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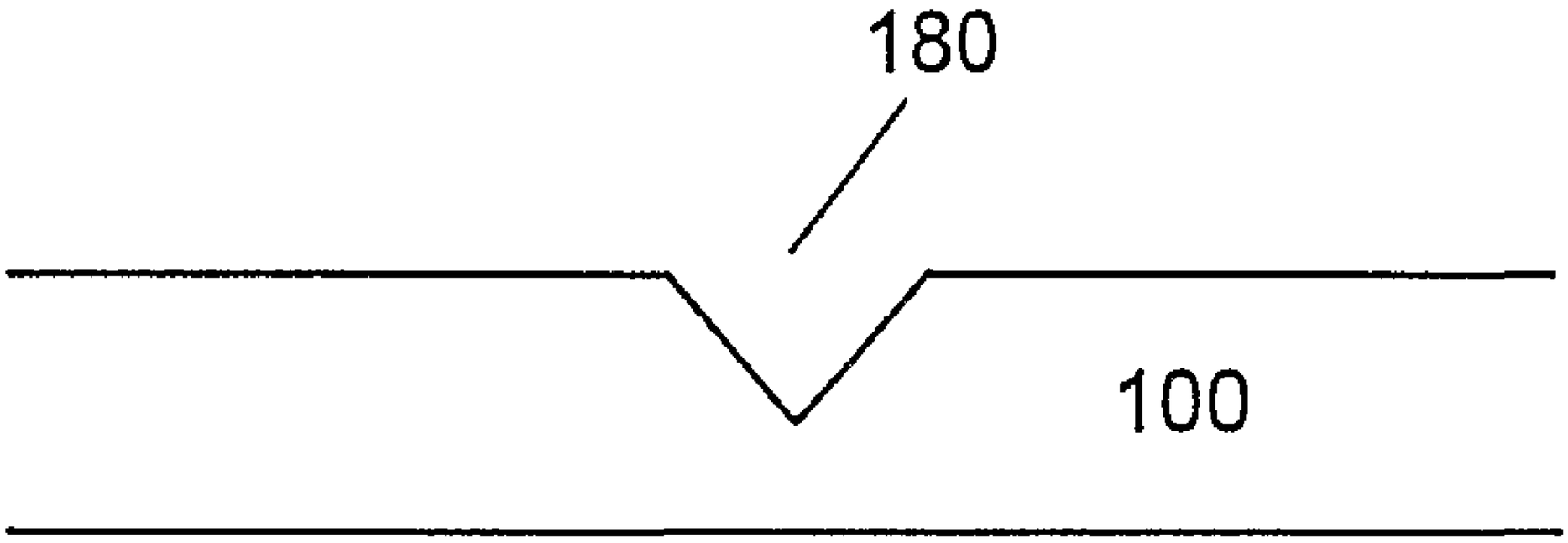
(54) Titre : ETUI A CIGARETTES ET FEUILLE DECOUPEE
(54) Title: CIGARETTE BOX AND PRE-CUT SHEET



(57) Abrégé/Abstract:
The invention relates to cut sheets (100) and cigarette packets produced therefrom with rounded or chamfered edges, whereby the rounded or chamfered edges are produced by means of scored lines (180) in the cut sheet material.

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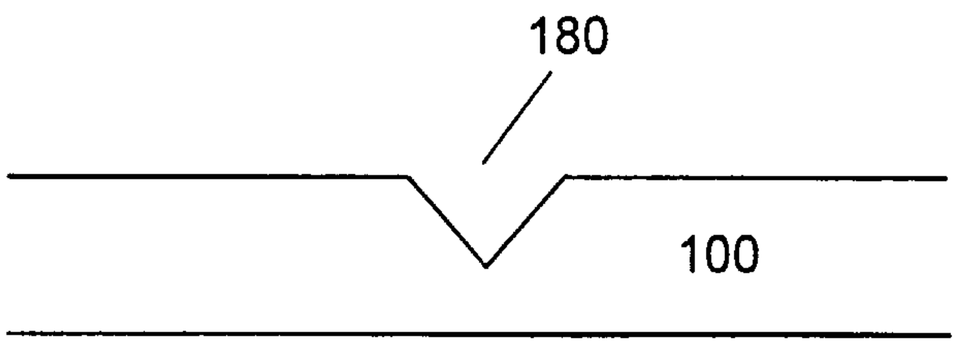
(54) **Title:** CIGARETTE PACKET AND CUT SHEET

(54) **Bezeichnung:** ZIGARETTENSCHACHTEL UND ZUSCHNITTBOGEN



(57) Abstract: The invention relates to cut sheets (100) and cigarette packets produced therefrom with rounded or chamfered edges, whereby the rounded or chamfered edges are produced by means of scored lines (180) in the cut sheet material.

(57) Zusammenfassung: Die vorliegende Erfindung betrifft Zuschnittbögen (100) und daraus hergestellte Zigarettenschachteln mit abgerundeten oder abgeschrägten Kanten, wobei die abgerundeten oder abgeschrägten Kanten durch Ritzlinien (180) in dem Zuschnittbogenmaterial erzielt werden.

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Cigarette Box and Pre-Cut Sheet

Description

The invention relates to a box, in particular for cigarettes, in which one or more of the edges are rounded off or chamfered, and also to pre-cut sheets for their production.

