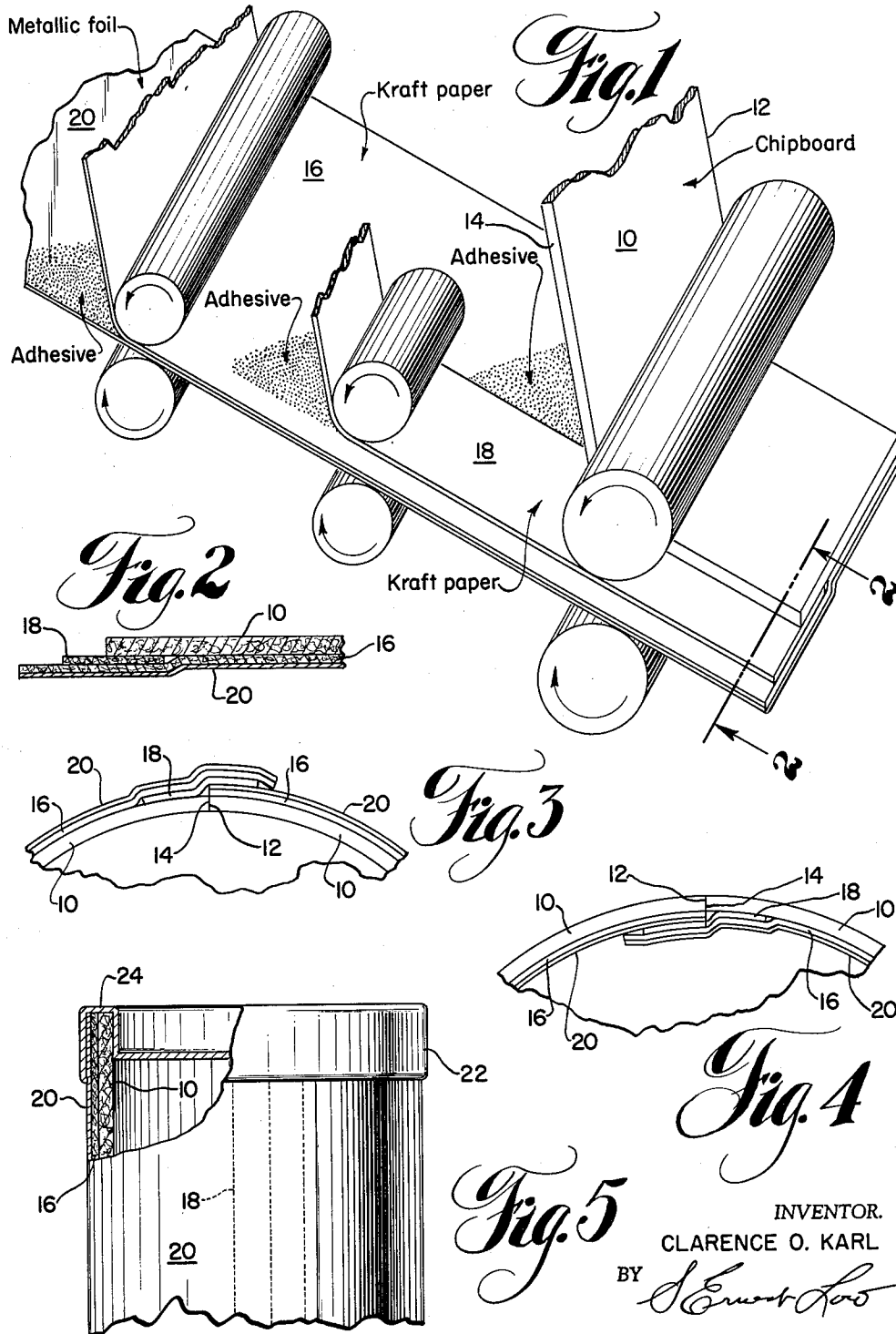


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CONTAINER STRUCTURES
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CONTAINER STRUCTURES

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This invention relates in general to containers or cans fabricated or constituted, at least in major part, from cellulose fibrous web body stock or similar materials. The invention is more specifically addressed to container or can bodies incorporating a reinforced butt seam joint between marginal edges of a relatively inexpensive fibrous base sheet of web body material.

The fibrous container art has been plagued with a serious problem in attaching the normally employed rigid and semi-rigid end closures to tubular fibrous container bodies as a result of the inherent tendency of such flexible bodies to spring out of their intended cross-sectional shape at the time they are discharged from the usual interior supporting mechanism, such as a mandrel or horn, over which the tubular bodies have been shaped and adhesively seamed.

