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(54) **SHIPPING PACKAGE WITH END RETAINER AND METHOD THEREFOR**

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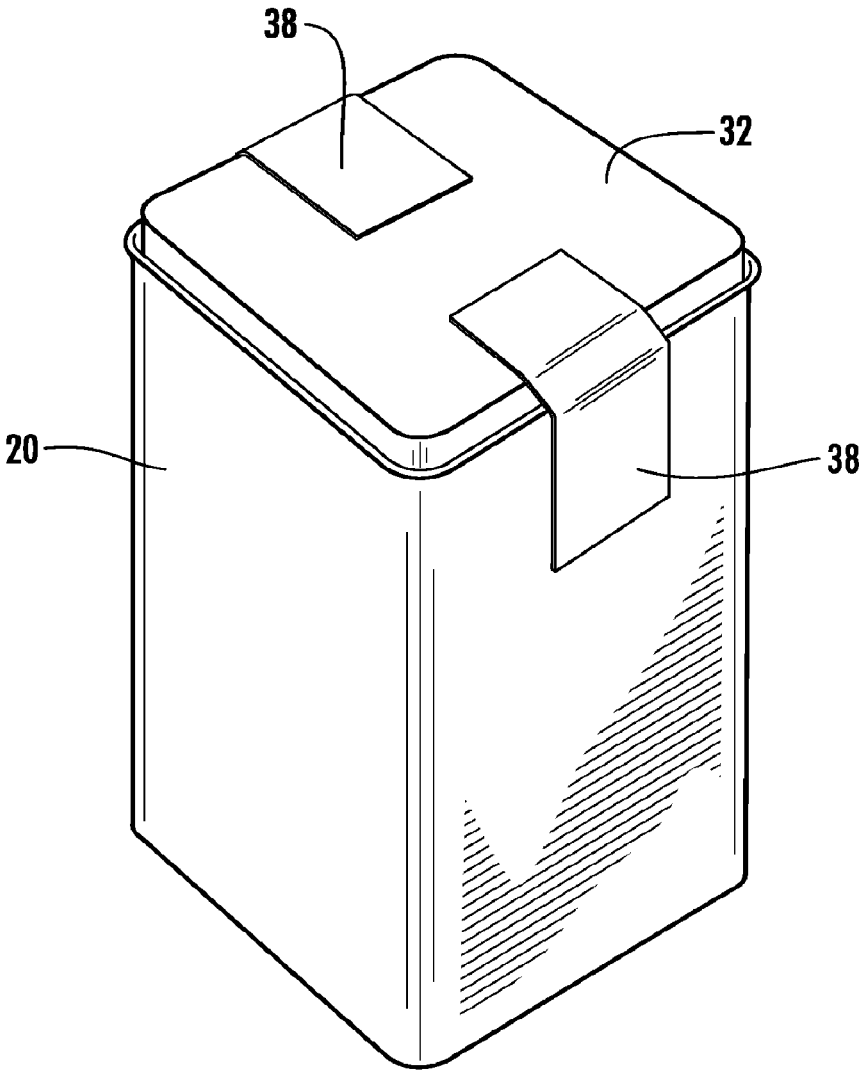
(57) **ABSTRACT**

A shipping package includes a can body having an interior volume and at least one closable end, an end closure closably engaging the closable end of the can body having a recessed portion adapted to fit within a portion of the can body adjacent the closable end, and a disposable reinforcing member corresponding to at least a portion of the recessed portion of the end closure secured adjacent to an exterior surface of the recessed portion.



