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(54) **ERGONOMICALLY-SHAPED PLASTIC BAIL AND CONTAINER**

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(57) **ABSTRACT**

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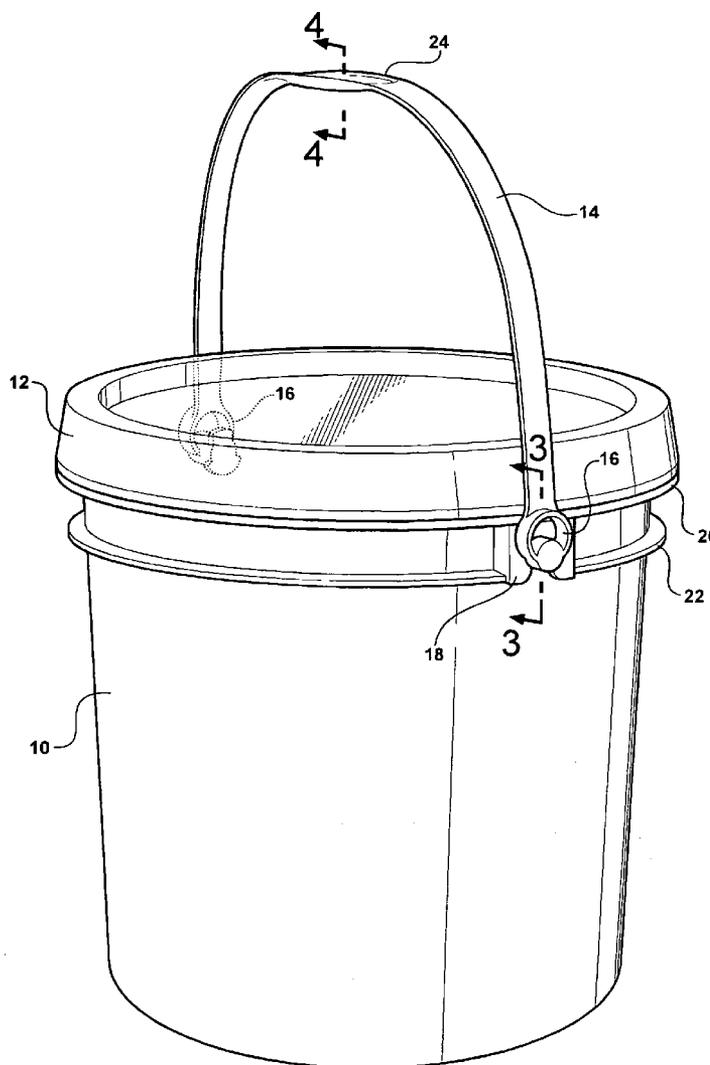
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An ergonomically-shaped one-piece molded plastic lifting bail for attachment to a molded plastic container by means of attachment structures at the opposite longitudinal ends of the bail. A center portion of the bail is crescent shaped over a length of at least approximately four inches to provide increased rigidity and a smoothly rounded bottom surface which the user's hand engages when lifting the pail. The attachment structures permit the bail to be rotated relative to the pail so as to move between an upright lifting position and a laid over storage position.



