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(54) **A LAUNDRY WASHING OR LAUNDRY WASHING-DRYING MACHINE DRUM**

WASCHMASCHINEN,- ODER WASCH-/TROCKNUNGSMASCHINENTROMMEL

TAMBOUR DE MACHINE À LAVER OU DE MACHINE À LAVER ET À SÉCHER LE LINGE

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Description

[0001] The present invention relates to a drum that is suitable for using in laundry washing or laundry washing-drying machines.

[0002] In laundry washing or laundry washing-drying machines, laundry is loaded into a drum, the drum is rotated by means of a motor and washing, spin-drying or laundry washing-drying processes are realized. In the state of the art, for the production of the drum, a rectangle-shaped sheet metal is bent into a cylinder and the edges that face one another are joined and thus, the hollow cylindrical body of the drum is formed. The front and the rear sides of the cylindrical body are covered by a circular front door whereon the laundry intake opening is located and a rear door. Holes are formed on the cylindrical body to allow the washing liquid to exit the drum and bulges are formed in the areas remaining between the holes. The performance of the washing process is increased by means of the form, positioning and number of the holes and bulges on the cylindrical body. In the state of the art, embodiments are available about the form and positioning of the holes and bulges on the cylindrical body.

[0003] In the European Patent No. EP1974083, a washing machine drum is explained that comprises bulges with a curved outline which is formed by joining circular spring parts.

[0004] In the Czech published patent application CZ 20100341 A3, a washing machine drum is disclosed wherein the band (rectangle-shaped sheet metal) is provided with stamps in the shape of a half-moon extruded from an outer side of the drum in an inward direction. The stamps are arranged in rows parallel to the drum axis, whereas an orientation of the stamps is changing each row about 180°, and by this way are formed left stamps and right stamps. Alternately, in each second row is about one stamp less. In the rows with a lower number of stamps these stamps are arranged in a level of gaps between two stamps in the neighbouring row.

[0005] The aim of the present invention is the realization of a drum that is suitable for using in laundry washing or laundry washing-drying machines and that is prevented from harming the laundry placed therein.

[0006] The drum realized in order to attain the aim of the present invention, explicated in the first claim and the respective claims dependent thereof, is suitable for using in laundry washing or laundry washing-drying machines and comprises a cylindrical body and holes and bulges located on the cylindrical body. The contour of the bulges is shaped as a closed curve. The contour of the bulges is formed by joining the concave and convex portions end to end.

[0007] The concave portion of the contour is between the two convex portions.

[0008] The contour of the bulge is composed of line segments joined end to end.

[0009] The corners wherein the line segments join are rounded. The line segments are joined to one another

alternatively with obtuse angle and acute angle, respectively.

[0010] In an embodiment of the present invention, the bulge is shaped as a simple concave polygon with rounded corners.

[0011] In an embodiment of the present invention, the bulge is arrowhead-shaped.

[0012] In an embodiment of the present invention, the bulge comprises a ridge and at least two surfaces that are inclined in different directions from the ridge towards the surface of the cylindrical body. In a derivative of this embodiment, the surfaces are mirror-symmetric with respect to the ridge.

[0013] In an embodiment of the present invention, the ridge is inclined towards the surface of the cylindrical body.

[0014] In an embodiment of the present invention, the holes and bulges are arranged along lines parallel to one another in the axial direction with respect to the rotational axis of the drum. The holes and bulges are aligned so as to follow one another alternately. In this embodiment, the ridge extends inclined in the radial direction with respect to the rotational axis of the drum.

[0015] In an embodiment of the present invention, the concave portion of the bulge contour partially surrounds the hole that comes thereafter on the bulge-hole sequence. The bulge and the hole surrounded by the concave portion of the bulge contour form a deltoid shape together.

[0016] In an embodiment of the present invention, the holes in adjacent lines are positioned in a staggered manner with respect to one another.

