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## (54) CUTTER BLADE FOR A PACKING CONTAINER AND A PACKING CONTAINER

(57) A cutter blade (201, 301) for a packing container (400) accommodating a roll of packing material, wherein said cutter blade (201, 301) is provided with teeth (203, 205, 207, 209, 211, 303, 305, 307, 309, 311) along a cutting side (213, 313) of said cutter blade (201, 301) for cutting said packing material in a cutting direction (C) of said cutter blade (201, 301), wherein said cutting side (213, 313) comprises a first portion (215, 315), a second portion (217, 317) and an intermediate portion (219, 319) between said first portion (215, 315) and said second portion (217, 317),
wherein a first tooth top line (225, 325) connects tooth tops of teeth (205) of said first portion (215, 315), a second tooth top line (227, 327) connects tooth tops of teeth (209) of said second portion (217, 317) and wherein an intermediate tooth top line (219, 319) connects tooth tops of teeth (207) of said intermediate portion (219, 319),
wherein said first tooth top line (225, 325) and/or said second tooth top line (227, 327) enclose an obtuse angle (G, H) with said intermediate tooth top line (229, 329). A packing container (400) accommodating a roll of packing material comprising a cutter blade according to the present disclosure.

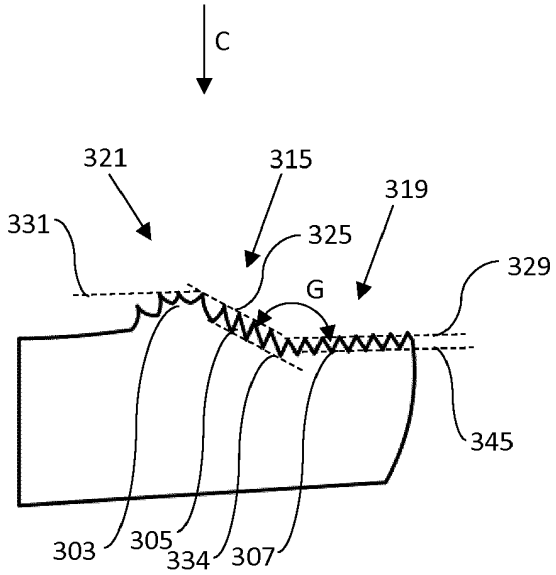


Fig. 7

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## Description

**[0001]** According to a first aspect the present disclosure relates to a cutter blade for a packing container accommodating a roll of packing material, wherein said cutter blade is provided with teeth along a cutting side of said cutter blade for cutting said packing material in a cutting direction of said cutter blade

**[0002]** According to a second aspect the present disclosure relates to a packing container accommodating a roll of packing material comprising a cutter blade according to the first aspect of the present disclosure.

**[0003]** Known cutter blades for cutting packing material such as a highly stretchable cling film made from of polyethylene, polypropylene, or polyvinyl chloride have a cutting side comprising teeth. By pulling the packing material in a cutting direction of the cutter blade against the teeth of the cutter blade the packing material may be cut along a width of the packing material for separating a piece of packing material. A drawback of these known cutter blades is that it is relative difficult to avoid wrinkling of the piece of packing material and/or the packing material upon cutting the packing material by said cutter blade.

**[0004]** An objective of the present disclosure is to provide a cutter blade allowing to reduce wrinkling of the piece of packing material and/or the packing material upon cutting the packing material by said cutter blade.

**[0005]** This objective is achieved by the cutter blade according to the present disclosure. The cutter blade according to the first aspect of the present disclosure is provided with teeth along a cutting side of said cutter blade for cutting said packing material in a cutting direction of said cutter blade, wherein said cutting side comprises a first portion, a second portion and an intermediate portion between said first portion and said second portion,

wherein a first tooth top line connects tooth tops of teeth of said first portion, a second tooth top line connects tooth tops of teeth of said second portion and wherein an intermediate tooth top line connects tooth tops of teeth of said intermediate portion,

wherein said first tooth top line and/or said second tooth top line enclose an obtuse angle between 91 and 179 degrees with said intermediate tooth top line.

**[0006]** By providing the first portion and/or the second portion relative to said intermediate portion such that the first tooth top line and/or the second tooth top line enclose an obtuse angle between 91 and 179 degrees with said intermediate tooth top line, the tooth tops of teeth of the first portion and/or the tooth tops of teeth of the second portion are shifted positioned relative to the tooth tops of teeth of the intermediate portion adjacent to the first portion and/or adjacent to the second portion in a direction opposite to the cutting direction of the cutter blade. A configuration of the cutter blade wherein the tooth tops of said teeth of said first portion and/or said tooth tops of said teeth of said second portion are provided in a position that is moved in said direction opposite to said cutting direction may result in a relative reliable cutting of outer ends of the packing material.

**[0007]** It is noted that in the context of the present disclosure the cutting direction of the cutter blade is defined as a direction wherein the packing material is moved relative to the cutting side of the cutter blade for cutting the packing material when the cutter blade remains stationary.