Cigarettes are usually marketed either in soft-pack packs or in hard-pack packs, for example in flip-top boxes or hinge-lid boxes, however also in so-called rigid-soft packs without flip tops. For hard-pack packs it is also known to round off or chamfer the corners of the boxes. Thus for example EP 0 205 766 B1 discloses hinge-lid boxes all 4 longitudinal edges of which are rounded off with the result that on the one hand less material is required for the production of cigarette boxes and on the other hand the box lies better in the consumer's hand.

In order to achieve rounded-off or chamfered edges, the pre-cut sheet from which the cigarette box is produced is provided with grooves at the areas forming the edges of the cigarette box. According to US 4 955 531, the grooves can be produced in a form in which the pre-cut sheet is indented by a grooving unit at the relevant points. On the opposite side there is a groove channel into which the material of the pre-cut sheet can be pressed. In the case

of parallel-running grooves, a corrugated cross-section is produced according to the described process. When the thus-processed pre-cut sheet is folded up, the round (in the case of several grooves) or chamfered (in the case of two grooves) edges of the cigarette pack then automatically form along the grooves.

The disadvantage of this is however that, due to the inherent rigidity and the elastic restoring forces of the pack material, the gluing for producing the cigarette pack is not unproblematic. This is usually carried out on overlapping areas of the pre-cut sheet which form the side walls of the box. As a result of the rounded-off or chamfered edges, these overlapping areas are clearly reduced compared with a normal hinge-lid box with the result that only a limited amount of glue can be applied. As a result therefore, the machine production is slowed down, as it is necessary to wait longer until the relatively small amount of glue has dried well as the box would otherwise reopen as a result of the elastic restoring forces of the material.

This is particularly pronounced when shortgrain cardboard or paper is used for the production of the hinge-lid boxes. In the case of paper or cardboard production, the product-forming material is placed on a fast-moving belt. This has the effect that the long fibres in the material preferably orient themselves in longitudinal direction. Depending on whether the pre-cut sheet is later cut along or across the finished material web, the long fibres in the pre-cut sheet are arranged across the longitudinal axis of the pre-cut sheet (shortgrain) or along the longitudinal axis of the

pre-cut sheet (longgrain). The result of the orientation of the fibres across the longitudinal direction of the shortgrain pre-cut sheet is a good flexibility about the transverse axis, but a poor flexibility about the longitudinal axis. The elastic restoring forces for the lateral gluing are therefore stronger than with longgrain pre-cut sheets in which, due to the transposed position of the long fibres in the material, the conditions are exactly the opposite. On the other hand however, shortgrain pre-cut sheets are preferably used for flip-top boxes, as they clearly favour the stability of the lid (no crooked closures, no easy tearing-off of the lid), the rigidity of the pack as a result of a higher stability in the transverse direction and the flat position of the pack, i.e. as small a curvature of the pack as possible, compared with the use of longgrain materials.

The object of the invention is therefore to avoid the advantages described above, in particular when using shortgrain pre-cut sheets.

The object is achieved by a box made of foldable material, such as for example paper, cardboard, plastic, plastic film or plastic laminate with a box part, the box part having a box front wall, a box rear wall, box side walls and a box base, and one or more edge(s) of the box being rounded off or chamfered in each case by two or more neighbouring, essentially parallel fold lines in the foldable material, characterized in that the fold lines are scoring lines, and also by a pre-cut sheet for the production of the box, i.e. a pre-cut sheet made of foldable material with a first main surface field with a left- and right-hand first side-

surface field, a base field joining up with the top edge of the first main surface field and a second main surface field with a left- and right-hand second side-surface field joining up with the top edge of the base field, and with one or more fold area(s) each with two or more, essentially parallel fold lines, characterized in that the fold lines are scoring lines and that the fold area(s) is/are arranged between one or more of the side-surface fields and one or both main surface field(s) or between one or both main surface fields and the base field.

By folding the pre-cut sheet described above, a hard-pack pack is obtained which consists only of a box part into which a cigarette group wrapped in an inner liner can be inserted. Usually the box size is dimensioned such that the cigarette group sits tightly in the box and projects somewhat at the top, open end of the box in order to make it possible for the consumer to open the box and to remove the cigarettes.

As a rule however, in addition to the box part the box has a lid part which has a lid front wall, a lid rear wall, lid side walls and a lid top side and is linked with the lid rear wall to the box rear wall so that a customary hinge-lid box results.

In order to obtain this customary hinge-lid box, the pre-cut sheet described above has additional fields, namely, joining up with the second main surface field a third main surface field with a left- and right-hand third side-surface field, a top side field joining up with the top edge of the third main surface field and a fourth main

surface field with a left- and right-hand fourth side-surface field joining up with the top edge of the top side field, and the pre-cut sheet having one or more fold area(s) each with two or more, essentially parallel scoring lines, which is/are arranged between one or more of the third and fourth side-surface fields and the third and/or fourth main surface field or between the third and/or fourth main surface field and the top side field.

Advantageously, the pre-cut sheet, in addition to the fields described, also has supplementary left- and right-hand second side-surface field end tabs on the bottom edge of the left- and right-hand second side-surface fields, and also left-hand and right-hand third side-surface field end tabs on the top edge of the left- and right-hand third side-surface fields. These side-surface field end tabs serve to strengthen the base and the lid of the finished box.

There is preferably located on the top edge of the fourth main surface field a strengthening field which, during the production of the box, is glued to the inside of the fourth main surface field and likewise serves to strengthen.