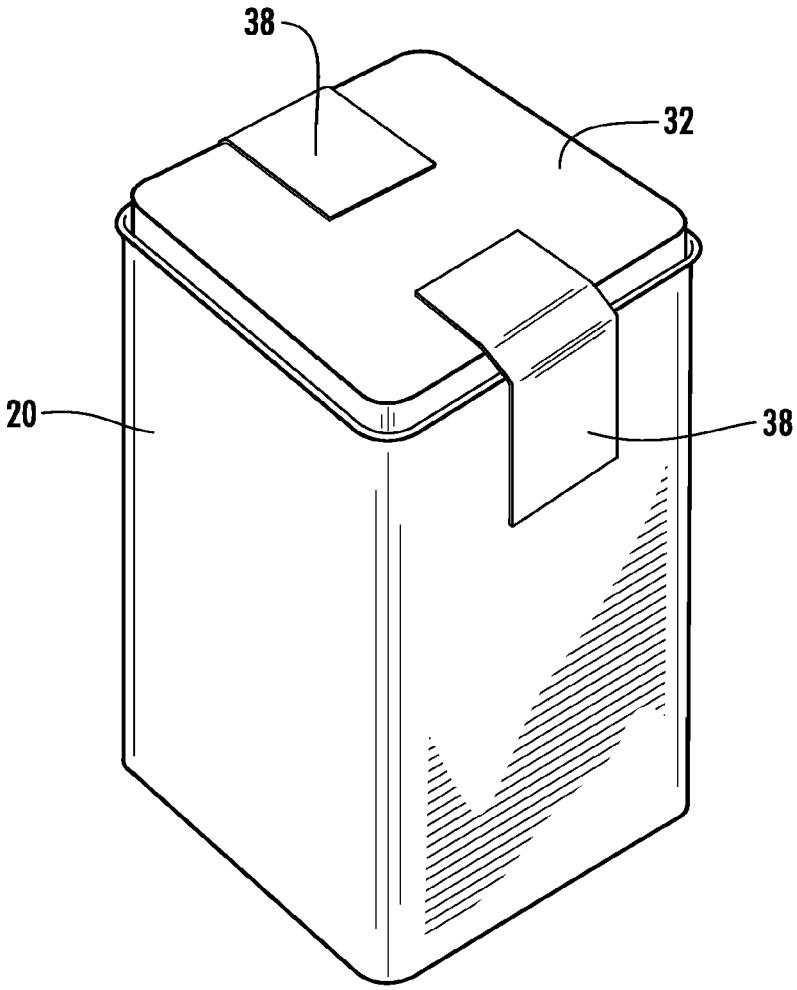


FIG. 1

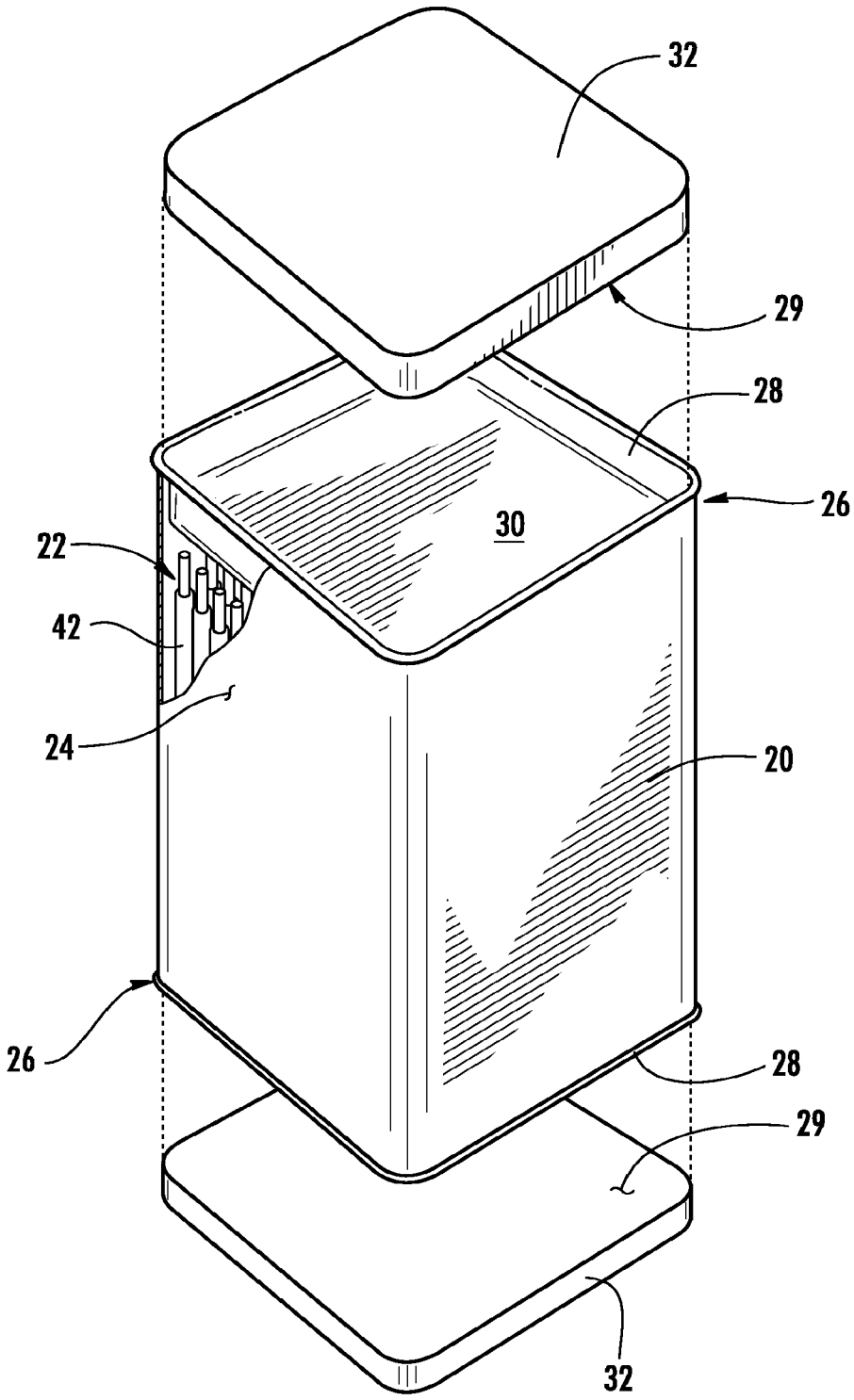
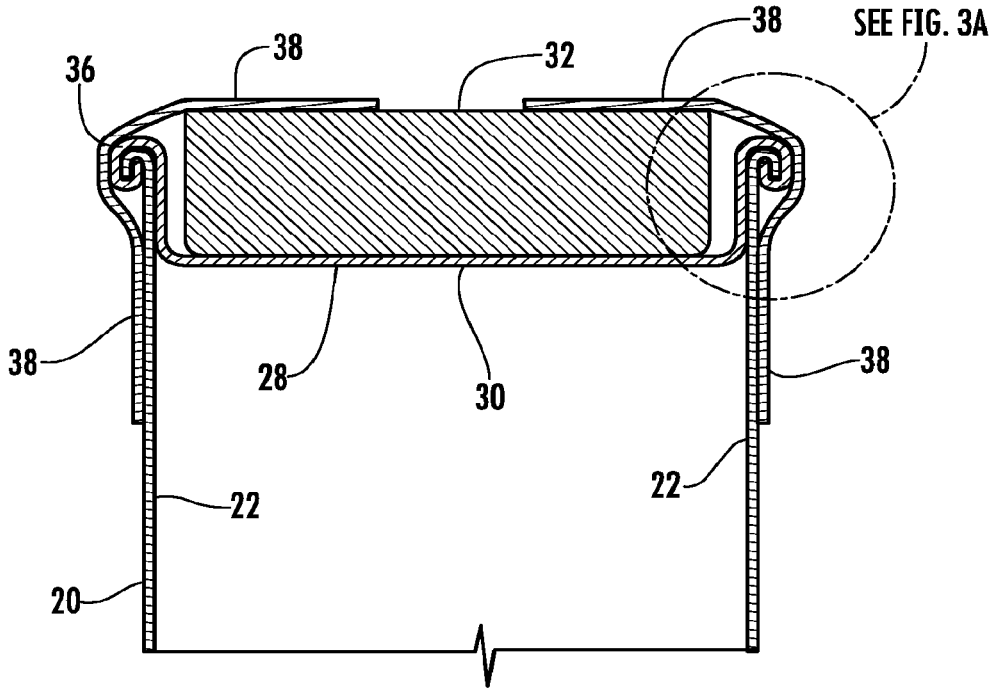