**[0008]** The present disclosure relies at least partly on the insight that when using a cutter blade that has a straight cutting side or a generally V-shaped cutting side a relative large force is required to cut the foil near outer ends of the packing material when pulling the material in the cutting direction when holding the packing material between the outer ends of the packing material while pulling the packing material. The force required to separate a piece of packing material near from a roll of packing material by pulling the packing material against the teeth of the cutter blade increases with the width of the roll of packing material. Moreover, when holding the packing material near a centre part between the outer ends of the packing material the force exerted on the outer ends of the packing material when pulling the packing material against the teeth of the cutter blade near the outer ends of the cutter blades has a relative large force component in a direction transversal to the cutting direction and a relative small force in the cutting direction. It has been found that the relative large force transversal to the cutting direction may be an important cause for wrinkling of the packing material and that wrinkling of the piece of packing material and/or the packing material upon cutting the packing material by said cutter blade may be greatly reduced by a configuration of the cutter blade wherein the tooth tops of said teeth of said first portion and/or said tooth tops of said teeth of said second portion are provided in a position that is moved forward in said cutting direction relative to said tooth tops of said teeth of said intermediate portion.

**[0009]** It is advantageous if said cutting side comprises a third portion at a side of said first portion opposite said intermediate portion and/or comprises a fourth portion at a side of said second portion opposite said intermediate portion, wherein a third tooth top line connects tooth tops of teeth of said third portion and/or a fourth tooth top line connects tooth tops of teeth of said fourth portion, wherein said third tooth top line and/or said fourth tooth top line is substantially parallel to said intermediate tooth top line. This is beneficial for cutting the packing material near the outer ends of the packing material and thereby reduce wrinkling of the piece of packing material and/or the packing material upon cutting the packing material by said cutter blade

**[0010]** Preferably a distance in said cutting direction between said first tooth top line and a first root line that connects roots of said teeth of said first portion and/or a distance in said cutting direction between said second tooth top line and a second root line that connects roots

of said teeth of said second portion is larger than a distance in said cutting direction between said intermediate tooth top line and an intermediate root line that connects roots of said teeth of said intermediate portion. This is beneficial for cutting the packing material near the outer ends of the packing material and thereby reducing wrinkling of the piece of packing material and/or the packing material upon cutting the packing material by said cutter blade.

**[0011]** In an embodiment of the cutter blade according to the first aspect of the present disclosure, said intermediate portion comprises a first part adjacent to said first portion, a second part adjacent to said second portion and a centre part between said first part and said second part, wherein said intermediate tooth top line connects tooth tops of teeth of said first part and/or said second part.

**[0012]** In this regard it is beneficial if a centre tooth top line connects tooth tops of teeth of said centre part, wherein a distance in said cutting direction between said centre tooth top line and a centre root line that connects roots of said teeth of said centre part is larger than a distance in said cutting direction between said intermediate tooth top line and an intermediate root line that connects roots of said teeth of said first part and/or said second part. This is beneficial for cutting the packing material near the centre part between the outer ends of the packing material for cutting the packing material near the centre of the packing material in a relative early phase of a cutting process for separating a piece of packing material from a roll of packing material and thereby reducing the force required for cutting the packing material and reduce wrinkling of the piece of packing material and/or the packing material upon cutting the packing material by said cutter blade.

**[0013]** It is beneficial if said centre part is shifted positioned relative to said first part and/or said second part in said direction opposite to said cutting direction. This is beneficial for cutting the packing material near the centre part between the outer ends of the packing material for cutting the packing material near the centre of the packing material in a relative early phase of a cutting process for separating a piece of packing material from a roll of packing material and thereby reducing the force required for cutting the packing material and reduce wrinkling of the piece of packing material and/or the packing material upon cutting the packing material by said cutter blade.

**[0014]** It is advantageous if a pitch of said teeth of said first portion and/or said second portion is larger than a pitch of said teeth of said first part and/or said second part.

**[0015]** Preferably a distance in said cutting direction between said first tooth top line and a first root line that connects roots of said teeth of said first portion and/or a distance in said cutting direction between said second tooth top line and a second root line that connects roots of said teeth of said second portion is larger than a distance in said cutting direction between said intermediate tooth top line and an intermediate root line that connects roots of said teeth of said first part and/or said second part. This is beneficial for cutting the packing material near the outer ends of the packing material and thereby reducing wrinkling of the piece of packing material and/or the packing material upon cutting the packing material by said cutter blade.

**[0016]** Preferably said cutter blade is symmetrical. This is beneficial for allowing both left handed and right handed users to reduce wrinkling of the piece of packing material and/or the packing material upon cutting the packing material by said cutter blade.

**[0017]** In an embodiment of the cutter blade according to the first aspect of the present disclosure, said cutter blade comprises a non-metallic material, preferably wherein said cutter blade is made from a non-metallic material. A non-metallic material is beneficial for providing a relative cost efficient cutter blade.

