



# PATENT SPECIFICATION

DRAWINGS ATTACHED

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## COMPLETE SPECIFICATION

### Improvements in or relating to Container Type Applicators

We, THE METAL BOX COMPANY LIMITED, a Company Incorporated under the laws of Great Britain, of 37, Baker Street, London, W.1, England, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to container type applicators for flowable materials such as liquids or creams and which is of the kind which comprises an applicator in the form of a pad one end face of which is secured to an element integral with the container or with a holder arranged to be fitted to a container, the element having an aperture through which flowable material can pass from the container for spreading by the pad.

In an applicator of the kind described above it is usual for the pad to be secured, at least in part, by an adhesive. The securing of the pad by the use of adhesive renders it difficult to effect fitting of the pad to said element by automatic means and it is an object of the present invention to provide an applicator of the kind described in which the pad can be secured in position automatically and without the use of adhesives. A further object of the invention is to provide an applicator for fitment to a container in a manner such that the applicator is rigidly located in position and can be removed from the container only with considerable difficulty.

According to the invention there is provided an applicator for flowable materials such as liquids or creams comprising a pad one face of which is secured to an element integral with a container for the material or with a holder arranged to be fitted to a container, the element having an aperture through which flowable material can pass from the container for spreading by the pad, wherein said element is made by an injection moulding process

from synthetic thermoplastic material and wherein the pad is made from a material capable of withstanding the physical conditions of the process by which the thermoplastic material is moulded and has said one face thereof secured to the element by contact therewith during the moulding thereof.

In one embodiment of the invention said element comprises a transverse wall extending across and integral with an annular holder made from a flexible synthetic thermoplastic material, said wall being provided with an annular stem which extends therefrom for co-operation with a delivery opening formed in an end wall portion of an annular neck of a container to retain the holder in position relative to the container, the stem communicating with said aperture.

The invention also comprehends the method of manufacturing an applicator by compressing a pad axially in the cavity of a moulding tool, shielding the longitudinal edges of the pad against engagement with molten synthetic thermoplastic material during formation of the applicator, and injecting molten thermoplastic material into the mould cavity from a plurality of positions offset from the axis of the pad towards and against an end face of the compressed pad.

In order that the invention may be clearly understood two embodiments thereof will now be described by way of example with reference to the drawings accompanying the provisional specification, in which:—

Fig. 1 illustrates, partly in section, an applicator according to the invention and fitted to a container, and

Fig. 2 illustrates a method of manufacturing the applicator and with reference to the accompanying drawings, in which:—

[Price 4s. 6d.]

Figure 3 is a view, similar to Fig. 1, of a modified form of applicator, and

Fig. 4 is a view, similar to Fig. 2, illustrating the method of manufacturing the applicator shown in Fig. 3.

In the drawings like reference numerals refer to like or similar parts.

Referring to the drawings, the container, Fig. 1, is illustrated as being a collapsible tube having a body 1 formed, for example, from extruded aluminium. It is, however, to be understood that, if desired, the container may be of a kind other than a collapsible tube and it may be made from extruded synthetic thermoplastic material.

The container, Fig. 1, is provided with an annular neck 2 having a delivery opening 3 formed in an end wall portion of the neck and the neck is connected to the container body 1 by a shoulder 4 which forms an acute angle with the axis of the container.

The applicator for attachment to the container comprises an applicator pad 5 which is made of any suitable material which will withstand the physical conditions of the process by which a holder, described below, is injection moulded, but which is preferably made of artificial sponge material, whether the material be intercellular or non-intercellular, for example the pad is made of polyurethane foam. The pad 5 projects beyond the outer end 6 of an annular holder 7 which is injection moulded from a synthetic thermoplastic material, for example from low density polyethylene, and one end face of the pad is secured to a transverse element shown as a wall 8 which extends across and is integral with the annular holder 7. As shown in Fig. 1, the wall 8 is located between the outer end 6 and the inner end 9 of the annular holder. An aperture 10 extends through the wall 8 and communicates with the interior of an annular stem 11 which extends from the transverse wall 8 towards the inner end 9 of the holder and which, as can be seen from the drawing, is arranged for co-operation with the delivery opening 3 to retain the holder 7 in position relative to the container. As shown in Fig. 1 the stem 11 is insertable through the delivery opening 3 to effect sealing engagement with the sides thereof. The stem 11 is provided with an external projection, or barb, 12 which is engageable beneath the end wall of the neck through which the delivery opening 3 extends. As illustrated in the drawings, the projection, or barb, 12 extends continuously round the stem 11 but, if desired, the projection may be formed by two or more shorter projections spaced apart one from the other around the stem and located in a single plane perpendicular to the axis of the stem. The rim 9 at the inner end of the holder is chamfered to engage the shoulder 4 of the container.

The pad 5 is provided with a hole 13

which extends therethrough in alignment with the aperture 10, and the hole 13 and aperture 10 are sealed by a plug 14 which extends therethrough and is integral with, or is secured to, a cap 15 arranged to enclose the pad and be fitted to the exterior of the holder 7.

