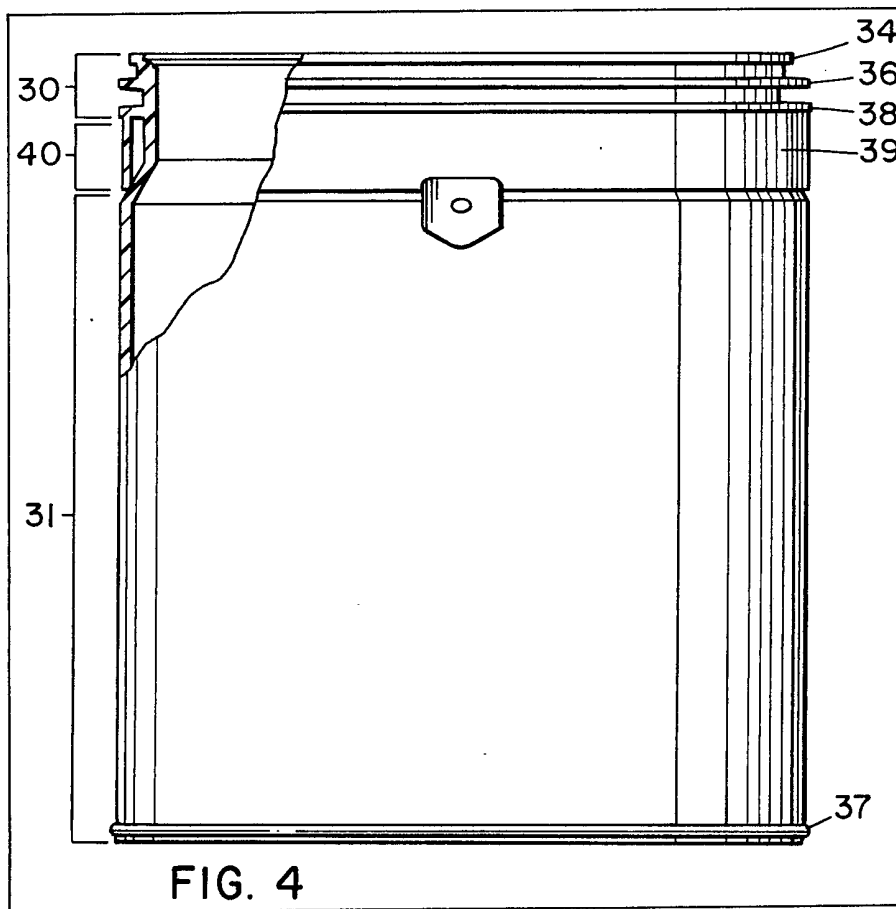


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(54) Moulded container having a depending skirt for label attachment

(57) A container has an injection-molded annular mouth portion 30, a generally cylindrical body portion 31 blow-molded from a parison integrally injection-molded with the mouth portion, the body portion having an internal diameter slightly larger than that of the mouth portion, and an annular reinforcing region 40 joining the mouth portion to the body portion and forming a transitional surface therebetween, the mouth portion including an annular depending skirt 39 which serves as an outside wall over the transitional surface and enlarges the container area suitable for label attachment. Reinforcing ribs and bail ears may be formed integrally with the skirt, and protrusions on the ribs or ears may be used to lock the skirt or ear into the body portion for added strength.



