

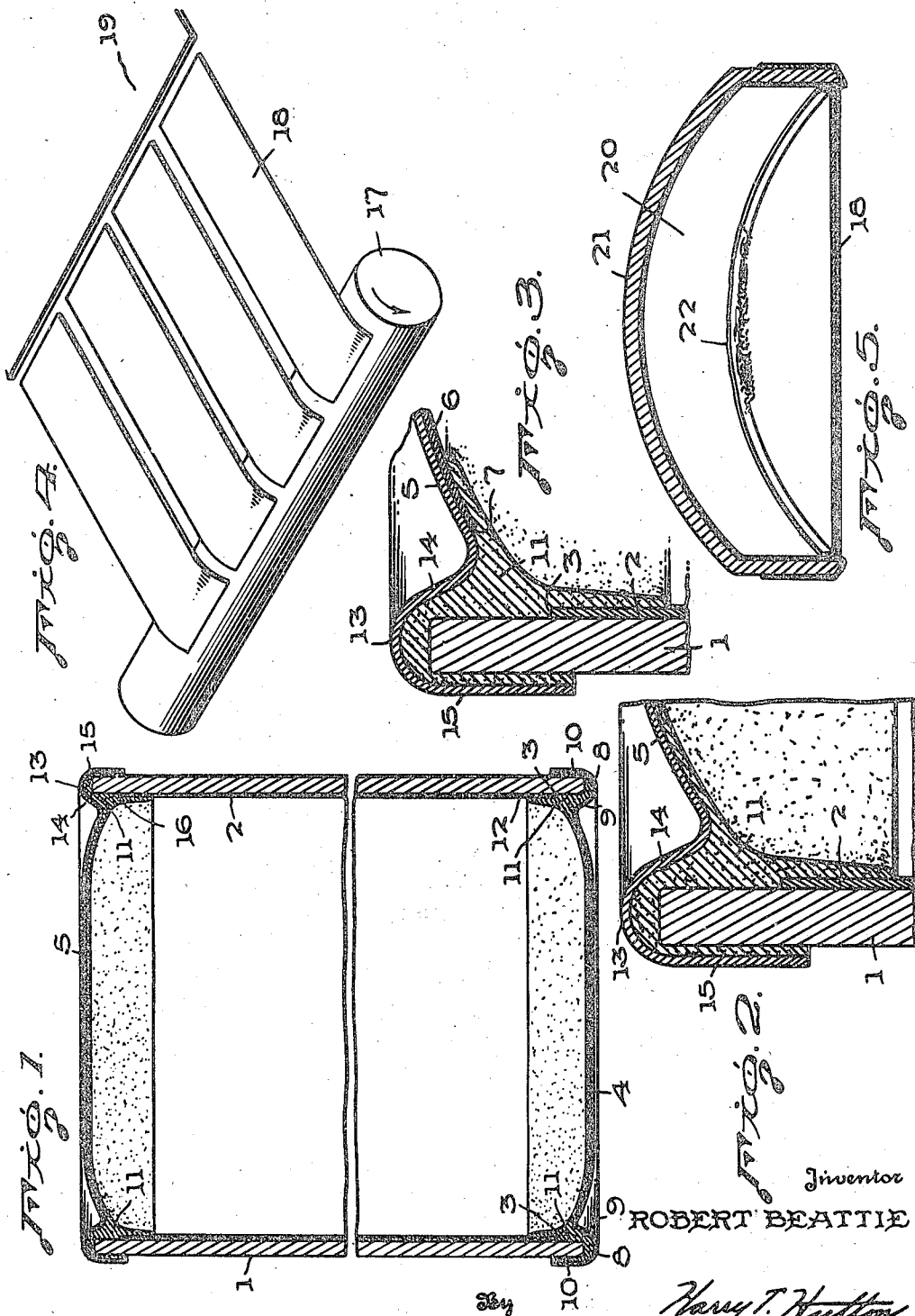
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CONTAINER

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CONTAINER

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This invention relates to improvements in the container art and is more particularly concerned with the provision of so-called proofed containers for use in storing and transporting liquids such as lubricating oils and the like. In its more specific aspects, it is concerned with the production of a new and improved non-metallic "unit" container for lubricating oils, which is proofed by inner linings to prevent leakage or seepage of the container oil through the side walls and top and bottom caps of the container as well as through the closure joints between the side walls and caps.

Proofed containers of this general type are not, of course, new, and it has been the custom and practice in the art for at least sixty years to proof the side walls and top and bottom caps of small containers of this sort by applying to the inner or outer surfaces thereof, or both, a coating of paraffin, pitch, or the like. Such containers are still in use today. The really serious disadvantage attending containers proofed in this manner is the fact that these coatings are not always of sufficient resiliency to obviate cracking thereof under conditions of stress and strain. Should cracks of any size develop in the coating, the oil or other liquid material in the container will leak or seep through the cracks.

