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3,423,009

STEEL FOIL BAND SIDE WALL SUPPORTS FOR FLEXIBLE CONTAINERS

Filed Sept. 14, 1966

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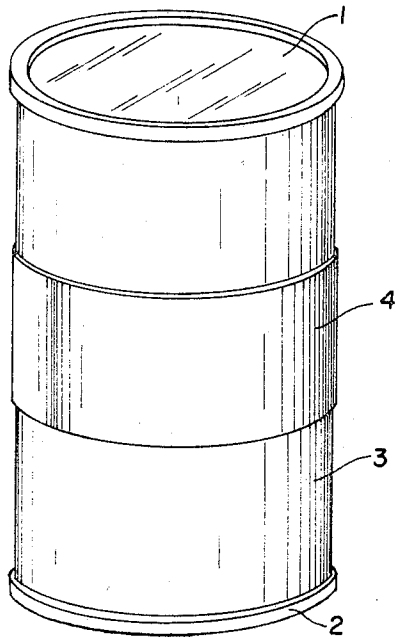


Fig. 2

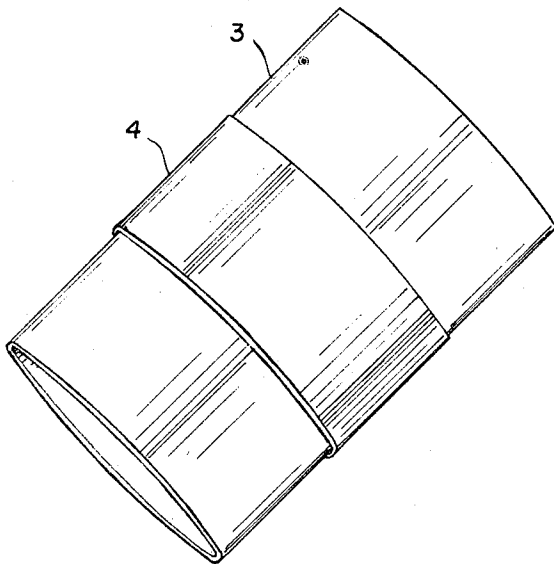
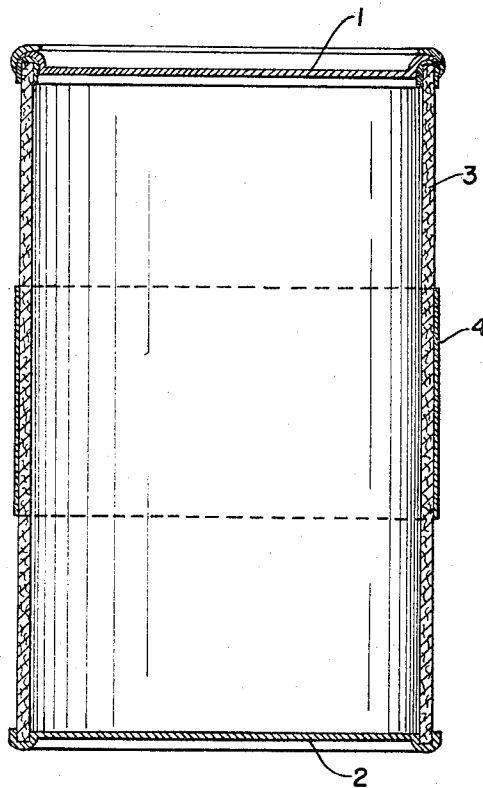


Fig. 1

Fig. 3



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Fig. 4

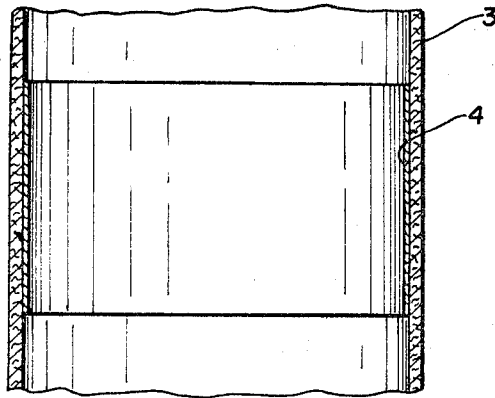
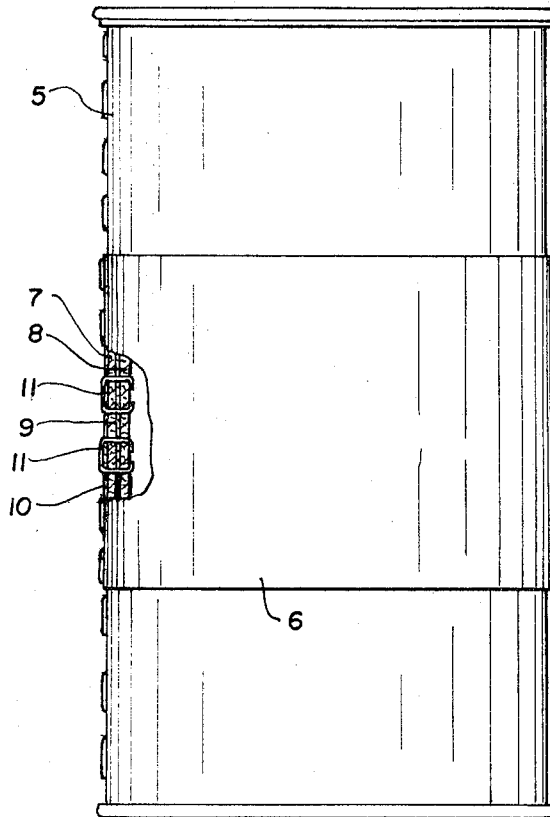