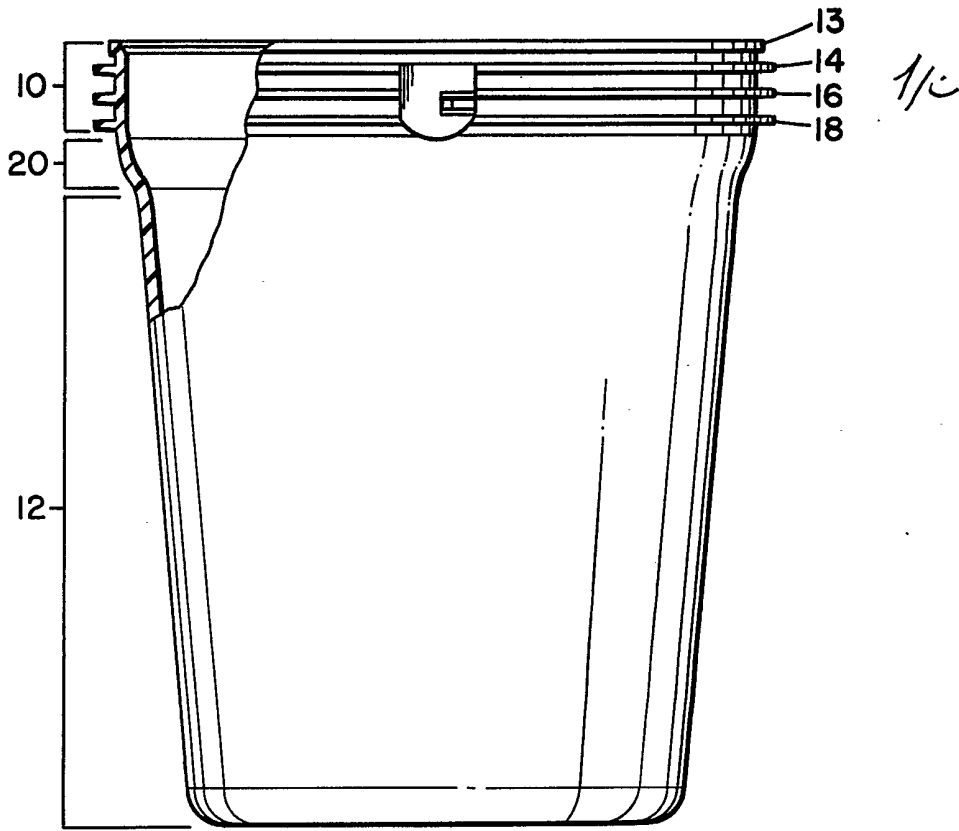


FIG. 1

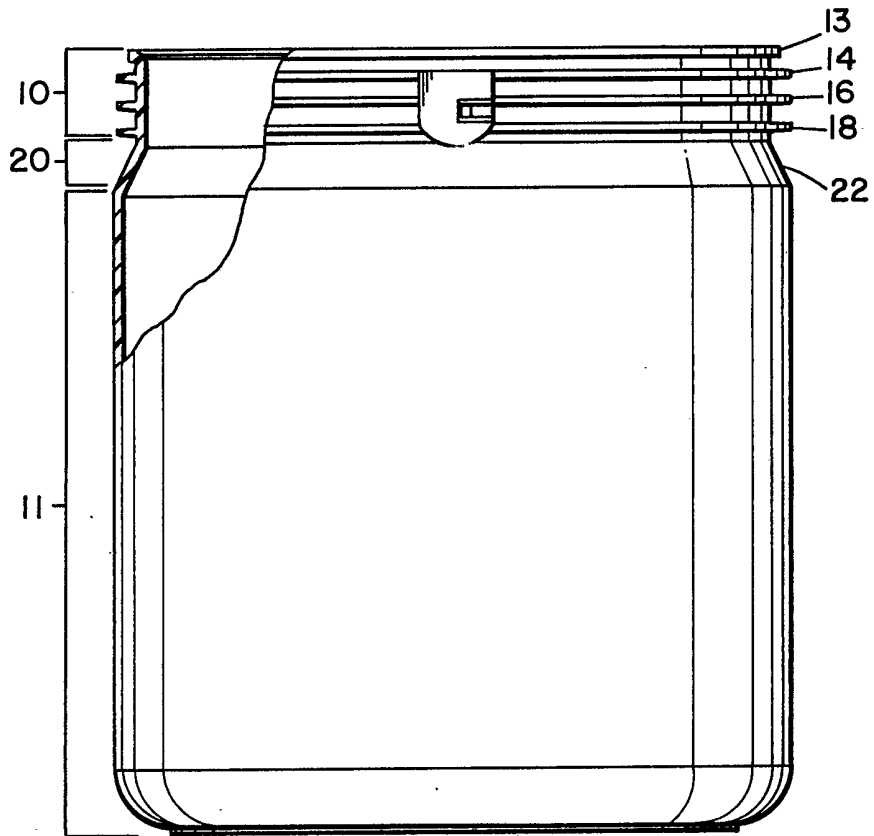


FIG. 2

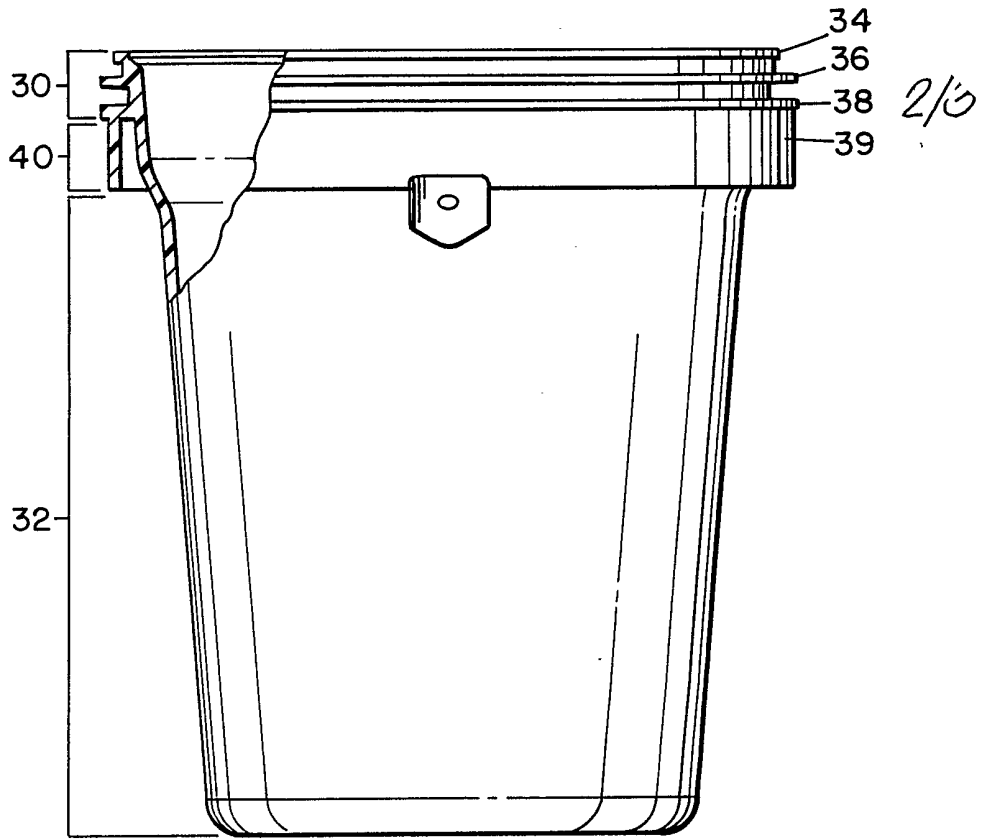


FIG. 3

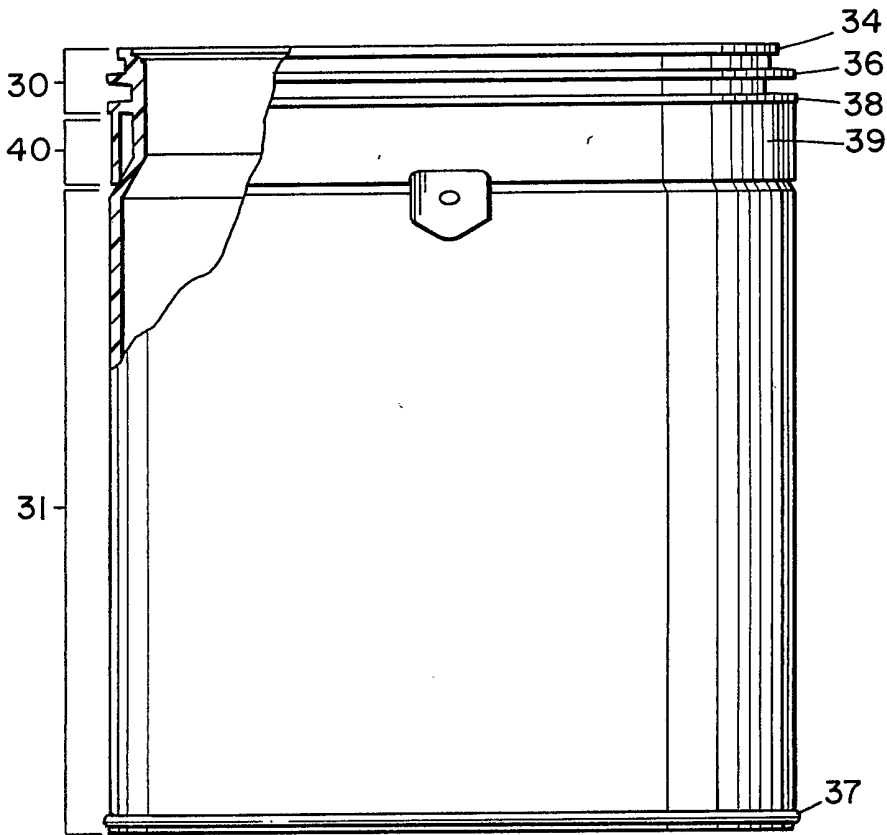


FIG. 4

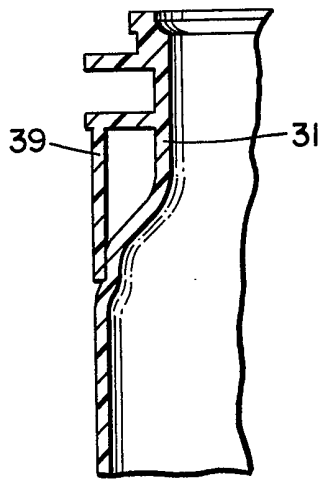


FIG. 5A

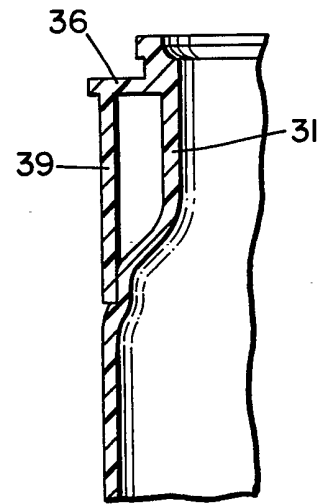


FIG. 5B

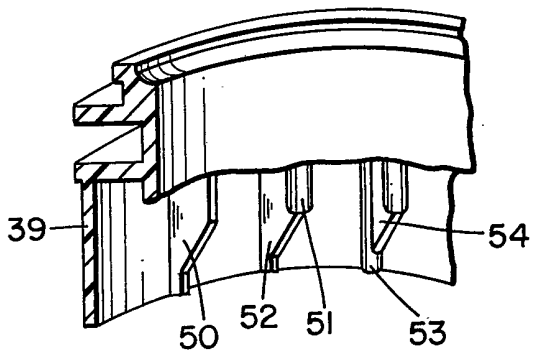


FIG. 6

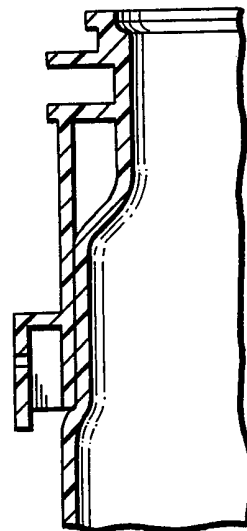


FIG. 7

SPECIFICATION

Paint pail with depending skirt for label attachment

5 The present invention relates to a container formed by blow molding the parison portion of an injection molded preform. Specifically, the present invention relates to a container in which there is provided as an element of high definitional detail injection
10 molded into the preform a depending skirt which serves as an outside wall to provide a label attachment area over the transitional surface formed following blow molding between the injection molded detail area and the blown parison portion.
15 Also provided as elements of the high definitional detail which may be injection molded into the preform are interior reinforcing ribs or lowered bale ears which are formed at the lower periphery of the depending skirt. In addition, protrusions on the
20 injection molded ribs or bale ears may be used to lock the skirt or bale ear into the body portion for added strength.

