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PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Improvements in or relating to Dispensing Containers

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 dispensing containers and in particular to a container of the kind in which a commodity contained therein is dispensed through apertures formed in closely overlying elements which are permitted restricted angular movement relative one to the other to obturate the dispensing apertures or to align those of the overlying element with those of the underlying element to permit dispensing of the commodity, for example a powder, through the aligned apertures.

Dispensing containers of the said kind are known in which the container is made of thin sheet metal and are provided with a dispensing hood or cover made of synthetic thermoplastic material and one such container is described in British Patent Specification No. 741,872.

As an alternative to metal containers it is now usual to provide containers blow-moulded from synthetic thermoplastic materials and because it is impossible to control the inner surface of the neck of a container produced by blow-moulding it has been found difficult to use such containers as dispensing containers of the kind described. This difficulty results from the problem of preventing rotation relative to the neck of the container of an inner part of a dispensing closure which when fitted to the neck should remain stationary relative thereto in order that the outer part of the closure may be capable of restricted rotation relative to the inner part to permit or prevent dispensing of the commodity contained in the container. It is a main object of the present invention to provide for a container made of synthetic thermoplastic material a closure which overcomes the said difficulty.

According to the invention there is provided a closure for a container made of synthetic thermoplastic material, said closure comprising an outer component made of synthetic thermoplastic material and having an apertured crown and a depending skirt provided with projections extending from the interior thereof and an inner component made of synthetic thermoplastic material and having an apertured crown and a depending skirt adapted to grip the exterior of a neck formed on the container and to be constrained against rotation relative to the neck about the axis thereof, said inner component being located within the outer component with the crowns disposed in close overlying relation and having the skirt thereof provided with exterior projections which by co-operation with the projections on the interior of the skirt of the outer component permit restricted relative rotation between the inner and outer components about the axis thereof for obturating the apertures in the crown of the inner component or for aligning the apertures in the crowns of the inner and outer components.

The interior of the skirt of said inner component may be provided with a plurality of teeth extending lengthwise of the skirt for interengagement with similar teeth provided on the neck of the container. The inner component may include an inner skirt concentric with its said first skirt and adapted to engage the interior of the neck of a container to act as a plug which forces said teeth into engagement with each other.

At least one projection may be formed on the interior of the first said skirt of the inner component at a position or positions adjacent to the open end thereof, said projection or projections being arranged to co-operate with a similar projection or projections formed on the exterior of the container neck to prevent unintentional axial displacement between the closure and the neck. The projection may consist of an annular barb.

The invention also contemplates the com-

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bination of a closure with a container made of synthetic thermoplastic material.

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

Figure 1 is a top plan of a closure according to the invention,

Figure 2 is an underneath plan of the closure,

Figure 3 is a section on line III—III, Figure 1,

Figure 4 is a section on line IV—IV, Figure 3,

Figure 5 is a broken elevation of a container to have the closure fitted thereto,

Figure 6 is a top plan of Figure 5, and

Figure 7 is an elevation, partly in section, of the container fitted with the closure.

Referring to Figures 1 to 4 of the drawings, the closure comprises an outer component, indicated generally by the reference 1, and an inner component, indicated generally by the reference 2. Each component is moulded from synthetic thermoplastic material. The outer component has a crown 3, provided with dispensing apertures 4, and a depending skirt 5 provided with projections 6, Figure 4, which extend from the interior thereof.

The inner component has a crown 7, provided with dispensing apertures 8, and concentric inner and outer skirts 9, 10 adapted to grip the neck 11, Figure 5, formed on a container 12 blow-moulded from synthetic thermoplastic material. The inner component is arranged to be constrained against rotation relative to the neck 11 about the axis thereof and to this end the interior of the outer skirt 10 is formed with a plurality of teeth 13, Figure 4, which extend lengthwise of the skirt and which are substantially parallel with the axis thereof. The exterior of the outer skirt 10 is also provided with projections 14, Figure 4, for co-operation with the projections 6, and with an annular barb 15, Figure 3, for co-operation with an annular barb or bead 16, Figure 5, provided on the neck 11.

The inner component 2 is located within the outer component 1 so that the crowns 3, 7 are in close overlying relation, Figures 3 and 7, and the projections 6, 14 permit restricted relative rotation between the inner and outer components about the axis thereof for obturating the apertures 4, 8 or for aligning them as shown in the drawings. The inner component is retained within the outer component by a barb or the like 5a which is engaged beneath the projections 14. If it is desired to obturate the apertures 4, 8 the outer component 1 is moved angularly relative to the inner component 2, clockwise as viewed in Figure 4, until the projections 6 thereon

are engaged with the projections 14 next to the right thereof.

