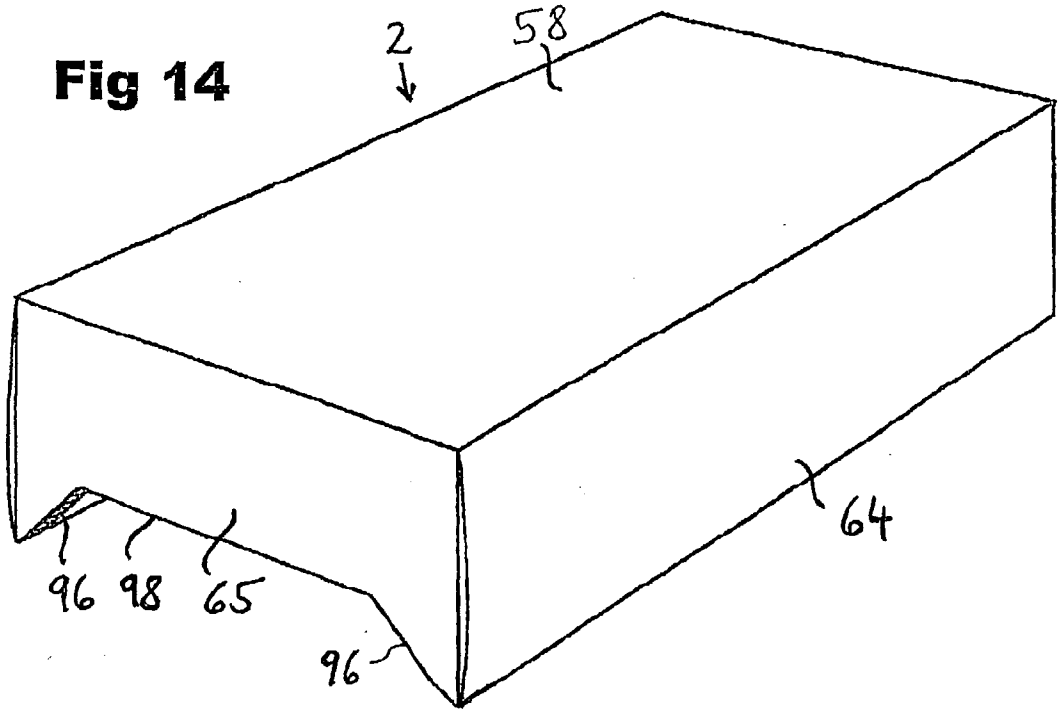


Fig 13

Fig 14



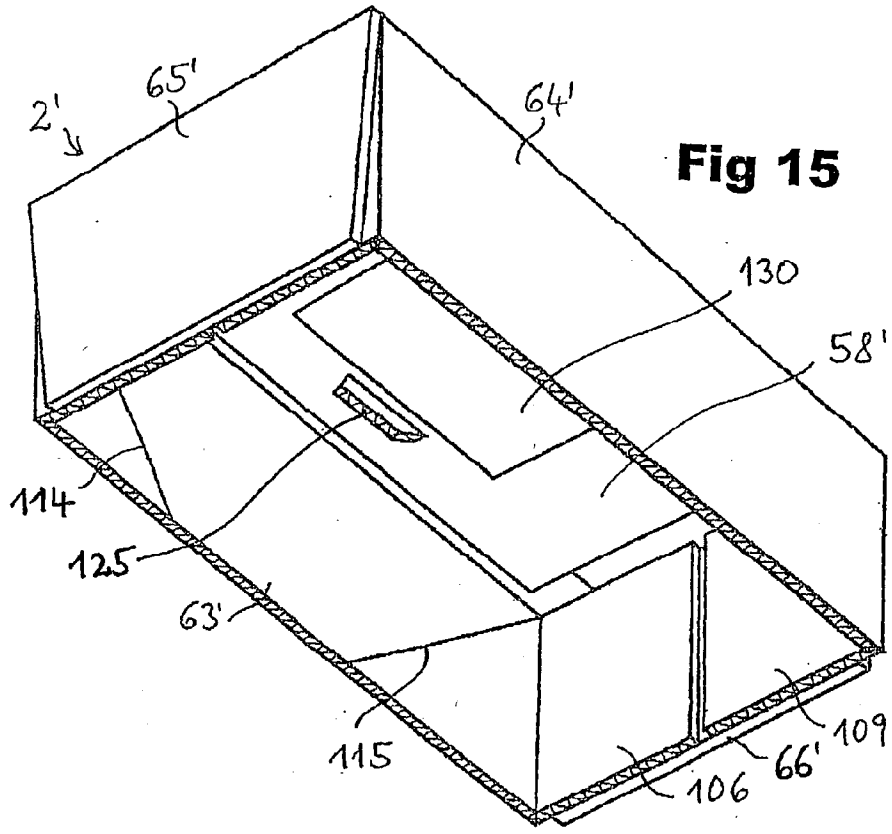


Fig 15

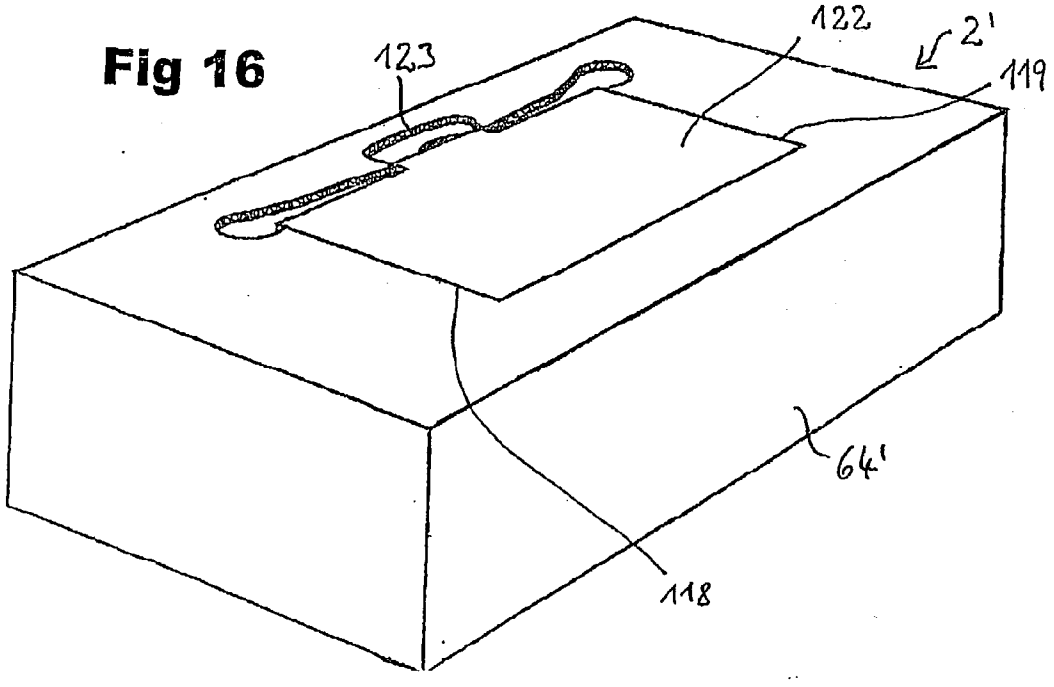
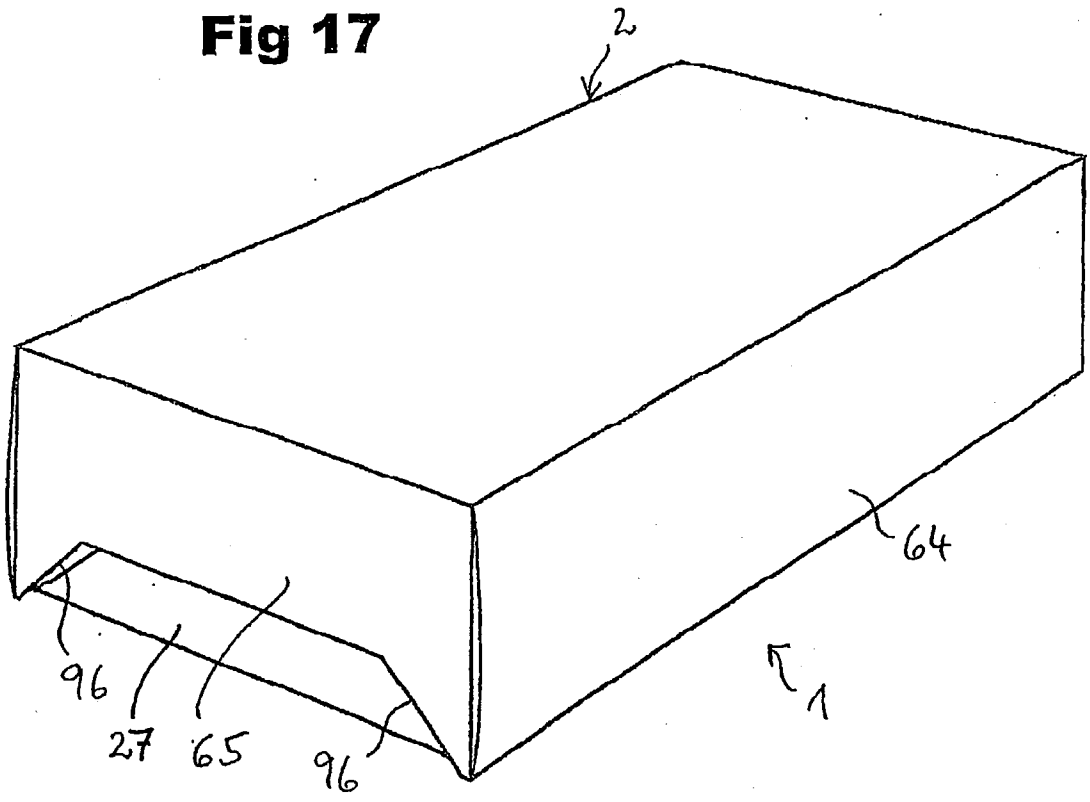