FIG. 2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SEE FIG. 3A
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FIG. 3

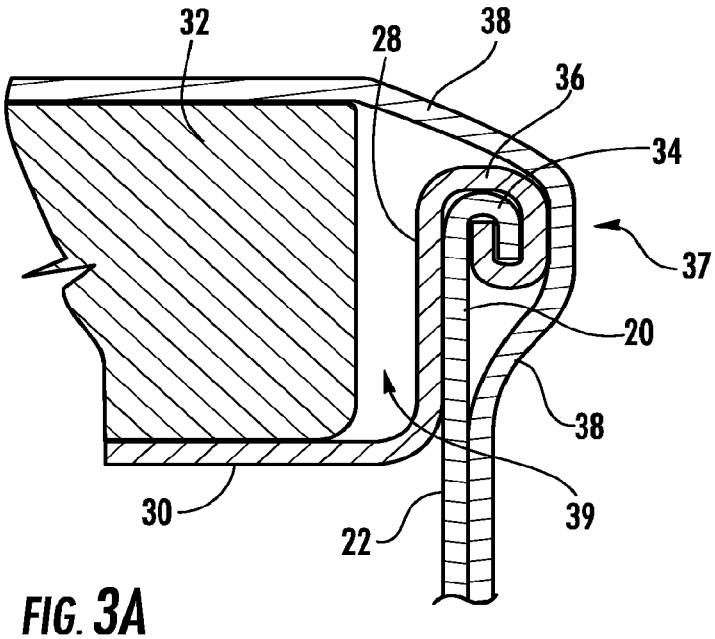
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FIG. 3A

