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(54) **LAUNDRY TREATMENT APPLIANCE COMPRISING A WASHING RECEPTACLE HAVING
LAUNDRY PROTECTION STRUCTURE**

WÄSCHEBEHANDLUNGSGERÄT MIT EINEM WÄSCHEBEHÄLTER MIT EINER
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APPAREIL DE TRAITEMENT DU LINGE AVEC UN RÉCEPTACLE DE LAVAGE AVEC UNE
STRUCTURE DE PROTECTION DU LINGE

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Description

[0001] The present invention relates to a laundry treatment appliance with a washing receptacle, i.e. a drum equipped with a plurality of lifters by which any damage to the laundry being washed is prevented.

[0002] Laundry treatment appliances such as washing machines, dryers and combo washing/drying machines have a washing receptacle along a plurality of internal surface axial lines of which several lifters at various dimensions are provided in the manner to increase the washing efficiency by enabling the movement of the laundry. While the washing process takes place, the cloth items are raised to a certain height and then left free to fall, thereby a required displacement is accordingly induced in the washing receptacle.

[0003] A washing receptacle is typically produced by joining two opposite sides of a plate so as to obtain a cylindrical shape and by covering the axial ends of the resulting form by means of front and rear lids. A conventional technique for joining the two opposite sides of a plate is the clinching method by which the two metal layers one over the other are fastened together with the help of a punch and die. The tooling typically clamps the layers between the punch and die by drawing and squeezing the same into the die so as to form a lock.

[0004] A few lifters, preferably three lifters i.e. baffles can be obtained by conventional manufacturing techniques such as cutting, boring and bending or can be manufactured as a separate element to be mounted within the washing receptacle. A lifter can be attached to the washing receptacle through holes on the internal surface thereof by means of various locking arrangements. It is to be noted that it is of great concern that the joining line on which the clinching technique is applied is covered by a lifter. However, the fact that the joining line in the washing receptacle involves an inwardly projecting surface character due to the nature of the technique being applied, the lifter being directly attached on the joining line may result in that an opening of a certain size appears in between the lifter and the internal surface of the washing receptacle through the joining line,

or even the lifter may prove not possible to be attached at all due to the mutual irregularity. These gaps under the lifters might cause laundry damage in case a respective end of a cloth item is stuck in such a gap.

It is therefore desirable to obtain a structural arrangement by which the openings in between the lifter and the joining line of the washing receptacle is closed so as to avoid an open region exposed to cloth items and respective parts thereof, such as zippers, belts, collars and other end parts.

A prior art reference in the technical field of the present invention may be referred to as WO0213332, disclosing a washing receptacle for a washing machine comprising a jacket surface and a plurality of paddles. The side surface of the paddle is concave, convex or wedge-shaped at the distal end thereof, such that laundry is conveyed

in the axial direction from the drainage zone, during rotation of the drum, towards the spin-drying zone of the drum in the axial direction that is designed for spin-drying the laundry.

The present invention, on the other hand, provides a structural arrangement by which the openings in between the lifter and the joining line of the washing receptacle is fully closed so as to avoid an open region exposed to cloth items.

[0005] Prior art document JP H0358299 U discloses a washing machine with a hollow lifter that is fixed adjacent to the connection line of the drum.

[0006] Prior art document KR 100725742B discloses a washing machine in which a solid lifter is arranged above the connection line of the drum, the lifter having a groove on its lower surface that provides space for projecting parts of the connection line. Moreover, remaining space between the lower side of the lifter and the drum can additionally be sealed with silicone.

[0007] Primary object of the present invention is therefore to avoid an open region exposed to cloth items in between the lifter and the joining line of the washing receptacle

The present invention therefore provides a washing receptacle, which is defined in the characterized portion of Claim 1.

The present invention discloses a laundry treatment appliance, i.e. an appliance having a drum receiving the laundry to be treated, the latter conventionally disposed in a tub. The washing receptacle, i.e. the drum is manufactured by way of clinching two opposite sides of a plate and mounting a plurality of axial lifters therein for imparting movement to the laundry under different operational conditions.

The clinching line, or in other expression the "seam" of the washing receptacle is covered by a lifter such that said clinching line is concealed in its entirety and contact of the laundry with the same during operation of the appliance is prevented. The axial side surfaces of the lifter that is the two end surfaces at the longitudinal ends thereof have intermediate cavities at the skirt portions, shaped to receive a clinching line protrusion in a mutually confronting relationship.