Fig 16

Fig 17



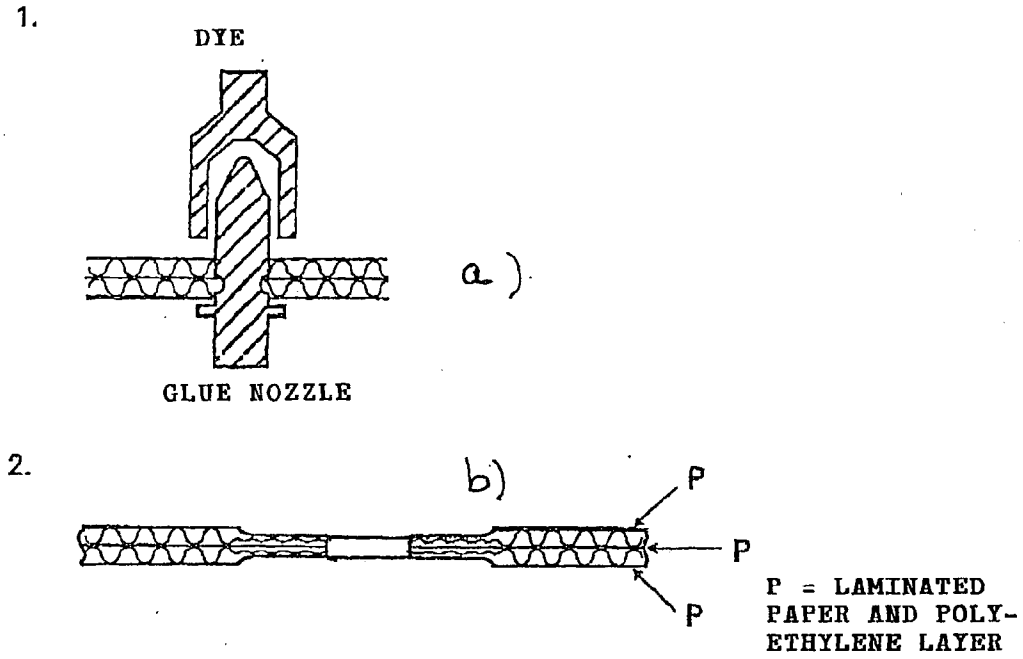
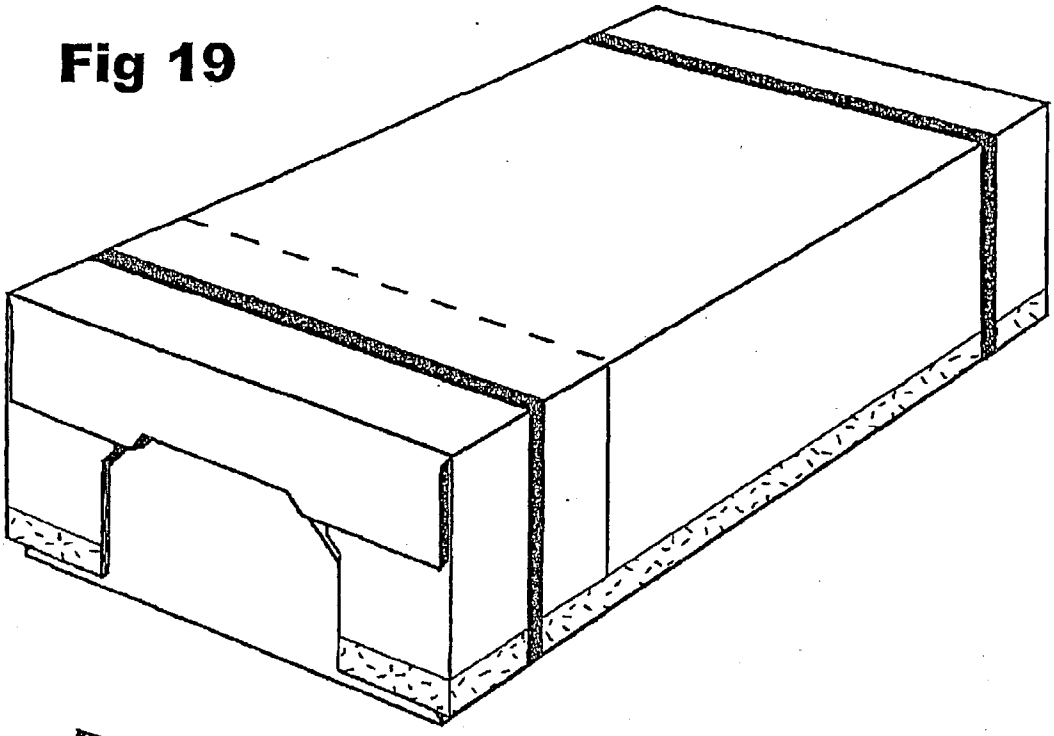