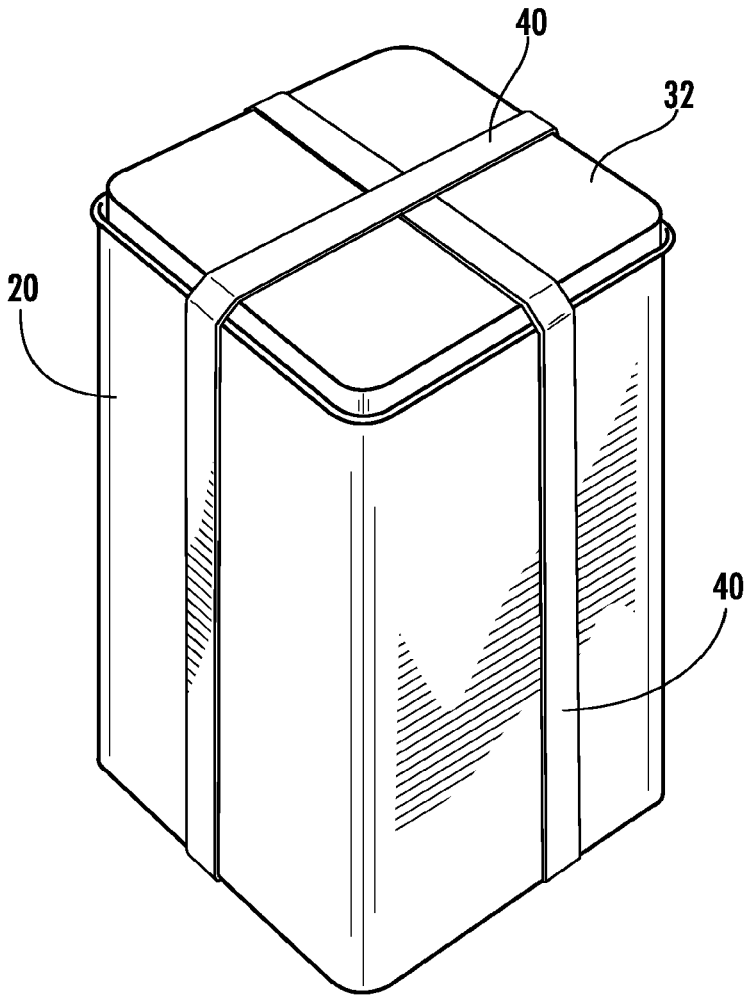

FIG. 4

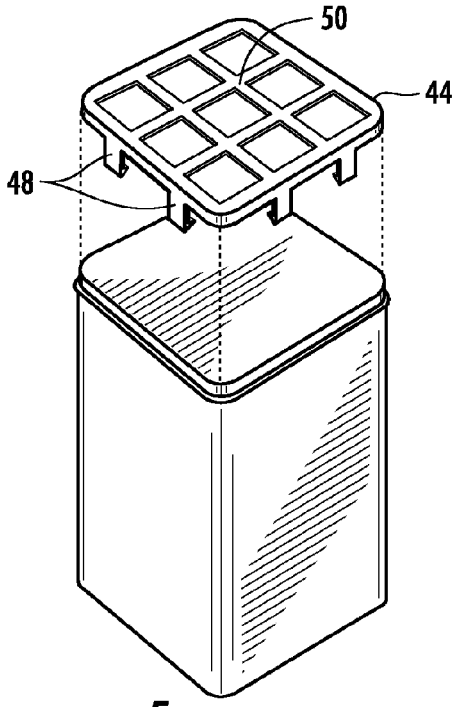

FIG. 5

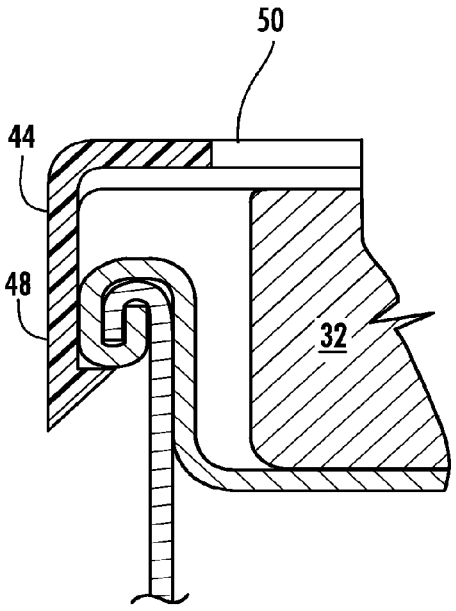

FIG. 5A

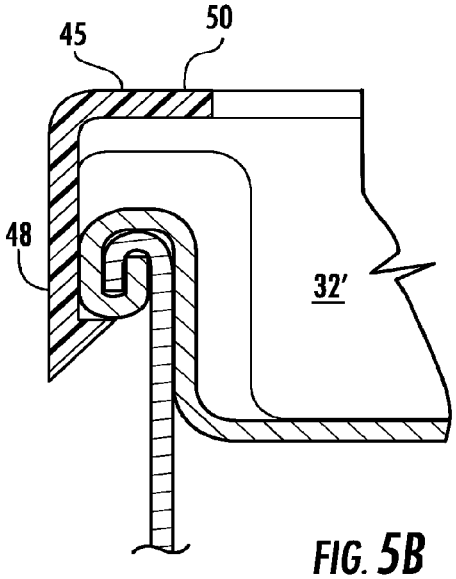

FIG. 5B

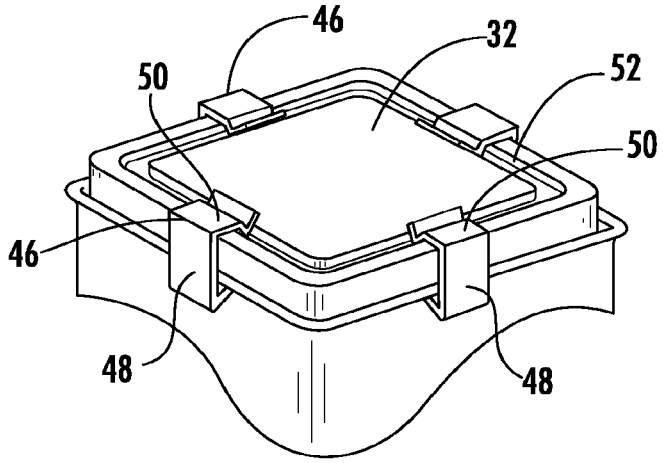

FIG. 6

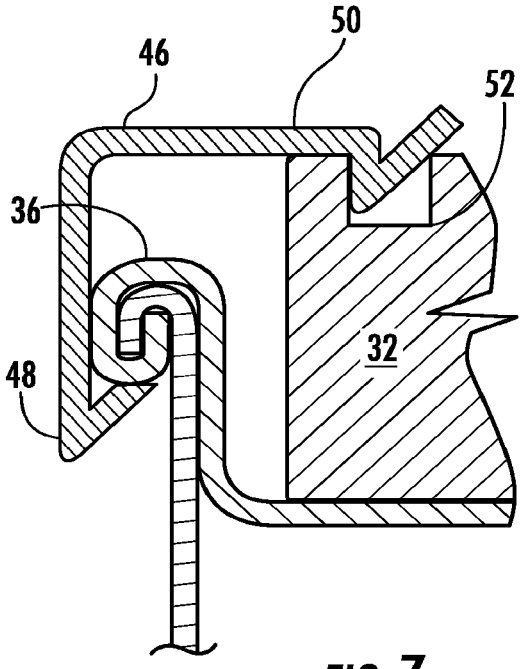

FIG. 7

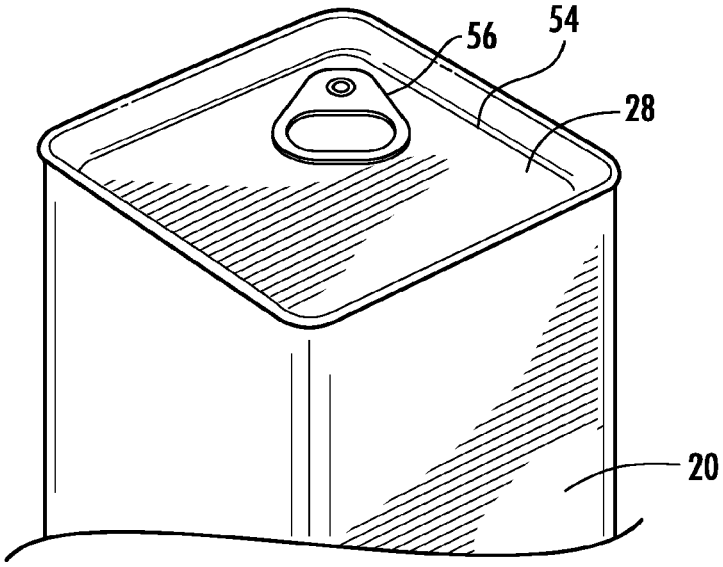

FIG. 8

