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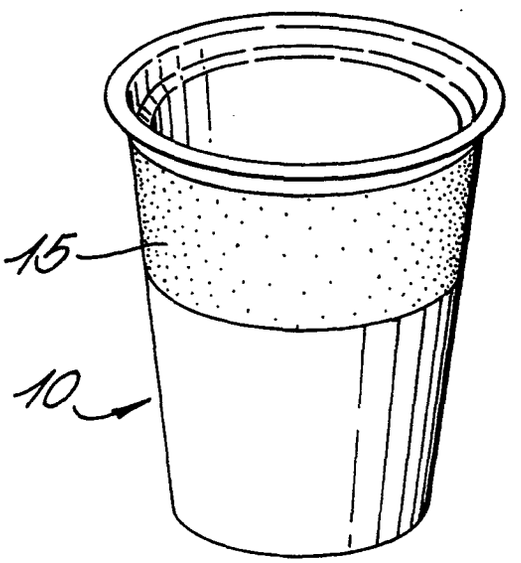
(71) Applicant: **Mars Limited, 143-149 Fenchurch Street, London, E.C.3. (GB)**

(72) Inventor: **Woolman, Paul, Glenwood Fir Tree Avenue Stoke Poges, Slough, Berks (GB)**
Inventor: **Austin, Martin David, 15 Henley Drive Frimley Green, Camberley Surrey (GB)**

(74) Representative: **Colgan, Stephen James, CARPMAELS & RANSFORD 43 Bloomsbury Square, London WC1A 2RA. (GB)**

(54) Disposable plastics containers.

(57) The insulation of a thin wall disposable plastics cup member 10 is improved by applying a band 15 of foamed resilient plastics material (e.g. foamed polyethylene) around the cup member in the region where the cup is gripped. The band has upper and lower sides of equal length in the unstressend condition before the band is applied to the container but the foamed plastics material is stretchable so that the band is a smooth fit over the frusto-conical portion of the cup member.



EP 0 038 111 A1

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"Disposable Plastics Containers"

The present invention relates to disposable plastics containers, especially disposable plastics drinking cups.

The conventional disposable plastics cup is of thin-walled construction inorder to keep to a minimum the amount of plastics used and thereby reduce the cost of the cup. Because of its thinness the wall of the container has poor insulating properties and when the cup contains a hot beverage the cup is uncomfortable if not impossible to hold in the unprotected hand. Such cups are normally of a uniform wall thickness (such as is produced by thermo-forming) and it has been proposed to provide the side-wall of such cups with ribs or ridges whereby the area of contact between the cup and the fingers of the user is reduced in order to make the cup more comfortable to hold. In practice, the soft fleshy parts of the finger enter between such ridges and the area of contact between the fingers and the cup is not much less than it would be with a plain walled cup. It has also been proposed to make double walled disposable plastics cups with projections or ridges on one or both walls in order to ensure that the area of contact between the two walls in the region where the cup is gripped is small. The air gap between the walls of the cup in the region where the cup is gripped provides effective insulation between the hot contents of the cup and the fingers of the user. However, such double-walled cups are difficult to manufacture satisfactorily and require more plastics material than the equivalent single-walled cup. They are therefore more expensive to manufacture.

Cups formed of an insulating material (such as expanded polystyrene) are difficult to handle mechanically and have also received adverse consumer reaction.

Another proposal for overcoming the problem of providing satisfactory insulation in disposable cups is to apply over a region of the side-wall an additional layer of foamed plastics material which increases the effective thickness of the wall in the region where the cup is gripped.

The material normally proposed for such additional layers is expanded polystyrene. Expanded polystyrene is however a fairly rigid and brittle material. The region of the walls to which it is applied are usually frusto-conical and in order to achieve a satisfactory fit it is necessary either to mould the expanded polystyrene sleeve as a frusto-conical sleeve or to cut an arcuate strip from a sheet of plastics material and fix it with adhesive to the cup. In either case the manufacturing process is expensive and complicated.