1.
DYE
a)
GLUE NOZZLE
2.
b)
P
P
P
P = LAMINATED PAPER AND POLY-ETHYLENE LAYER
GLUE
DRAIN HOLE

Fig 18

Fig 19



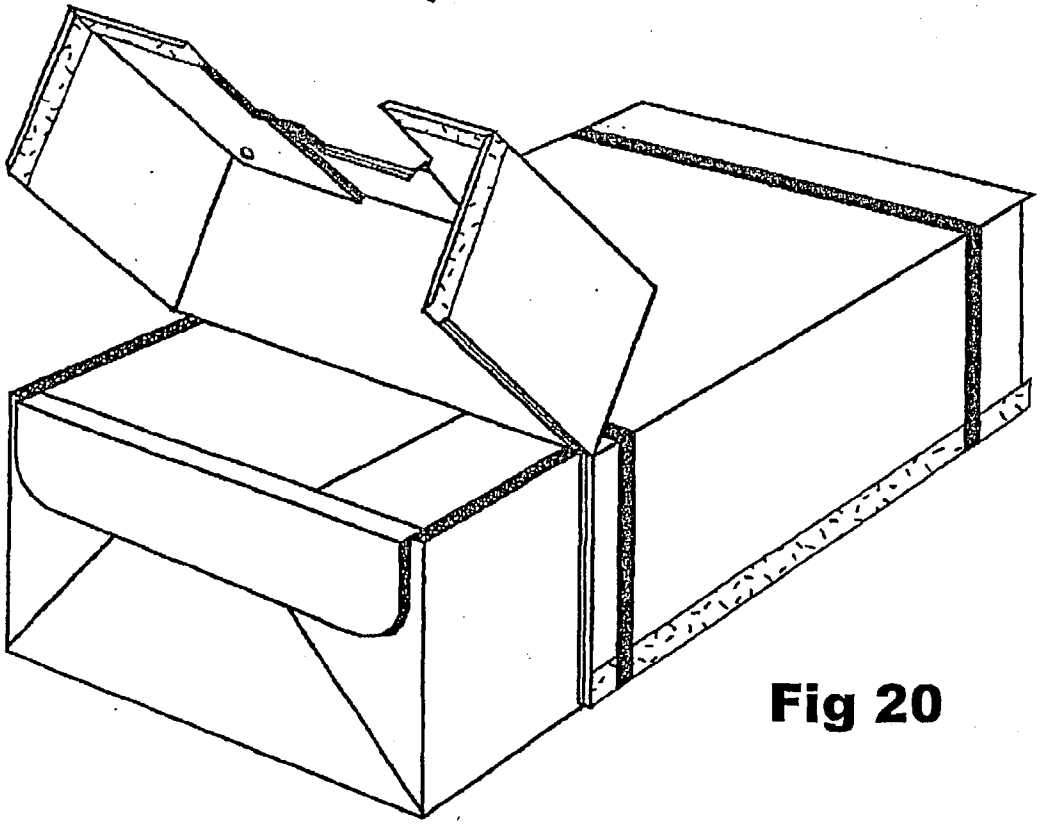


Fig 20

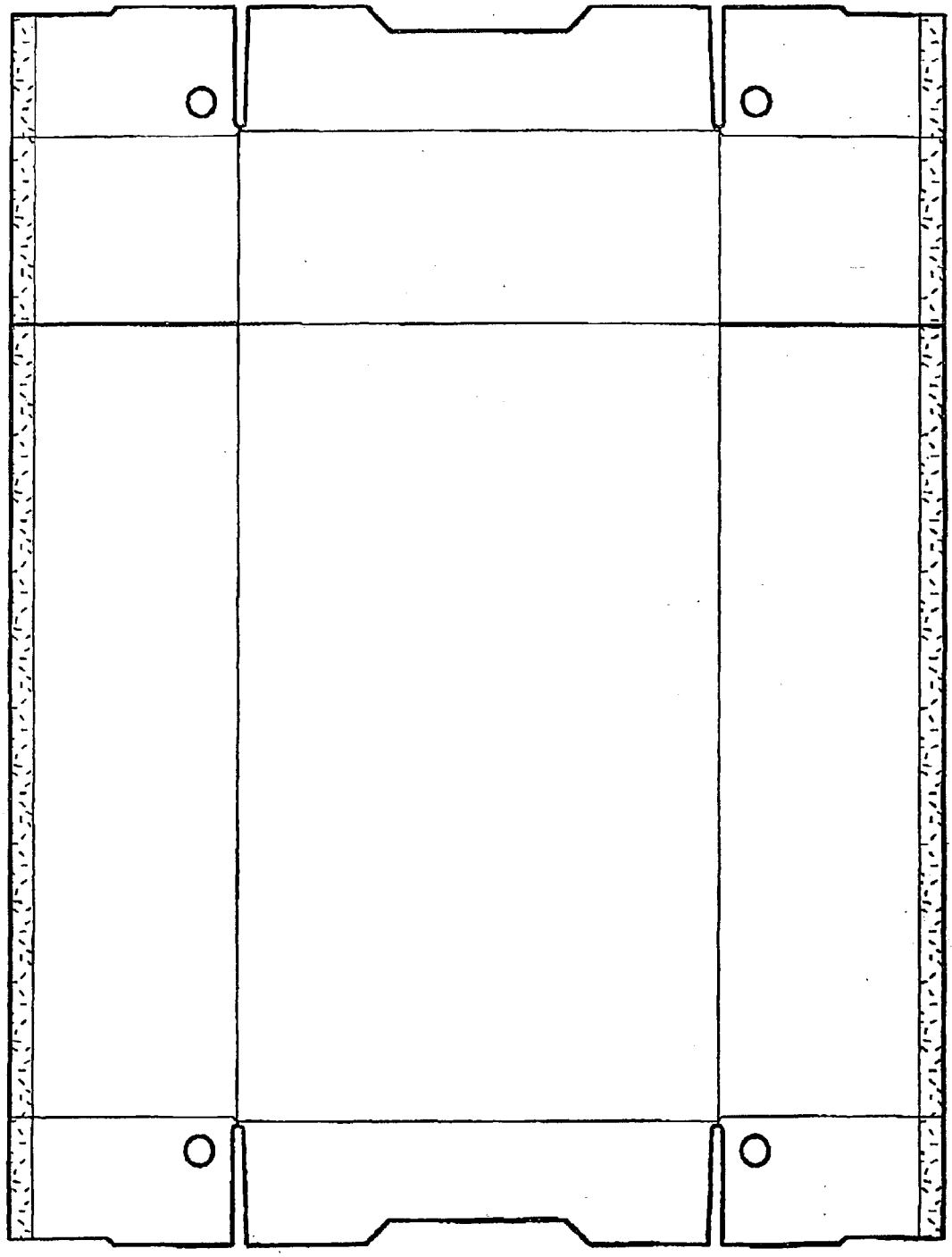


Fig 21

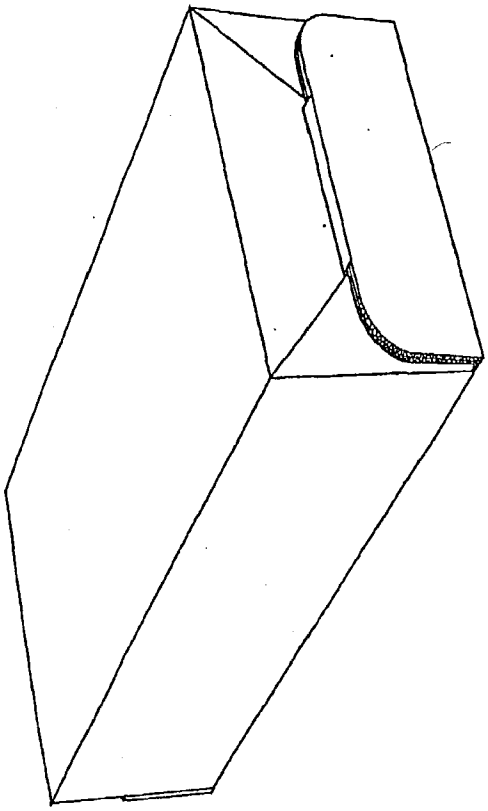


Fig 22

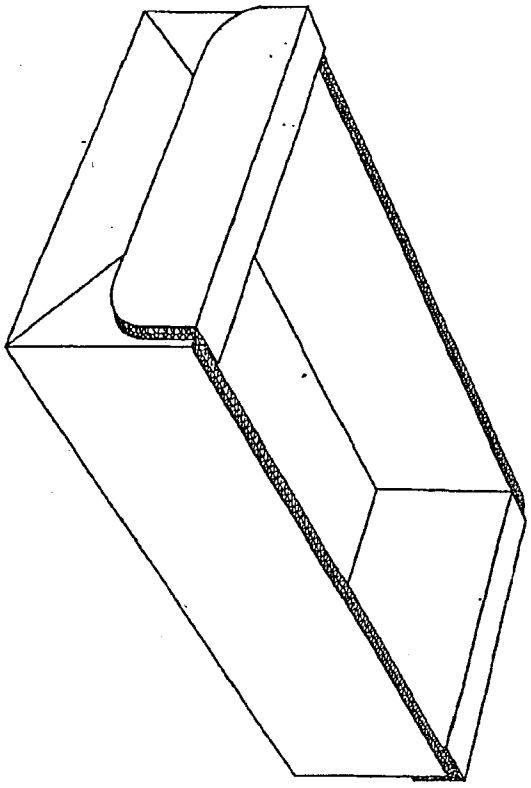
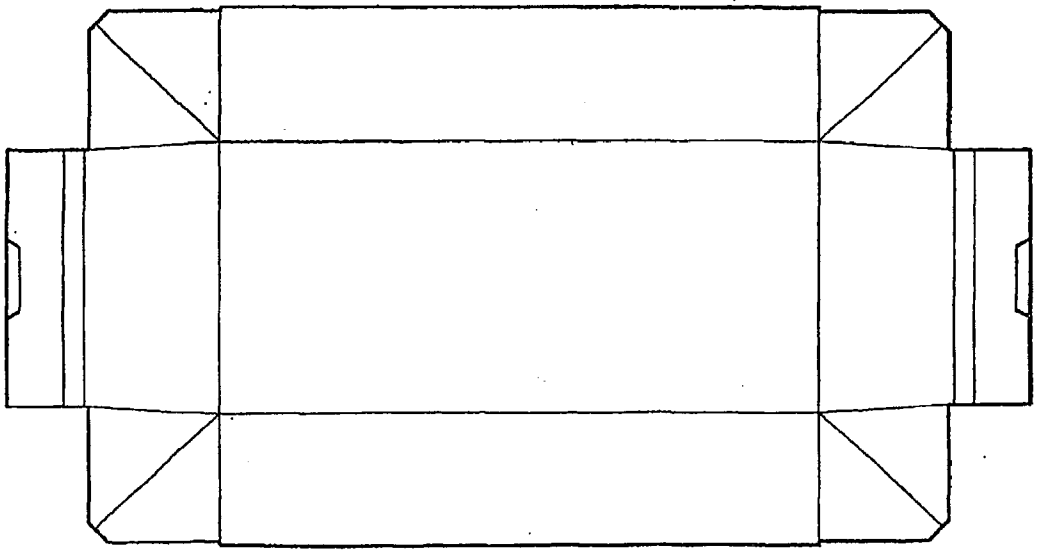


Fig 23

Fig 24



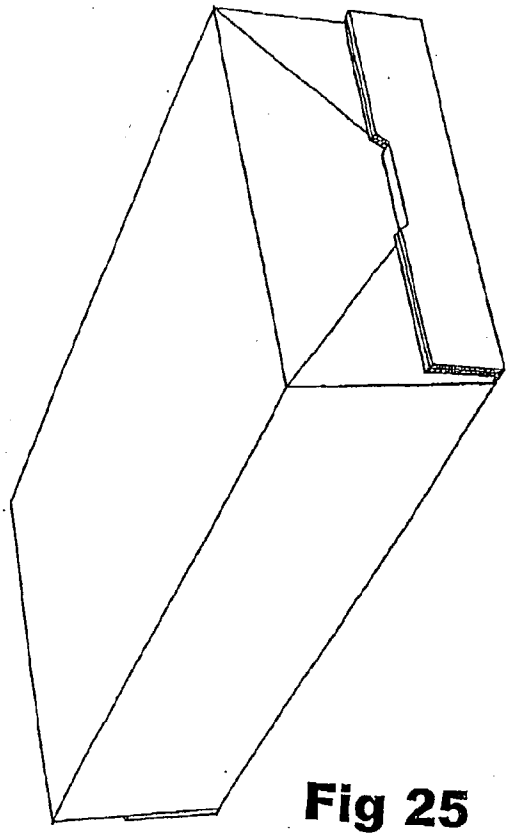


Fig 25

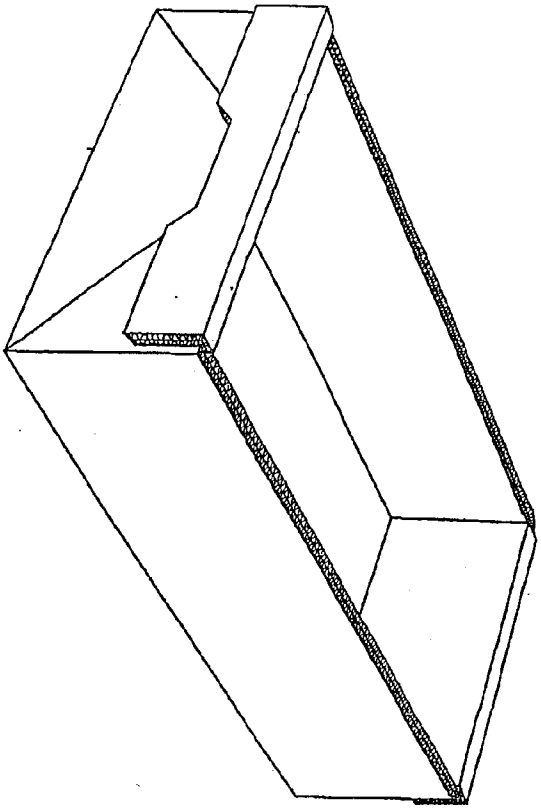


Fig 26

CASE

FIELD OF THE INVENTION

[0001] The present invention relates to a case of the type described more in detail in the preamble of claim 1. With the term "case" is in this connection meant a trough-like bottom portion with or without a lid as well as only a lid separately. The present invention also relates to a method of manufacturing a case according to claim 1.