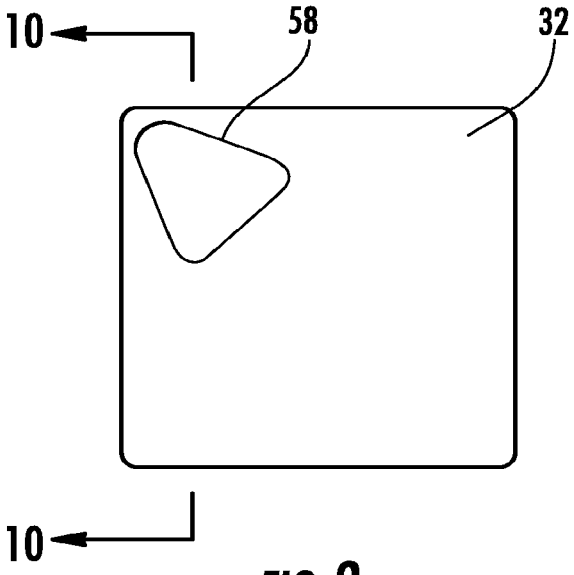

FIG. 9

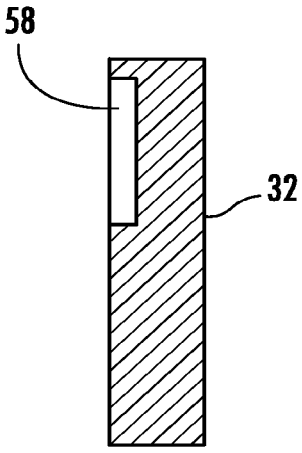

FIG. 10

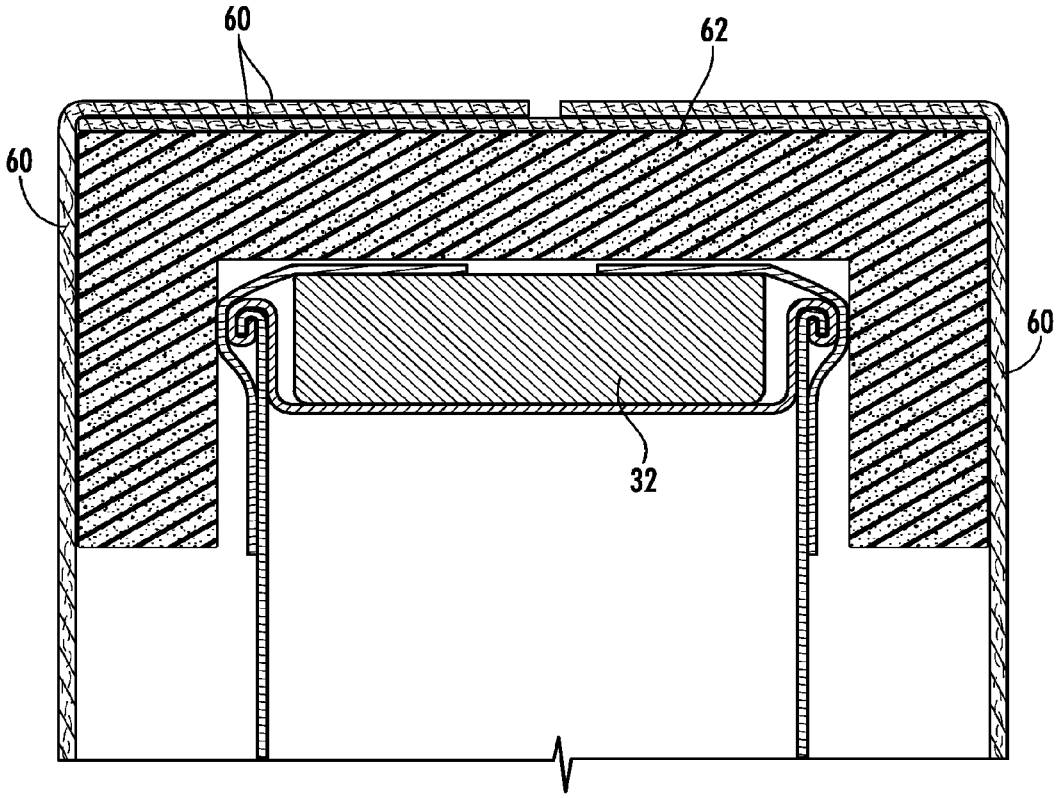

FIG. 11

SHIPPING PACKAGE WITH END RETAINER AND METHOD THEREFOR

[0001] This application is a divisional of U.S. patent application Ser. No. 12/890,839 filed Sep. 27, 2010, which is incorporated herein by reference.