[0008] Further, embossed fillings are alternatively disposed between the intermediate cavities and said clinching line protrusions to feature an improved contact engagement. The embossed fillings are also applicable on the internal side of the lateral surface of said washing receptacle where no clinching lines are present.

[0009] Accompanying drawings are given solely for the purpose of exemplifying a washing receptacle whose advantages over prior art were outlined above and will be explained in brief hereinafter.

[0010] The drawings are not meant to delimit the scope of protection as identified in the claims nor should they be referred to alone in an effort to interpret the scope identified in said claims without recourse to the technical disclosure in the description of the present invention.

Fig. 1 demonstrates a general cross-sectional side view of a laundry treatment appliance according to the present invention.

Fig. 2a and 2b respectively demonstrate general perspective views of a washing receptacle in pre-assembled and assembled states according to the present invention.

Fig. 3a and 3b respectively demonstrate an axial cross-sectional view and a partial general perspective view of a washing receptacle with several lifters according to the present invention.

Fig. 4a and 4b respectively demonstrate axial cross-sectional views of the positioning of a lifter relative to a washing receptacle internal wall in an assembled and pre-assembled state according to the present invention.

[0011] The followings numerals are used in the detailed description:

1. Laundry treatment appliance
2. Tub
3. Washing receptacle
4. Front lid
5. Rear lid
6. Lateral surface
7. Lifter
8. Axial side surface
9. Intermediate cavity
10. Clinching line protrusions
11. Embossed filling
12. Clinching line

[0012] The present invention proposes a laundry treatment appliance (1) such as for instance a washing machine, a dryer or a combo washing/drying machine. The laundry treatment appliance (1) of the invention conventionally comprises a tub (2) and a washing receptacle (3), i.e. a drum located in the tub (2), in which the laundry to be washed is placed. Said washing receptacle (3) is produced by joining two opposite sides of a plate so as to obtain a cylindrical shape and by covering the axial ends thereof by means of a front (4) and a rear lid (5). To this end, the lateral surface (6) of the washing receptacle (3) making up the axially extending side surface thereof is obtained by the clinching method such that the two reciprocal metal layers are fastened together with the help of a punch and die. The internal side of the lateral surface (6), i.e. the internal surface, conventionally comprises a plurality of lifters (7) i.e. the baffles intended for inducing displacement of the laundry under different operational condition, i.e. so as to move in a predetermined manner during washing or spin-drying. In a nutshell, the present invention proposes a laundry treatment appliance (1) comprising a tub (2) and a washing receptacle (3) located in the tub (2) and in which the laundry to be washed is placed, said washing receptacle (3) having a clinching line (12) i.e. a seam by which two opposite sides

of a plate are joined to obtain a cylindrical shape. A plurality of lifters (7) for inducing predetermined displacement of the laundry under different operational conditions is provided in said washing receptacle (3).

[0013] The joining line on which the clinching technique is applied is needed to be covered by a lifter (7) due to a plurality of reasons, including those such as aesthetical ones in an effort to conceal the joining line or simply in order for regaining discharge or circulation holes provided on the lateral surface (6) of the washing receptacle (3), which would otherwise be covered by the respective lifter (7). Since the fact that the joining line in the washing receptacle (3) involves an inwardly projecting surface character due to the nature of the clinching technique, the lifter (7) being attached on the joining line may result in that an opening appears in between the lifter (7) and the lateral surface (6) of the washing receptacle (3), in which case a respective end of a cloth item can be stuck in such an opening and damaged. According to the present invention, to overcome the above-identified inconvenience, the axial side surfaces (8) of the lifters (7) have an intermediate cavity (9) at the skirt portions thereof, designed so as to be receiving a clinching line protrusion (10). These axial end clinching line protrusions (10) are therefore covered by the borders of the intermediate cavities (9) so as to cover any gap between the skirt portions of the lifters (7) where the intermediate cavities (9) are disposed and the internal side of the lateral surface (6), where the clinching line protrusions (10) are present. Alternatively, as shown in Fig. 4a and 4b, an additional embossed filling (11) can be employed to obtain a reciprocally tight-fit engagement surface between the intermediate cavities (9) and said clinching line protrusions (10). In a nutshell, the present invention provides that said joining line or clinching line (12) of the washing receptacle (3) is covered by a lifter (7) and axial side surfaces (8) of said lifter (7) that is covering said clinching line (12) have intermediate cavities (9) at the skirt portions thereof designed so as to be receiving a clinching line protrusion (10).

