Aug. 22, 1944. A. G. HATCH 2,356,401

MOTOR OIL CONTAINER

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Fig. 1

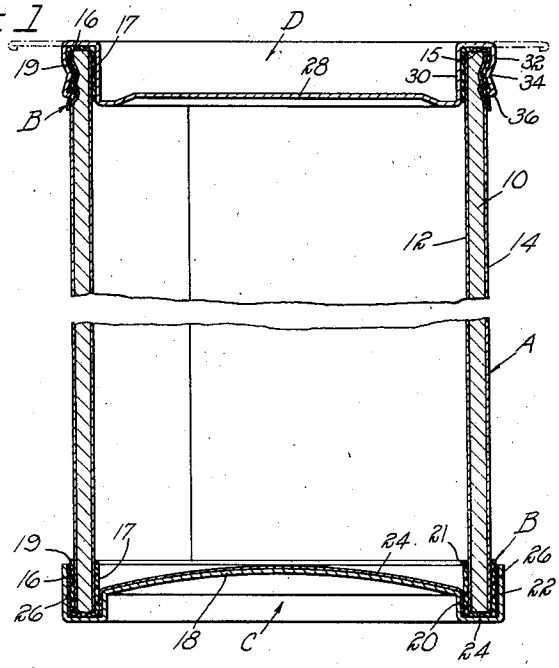


Fig. 2

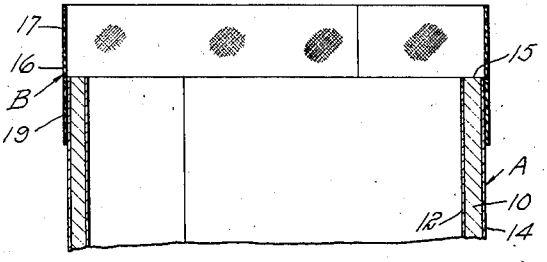
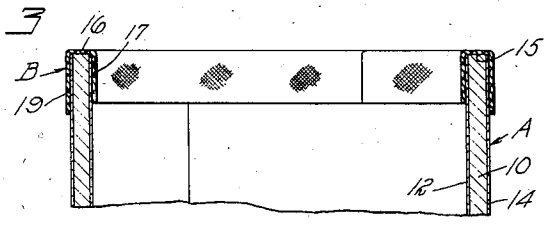


Fig. 3



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MOTOR OIL CONTAINER

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1 Claim. (Cl. 229—5.5)

The present invention relates to containers utilized for the packaging of motor oil, and, more particularly, to fibre bodied containers intended for the aforementioned purpose.

It is essential that containers of the above-indicated type be inexpensive, capable of being manufactured at high rates of speed (two hundred to three hundred per minute), and of sufficient strength to withstand not only normal handling but the abnormal abuse to which such containers are sometimes subjected. Such containers must also be of sufficient strength as to withstand pressure which may be built up in same caused by being subjected to high temperatures as may occur during shipping or may occur due to rapid changes in weather conditions.

It is well known that the body structures can be inexpensively made with sufficient strength from chipboard or Kraft paper. However, these materials are highly absorbent and must be further treated to render them oil-impervious. It has been common to render the inner wall or surface of a fibre body structure oil-impervious either by utilizing an inner lining of an oil-repellent sheet material or by treating the inner surface with a composition which is non-soluble in oil. Even though the inner surface be so treated, the raw edges at the ends of the body structure will act as a wick if the oil contacts such edges, making it essential to provide means for preventing the oil from coming into contact with the raw edges or means which render the raw edges wickproof.

It is recognized that others have attempted to accomplish the aforementioned results. One suggestion has been to render the raw edges wickproof by dipping the ends of the body structures into a molten oilproof compound. Another suggestion, applicable only to the type of container utilizing a sheet lining material, is to make the lining of stretchable material and of sufficient length to permit its being turned outwardly and over the raw edges of the body. But, so far as applicant is aware, methods have not been devised whereby containers incorporating bodies made in accordance with such suggestions can be made at sufficient rates of speed to meet the requirements of the packers of oil.