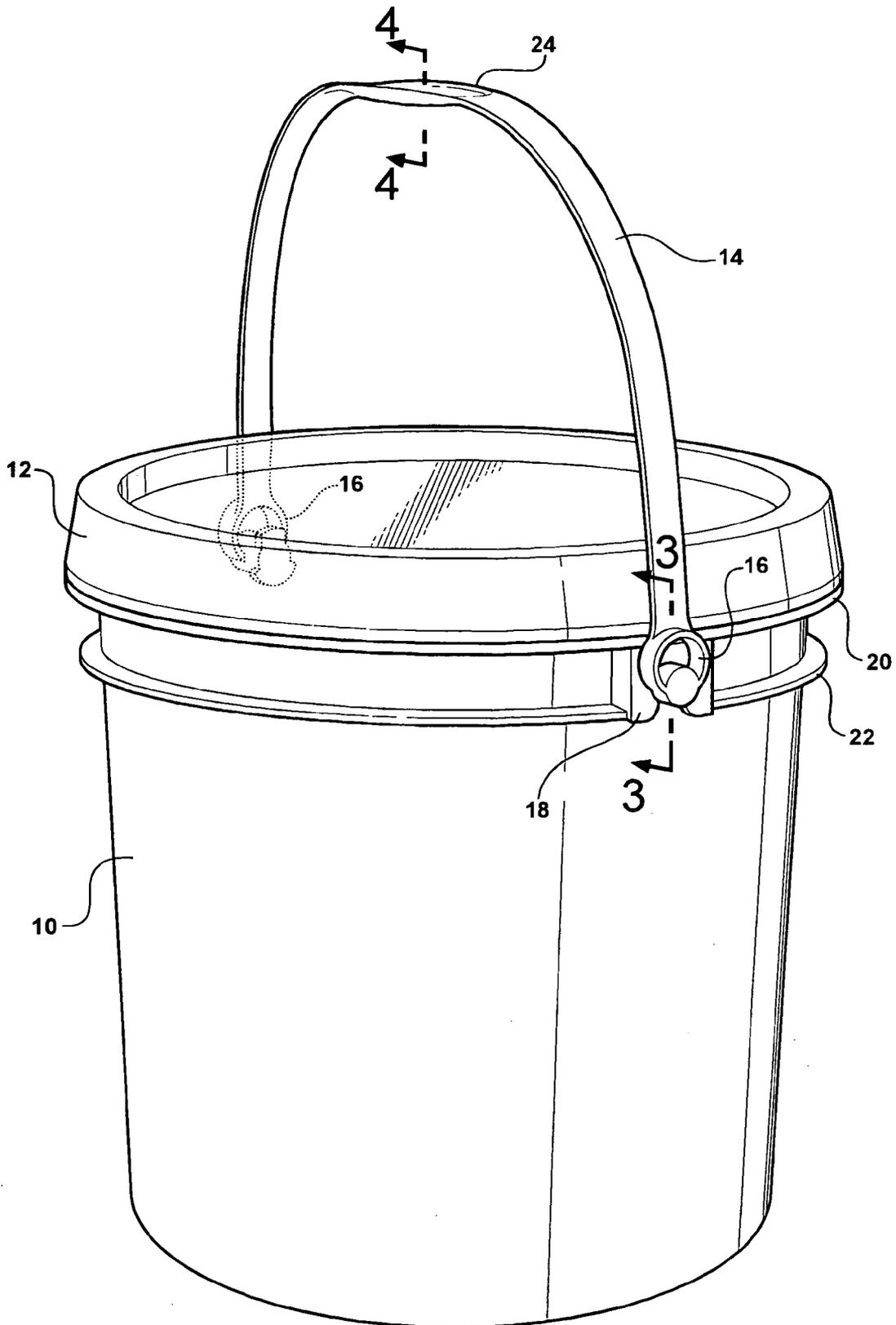
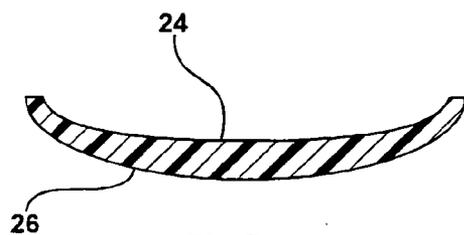
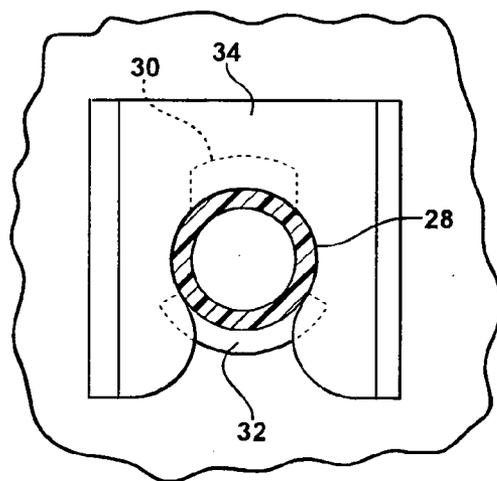
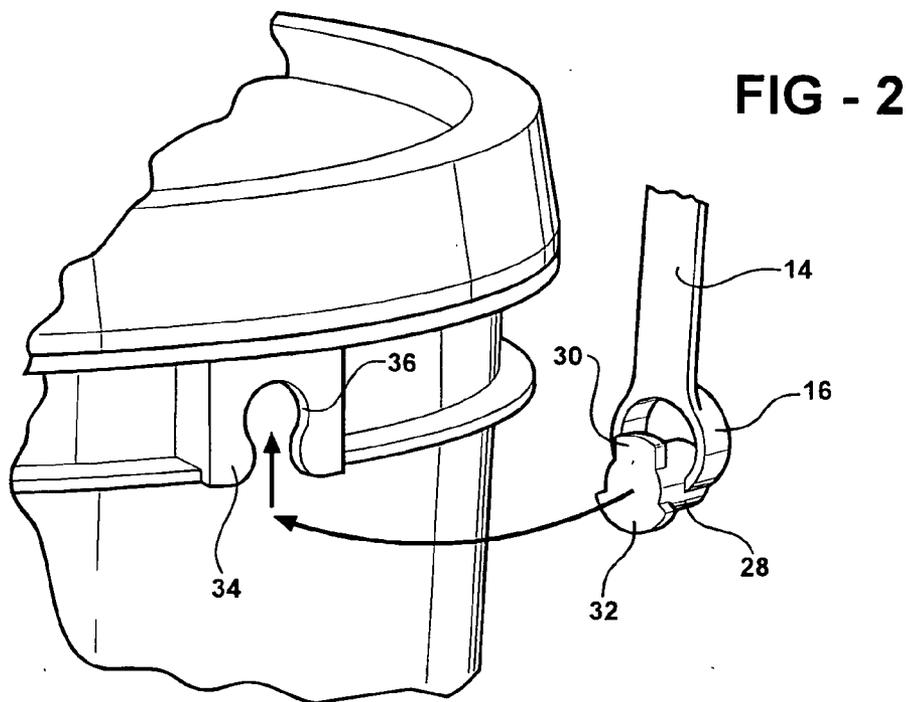


