



EUROPEAN PATENT SPECIFICATION

Date of publication of patent specification :
25.08.93 Bulletin 93/34

Int. Cl.⁵ : **B65D 8/02**

Application number : **91904046.9**

Date of filing : **19.02.91**

International application number :
PCT/NL91/00028

International publication number :
WO 91/12182 22.08.91 Gazette 91/19

DRUM.

Priority : **19.02.90 NL 9000396**

Date of publication of application :
02.12.92 Bulletin 92/49

Publication of the grant of the patent :
25.08.93 Bulletin 93/34

Designated Contracting States :
AT BE CH DE DK ES FR GB GR IT LI LU NL SE

References cited :
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DE-U- 8 709 594
NL-A- 8 802 842

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EP 0 515 465 B1

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Description

The invention relates to a drum, comprising a side wall, a bottom and a top wall, which bottom and top wall are connected by a folded joint to the side wall, and in which the top wall is provided with at least one closable aperture with a neck going out from an axially outward-pressed part surrounding the neck, which top wall radially inwards from a circle in the surface of the top wall is axially curved inwards and radially outwards from said circle has an edge strip, all this in such a way that in the inverted position of the drum the contents can run off through the apertures.

Such a drum is known from, for example, German Gebrauchsmuster G 87 09594.7. In the case of this known drum the curvature and the conical surface shaped edge strip intersect each other approximately at the centre lines of the apertures, so that these intersections form a valley which runs round in the peripheral direction and forms the lowest point when the drum is placed upside down. At the place of this intersection or meeting of curvature and conical surface shaped edge strip a groove is also pressed into the top wall, which groove itself slopes down from the large aperture to the small, lower-lying aperture, in order to make emptying of the drum easier.

The manufacture of such a top wall requires more material, and is complex and thus expensive.

This known drum was designed because the chemical industry has now set the condition for drum manufacturers that a drum, such as a 55-gallon drum filled with water, when placed upside down to achieve emptying of the drum, must be emptied in the purely vertical position to such an extent that within five minutes no more than 100 ml is left in the drum. This known drum meets this condition.

A drum with an entirely flat top wall, which is provided in the known manner with two apertures, also meets this condition, but a drum with such a flat top wall also has the problem of not-being strong enough. Internal excess pressure can lead to permanent deformation. The curvature, as in the case of the above-mentioned known drum, does not have that problem.

A disadvantage of the known drum is, however, that the remaining liquid has to drain off through the small aperture, while in general there is a requirement that this must take place through the large aperture. It is possible to place the large aperture lower down than the small one and to make the groove of the small one slope towards the large aperture.

However, in that case, in order to prevent the large closure from projecting beyond the edge of the drum, the top wall must be made of a greater depth. A considerably greater quantity of material is required for this.

The object of the invention is then to provide a drum which meets the requirement set, remains simple to manufacture, and is strong enough.

This object is achieved according to the invention in that the circle surrounding the inward curvature has a diameter which is greater than the largest circle within which the edge of any outward-pressed part surrounding its neck facing the folded joint is situated, but is smaller than the diameter of the inside face of the side wall of the drum, so that the edge strip is formed between said curvature and the drum wall, and in that at least one of the apertures the top wall has a strip which from the edge strip faces away from the drum wall, and which surrounds the outward-pressed part at least partially, and forms a small angle with a horizontal face lying at right angles to the centre line of the drum, in such a way that in the inverted position of the drum with the aperture downwards this strip forms a run-off face running from the edge strip in a downward slope.

In this way virtually complete emptying can be achieved, not only in a purely vertically placed position, but also in a position which deviates slightly from it. Besides, full emptying can be ensured by lifting the drum slightly at the side lying opposite the drain aperture when it is placed in the inverted position, for example in such a way that the centre line forms an angle of 5° with the vertical, as a result of which all remaining liquid is sure to run to the part of the edge strip connecting to the run-off strip sloping towards the aperture.

This also means that with a relatively small curvature the drum can still be given the necessary strength, so that there is no risk of the wall being pressed outwards permanently.

It also means that the shape of the top wall ensuring complete draining of the contents requires no additional space, so that no adverse effect takes place on the contents of the drum, the edge height remains at the folded joint, and the closure remains below the plane through the folded joint edge.

For the manufacture of the top wall, no great changes as regards the normal production equipment are needed. The same sheet form can also be used for the bottom wall, of course without the outward-pressed parts with the necks and apertures.