[0014] According to an alternative embodiment of the present invention, embossed fillings (11) are employed to obtain a reciprocally tight-fit engagement surface between the intermediate cavities (9) and said clinching line protrusions (10) so as to be disposed thereinbetween. The embossed fillings (11) fully cover said clinching line protrusions (10). It is to be noted that a lifter (7) provided with intermediate cavities (9) according to the present invention can be used on the internal side of the lateral surface (6) along axial lines where no clinching line (12) is present. To this end, to adapt the internal side of the lateral surface (6) to be suitable for establishing a mutually confronting surface relationship with the skirt portions at the axial side surfaces (8) of said lifters (7), said embossed fillings (11) are also provided along axial lines outside the clinching line (12). To this end, a lifter (7) used on the clinching line (12) is also usable on other parts of the washing receptacle (3). Said embossed fill-

ings (11) are therefore directly applicable on the internal side of the lateral surface (6) of said washing receptacle (3).

[0015] In another embodiment of the present invention, said embossed fillings (11) can be formed by applying the clinching technique such that a modified die is used to obtain a greater protrusion at the skirt portions of the lifters or they can be designed in the shape of individual members mechanically connectible with said washing receptacle (3).

[0016] Accordingly, a structural arrangement is proposed, by which the openings in between the lifter (7) and the clinching line (12) of the washing receptacle (3) is closed so as to avoid an open region exposed to cloth items and respective parts thereof, such as zippers, belts, collars and other end parts.

Claims

1. A laundry treatment appliance (1) comprising a tub (2) and a washing receptacle (3) located in the tub (2) and in which the laundry to be washed is placed, said washing receptacle (3) having a clinching line (12) by which two opposite sides of a plate are joined to obtain a cylindrical shape, a plurality of lifters (7) for inducing predetermined displacement of the laundry under different operational conditions being provided in said washing receptacle (3), wherein said clinching line (12) of the washing receptacle (3) is covered by a lifter (7) and axial side surfaces (8) of said lifter (7) that is covering the clinching line (12) have intermediate cavities (9) at the skirt portions thereof designed so as to be receiving a clinching line protrusion (10), **characterized in that** embossed fillings (11) are disposed between the intermediate cavities (9) and said clinching line protrusions (10), wherein the embossed fillings (11) are formed by applying the clinching technique for forming the clinching line such that a modified die is used to obtain a greater protrusion at the skirt portions of the lifters.
2. An electrical household appliance as (1) in Claim 1, **characterized in that** said embossed fillings (11) fully cover said clinching line protrusions (10).
3. An electrical household appliance (1) as in Claim 1 and 2, **characterized in that** the embossed fillings (11) are directly applicable on the internal side of the lateral surface (6) of the washing receptacle (3).

Patentansprüche

1. Wäschebehandlungsvorrichtung (1) mit einer Wanne (2) und einem in der Wanne (2) liegenden Wasch-

behälter (3), in dem die zu waschende Wäsche platziert ist, der Waschbehälter (3) eine Clinchlinie (12) aufweist, durch die zwei gegenüberliegende Seiten einer Platte zusammengefügt sind, um eine zylindrische Form zu erhalten, in dem Waschbehälter (3) eine Vielzahl von Hebern (7) zum Einleiten einer vorbestimmten Verschiebung der Wäsche unter verschiedenen Betriebsbedingungen vorgesehen ist, wobei die Clinchlinie (12) des Waschbehälters (3) durch einen Hebern (7) abgedeckt ist und axiale Seitenflächen (8) des Hebers (7), der die Clinchlinie (12) abdeckt, Zwischenhohlräume (9) an ihren Schürzenabschnitten aufweisen, die so gestaltet sind, dass sie einen Vorsprung (10) der Clinchlinie aufnehmen, **dadurch gekennzeichnet, dass** geprägte Füllungen (11) zwischen den Zwischenhohlräumen (9) und den Vorsprüngen (10) der Clinchlinie entsorgt sind, wobei die geprägten Füllungen (11) durch Anwendung der Clinchtechnik zum Bilden der Clinchlinie gebildet werden, so dass eine modifizierte Matrize verwendet wird, um einen größeren Vorsprung an den Schürzenabschnitten der Heber zu erhalten.