[0017] The interaction of the laundry inside the drum and the washing liquid is improved during the rotation of the drum by means of the shape of the bulges.

[0018] The drum realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

Figure 1 - is the perspective view of a drum.

Figure 2 - is the view of detail "A" in Figure 1.

Figure 3 - is the top view of a bulge.

Figure 4 - is the detailed view of a drum.

Figure 5 - is the view of cross-section BB in Figure 4.

Figure 6 - is the view of cross-section DD in Figure 4.

Figure 7 - is the view of CC cross-section in Figure 4.

[0019] The elements illustrated in the figures are numbered as follows:

1. Drum
2. Cylindrical body
3. Hole
4. Bulge
5. Ridge
6. , 106. Surface

[0020] The drum (1) which is suitable for using in laun-

dry washing or laundry washing-drying machines and wherein the laundry is placed comprises a cylindrical body (2), at least one hole (3) located on the cylindrical body (2) and at least one bulge (4) which is located on the cylindrical body (2) and extends from the surface of the cylindrical body (2) towards the rotational axis (E) of the drum (1) (Figure 1 and Figure 2).

[0021] The contour of the bulges (4) is shaped as a closed curve. At least one portion (C1 and C2) of the contour is convex-shaped and another portion (C3) thereof is concave-shaped. The concave-shaped portion (C3) is located between the convex-shaped portions (C1 and C2).

[0022] In an embodiment of the present invention, the contour is composed of line segments (D1, D2, D3, D4, D5 and D6) joined end to end to one another. The junctures of the line segments (D1, D2, D3, D4, D5 and D6) have radiuses (R1, R2, R3, R4, R5 and R6) (Figure 3).

[0023] In an embodiment of the present invention, the line segments (D1, D2, D3, D4, D5 and D6) forming the contour are joined such that there is an acute and obtuse angle therebetween, respectively.

[0024] In an embodiment of the present invention, the bulge (4) comprises at least one ridge (5) and at least two surfaces (6, 106) that are inclined from the ridge (5) towards the surface of the cylindrical body (2) (Figure 3). The ridge (5) separates the surfaces (6, 106) from each other. The ridge (5) is inclined towards the surface of the cylindrical body (2). The surfaces (6, 106) are mirror-symmetric with respect to the ridge (5). Since both the ridge (5) and the surfaces (6, 106) are inclined towards the surface of the cylindrical body (2), the washing liquid coming onto the bulge (4) during the washing process is facilitated to flow over the bulge (4) towards the surface of the cylindrical body (2) (Figure 4, Figure 5, Figure 6 and Figure 7).

[0025] In an embodiment of the present invention, the holes (3) and bulges (4) are arranged along lines (S) parallel to one another in the axial direction with respect to the rotational axis (E) of the drum (1). The holes (3) and the bulges (4) are arranged so that there is one hole (3) and after that one bulge (4) on each line (S). One hole (3) is located before and after the bulge (4) along the line (S). The hole (3) located after the bulge (4) among the line (S) is partially surrounded by the concave portion (C3) of the bulge (4) contour.

[0026] In an embodiment of the present invention, the holes (3) in adjacent lines (S) are arranged so as to be off-set from one another (Figure 4).

[0027] While the washing process is performed inside the drum (1), the washing liquid in the drum (1) is discharged out of the drum (1) by means of the holes (3). In the drying process, the washing fluid coming onto the bulge (4) drains towards the surface of the cylindrical body (2) in different directions by means of the inclination of the surfaces (6, 106) and ridge (5) towards the surface of the cylindrical body (2). The washing fluid is directed towards three different holes (3) is located around the

bulge (4).

[0028] By means of the shape of the bulges (4) formed on the cylindrical body (2) of the drum (1) used in laundry washing or laundry washing-drying machines, the circulation properties of the washing fluid in the drum (1) are improved.