Injection blow molding machines, such as disclosed in U.S. Patent 4,076,484, are well known in the
25 art for forming hollow articles, particularly containers of various sizes and shapes. Thermoplastic materials such as polypropylene or polyethylene are heated to a molten, semi-fluid state and are injected into the cavity of an injection mold to form a parison
30 over a removable core or parison pin. Before the material has had an opportunity to completely set, the parison thereon is removed from the injection mold and transferred to a blow mold where pressurized gas or air is blown through the pin to the
35 interior of the parison and causes the parison to expand outwardly in the larger cavity of the blow mold. The expanded parison takes the shape of the blow mold cavity corresponding to a desired shape of the article, and is allowed to set sufficiently to
40 retain that shape thereafter.

In containers of the kind envisioned in the present invention, a highly detailed mouth area is injection molded integrally with a parison portion. The parison portion is then blow molded to the dimensions
45 of the body portion of the finished container. In doing so, a transitional surface is formed between the injection molded mouth area and the larger diameter body portion, which appears as an annular groove on the outside surface of the container just
50 below the mouth area. A container of this kind is illustrated in Figure 1 of United States Patent No. 3,977,563.

This groove is not a structural defect from the stand-point of the container's integrity although the
55 groove does decrease the container's stackability slightly. It does, however, represent an irregularity from the standpoint of using the container interchangeably with conventional metal containers in mechanical filling, labeling and packaging equipment. Thus, if the container is designed to specifications which allow it to be filled and packaged interchangeably with conventional containers, the labeling area available on the body portion is substantially smaller than the labeling area of conventional containers. This prevents the application

of labels to the containers on existing machinery without substantial modification of those machines to accommodate the differently sized labels.

In addition, in order to provide integral and
70 therefore stronger bale ears for the attachment of a handle to the container, the prior art required that such bale ears must be provided very near the top of the container since these features were required to be provided by injection molding in order to have
75 sufficient detail. In so doing, the containers could not readily be prepared on automatic bale equipment, and were additionally incompatible for this reason.

It is an object of the present invention to provide a container which has a labeling area sufficient for use
80 of the container on conventional labeling machinery without substantial modification of the machinery.

It is a further object of the present invention to provide a container which may be used interchangeably with conventional containers on filling, labeling
85 and packaging machinery.

It is a still further object of the present invention to provide a container with increased wall strength in the region of the transitional surface between the injection molded preform and the blown parison.

90 It is still a further object of the present invention to provide a container in which integrally injection molded bale ears may be provided in the region which would make the container interchangeable with conventional containers on automatic bale
95 equipment.

The objects, features, and advantages of the present invention will become more apparent in light of the following detailed description of the preferred embodiment thereof and as illustrated in
100 the accompanying drawings.

According to the present invention, there is provided a container comprising: an injection molded annular mouth portion having detail of high definition, a generally cylindrical body portion blow
105 molded from a parison integrally injection molded with the mouth portion, said body portion having an inside diameter slightly larger than the inside diameter of the mouth portion, and an annular reinforcing region joining the mouth portion to the body
110 portion and forming a transitional surface therebetween, in which the detail of high definition in the mouth portion includes a depending skirt which serves as an outside wall over said reinforcing region providing a suitable sidewall label attachment area over the reinforcing region.

115 *Figure 1* shows a partially broken away view of the preform used to form the container of the prior art.

Figure 2 shows a partially broken away view of the completed container of the prior art.

120 *Figure 3* shows a partially broken away view of the preform used to form the container of the present invention.