FIG - 1



ERGONOMICALLY-SHAPED PLASTIC BAIL AND CONTAINER

FIELD OF THE INVENTION

[0001] This invention relates to containers and more particularly to an ergonomically-shaped one-piece molded plastic bail for lifting an attached container.

BACKGROUND OF THE INVENTION

[0002] Plastic containers in various sizes ranging from one to six gallons are in common usage for the shipment and storage of various materials including asphalt sealant, wall-board putty, wallpaper paste, paint and various food products, to name a few. Such containers typically comprise a pail body, a closure which fits on and over the open top of the pail body, and a bail which is attached to receiver structures on opposite sides of the pail body near the top.

[0003] A common bail structure comprises a stiff metal wire which is bent into a semi-hoop shape and typically provided with a cylindrical plastic handle member which is trapped by bends in the wire into a central location between the longitudinally opposite ends of the bail. To manufacture a bail of the type described immediately above requires a number of separate operations including cutting the wire to length, sliding on the plastic handle, bending the wire to trap the handle and to form the semi-hoop shape, and bending the opposite ends of the wire to form geometries which mate with the bail receiver structures on the pail body.

[0004] A more cost effective approach is to mold the bail out of a suitable plastic material such as high-density polyethylene. Such a bail is typically molded in the shape of a flat band which is ergonomically inferior for at least two reasons: first, the molds used to make the bails have a parting line which runs down the center of the bail and the flashing which results from the parting line is uncomfortable when engaged by the hand of the person lifting the container by way of the bail; second, the flat band typically has relatively sharp edges which can produce discomfort when a loaded pail is lifted by the bail and carried for significant periods of time.