BACKGROUND AND SUMMARY

[0002] Many products, including stick electrodes for welding, are shipped in canister shipping packages. During shipping, the packages are typically dropped, thrown, bounced, and otherwise subjected to forces caused by handling.

[0003] In the past, when a canister shipping package was dropped or otherwise handled, the contents of the package shifted impacting against the package end cap or end closure. Such movement of the package contents was one cause of the end closure deforming and/or tearing from the package. In certain applications such as stick electrodes for welding, movement of the package contents inside the package in a longitudinal direction cause the contents to impact the end closure. Prior shipping packages could not withstand the shipping forces caused by high density electrode products moving inside the package without deformation and damage to the end closures. There remains a need for improved shipping containers that withstand the forces of shipping and reduce shipping damage to the package contents.

[0004] What is disclosed is a shipping package comprising a can body having an interior volume and at least one closable end, an end closure closably engaging the closable end of the can body having a recessed portion adapted to fit within a portion of the can body adjacent the closable end, and a disposable reinforcing member corresponding to at least a portion of the recessed portion secured adjacent an exterior surface of the recessed portion.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] FIG. **1** is a perspective view of a shipping package of the present disclosure,

[0006] FIG. **2** is an exploded perspective view of the shipping package of FIG. **1**,

[0007] FIG. **3** is a cross sectional view through the end of the shipping package,

[0008] FIG. **3**A is a detail of the rim of the shipping package of FIG. **3**,

[0009] FIG. **4** is a perspective view of an alternative shipping package of the present disclosure,

[0010] FIG. **5** is an exploded perspective view of an alternative shipping package of the present disclosure,

[0011] FIG. **5**A is a cross sectional view through a clip of the shipping package of FIG. **5**,

[0012] FIG. **5**B is a cross sectional view through an alternative clip of the shipping package of FIG. **5**,

[0013] FIG. **6** is a perspective view of yet another alternative shipping package of the present disclosure,

[0014] FIG. **7** is a partial cross sectional view of the shipping package of FIG. **6**.

[0015] FIG. **8** is a perspective view of an alternative shipping package of the present disclosure,

[0016] FIG. **9** is an bottom view of an alternative disposable reinforcing member of the present disclosure,

[0017] FIG. **10** is a cross sectional view of the reinforcing member of FIG. **9**, and

[0018] FIG. **11** is a cross sectional view through the end of a shipping package of the present disclosure with an outer packaging.

DETAILED DESCRIPTION OF THE DRAWINGS

[0019] Referring now to FIGS. **1** and **2**, a shipping package has a longitudinal can body **20** having an inside volume **22** and an outside surface **24** and at least one closable end **26**. The closable end **26** is closed using an end closure **28** closably engaging the closable end **26** of the can body **20**. A disposable reinforcing member **32** is provided having a support surface **29** corresponding to at least a portion of the end closure **28** and secured adjacent at least a portion of an exterior side of the end closure **28** as shown in FIG. **3**. The disposable reinforcing member **32** is positioned such that at least a portion of the support surface **29** is in contacting engagement with at least a portion of the exterior of the end closure **28** and adapted to reinforce the end closure **28** to withstand greater shipping forces than a shipping package without the reinforcing member **32**, and particularly may be adapted to resist forces applied by package contents impacting the inside of the recessed portion of the end closure **28**. The disposable reinforcing member **32** may be adapted to be removed after shipping of the package for a user to access the end closure **28**.

[0020] The can body **20** may have a four-sided cross sectional shape as shown in FIGS. **1** and **2**. Alternatively, the can body **20** may have a circular cross sectional shape, a triangular cross sectional shape, a hexagonal cross sectional shape, or any other polygonal, arcuate, or other cross sectional shape as desired (not shown).

[0021] The end closure **28** engages the can body **20** to close the end. As shown in FIG. **3**, the can body **20** may have a flange **34** adjacent the closable end and the end closure **28** may have a flange portion **36** adapted to engage the can flange **34** when seam-sealed together around the perimeter of the end of the can body **20** as is well known by those skilled in the art. The seamed flanges **34**, **36** form a rim **37** around the shipping package adjacent the closable end **26**. A sealing compound may be provided between the can flange **34** and the closure flange portion **36** to form a hermetically sealed closure on the can body **20**.

[0022] The end closure **28** may have a planar exterior surface engaging a corresponding planar support surface **29** on the reinforcing member **32**. Alternatively, the end closure **28** may have a contoured exterior surface engaging a corresponding contoured support surface **29** on the reinforcing member **32**. The end closure **28** may have a recessed portion **30** adapted to fit within a portion of the can body **20** adjacent the closable end **26** as shown in FIG. **3**. At least a portion of the disposable reinforcing member **32** corresponding to at least a portion of the recessed portion **30** may be recessed with the end closure **28** into the closable end **26** of the can body **20**.

[0023] As shown in FIG. **3**A, there may be a gap **39** between the edge surface of the reinforcing member **32** and the side surface of the recessed portion **30** adjacent the rim **37**. In one exemplary and non-limiting example, the gap **39** may be between about 0 and about 0.01 inch. In an alternative application, the gap **39** may be between about 0 and 0.06 inch, preferably between about 0.01 and 0.03 inch. In yet another alternative, the gap **39** may be between about 0 and 0.2 inch. The gap **39** may be selected to reduce the ability of the rim **37** to deform toward the reinforcing member **32** during shipping as desired.