**[0018]** It is known that non-metallic cutter blades generally have less efficient cutting performance as compared to metal cutter blades. As a result relative great force is required for cutting packing material when a non-metallic cutter blade is used to cut highly stretchable cling film that is made of, for example, polyethylene, polypropylene, or polyvinyl chloride.

**[0019]** According to the second aspect, the present disclosure relates to a packing container accommodating a roll of packing material, wherein said packing container comprises a cutter blade according to the first aspect of the present disclosure, wherein said cutter blade is arranged to cut said packing material for separating a piece of packing material from said roll of packing material. Embodiments of the packing container correspond to embodiments of the cutter blade according to the first aspect of the present disclosure. The advantages of the packing container correspond to the advantages of the cutter blade according to the first aspect of the present disclosure presented previously.

**[0020]** A packing container according to the second aspect of the present disclosure may also be named a dispensing container or dispensing unit for dispensing packing material such as cling film from the container or unit. Dispensing may be effected by pulling a piece of the packing material from the roll of packing material and cutting said packing material by said cutter blade and thereby dispensing a piece of packing material such as a piece of cling film.

**[0021]** In this regard it is beneficial if a width of said cutter blade is larger than a width of said accommodated roll of packing material wherein said cutter blade is arranged such that outer ends of said cutter blade extend respectively beyond outer ends of said packing material. This is beneficial for allowing a relative reliable cutting of the outer ends of the foil by said cutting side of the cutter blade and thereby allowing reduction of wrinkling of the piece of packing material and/or the packing material upon cutting the packing material by said cutter blade.

**[0022]** It is beneficial if said first portion is arranged

relative to said roll of packing material for cutting a first edge of said packing material and wherein said second portion is arranged relative to said roll of packing material for cutting a second edge of said packing material. By positioning the first portion in alignment with the first end of the packing material and positioning the second portion in alignment with a second end of said packing material the risk is reduced that the outer ends of the packing material upon cutting of the packing material are cut by the intermediate portion instead of the first portion and the second portion. This is beneficial for allowing a relative reliable cutting of the outer ends of the packing material by said first portion and/or said second portion of the cutter blade and thereby allowing reduction of wrinkling of the piece of packing material and/or the packing material upon cutting the packing material by said cutter blade.

**[0023]** Preferably said roll of packing material is provided with a roll receiving space and wherein said packing container comprises a holding arrangement arranged in said roll receiving space for retaining said roll of packing material inside said packing container when unrolling said packing material. This is beneficial for allowing a user to at least partly unroll said roll of packing material by pulling a free end of the packing material with a relative small force and thereby allowing reduction of wrinkling of the piece of packing material and/or the packing material upon cutting the packing material by said cutter blade.

**[0024]** In an embodiment of the packing container according to the second aspect of the present disclosure said packing material is made of polyethylene, polypropylene, or polyvinyl chloride. A non-metallic material is beneficial for providing a relative cost efficient cutter blade.

**[0025]** It is known that non-metallic cutter blades generally have less efficient cutting performance as compared to metal cutter blades. As a result relative great force is required for cutting packing material when a non-metallic cutter blade is used to cut highly stretchable cling film that is made of, for example, polyethylene, polypropylene, or polyvinyl chloride.

**[0026]** The present disclosure will now be explained by means of a description of preferred embodiments of a cutter blade according to the first aspect of the present disclosure and an embodiment of a packing container according to the second aspect of the present disclosure, in which reference is made to the following schematic figures, in which:

Fig. 1: a known cutter blade not according to the first aspect of the present disclosure is shown;
Fig. 2: a known packing container not according to second aspect of the present disclosure is shown;
Fig. 3: a cutter blade according to the first aspect of the present disclosure is shown;
Fig. 4: detail E from Fig. 3 is shown;
Fig. 5: detail F from Fig. 3 is shown;
Fig. 6: another cutter blade according the first aspect of the present disclosure is shown;
Fig. 7: detail I from Fig. 6 is shown;
Fig. 8: detail J from Fig. 6 is shown;
Fig. 9: detail K from Fig. 6 is shown;
Fig. 10: a front view of a packing container according to the second aspect of the present disclosure is shown.

**[0027]** The known cutter blade 1 shown in Fig. 1 has a general V-shape comprising a first cutter leg 5 and a second cutter leg 7. Both the first cutter leg 5 and the second cutter leg 7 are at a cutting side provided with teeth 3. A first tooth top line 9 connects tooth tops of teeth 3 of said first cutter leg 5 and a second toot top line 11 connects tooth tops of teeth 3 of said second cutter leg 7. The first tooth top line 9 and the second tooth top line 11 enclose an angle A larger than 180 degrees.