BACKGROUND OF THE INVENTION

[0002] The invention particularly relates to cases for food products, particularly fresh fish, e.g. salmon from salmon breedings. Such cases have so far been made of materials, which can resist moisture, i.e. wood, metals or plastic materials. However, none of these materials can without special considerations and construction measures be regarded as harmless to the environment and sanitary, since it is inherent in the nature of these materials, that a recycling ought to be realized due to economic and other reasons. However, a recycling is a very lengthy, time consuming and expensive procedure, since the relatively expensive starting product must be subjected to a reliable cleaning, control and possibly repair work as well as a returning to the starting point. Consequently a recycling is not considered in praxis.

[0003] Applicant then discovered, that it is possible to use a more typical one-way material, i.e. cardboard or corrugated cardboard, which is provided with one or several very thin plastic layers as a barrier against moisture. Applicant has also found, that this idea works quite well in praxis. However, stability and sanitation requirements have not been easily met in a fully satisfactory way and neither a frequent requirement, that the case for storage and transport reasons must be provided as a finished, prepared plane blank, which quickly, simply and reliably can be converted into a useful case in e.g. a filling station for fresh fish. Finally, problems can arise in connection with the arrangement of handles and the application or mounting of a lid respectively and also a disassembly of the case and the handles and the lid respectively to a plane blank again for removal to e.g. a recycling plant. Also a lid, the use of which not always is mandatory, can have its own weaknesses and not be compatible with the case in a desirable way respectively.

SUMMARY OF THE INVENTION

[0004] Thus, the object of the present invention is to, by using a manufacturing material, which is particularly suitable for an one-way use, further develop already known cases and cardboard-like constructions, in order to make them meet relatively high stability and sanitation requirements, make them heat insulating against the environment, make them allow a relatively simple and economic production, and let finished, prepared blanks be transformed to useful cases in a convenient, simple and quick way, e.g. in a filling station, let the handling of the cases be carried out in an advantageous way, e.g. in ergonomical respects, as well as let the disassembly for recycling purposes be carried out simply and expeditiously. Another object of the invention is to develop an optimally functioning lid, when a lid for the case is needed.

[0005] These objects are attained according to the present invention using a case of the type described in the introduction, which is constructed in the way set forth in the characterizing clause of claim 1.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] Additional characterizing features and advantages of the invention are set forth in the following description, reference being made to the accompanying drawings, which show a few preferred, but not limiting embodiments of the invention. The drawings show in detail in:

[0007] **FIG. 1 a** perspective view from above of a first embodiment of a finished case according to the invention;

[0008] **FIG. 2 a** perspective view from below of the case according to **FIG. 1**;

[0009] **FIGS. 3 and 4** views similar to **FIG. 1** of the same case in production and disassembly phases;

[0010] **FIG. 5 a** planar view of already punched and grooved respectively plane blanks for a case according to FIGS. **1-4**;

[0011] **FIGS. 6 and 7** views similar to **FIGS. 1 and 2** of a second embodiment of a finished case according to the invention;

[0012] **FIG. 8 a** planar view of an already punched and grooved respectively plane blank for a case according to **FIGS. 6 and 7**;

[0013] **FIG. 9 a** planar view of the interior of an already punched and grooved respectively blank for a lid according to the invention for any of the possible case embodiments;

[0014] **FIGS. 10 and 11** respectively cross sectional views of a corrugated cardboard material for case designs and lid designs respectively;

[0015] **FIG. 12 a** planar view from below/from the interior of a modified alternative lid according to the invention;

[0016] **FIGS. 13 and 14** perspective views from below and from above respectively of the lid according to **FIG. 9**;

[0017] **FIGS. 15 and 16** perspective views from below and from above respectively of the lid according to **FIG. 12**;

[0018] **FIG. 17 a** perspective view from above of a lid according to **FIGS. 9 and 13,14** respectively, mounted on a case according to any of the possible designs;

[0019] **FIG. 18 a** planar view of a blank for an additional embodiment of a case according to the invention as well as a few detailed views showing a few phases of the manufacturing process;

[0020] **FIG. 19 a** perspective view from above of an additional embodiment of a case according to the invention with a mounted and secured lid;

[0021] **FIG. 20 a** corresponding view of the same case with an upwardly folded lid section;

[0022] **FIG. 21 a** planar view of a blank for a lid according to **FIGS. 19 and 20**;

[0023] **FIG. 22 a** perspective view from below of a case made of a blank according to **FIG. 19**;

[0024] **FIG. 23 a** perspective view from above of a case according to **FIG. 22**;

[0025] **FIG. 24 a** planar view of a blank for an additional case design according to the invention;

[0026] **FIG. 25 a** perspective view from below of a case made of a blank according to **FIG. 24**; and

[0027] **FIG. 26 a** perspective view from above of a case according to **FIG. 25**.

DETAILED DESCRIPTION OF THE INVENTION

[0028] In FIGS. **1-5**, a case design is shown it its entirety, whereas in **FIGS. 6 and 8** a case design **1** is shown in its entirety. The two designs are substantially identical or similar, and thus the same reference numerals are used for both, but a prime sign is added for the second case design. The preferred manufacturing material of the two embodiments is corrugated cardboard, as seen in **FIGS. 10 and 11**, and this material is also preferred, when a lid **2** is manufactured, which suitably comprises a plain corrugated cardboard, i.e. a corrugated paper layer **4**, which on its two sides is coated with layers of paper and plastic.

[0029] The case or container **1** is made of a material having five layer sets **10**, **11**, **12**, **13**, **14**, the cross section of which can be seen in **FIG. 10**. Briefly, the first outwardly facing layer set **13** of the case has a very thin plastic layer **13***b* sandwiched between two sub layers of paper **13***a*, **13***c*. The second layer set **11** is a conventional sheet of corrugated paper. The third layer set **10** is an intermediate layer and is substantially the same as the first outwardly facing layer set **13**. That is, it is a very thin sub layer **10***b* of plastic material sandwiched between two sub layers of paper **10***a*, **10***c*. The fourth layer set **12** is a conventional sheet of corrugated paper. Finally, the fifth inwardly facing layer set **14** is made of a first layer **14***a* of paper, a first very thin layer of plastic **14***b*, a second layer of paper **14***c* and finally a second very thin layer of plastic **14***d*. These five layer sets **10**, **11**, **12**, **13** and **14** are adhered to each other by a water proof glue, for example, which mainly consists of corn starch or may be adhered to one another by any other suitable adhesive which is conventional and well known in the art.

[0030] More specifically, the case **1** is made of five sets of layers **10**, **11**, **12**, **13** and **14** having a total overall thickness of approximately 7 mm. The first outwardly facing layer set **13** is an exterior liner with a basis weight of about 220 g/m^2 and comprises a first sub layer **13***a* of about 60 g/m^2 basis weight bleached (white) strong paper; a second sub layer **13***b* of about 20 g/m^2 basis weight white polyethylene film; and a third sub layer **13***c* of about 125 g/m^2 basis weight non-bleached strong paper. The outwardly facing first sub layer **13***a* may also include about 10 g/m^2 basis weight water based friction enamel and/or about 5 g/m^2 basis weight water based print colors (preferably 2 colors, but up to 5 colors may be printed). The second layer set **11** is B flute (3 mm) corrugated cardboard paper having a basis weight of about 140 g/m^2 and may comprise, for example, 140 basis weight semi-chemical paper (for example, 50% recycled fiber and 50% new virgin fiber). The third layer set **10** is a paper layer having a basis weight of about 72 g/m^2 and comprises a first sub layer **10***a* of about 30 g/m^2 basis weight non-bleached strong paper; a second sub layer **10***b* of about 12 g/m^2 basis weight polyethylene film; and third sub layer **10***c* of about 30 g/m^2 basis weight non-bleached strong paper. The fourth layer set **12** is C flute (4 mm) corrugated cardboard paper having a basis weight of about 175 g/m^2 and comprises, for example, 175 g/m^2 basis weight semi-chemical paper (50% recycled fiber and 50% new virgin fiber). The fifth inwardly facing layer set **14**, forming an interior liner, has a basis weight of about 312 g/m^2 and may comprise, for example, a first sub layer **14***a* of about 140 g/m^2 basis weight bleached (white) strong paper; a second sub layer **14***b* of about 15 g/m^2 basis weight transparent polyethylene film; a third sub layer **14***c* of about 140 g/m^2 basis weight bleached (white) strong paper; and a fourth sub layer **14***d* of about 17 g/m^2 basis weight transparent polypropylene film.