Figure 4 shows a partially broken away view of the completed container of the present invention.

125 *Figure 5A* shows a partial cross-sectional view of another embodiment of the container of the present invention.

130 *Figure 5B* shows a partial cross-sectional view of another embodiment of the container of the present invention.

Figure 6 shows a broken away view of the rim section of an embodiment of the container of the present invention provided with different style ribs on the interior skirt surface.

5 Figure 7 shows a partial cross-sectional view of another embodiment of the container of the present invention in which the bale ears are provided at the lower periphery of the depending skirt.

10 In Figure 1, a partially broken away view of the preform used to form the container of the prior art is shown. This preform is prepared by injection molding a suitable thermoplastic material, such as polyethylene or polypropylene. The preform comprises two general areas: a mouth portion 10 and a parison portion 12. The mouth portion contains detail such as the sealing lip 13 and the ribs 14, 16 and 18 which are all meant to remain as features in the completed container. The parison portion 12 is intended to be expanded by internal pressure to the dimensions of the finished container in a blow molding step.

20 Between these two general areas there is a reinforcing region, shown as 20 in Figure 1. This region acts as a transitional surface between the injection molded mouth portion 10 and the parison portion 12. In the preform shown in Figure 1, this reinforcing region 20 has a generally decreasing inside diameter from the mouth portion 10 to the parison portion 12.

30 When the parison portion 12 is subjected to increased internal pressure during blow molding, the thermoplastic material of the parison portion 12 expands to fill the blow molding cavity, which has the dimensions of the finished container. This results in the container of the prior art, which is shown in a partially broken away view in Figure 2. In this drawing, the injection molded mouth portion 10 retains its shape and is still provided with the sealing lip 13 and the detail ribs, shown as 14, 16, and 18.

40 However, the body portion 11 of the container in Figure 2 has been formed from the parison portion, shown as 12 in Figure 1. The body portion 11 when thus formed, has an inside diameter which is larger than the inside diameter of the mouth portion 10. Thus, in the completed container of the prior art, the reinforcing region 20 must provide a transitional surface of gradually increasing diameter between the mouth portion 10 and the body portion 11.

50 The effect of this is to create an annular groove or notch 22 around the outside surface of the finished container of the prior art. This groove does not limit the integrity of the container in any way, although the groove does decrease the container's stackability slightly. However, when the design characteristics of the container are intended to make it interchangeable with conventional metal containers on filling machinery, the groove limits the area available for labelling, and such containers cannot be used interchangeably on labeling machinery. In fact, special sized labels must be used and this requires additional production time to hand affix such labels or modify the labeling machinery lines to accommodate them.

65 It has now been found that this difficulty may be overcome by providing additional detail to the

mouth portion of a container during the injection molding step. The preform used to form the container of the present invention is shown in a partially broken away view in Figure 3. In this preform, an injection molded mouth portion 30 and parison portion 32 joined by a reinforcing region 40 are all formed from a suitable thermoplastic.

70 The injection molded mouth portion 30 of the present invention is provided with detail similar to the prior art. However, in addition to the sealing lip 34 and the rib 36 which are substantially identical to the sealing lip 13 and the rib 14 in Figure 1, the second rib 38 is provided with a depending segment or skirt 39 which extends for part or all of the reinforcing region 40 and surrounds circumferentially said region. It is advantageous to position this skirt 39 just inside the periphery of the second rib 38, in order that the second rib 38 will provide protection for the edge of a label when affixed. Similarly, a bead, such as that shown as 37 in Figure 4, can be provided to protect the lower edge of the affixed label. A third rib, corresponding to rib 18 in Figure 1 is not required.

80 When the parison portion 32 of the preform shown in Figure 3 is subjected to increased internal pressure during blow molding, the thermoplastic material in the parison portion 32 expands to fill the blow molding cavity, which has the dimensions of the finished container. The container which results from this procedure is shown in Figure 4. As can be seen clearly in the partially broken away view of the container in Figure 4, the flat exterior surface of the body portion 31 is in line with the exterior surface of the injection formed depending skirt 39 provided on the rib 38 of the mouth portion 30.