**[0028]** The known packing container 100 accommodates a roll of packing material 102 in a container housing 104. The container housing 104 comprises a holder part 106 and a lid 108 that is arranged for providing in a first position of the lid 108 access to a packing receiving space of the packing container for receiving the roll of packing material 102. In a closed position of the lid 108 an opening is provided between the holder part 106 and the lid 108 for allowing the packing material of the roll of packing material 102 to extend outside the container housing 104. The opening is at a side bound by the cutter blade 1. A piece of packing material 110 may be separated from the roll of packing material 102 by pulling said packing material in a cutting direction C of said cutter blade 1 against said cutting side of said cutter blade 1.

**[0029]** Cutter blade 201 according to the first aspect of the present disclosure is symmetrical about a symmetry axis D and provided with teeth 203, 205, 207, 209 and 211 along a cutting side 213 of said cutter blade 201. The teeth 203, 205, 207, 209 and 211 define a cutting direction C such that when packing material is moved in said cutting direction C against said cutter blade 201 said packing material is cut. The cutting side 213 comprises a first portion 215, a second portion 217 and an intermediate portion 219 between said first portion 215 and said second portion 217. A first tooth top line 225 connects tooth tops of teeth 205 of said first portion 215. A second tooth top line 227 connects tooth tops of teeth 209 of said second portion 217. An intermediate tooth top line 229 connects tooth tops of teeth 207 of said intermediate portion 219.

**[0030]** The cutting side further comprises a third portion 221 at a side of said first portion 215 opposite said intermediate portion 219 and a fourth portion 223 at a side of said second portion 217 opposite said intermediate portion 219. A third tooth top line 231 connects tooth tops of teeth 203 of said third portion 221 and a fourth tooth top line 233 connects tooth tops of teeth 211 of said fourth portion 223.

**[0031]** A distance in said cutting direction C between

said first tooth top line 225 and a first root line 234 that connects roots of said teeth 205 of said first portion 215 and a distance in said cutting direction C between said second tooth top line 227 and a second root line 236 that connects roots of said teeth 209 of said second portion 217 is larger than a distance in said cutting direction C between said intermediate tooth top line 229 and an intermediate root line 245 that connects roots of said teeth 207 of said first part 215 and said second part 217. In other words, said teeth 205 and 209 of said first portion 215 and said second portion 217 are larger than said teeth 207 of said intermediate portion 219.

**[0032]** The first tooth top line 225 and said second tooth top line 227 each enclose an obtuse angle G, H of 150 degrees with said intermediate tooth top line 229. The third tooth top line 231 and the fourth tooth top line 233 are parallel to the intermediate tooth top line 229.

**[0033]** Cutter blade 301 differs mainly from cutter blade 201 in that said intermediate part has a general V-shape. Elements of cutter blade 301 that are similar to elements of cutter blade 201 are provided with a reference number equal to the reference number of the element in cutter blade 201 raised by 100. Intermediation portion 313 of cutter blade 301 comprises a first part 335 adjacent to said first portion 315, a second part 337 adjacent to said second portion 317 and a centre part 339 between said first part 335 and said second part 337. The intermediate tooth top line 329 connect tooth tops of teeth 307 of the first part 335 and the second part 337.

**[0034]** A centre tooth top line 341 connects the tooth tops of teeth of said centre part 339. A distance in said cutting direction C between said centre tooth top line 341 and a centre root line 343 of said teeth of said centre part 339 is larger than a distance in said cutting direction C between said intermediate tooth top line 329 and a intermediate root line 345 of said teeth of said first part 335 and/or said second part 337.

**[0035]** The packing container 400 differs mainly from packing container 100 in that said packing container comprises a cutter blade 301 according to the second aspect of the present disclosure. Elements of packing container 400 that are similar to elements of packing container 100 are provided with a reference number equal to the reference number of the element in packing container 100 raised by 300.

## Claims

1. A cutter blade (201, 301) for a packing container (400) accommodating a roll of packing material, wherein said cutter blade (201, 301) is provided with teeth (203, 205, 207, 209, 211, 303, 305, 307, 309, 311) along a cutting side (213, 313) of said cutter blade (201, 301) for cutting said packing material in a cutting direction (C) of said cutter blade (201, 301), wherein said cutting side (213, 313) comprises a first portion (215, 315), a second portion (217, 317) and an intermediate portion (219, 319) between said first portion (215, 315) and said second portion (217, 317),
wherein a first tooth top line (225, 325) connects tooth tops of teeth (205) of said first portion (215, 315), a second tooth top line (227, 327) connects tooth tops of teeth (209) of said second portion (217, 317) and wherein an intermediate tooth top line (219, 319) connects tooth tops of teeth (207) of said intermediate portion (219, 319),
wherein said first tooth top line (225, 325) and/or said second tooth top line (227, 327) enclose an obtuse angle (G, H) between 91 and 179 degrees with said intermediate tooth top line (229, 329).