2. Elektrisches Haushaltsgerät (1) nach in Anspruch 1, **dadurch gekennzeichnet, dass** die geprägten Füllungen (11) die Vorsprüngen (10) der Clinchlinie vollständig abdecken.
3. Elektrisches Haushaltsgerät (1) nach Anspruch 1 und 2, **dadurch gekennzeichnet, dass** die geprägten Füllungen (11) direkt auf der Innenseite der Seitenfläche (6) der Waschbehälter (3) einsetzbar sind.

Revendications

1. Appareil de traitement du linge (1) comprenant une cuve (2) et un réceptacle de lavage (3) situé dans la cuve (2) et dans lequel le linge à laver est placé, ledit réceptacle de lavage (3) ayant une ligne de clinchage (12) par laquelle deux côtés opposés d'une plaque sont joints pour obtenir une forme cylindrique, une pluralité d'élévateurs (7) pour induire un déplacement prédéterminé du linge dans différentes conditions opérationnelles étant prévus dans ledit récipient à linge (3), dans lequel ladite ligne de clinchage (12) du réceptacle de lavage (3) est recouverte par un élévateur (7) et les surfaces latérales axiales (8) dudit élévateur (7) qui recouvre la ligne de clinchage (12) ont des cavités intermédiaires (9) aux parties de jupe de celui-ci conçues de manière à recevoir une protubérance (10) de ligne de clinchage, **caractérisé en ce que** des garnitures gaufrées (11) sont disposées entre les cavités intermédiaires (9) et lesdites protubérances (10) de ligne de clinchage, dans lequel les garnitures gaufrées (11) sont formées en appliquant la technique de clinchage pour

former la ligne de clinchage de sorte qu'une matrice modifiée est utilisée pour obtenir une plus grande protubérance aux parties formant la bordure des poussoirs.

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2. Appareil électroménager (1) selon la revendication 1, **caractérisé en ce que** lesdites garnitures gaufrées (11) recouvrent complètement lesdites protubérances (10) de la ligne de clinchage.

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3. Appareil électroménager (1) selon la revendication 1 et 2, **caractérisé en ce que** les garnitures gaufrées (11) sont directement applicables sur le côté intérieur de la surface latérale (6) du réceptacle de lavage (3).