Fig. 5



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STEEL FOIL BAND SIDE WALL SUPPORTS FOR FLEXIBLE CONTAINERS

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ABSTRACT OF THE DISCLOSURE

Containers having relatively flexible side walls are provided with steel foil bands positioned about said side walls in wall-supporting relationship thereto. The side walls and steel foil bands are readily collapsible so that the containers may be stored in a flattened or folded condition.

This invention relates generally to containers constructed of relatively flexible materials and more particularly to the application of steel foil bands to the side walls of such containers so as to provide support thereto.

Relatively flexible containers constructed of paperboard, fiberboard, plastics, and the like have found widespread applications in the packaging art. Oftentimes such containers are not satisfactory however because, although otherwise suitable, they suffer from body wall sag and distortion when placed under heavy loads. Thus, for example, the walls of paperboard or fiberboard containers filled with roofing compound bulge and even split as the high density cold-flow roofing compound tends to settle during normal storage. In instances where the paperboard or fiberboard containers are joined at their seam by means of staples, the staples are caused to tear out and the container thereby split open. I have found that body wall sag and distortion can be eliminated from flexible wall containers by positioning one or more steel foil bands about the containers in a manner so as to provide girth support to the walls of the containers. I have also found that steel foil while strong enough to provide a high degree of support to the side walls of flexible containers can be quite readily folded and therefore steel foil bands may be incorporated into flexible body walls of containers when the body walls are in a flattened or folded condition as is the case for example when the body walls are stored or shipped prior to being filled and finally assembled.

I have, therefore, as an object of my invention the elimination of body wall sag and distortion of flexible wall containers, which results from the containers being placed under heavy loads.

Another object of my invention is to provide flexible wall containers with steel foil bands in a manner so as to support the side walls of the containers.

Still a further object of my invention is to use steel foil adhered to paperboard and fiberboard in the form of a band or bands for girth support.

Yet another object of my invention is to eliminate side wall staple tearout at the side wall seams of fiberboard containers.

A further object of my invention is to provide side walls for flexible containers which are in a flattened or folded condition and which have steel foil bands affixed thereto whereby the container walls are supported against sag and distortion when placed under heavy loads in an opened condition.

The use of steel foil bands in supporting the side walls of containers is preferred over other types of metal foil bands because the higher tensile strength and greater abrasion resistance of steel foil offers greater support to the side walls and reduces the likelihood of the bands being damaged.

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Steel foil of any gauge can be used in my invention, but I have found that steel foil of .001 to .004 inch thickness will have particular applicability thereto. Also, although the width of the steel foil bands employed will in large measure depend on the requirements of the particular application, a preferred size range is from about 1 inch to about 15 inches in width. Additionally, the steel foil which generally will be used will be "full hard" steel foil, that is, steel foil that has not been annealed after having been worked to gauge. For most applications as will be described hereinafter, the steel foil employed will be "as rolled" steel foil, that is, steel foil which has not undergone any cleaning.

The above brief description of my invention and statement of the objects of my invention will be more readily understood from the following description taken in connection with the accompanying drawing of embodiments of my invention presently preferred by me.

In the drawing, FIGURE 1 is a perspective view of the body wall of a flexible container in a flattened or folded condition having a steel foil band affixed thereto. FIGURE 2 is a perspective view of the container formed from the body wall of FIGURE 1. FIGURE 3 is a sectional view of the container through the line 3-3 of FIGURE 2 with the thickness of the steel foil and fiberboard enlarged for ease of illustration. FIGURE 4 is a fragmentary elevational sectional view of a flexible container having a steel foil girth-supporting band on the inside thereof. FIGURE 5 is a side elevational view of a flexible container with parts broken away to show the manner of attachment of a girth-supporting steel foil band thereto.

