May 30, 1961 C. R. BIERMAN ET AL 2,986,319

VENTING CONTAINER AND METHOD OF MAKING SAME

Filed Oct. 2, 1957

FIG. 1

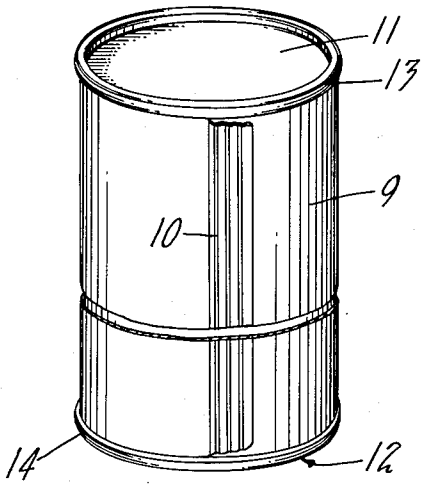


FIG. 3

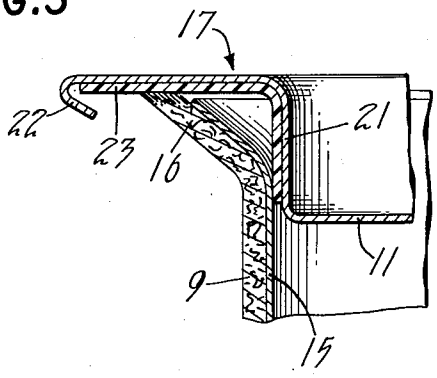


FIG. 2

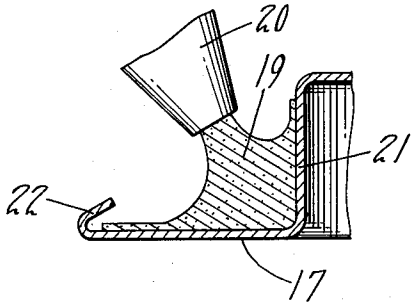


FIG. 5

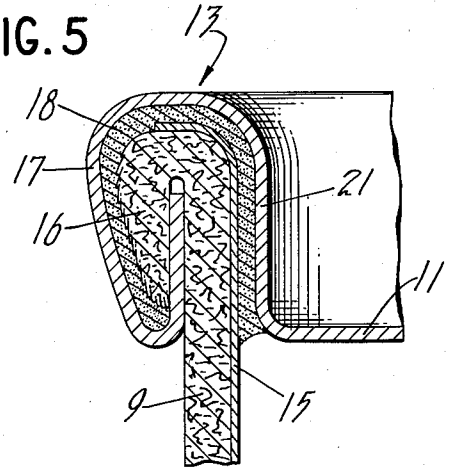
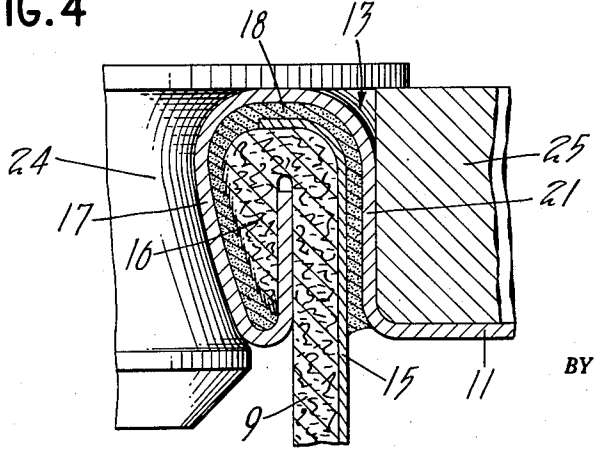


FIG. 4



INVENTORS
CLARENCE R. BIERMAN
LEHMAN E. HOAG
BY Charles H. Erne
Leland P. McCann
George W. Reiber
ATTORNEYS

United States Patent Office 2,986,319
Patented May 30, 1961

2,986,319

VENTING CONTAINER AND METHOD OF MAKING SAME

Clarence R. Bierman, Barrington, and Lehman E. Hoag, Cary, Ill., assignors to American Can Company, New York, N.Y., a corporation of New Jersey

Filed Oct. 2, 1957, Ser. No. 687,699

3 Claims. (Cl. 229—5.6)

The present invention pertains to a container particularly constructed to permit the release of pressure producing gases from inside a container and the method of making such a container. More particularly, the invention pertains to an end seam construction whereby pressure producing gases present within an otherwise hermetically sealed container may be vented through this end seam and to the method of making same.