It is not new, furthermore, to proof containers of the foregoing character by providing on the inner walls, and on the inner surfaces of the top and bottom caps, sheet lining material such as parchment, Cellophane, proofed paper, etc. So far as is known, however, the containers of the prior art, probably because of expediency in production methods, are usually constructed with the liner running the entire length from top to bottom of the tubular body portion or covering the entire under surfaces of the caps.

It has been found, in accordance with the present invention, that these full length liners running to the very edges of the tubular body portion or covering the entire under surface of the caps have one serious disadvantage. When the filled container, sealed at top and bottom with appropriate caps, is accidentally dropped on a surface such as concrete flooring, the edges of the container hit the floor with considerable force, the greatest distortion occurring at the juncture between cap and body. This usually results in the tearing away or shattering of that portion of the inner liners near the ends of the container or the parting or pulling away of the sealing compound from the liner in that area. This, of course, breaks the seal in the area affected and permits

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leakage or seepage of the oil or other liquid through the damaged portion.

It is a prime object of the present invention to provide a non-metallic unit container of conventional size and design, having its inner surfaces, i. e., tubular body portion and/or bottom and top caps, lined with a proofing sheet liner which will be able to withstand shocks occasioned by dropping of the container on the floor.

In order that the invention may be more readily understood, reference is had to the accompanying drawings, in which like reference numerals indicate like parts, and in which—

Fig. 1 is a vertical section of the lined container of the invention;

Fig. 2 is a fragmental enlarged section of the end structure;

Fig. 3 is a fragmental enlarged section of a modified end structure;

Fig. 4 is a perspective view depicting more or less diagrammatically one method of manufacturing the lined container; and

Fig. 5 is a fragmental perspective view in section showing damage and breakage occurring in prior art containers with full length liners.

The container body 1 is substantially tubular in form and is made up of any convenient non-metallic material, preferably rigid or at least semi-rigid in character, such as heavy cardboard, pulp board, so-called chip board, and the like. This body portion 1 may be unitary or it may be laminated, as will be readily understood by those skilled in the art. To the inner surfaces of this tubular body portion there is affixed a proofing liner 2 which is relatively non-elastic and which may be either Cellophane, parchment paper, or proofed paper. The liner is caused to adhere securely to the surfaces by employing a convenient adhesive which, when dry, leaves a resilient, flexible coating or film capable of absorbing shock. Animal glue is preferred, although other adhesives may be used as long as they exhibit the foregoing characteristics. Solutions of synthetic resins, such as vinyl resins, have been employed for this purpose. The adhesive used may be of proofing character.

The significant feature of this inner proofing lining, according to the present invention, is that it does not extend all the way from the top to the bottom of the inner surfaces of the tube, as shown very clearly in Figs. 1 and 2, but is discontinued, so to speak, at points 3 somewhat removed therefrom.

It is also within the contemplation of the pres-

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ent invention, as illustrated in Fig. 3, to provide both bottom cap 4 and top cap 5 with linings of the foregoing character, which do not extend outwardly as far as the tubular walls of the container, i. e., the outer peripheral edges of the circular cap liners are removed a suitable distance from the container walls. Thus, liner 6 for upper cap 5 is shown in Fig. 3 as extending only to a point 7 on the under surface of the cap.

In making up the container, the inner surfaces of the side walls are first lined as described above. Then, the bottom cap 4 of the design shown in Figs. 1 and 2 is affixed to the under edges of the body portion, in a manner described below. It will be noted that in the embodiments illustrated bottom cap 4 contains an annular well portion 8 formed by side portions 9 and 10. This annular well portion, before the bottom cap 4 is affixed to the body portion, is filled with adhesive sealing compound which may be thermoplastic animal glue or other suitable adhesive. Unlined caps may be coated over their entire inner surface with the adhesive. As to caps carrying the liner, the adhesive is extended only far enough toward the center of the cap as to overlap the edge of said liner, as clearly shown in Fig. 3. The lower end of the lined tubular body portion is inserted into the well 8 of the cap to affix the cap in sealing position. In pressing the container side walls into the well 8 in sealing on the cap, the glue 11 is allowed to flow over the lined inner walls of the container to a point 12 well above the lower edge 3 of the proofing liner. When using a thermoplastic sealing compound, the sealing operation may be performed by application of heat to the cap with aid of a hot die, which facilitates this flow of adhesive and forms a fillet of adhesive as shown in Figs. 1 to 3.

The top cap 5 may be affixed to the container after filling with lubricating oil and the like in the same manner in which the bottom cap 4 is fitted. In other words, the top cap 5, with its well 13 formed by side portions 14 and 15, is coated with glue in the foregoing manner and is fitted down and over the top edges of the body portion to provide for the flowing of the glue down and over the upper edge 16 of the proofing liner 2.