[0029] It is to be understood that the present invention is not limited by the embodiments disclosed above and a person skilled in the art can easily introduce different embodiments. These should be considered within the scope of the protection postulated by the claims of the present invention.

Claims

1. A drum (1) which is suitable for using in laundry washing or laundry washing-drying machines and wherein the laundry is placed, comprising a cylindrical body (2), at least one hole (3) which is located on the cylindrical body (2) and at least one bulge (4) which is located on the cylindrical body (2) and extends from the surface of the cylindrical body (2) towards the rotational axis (E) of the drum (4), and the contour of which has a closed curve form, **characterized in that** at least one portion (C1 and C2) of the contour is convex-shaped and another portion (C3) is concave-shaped and wherein the concave-shaped portion (C3) is located between the convex-shaped portions (C1 and C2), wherein the contour is composed of line segments (D1, D2, D3, D4, D5 and D6) joined end to end to one another and wherein the junctures of the line segments (D1, D2, D3, D4, D5 and D6) have radiuses (R1, R2, R3, R4, R5 and R6) wherein the radiuses (R1, R2, R3, R4, R5 and R6) are rounded portions of the contour which are formed at the junctures where two line segments (01, 02, 03, 04, 05 and 06) are joined end to end to another.
2. The drum (1) as in Claim 1, **characterized by** the bulge (4) wherein the line segments (D1, D2, D3, D4, D5 and D6) forming the contour are joined to one another alternately with acute and obtuse angle therebetween, respectively.
3. The drum (1) as in any one of the above claims, **characterized by** the bulge (4) which comprises at least one ridge (5) and at least two surfaces (6, 106) that are inclined from the ridge (5) towards the surface of the cylindrical body (2).
4. The drum (1) as in Claim 3, **characterized by** the ridge (5) that separates the surfaces (6, 106) from each other.
5. The drum (1) as in Claim 3 or 4, **characterized by** the ridge (5) that is inclined towards the surface of

the cylindrical body (2).

6. The drum (1) as in Claim 4 or 5, **characterized by** the surfaces (6, 106) that are mirror-symmetric with respect to the ridge (5).
7. The drum (1) as in any one of the above claims, **characterized by** the holes (3) and bulges (4) that are arranged along lines (S) parallel to one another in the axial direction with respect to the rotational axis (E) so that there is one hole (3) and after that one bulge (4).
8. The drum (1) as in Claim 7, **characterized by** the hole (3) that is located after the bulge (4) among the line (S) and that is partially surrounded by the concave portion (C3) of the bulge (4) contour.
9. The drum (1) as in Claim 7 or 8, **characterized by** the holes (3) that are arranged so as to be off-set from one another in adjacent lines (S).
10. A laundry washing machine comprising the drum (1) as in any one of the above claims.
11. A laundry washing-drying machine comprising the drum (1) as in any one of the Claims 1 to 9.

Patentansprüche

1. Trommel (1), die zur Verwendung in einer Waschmaschine oder Wasch-/Trockenmaschine geeignet ist und in die Wäsche gegeben wird, **umfassend** einen zylindrischen Körper (2), wenigstens eine Bohrung (3), die an dem zylindrischen Körper (2) angeordnet ist, und wenigstens eine Wölbung (4), die an dem zylindrischen Körper (2) angeordnet ist und sich von der Fläche des zylindrischen Körpers (2) zur Drehachse (E) der Trommel (4) erstreckt und deren Kontur eine geschlossene Krümmungsform aufweist, **dadurch gekennzeichnet, dass** wenigstens ein Abschnitt (C1 und C2) der Kontur konvex geformt ist und ein anderer Abschnitt (C3) konkav geformt ist und wobei der konkav geformte Abschnitt (C3) zwischen den konvex geformten Abschnitten (C1 und C2) angeordnet ist, wobei die Kontur aus Liniensegmenten (D1, D2, D3, D4, D5 und D6) gebildet ist, die Ende an Ende miteinander verbunden sind, und wobei die Verbindungsstellen der Liniensegmenten (D1, D2, D3, D4, D5 und D6) Radien (R1, R2, R3, R4, R5 und R6) aufweisen, wobei die Radien (R1, R2, R3, R4, R5 und R6) gerundete Abschnitte der Kontur sind, die an den Verbindungsstellen gebildet sind, an denen zwei Liniensegmente (01, 02, 03, 04, 05 und 06) Ende an Ende miteinander verbunden sind.