The problem and the number of rejects of containers attributable thereto are a function of the "life" or springiness of the fibrous web material or body stock constituting the base sheet of the container body. This is manifest by the exhibited tendency of the web base sheet to resist permanent deformation. This inherent tendency or inclination of the container bodies to spring out of their intended cross-sectional shape is most noticeable in the area where the edges of the base sheet of fibrous material are joined and particularly so when the edges are maintained in butting relationship, as distinguished from overlapping lap seam jointure of the edges of the fibrous base sheet. When the marginal edges of the fibrous base sheet are butted to form a butt seam in a container body, the joint thus formed is generally secured by means of an adhered layer of relatively thin flexible material having a marginal portion adjacent at least one of its own edges overlying the joint between the butted edges of the base sheet. This overlying or overlapping layer is frequently the only means for securing the butted edges of the base sheet together. Since this overlapping layer generally constitutes either the outer layer of the container, where its function is primarily one of appearance, or the inner layer, where its function affords moisture-proofing, corrosion resistance properties, and the like, it may comprise appropriately prepared kraft paper, metallic foils, or organic film materials, such as cellophane or polyethylene, or equivalent flexible materials. All of these materials, while they may have good appearance, resistance to moisture and corrosion, and high tensile strength and other desirable mechanical properties, are still relatively flexible, particularly when used in relatively thin gauges, as dictated by manufacturing economics. Because of its flexibility, the butt joint overlapping layer has difficulty in counteracting the tendency of the base sheet to spring out of shape at the butted joints in tubular container bodies.

Therefore, a primary object of the invention is the provision of tubular containers or can bodies made from relatively inexpensive cellulose fibrous natural or synthetic materials, exhibiting a relatively high degree of springiness or tendency to fight permanent deformation, incorporating one or more butt seams in their fabrication and laminated to one or more thin, flexible covering layers, which container structures maintain their intended cross-sectional shape after fabrication.

Another object of the invention is the provision of a

tubular container or can body made from a base sheet of relatively inexpensive chip board, which is longitudinally bent into substantially circular configuration with its edges in butting relationship, covered with a layer or lamina of relatively thin flexible sheet material, a portion of which overlies the butted edges of the chip board and which container maintains its cross-sectional configuration after fabrication.

It has been discovered that containers characterized by having satisfactory permanent cross-sectional shape or configuration may be constructed from inexpensive base sheet of cellulose fibrous material with butted edges laminated to a thin gauge, flexible, relatively inexpensive overlapping layer by the addition of one or more strips of reinforcing material interposed between the overlapping layer and base sheet on one side of the butting edges and extending into overlapping relationship with the surface of the laminated stock on the other side of the butting edges of the container, while positioned so as to be non-exposed in the finished container structure. The reinforcing strip, or strips in the case of a laminated reinforcing strip, need be of only such width as to cover a relatively narrow marginal area or portion on either side of the butted edges of the base material. Furthermore, because the reinforcing strip member is invisible in the finished product it can be made of less expensive material than the overlapping layer, if said overlapping layer is intended to be the outer exposed or visible surface of the container. On the other hand, if the overlapping layer is intended to constitute the inner surface of the container and is selected from a flexible material which is impervious to liquids, resistant to corrosion, or exhibits some other desirable property in terms of the contents of the container, which materials would, generally speaking, be more expensive than those not having these properties, it would still not be necessary to make the reinforcing strip of the same expensive material, since it still would be concealed and not be exposed to the contents of the container.

Regardless of the location of the reinforcing strip, it has been found that its disposition along the butting edges of the seam in the tubular container body imparts rigidity and stiffness to the butt joint in a transverse direction across the joint, as well as in the axial direction of the joint. Furthermore, the presence of the reinforcing strip permits a reduction in the gauge of the remaining laminae employed in fabricating the container bodies.

The above and other features and advantages of the invention, including various novel details of construction and combinations of parts, will now be more particularly described with reference to the accompanying drawings, and pointed out in the appended claims.

In the drawings:

FIG. 1 somewhat schematically portrays, in perspective view, the formation by lamination of a composite unitary flexible web stock employable in a preferred embodiment and practice of the invention;

FIG. 2 represents a fragmentary sectional view of the composite web stock taken on the line 2-2 of FIG. 1;

FIG. 3 illustrates a fragmentary exaggerated end view of a tubular container or can body, incorporating the preferred butt seam joint of the invention, with the overlap at the joint disposed on the outer surface of the container body;

FIG. 4 is a view similar to FIG. 3 with the overlap at the joint disposed on the inner surface of the container body; and

FIG. 5 shows a fragmentary external view of a completed container, with parts broken away in section to more clearly illustrate an attached end cover.