In addition to providing means for preventing wicking, it is also necessary to provide a seal between the body structure and the closure, which seal will prevent any mechanical leakage or seepage of oil past the closure. In metal cans, a seal is obtained by using a latex gasket between the can body and the closure. The gasket is placed in the double seam formed by the flanged end of the can body and the flange of the closure, whereby a leakproof joint under all normal conditions results. In the case of fibre bodied containers, it is impossible to flange the body sufficiently to obtain a true double seam, and the closure is secured by crimping the flange into the outer wall of the body in what is known as a false double seam. With this type of seam, if internal pressure is built up within the container or the container is subjected to rough handling, the setting of the closure will be disturbed, this in turn disturbing the sealing compound therebetween and resulting in a wicking or leaking.

An object of the present invention is to provide a container for the packaging of motor oil wherein means are utilized for rendering the raw ends of the fire body structure wickproof, which means also function as a gasket cooperating with the closure to provide a positive seal against leakage.

A further object is the elimination of the necessity of using relatively expensive sealing compounds to effect an oilproof joint between the closure member and the body.

A still further object is the elimination of the use of rubber and the reduction or the elimination of the use of tin in the manufacture of containers for motor oil.

A still further object is the accomplishment of the foregoing in a simple and economical manner and at a sufficient rate of speed to meet the requirements of the packers of oil.

Other objects will be in part obvious and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements, and arrangement of parts which will be exemplified in the construction hereafter set forth and the scope of the application of which will be indicated in the appended claim.

In the accompanying drawing:

Figure 1 is a cross sectional view of a container embodying the invention herein;

Fig. 2 is a cross sectional, fragmentary view showing a step in the manufacture of the body structure; and

Fig. 3 is a cross sectional end view of the body structure prior to the application of the closure.

Referring to the drawing, there is shown a body structure A which comprises a tubular supporting member 10, lining 12, and label 14. More specifically, the member 10 is made of suitable fibrous material, such as inexpensive chipboard,

which may be wound into a plurality of plies to provide sufficient bulk for the body structure. In the embodiment shown, the lining 12 is a sheet of oil-impervious material adhesively secured to the inner surface of the supporting portion 10, but could be treated with a composition which is non-soluble in oil. The outer label 14, which is desirous but not essential, is made of an oil- and water-repellent material, being primarily intended for the purpose of covering the chipboard and protecting it against handling or weathering.

With the body structure made in the manner described, the raw edges 15 (see Fig. 2) of the fibrous tubular member are exposed and will act as a wick if the oil drops thereon during the filling or seeps into contact therewith after a closure has been applied.

In accordance with the present invention, the body structure is rendered wickproof by providing a U-shaped mask B of oil-repellent material which is bonded to the end of the body in a manner to completely enclose and cover the raw edges 15. More specifically, the mask B consists of a narrow ribbon or band 16 of oil-repellent, pliable sheet material, such, for example, as polyvinyl alcohol, "Cellophane," "Pliofilm," or cloth or paper impregnated with a suitable compound which is non-soluble in oil. In the embodiment shown, the mask B is applied to the body by initially treating the inner surface of band 16 with an adhesive which is non-soluble in oil, and while the adhesive is still tacky the band is wound around the outer surface of the body member. As seen in Fig. 2, the band is so wound as to extend beyond the end of the member, and inasmuch as it is of greater diameter than the latter, the extending portion may be readily turned inwardly to cover the raw edge 15 and then downwardly and into adhesive engagement with the lining material 12.

With the mask B applied in the manner described, it completely covers the raw edge and also provides a circumferential inner portion 17 and outer portion 19 extending along the inner and outer surfaces of the body member. Obviously if any oil should drop onto the mask B during filling, wicking will not occur. Moreover, as the mask is bonded to the lining by a non-oil-soluble adhesive, seepage of oil under the mask and into contact with the raw edge is prevented. It is understood that the mask could be secured in other ways. For example, if the lining of the body structure should be of a polyvinyl alcohol composition and the mask treated with polyvinyl alcohol, the two could be bonded by the application of heat and pressure. Likewise, the mask could be secured by using an oil-soluble adhesive and the junction of the inner portion 17 of the mask bonded to the lining by flowing a bead 21 of non-oil-soluble compound therearound to prevent seepage.