It is pointed out that Dutch Patent Application 8802842 (not a prior publication) gives a solution to the same problem by ensuring that the inward curvature of the top wall ends at a circle which lies inside the facing edges of the circular outward-pressed parts of the apertures where a transition occurs towards an outward-sloping conical face, which conical face forms a very small angle with the horizontal face lying at right angles to the centre line, all this in such a way that when it is placed in the inverted position virtually complete emptying is obtained, in such a way that no more than 50 ml can remain behind, which lies within the values laid down by the industry.

The invention will now be explained in greater detail with reference to the drawing.

Fig. 1 is a top view of a part of the top wall of a drum.

Fig. 2 is a cross-section through the top wall of the drum of Fig. 1, but where the drum is placed on its head.

Fig. 3 is an enlarged cross-section through the righthand part of Fig. 2.

The figures show a part of a drum with a drum wall 1 and a top wall 2.

Fig. 2 shows the drum placed on its head, so that the top wall 2 is facing the ground surface 3 and rests on it with the folded joint 4, by which top wall 2 and drum wall 1 are connected to each other.

A closable filling aperture 5 and a closable vent aperture 6 are situated in the top wall. These apertures are formed by bushes 7, 8 which are provided with octagonal flanges, and which with the flanges indicated in Fig. 1 fit into outward-pressed parts 9, 10 of the top wall.

The top wall 2 is pressed inwards over virtually its entire surface with a large radius, so that an inward curvature is formed, which in the inverted position shown in Fig. 2 forms a run-off face ending at 10, at a short distance from the inside wall of the drum.

This preferably takes place via a stepped transition 10' shown in Fig. 3.

In this way a narrow edge strip 11, for example 8 mm wide, is left between the outside edge of the inward-curved part and the inside wall of the drum 1, said strip being essentially flat, i.e. runs horizontally and can have only a small gap 12 determined by the folded joint finish where the top wall connects to the drum wall.

In order to reinforce the top wall, it can have various stepped slopes, such as the slope 13, 14.

Situated at the larger aperture 5 is a run-off strip 15 running from the edge strip 11 and sloping at a slight angle, which is more clearly visible in Fig. 3. This run-off strip 15 runs from the edge strip 11, in the inverted position shown in the drawing, slanting downward at a slight angle, at least to the face 16 in which the flange of the bush 7 is situated. This run-off strip can also be surrounded by a sloping, for example U-shaped edge 17 running from the edge strip.

During emptying of this drum the liquid will in the end go into the edge strip. In most approximately vertical positions the remaining liquid will flow via the edge strip and the run-off face 15 to the aperture and flow away.

If one wishes to be sure, then it is sufficient to lift the drum slightly at the side where the second aperture 6 is situated, as a result of which remaining liquid present in the edge strip 11 is certain to flow in the direction of the run-off face 15 and is certain to flow away through the aperture 5 when the drum is lowered again.

Liquid will then remain behind at most in the gap 12, insofar as present, for it can also be filled up with

an internal lacquer coating or the like. In any case, what liquid could remain behind is less than the earlier mentioned conditions.

Claims

1. Drum, comprising a side wall (1), a bottom and a top wall (2), which bottom and top wall (2) are connected by a folded joint (4) to the side wall (1), and in which the top wall (2) is provided with at least one closable aperture (5, 6) with a neck going out from an axially outward-pressed part surrounding the neck (7, 8), which top wall (2) radially inwards from a circle in the surface of the top wall (2) is axially curved inwards and radially outwards from said circle has an edge strip (11), all this in such a way that in the inverted position of the drum the contents can run off through the apertures (5, 6), characterized in that the circle (10) surrounding the inward curvature has a diameter which is greater than the largest circle within which the edge (9) of any outward-pressed part surrounding its neck (7) facing the folded joint (4) is situated, but is smaller than the diameter of the inside face of the side wall (1) of the drum, so that the edge strip (11) is formed between said curvature and the drum wall (1), and in that at least one of the apertures (5, 6) the top wall (2) has a strip (15) which from the edge strip (11) faces away from the drum wall, and which surrounds the outward-pressed part (9) at least partially, and forms a small angle with a horizontal face (16) lying at right angles to the centre line of the drum, in such a way that in the inverted position of the drum with the aperture (5, 6) downwards this strip (15) forms a run-off face running from the edge strip (11) in a downward slope.
2. Drum according to Claim 1 with two apertures, characterized in that the run-off face (15) is situated at only one aperture (5).
3. Drum according to Claim 1 or 2, characterized in that the inward-curved top face has an upward-sloping step at a circle which is on a diameter which is smaller than the inward limit of the outward-pressed part (9, 10) of the neck (8, 9) of the aperture(s) (5, 6).
4. Drum according to Claim 1, 2 or 3, characterized in that the top face has an upward-sloping step (10') at the transition to the edge strip (11).
5. Drum according to one or more of the preceding claims, characterized in that the top face has an upward-sloping step at the circle on which the

centre line(s) of the aperture(s) is (are) situated.