In the case of the scoring lines, the thickness of the material forming the pack is reduced using a scoring knife. For this purpose, the pre-cut sheet is placed on a flat support and worked with a scoring knife with the result that, in addition to a compression, material can also be removed. Depending on the shape of the scoring knife, for example a v- or u-shaped cross-section is formed. As the support does not have channels at points opposite the

scoring knife, as known from the state of the art, but rather a flat surface, a reduction in thickness results and not, as known in the state of the art, a deformation without a reduction in thickness. The side-surface fields of this pre-cut sheet provided with scoring lines are then firstly bent by 90° to produce the cigarette pack, the elastic restoring forces being clearly smaller, in particular when using shortgrain materials, with the result that in machine production, a faster gluing is possible.

The extent of reduction in thickness depends on the material used, but as a rule will be 10 to 80% of the overall thickness, preferably 20 to 70%, quite particularly preferably 40 to 50%.

The scoring lines are preferably located on the side of the pre-cut sheet which forms the inside in the finished box. This has the further advantage of a more optically attractive appearance of the finished box. With the boxes with round edges of the state of the art, the grooves can always be seen on the edges. This can be avoided with the present invention. Provided the scoring lines are on the inside of the boxes, the outside of the box visible to the consumer is unworked and displays a smooth surface.

The extent and the type of rounding can be fixed by the number of scoring lines and their distance from one another. 6 to 8, in particular 7, scoring lines per fold area which are located at a distance of approx. 1 mm from one another are preferred. Upon folding, a box with round edges results; the radius of the rounding then approximately corresponds to that of a cigarette customary

in the trade. 2 scoring lines per fold area which are located at a distance of 6 to 8 mm, in particular approximately 7 mm, from each other are also preferred. Upon folding a box with chamfered (or bevelled) edges then results.

The scoring lines preferably extend over the whole length and/or breadth of the box with the result that completely round or chamfered transverse and/or longitudinal edges are obtained.

All customary materials can be used as foldable materials for the pre-cut sheets and the cigarette boxes, in particular the papers and cardboards usually used for cigarette boxes, with or without coating, but also plastic materials. Particularly preferred are shortgrain papers and cardboards in which the scoring lines have a particularly positive effect on the elastic restoring forces and thus on a swift working.

All 4 longitudinal edges of the box, i.e. the longitudinal edges of the box part and the longitudinal edges of the lid part (if present) are particularly preferably rounded off or chamfered, but not the transverse edges. With a suitably designed pre-cut sheet, it is however also possible that only two longitudinal edges (neighbouring or diagonally opposite) or also, in addition to the longitudinal edges, the transverse edges are rounded off and/or chamfered.

It is furthermore preferred that the transverse edges are rounded off or chamfered between box base, box front wall and box rear wall and also, if a lid part is present, the

transverse edges between lid front wall, lid rear wall and lid top side, but not the longitudinal edges of the box, i.e. the longitudinal edges of the box part and, if present, the longitudinal edges of the lid part.

The pre-cut sheets are produced in known manner, i.e. the pre-cut sheets are taken off widths of pre-cut sheet material which are stored on rolls and printed, preferably as shortgrain pre-cut sheets. This is usually followed by a step in which the pre-cut sheets are worked by a scoring knife in the described manner and at the same time punched and/or cut and optionally embossed. By customary folding and gluing at the side surfaces, the finished cigarette box is then obtained by machine, which usually contains a cigarette group wrapped in an inner liner. A customary collar part is normally also inserted into hinge-lid boxes according to the invention, which, in the opened box, protrudes slightly on the inside of the box front wall and has a recess which makes it possible to grasp the cigarettes located in the box.

The invention will be further explained using an embodiment. There are shown in:

Fig. 1 a cross-section through a pre-cut sheet 100 according to the invention with a scoring line 180,

Fig. 2 a cross-section through a pre-cut sheet 100 according to the invention with another version of a scoring line 180,

Fig. 3 a cross-section through a pre-cut sheet of the state of the art,

Fig. 4 a pre-cut sheet 100 according to the invention for the production of a cigarette box 10 according to the invention of hinge-lid type,

Fig. 5 a cigarette box 10 according to the invention of hinge-lid type, the 4 longitudinal edges of which are rounded off,

Fig. 6 a cross-section of the cigarette box 10 of Fig. 5,

Fig. 7 a cross-section through a cigarette box 10 with chamfered edges and also

Fig. 8 a pre-cut sheet 100 according to the invention for the production of a cigarette box 10 according to the invention without lid part.

Fig. 1 shows a cross-section through a pre-cut sheet 100 with a scoring line 180 with v-shaped cross-section. The cross-section of the scoring line 180 depends on the scoring knife used and can for example also have a more acute angle than in Fig. 1 or be rectangular, as is shown in Fig. 2.

For comparison, a groove known from the state of the art in which, not according to the invention, there is no reduction in thickness is shown in Fig. 3.

