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(54) Container for a brushable coating composition

(57) A container containing a coating composition the container comprising a container body and a lid, the lid comprising a collar and a disc, the container body having an opening provided with a screw-thread cooperable with a screw-thread on the collar and closeable by said lid characterised in that the disc is formed of polyethylene terephthalate (PET) which is sufficiently transparent to allow the coating composition to be visible therethrough.

FIG. 3

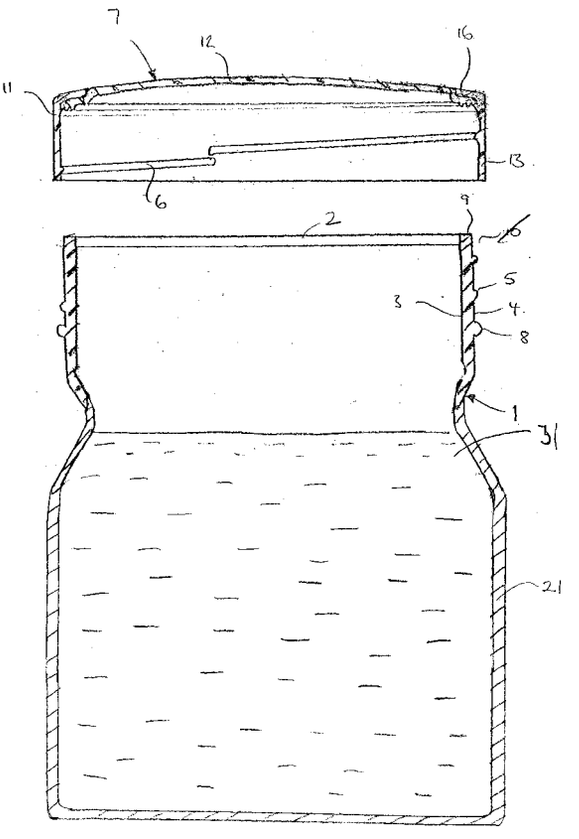

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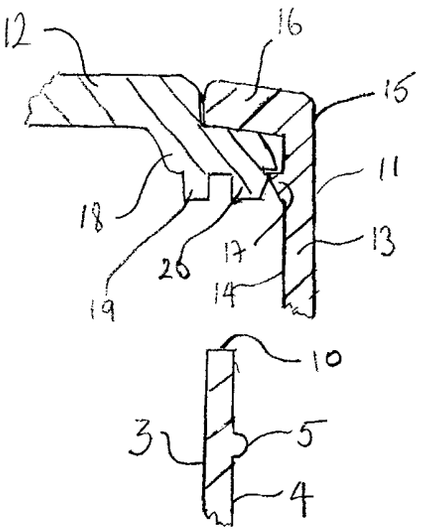
FIG 4



Description

[0001] This invention relates to a large container or can containing a coating composition which can has a capacity of above 0.2 litres and can be closed and sealed by a screw-thread lid. The container is large enough to be useful as a container for paints, lacquers, varnishes, woodstains and any other coating compositions of the type which are commonly applied using large brushes (usually at least 20mm wide and at least 5 mm broad) at ambient temperatures (say 5 to 40ºC) to surfaces found in buildings. Such compositions are often applied by amateur, that is to say "do-it-yourself" or "DIY" painters. For brevity the containers will be frequently referred to as "paint containers" even though they are useful for containing other coating compositions, usually brushable coating compositions.

[0002] Artists' materials, touch-up paints for motor vehicles, nail varnishes and other specialist paints which are conveniently sold in relatively small volumes are often supplied in small tubes or small jars having openings which are closeable by means of a screw-thread lid where threads on the lid co-operate with threads extending around the opening in order to hold the lid in a closing position on the tube or jar. One such tube is disclosed in British Patent Specification GB 835 862 published in 1958.

[0003] Screw-thread lids on small tubes or small jars are easy to use by amateurs provided that the tube or jar is small. Attempts to use screw-thread lids on larger paint containers (such as paint container bigger than say 0.2 litres) have not proved successful because when the screw-threads become covered in paint, as frequently occurs in normal use, additional force is required to screw the lid on or off. It is also messy, especially when screwing the lid on, as some of the excess paint caught between the threads of the lid and the container is squeezed out onto the neck and body of the container. Furthermore, the paint which remains trapped between the threads forms a solid coating on drying and in so doing sticks the threads of the lid to the threads of the container opening, increasing the force required still further. The nature of this solid coating is such that it cannot be re-dissolved by the liquid paint contained within the container. The problem of sticking is aggravated when the screw threads of the lid and container are both made of polyethylene terephthalate (PET) because the application of a turning force to opposed PET surfaces creates a combination of sticking and friction, probably unique to PET, referred to as stiction.