6. Drum according to one or more of the preceding claims, characterized in that the run-off face is surrounded by a sloping step (17) surrounding the aperture (5) in a U-shape from the edge strip (11).
7. Drum according to one or more of the preceding claims, characterized in that the angle of gradient of the run-off face (15) relative to the horizontal is less than 2°.
8. Drum according to one or more of the preceding claims, characterized in that the edge strip is of a width of less than 10 mm.

Patentansprüche

1. Faß, mit einer Seitenwand (1), einer unteren Wand und einer oberen Wand (2), wobei die untere Wand und die obere Wand (2) mittels einer gefalteten Verbindung (4) mit der Seitenwand (1) verbunden sind und wobei die obere Wand (2) mit wenigstens einer verschließbaren Öffnung (5, 6) versehen ist, die einen Hals aufweist, der aus einem den Hals (7, 8) umgebenden, axial nach außen gepreßten Teil herausführt, wobei die obere Wand (2) in radialer Richtung innerhalb eines Kreises in der Oberfläche der oberen Wand (2) in axialer Richtung nach innen gekrümmt ist und in radialer Richtung außerhalb des Kreises einen Randstreifen (11) besitzt, wobei all dies von der Art ist, daß in der umgedrehten Stellung des Fasses die Inhalte durch die Öffnungen (5, 6) abfließen können, dadurch gekennzeichnet, daß der die Krümmung nach innen umgebende Kreis (10) einen Durchmesser besitzt, der größer ist als der größte Kreis, innerhalb dessen sich der Rand (9) jedes beliebigen nach außen gepreßten Teils befindet, welcher den Hals (7) umgibt und zur gefalteten Verbindung (4) weist, jedoch kleiner als der Durchmesser der Innenfläche der Seitenwand (1) des Fasses ist, so daß der Randstreifen (11) zwischen der Krümmung und der Faßwand (1) gebildet ist, und daß wenigstens eine der Öffnungen (5, 6) der oberen Wand (2) einen Streifen (15) besitzt, der ausgehend vom Randstreifen (11) von der Faßwand weggerichtet ist und den nach außen gepreßten Teil (9) wenigstens teilweise umgibt und mit einer waagrechten Fläche (16), die zur Mittellinie des Fasses im rechten Winkel orientiert ist, einen kleinen Winkel bildet, derart, daß in der umgedrehten Position des Fasses die Öffnung (5, 6) unterhalb dieses Streifens (15) eine Ablauffläche bildet, die vom Randstreifen (11) mit einer abfallenden Schräge verläuft.

2. Faß gemäß Anspruch 1 mit zwei Öffnungen, dadurch gekennzeichnet, daß sich die Ablauffläche (15) nur an einer Öffnung (5) befindet.

3. Faß gemäß Anspruch 1 oder 2, dadurch gekennzeichnet, daß die nach innen gekrümmte obere Fläche bei einem Kreis mit einem Durchmesser, der kleiner als die innere Grenze des nach außen gepreßten Teils (9, 10) des Halses (8, 9) der Öffnung(en) (5, 6) ist, eine nach oben geneigte Stufe besitzt.

4. Faß gemäß Anspruch 1, 2 oder 3, dadurch gekennzeichnet, daß die obere Fläche im Übergang zum Randstreifen (11) eine nach oben geneigte Stufe (10') besitzt.

5. Faß gemäß einem oder mehreren der vorangehenden Ansprüche, dadurch gekennzeichnet, daß die obere Fläche bei einem Kreis, auf dem sich die Mittellinie (n) der Öffnung(en) befindet (befinden), eine nach oben geneigte Stufe besitzt.

6. Faß gemäß einem oder mehreren der vorangehenden Ansprüche, dadurch gekennzeichnet, daß die Ablauffläche von einer schrägen Stufe (17) umgeben ist, welche die Öffnung (5) ausgehend vom Randstreifen (11) U-förmig umgibt.

7. Faß gemäß einem oder mehreren der vorangehenden Ansprüche, dadurch gekennzeichnet, daß der Neigungswinkel der Ablauffläche (15) in bezug auf die Horizontale kleiner als 2° ist.

