March 26, 1935. F. C. CLARK 1,995,703

CONTAINER

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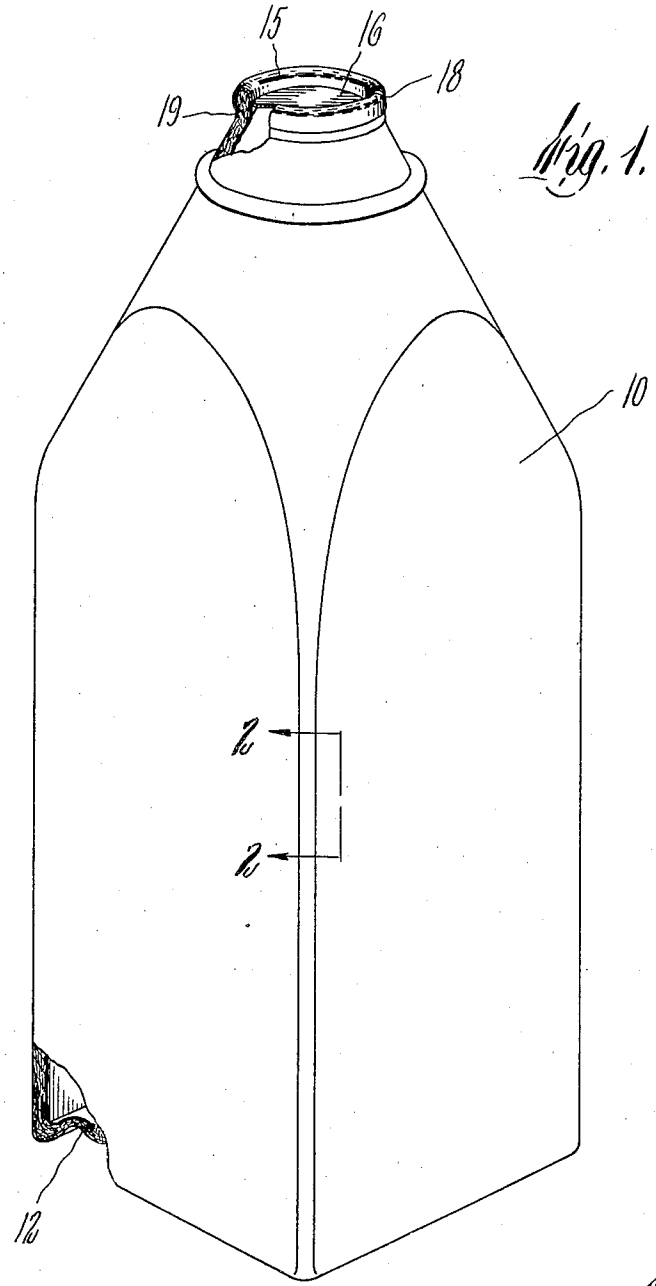

Fig. 1.

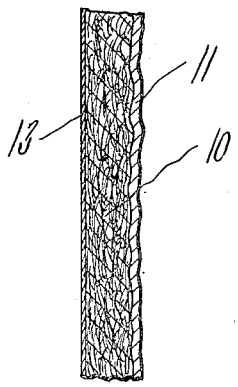

Fig. 2.

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CONTAINER

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4 Claims. (Cl. 229—3.5)

This invention relates to containers for dispensing oil and other similar liquids. More specifically the invention relates to bottles or equivalent containers made of fiber and treated with an oil-proof lining so as to prevent absorption of the oil by the material of the container.

It is an object of the invention to provide an oil bottle which can be cheaply and easily made, which can hold lubricating oil, grease, or other oleaginous compounds without loss, which will drain quickly when it is desired to empty the contents, which will be sufficiently tough to stand a reasonable amount of rough handling, and which when once used cannot be used again.

In selling lubricating oil at retail for automobiles at filling stations, one-quart glass jars having spouts are frequently used for dispensing lubricating oil. Oil is purchased by the quart and is emptied directly into the crank cases of automobile engines from these glass jars. By reason of the viscosity of the oil and its tendency to clink to the smooth inner surface of the glass jar, a considerable percentage of the oil is retained in the jar even when the jar is held inverted for a considerable length of time, especially in cold weather. The purchaser has no guarantee that the particular type or brand of oil in the jar is as represented, since the jar can be, and generally is, refilled for subsequent use.