2. Cutter blade (201, 301) according to claim 1, wherein said cutting side (213, 313) comprises a third portion (221, 321) at a side of said first portion (215, 315) opposite said intermediate portion (219, 319) and/or comprises a fourth portion (223, 323) at a side of said second portion (217, 317) opposite said intermediate portion (219, 319), wherein a third tooth top line (231, 331) connects tooth tops of teeth (203) of said third portion (221, 321) and/or a fourth tooth top line (233, 333) connects tooth tops of teeth (211, 311) of said fourth portion (223, 323), wherein said third tooth top line (231, 331) and/or said fourth tooth top line (233, 333) is substantially parallel to said intermediate tooth top line (229, 329).

3. Cutter blade (201, 301) according to claim 1 or 2, wherein a distance in said cutting direction (C) between said first tooth top line (225, 325) and a first root line (234, 334) that connects roots of said teeth (205, 305) of said first portion (215, 315) and/or a distance in said cutting direction (C) between said second tooth top line (227, 327) and a second root line (236, 336) that connects roots of said teeth (209, 309) of said second portion (217, 317) is larger than a distance in said cutting direction (C) between said intermediate tooth top line (229, 329) and an intermediate root line (245, 345) that connects roots of said teeth (207, 307) of said intermediate portion (219, 319).

4. Cutter blade (301) according to any one of the preceding claims, wherein said intermediate portion (319) comprises a first part (335) adjacent to said first portion (315), a second part (337) adjacent to said second portion (317) and a centre part (339) between said first part (335) and said second part (337), wherein said intermediate tooth top line (329) connects tooth tops of teeth (307) of said first part (335) and/or said second part (337).

5. Cutter blade (301) according to claim 4, wherein a centre tooth top line (341) connects tooth tops of teeth (307) of said centre part (339), wherein a dis-

tance in said cutting direction (C) between said centre tooth top line (341) and a centre root line (343) that connects roots of said teeth (307) of said centre part (339) is larger than a distance in said cutting direction (C) between said intermediate tooth top line (329) and an intermediate root line (345) that connects roots of said teeth (307) of said first part (335) and/or said second part (337).

**6.** Cutter blade (301) according to any one of the claims 4 and 5, wherein said centre part (339) is shifted positioned relative to said first part (335) and/or said second part (337) in said direction opposite to said cutting direction (C).

**7.** Cutter blade (301) according to any one of the claims 4 to 6, wherein a pitch of said teeth (305, 309) of said first portion (315) and/or said second portion (317) is larger than a pitch of said teeth (307) of said first part (335) and/or said second part (337).

**8.** Cutter blade (201, 301) according to any one of the preceding claims, wherein said cutter blade (201, 301) is symmetrical.

**9.** Cutter blade (201, 301) according to any one of the preceding claims, wherein said cutter blade (201, 301) comprises a non-metallic material, preferably wherein said cutter blade is made from a non-metallic material.

**10.** A packing container (400) accommodating a roll of packing material, said packing container (400) comprising a cutter blade (301) according to any one of the preceding claims, wherein said cutter blade (301) is arranged to cut said packing material for separating a piece of packing material from said roll of packing material.

**11.** Packing container (400) according to claim 10, wherein a width of said cutter blade (301) is larger than a width of said accommodated roll of packing material, wherein said cutter blade (301) is arranged such that outer ends of said cutter blade (301) extend respectively beyond outer ends of said packing material.

**12.** Packing container (400) according to claim 10 or 11, wherein said first portion (315) is arranged relative to said roll of packing material for cutting a first edge of said packing material and wherein said second portion (317) is arranged relative to said roll of packing material for cutting a second edge of said packing material.

**13.** Packing container (400) according to any one of the claims 10 to 12, wherein said roll of packing material is provided with a roll receiving space and wherein said packing container comprises a holding arrangement arranged in said roll receiving space for retaining said roll of packing material inside said packing container (400) when unrolling said packing material.

**14.** A packing container (400) according to any one of the claims 10 to 13, wherein said packing material is made of polyethylene, polypropylene, or polyvinyl chloride.