Referring to the illustrations appended hereto, and gen-

erally described above, the composite web stock, from which tubular container bodies of the invention may be fabricated, preferably comprises a continuous base sheet 10 of fibrous material, such as chip board, recognized as a relatively inexpensive flexible material having noticeable springiness or inclination to resist permanent deformation. Since, in the preferred practice of the invention, a container or can body will be formed by curling or bending the base sheet 10 about an axis parallel to its edges 12 and 14, with said edges disposed in abutting relationship, the distance between these edges, i.e. the width of base sheet 10, will be selected in accordance with the approximate desired girth of the container. It will be understood, in this connection, that the container body may be of any desirable tubular cross-sectional shape, not necessarily circular, and may also incorporate more than one butt seam in its construction, in which latter case two or more widths of the base sheet 10 would be employed with butt joint construction between abutting edges thereof.

At least one sheet or lamina 16 of flexible material is adhesively secured to a major planar surface area of the base sheet 10 and purposely extended beyond one marginal edge 14 thereof. The sheet 16 may be selected from a wide variety of commercially available materials, such as calendered kraft paper, metallic foils and organic film materials, such as continuous film layers of cellophane and polyethylene and the like. The materials mentioned for the lamina 16 are merely representative and not expressive of limiting the scope of the invention, any material in flexible sheet or lamina form exhibiting sufficient tensile strength and gauge thickness for the purpose intended being satisfactory.

A significant feature of the invention lies in the provision of a stiffening and reinforcing strip or tape 18 between the base sheet 10 and the lamina or layer 16 applied adjacent the marginal edge 14 of the base sheet 10, shown to best advantage in FIGS. 1 and 2. The reinforcing strip 18 may be selected of the same material as the sheet or lamina 16 and is adhesively attached to both the base sheet 10 and lamina 16. It will be observed that the outwardly extending marginal edge of the reinforcing strip 18 preferably falls or lies between the outwardly extending marginal edge of the sheet 16 and marginal edge 14 of the base sheet 10, the other marginal edge of strip 18 preferably extending inwardly beyond the edge 14 a distance equal to approximately half the width of the strip 18, thus providing an overhanging or outwardly extending marginal edge portion of the lamina 16.

In the preferred practice of the invention, a second lamina or layer 20, coextensive with and adhesively attached to the outwardly disposed area of the major planar surface of the sheet 16, is employed. Where kraft paper has been selected for the sheet 16, the exposed sheet or lamina 20 is preferably selected in the form of a metallic foil, such as aluminum foil.

On reference to FIGS. 3 and 4, it will be observed that the butting marginal edges 12--14 of the base sheet 10 are secured by means of the marginally extending layers or lamina 16 and 20 and reinforcing strip 18 in overlapping relationship in respect to the outer layer 20 on the opposite side of the butt seam joint in the container bodies illustrated therein. The only difference between FIGS. 3 and 4 lies in the relative position of the layers 16 and 20, and reinforcing strip 18, in respect to the interior or exterior of the can bodies illustrated therein. Otherwise, it is to be observed that the reinforcing strip 18 is completely enclosed beneath the outwardly extending overhanging marginal edge portions of the layers 16 and 20 to completely seal and conceal the reinforcing strip 18 over the entire length of the joint. Any suitable commercial adhesive may be employed to secure the overlapping contacting surfaces between the exposed liner 20 and overlying reinforcing strip 18 in completing the butt seam joints in the tubular

container bodies (FIGS. 3 and 4), a heat-meltable or thermoplastic type adhesive cement having been found commercially satisfactory for this purpose.

Preformed fibrous or metal end closures 22, preferably of the drop center variety and having an inverted channel-shaped body-engaging perimetrical flange 24, have been employed successfully with tubular container bodies fabricated in accordance with the invention, the end closures being crimped into engagement with the walls of the container body, with or without the application of an adhesive cement between the contacting surfaces of the inverted channel-shaped flange 24 and end wall of the container body enclosed within the same.

In respect to adhesives useful in fabricating the composite flexible web stock of FIGS. 1 and 2 of the invention, it has been discovered that any one or several commercially available adhesives, including casein, asphaltum, animal and vegetable type room temperature setting glues, as well as thermally activated and melttable type adhesives, may be employed. Similar adhesives may be employed in the butt seam of the tubular container body, and if desired, as a supplementary precaution in securing the end closures on their complementary tubular container or can bodies.

Exemplary of the practice and container structures of the invention, a commercially successful fibrous container, for packaging a well known brand of household cleaning powder, is being regularly fabricated from a base sheet 10 of 30 point chip board, lamina 16 of 60 pound natural kraft paper, reinforcing strip 18 of the same grade and weight of kraft paper, and an outer aluminum foil layer 20 of 0.00035 inch gauge thickness.

Having thus described the preferred essential features and manner of practicing the invention, what is requested is that Letters Patent be granted on the novel inventions hereinafter defined, as follows.