[0004] Throughout this specification references to polyethylene terephthallate and PET are intended to include not only polyethylene terephthallate but also its copolymers derived from mixtures of terephthallic acid and minor amounts of other useful diacids, such as isophthallic acid, in minor amounts

[0005] An additional problem arises because any dried solid coating material which has formed at the rim of the container opening is broken by the twisting force exerted on the lid, for example during the initial step of lid removal. Further twisting to complete the removal of the lid tends to break the solid coating into smaller pieces driving them into the container. This contaminates the paint contained therein, frequently making it unusable.

[0006] A further problem with screw-thread lids is that of providing a good seal between the lid and the container, particularly when the container is holding an organic solvent based product such as some paints. A good seal is required to prevent any leakage of the product or escape of solvent vapour.

[0007] Equally important is the ingress of air, particularly where the paint is autoxidiseable, such as many gloss paints. By autoxidiseable is meant that such paint is intended to react with oxygen in the atmosphere to form a solid coating when applied to a surface such as a wall. Similarly, the paint inside the container also reacts with oxygen in the air contained within the container in the space above the paint. When a good seal is present, once the oxygen is consumed the reaction stops and the paint remains usable. However, if more air is able to enter the container due to poor sealing, the reaction continues and a skin forms on the surface of the paint. This skin cannot be dissolved in the liquid paint beneath and attempts to remove it generally result in it breaking up and falling into the bulk of the paint rendering the whole contents unusable.

[0008] Traditionally press-fit lids have been preferred for paints because the press-fit provides a good seal. The press-fit must be sufficiently tight to provide a degree of shock resistance to avoid dislodging the lid if the container is accidentally dropped or knocked. However, such press-fit lids can be difficult to open and require the use of a special tool. More frequently, in the absence of a special tool the most conveniently available sharp tool such as a screwdriver is used instead and this may cause injury when used carelessly and inappropriately, for example by a DIY painter.

[0009] When screw-thread lids have been tried, to avoid the need for an opening tool, it has been found necessary to introduce a separate gasket to ensure a good seal is still achieved, but this has never succeeded commercially. It has been found that the gasket never reseals reliably after the container is first opened and it is also messy.

[0010] For these reasons, screw-thread lids have not been commercially successful when used on large paint containers for supplying paint used in painting buildings.

[0011] A still further and related problem associated with paint containers is that purchasers and users are unable to see the colour of the contents.

[0012] Manufacturers provide an indication of the colour of the paint using small representations, usually in the form of a small colour region printed on a larger label carrying the manufacturers livery and stuck to the container body. However, purchasers regard such colour

representations as unreliable and prefer to see the colour of the actual paint in the container. One way, of course, is to remove a press-fit lid to inspect the contents prior to purchase but this is both inconvenient and messy. Furthermore, it introduces a risk of contaminating the paint with foreign material and consequently is generally discouraged by retailers. Similarly, removing a screw-thread lid, although more convenient and less messy nevertheless retains the risk of contaminating the contents.

[0013] Providing a transparent container body is one known solution but of course a large amount of the available space through which the paint could be seen is taken up by the manufacturer's livery. Additionally, regulatory instructions regarding health and safety must also be provided taking up yet more of the available space thus leaving only a small area through which to view the paint.

[0014] It is an object of this invention to provide a large container or can containing a coating composition, which is conveniently closable and reopenable by means of a transparent screw-thread lid so avoiding the need for a sharp tool and through which the contents can be seen.

[0015] Accordingly, the present invention provides a container containing a coating composition, the container comprising a container body and a screw-threaded lid, the lid comprising a collar and a disc, the container body having an opening provided with a screw-thread co-operable with a screw-thread on the collar and closeable by said lid characterised in that the disc is formed of polyethylene terephthalate which is sufficiently transparent to allow the coating composition to be visible therethrough.

[0016] The container body and the collar may be formed of mouldable material. Suitable examples of such mouldable materials include polyethylene, polypropylene, styrene-butadiene copolymers and PET.

[0017] Preferably, the container body is formed of PET as this material is resistant to both waterborne emulsion paints and paints containing large amounts of organic solvent.

[0018] Where the container body is formed from PET it is essential that the collar is formed of a mouldable material other than PET, such as polyethylene, polypropylene or styrene-butadiene copolymer. This avoids the problem of stiction.

[0019] Preferably the collar is formed of polypropylene.

[0020] The container body may be transparent or opaque. Preferably it is transparent.