2. Trommel (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** bei der Wölbung (4) die Liniensegmenten (D1, D2, D3, D4, D5 und D6), die die Kontur bilden, jeweils alternierend mit spitzen und stumpfen Winkel dazwischen miteinander verbunden sind.

3. Trommel (1) nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die Wölbung (4) wenigstens einen Grat (5) und wenigstens zwei Flächen (6, 106) umfasst, die von dem Grat (5) zur Fläche des zylindrischen Körpers (2) geneigt sind.

4. Trommel (1) nach Anspruch 3, **dadurch gekennzeichnet, dass** der Grat (5) die Flächen (6, 106) voneinander trennt.

5. Trommel (1) nach Anspruch 3 oder 4, **dadurch gekennzeichnet, dass** der Grat (5) zur Fläche des zylindrischen Körpers (2) geneigt ist.

6. Trommel (1) nach Anspruch 4 oder 5, **dadurch gekennzeichnet, dass** die Flächen (6, 106) in Bezug auf den Grat (5) spiegelsymmetrisch sind.

7. Trommel (1) nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die Bohrungen (3) und Wölbungen (4) an Linien (S) angeordnet sind, die in Bezug auf die Drehachse (E) in Axialrichtung parallel zueinander angeordnet sind, so dass eine Bohrung (3) danach eine Wölbung (4) vorliegt.

8. Trommel (1) nach Anspruch 7, **dadurch gekennzeichnet, dass** die Bohrung (3) an der Linie (S) nach der Wölbung (4) angeordnet ist und teilweise von dem konkaven Abschnitt (C3) der Kontur der Wölbung (4) umgeben ist.

9. Trommel (1) nach Anspruch 7 oder 8, **dadurch gekennzeichnet, dass** die Bohrungen (3) in benachbarten Linien (S) derart angeordnet sind, dass sie zueinander versetzt sind.

10. Waschmaschine, umfassend die Trommel (1) nach einem der vorangehenden Ansprüche.

11. Wasch-/Trockenmaschine, umfassend die Trommel (1) nach einem der Ansprüche 1 bis 9.

Revendications

1. Un tambour (1) qui est adapté à être utilisé dans des lave-linges ou lavante-séchantes et dans lequel le linge est placé, **comprenant** un corps cylindrique (2), au moins un trou (3) qui est disposé sur le corps cylindrique (2) et au moins un renflement (4) qui est

disposé sur le corps cylindrique (2) et qui s'étend à partir de la surface du corps cylindrique (2) vers l'axe de rotation (E) du tambour (4), et dont le contour est en forme de courbe fermée, **caractérisé en ce qu'**au moins une partie (C1 et C2) du contour est convexe et une autre partie (C3) est concave et où la partie concave (C3) est situé entre les parties convexes (C1 et C2), où le contour est composé de segments de ligne (D1, D2, D3, D4, D5 et D6) reliés bout à bout l'un à l'autre et où les jonctions des segments de ligne (D1, D2, D3, D4, D5 et D6) présentent des rayons (R1, R2, R3, R4, R5 et R6) où les rayons (R1, R2, R3, R4, R5 et R6) sont les parties arrondies du contour qui sont formées aux jonctions où deux segments de ligne (01, 02, 03, 04, 05 et 06) sont reliés bout à bout l'un à l'autre.