[0031] **FIG. 11** represents a cross section of the lid **2**. The lid **2** is made of a material having three sets of layers **4**, **5** and **6**. Generally, the first outwardly facing layer set **5** has a very thin plastic layer **5***b* sandwiched between two paper layers **5***a* and **5***c*. The second middle layer set **4** is a single corrugated paper layer. The third inwardly facing layer set **6** has a first sub layer of paper **6***a* located adjacent the single corrugated paper layer **4**. A very thin first layer of plastic, forming the second sub layer **6***b*, is secured to a rear surface of the first sub layer **6***a*. A second layer of paper, forming the third sub layer **6***c*, is secured to a rear surface of the second sub layer **6***b*. A layer of aluminum foil, forming the fourth sub layer **6***d*, is secured to a rear surface of the third sub layer **6***c*. Finally, a second layer of plastic, forming the fifth sub layer **6***e*, is secured to a rear surface of the fourth sub layer **6***d*. The fifth sub layer **6***e* forms the inwardly facing surface of the third layer set **6**. These three layer sets **4**, **5** and **6** are adhered to each other by a water proof glue, for example, which mainly consists of corn starch or may be adhered to one another by any other suitable adhesive which is conventional and well known in the art.

[0032] More specifically, the lid **2** is made of three sets of layers **4**, **5** and **6** having in overall total thickness of approximately 4 mm. The first outermost layer set **5** forms an exterior liner and has a basis weight of about 194 g/m^2. This first layer set **5** comprises a first sub layer **5***a* of about 100 g/m^2 basis weight non-bleached strong paper; a second sub layer **5***b* of about 20 g/m^2 basis weight transparent polyethylene film and a third sub layer **5***c* of about 60 g/m^2 basis weight bleached (white) strong paper. The outwardly facing first sub layer **5***a* may contain, for example, about 5 g/m^2 basis weight of water based printing colors, about 7 g/m^2 basis weight of water based durability enamel, and about 7 g/m^2 basis weight water based friction enamel. The second layer **4** set comprises C flute (4 mm) corrugated cardboard having a basis weight of about 175 g/m^2 comprising 175 g/m^2 basis weight semi-chemical paper (50% recycled and 50% new virgin fiber). The third layer set **6** forms an interior liner set and has a basis weight of about 305 g/m^2. This third layer set **6** comprises a first sub layer **6***a* of about 125 g/m^2 basis weight non-bleached strong paper; a second sub layer **6***b* of about 15 g/m^2 basis weight transparent polyethylene film; a third sub layer **6***c* of about 125 g/m^2 basis weight non-bleached strong paper; a fourth sub layer **6***d* of about 25 g/m^2 basis weight aluminum foil; and fifth sub layer **6***e* of about 15 g/m^2 basis weight transparent polyethylene film.

[0033] The paper layers preferably have a thickness of about 20 μm and the plastic layers, suitably made of polyethylene, preferably have a thickness of about 15 μm. Corrugated cardboard materials of this type are particularly

suitable for recycling purposes and for direct contact with food products and are very strong and shape permanent as well as can resist moisture for a relatively long time without loosing the main part of its strength. Also they have very satisfactory heat insulating properties. The term "case" of course is in this connection to include a case with a lid or without a lid. The case design according to FIGS. **1-5** comprises a loose handle element **17**, which according to FIGS. **6-8** is made integral with the respective case blank, with reference number **17'**.

[**0034**] **FIGS. 5 and 8** show, that the blanks for a case according to the invention include a central rectangu-lar field **18** and **18'** respectively, to which via folding notches **19** and **19'** respectively and **20** and **20'** respectively on e.g. inner side **21** and **21'** respectively upwardly tiltable side walls **22** and **22'** respectively and **23** and **23'** respectively are attached. In a similar fashion end walls **26** and **26'** respectively and **27** and **27'** respectively are via folding notches **24** and **24'** respectively and **25** and **25'** respectively attached to the other two sides. The corner areas between walls adjacent to each other are filled up within the framework of a rectangular shape for the entire blank with folding lugs **28** and **28'** respectively, **29** and **29'** respectively, **30** and **30'** respectively, **31** and **31'** respectively, **32** and **32'** respectively, **33** and **33'** respectively, **34** and **34'** respectively and **35** and **35'** respectively. Folding notches **36** and **36'** respectively, **37** and **37'** respectively, **38** and **38'** respectively, **39** and **39'** respectively, **40** and **40'** respectively, **41** and **41'** respectively, **42** and **42'** respectively and **43** and **43'** respectively, also positioned on the inner side, will then facilitate a folding of said lugs towards the adjacent wall sides, whereas roughly diagonally between each pair of lugs outwardly directed folding notches **44** and **44'** respectively, **45** and **45'** respectively, **46** and **46'** respectively and **47** and **47'** respectively form a hypotenuse for each lug and separate the two lugs between themselves. According to a preferred embodiment the last-mentioned folding notches start in the corner point between the central field and two walls, adjacent to each other, but they end on the end wall side a few millimeters or a few centimeters from the outer corner point of the blank, which e.g. results in a folding shape having truncated corners, as is shown in **FIG. 3**. The folding notches mentioned above and below are every type of measure, which facilitates a folding. Thus, it is possible to use e.g. grooves, and/or embossings and/or perforations and/or partial cuts into the blank etc.

[**0035**] Whereas folding notches **24**, **36**, **38** and **25'**, **40'**, **42** and **24'**, **36'**, **38'** and **25'**, **40'**, **42'** respectively preferably are located along a folding line, folding notches **37** and **41** and **39** and **43** respectively tilt according to a preferred embodiment inwards towards the center of the respective end wall with an angle of 1-10°, preferably about 4°. This results in, that side walls **22**, **23** and **22'**, **23'** slightly tilt inwards towards the inlet opening of the case, which in its turn results in, that a lid will have a slightly larger play, when it is applied to the case and can be applied with a certain press fit during this final application phase respectively. Also, products in the case will be kept there with a slightly improved security. It is of course possible to also or as an alternative let folding notches **36** and **38** and **40** and **42** respectively tilt to the corresponding extent towards the center of side walls **22**,**23** and **22'**, **23'** respectively.

[**0036**] According to the invention the lug pairs are folded or left, when the walls are folded upwards to obtain a border shape, outside the walls and are then in their folded shape folded to abut the end walls (see **FIG. 3**). Then it is possible to use the truncated corner areas like levers, the side walls and the end walls being forcefully pressed against each other and possibly also somewhat into the material, which they are made of, in the final folding phase, which initially is shown in the upper right corner in **FIG. 3** and finally in the uppermost corner in **FIG. 3**. In this way initially existing gaps **48**, **49**, **50**, **51** and **48'**, **49'**, **50'**, **51'** respectively within the corner areas disappear and completely sealed corners are obtained, which is important as regards the sealing, the stability and the sanitation. In case the double-folded lug pairs had been positioned inside the walls, they had partly detrimentally influenced the interior of the case with the formation of unsanitary pockets and gaps and partly required a gluing and/or a stapling to one of the walls and to each other in a very efficient way in order to keep them sufficiently removed. However, since the inherent elasticity is very large, this would have been difficult to carry out, not least considering the strength of the double corruga-ted cardboard of this type and that the drawing apart-forces in this case are directed straight away from the gluing surfaces.

[**0037**] The finished, completely folded case (see the uppermost corner in **FIG. 3**) will then be supplemented to make it portable by attaching loose handle elements **17** having a width, which corresponds to the width of the end walls, and consisting of three fields, namely one field **52** for e.g. gluing the handle elements onto the inner side of the end walls, one field **53** for bridging the total thickness of the end walls and the lug pairs, folded against the end walls, and which lug pairs can be glued onto each other and/or onto the end walls, the latter however preferably being avoided, and one field **54** for gluing in preferably only two points on the outer side of lugs **28** and **30** and **34** and **34** respectively. It is important to note, that possibly resulting drawing apart forces in this case design act like shear stresses, i.e. within substantially the same plane as the glue surfaces, which can be held together much more efficient against such forces than in the case described above. Field **54** has along its free longitudinal edge a central, substantially trapezoidal recess **55** with a tongue **56**, inserted into the innermost portion of the recess. This tongue extends in the longitudinal direction parallel to central field **18**, which is tantamount to the bottom of the case, and is attached to field **54** solely via a longitudinal side, which initially is formed by a folding notch **57** on the side facing the end wall. The tongue is folded inwards against the end wall at an angle of about 90° and is supported in its inwardly folded position with its short sides also by the obliquely downwardly directed double-folded edges of the lug pairs. Thanks to the double-folded lug pairs there is also a certain space between field **52** and the respective end wall, and thus, it is easier to hold the case within this area. The inherent elasticity of the lug pairs is also conducive to the maintenance of a space, which is slightly larger than the above mentioned space due to a budging caused by the elasticity of the material and the structure, and consequently the tongue can be made slightly wider than the total thickness of the end wall and the lug pair and satisfactory gripping features can be obtained at minimal costs, the end walls simultaneously being pressed against the side walls. Applicant has also found, that the shape of the case very closely approaches the parallelepiped shape and that e.g. inappropriately curving case parts are avoided. Handle element **17** suitably is made of a strong cardboard material,

which will protect and reinforce the sensitive fastening areas of the case in an optimal way. The folding notches of the handle element and possibly of the case blank suitably are supplemented by embossings, which consequently on the side, which faces e.g. the grooves as folding notches, becomes elevated, an advantageous hinge-like effect being promoted. Since said folding notch tiltings result in, that the upper edges of the double-folded lug pairs extend slightly obliquely towards the center of the end walls, an advantageous effect of the handle elements resides in the fact, that they completely conceal such oblique extensions.