The pad 5 is secured to the transverse wall 8 of the holder 7 but is not secured to the side portions of the outer end of the holder which surround it.

The method of manufacturing the applicator is illustrated in Fig. 2 and is effected by an injection moulding machine which, as is customary, comprises a fixed moulding tool 16 and an axially movable tool 17. The fixed tool includes a plurality of injection nozzles 18 offset from the axis thereof and the nozzles are preferably four in number. The movable tool comprises a die part 19, a shield 20, and a reciprocable piston or plunger 21 provided with a co-axial spigot 22. A stripper element 23 is also movable axially relative to the fixed tool 16.

At the commencement of operation the movable tool 17 is separated from the fixed tool 16 and the piston 21 is retracted within the shield 20. A pad 5 is placed within the shield 20 and the movable tool is moved into cooperation with the fixed tool as shown in the drawing. The piston 21 is then moved to the forward position thereof, that is the position shown in Fig. 2, so that the spigot 22 enters the hole 13 in the pad and the piston effects axial compression of the pad 5 against the end face of the fixed tool 16. Molten synthetic thermoplastic material is then injected through the nozzles 18 towards and against the end face of the compressed pad which is engaged with the tool 16 and the pressure exerted on the pad by the thermoplastic material causes further compression of the pad against the face 24 of piston 21 so that the molten material flows into the mould cavity and forms the annular holder 7. It will be seen that the longitudinal edges of the compressed pad are located within the shield 20 so that they are not engaged by the thermoplastic material which is caused to flow past them to form the outer end portion of the holder. Following completion of the moulding operation the movable part 17 of the mould is retracted together with piston 21 whereupon the pad 5 expands and projects beyond the outer end of the holder 7. The stripper element 23 is then moved, to the right as viewed in Fig. 2, to strip the holder from the fixed mould part 16. Due to the injection of the molten thermoplastic material against the end face of the pad 5 the latter is firmly secured to the transverse wall portion 8 of the holder.

Fig. 3 illustrates a modified form of applicator from which the outer end 6 has been omitted so that the pad 5 stands proud from the wall 8. In this embodiment of the

invention aperture 10 is of constant diameter throughout the length of the stem 11 and the annular holder 7 is provided with small beads 25 by which the cap 15 is held in position.

Fig. 4 illustrates the method by which the applicator of Fig. 3 is manufactured, this method being as described above with reference to Fig. 2 except that the shape of die parts 19 and 20 are modified to accommodate the formation of the beads 25 and to omit the outer end 6, and the spigot 22 is of uniform diameter throughout its length.

In the foregoing description the applicator holder has been described as made from flexible thermoplastic material and this is because it is to be secured to a metal container by a projection, or barb, 12. If, however, the container is made of a flexible material the holder can be made as herein described but from a relatively rigid plastic material. Alternatively, if the spigot 11 is moulded with internal screw threads, instead of a projection 12, to be screwed on to the neck of a container, the holder may be injection moulded from a relatively rigid thermoplastic material.

Further, if desired, it may in some circumstances be found possible, using the manufacturing method above described, to secure the pad 5 directly to the end wall portion of the neck of a container thus avoiding the necessity of providing the pad on a separate holder to be fitted to the neck of the container.

#### WHAT WE CLAIM IS:—

1. An applicator for flowable materials such as liquids or creams comprising a pad one face of which is secured to an element integral with a container for the material or with a holder arranged to be fitted to a container, the element having an aperture through which flowable material can pass from the container for spreading by the pad, wherein said element is made by an injection moulding process from synthetic thermoplastic material and wherein the pad is made from a material capable of withstanding the physical conditions of the process by which the thermoplastic material is moulded and has said one face thereof secured to the element by contact therewith during the moulding thereof.

2. An applicator according to Claim 1, wherein said element comprises a transverse wall extending across and integral with an annular holder made from synthetic thermoplastic material, said wall being provided with an annular stem which extends therefrom for co-operation with a delivery opening formed in an end wall portion of an annular neck of a container to retain the holder in position relative to the container,

the stem communicating with said aperture.

3. An applicator according to Claim 2, wherein the transverse wall is located between the outer and inner ends of the annular holder.

4. An applicator according to Claim 2, or Claim 3, wherein the annular stem is arranged to make sealing engagement with said delivery opening and is provided with an exterior projection engageable beneath said end wall portion to retain the holder in position relative to the container.

5. An applicator according to Claim 4, wherein the holder is made from a flexible synthetic thermoplastic material such as polyethylene.

6. An applicator according to any one of Claims 1 to 5, wherein the pad is made of artificial sponge material.

7. An applicator according to Claim 5, wherein the pad is made of polyurethane foam.

8. An applicator according to any one of Claims 1 to 7, wherein the pad is provided with a hole which extends therethrough in alignment with said aperture, and the hole and aperture are sealed by a plug which extends therethrough and is integral with or is secured to a cap arranged to enclose the pad.