For economy reasons, the body of many containers is made of a fibrous material, i.e. paper, having a moisture and gas proof interior coating to prevent attack and weakening of the fibre by the product. As a general rule, a metal-to-paper end seam formed by crimping a metal end onto a paper body is not hermetic. However, all or part of the interior coatings used on this type of container body are often sufficiently plastic or deformable to form, in effect, a sealing gasket in the seam thereby making the finished can hermetic.

With certain products, a hermetically sealed can is of no consequence and may even be desirable. With certain types of gas releasing products, however, the increase of internal pressure in a hermetically sealed container is detrimental not only to the container, which is not constructed to withstand such increased pressure, but also to the product packed therein.

A particular example of packed products wherein an increase of internal pressure in the package is undesirable is the packaging or canning of raw or uncooked biscuit dough. The raw biscuit dough, after packaging in the container, liberates carbon dioxide gas. At the same time, the raw dough expands or rises. If the envolved carbon dioxide and other gases present in the container are not vented, the increase of internal pressure restricts the desired expansion or rising of the biscuit dough causing it to be unmarketable; and may cause bursting of the container.

It is, therefore, an object of the instant invention to provide a container adapted to withstand a certain amount of internal pressure and at the same time to permit venting of pressure-producing gases from the interior thereof.

Another object is to provide a container wherein the gases generated by uncooked biscuit dough packed therein may be vented to permit rising of the dough.

Yet another object is to provide a venting container which is simple and easy to manufacture and assemble.

A further object is to provide a method for making a venting end seam for a container.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

The above and other objects of the present invention are obtained by providing at least one end seam of a container with a discontinuous lining between the body of the container, including any interior coating thereon, and the end attached thereto to provide leak passages through the seam. This construction is obtained by enclosing within the end seam of the container during its formation a brittle, frangible or friable lining compound which fractures or crumbles during the double seaming of the end onto the body.

Referring to the drawings:

Figure 1 is a side, elevational view in perspective of a finished container constructed according to the present invention;

Fig. 2 is an enlarged, schematic view showing the application of the lining compound to the can end;

Fig. 3 is an enlarged, sectional view with parts broken away showing joining of the can end carrying the frangible or friable lining compound to the can body;

Fig. 4 is an enlarged, sectional view with parts broken away showing the double seaming of the can end onto the can body;

Fig. 5 is an enlarged, sectional view with parts broken away of the finished end seam showing the placement and discontinuous nature of the lining.

As a preferred or exemplary embodiment of the present invention, Fig. 1 illustrates a can body **9** having a longitudinally extending lap side seam **10** and metal end closures **11, 12** joined to the can body **9** by means of end or double seams **13, 14**. The can body **9** illustrated is formed from a fibrous material such as paper, and has a wax-like, moisture and vapor proof interior coating **15** covering at least the entire length of the side seam **10**. If the wax-like interior coating covers only the inside of side seam **10**, the remainder of the inside of body **9** is covered by a moisture and vapor proof interior coating (not shown) such as aluminum foil. Although the preferred embodiment can body **9** is illustrated as being fibre, it should be understood that the present invention is adaptable to container bodies composed of other materials such as metal provided their interior is coated in whole or in part with a deformable or plastic coating capable of forming a hermetic seal in the end seam.

For the purpose of the following description, reference will be made only to the top end seam **13**. However, it is to be understood that the bottom seam **14** may have a venting construction identical with that of the upper end seam **13** or may be different as desired.

End seam **13** (Fig. 5) comprises an outwardly and downwardly extending flange **16** of the body **9**. Extending around and enclosing flange **16** is the flange **17** of the metal end **11**. Disposed between the outer surface of body flange **16**, including the coating **15**, and the inner surface of the end flange **17** is a lining material **18**. The lining material **18** prevents intimate or sealing contact between the coating **15** and end flange **17** and provides channels or leak passages through the end seam **13** communicating with the interior of the container. Any metal-to-paper contact in the remainder of the seam is of itself non-hermetic and can cause no hermetic seal. In this manner, although the end **11** is securely attached to the body **9**, one or more leak paths are provided between the interior of the container and the outside.