After the body structure A has been so made, there is initially secured thereon by the container manufacturer a bottom end closure C which in the embodiment shown is made of fibre material in order to save metal. The member C includes a central disk portion 18 having a concave curvature relative to the bottom edge of the container; said disk carrying on its peripheral edge inner and outer flange portions; one portion being a flange 20 and the other portion a securing flange 22 connected to the heel flange by a cross member 24; these members defining a U-shaped channel into which the end of the container fits. In order to render the closure C oilproof, the inner surface is lined with an oil-repellent sheet material 24 or treated with a suitable oil-proofing composition.

In order to secure the closure onto the end of the body, the adjacent faces of the closure securing flange 22 and the outer portion 19 of the mask B are sealed against one another by a band of adhesive 26. The adhesive may be a solution of plasticized glyptal resin of the alkyd resin type, which adhesive is thermoplastic and non-soluble in oil. In making the container, the adhesive may be initially placed onto the outer face of the portion 19 of the mask B or it may be placed onto the inner face of the securing flange 22. Thereafter, when the closure has been positioned on the end of the body, suitable heated gripping jaws may be brought into contact with the flange 22 to apply both heat and pressure and seal it against the mask portion 19 to thereby prevent leakage of oil past this point even though it seeps past the heel flange and around the ends of the body structure.

It will also be noted that by making the disk portion 18 of the closure member C in the manner disclosed, greater strength is provided for resisting internal pressure which may be built up after the container is filled. If pressure should build up, it will exert a downward force on the disk portion 18, tending to flatten it and thus force the heel flange against the body, rather than tending to separate it from the body.

Following the filling of the container at the refinery, the top closure D is added; this closure being shown of metal because currently the oil industry is educated to and equipped for the handling of metal closures. This closure includes a disk portion 28 carrying on its outer peripheral edge inner and outer flange portions; one portion being a heel flange 30 and the other a seaming flange 32. The closure is initially applied by positioning it onto the body structure with the heel flange and disk inserted therein and the seaming flange extending laterally from the heel flange as indicated in dotted lines in Fig. 1. Thereafter a chuck is inserted above the disk 28 and seaming rolls are brought into contact with the seaming flange 32. The seaming rolls will then bend the seaming flange down and into engagement with the portion 19 of the mask B; these rolls being arranged to simultaneously crimp the flange inwardly at 34 and also force the bead 36 at the end of the flange into the body A. As a result, the outer flange portion of the closure is sealed against the depending portion of the mask to provide a leakproof joint at this point.

With the container completed in the manner disclosed, it includes a body structure having a tubular wall member provided with means at each end for rendering same wickproof; this means also functioning as a gasket against which the outer flange portion of each closure is sealed to thereby prevent oil leakage. Inasmuch as this is the only point at which the closure is sealed to the container, the container may be subjected to undue shock, causing the closure member to be distorted in a manner which separates the heel flange from the body structure. When so distorted, oil will seep past the heel flange and over the end of the body structure, but the container will nevertheless remain both wickproof and leakproof.

While the present description relates primarily to a container suitable for the packaging of motor oil, it should be understood that by the selection

of proper lining and mask materials containers of the type described can be used for the packaging of a variety of products which have not heretofore been successfully packaged in fibre containers, such, for example, as paint, peanut butter, lard, and mayonnaise.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claim is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

I claim as my invention:

In a container for the packaging of oil, a tubular body member formed of fibrous material and having an oilproof inner surface, a mask completely enclosing and covering the raw end edge of said tubular member, said mask comprising a strip of pliable oilproof sheet material extending completely across said edge and having circumferential portions extending along the inner and outer peripheral faces of said member, the contacting faces of said circumferential portions and said tubular member being bonded together to securely attach said mask to said member and to prevent seepage thereunder and render the end of said member wickproof, and a closure having a peripheral channel provided with inner and outer annular flange portions, the inner flange portion closely fitting within the masked end of said tubular member but otherwise being free thereof and the outer flange portion fitting about said end, and adhesive means for bonding together the inner face of said outer flange portion and the outer face of the outer circumferential portion of said mask to secure the closure in position and prevent oil seepage therebetween.

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