8. Faß gemäß einem oder mehreren der vorangehenden Ansprüche, dadurch gekennzeichnet, daß der Randstreifen eine Breite von weniger als 10 mm besitzt.

Revendications

1. Bidon comprenant une paroi latérale (1), des parois inférieure et supérieure (2), lesquelles parois inférieure et supérieure (2) sont raccordées par une liaison repliée (4) sur la paroi latérale (1), et sur lequel la paroi supérieure (2) est pourvue d'au moins un orifice pouvant être obturé (5, 6) constitué par un manchon ressortant d'une partie axiale emboutie vers l'extérieur entourant le manchon (7, 8), laquelle paroi supérieure (2), radialement à l'intérieur d'un périmètre de la surface de la paroi supérieure (2), est incurvée dans la direction axiale vers l'intérieur et, radialement à l'extérieur dudit périmètre, est pourvue d'une bande de bord (11), tout ceci pour que, le bidon étant retourné, son contenu puisse être évacué par les

- orifices (5, 6), caractérisé en ce que le périmètre (10) délimitant la partie incurvée vers l'intérieur a un diamètre supérieur au plus grand cercle à l'intérieur duquel le bord (9), de l'une quelconque des parties externes embouties entourant son manchon (7) faisant face à la liaison repliée (4), est contenu, mais est inférieur au diamètre de la face interne de la paroi latérale (1) du bidon, de façon à ce que la bande de bord (11) soit délimitée par ladite partie incurvée et par la paroi du bidon (1), et en ce qu'au moins un des orifices (5, 6) de la paroi supérieure (2) est pourvu d'une bande (15) laquelle, par rapport à la bande de bord (11), s'écarte de la paroi du bidon, et laquelle entoure la partie externe emboutie (9) au moins partiellement, et forme un angle faible par rapport à la face horizontale (16) s'étendant à angle droit de l'axe du bidon, de telle sorte qu'en position retournée du bidon, les orifices (5, 6) orientés vers l'extérieur par rapport à cette bande (15) constituent une face d'évacuation partant de la bande (11) avec une pente orientée vers le bas.
- 5
- 10
- 15
- 20
2. Bidon selon la revendication 1, pourvu de deux orifices, caractérisé en ce que la face d'évacuation (15) est présente sur un seul des deux orifices (5).
- 25
3. Bidon selon la revendication 1 ou 2, caractérisé en ce que la face supérieure incurvée vers l'intérieur est pourvue d'un chanfrein orienté vers le haut, le long d'un périmètre dont le diamètre est inférieur à la limite interne de la partie externe emboutie (9, 10) du manchon (7, 8) de l'(des) orifice(s) (5, 6).
- 30
- 35
4. Bidon selon la revendication 1, 2 ou 3, caractérisé en ce que la face supérieure est pourvue d'un chanfrein incliné vers le haut (10') à la limite de la bande de bord (11).
- 40
5. Bidon selon l'une ou plusieurs des revendications précédentes, caractérisé en ce que la face supérieure est pourvue d'un chanfrein incliné vers le haut, le long d'un périmètre sur lequel est (sont) situé(s) l'(es) axe(s) de l'(des) orifice(s).
- 45
6. Bidon selon l'une ou plusieurs des revendications précédentes, caractérisé en ce que la face d'évacuation est délimitée par un chanfrein incliné (17), entourant l'orifice (5), en forme de U depuis la bande de bord (11).
- 50
7. Bidon selon l'une ou plusieurs des revendications précédentes, caractérisé en ce que l'angle d'inclinaison de la face d'évacuation (15) est, par rapport à l'horizontale, inférieur à 2°.
- 55
8. Bidon selon l'une ou plusieurs des revendications précédentes, caractérisé en ce que la bande de bord est d'une largeur inférieure à 10 mm.