2. Un tambour (1) selon la Revendication 1, **caractérisé par** le renflement (4) où les segments de ligne (D1, D2, D3, D4, D5 et D6) formant le contour sont reliés l'un à l'autre alternativement avec un angle aigu et obtus entre eux respectivement.
3. Un tambour (1) selon l'une quelconque des revendications précédentes, **caractérisé par** le renflement (4) qui comprend au moins une crête (5) et au moins deux surfaces (6, 106) qui sont inclinées à partir de la crête (5) vers la surface du corps cylindrique (2).
4. Un tambour (1) selon la Revendication 3, **caractérisé par** la crête (5) qui sépare les surfaces (6, 106) l'une de l'autre.
5. Un tambour (1) selon la Revendication 3 ou 4, **caractérisé par** la crête (5) qui est inclinée vers la surface du corps cylindrique (2).
6. Un tambour (1) selon la Revendication 4 ou 5, **caractérisé par** les surfaces (6, 106) qui sont en symétrie miroir par rapport à la crête (5).
7. Un tambour (1) selon l'une quelconque des revendications précédentes, **caractérisé par** les trous (3) et les renflements (4) qui sont arrangés le long des lignes (S) en parallèle l'une à l'autre dans la direction axiale par rapport à l'axe de rotation (E) de telle sorte qu'il y a un trou (3) et ensuite un renflement (4).
8. Un tambour (1) selon la Revendication 7, **caractérisé par** le trou (3) qui est situé après le renflement (4) parmi les lignes (S) et qui est entouré partiellement par la partie concave (C3) du contour du renflement (4).
9. Un tambour (1) selon la Revendication 7 ou 8, **caractérisé par** les trous (3) qui sont arrangés de manière à être à l'écart par rapport l'un à l'autre sur les

lignes adjacentes (S).

10. Un lave-vaisselle comprenant le tambour (1) selon l'une quelconque des revendications précédentes.
11. Une lavante-séchante comprenant le tambour (1) selon l'une quelconque des revendications de 1 à 9.