In some instances, it is advantageous to precoat the ends of the body portion of the containers with adhesive prior to affixing the caps thereto. In such cases, the raw edge of the body portion and the inner walls thereof are coated with glue to a distance such that the glue overlaps the edge of the liner.

Fig. 4 shows in a somewhat diagrammatic fashion a procedure well adapted for the production of proofed containers of the present invention where convolute windings are employed. There is provided a mandrel 17 upon which are wound spaced strips 18 of the proofing material such as Cellophane coated on its upper side with adhesive. After the mandrel is rotated a little more than 360° in a counter-clockwise direction, as shown in Fig. 4, the inner liner will have been formed on the mandrel. There will then be wound on the mandrel, and over the proofing liners 18, a desired thickness of cardboard or chip-board 19 to form the body portion of the container. The resulting laminated tubular form is cut midway between the liner strips 18 and the resulting lined cylinders are then removed from the mandrel. Thus, it will be observed, there will be produced individual tubular elements having inner proofing liners which do not reach entirely to the top or bottom of the tube.

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In Fig. 5 there is shown a typical construction of the prior art which is susceptible to damage through dropping of the filled container on the floor. Prior art containers of this character, as pointed out, have their inner proofing liner 20 running clear to the top and bottom of the tubular body portion 21. When the filled container strikes a surface, it usually falls so that considerable pressure is applied to the cap portion at the periphery thereof, causing a hinging movement at the juncture between cap and body portion, and the liner is shattered and torn as shown at 22. When so torn, the oil or other contained liquid will, in time, find its way through the walls of the container to the outside thereof.

With the construction of the present invention, however, this tendency of the liner to tear or pull away upon dropping of the container is either completely obviated or greatly minimized. The edges of the liners are well removed from the corners of the container where the greatest strain occurs, and are embedded in a bead of resilient proofing adhesive which with the relatively resilient chipboard or other body material to which it remains adhered will absorb all of the shock and leave the liners substantially undamaged and the seal unbroken.

The distance from the edge of the container body wall to the liner edge may vary according to requirements. However, in most instances, a distance of about $\frac{1}{8}$ inch to $\frac{1}{4}$ inch minimum will be sufficient.

I claim:

1. A unit container for lubricating oils and the like proofed to prevent seepage or leakage, comprising a non-metallic, deformable, substantially tubular body portion, a lining of separate, preformed sheet proofing material substantially completely covering the interior surfaces of said tubular body portion but extending to a point appreciably removed from either end thereof, a resilient and flexible film of adhesive material extending from the ends of the body portion over the unlined surfaces and to a point beyond the lateral extremities of said lining, and flanged, deformable top and bottom caps fitted over the ends of the body portion, the surfaces of the caps being appreciably removed from the edges of said lining so that, in the event of shock from accidental dropping, the surfaces of the cap, the film of adhesive material and the unlined body portion absorb the shock before it reaches the lining.

2. A unit container for lubricating oils and the like proofed to prevent seepage or leakage, comprising a non-metallic, deformable, substantially tubular body portion, a lining of separate, preformed sheet proofing material substantially completely covering the interior surfaces of said tubular body portion but extending to a point appreciably removed from either end thereof, a resilient and flexible film of adhesive material extending from the ends of the body portion over the unlined surfaces and to a point beyond the lateral extremities of said lining, flanged, deformable, circular top and bottom caps fitted on the ends of the body portion, the surfaces of the caps being appreciably removed from the edges of said lining, circular proofing linings adhesively affixed to the interior surfaces of said caps and having diameters such that the peripheries of the liners do not extend to the corners of the container, and a resilient and flexible film of adhesive material extending over the surfaces of the cap linings and over the unlined surfaces of the cap to the corners of the container, the foregoing construction

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being such that the surfaces of the cap, the films of adhesive material and the unlined body and cap portion all cooperate to absorb shock before it reaches said body and cap linings.

3. A unit container for lubricating oils and the like proofed to prevent seepage or leakage, comprising a non-metallic, deformable, substantially tubular body portion, a lining of separate, pre-formed sheet proofing material substantially completely covering the interior surfaces of said tubular body portion but extending to a point appreciably removed from either end thereof, a resilient and flexible film of adhesive material extending from the ends of the body portion over the unlined surfaces and to a point beyond the lateral extremities of said lining, flanged, deformable, circular top and bottom caps over the ends of the body portion each having a formed circular well near the periphery of the caps to receive the ends of the body portion, the surfaces of the caps being appreciably removed from the edges of said lining, circular proofing linings adhesively affixed to the interior surfaces of said caps and having diameters such that the periph-

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eries of the liners do not extend to the corners of the container, and a resilient and flexible film of adhesive material extending over the surfaces of the cap linings and over the unlined surfaces of the cap to the corners of the container, the foregoing construction being such that the surfaces of the cap, the films of adhesive material and the unlined body and cap portion all cooperate to absorb shock before it reaches said body and cap linings.

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