Fig. 4 shows a pre-cut sheet 100 for the production of a cigarette box 10. There can be seen the main surface fields 122, 124, 142 and 144 which, in the finished cigarette box, form the box front wall 22, the box rear wall 24, the lid front wall 42 and the lid rear wall 44. Also to be seen are the base field 130 and the top side field 150 and also the side-surface fields 126, 127, 128, 129, 146, 147, 148 and

149 which, in the finished box, correspond to the box base 30, the lid top side 50 and also the side walls 26, 28, 46 and 48. The pre-cut sheet 100 of Fig. 4 has 7 essentially parallel-running scoring lines 180. Only 4 scoring lines 180 are provided in the strengthening field 170, due to the somewhat smaller dimensioning. Lines about which the individual parts of the pre-cut sheet are folded are (with the exception of the scoring lines 180) represented in Fig. 4 by dotted lines and numbered 182. The pre-cut sheet 100 also has two indents 184, 185. To produce the cigarette box 10, the side-surface fields 128 and 129 can firstly be folded upwards by 90° and the side-surface field end tabs 160 and 161 located there folded inwards also by 90°. Then the bottom part of the pre-cut sheet 100 is folded upwards by 90° with the base surface 130 and the first main surface field 122, as a result of which the side-surface field end tabs 160 and 161 come into contact with the base field 130 and are glued. If the first main surface field 122 is folded in further (by 90°), the side-surface fields 128, 129 and 126, 127 come to lie on top of one another and can be glued, with the result that the box part 20 is finished. The lid part 40 is produced in similar manner, i.e. the side-surface field end tabs 162 and 163 are glued to the top side field 150. The strengthening field 170 is glued inwardly onto the fourth main surface field 142 and thereupon the side-surface fields 148, 149 and 146, 147 glued together.

The finished box can then be seen in Fig. 5. Shown are among others the rounded-off longitudinal edges 32, 34, 36, 38, 52, 54, 56, 58 and also the non-rounded-off transverse edges 31, 33, 51, 55. The scoring lines 180 are located on

the inside of the box and cannot be seen from the outside by the consumer.

Fig. 6 shows a cross-section through the box part 20 of the box 10 of Fig. 5, where there are to be seen the rounded-off longitudinal edges 32, 34, 36 and 38, the overlapping side field surfaces 126, 128 and 127, 129 and the essentially rectangular cross-section customary for hinge-lid boxes of the box 10, if the rounded-off edges are not taken into account.

Fig. 7 shows a cross-section through the box part 20 of a box 10 with chamfered edges 32, 34, 36, 38, each edge being formed by two scoring lines 180 located on the inside.

Fig. 8 shows a pre-cut sheet 100 for the production of a cigarette box 10 without lid part 40. The pre-cut sheet 100 is composed of the two first main surface fields 122 and 124 with their side-surface fields 126, 127, 128 and 129 and the base field 130 located in between. The side-surface fields 128 and 129 have side-surface field end tabs 160 and 161 which are glued to the base field 130 when folded together and contribute to the stabilizing of the box.

Patent claims

1. Box made of foldable material with a box part, the box part having a box front wall, a box rear wall, box side walls and a box base, and one or more edges of the box being rounded off or chamfered in each case by two or more neighbouring, essentially parallel fold lines in the foldable material, characterized in that the fold lines are scoring lines and that the foldable material is shortgrain cardboard or shortgrain paper.

2. Box according to claim 1, characterized in that it furthermore has a lid part with a lid front wall, a lid rear wall, lid side walls and a lid top side, the lid part with the lid rear wall being linked to the box rear wall.

3. Box according to claim 1 or 2, characterized in that the scoring lines are located on the inside of the box.

4. Box according to one of claims 1 to 3, the box part having 4 longitudinal edges, characterized in that all 4 longitudinal edges of the box part are rounded off or chamfered.

5. Box according to one of claims 1 to 4, the lid part having 4 longitudinal edges, characterized in that all 4 longitudinal edges of the lid part are rounded off or chamfered.

6. Box part according to one of claims 1 to 5, the box part having transverse edges between box front wall and box rear wall as well as

box base, characterized in that the transverse edges of the box part are rounded off or chamfered.

7. Box part according to one of claims 1 to 6, the lid part having transverse edges between lid front wall and lid rear wall as well as lid top side, characterized in that the transverse edges of the lid part are rounded off or chamfered.

8. Box according to one of claims 1 to 7, characterized in that the scoring lines are formed by a 10 — 80% reduction in the thickness of the foldable material.

9. Pre—cut sheet made of foldable material with a first main surface field with a left— and right— hand first side—surface field, a base field joining up with the top edge of the first main surface field and a second main surface field, the second main surface field with a left— and right—hand second side—surface field, the second main surface field joining up with the top edge of the base field, and with one or more fold areas each with two or more, essentially parallel fold lines, characterized in that the fold lines are scoring lines, and that the foldable material is shortgrain cardboard or shortgrain paper, and that the fold area is arranged between one or more of the side—surface fields and one or both main surface fields or between one or both main surface fields and the base field

10. Pre—cut sheet according to claim 9, characterized in that a side-surface field end tab joins up with the bottom edge of the left— and right—hand second side—surface field.

11. Pre—cut sheet according to claims 9 or 10, characterized in that fold areas are located between all side—surface fields and the two main surface fields or between the two main surface fields and the base field.

12. Pre—cut sheet according to one of claims 9 to 11, characterized in that a third main surface field with a left— and right—hand third side—surface field joins up with the top edge of the second main surface field, a top side field joins up with the top edge of the third main surface field and a fourth main surface field with a left— and right—hand fourth side—surface field joins up with the top edge of the top side field and in that the pre—cut sheet has one or more fold areas each with two or more, essentially parallel scoring lines, which are arranged between one or more of the third and fourth side—surface fields and at least one of the third and fourth main surface field or between at least one of the third and fourth main surface field and the top side field.

13. Pre—cut sheet according to claim 12, characterized in that a side—surface field end tab joins up with the top edge of the left— and right—hand third side—surface field and a strengthening field joins up with the top edge of the fourth main surface field.