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Fig. 1

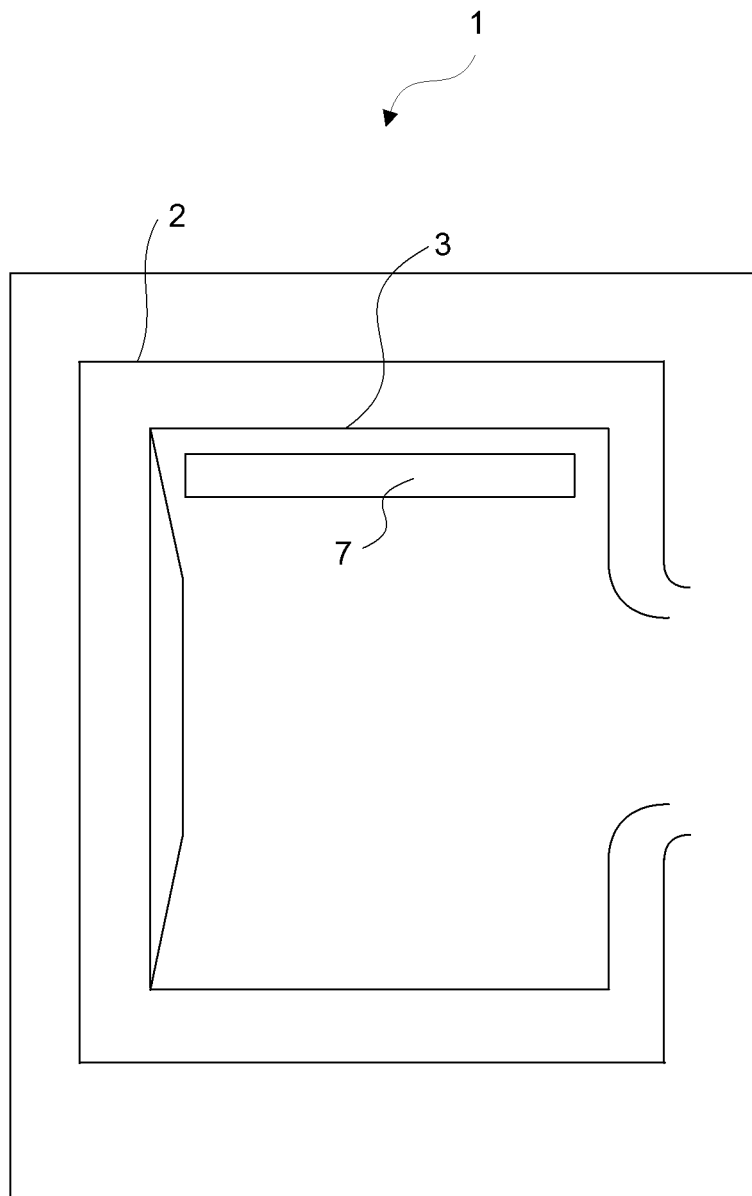


Fig. 2a

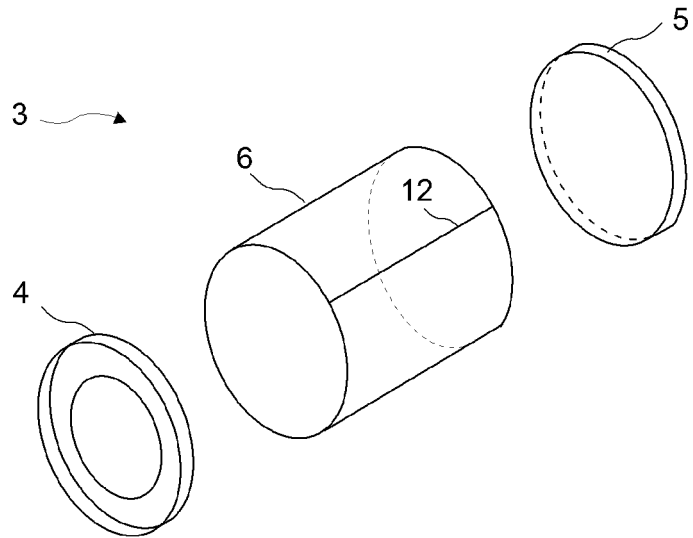


Fig. 2b

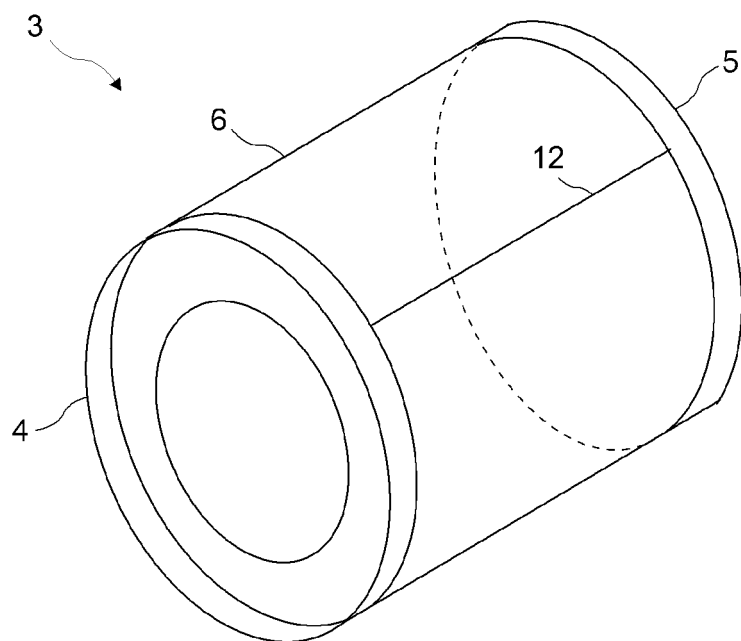


Fig. 3a

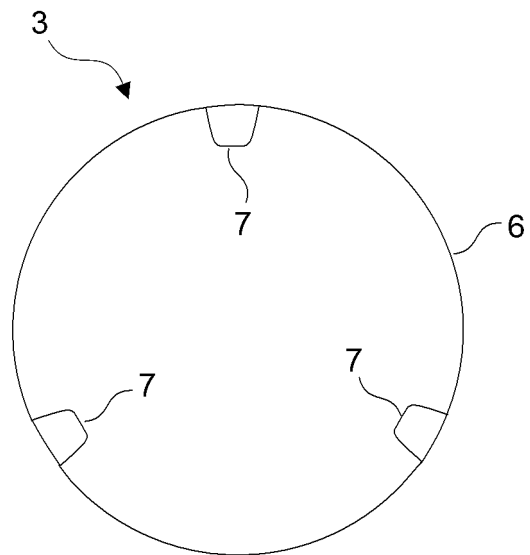