According to the present invention in one aspect a disposable plastics container comprises a single-walled cup member with a bottom wall and a side wall diverging generally from the bottom wall towards its rim and a band of foamed plastics material disposed around a portion of the side wall of the cup member, the band when in an unstressed condition before it is applied to the cup having substantially equal lengths around its upper and lower edges, but the material being sufficiently elastic that it is a close fit on a non-cylindrical part of the side wall when fitted on the cup member.

We have found that foam polyethylene is a suitable material for the band, although other resilient foamed plastics materials may be employed.

The band may be formed by cutting a length from a cylindrical tube of the foamed material and telescoping it over the cup member. Alternatively, the band may be a straight sided length of material cut, for example, from a roll of foam plastics material and adhered to the wall of the cup member with adhesive or double sided adhesive tape or by welding. The invention enables the band to be made by cutting lengths from stock material and to be applied to the cup by a relatively simple operation.

The band of material may be located in an annular recess around the cup.

According to the present invention in another aspect the method of forming a disposable plastics container comprises providing a disposable plastics cup member having

a bottom wall and a side wall diverging generally upwardly from thebottom wall towards its rim, and applying a band of stretchable foam plastics material to a non-cylindrical portion of the side wall of the container, the band having upper and lower edges of the same length in the unstressed condition before the band is applied to the cup member.

Embodiments of the invention will now be described by way of example with reference to the accompanying drawings in which:

Fig. 1 shows a perspective view of a container according to the invention;

Fig. 2 shows a fragmentary cross-section of the container of Fig. 1;

Fig. 3 shows a first method of applying the band to the container, and

Fig. 4 shows a second method applying the band to the container.

Referring to Figs. 1 and 2, a thermo-formed thin-walled plastics cup member 10 comprises a bottom wall 11 and a side wall 12 diverging generally upwardly from the bottom wall to its rim 13. In the region of the top third of the side wall of the cup on the outside of the cup is a broad annular groove or recess 14 formed by the side wall being displaced inwardly relative to the adjacent parts of the side wall above and below the groove. A band 15 of foam polyethylene is placed in the groove and provides in the region of the groove 14 an area of increased effective wall thickness where the user can grip the cup with comfort when the container is holding a hot liquid. The band 15 has upper and lower edges of equal length when the band is in the unstressed condition before it is applied to the cup. The foam polyethylene is however sufficiently elastic to stretch to fit smoothly without rucks on the side wall 12 even though the side wall in the region where it forms the bottom of the groove 14 is of frusto-conical shape. A typical type of foamed polyethylene we have employed is "Cellaire", 1.5 mm thickness, as sold by Spicer-Cowan Ltd,

Banner Street, London EC1.

Fig. 3 shows one method applying the band to the cup member. A length of foamed polyethylene tape 16 with straight sides is cut from a roll to the length of the periphery of the cup member 10 at the lower side of the groove 14. The cup member is placed on a mandrel 17 and the mandrel is rotated with the cup member. The tape 16 is glued to the cup member in the groove as it is wound around the cup member. At the same time the upper edge of the tape is stretched in order to fit around the wider end of the groove 14.

Fig. 4 shows an alternative arrangement for applying the band to the cup member 10 in which a short tube 18 of foamed polyethylene material is cut from a longer tubular length of material and, carried by fingers 19, is telescoped over the cup member 10 whilst the cup member is on the forming mandrel 17. When the tube 18 is opposite the groove 14 the fingers are moved inwardly and a detent (not shown) retains the tube 18 whilst the fingers 19 are withdrawn to the left as seen in Fig. 4. The tube 18 which is of uniform diameter along its axial length in the unstressed condition prior to application to the cup member 10, is stretched at its end nearest the rim 13 in order to fit the frusto-conical side wall of the cup member in the region of the groove 14.