[0024] The shipping package may contain stick electrodes **42** for welding as shown in FIG. **2**. In one exemplary and non-limiting example, the can body **20** and end closure **28** are sized such that there is a gap between the end of the stick electrodes and the inside of the end closure **28** of between about 0.06 and 0.4 inches on at least one end of the shipping package. In one exemplary and non-limiting example, at least a portion of the support surface **29** is in contacting engagement with at least a portion of the exterior of the end closure **28** and positioned between about 0.008 inch and 0.4 inch from the end of the stick electrodes in the package on at least one end of the shipping package. Alternatively, at least a portion of the support surface **29** may be positioned between about 0.01 inch and 0.3 inch from the end of the stick electrodes in the package. In yet another alternative, at least a portion of the support surface **29** may be positioned between about 0.01 inch and 0.2 inch from the end of the stick electrodes in the package.

[0025] The can body **20** of the shipping package may include a closable end at both ends of the can body. The second closable end **26** may be closed using the end closure **28** and reinforced using the disposable reinforcing member **32** as shown in FIG. **2**.

[0026] As shown in FIG. **3**, the disposable reinforcing member **32** is positioned adjacent at least a portion of the exterior of the end closure **28** positioned to reinforce the end closure **28**. The disposable reinforcing member **32** corresponding to at least a portion of the end closure may be secured by taping to the can body **20** using tape **38**. As shown in FIG. **1**, one or more pieces of tape **38** may be adhered to at least two sides of the can body **20** and at least a portion of the reinforcing member **32**. Additional pieces of tape **38** may be applied as desired to secure the reinforcing member **32** to the shipping package. In one application, the tape **38** is a 3 inch wide shipping tape. Alternatively, the tape is a 2 inch wide tape. It is contemplated that the size of the tape may be varied as desired for satisfactory shipping performance.

[0027] Alternatively or additionally, the disposable reinforcing member **32** may be banded or strapped to the can body **20** using strapping **40**. The strapping **40** may be wrapped around the shipping package forming a band. Additionally, the strapping **40** may be wrapped around the shipping package in two or more bands, such as around two opposite sides of the can body **20** in a first band, and around another two opposite sides of the can body **20** in a second band such as shown in FIG. **4**. Additional bands of strapping **40** may be applied as desired to secure the reinforcing member **32** to the shipping package. In one application, the strapping **40** is ½ inch polypropylene strapping. Alternatively, the strapping is ⅜ inch polypropylene strapping. It is contemplated that the size and material of the strapping may be varied as desired for satisfactory shipping performance.

[0028] In one application, the disposable reinforcing member **32** may be secured adjacent at least a portion of the exterior side of the end closure using at least one clip, such as clip **44** adapted to secure the reinforcing member adjacent the end closure **28**. As shown in FIG. **5**, the clip **44** may be adapted to be positioned over at least a portion of the reinforcing member **32** to secure the reinforcing member **32** adjacent the end closure **28**. An alternative clip **46** is shown in FIGS. **6** and **7**. A plurality of clips, such as clips **46**, may be provided to secure the reinforcing member **32** adjacent the end closure **28**.

[0029] The clips **44**, **46** may include at least one axial retaining portion **48** and a grip portion **50**. As shown in FIGS. **5**A and **6**, the axial retaining portion **48** is adapted to prevent movement of the clip in the axial or longitudinal direction of the package. The axial retaining portion **48** may be adapted to engage a portion of the end closure **28**, such as the flange **36** as shown in FIGS. **5**A and **7**. Alternatively, the axial retaining portion **48** may be adapted to engage a feature on the end closure **28** such as a rib, protrusion, recess, aperture, or other feature (not shown). Alternately, the axial retaining portion **48** may be adapted to engage the can body **20**, such as to engage a rib, protrusion, recess, aperture, or other feature (not shown) provided on the can body **20**.

[0030] The grip portion **50** of the clip **44**, **46** may be adapted to engage at least a portion of the reinforcing member **32**. As shown in FIGS. **5** and **5**A, the grip portion **50** may be a cap-like structure that covers a portion of the reinforcing member **32**. The clip **44** may be molded as one piece adapted to snap over the reinforcing member **32** and end closure **28** for shipping. Alternatively, as shown in FIGS. **6** and **7**, the clip **46** may include a grip portion **50** adapted to engage a feature on the reinforcing member **32** such as a groove **52**. Alternatively, the grip portion **50** may be adapted to engage a rib, protrusion, recess, aperture, or other feature (not shown) on the reinforcing member **32**. Alternatively, the reinforcing member **32** may be formed integrally with the clip such as shown by exemplary clip **45** in FIG. **5**B. In this application, the clip **45** may have a plurality of ribs **32'** adapted to reinforce the end closure **28**, the ribs **32'** extending from the grip portion **50** to form contacting engagement with at least a portion of the exterior of the end closure **28**.

[0031] The can body **20** may be made of steel. The can body **20** may be coated with a corrosion inhibitor such as galvanized, aluminized, tin-plated, epoxy-coated, painted, or other coating well known in the art. For certain lighter applications, the can body may be aluminum or thermoplastic.

[0032] The end closure **28** may be made of steel. The end closure **28** may be coated with a corrosion inhibitor such as galvanized, aluminized, tin-plated, epoxy-coated, painted, or other coating well known in the art. For certain lighter applications, the end closure **28** may be made of aluminum, thermoplastic such as polypropylene, PET, polyethylene, ABS, polystyrene, polyethylene, or other thermoplastic material, or other material suited to close the closeable end of the can body **20**. In applications where the end closure and can body are thermoplastic, the end closure may be secured to the can body using ultrasonic welding, spin welding, adhesive, or other joining techniques for securing the end closure to the can body.