[0038] **FIG. 4** indicates, that the recycling will be rather simple, since the glue fastening of the outer handle element field can be torn apart manually or by means of a tool and then the case blank can be unfolded in order to obtain a plane blank shape, the handle element remaining, fastened to the inner side of the end walls, or it is also possible to tear apart this connection in order to recover the handle elements separately.

[0039] Case design **1'** according to FIGS. **6-8** differ from case design **1**, described above, only to the extent, that handle elements **17'** are integral parts of the case blank, the end walls, fastening fields **52** being eliminated, via folding notches merging into fields **53'** and **54'**. A certain small waste in the corner areas between the lugs and the handle element results in this way. The wave shape is in this case suitably parallel to the side walls, whereas in the former case it preferably extends at right angles to these walls, as the drawings show.

[0040] Lid **2** has a central rectangular field **58**, which is slightly larger than the outer dimensions of case **1** and case **1'** respectively. Border parts **63**, **64**, **65**, **66** are via folding notches **59**, **60**, **61**, **62** positioned adjacent this field, which border parts between themselves in the corner areas via folding notches **67**, **68**, **69**, **70**, **71**, **72**, **73**, **74** include lugs **75**, **76**, **77**, **78**, **79**, **80**, **81**, **82**, which by means of diagonal folding notches **83**, **84**, **85**, **86** in pairs are separated from each other. However, the free outer edges of the lugs are slightly oblique inwards, seen from the border part, from which the edges project, an obliquely, downwardly, towards field **58** directed extension of the free edges of the lugs being formed, when the lug pairs are folded. Thanks to this incline flaps **102**, **103**, adjacent to the side border parts via double-folding notches **104**, **105** will not be stretched too much away from said side border parts, against which the flaps will abut from within. Short rectangular projections **87**, **88**, **89**, **90** will in this way be forced into the side edge areas of field **58**, which on the inner side **91** are provided with flat recesses **92**, **93**, **94**, **95**, which suitably are cut into only the innermost paper layer. The projections are hooked there behind sections, comprising the inner longitudinal edges of the recesses, and consequently lock the flaps in their inwardly folded positions with the double-folded lugs between themselves and the side border parts. The wave shape suitably extends at right angles to the flaps.

[0041] The border parts on the end wall sides are at their free longitudinal edges provided with cuts **96**,**97**, which converge towards the central field, and between the inner ends of said cuts double-folding notches **98**, **99** extend. In this way trapezoidal locking flaps **100**, **101** are formed, which are folded inwards and downwards subsequent to the folding upwards of the border parts in order to with their points be directed towards the end areas of the side wall border parts and lock them in their positions. At the same time also a double-function is obtained in this way, since the end wall border parts within the areas, cut out in this way, open the access to the handle elements of the case design and form gripping elements jointly with them respectively. Such gripping elements are always active for the case but also for the lid, provided the case and the lid applied on the case, are fastened to each other, e.g. by surrounding them with locking tape or the like.

[0042] As an alternative to or despite a lid the open side of the case can be provided with an e.g. film-like closure, preferably with a possibility to reclose it or with special means, designed for this purpose, e.g. a "window" in the film, which is overlapped by a film having self-adhesive edges. It is also possible to provide the lid with such a "window". Is it not desirable to be able to reclose the closure; it never the less may be desirable to define the "window" by means of a so called tear tape. In this way products and supplements to them, e.g. ice and water respectively, can be introduced into and be removed from respectively the case according to desires. If the case will be used to keep e.g. fish, it is suitable to place a liquid-absorbing layer at the bottom of the case.

[0043] One embodiment of such a lid **2'**, which primarily is designed for cases as air-freight to foreign countries, often with a warm climate, is shown in **FIG. 12**. The lid has a central field **58'** and side walls **63'**, **64'** and end walls **65'**, **66'** respectively, attached to it via folding notches, **59'**, **60'** and **61'**, **62'** respectively. Lugs **106**, **107**, **108**, **109** are attached to the short sides of the end walls via folding notches **67'**, **69'**, **71'**, **73'**, gaps **110**, **111**, **112**, **113** being provided between them and the intermediate end walls by allowing the short sides of the latter converge outwards and/or by slightly displacing the sides of the former, which are exposed to these short sides, and in relation to the folding notches of the side walls. The folding notches of the lugs suitably are slightly displaced towards each other in relation to the folding notches of the end walls.

[0044] Such a lid blank is formed to a lid by folding the lugs 90° relation to the corresponding side walls, and the latter are folded 90° in relation to the central field. Subsequently the end walls are folded and will abut against and be fastened by gluing and/or stapling to the lugs.

[0045] For recycling purposes subsequent to the use of a case, it is suitable to unfold the lid blank, which is possible according to the invention without tearing apart the connection between the lugs and the end walls. To accomplish this folding notches **114**, **115**, **116**, **117** in the side walls start from the inner end of said gaps at an angle of 45° in relation to the outer edges of the side walls, defining folding notches all the way to the free longitudinal edges of the side walls. In this way it is possible, by one folding around said folding notches and another along the folding notches belonging to the short sides of the side walls, to unfold the blanks without tearing apart any connections, even if double-foldings exist.

[0046] Field **58'** is in its center provided with two transverse cuts **118**,**119**, which are made up to their closed shapes by means of partly a tear tape **120** between some of the cut end areas and partly a folding notch **121** between the rest of the ends in order to obtain a hinged cover **122**. The tear tape is interrupted in the center by a locking tongue **123**, turned

away from the folding notch and cut out from field **58'** at the sides and at its free end and having preferably slightly bulging side edges in order to form additional retaining means. The shoulder area of the locking tongue is formed by a folding notch **124**, which facilitates the folding of the locking tongue in order to allow it to be inserted into a locking hole **125**, already described. The tear tape preferably is applied uninterrupted along the entire lid blank in connection with the manufacture of the material for the blank or when the treatment of the blank is continued. When said cuts **118,119** are made through the blank and also when the locking tongue is punched, these cuts penetrate the tear tape. In the end areas of the cuts cut out gripping ears **126,127** are arranged around the tear tape; the tear tape parts between the cuts and the locking tongue can be gripped and removed by means of the gripping ears.

[**0047**] A spacer pad **128** of e.g. cardboard and with dimensions, which are slightly smaller than central field **58'**, is fastened, preferably glued, to the underside of the central field. This pad has below cover **122** a slightly smaller U-cut **129**, a smaller inner cover **130** being formed, the base line (folding notch) of which comprises e.g. a double or triple groove **131**, which coincides with the folding notch of the outer cover. The spacer pad comprises around the inner cover a shoulder step **132** for the outer cover to prevent, that the two covers will be pressed into the interior of the lid. Finally there is in the spacer pad outside the U-web said locking hole **125** for an insertion of the locking tongue, when the covers are opened up for e.g. an ice filling and a closing again. In addition to the function of creating a reclosable hole in connection with the central field of the lid the spacer pad is also designed to have heat insulation, shock absorption and possibly supplementary moisture isolation properties. The sides of course do not need this, since several walls and lugs etc. overlap each other. In this way a high and valuable heat, shock and possibly moisture isolation in the area of the entire lid is obtained, despite cost advantages obtained by manufacturing the lid of plain cardboard.

[**0048**] Such a lid according to the invention may weigh only about 1-1.5 kg and hold 20-25 kg fish. We have found, that the stability, life, sanitary quality, simple and economic production as well as disassembly for recycling come up to high expectations.

[**0049**] The invention is not limited to the embodiments described above and shown in the drawings, which solely are to be regarded as not limiting embodiments, which can be modified and supplemented in an arbitrary fashion within the scope of the inventive idea and according to the accompanying claims. Also, in special situations corrugated cardboard as a manufacturing material can be completely or partially replaced by non-corrugated paper board and/or a plastic material and/or a metal, and yet the typical corrugated cardboard structure may be retained. The folding lug pairs can of course be formed as to dimensions and design in such a way, that they form a part of the gripping elements in connection with the handles.

[**0050**] In the case design, shown in **FIG. 18**, there are a few transverse through drainage holes, preferably arranged within the lower corner area of the end walls, which are used as outlets for melted ice, if the case is to be used as a fish case, which contains ice primarily for road and sea transport. These holes are made preferably by providing the e.g. double-corrugated cardboard material with punched holes. Then finger-like nozzles are inserted into the holes, in a machine, which folds and glues the bottom blanks to their finished shape, according to **FIG. 18*a***, until a stop flange on the nozzles abuts the wall material, which surrounds the holes. The nozzles have then with their points penetrated the holes and ended up with outlet openings for melted adhesive roughly in the middle of the depth of the hole. Adhesive is introduced and simultaneously the nozzles are rotated. A die is now driven towards the side, which is turned away from the nozzles, against and around the nozzle points and against the wall material around the holes, which material is forcefully compressed between the die and nozzle flange. The introduced melted adhesive penetrates and is pressed into the material around the holes and solidifies immediately, a sealing of the hole wall being obtained, which stops water from penetrating into the wall material and softening it (see **FIG. 18*b***).