SUMMARY OF THE INVENTION

[0005] The present invention provides an ergonomically improved one-piece molded plastic bail for lifting an attached container. In general, the bail is manufactured in the form of a flat band of solid moldable plastic with attachment structures integrally molded into the opposite ends for snap-in rotatable attachment to bail receivers on the opposite sides of a pail body. However, in addition, the bail of the present invention comprises an integral center portion having an effective length approximating the width of an adult human hand; i.e., about four inches or more, characterized by increased rigidity relative to the balance of the flat band, and a smoothly rounded bottom surface which is engaged by the hand when lifting the bail and the attached container.

[0006] The increased rigidity of the center portion can be provided in any of several ways including molded-in curvature of the band cross-section, increased thickness, and combinations of these. In the preferred form, the center portion of the bail is crescent shaped in cross section such that the top surface is concave and the bottom surface is convex. It is at maximum thickness along the longitudinal midline. The attachment portions are preferably cylindrical with the axis of symmetry of the cylinder lying at right

angles to the longitudinal axis of the bail. In addition, first and second flanges are molded onto an end of the attachment structure cylinders such that, when the cylinders are forced into and through the narrowed opening of a bail slot, the segmented flanges lie on the interior of the receiver structure while the attachment portion of the bail to the cylinder lies outside the bail receiver. In this arrangement a bail can be rotated within the receiver structure between an insertable position and a folded position without fear of disassembly or disattachment from the container. The bail is made in one piece, does not require the secondary operations which are associated with wire bails and can be readily molded in a die in which there is no parting line running down the center of the bottom surface of the bail.

[0007] Other applications of the present invention will become apparent to those skilled in the art when the following description of the best mode contemplated for practicing the invention is read in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The description herein makes reference to the accompanying drawings wherein like reference numerals refer to like parts throughout the several views, and wherein:

[0009] **FIG. 1** is a perspective view of a container combination comprising pail, closure and bail constructed in accordance with the present invention;

[0010] **FIG. 2** is an exploded view of a detail of the structure of **FIG. 1** illustrating the attachment mechanism between the bail and the pail body;

[0011] **FIG. 3** is a sectional view along the line **3-3** indicated in **FIG. 1**; and

[0012] **FIG. 4** is another sectional view through the center of the bail along the line **4-4** shown in **FIG. 1** illustrating the crescent shape of the bail throughout the central portion thereof.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0013] Referring to **FIG. 1**, a container assembly is shown to comprise a molded plastic pail **10**, a snap-on molded plastic closure **12** attached to the open top of the pail **10** and a molded plastic lifting bail **14** having attachment structures **16** at the longitudinally opposite ends thereof for snap-in association with receiver structures **18** molded into the sides of the pail **10** between circumferential ribs **20** and **22** which add hoop strength as well as a distinctive appearance. The first rib **20** is spaced below the open top (not shown) of the pail **10** sufficiently to accommodate the conventional lock-on closure **12**. The second circumferential rib is spaced approximately 1¼ inches below the top rib **20** and is integral with a receiver structures **18** as hereinafter described.

[0014] Bail **14** is injection molded of a suitable high density plastic material such as polyethylene principally in the form of a flat band, the particular length being varied to suit or accommodate the diameter of the pail **10** with which it is to be associated. Typically the bail length is at least about 1½ times the pail diameter. The attachment structures **16** are integrally molded into the opposite longitudinal ends of the bail. A center portion **24** of increased rigidity is molded into the bail **14** midway between the longitudinally opposite ends and has a crescent-shaped cross section as best