[0021] Preferably the collar and disc are rotatable relative one to the other thereby allowing a vertical lifting force to be exerted on the disc by the collar as the collar is unscrewed. This is advantageous in circumstances when the disc of the lid is stuck to the rim of the container as the screw-thread allows a lifting force to be exerted with mechanical advantage on the stuck disc. This significantly reduces the force necessary to remove the lid. The mechanical advantage arises because the vertical movement of the collar is very small compared to its rotational movement and hence there is a large gearing effect. As the unscrewing operation continues, the collar rises lifting the disc thereby breaking the dried solid coating of paint without the need for excessive force.

[0022] Preferably, the lid includes a dependent circular surface which is sealingly engageable against the rim.

[0023] In particular, the lid may include a pair of concentric surfaces depending downwardly for receiving the rim therebetween.

[0024] The lid preferably comprises a collar and a disc secured to one another. More preferably they are secured by means that allow relative rotation of the collar and disc.

[0025] Conveniently, the collar comprises a pair of annular surfaces extending radially inwardly, between which the periphery of the disc is held captive, for example by a snap fit or interference fit.

[0026] The invention will now be described in detail, by way of example only, with reference to the accompanying drawings in which:

Figure 1 is a front elevation of a paint can according to this invention;

Figure 2 is a perspective view on a slightly smaller scale of a combination of the can shown in Figure 1 and a lid;

Figure 3 is a cross section on the line A-A through the lid and the rim of the container shown in Figure 2 but shown separated from one another; and

Figure 4 is an enlarged detail view of one side of the lid and rim of Figure 3.

[0027] Figure 1 shows a paint can 1 containing 0.5 litres of paint 31, the can having a container body 21 provided with a circular opening 2 defined by cylindrical inner surface 3 and cylindrical outer surface 4, as shown in Figure 3. Screw-threads 5 extend around outer surface 4 and are dimensioned so as to be able to receive screw-threads 6 formed on the inside of screw-thread lid 7 as also shown in Figure 3. Threads 5 and 6 can co-operate to retain screw-thread lid 7 on can 1 as shown in Figure 2 whereby lid 7 closes opening 2. Can 1 also has a circumferential rib 8 which acts as a stop for lid 7 to prevent over-tightening which might increase the risk of jamming.

[0028] The inner and outer surfaces 3, 4 are joined by a rim 10 formed by a surface which is a straight edge.

[0029] As best seen in Figures 3 and 4 the lid 7 is formed in two parts, comprising a collar 11 and a disc 12. The collar 11 comprises an annular wall 13 with inner and outer surfaces 14, 15. Screw-threads 6 are provided on the inner surface 14. An annular flange 16 extends radially inwardly from the top of the wall 13. An inwardly

projecting lip 17 is formed on the inner surface 14 spaced a short distance below the flange 16 Figure 3 shows the paint 31.

[0030] The disc 12 is circular and may be slightly convex as shown. It is formed with a stepped periphery 18 which is received as a snap fit or interference fit between the flange 16 and the ledge 17 on the collar 11 to secure the collar 11 and the disc 12 together to form the lid 7.

[0031] A pair of annular, concentric walls 19, 20 depend downwardly from the lower surface of the stepped periphery 18. The walls 19, 20 are preferably profiled in a rectangle shape. The concentric walls 19, 20 are dimensioned such that when the lid 7 is screwed onto the can 1, the profiled surface 9 around the rim of the opening 2 is received between the two walls 19,20 to form a seal.

[0032] Can 1 is conveniently made by a compound injection/blow moulding process using a suitable thermoplastics material. The use of injection moulding allows very precise reproduction particularly of opening 2 and screw-threads 5 which is important to the achievement of the best possible fluid-tight fit between the screw-threads 5 and 6 when lid 7 is screwed into its closing position on can 1.

[0033] In this way a container or can 1 containing a coating composition 31 can be produced with the container having a transparent screw-threaded lid through which the paint can be seen.

Claims

1. A container (1) containing a coating composition (31) the container comprising a container body (21) and a lid (7), the lid comprising a collar (11) and a disc (12), the container body having an opening (2) provided with a screw-thread (5) co-operable with a screw-thread (6) on the collar (11) and closeable by said lid **characterised in that** the disc (12)is formed of polyethylene terephthalate (PET) which is sufficiently transparent to allow the coating composition to be visible therethrough.

2. A container containing a coating composition according to Claim 1 **characterised in that** the container body (21) is formed of PET.

3. A container containing a coating composition according to Claim 1 or Claim 2 **characterised in that** the container body (21) is transparent.

