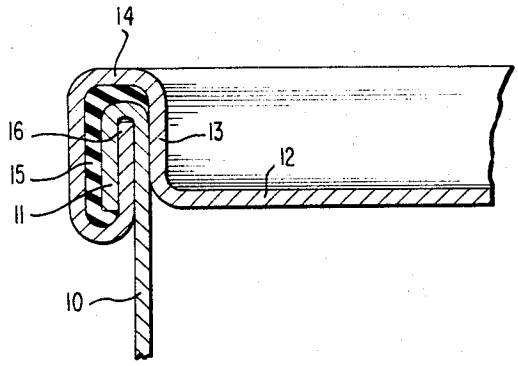
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END SEALANT FOR METAL CANS

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END SEALANT FOR METAL CANS

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ABSTRACT OF THE DISCLOSURE

A metal container or can made of sheet metal such as aluminum, and having end seams formed of interfolded layers, is sealed by bonding the seams with a layer of atactic amorphous polypropylene.

This invention relates to metal containers having end seams formed of interfolded layers sealed by means of a resinous polymeric sealant. More particularly, the invention concerns a metal can having an interfolded end seam sealed with amorphous polypropylene.

Metal containers or cans are conventionally made from sheet metal. The can body is usually tubular and may be closed by a side seam or may be seamless. The end seam of such a tubular can is generally formed by interfolding an outwardly extending flange on the can body with a peripheral flange on the end closure piece. A sealant, which may be rubber or a synthetic resin, is interfolded into the seam between the metal flanges to provide a gasket. The sealant or gasketing materials hitherto employed in beverage and food cans such as, for example, acrylonitrile or butyl or styrenebutadiene rubber, have not been entirely satisfactory in regard to odor, and have, moreover, tended to affect the taste of the can contents.

In accordance with the present invention, there is provided a metal container having end seams bonded with an improved sealant comprising an atactic amorphous polyolefin. The preferred polyolefin is atactic amorphous polypropylene. This material is available commercially under the designation Epolene D–10 (Eastman Chemical Company, Kingsport, Tenn.).

The sealant of the invention possesses the advantages of greatly diminished tendency toward imparting odor and taste to the canned goods, in comparison with known sealants. It also possesses resistance to low molecular weight alcohols, ketones, aldehydes, and ethers. As a sealant it has viscosity characteristics such that it provides a permanently tacky sealant between the can end and can body. It also possesses the requisite toughness and resiliency to resist rough handling of the cans during filling and subsequent shipment.

As herein employed and as understood by those skilled in the art, the term atactic amorphous polypropylene refers to polypropylene polymers which are composed predominantly of atactic macromolecules, i.e., of linear, regular head-to-tail molecules having substantially no branches longer than CH_3 in $CH_2=CH-CH_3$ and in which tertiary asymmetric carbon atoms having the same steric configuration are randomly distributed along the polymer chain. These polymers are of low molecular weight and provide excellent adhesives for bonding purposes. They are obtained by extraction of polymerized propylene, after polymerization, with hydrocarbon solvents, such as hexane or heptane, in which the atactic

amorphous propylene fractions are soluble. Thus, they differ from isotactic polypropylene polymers which are composed predominantly of crystalline material characterized by a regularity of molecular structure, i.e., in which the tertiary asymmetric carbon atoms of successive monomeric units have the same steric configuration.

The containers or cans within contemplation of the present invention are made of metals conventionally employed for this purpose, including particularly aluminum and tin plate.

The Epolene D–10 and opacifier titanium dioxide are dissolved in hexane at the rate of 40 to 45 percent solids by weight. This ensuing solution has a viscosity of 2000 to 2500 centipoises. The solution is then applied by a forced air spray into the flange of the formed but unseamed can end. The end is then allowed to air dry or may be force dried.

There may also be included in the amorphous polypropylene a suitable filler or opacifier, such as, for example, titanium dioxide, to impart color and opacity to the sealant, in an amount from about 2.0% to 5% by weight.

For a better understanding of the invention, reference is made to the accompanying drawing showing a presently preferred embodiment. In the drawing there is shown an enlarged sectional view of a metal can having a can end member applied to a can body flange. The can body **10** formed from a metal blank and end sealed into tubular shape has an outwardly flared peripheral portion at each end to form a can body flange **11**. The can end member **12** is fitted into the end of the can body **10** by means of wall **13** which extends over the edge of can body flange **11** via a peripheral flange **14** which extends around and under can body flange **11** to form a seam of interfolded layers **16** referred to in the art as a double seam. A layer of the sealant **15** of the invention is applied to the underside of the can end flange **14** prior to seaming so that when it is seamed it provides a hermetic seal.

It will be understood by those skilled in the art that the sealant of the invention can also be applied to the sealing of the side seams of metal can bodies which are made of interfolded metal layers with a deposit of sealant in between.

What is claimed is:

1. A metal can provided with seams, said seams being bonded with a layer of an atactic amorphous polyolefin.

2. A metal can provided with seams formed of interfolded layers, said seams being bonded with a layer of atactic amorphous polypropylene.

3. A metal can having an end seam structure comprising a peripheral outwardly and downwardly bent can body flange, an end closure flange bent outwardly, downwardly and upwardly around said can body flange to form an end seam, and a sealant comprising a layer of an atactic amorphous polyolefin disposed between said flanges for filling voids therebetween.

4. The can of claim **3** in which the polyolefin is propylene.

5. The can of claim **3** in which the metal of the can is aluminum.

6. The can of claim **3** in which the metal of the can is tin plate.

7. The can of claim **3** in which the polyolefin further includes from about 2% to about 5% by weight of a filler.

8. The can of claim 7 in which the filler is titanium dioxide.

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