When raw biscuit dough is initially packed in a container having this construction, the dough occupies only the bottom portion of the container. Upon standing, the biscuits release carbon dioxide gas and begin to swell. When the pressure inside the container exceeds that of the atmosphere surrounding the container, the pressure producing gas travels up through space occupied by the lining material **18**, around the outer surface of the body flange **16** and vents into the atmosphere. In this manner, the pressure within the container remains substantially atmospheric and produces no resistance to the rising of the biscuit dough. When the dough has risen sufficiently to fill the entire volume of the container, a portion of the dough squeezes in, fills and seals off the interior entrance to the space filled by lining material **18**. The biscuit

dough is now in a marketable condition. The rigid construction of the container resists rupturing or bursting thereof upon further increase of internal pressure. However, to maintain the internal pressure at a minimum, these filled containers are kept under refrigeration.

Referring to the method of forming the venting container of the instant invention, a fluid lining material **19** is applied to the end flange **17** by any suitable means such as a nozzle **20** (Fig. 2). By virtue of its fluidity and the force with which it is ejected from the nozzle **20**, the lining material **19** flows upwardly along the vertical portion **21** of the flange **17** and outwardly toward the peripheral curl **22** of the flange **17**. Curl **22** must be kept free of the lining **19** so as to enable curl **22** to have firm engagement with the body flange **16** after double-seaming and thereby securely anchor the top end **11** to body **9**. After application, the fluid material **19** is dried by any suitable means such as air drying or exposure to heat, such as in an oven to form a solid, friable or brittle lining material **23** (Fig. 3).

To produce the desired brittleness or friability in the liner **23**, the lining composition contains a preponderence, i.e. over 90%, of filler material such as powdered, hydrated, aluminum silicate, known commercially as Buca clay. As a temporary binder for the filler particles and to enable the lining, after drying, to form a continuous solid film, the composition contains a small percentage of an elastomeric material, such as a styrene-acrylonitrile copolymer (Buna N) or a styrene-butadiene copolymer (GR–S). For ease of application, optional ingredients, such as thickeners and wetting agents, may be added to the composition.

After the container has been packed with a gas producing product such as raw biscuit dough, the end **11** is loosely positioned on the body **9** the peripheral edge of which has been turned outwardly to form the body flange **16**. The two members, i.e. end **11** and body **9**, are then tightly interengaged or interfolded, such as by double seaming between opposed seaming members, roller **24** and chuck **25** as best shown in Fig. 4. The tight interengagement of the body and end flanges rigidly attaches the end to the body and provides the strength necessary to resist displacement or blowing off of the end from the body due to any internal pressure generated in the container.

During the double seaming operation, the pressure exerted by the seaming members **24, 25** causes the liner **23** to fracture and become discontinuous at a plurality of places throughout the seam thereby providing the desired leak passages through the seam. Although the exact mechanism by which the discontinuous lining **18** performs its function is not known, tests have proved the instant invention to be 100% effective in providing a venting end seam.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts and that changes may be made in the steps of the method described and their order of accomplishment without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

We claim:

1. In a container comprising a tubular interiorly coated fibre body and a metal end closure attached to the top and bottom end of said body by means of a double seam, the improvement comprising a lining consisting essentially of an inert pulverulent material enclosed within at least one of said double seams and forming a layer in said seam between said closure and the wall of said body, said layer being in communication with the interior of said container and with the wall of said body whereby gas under pressure within said container is vented through said pulverulent material to outside of said container.

2. The container according to claim 1 wherein said lining is in one double seam only.

3. The container according to claim 1 wherein said lining is in the top double seam only.

References Cited in the file of this patent

UNITED STATES PATENTS

2,005,055	Sprague	June 18, 1935
2,164,055	Ellstrom	June 27, 1939
2,176,950	Aumont	Oct. 24, 1939
2,389,534	O'Brien	Nov. 24, 1945
2,455,737	Coyle	Dec. 7, 1948
2,633,095	Magill	Mar. 31, 1953
2,819,006	Magill	Jan. 7, 1958
2,855,884	Magill	Oct. 14, 1958