Figure 1

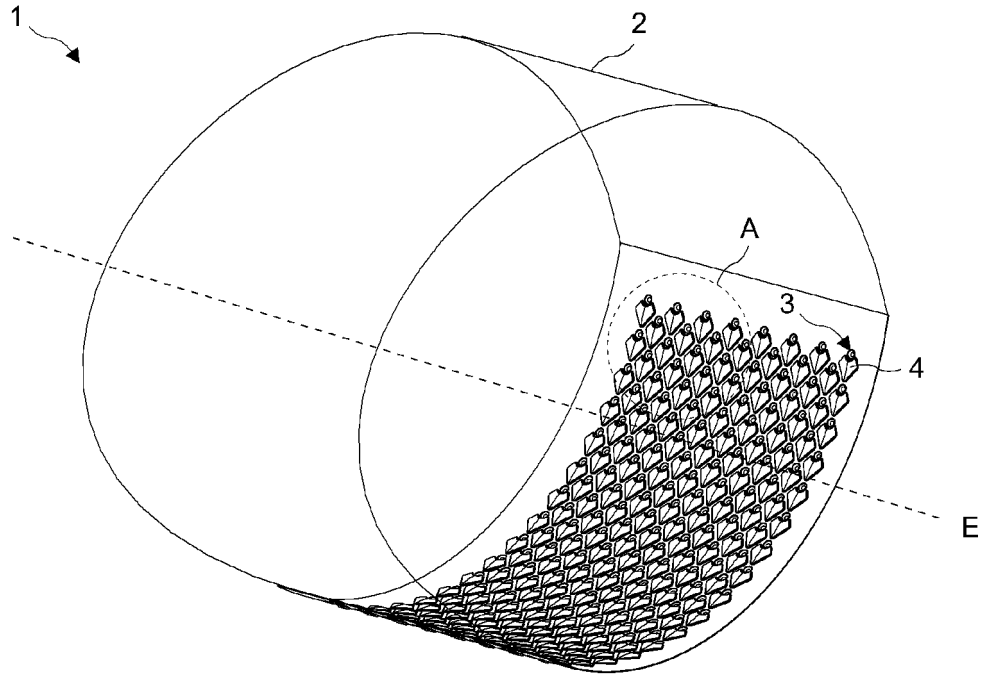


Figure 2

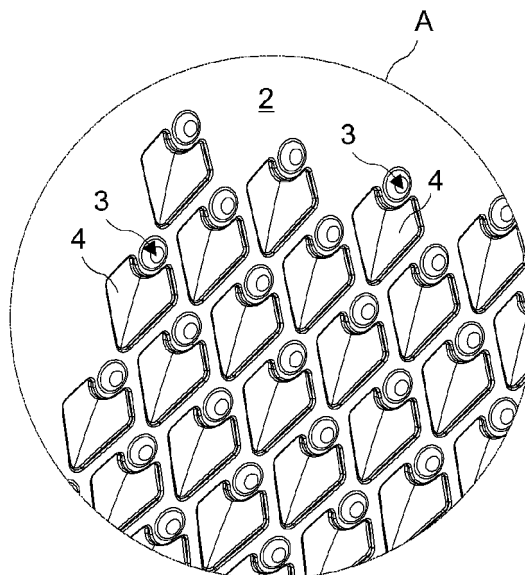


Figure 3

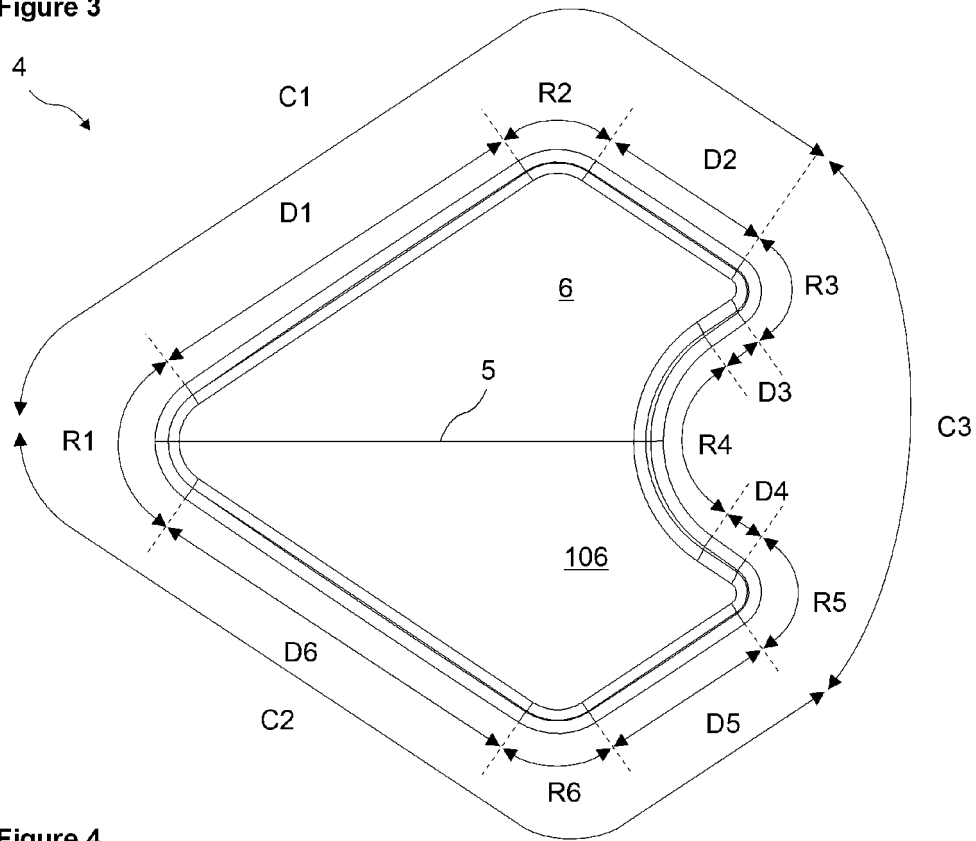


Figure 4

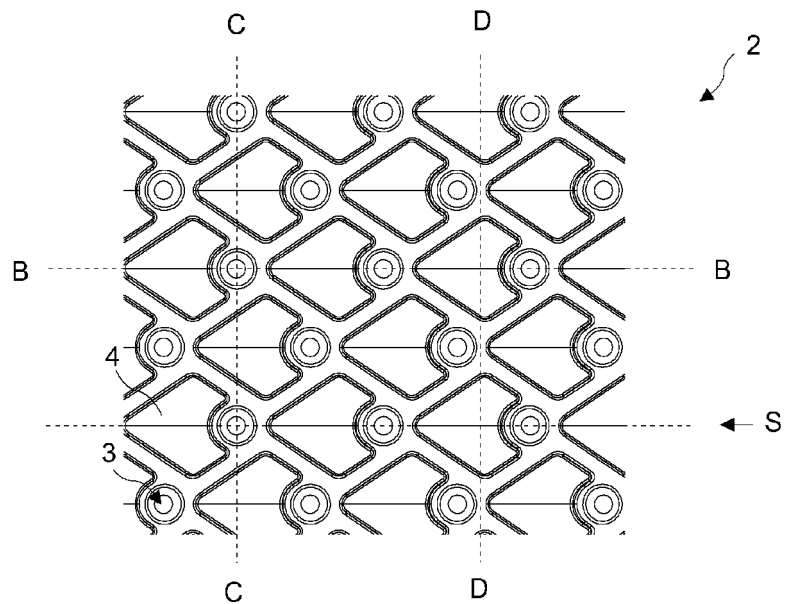


Figure 5