Fig. 1

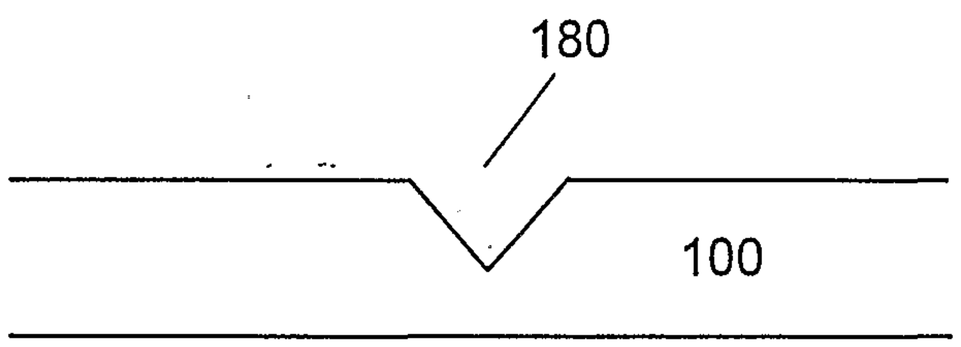

Fig. 2

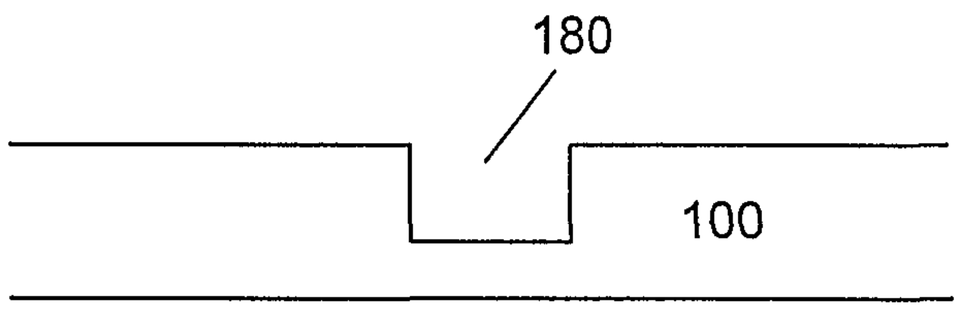

Fig. 3 (StdT)

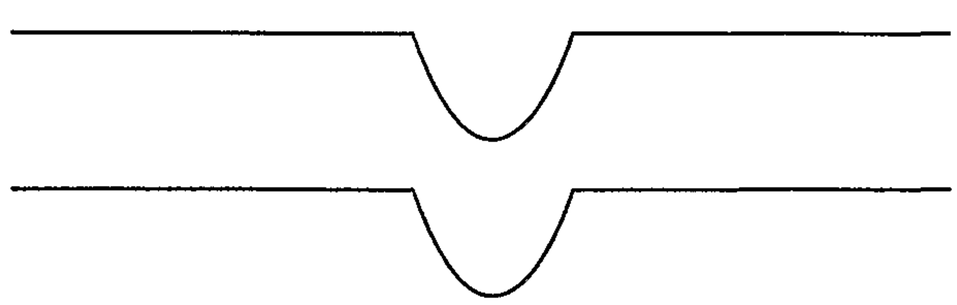

Fig. 4

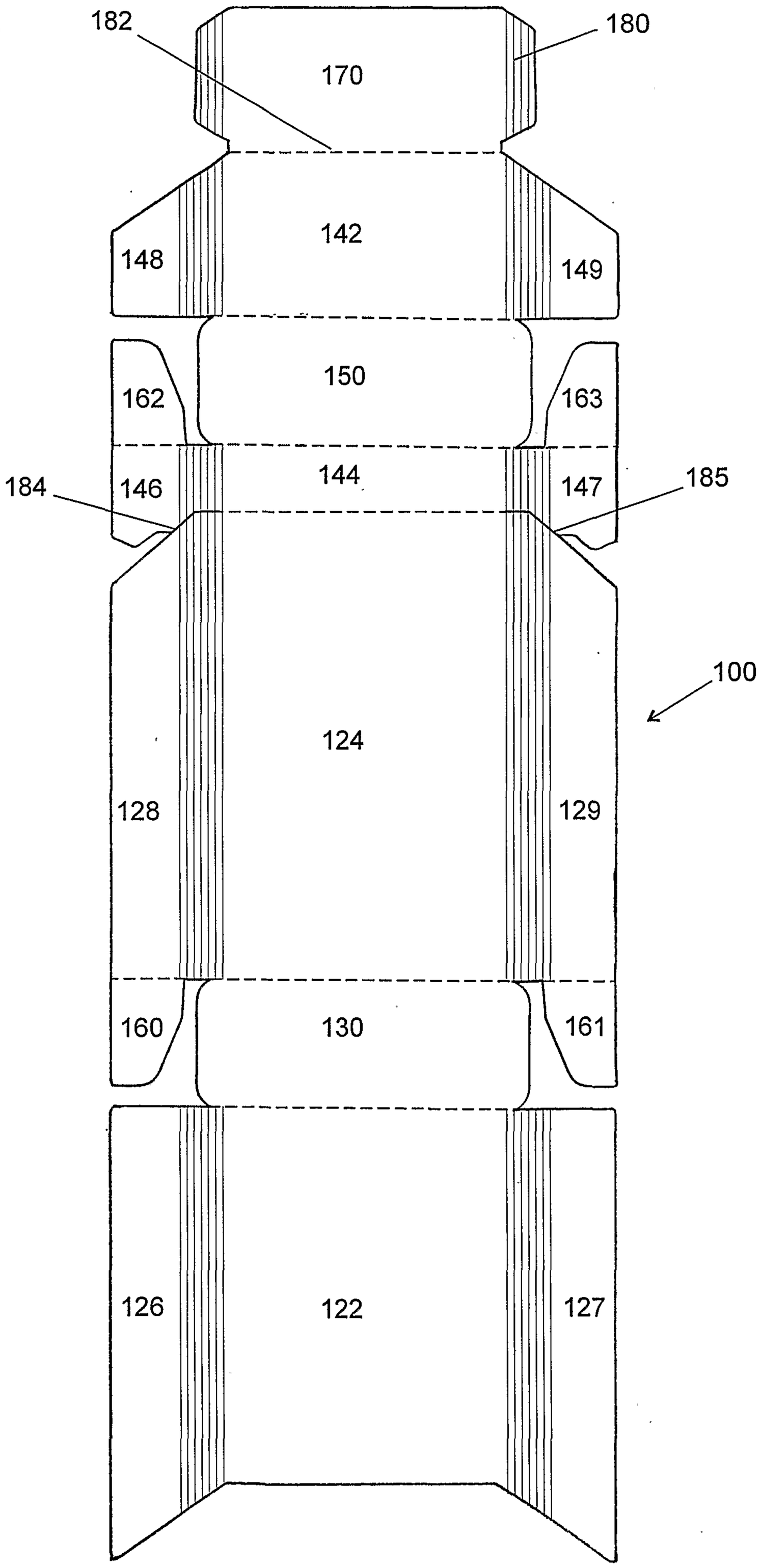
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Fig. 5