shown in **FIG. 4**. The crescent shape shown in **FIG. 4** is characterized by an increased midline thickness relative to the balance of the flat band bail **14**, said increased midline thickness gradually diminishing toward the outer edges. This results in additional stiffness and a smoothly rounded bottom surface **26** which the hand of the user engages when lifting the pail **10** by way of the center portion of the bail **14**. The top surface of the center portion **24** is concave whereas the bottom surface is smoothly convex and is free of any flashing ridges caused by parting lines in the injection mold. The mold (not shown) is preferably of a clam-shell shape such that any parting lines fall at the outer edges of the bail center portion **24** as shown in **FIG. 4**. It should be understood that the crescent shape is but one way of achieving rigidity in the center portion of the bail; i.e., the center section may also be of uniform thickness in cross-section and either thicker than the side portion of the bail or of the same thickness. In the latter case, the curvature provides the rigidity which tends to maintain the relatively flat longitudinal shape of the center portion.

[0015] Looking specifically to **FIGS. 1-3**, the attachment structures **16** comprise integral loops of plastic which are attached to hollow cylinders **28**, the axis of symmetry or rotation thereof being at right angles to the longitudinal dimension of the bail band **14**. Integrally molded into and proximate the inner end of the hollow cylinder **24** for each attachment structure **16** are segmented flanges **30** and **32** of non-uniform circumferential dimension spaced apart by approximately 140°. The flanges **30** and **32** cooperate with the receiver structure wall **34** and the key hole shaped slot **36** such that the hollow cylinder **28** rests within the slot **36**, the loop **16** being on the outside of the wall **34** and the flanges **30** and **32** being on the inside of the wall. In this condition, the cylinder **28** rotates smoothly within the key hole shaped slot **36** and the flanges prevent inadvertent disengagement. The bail may be easily rotated between an upright insertion and lifting position and a laid over storage position which permits multiple pails to be stacked on top of one another.

[0016] While the invention has been described in connection with what is presently considered to be the most practical and preferred embodiment, it is to be understood that the invention is not to be limited to the disclosed embodiments but, on the contrary, is intended to cover various modifications and equivalent arrangements included within the spirit and scope of the appended claims, which scope is to be accorded the broadest interpretation so as to encompass all such modifications and equivalent structures as is permitted under the law.

What is claimed is:

1. A one-piece molded plastic bail for lifting an attached container comprising:

a flat band of solid moldable plastic having longitudinally opposite ends and a non-flat center portion; and

attachment structures integrally molded into said opposite ends for snap-in rotatable attachment to bail receivers;

said center portion, over a length approximating the width of an adult human hand, being characterized by increased rigidity relative to the balance of the flat band and a smoothly rounded bottom surface which is engaged by the hand when lifting the bail and attached container.

2. A bail as defined in claim 1 wherein the center portion of the bail is crescent shaped in cross section.

3. A bail as defined in claim 1 wherein each attachment structure comprises a cylindrical body integrally connected with the band such that the axis of symmetry of the cylindrical body is at right angles to the longitudinal dimension of the band, each structure further comprising first and second arcuate flanges at spaced apart locations proximate an end of the body such that the body may be forced into a slotted opening in a bail receiver with the flanges internally of the receiver.

4. In combination:

a molded plastic pail having bail receiver structures integrally molded into an outer body surface thereof at diametrically opposite positions;

a molded plastic bail for lifting the container when attached thereto and comprising a generally flat band of solid moldable plastic having longitudinally opposite ends and a non-flat center portion; and

attachment structures integrally molded into said opposite ends for snap-in rotatable attachment to said bail receivers;

said center portion, over a length approximating the width of an adult human hand, being characterized by increased rigidity relative to the balance of the flat band and a smoothly rounded bottom surface which is normally engaged by the hand when lifting the bail and attached container.

5. The combination defined in claim 4 wherein the receiver structures comprise slotted walls integral with but radially spaced outwardly from the outer surface of the pail and having key hole shaped slots for receiving the attachment structures of the bail therein, said attachment structures comprising flanged cylindrical bodies which snap-fit into the key hole shaped slots.

6. The combination defined in claim 4 wherein the bail receiver bodies are integrally molded with first and second spaced circumferential bands on the outer surface of the pail.

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