[**0051**] The lid according to **FIG. 19**, which preferably is combined with a case according to FIGS. **1-17**, is particularly suitable for airplane transport, when drainage of melted ice is not suitable and instead an absorber, known per se, for melted ice, is positioned at the bottom of the case. However, a subsequent so called icing up, i.e. that somewhere along the way from a filling station to the receiver ice is filled, is considered important. To accomplish this in a relatively simple, quick and in additional regards appropriate way, a lid is provided according to the invention, mainly corresponding to one or several of the already described/shown embodiments, in which however the longitudinal border sides of the lid, suitably at a small distance from one of the end walls, are slotted all the way to the main plane of the lid, e.g. parallel to said end wall. This slotting is done in connection with the punching, grooving, perforating or the like of the lid blank, suitably also a downwardly open recess being done in the two end walls, which facilitates the gripping of the lid and the case in their handle elements at about the same level and which leaves free a field on the end walls of the case for e.g. labels or the like. The field, which constitutes the main plane of the lid, is provided between the two adjacent slotting ends with grooves, perforations or the like, a hinge action being allowed. Such a lid blank is provided according to **FIG. 21** in its plane condition with a protective tape along the two elongated sides, i.e. a tape strip covers e.g. a centimeter or two along the inner side and the outer side and consequently covers the moisture sensitive underside. In order to be able to draw the blank through an edge tape application device there are e.g. gripping holes in the inner corners of the outer corner lugs.

[**0052**] When the protective tape has been applied, the lid is folded and glued, stapled or the like to obtain its finished shape according to **FIG. 19**. Said cut is then not functioning and a strapping or the like is stretched around the lid, applied on the case, straight above the section, which extends from the adjacent end wall and all the way to said "hinge line" (see **FIG. 19**). If an icing up, an inspection or the like is required, the strapping is displaced towards and past said hinge line and the protective tape is split along the cuts and then the detached cover can be lifted up towards the main field of the lid, and an inspection, an icing up, possibly a limited product removal and the like can be done (see **FIG. 20**). A reclosure is done by lowering the lid and pushing back the strapping to its original position, which consequently

will keep the cover in place and keep the lid and the case together, a very advantageous double function being achieved.

[0053] **FIGS. 19 and 20** show, that strappings suitably can be placed around the two ends of finished packs. It is of course possible to arrange said covers at both lid ends. It is also possible to form such covers by means of a cutting or a tearing element, which runs substantially in a central position straight across the main field of the lid and which continues straight through the borders or stepwise through the folding notch between the borders and the main field and through the borders to obtain foldable lugs. Such a design is advantageous, since one or both end covers of the lid can be kept in place, until the contents of the pack has been removed or even subsequent to such a removal. One or both main fields of the lid and the "central covers", formed by the adjacent border parts, can then as a matter of choice be opened up, possibly with a preceding folding of said lugs, in order to prevent, that the border parts will stop an opening up. One of several additional strappings, adhesive tape pieces or the like can be used to keep the covers in place after an opening up and a closing back, and then the lowering of said border lugs can also contribute to a durable reclosure. The "end covers" or the "central covers" can also allow access to divided compartments in a case, e.g. one compartment for only ice.

[0054] Finally it is possible to form a cover by extending two cuts along the same side a small distance into the main field of the lid and connect the existing cut ends in this field by means of a "hinge line".

[0055] In all these cases a protective tape can also cover the cuts, since it is easy, in a later phase, to divide the tape along the cuts. Before the tape is divided, it has a protective as well as uniting action. In this connection it is also possible to use an adhesive tape, which can be reapplied, provided a suitable surface for this purpose is available, e.g. an underlying smooth surface having a suitable adhesion and release ability.

[0056] The design according to **FIG. 24** is particularly suitable for an automatic mechanical transformation to an upwardly folded lid. Between the corner lugs, which jointly looks like two triangles, an end wall side is included on each short side of the blank, the side edges (folding notches) of the end wall side including a smaller angle then 90°, preferably 86°, in relation to the base side, which also is a folding notch. Initially the two longitudinal sides are folded upwards in relation to the central field, which constitutes the bottom, e.g. about 70°, which is considered sufficient. Thanks to said angle, which is less than 90°, the folding lines between said corner triangles will force them to fold with their hypotenuses outwards, particularly around the central field, and the end walls will be kept in place on a plane support surface. When the end wall sides later are folded upwards against the central field and are folded more than about 100°, the corner lugs will always automatically pivot about said folding notch, which is less than 90° in relation to the base line, and turn towards the outer side of the end walls, to which they will later be attached in any of the ways already described in this text. At least the longitudinal sides will, thanks to the described and shown design, slightly tilt inwards, which facilitates the mounting of a possible lid and stabilizes the construction even more. It is shown in **FIGS. 7 and 8**, that the handle lug, which is attached to each end wall, is applied around the double-folded corner lugs and it is subsequently, jointly with the gripping lug, punched out of the sides, inserted into the area between the double-folded corner lugs.

1. A case (**1**;**1'**) with a lid (**2**), particularly designed for packing, storing and transporting food stuffs, e.g. fresh fish, manufactured from a substantially plane blank, which includes a central rectangular field (**18**;**18'**), to which e.g. via folding notches (**19**;**19'** and **20**;**20'** and **24**;**24'** and **25**;**25'**), arranged on the inside (**21**;**21'**), upwardly foldable side walls (**22**;**22'** and **23**;**23'**) and end walls (**26**;**26'** and **27**;**27'**), respectively, are attached, whereas the corner areas bet-ween walls adjacent each other are filled with folding lugs (**28**;**28'**, **29**;**29'**, **30**;**30'**, **31**;**31'**, **32**; **32'**, **33**;**33'**, **34**;**34'**, **35** ;**35'**), which in pairs are mutually separated by substantially diagonally outwardly directed folding notches (**44**;**44'**,**45**;**45'**,**46**;**46'**, **47**;**47'**), and which are designed to be folded together in pairs in order to abut against an adjacent wall and be fastened to it, the folding lug pairs being designed to in a folded condition be folded on the outside of an adja-cent end wall, a handle element (**17**;**17'**) being designed to be folded around such an end wall in order to in a lever-like way exert a press action of two walls adjacent each other against each other, the folding lug pairs folded away in this way being included, the handle element being designed to be fastened to the outside of these folding lug pairs, their total thickness, inherent elasticity and mutual distance being utilized to achieve an increased gripping depth and where appropriate extra gripping action jointly with the handle element, a lid comprising a plane main field and adjacent border parts, (characterized in that) in order to form one or several covers, which can be opened up and reclosed again, said border parts and possibly said main field in at least one area being cut through and between such through cuts being provided a hinge notch interconnecting the ends of the said cuts within the main field in the form of a groove, perforation or the like, said through cuts, up to the time, when said hinge function is to be utilized, being held together jointly with the adjacent lid material by means of a protective tape, which is provided to be removed and/or be applied again, or the like.

2. A case according to claim 1, characterized in that the case (**1**;**1'**) and the lid (**2**), respectively, entirely or partially are made from corrugated cardboard, the lid preferably being made from plain corrugated cardboard (**3**), i.e. a corrugated paper layer (**4**), which on its two sides is coated with a plane paper layer (**5** and **6** respectively), preferably with a very thin plastic layer (**7** and **8** respectively) as a moisture barrier between them, in that the corrugated cardboard paper (**9**) suitably is double, i.e. that corrugated paper layers (**11** and **12** respectively) face a plane, preferably on at least one of its sides plastic-coated paper layer (**10**) on both sides, which corrugated paper layers in their turn face plane, outer paper layers (**13** and **14** respectively), preferably with intermediate thin plastic layers (**15** and **16** respectively) as a moisture barrier, in that the paper layers preferably have a thickness of about 20 μm, and in that the plastic layers preferably has a thickness of about 15 μm.

3. A case according to claim 1 or **2**, characterized in that a blank for the case includes a central rectangular field (**18** and **18'** respectively), to which two upwardly foldable side walls (**22** and **22'** respectively and **23** and **23'** respectively) are attached via folding not-ches (**19** and **19'** respectively and **20** and **20'** respectively) on e.g. the inner side (**21** and **21'**

respectively), in that via folding notches (**24** and **24'** respectively and **25** and **25'** respectively) end walls (**26** and **26'** respectively and **27** and **27'** respectively) are attached to the two other sides, and in that the corner areas between walls adjacent each other are filled, preferably within the framework of a rectangular shape for the entire blank, with folding lugs (**28** and **28'** respectively, **29** and **29'** respectively, **30** and **30'** respectively, **31** and **31'** respectively, **32** and **32'** respectively, **33** and **33'** respectively, **34** and **34'** respectively and **35** and **35'** respectively), in that preferably also on the inner side positioned folding notches (**36** and **36'** respec-tively, **37** and **37'** respectively, **38** and **38'** respectively, **39** and **39'** respectively, **40** and **40'** respectively, **41** and **41'** respectively, **42** and **42'** respectively and **43** and **43'** respectively) are designed to allow a folding of said lugs towards the adjacent wall sides, whereas substan-tially diagonally between each lug pair outwardly directed folding notches (**44** and **44'** respec-tively, **45** and **45'** respectively, **46** and **46'** respectively and **47** and **47'** respectively) form a hypotenuse for each lug and mutually separate the lug pairs, and in that the last-mentioned folding notches in the corner point are located between the central field and two walls adja-cent each other but preferably end on the end wall sides at a distance from the outer corner point of the blank in order to obtain a folding shape with truncated corners.