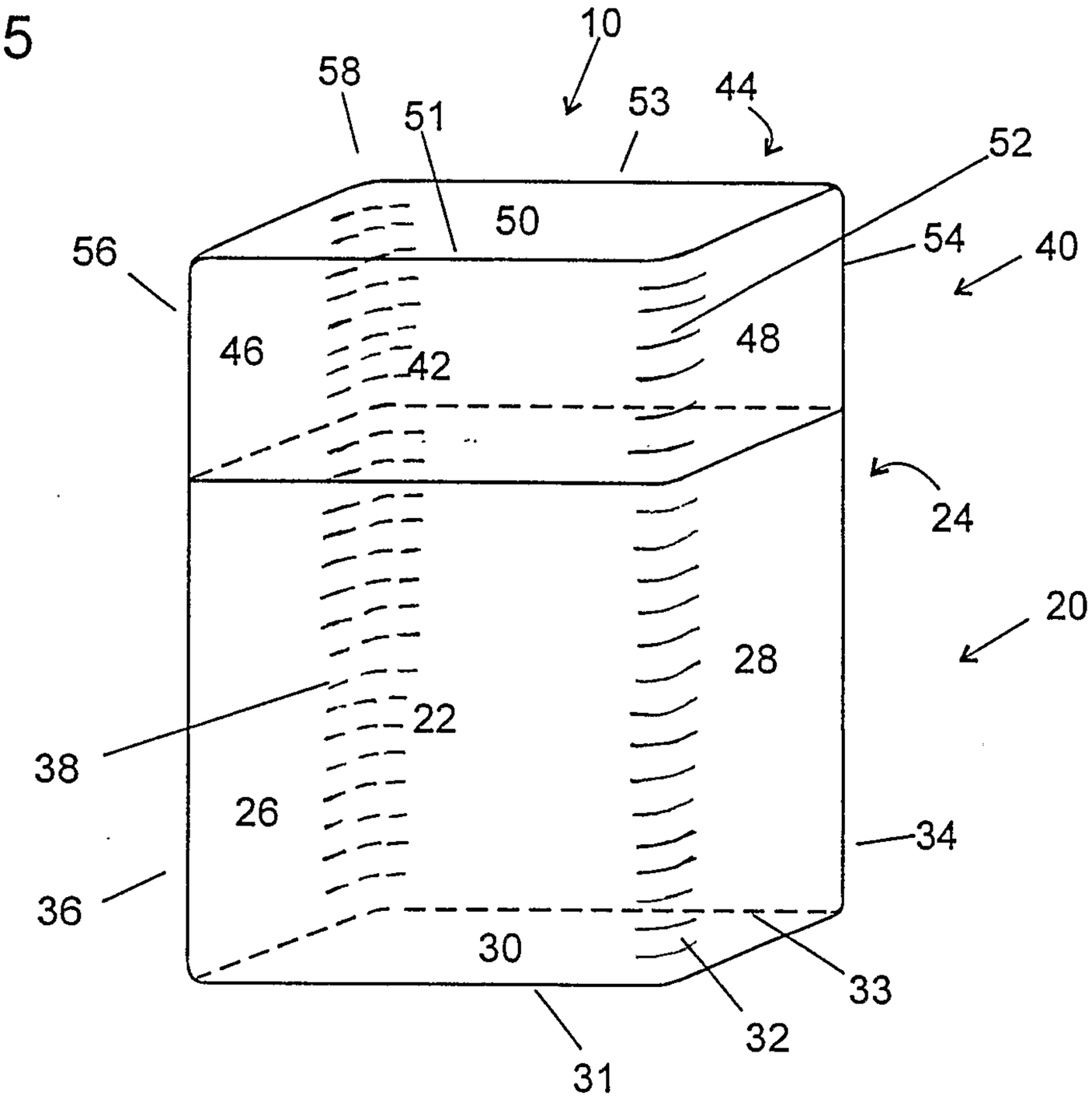


Fig. 6

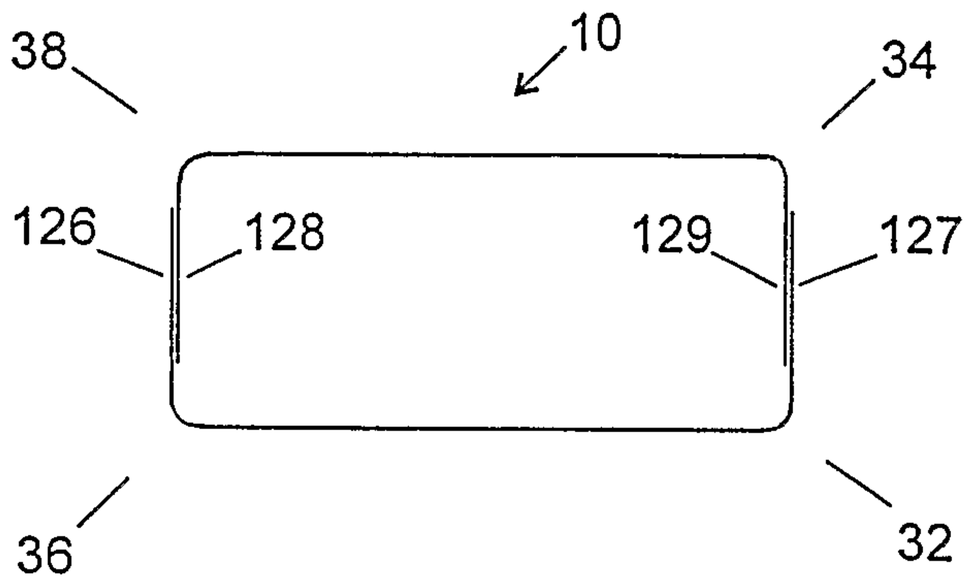