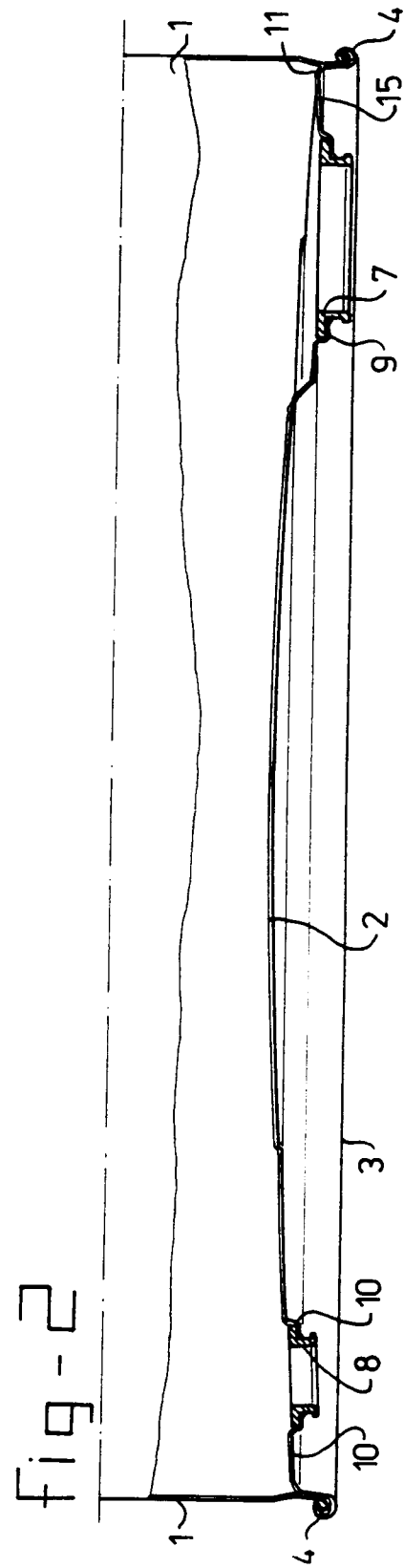
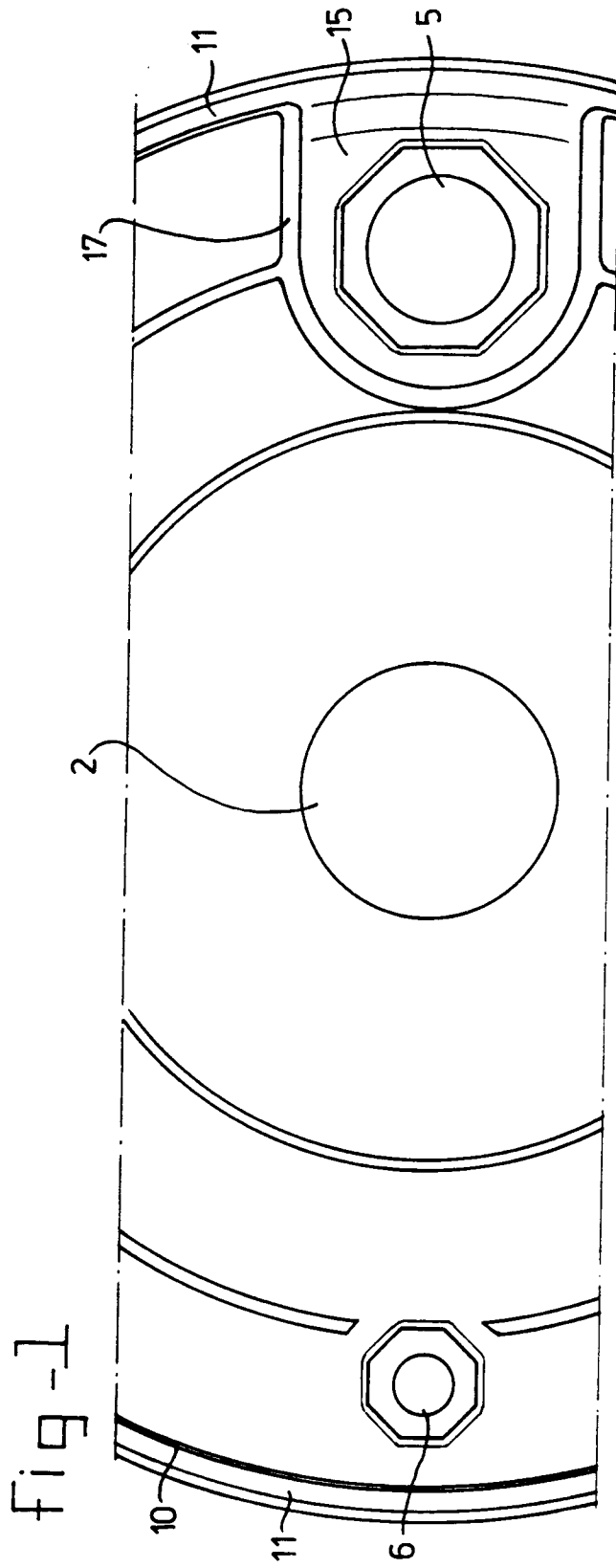


fig - 3