In an optional embodiment, the foamed band may be overlaid with a non-foamed plastics sheet material, for example a reverse-printed stretch or shrinkable plastics film. If used in the embodiment as illustrated, the stretch or shrinkable plastics film can retain the foamed plastics band in the groove 14 and act as a laminate, although it is not essential actually to bond the plastics film to the foamed plastics band. The plastics sheet may be wider than the foamed plastics band and extend over onto the sidewall of the cup member for a small distance, beyond the edge of groove 14. This enables the plastics sheet to prevent dust settling on the foamed band. Typically such

a container may be formed by a method similar to that shown in Figure 3, by merging a tape of the foamed polyethylene with a slightly wider tape of stretchable plastics sheet material. The two are then heat-bonded together at their edges and the laminate applied to the sidewall of the cup member with the foamed material fitting snugly within groove 14 and the stretchable material lying thereover and extending beyond the two side edges of the groove 14. Reverse-printing of the plastics sheet enables advertising material and other indicia to be displayed. A typical example of such plastics sheet material is heat-shrinkable PVC.

Claims:-

1. A disposable plastic container comprising a single walled cup member with a bottom wall and a side wall diverging generally from the bottom wall towards its rim and a band of foamed plastics material disposed around a portion of the side wall of the cup member, the band when in an unstressed condition before it is applied to the cup member having substantially equal lengths around its upper and lower edges, but the material being sufficiently elastic that it is a close fit on a non-cylindrical part of the side wall when fitted on the cup member.

2. A container according to claim 1, in which the band is of foamed polyethylene.

3. A container according to claim 1 or claim 2, in which the band is a cylindrical tube which has been telescoped over the cup member.

4. A container according to claim 1 or claim 2, in which the band is a straight-sided length of material adhered to the wall of the cup member.

5. A container according to any of claims 1 to , in which the band of material is located in an annular recess around the side wall of the cup member.

6. A container according to any of claims 1 to 5 wherein the band of foamed plastics material is overlaid with a layer of non-foamed plastics sheet material.

7. A container according to claim 5 and 6 wherein the layer of non-foamed plastics sheet material extends beyond the side edges of the annular recess.

8. A method of forming a disposable plastics container comprising providing a disposable plastics cup member having a bottom wall and a side wall diverging generally upwardly from the bottom wall towards its rim, and applying a band of stretchable foamed plastics material to a non-cylindrical portion of the side wall of the container, the band having upper and lower edges of the same length in the unstressed condition before the band is applied to the cup member.

9. A method according to claim 8, in which the band is of foam polyethylene material.

10. A method according to claim 9, in which the band of material is formed by cutting a straight-sided length of foamed plastics material, stretching it around the container and adhering it to the side wall of the container.

11. A method according to claim 10, which additionally comprises overlaying the band of foamed plastics material with a layer of non-foamed plastics sheet material.

12. A method according to claim 11, which comprises providing a tape of the foamed plastics material and of the non-foamed plastics material, respectively, merging the two tapes together and at least partially bonding the tapes together.

13. A method according to claim 8 or 9, in which the band is a cylindrical tube of foamed material cut from a tubular length of material and telescoped over the cup member.

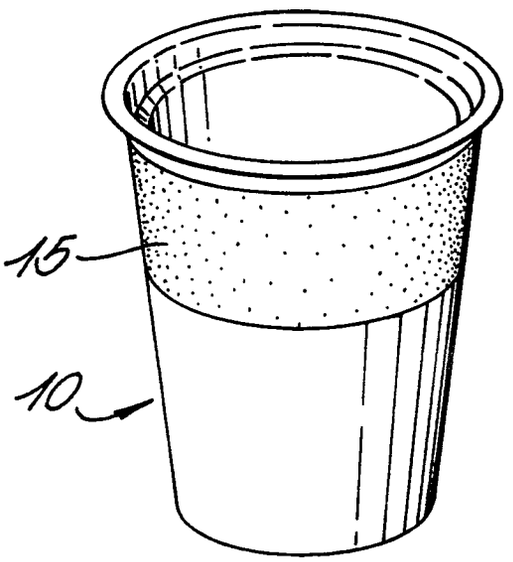

FIG. 1.