90 It is not required that the body portion 31 and the depending skirt 39 actually touch or be mechanically bonded, although this may be done if desired. It is only required that their flat exterior surfaces are substantially in line with each other and that any gap between them be relatively small. The combination of these flat, linear surfaces provide a labeling area substantially similar to the conventional metal containers and allow the containers of the present invention to be used on conventional filling and labeling equipment substantially interchangeably with conventional metal containers.

100 When it is desired to mechanically bond the depending skirt 39 to the blown body portion 31, it is advantageous to provide for at least a small portion of the body portion 31 to be blown flat directly against the depending skirt 39. This is shown most clearly in the partial cross-section view of Figure 5A. For the maximum label area, the depending skirt 39 may depend from rib 36, eliminating rib 38, as shown in Figure 5B.

110 When still greater wall strength in the area of the transitional surface is desired, a plurality of integral injection molded ribs may be provided which will connect the skirt to the blown parison portion in the region of the transitional surface. Various forms of such ribs are shown for illustration in Figure 6, although it is assumed, but not required, that only one style of rib will be present in any embodiment employing such a plurality of ribs. The simplest style

rib 50 is a flat injection molded projection on the interior surface of the skirt 39 which extends inward in the radial direction a short distance. In another embodiment, the rib might have a flanged upper inner face, such as the portion 51 on rib 52, or a flanged lower inner face, such as the portion 53 on rib 54. When the parison portion 32 is blown, material would extend around the flanged portion and serve to anchor or lock the flange protuberances into the body portion 31.

One major advantage which the present invention provides over the prior art is the placement of the bale ears. Prior to the present invention integral bale ears could only be provided by injection molding in the area of the mouth portion at the top of the container where they are not compatible with conventional automatic bale machinery. Alternatively, non-integral bale ears may be provided by the mechanical, sonic or adhesive bonding of individual pieces onto the container at a position which would be compatible. Any such operation is very expensive. Further, any such attachment means would not be nearly as strong as the integral molding.

It has now been found that the present invention will allow for the bale ears to be injection molded and yet provided in the more advantageous position which is compatible with conventional automatic bale equipment. This is done by injection molding the bale ears as a feature on the lower periphery of the depending skirt, as shown in partial cross-section in Figure 7.

CLAIMS

1. A container comprising: (a) an injection molded annular mouth portion having detail of high definition; (b) a generally cylindrical body portion blow molded from a parison injection molded integrally with the mouth portion, said body portion having a closed bottom and an inside diameter slightly larger than the inside diameter of the mouth portion; and (c) an annular reinforcing region joining the mouth portion to the body portion and forming a transitional surface therebetween, in which the detail of high definition provided in the mouth portion includes as an outside wall over said reinforcing region an annular depending skirt which is integrally injection molded as a feature of the mouth portion.

2. The container of claim 1 further comprising as an element of the high definitional detail injection molded into the mouth portion, a plurality of ribs on the interior surface of the depending skirt extending inward a short distance in the radial direction and having the transitional surface of the finished container meet the inner periphery of said ribs.

3. The container of claim 1 further comprising as an element of the high definitional detail injection molded into the mouth portion, a plurality of ribs on the interior surface of the depending skirt extending inward a short distance in the radial direction and having the inner periphery of said ribs anchored in the thermoplastic material forming the transitional surface.

4. The container of any of claims 1-3 further

comprising as an element of the high definitional detail injection molded into the mouth portion, two bale ears on the depending skirt.

5. The container of claim 1 substantially as hereinbefore described and illustrated in Figure 4 of the drawings.

6. The container of claim 1 substantially as hereinbefore described and illustrated in Figure 5A of the drawings.

7. The container of claim 1 substantially as hereinbefore described and illustrated in Figure 5B of the drawings.

8. The container of claim 1 substantially as hereinbefore described and illustrated in Figure 6 of the drawings.

9. The container of claim 1 substantially as hereinbefore described and illustrated in Figure 7 of the drawings.

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