9. An applicator according to Claim 2 or to Claim 2 in combination with any one of Claims 3 to 8 fitted to a container.

10. The method of manufacturing an applicator according to any one of Claims 1 to 7 by compressing a pad axially in the cavity of a moulding tool, shielding the longitudinal edges of the pad against engagement with molten synthetic thermoplastic material during formation of the applicator, and injecting molten thermoplastic material into the mould cavity from a plurality of positions offset from the axis of the pad towards and against an end face of the compressed pad.

11. An applicator of the kind described substantially as herein described with reference to and as illustrated in Fig. 1 of the drawings accompanying the provisional specification, or as herein described and as illustrated in Fig. 3 of the accompanying drawings.

12. A container having an applicator of the kind described fitted thereto substantially as herein described with reference to and as illustrated in Fig. 1 of the drawings accompanying the provisional specification, or substantially as herein described with reference to and as illustrated in Fig. 3 of the accompanying drawings.

13. The method of manufacturing an applicator of the kind described substantially as herein described with reference to Fig. 2 of the drawings accompanying the provisional



110 Provisional Specification

115 Caps



120 Cap

invention aperture 10 is of constant diameter throughout the length of the stem 11 and the annular holder 7 is provided with small beads 25 by which the cap 15 is held in position.

Fig. 4 illustrates the method by which the applicator of Fig. 3 is manufactured, this method being as described above with reference to Fig. 2 except that the shape of die parts 19 and 20 are modified to accommodate the formation of the beads 25 and to omit the outer end 6, and the spigot 22 is of uniform diameter throughout its length.

In the foregoing description the applicator holder has been described as made from flexible thermoplastic material and this is because it is to be secured to a metal container by a projection, or barb, 12. If, however, the container is made of a flexible material the holder can be made as herein described but from a relatively rigid plastic material. Alternatively, if the spigot 11 is moulded with internal screw threads, instead of a projection 12, to be screwed on to the neck of a container, the holder may be injection moulded from a relatively rigid thermoplastic material.

Further, if desired, it may in some circumstances be found possible, using the manufacturing method above described, to secure the pad 5 directly to the end wall portion of the neck of a container thus avoiding the necessity of providing the pad on a separate holder to be fitted to the neck of the container.

#### WHAT WE CLAIM IS:—

1. An applicator for flowable materials such as liquids or creams comprising a pad one face of which is secured to an element integral with a container for the material or with a holder arranged to be fitted to a container, the element having an aperture through which flowable material can pass from the container for spreading by the pad, wherein said element is made by an injection moulding process from synthetic thermoplastic material and wherein the pad is made from a material capable of withstanding the physical conditions of the process by which the thermoplastic material is moulded and has said one face thereof secured to the element by contact therewith during the moulding thereof.
2. An applicator according to Claim 1, wherein said element comprises a transverse wall extending across and integral with an annular holder made from synthetic thermoplastic material, said wall being provided with an annular stem which extends therefrom for co-operation with a delivery opening formed in an end wall portion of an annular neck of a container to retain the holder in position relative to the container,

the stem communicating with said aperture.

3. An applicator according to Claim 2, wherein the transverse wall is located between the outer and inner ends of the annular holder.

4. An applicator according to Claim 2, or Claim 3, wherein the annular stem is arranged to make sealing engagement with said delivery opening and is provided with an exterior projection engageable beneath said end wall portion to retain the holder in position relative to the container.

5. An applicator according to Claim 4, wherein the holder is made from a flexible synthetic thermoplastic material such as polyethylene.

6. An applicator according to any one of Claims 1 to 5, wherein the pad is made of artificial sponge material.

7. An applicator according to Claim 5, wherein the pad is made of polyurethane foam.

8. An applicator according to any one of Claims 1 to 7, wherein the pad is provided with a hole which extends therethrough in alignment with said aperture, and the hole and aperture are sealed by a plug which extends therethrough and is integral with or is secured to a cap arranged to enclose the pad.

9. An applicator according to Claim 2 or to Claim 2 in combination with any one of Claims 3 to 8 fitted to a container.

10. The method of manufacturing an applicator according to any one of Claims 1 to 7 by compressing a pad axially in the cavity of a moulding tool, shielding the longitudinal edges of the pad against engagement with molten synthetic thermoplastic material during formation of the applicator, and injecting molten thermoplastic material into the mould cavity from a plurality of positions offset from the axis of the pad towards and against an end face of the compressed pad.

11. An applicator of the kind described substantially as herein described with reference to and as illustrated in Fig. 1 of the drawings accompanying the provisional specification, or as herein described and as illustrated in Fig. 3 of the accompanying drawings.

12. A container having an applicator of the kind described fitted thereto substantially as herein described with reference to and as illustrated in Fig. 1 of the drawings accompanying the provisional specification, or substantially as herein described with reference to and as illustrated in Fig. 3 of the accompanying drawings.

13. The method of manufacturing an applicator of the kind described substantially as herein described with reference to Fig. 2 of the drawings accompanying the provisional



Provisional Specification

Caps



Cap



\* C L M S \*



specification, or substantially as herein described with reference to Fig. 4 of the accompanying drawings.

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