4. A case according to claim 3, characterized in that the folding notches (**24,36, 38** and **25,40,42** and **24', 36', 38'** and **25', 40', 42'** respectively) between the side walls and the folding lugs as well as between the central field and the end walls preferably are located along a folding line, and in that the folding notches (**37** and **41** and **39** and **43** respectively) between the end walls and the folding lugs tilt inwards towards the center of the respective end wall with an angle of 1-10°, preferably about 4°, the side walls (**22, 23** and **22'** and **23'** respectively) slightly tilting inwards towards the inlet opening of the case in order to give a possible lid a slightly larger play for a mounting and a certain press fit respectively during the final application phase.

5. A case according to any of claims **1-4**, characterized in that the finished, folded case is designed to be supplemented to a shape, which can be carried by means of handle elements (**17;17'**) having a width, which corresponds to the width of the end walls and including a field (**53;53'**) designed to bridge the total thickness of the end walls and the lug pairs, folded against them, and a field (**54;54'**) for fastening, preferably by gluing, preferably in solely two points on the outside of the lugs (**28;30** and **32;34** and **28'; 30'** and **32'; 34'** respectively) folded against the end walls.

6. A case according to claim 5, characterized in that the field (**54;54'**), designed to be fastened to the lugs, folded against the end walls, has along its free longitudinal edge a central, substantially trapezoidal recess (**55;55'**) with a tongue (**56;56'**), inserted into the innermost part of the recess, which tongue extends longitudinally and parallel to the central field (**18;18'**) and is connected to the first-mentioned field (**54;54'**) solely via a longitudinal side, which suitably is formed by a folding notch (**57;57'**) on the side facing the end wall, and in that the tongue is designed to be folded inwards towards the end wall with an angle of about 90° and be supported in the inwardly folded position with its short sides also by the obliquely downwardly directed double-folded edges of the inwardly folded lug pairs.

7. A case according to claims **1-5**, characterized in that the handle elements (**17'**) are integral parts of the case blank (**1'**), the end walls on the side facing the central field (**18'**) merging into fields (**53'** and **54'**) for said handle elements, or in that the handle elements (**17**) are designed as loose elements, preferably being made from a strong cardboard material, a field (**52**) being connected to said bridge field (**53**) and being designed to be fastened, preferably by gluing, to the inner side of the respective end wall.

8. A case according to any of claims **1-7**, characterized in that the lid (**2**) has a central rectangular field (**58**), which is slightly larger than the outer dimensions of the case (**1** and **1'** respectively), which field via folding notches (**59,60,61, 62**) adjoins border parts (**63, 64,65,66**), which between them in the corner areas via folding notches (**67,68,69,70,71,72, 73, 74**) include lugs (**75,76,77,78,79,80,81,82**), which by means of diagonally extending folding notches (**83,84,85, 86**) in pairs are mutually separated, and in that the free outer edges of the lugs preferably slightly tilt inwards in relation to the border part, from which the edges project, an obliquely, downwardly towards the field (**58**) directed extension of the free edges of the lugs being formed, when the lug pairs are folded, and in that flaps (**102,103**) are located adjacent to the side border parts, preferably via double-folding notches (**104,105**), and de-signed to from within abut said side border parts, in that e.g. short rectangular projections (**87, 88,89,90**) are designed to be inserted into the side edge areas of the control field (**58**), which on the inner side (**91**) are provided with smooth recesses (**92,93, 94,95**), suitably only cut in the innermost upper layer, and in that the projections are designed to hook behind cuts, which constitute the inner longitudinal edges of the recesses, and in this way lock the flaps in their inwardly folded position, the double-folded lugs being positioned between the flaps and the side border parts.

9. A case according to claim 8, characterized in that the border parts of the lid (**2**) on the end wall sides at their free longitudinal edges are provided with cuts (**96,97**), which converge towards the central field (**58**), e.g. double-folding notches (**98,99**) extending between the inner ends of said cuts in order to form trapezoidal locking flaps (**100,101**), which are designed to be folded inwards and downwards in relation to the upwardly folded border parts in order to be directed with their points towards the end areas of the side border parts and lock them in their position, and simultaneously allow a double function, since the end wall border parts with their cut out areas leave free an access to the handle elements of the case and form gripping means jointly with them respectively, which gripping means are designed to always be active for the lid but also for the case, if the case and the lid, mounted on it, are fastened to each other, e.g. by means of a surrounding locking tape or the like.

10. A case according to any of claims **1-9**, characterized in that as an alterna-tive to and in addition to a lid respectively the open side of the case is provided with an e.g. film-like closure, preferably having a reclosure capacity or special means for this, e.g. a win-dow, in the film, which is overlapped by a film having self-adhesive edges, and/or that the central field (**58'**) of the lid (**2'**) is provided with two transverse cuts (**118,119**), which are supplemented to obtain a closed shape by partly a tear tape (**120**) between one pair of cut end areas and partly a folding notch (**121**) between the other pair of cut ends to obtain a pivotable cover (**122**), the tear tape preferably being broken off in a central area by a locking tongue (**123**), cut out along the sides and at its free and out of the central field (**58'**) and directly away from the

folding notch (**121**) slightly bulging side edges to form additional retaining means, in that the shoulder area of the locking tongue is formed by a folding notch (**124**), which facili-tates the folding of the locking tongue for an insertion into a locking opening (**125**), in that the tear tape preferably is applied continuously along the entire lid blank (**2'**) and is designed to be cut into two parts by means of said cuts (**118,119**) as well as the lateral cuts of the locking tongue, the gripping ears for the tape sections between these cuts being cut out around the ends of said tape sections facing each other, in that below the central field (**58'**) preferably a spacer pad (**128**) is fastened, preferably made of corrugated cardboard and having slightly smaller dimensions than said field, which spacer pad below said cover (**122**) has a slightly smaller U-cut (**129**) than the above-mentioned cover to form a smaller inner cover (**130**), the base line of which is a folding notch (**131**), which coincides with the folding notch of the outer cover, in that the spacer pad forms around the inner cover a shoulder step (**132**) for the outer cover, and in that the spacer pad outside the web and the U-cut (**129**) is provided with said locking opening (**125**) for insertion of said locking tongue, when the covers have been opened up and a reclosure is to be carried out.

11. A case according to claim 1, characterized in that the longitudinal border sides of the lid, suitably at a small distance from one of the end walls, are slotted all the way to the main plane of the lid, preferably parallel to said end wall, which slotting is provided in connection with the punching, grooving, perforating or the like of the lid blank, also a down-wardly open recess being provided in the two end walls, which facilitates the gripping of the lid and the case in their handle elements at about the same level and which leaves free a field on the end walls of the case for e.g. labels or the like.

12. A case according to claim 1 or **11**, characterized in that the field, which constitutes the main plane of the lid, is provided between the two adjacent slotting ends with grooves, perforations or the like aloowing said hinge action, a blank for such a lid being pro-vided, in its plane condition, with a protective tape along the two elongated sides, namely a tape strip covering e.g. a centimeter or two along the inner side and the outer side and conse-quently covering the moisture sensitive underside of said border sides, preferably gripping holes for an edge tape application device being provided in the inner corners of the outer cor-ner lugs.

13. A case according to any of claims **1** and **11-13**, characterized in that, upon application of the protective tape, the lid is provided to be folded and glued, stapled or the like to obtain its finished shape, whereby said cuts are prevented from functioning, a strap-ping or the like being provided to be stretched around the lid applied on the case, straight above the section, which extends from the adjacent end wall and all the way to said hinge line, and that, in case of icing up, an inspection, a limited product removal or the like, the strapping is provi-ded to be displaced towards and past said hinge line and the protective tape being provided to be split along the cuts, the detached cover being provided to be lifted up towards the main field of the lid, a reclosure being provided to be effected by lowering the lid and pushing back the strapping to its original position to keep the cover in place and keep the lid and the case together, strappings suitably being provided to be placed around the two ends of finished packs.

14. A case according to any of claims **1** and **11-14**, characterized by a cutting or a tearing element, which runs substantially in a central position straight across the main field of the lid and which continues straight through the borders or stepwise through the folding notch between the borders and the main field and through the borders to obtain foldable lugs, one or both end covers of the lid being provided to be kept in place, until the contents of the pack has been removed or even subsequent to such a removal, one or both main fields of the lid and the central covers formed by the adjacent border parts being provided to be opened up, possibly with a preceding folding of said lugs, in order to prevent, that the border parts will stop an opening up, one of several additional strappings, adhesive tape pieces or the like being provi-ded to be used to keep the covers in place after an opening up and a closing back, the lowe-ring of said border lugs being provided to contribute to a durable reclosure, the end covers or the central covers being provided to allow access to divided compartments in said case, e.g. one compartment for only ice.

15. A case according to any of claims **1** and **11-14**, characterized by a cover formed by extending two cuts along the same side a small distance into the main field of the lid and connect the existing cut ends in this field by means of a hinge line.

16. A case according to any of claims **1** and **11-15**, characterized by a protective tape covering the cuts and being adapted to, in a later phase, be divided along the cuts, the protective tape being provided, before division, to serve as a protective as well as a uniting means, the tape possibly being an adhesive tape, which can be reapplied, a suitable surface for this purpose being provided, e.g. an underlying smooth surface having a suitable adhesion and release ability.

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