Fig. 7

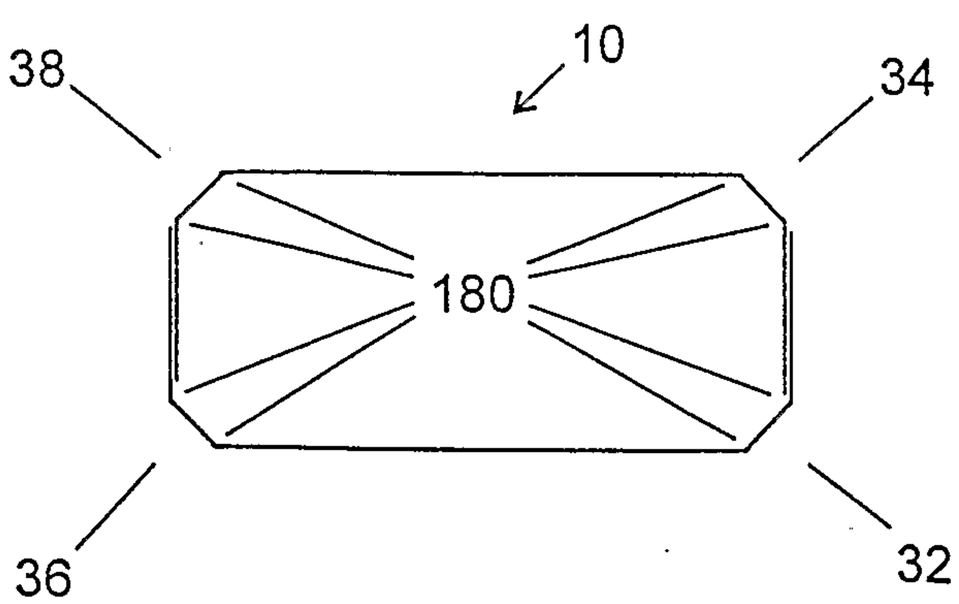
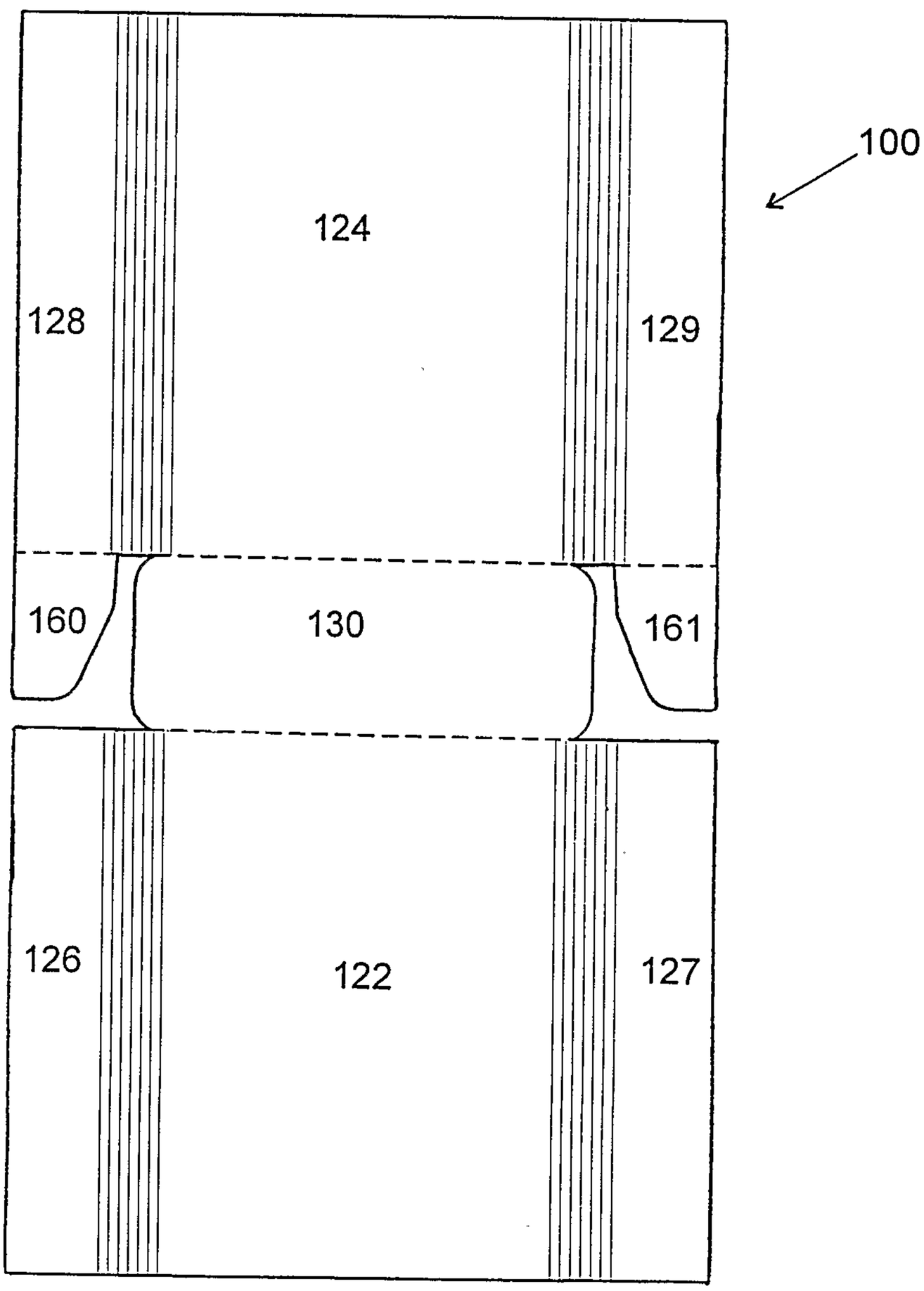