The teeth 13 are arranged to co-operate with teeth 17 on the neck 11 and the teeth 13 extend completely around skirt 10 as shown in Figure 4. The teeth 17 are formed on segments spaced apart angularly around the neck 11 as shown in Figure 6.

When the closure is applied to the neck 11, by direct axial pressure, the resilience of the closure allows the outer skirt 10 to expand so that the barb 15 snaps under the barb 16 on neck 11. This stretching action means that the teeth 13 on the outer skirt 10 do not connect with the teeth 17 on the neck 11 in an axial direction; instead, because of the stretching action required to connect the co-operating barbs 15, 16, the teeth on the skirt 10 meet the teeth on the neck 11 radially as the material returns to normal and the shape of the teeth ensures that they will intermesh so that the inner component will not rotate about the neck 11. The inner skirt 9 acts as a plug which engages the interior of the neck 11 and forces the teeth 13, 17 into engagement. Because the teeth 13 are provided all round the skirt 10 it is not necessary to register the closure in relation to the neck. The depth of the teeth may be varied, without losing the advantage of there being no necessity to register the closure relative to the neck.

The material of the container may be low or high density polyethylene, or polystyrene and by providing the teeth 17 on the neck in segments as described above the teeth in the face of the mould need not be extended to the parting line of the mould.

The material used for moulding the inner and outer components of the closure may be polyethylene or a similar thermoplastic material of suitable strength and resilience.

As described above, the barbs 15, 16 are each of annular form but, if desired, one of the barbs may be replaced by a plurality of angularly spaced ribs. Alternatively, it may in some instances be found that the barbs 15, 16 may be omitted. Further, although as described with reference to the drawings the inner component has an inner skirt 9, the inner skirt may in some instances be omitted, particularly if the container is made of relatively rigid material such as polystyrene.

WHAT WE CLAIM IS:—

1. A closure for a container made of synthetic thermoplastic material, said closure comprising an outer component made of synthetic thermoplastic material and having an apertured crown and a depending skirt provided with projections extending from the interior thereof, and an inner component made of synthetic thermoplastic material and having an apertured crown and a depending skirt adapted to grip the exterior of a neck formed on the container and to be constrained against

mination of a closure with a container made of synthetic thermoplastic material.

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

Figure 1 is a top plan of a closure according to the invention,

Figure 2 is an underneath plan of the closure,

Figure 3 is a section on line III—III, Figure 1,

Figure 4 is a section on line IV—IV, Figure 3,

Figure 5 is a broken elevation of a container to have the closure fitted thereto,

Figure 6 is a top plan of Figure 5, and

Figure 7 is an elevation, partly in section, of the container fitted with the closure.

Referring to Figures 1 to 4 of the drawings, the closure comprises an outer component, indicated generally by the reference 1, and an inner component, indicated generally by the reference 2. Each component is moulded from synthetic thermoplastic material. The outer component has a crown 3, provided with dispensing apertures 4, and a depending skirt 5 provided with projections 6, Figure 4, which extend from the interior thereof.

The inner component has a crown 7, provided with dispensing apertures 8, and concentric inner and outer skirts 9, 10 adapted to grip the neck 11, Figure 5, formed on a container 12 blow-moulded from synthetic thermoplastic material. The inner component is arranged to be constrained against rotation relative to the neck 11 about the axis thereof and to this end the interior of the outer skirt 10 is formed with a plurality of teeth 13, Figure 4, which extend lengthwise of the skirt and which are substantially parallel with the axis thereof. The exterior of the outer skirt 10 is also provided with projections 14, Figure 4, for co-operation with the projections 6, and with an annular barb 15, Figure 3, for co-operation with an annular barb or bead 16, Figure 5, provided on the neck 11.

The inner component 2 is located within the outer component 1 so that the crowns 3, 7 are in close overlying relation, Figures 3 and 7, and the projections 6, 14 permit restricted relative rotation between the inner and outer components about the axis thereof for obturating the apertures 4, 8 or for aligning them as shown in the drawings. The inner component is retained within the outer component by a barb or the like 5a which is engaged beneath the projections 14. If it is desired to obturate the apertures 4, 8 the outer component 1 is moved angularly relative to the inner component 2, clockwise as viewed in Figure 4, until the projections 6 thereon

are engaged with the projections 14 next to the right thereof.