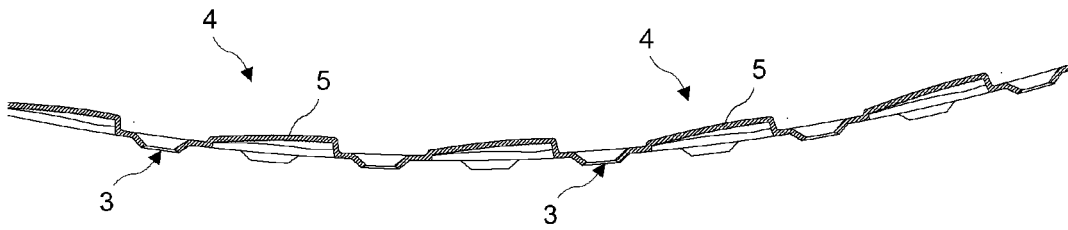


Figure 6

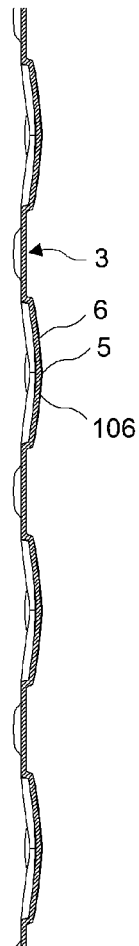
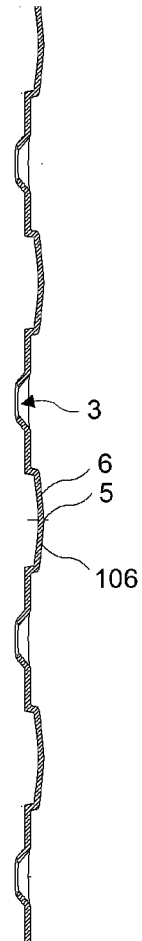


Figure 7



REFERENCES CITED IN THE DESCRIPTION

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