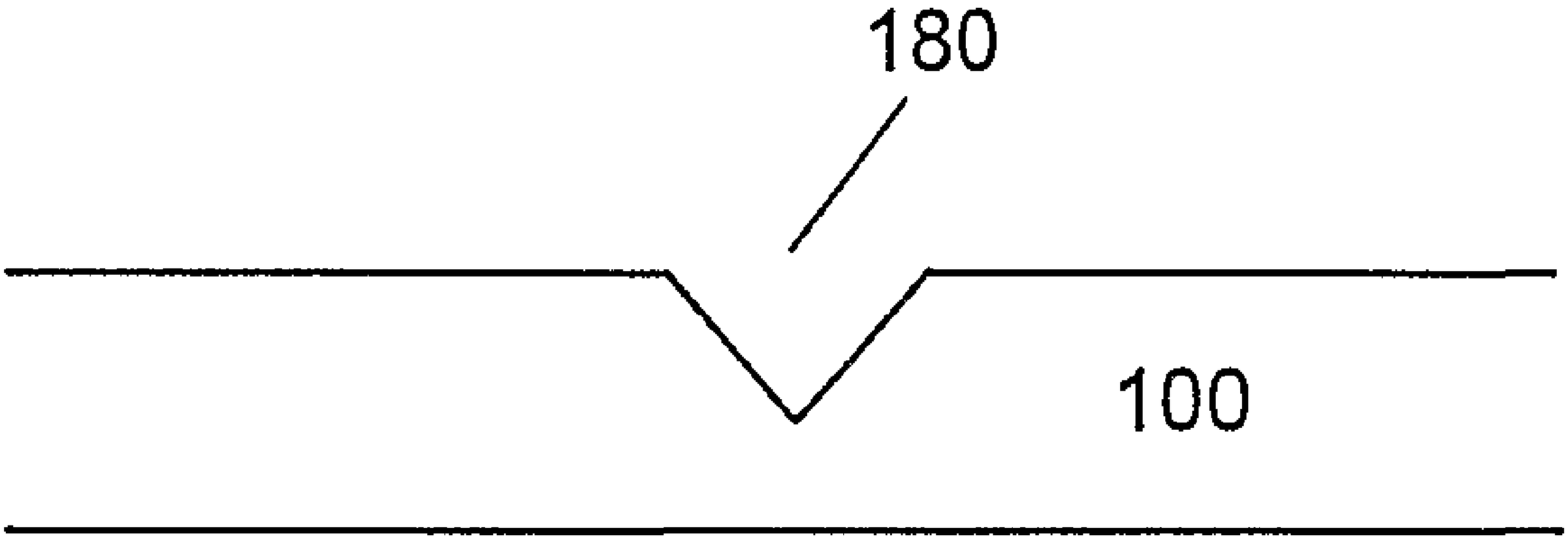


Fig.8

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