FIGURE 1 illustrates a flattened or folded fiberboard drum 3 prior to expansion of the drum into a material receiving condition and prior to the final assembly of the drum by affixing of the top and bottom of the drum. In order to eliminate body wall sag and distortion of the opened drum under heavy loads either from material within the drum itself or from the stacking of other drums or heavy material upon the drum, affixed to the drum about its circumference and at about its midpoint by means of an adhesive is a steel foil band 4 of .004 inch thickness and 15 inches width. The width of the band is less than the height of the drum so that the band is in contact with only a portion of the drum side wall. Because the high tensile strength of the steel foil prevents the opened drum from expanding under heavy loads, any tendency of the side wall of the drum to bulge or sag is eliminated. The folded drum after it is opened is filled and provided with a top 1 and bottom 2 in a conventional manner to produce the drum of FIGURE 2.

Thus, by providing flexible wall containers with steel foil bands in a manner as described, containers are constructed which have greater girth strength than similar containers having no such bands and yet the desirable feature which flexible body walls possess of being able to be shipped, stored or generally handled in a flattened condition is retained.

Instead of providing only one band on a container, as I have in my preferred embodiment, I can provide any number positioned in any manner. Thus, one skilled in the art cognizant of my disclosure of using one or more steel foil bands for preventing body wall sag or distortion of flexible wall containers, and further aware of my teaching of using steel foil generally but preferably of .001 to .004 inch thickness, and of using steel foil of various widths but preferably of about 1 inch to about 15 inch width could readily control the variables of the number of bands used, distance between adjacent bands, when more than one is used, as well as the width and thickness of the bands in a manner so as to provide flexible wall containers, having at least one steel foil band positioned

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about the container in wall supporting relationship thereto, not subject to body wall sag or distortion when placed under heavy loads.

I have found that steel foil bands can be applied to any type of flexible wall containers of any shape or size and provide the necessary support for preventing the side walls of the container from bulging. Thus, for example, the bands can be applied to fiberboard, paperboard, or plastic containers of cylindrical, oval, or rectangular configuration.

I have also found that the bands can be placed on the inside of the container as shown in FIGURE 4. When placed on the inside of the container, it will be necessary to use steel foil bands that have been cleaned in those instances where the material within the container would be contaminated by the residue material on unclean bands. Further, when using more than one band, some of the bands can be placed inside the container and some outside the container or when the walls of the container are formed from a number of sheets of material laminated together, the steel foil bands may be sandwiched between any of the sheets.

In securing the bands to the walls of the container, I prefer to use an adhesive as the bonding material. I can, however, secure the bands to the container by fastening the band to the container at the container seam as the seam is being formed. Thus, as shown in FIGURE 5, container 5 is closed along overlapping portions 7 and 8 by staples 11—11 and the staples are also used to fasten the band 6 along its overlapping portions 10 and 11 to the container. Similarly on a container which is joined at the seam by stitching, the band is stitched to the container at the container seam as the seam is being stitched.

Thus, it can be seen that I have provided an effective means for eliminating body wall sag and distortion of flexible wall containers.

I claim:

1. In combination with a container having relatively flexible side walls of non-metallic material means for providing girth support to said container comprising at least one steel foil band positioned about the side walls of the container in wall-supporting relationship thereto, the width of said means for providing girth support being less

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than the height of the container side walls so that said means for providing girth support contacts only a portion of the side walls, said side walls and means for providing girth support being readily collapsible so that said container may be stored in a flattened or folded condition.

2. The combination of claim 1 wherein the band is positioned on the outside of the container.

3. The combination of claim 1 wherein the band is positioned on the inside of the container.

4. The combination of claim 1 wherein the band is from about .001 to about .004 inch thick.

5. The combination of claim 1 wherein the band is from about 1 inch to about 15 inches wide.

6. The combination of claim 1 wherein the band is formed of full hard steel foil.

7. The combination of claim 1 wherein the container sidewall is fiberboard.

8. The combination of claim 1 wherein the container sidewall is fiberboard and the band is formed from full hard steel foil.

9. The combination of claim 1 wherein the container sidewall is fiberboard, the band is formed from full hard steel foil of about .001 to about .004 inch thickness and wherein the band is from about 1 inch to about 15 inches wide.

10. The combination of claim 1 wherein said container has a side seam, and the means for providing girth support is secured to the container at that seam by means of the same instrumentality which joins the container thereat.

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