Fig. 3b

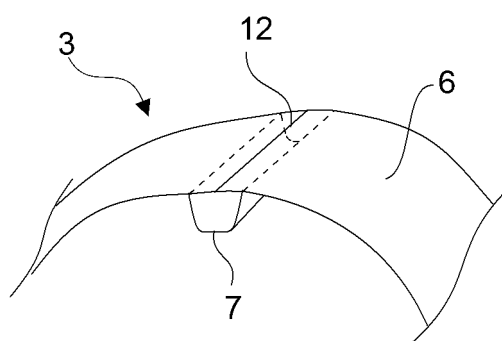


Fig. 4a

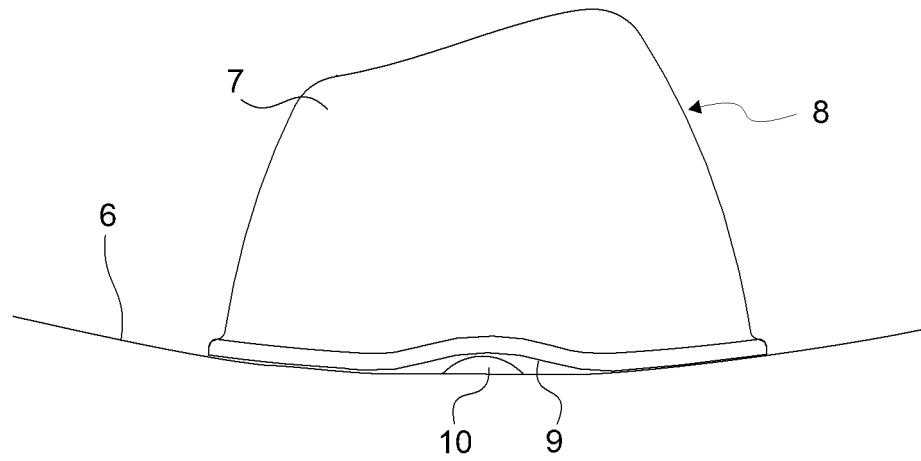
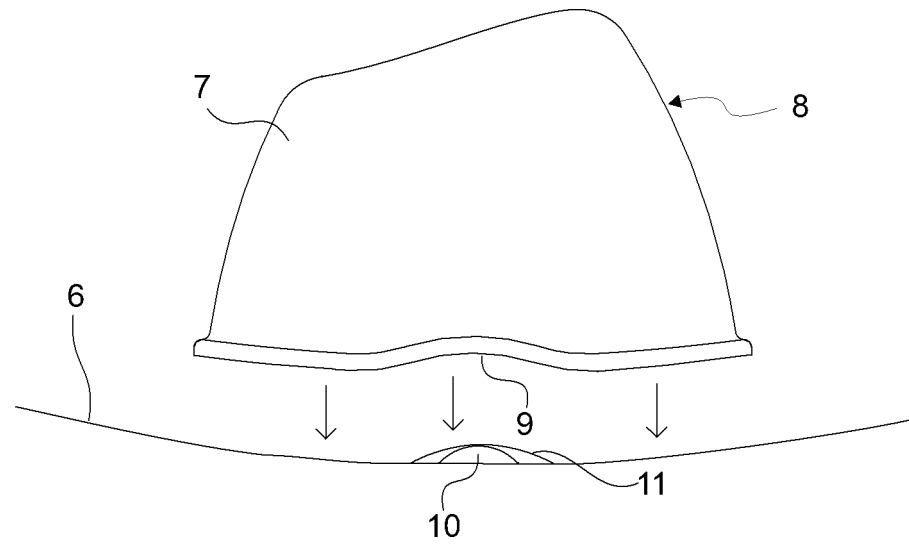


Fig. 4b



REFERENCES CITED IN THE DESCRIPTION

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