4. A container containing a coating composition according to any one of the preceding claims **characterised in that** the collar (11) is formed of a mouldable material other than PET.

5. A container containing a coating composition according to Claim 4 **characterised in that** the mouldable material is selected from any one of polyethylene, polypropylene and styrene-butadiene copolymer.

6. A container containing a coating composition according to Claim 5 **characterised in that** the mouldable material is polypropylene.

7. A container containing a coating composition according to any one of the preceding claims **characterised in that** the collar (11) and disc (12) are rotatable relative one to the other.

8. A container containing a coating composition according to Claim 7 **characterised in that** a vertical lifting force is exerted on the disc (12) as the collar (11) is unscrewed.

9. A container containing a coating composition according to any one of the preceding claims **characterised in that** the lid (7) includes a dependent circular surface which is sealingly engageable against the rim.

10. A container containing a coating composition according to Claim 9 **characterised in that** the lid includes a pair of concentric (19, 20) surfaces depending downwardly for receiving the rim (10) therebetween.

11. A container containing a coating composition according to any one of the preceding claims **characterised in that** the lid comprises a collar (11) and a disc (12) secured to one another.

12. A container containing a coating composition according to Claim 11 **characterised in that** the collar (11) comprises a pair of annular surfaces extending radially inwardly, between which the periphery of the disc is held captive.

13. A container containing a coating composition according to Claim 12 **characterised in that** the periphery of the disc (12) forms a snap fit or interference fit with the collar (11).