I claim:

1. A tubular container body formed from fibrous body sheet bent to desired cross-sectional shape and incorporating a butt seam joint between adjacently disposed marginal edges of the body sheet, said body sheet being characterized by springiness against permanent deformation and being provided with a layer of thin flexible material laminated to a major surface area of the body sheet on either side of the joint, a reinforcing strip interposed between the body sheet and surface of the laminating layer facing the same along one marginal edge of the joint and extending into overlapping relationship in respect to the opposite surface of the laminating layer on the opposite side of the joint, and said reinforcing strip being adhesively secured on both sides of the butt seam joint.

2. A tubular container body formed from fibrous body sheet bent to desired cross-sectional shape and incorporating a butt seam joint between adjacently disposed marginal edges of the body sheet, said body sheet being characterized by springiness against permanent deformation and being provided with a layer of thin flexible material laminated to the same major surface area of the body sheet on either side of the joint, a reinforcing strip interposed between the body sheet and surface of the laminating layer facing the same along one marginal edge of the joint and extending across the joint into overlapping relationship in respect to the opposite surface of the laminating layer on the opposite side of the joint, said overlapping laminating layer extending beyond the extending marginal edge of the reinforcing strip and contacting the underlying laminating layer beyond the extending marginal edge of the reinforcing strip on the opposite side of the joint to thereby completely conceal the reinforcing strip over the entire length of the joint, and said laminating layers and reinforcing strip being adhesively secured in respect to each other and the body sheet.

3. A tubular container body formed from fibrous body sheet characterized by springiness against permanent deformation and bent to incorporate a butt seam joint be-

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tween adjacently disposed marginal edges of the body sheet exhibiting a tendency to spring open at the butt seam joint, a thin flexible layer laminated to major surface areas of the body sheet on either side of the joint, a reinforcing strip interposed and adhesively secured between the surfaces of the laminating layer and body sheet facing each other on one side of the joint and extending into overlying relationship with the opposite surface of the laminating layer on the opposite side of the joint to which it is adhesively secured, and said laminating layer overlying the reinforcing strip extending beyond the marginal edge thereof and across the joint into adhesive attachment to the laminating layer underlying the reinforcing strip.

4. A tubular container body formed from fibrous body sheet formed by bending to desired cross-sectional shape and incorporating at least one butt seam joint between abutting gauge thickness marginal edges of the body sheet, said body sheet being characterized by springiness and inherent tendency to spring open at the butt seam joint, a thin flexible sheet of kraft paper laminated to the body sheet over major surface areas thereof on either side of the joint, said laminating kraft paper sheet extending outwardly beyond the marginal abutting edge of the body sheet incorporated in the joint on one side thereof and coincident with the marginal abutting edge of the body sheet in the joint on the opposite side thereof, a narrow reinforcing strip of kraft paper interposed between the body sheet and laminating kraft paper sheet and spanning the abutting marginal edges of the body sheet in the joint, said reinforcing strip of kraft paper being interposed between the surfaces of the laminating kraft paper sheet and body sheet facing each other on that side of the joint where the laminating kraft paper is extended outwardly beyond the marginal edge of the body sheet in the joint, and otherwise overlapping the opposite surface of the laminating kraft paper on the opposite side of the joint, said reinforcing strip of kraft paper being adhesively secured over its coextensive surfaces in contact with the body sheet and laminating kraft paper sheet, and said laminating kraft paper sheet in its outwardly extending marginal edge area being dimensionally selected to completely conceal the reinforcing strip of kraft paper over the entire length of the joint.

5. A tubular container body formed from fibrous body sheet formed by bending to desired cross-sectional shape

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and incorporating at least one butt seam joint between abutting gauge thickness marginal edges of the body sheet, said body sheet being characterized by springiness and inherent tendency to spring open at the butt seam joint, a thin flexible sheet of kraft paper laminated to the body sheet over major surface areas thereof on either side of the joint, said laminating kraft paper sheet extending outwardly beyond the marginal abutting edge of the body sheet incorporated in the joint on one side thereof and coincident with marginal abutting edge of the body sheet in the joint on the opposite side thereof, a layer of thin flexible metallic foil coextensive with and adhesively attached to the surface of the laminating kraft paper sheet remote from the body sheet, a narrow reinforcing strip of kraft paper interposed between the body sheet and laminating kraft paper sheet and spanning the abutting marginal edges of the body sheet in the joint, said reinforcing strip of kraft paper being interposed between the surfaces of the laminating kraft paper sheet and body sheet facing each other on that side of the joint where the laminating kraft paper is extended outwardly beyond the marginal edge of the body sheet in the joint and otherwise overlapping the metallic foil layer on the opposite side of the joint, said reinforcing strip of kraft paper being adhesively secured over its coextensive facing surfaces in contact with the body sheet and laminating kraft paper sheet, and said laminating kraft paper sheet and metallic foil layer in their coextensive outwardly extending marginal edge areas being dimensionally selected to completely conceal the reinforcing strip of kraft paper in unitary adhesive securement over the entire length of the joint.

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