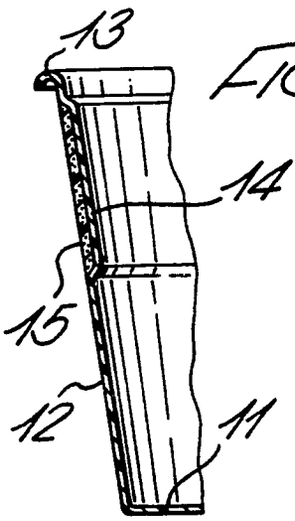

FIG. 2.

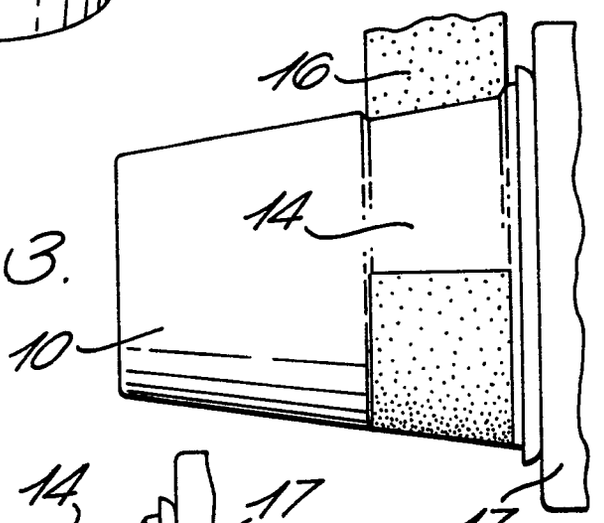

FIG. 3.

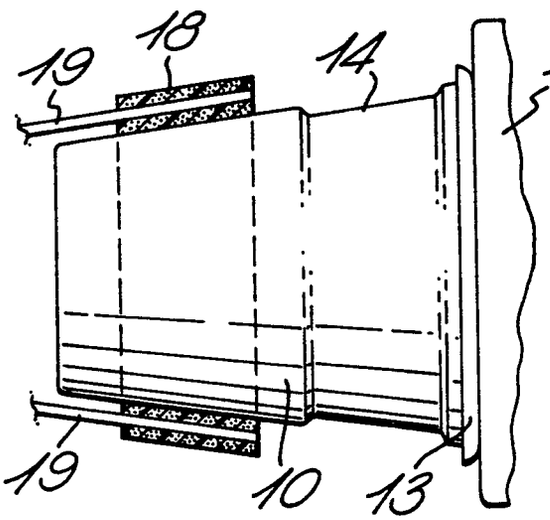

FIG. 4.

European Patent Office

EUROPEAN SEARCH REPORT

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Application number

EP 81 30 0466

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
A	US - A - 3 203 611 (ANDERSON) * Patent specificaiton * --	1,8
A	US - A - 3 126 139 (SCHLECHTER) * Patent specification * --	1,8
	FR - A - 973 911 (HUANT) * Patent specification * --	1,3,8,13
	GB - A - 1 406 234 (RHEEM BLAGDEN) * Patent specification * ----	1,3,5,8,13

CLASSIFICATION OF THE APPLICATION (Int. Cl.³)

B 65 D 1/26

TECHNICAL FIELDS SEARCHED (Int. Cl.³)

B 65 D
A 47 F

CATEGORY OF CITED DOCUMENTS

X: particularly relevant
A: technological background
O: non-written disclosure
P: intermediate document
T: theory or principle underlying the invention
E: conflicting application
D: document cited in the application
L: citation for other reasons

&: member of the same patent family, corresponding document

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	14-05-1981	VANTOMME

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