FIG. 1

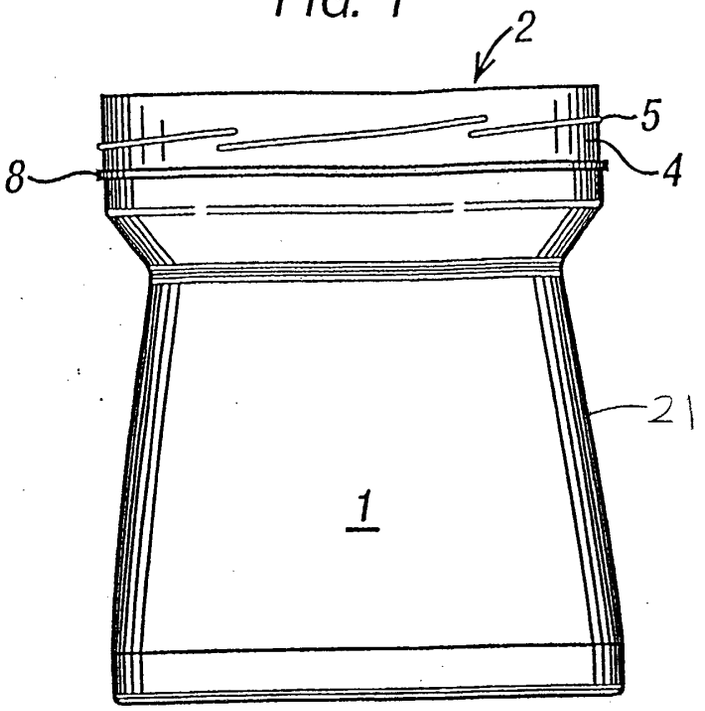


FIG. 2

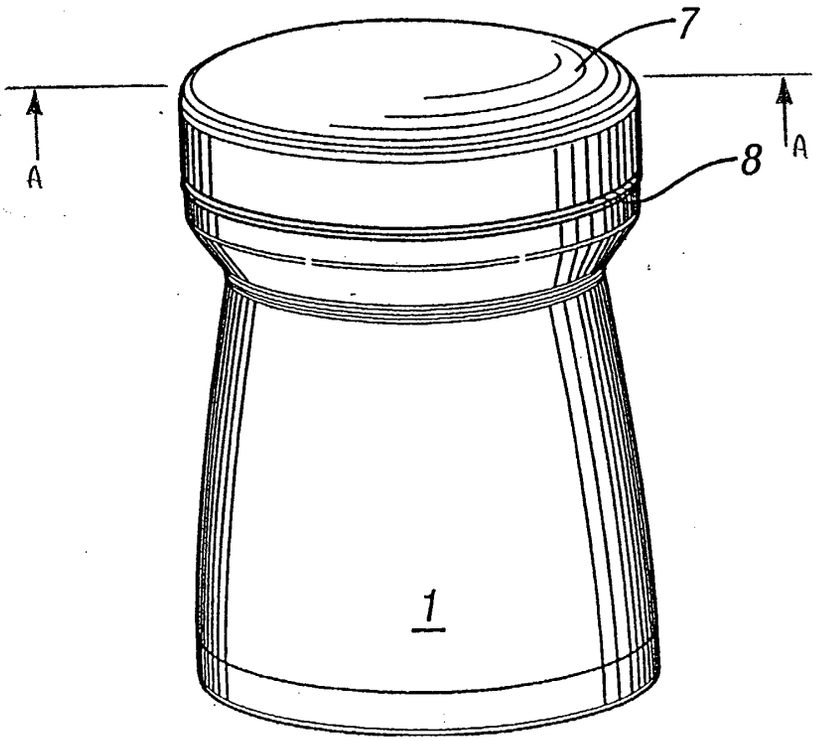


FIG. 3

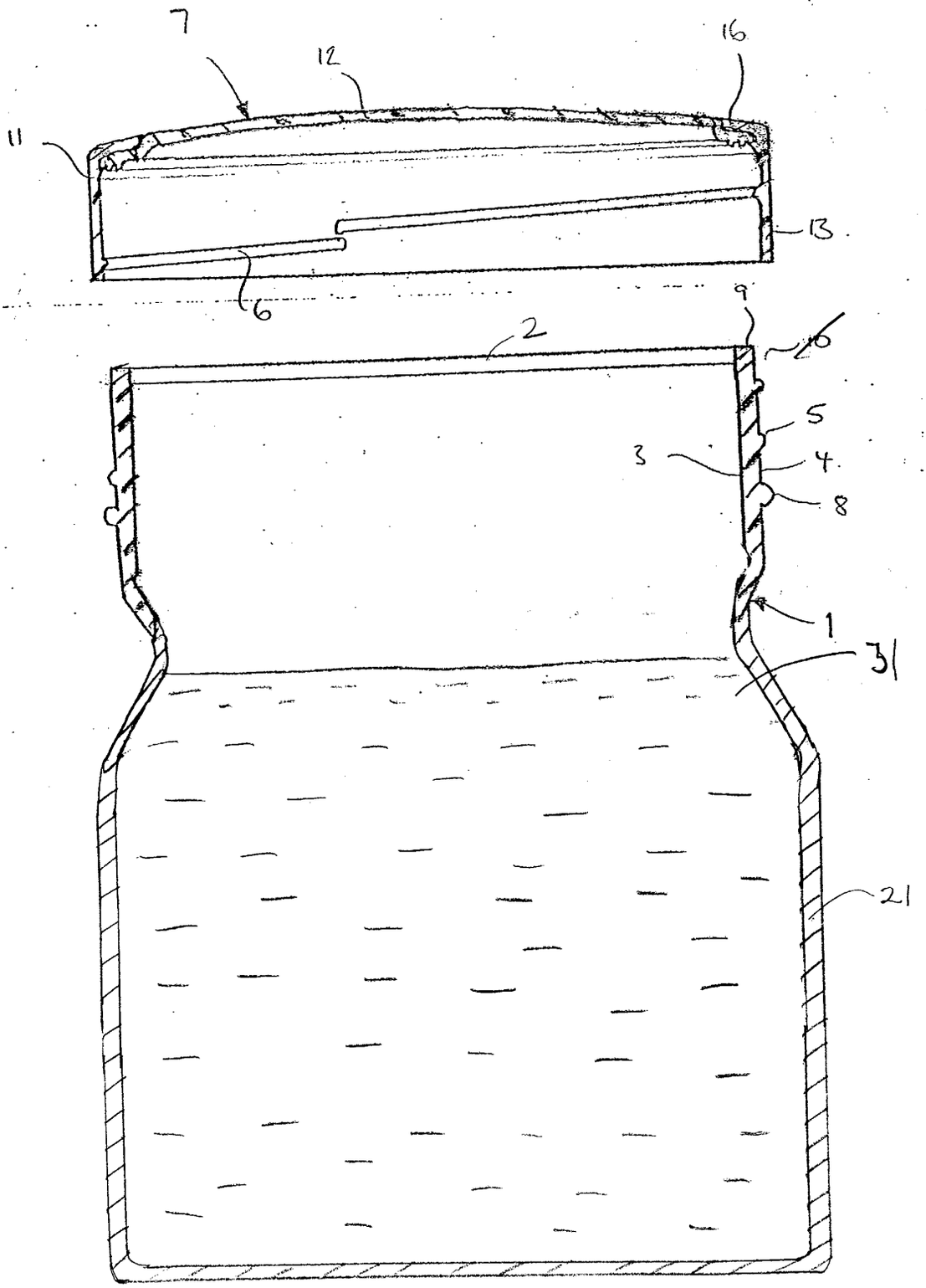


FIG 4