The teeth 13 are arranged to co-operate with teeth 17 on the neck 11 and the teeth 13 extend completely around skirt 10 as shown in Figure 4. The teeth 17 are formed on segments spaced apart angularly around the neck 11 as shown in Figure 6.

When the closure is applied to the neck 11, by direct axial pressure, the resilience of the closure allows the outer skirt 10 to expand so that the barb 15 snaps under the barb 16 on neck 11. This stretching action means that the teeth 13 on the outer skirt 10 do not connect with the teeth 17 on the neck 11 in an axial direction; instead, because of the stretching action required to connect the co-operating barbs 15, 16, the teeth on the skirt 10 meet the teeth on the neck 11 radially as the material returns to normal and the shape of the teeth ensures that they will intermesh so that the inner component will not rotate about the neck 11. The inner skirt 9 acts as a plug which engages the interior of the neck 11 and forces the teeth 13, 17 into engagement. Because the teeth 13 are provided all round the skirt 10 it is not necessary to register the closure in relation to the neck. The depth of the teeth may be varied, without losing the advantage of there being no necessity to register the closure relative to the neck.

The material of the container may be low or high density polyethylene, or polystyrene and by providing the teeth 17 on the neck in segments as described above the teeth in the face of the mould need not be extended to the parting line of the mould.

The material used for moulding the inner and outer components of the closure may be polyethylene or a similar thermoplastic material of suitable strength and resilience.

As described above, the barbs 15, 16 are each of annular form but, if desired, one of the barbs may be replaced by a plurality of angularly spaced ribs. Alternatively, it may in some instances be found that the barbs 15, 16 may be omitted. Further, although as described with reference to the drawings the inner component has an inner skirt 9, the inner skirt may in some instances be omitted, particularly if the container is made of relatively rigid material such as polystyrene.

WHAT WE CLAIM IS:—

1. A closure for a container made of synthetic thermoplastic material, said closure comprising an outer component made of synthetic thermoplastic material and having an apertured crown and a depending skirt provided with projections extending from the interior thereof, and an inner component made of synthetic thermoplastic material and having an apertured crown and a depending skirt adapted to grip the exterior of a neck formed on the container and to be constrained against



- rotation relative to the neck about the axis thereof, said inner component being located within the outer component with the crowns disposed in close overlying relation and having the skirt thereof provided with exterior projections which by co-operation with the projections on the interior of the skirt of the outer component permit restricted relative rotation between the inner and outer components about the axis thereof for obturating the apertures in the crown of the inner component or for aligning the apertures in the crowns of the inner and outer components.
2. A closure according to Claim 1, wherein the interior of the skirt of said inner component is provided with a plurality of teeth extending lengthwise of the skirt for inter-engagement with similar teeth provided on the exterior neck of the container.
3. A closure according to Claim 2, wherein the inner component includes an inner skirt concentric with its said first skirt and adapted to engage the interior of the neck of a container to act as a plug which forces said teeth into engagement with each other.
4. A closure according to any one of Claims 1 to 3, wherein at least one projection is formed on the interior of the first said skirt of the inner component at a position or positions adjacent to the open end thereof, said projection or projections being arranged to co-operate with a similar projection or projections formed on the exterior of the container neck to prevent unintentional axial displacement between the closure and the neck.
5. A closure according to Claim 4, wherein the projection consists of an annular barb.
6. A closure according to any one of Claims 2 to 5 fitted to a container made of synthetic thermoplastic material and having a neck provided with a plurality of teeth extending lengthwise of the neck and interengaged with the teeth formed on the interior of the outer skirt of the inner component.
7. A closure according to Claim 3 or Claim 4 fitted to a container made of synthetic thermoplastic material and having a neck provided with a plurality of teeth extending lengthwise of the neck and interengaged with the teeth formed on the outer skirt of the inner component, said neck including at least one external projection beneath which an internal projection on said outer skirt of the inner component is engaged to prevent said axial displacement between the closure and neck.
8. A closure according to Claim 5 fitted to a container made of synthetic thermoplastic material and having a neck provided with a plurality of teeth extending lengthwise of the neck and interengaged with the teeth formed on the outer skirt of the inner component, said neck including an external annular barb beneath which the internal barb on said outer skirt of the inner component is engaged to prevent said axial displacement between the closure and neck.
9. The combination according to any one of Claims 6 to 8, wherein the teeth on the neck are formed on segments spaced apart angularly around the exterior of the neck.
10. A closure according to Claim 1 substantially as herein described with reference to and as illustrated in Figures 1 to 4 of the accompanying drawings.
11. A combined closure and container substantially as herein described with reference to Figures 5 to 7.

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