[0033] The disposable reinforcing member **32** may be made of particleboard, medium density fiberboard, oriented strand board, or chipboard. Alternatively, the disposable reinforcing member **32** may be made of wood plank, plywood, thermoset resin, thermoplastic, ceramic, or any material suited for reinforcing the end closure **28** from impact forces applied from within the package.

[0034] In some applications, the end closure **28** may include an easy-opening access **54** as shown in FIG. **8**, such as a score line defining an area in the end closure **28** adapted to tear away along the score line by pulling a pull tab **56**. As shown in FIGS. **9** and **10**, the underside surface of the disposable reinforcing member **32** may include a recess **58** corresponding to the pull tab **56** such that the reinforcing member **32** provides contact with at least a portion of the exterior

surface of the end closure **28** without interference with the pull tab. The depth of the recess **58** may be adapted such that the pull tab **56** contacts at least a portion of the inner surface of the recess **58**.

[0035] The present shipping package may further include outer packaging such as an overpack corrugated carton **60** as shown in FIG. **11**. The outer packaging may further include additional packaging materials between the outside surface **24** of the can body **20** and the overpack carton. Alternatively or additionally, the outer packaging may further include additional packaging materials between the disposable reinforcing member **32** and the overpack carton **60**. In one application, a cushioning member **62** may be provided between disposable reinforcing member **32** and the overpack carton. The cushioning member **62** may be made from at least one material selected from the group consisting of corrugated fiberboard, polystyrene foam, polyurethane foam, rubber, thermoplastic elastomer, and/or other cushioning material. In one exemplary and non-limiting example shown in FIG. **11**, the cushioning member **62** may extend at least along a portion of the can body **20** such as an end cap. It is contemplated that the size of the cushioning member **62** may be varied as desired for satisfactory shipping performance.

[0036] In one application, the shipping package contains stick electrodes **42** for welding. The reinforcing member **32** is useful in reducing shipping damage for packages of stick electrodes **42** as the longitudinal rod shape and density of electrode products tends to increase forces applied to the end closure during shipping.

[0037] The disposable reinforcing member **32** is adapted to reduce shipping damage as measured, for example, by International Safe Transit Association (ISTA) Test Procedure 3a. In one application, the present shipping package containing 50 pounds of stick electrodes for welding with outer packaging was tested using ISTA Test Procedure 3a, shock test blocks 3 and 9. The reinforcing member **32** provided support for the package to withstand the electrodes impacting against the end closure **28** with less than about 1/16 inch deflection of the end closure **28** measured adjacent the can rim, with no fracture of the score of the easy-opening access **54**, if present, or any un-rolling of the seam. To summarize, ISTA Test Procedure 3a includes 13 procedures called test blocks. As stated above, test blocks 3 and 9 are shock tests. Test block 3 includes nine drops specified in the ISTA Standard 3a. Test block 3 includes drops on three bottom edges from 12 inches, drops on two bottom corners from 12 inches, one side edge drop from 12 inches, one top edge drop from 12 inches, one drop on the bottom from 12 inches, and one drop on the bottom from 24 inches. Test block 9 includes eight drops specified in the ISTA Standard 3a. Test block 9 includes drops on two bottom edges from 12 inches, one top edge drop from 12 inches, a drop on one bottom corner from 12 inches, drops on two different top corners from 12 inches, one drop on the bottom from 12 inches onto a hazard, and one drop on a most critical or damage prone flat panel from 24 inches.

[0038] While the invention has been illustrated and described in detail in the foregoing drawings and description, the same is to be considered as illustrative and not restrictive in character, it being understood that only illustrative embodiments thereof have been shown and described and that all changes and modifications that come within the spirit of the invention are desired to be protected. Additional features of the invention will become apparent to those skilled in the art upon consideration of the description. Modifications may be made without departing from the spirit and scope of the invention.

What is claimed is:

1. A method of reinforcing an end closure for a shipping package comprising:

providing a can body having an interior volume and at least one closable end, closably engaging the closable end of the can body using an end closure having a recessed portion adapted to fit within a portion of the can body adjacent the closable end, and

securing a disposable reinforcing member corresponding to at least a portion of the recessed portion of the end closure adjacent to an exterior surface of the recessed portion.

2. The method of reinforcing an end closure according to claim **1**, where the step of securing a disposable reinforcing member further comprises:

providing less than about 1/16 inch deflection of the end closure measured adjacent the can rim when tested according to ISTA Test Procedure 3a, shock test blocks 3 and 9.

3. The method of reinforcing an end closure according to claim **1**, further comprising the step of:

removing the disposable reinforcing member after shipping to access the end closure.

4. The method of reinforcing an end closure according to claim **1**, where the step of securing a disposable reinforcing member further comprises

securing the reinforcing member using at least one selected from the group consisting of taping, banding, and strapping.

5. The method of reinforcing an end closure according to claim **1**, where the step of securing a disposable reinforcing member comprises

providing a reinforcing member made from at least one material selected from the group consisting of particleboard, medium density fiberboard, oriented strand board, chipboard, wood plank, plywood, thermoset resin, thermoplastic, and ceramic.

6. The method of reinforcing an end closure according to claim **1**, where the step of securing a disposable reinforcing member further comprises

using at least one clip adapted to secure the reinforcing member adjacent the end closure.

7. The method of reinforcing an end closure according to claim **1**, prior to the step of closably engaging the closable end, providing stick electrodes for welding into the shipping package.

* * * * *