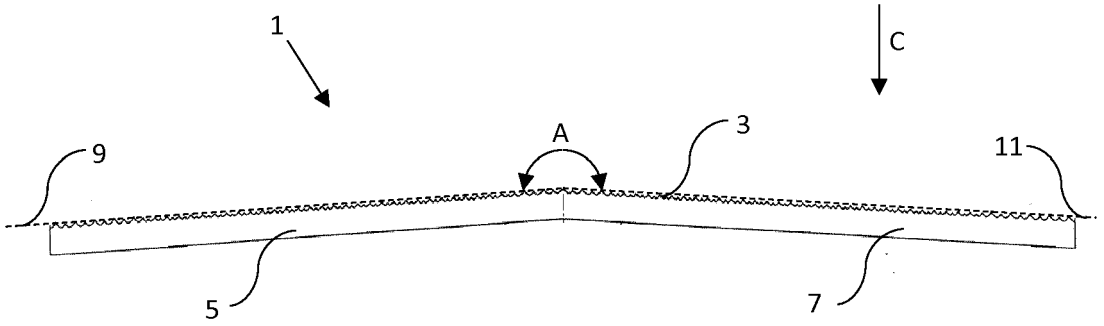


Fig. 1

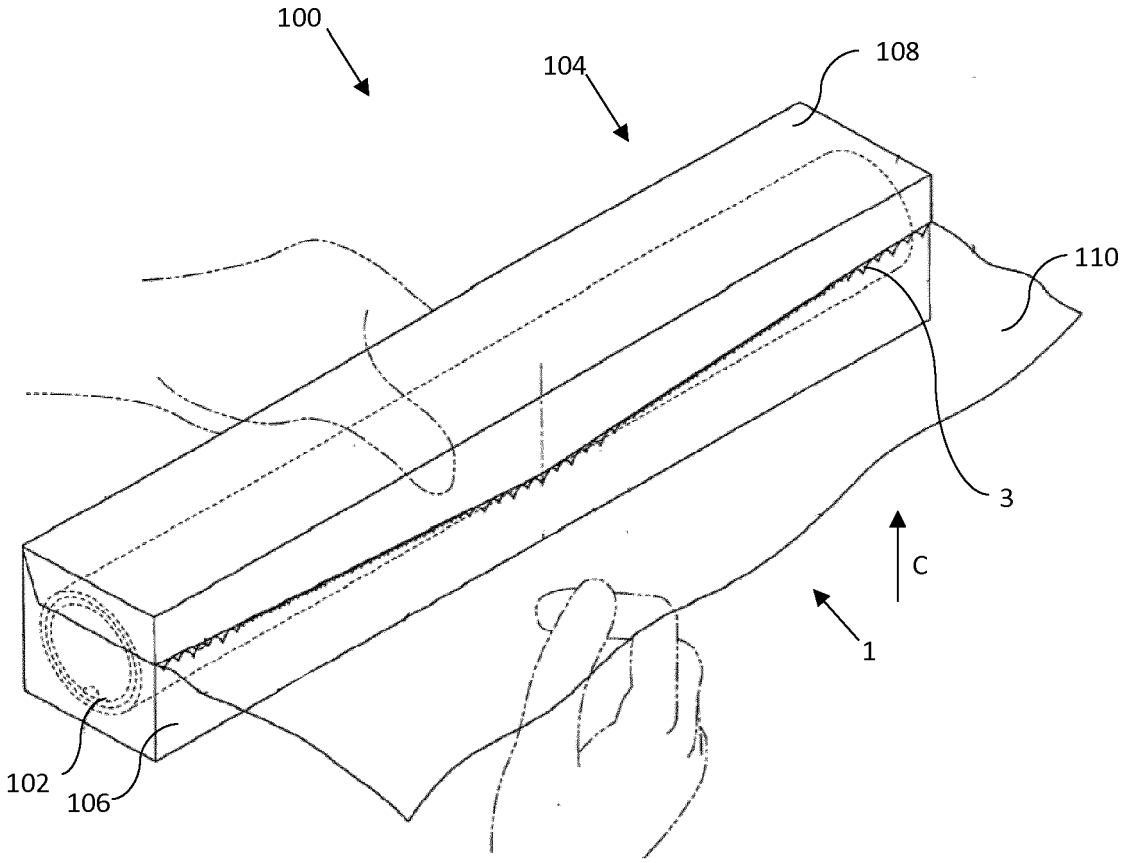


Fig. 2

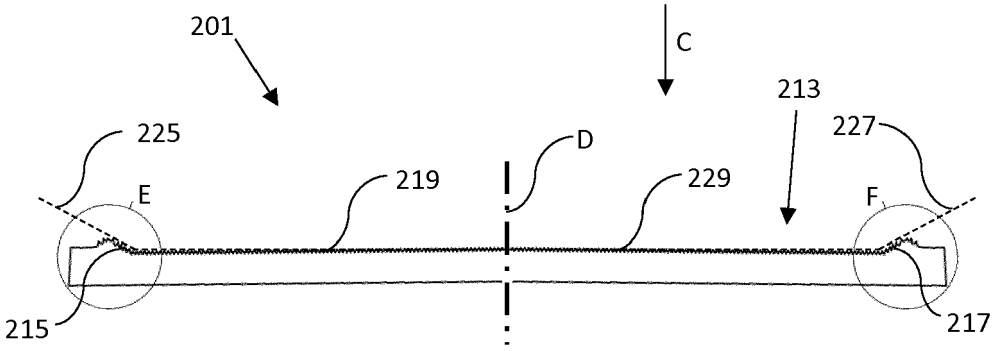


Fig. 3

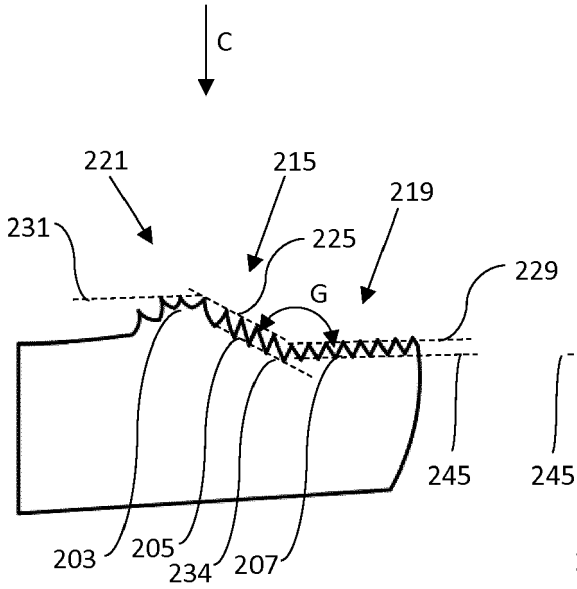


Fig. 4

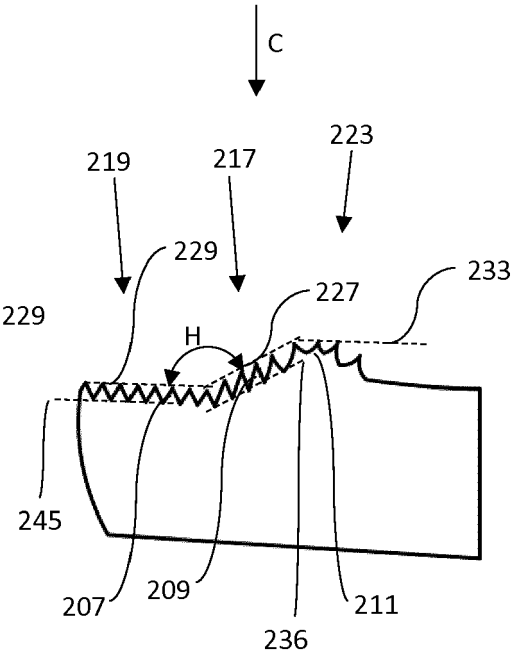


Fig. 5

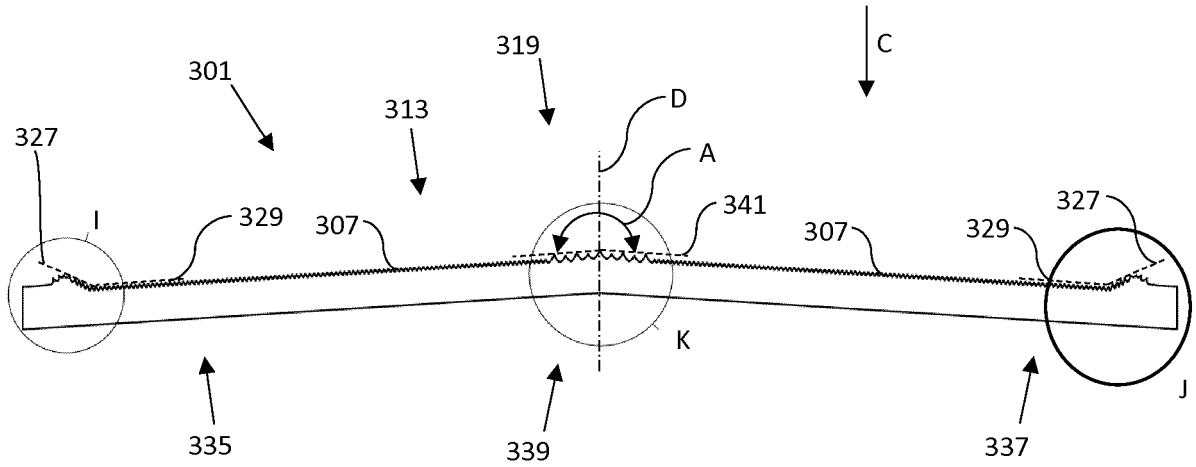


Fig. 6

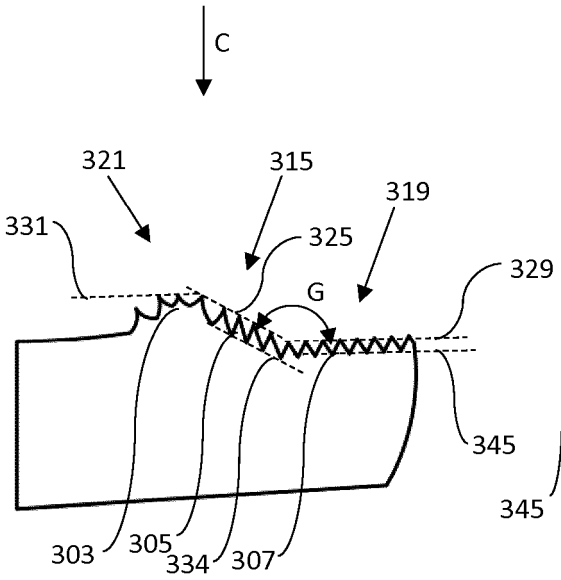


Fig. 7

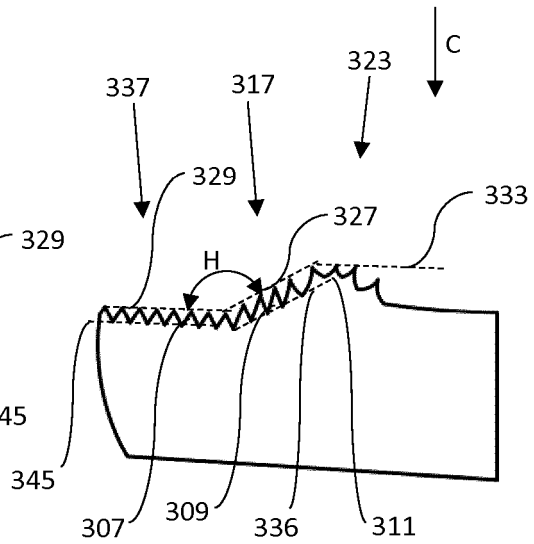


Fig. 8

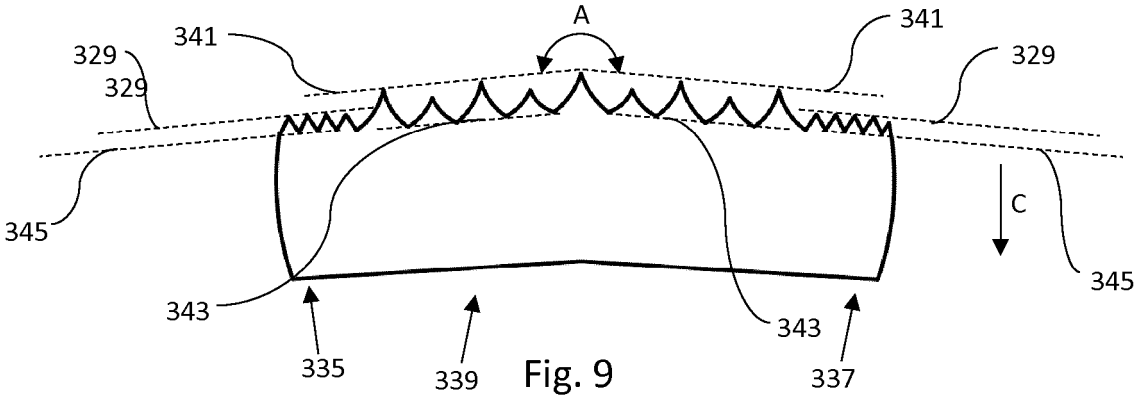


Fig. 9

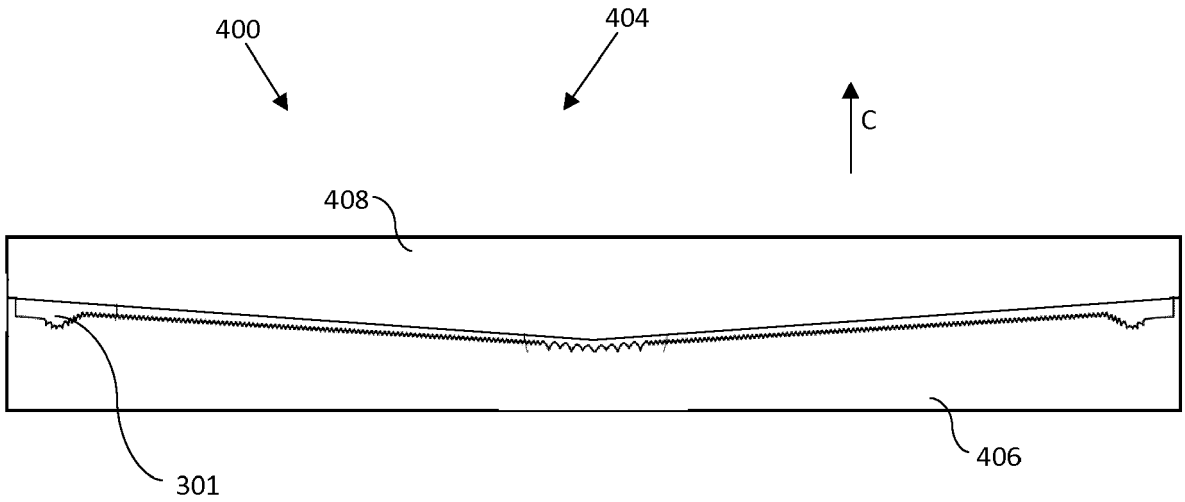


Fig. 10

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# EUROPEAN SEARCH REPORT

Application Number
EP 19 18 5193

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (IPC) |
|---|---|---|---|
| X<br>Y<br>A | JP 2001 018188 A (KAO CORP)<br>23 January 2001 (2001-01-23)<br>* the whole document *<br>----- | 1,2,4,6,<br>10-14<br>9<br>3,5 | INV.<br>B65H35/00<br>B65D83/08 |
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