It is an object of the present invention to supply a container which will drain a higher percentage of oil in a given time than will a glass bottle of the same capacity, which cannot be refilled after it has been emptied, and which can be manufactured cheaply enough to permit its being thrown away after a single use. To this end I provide a pulp fiber container suitably shaped for the purpose, such container being light in weight and capable of economical manufacture. While the invention is not limited thereto, I preferably employ a seamless container so that there will be no crimped joints to work loose. I coat the container on its interior surface with a solution or mixture which forms a flexible film of oil-proof material which is anchored to the fibrous material of the container wall by the fiber ends at the surface, but which does not appreciably penetrate the fibrous structure itself. The fibrous body of the container is preferably made of well sized pulp which may be molded into a single piece in a suitable mold so as to avoid any seams. I also preferably protect the container by coating the outer surface with a film of moisture- and oil-resistant material, such film being preferably applied to the surface in such a manner as not to penetrate appreciably into the fibrous body.

For a more complete understanding of the invention, reference may be had to the description thereof which follows and to the drawing in which

Figure 1 is a perspective view of a fiber bottle embodying the invention.

Figure 2 is a section on the line 2—2 of Figure 1.

While the invention may be embodied in containers of various sizes and shapes for oil, grease, or the like, a bottle suitable for dispensing lubricating oil in retail quantities is illustrated on the drawing. This bottle may be, for example, of a size to hold one quart of oil. The body portion 10 of the bottle is preferably of some cheap, lightweight material such as paper pulp. The bottle may be made by forming sheets of felted pulp into suitable shape, as has been previously done, or may be formed by molding the pulp directly from an aqueous suspension thereof within a suitable mold having the shape of the container itself. Molded articles of this type have a fairly smooth exterior surface by reason of the formation of the outer surface of the article against the surface of the screen in the mold. The inner surface of the molded article is usually somewhat uneven due to slight irregularities of local behavior of the pulp stock when it is being deposited on the inner surface of the screen during the molding operation. The molded article is preferably made of suitable pulp well sized with about 5%, more or less, of any suitable sizing material. When the fiber body of the molded article has been dried, it may be coated on its inner surface with an oil-proof substance such as a mixture of glue and glycerine. Such a substance may be prepared by soaking 60 parts of glue in sufficient water to soften it, heating the soft glue to melt it, adding enough water to bring the water content up to 60 parts, stirring in 40 parts of glycerine, heating and adding approximately 120 parts of water, then flowing the mixture into the molded fiber container, and allowing the excess to drain out by gravity, leaving a complete film of the glue-glycerine mixture covering the entire inner surface of each molded container. These proportions of ingredients are given by way of example only, it being evident that various proportions of these ingredients may be used, with or without the addition of other suitable substances. The amount of dilution and the temperature at which the solution is used may also be varied according to the thickness of film desired in the containers. This provides the containers with a continuous inner lining in the

form of a flexible film 11 which is not subject to cracking. Thus the container may be filled with lubricating oil or the like without danger of any of the oil soaking into the fibrous structure of the container. Furthermore, other oil-proof substances may be employed instead of the mixture described above by way of example. Any material or composition yielding a film impervious to oil can be used in a similar way. Such materials may include casein, albumen, nitrocellulose or cellulose acetate, lacquer, shellac or other natural or synthetic resins, gums or dextrins, or natural or synthetic waxes. The materials may be plasticized with any suitable substance or substances, such as ethylene glycol, diethylene glycol, dibutyl phthalate, glyceryl esters, phosphoric esters, etc., so as to provide a flexible film which does not become brittle under any conditions likely to be encountered by the containers when in use.

The film of coating material follows the irregularities of the somewhat uneven inner surface of the molded container. This unevenness, coupled with the low coefficient of adhesion of oil to a glue-glycerine surface results in a rapid draining of all but a relatively small percentage of the oil from a coated container of the kind described. The drainage of the oil may be further facilitated by the provision of an air relief vent. To this end, the container may be molded with an inwardly projecting boss on its bottom or side wall. Such a boss 12 in the bottom is shown on the drawing. This boss, which forms a depression or indentation in the outer surface of the bottom, acts as a guide for a piercing tool which may be used to punch an air vent in the bottom when the container is inverted to discharge its contents. If desired, the container may be molded in such a way as to cause the boss to be formed with a smaller wall thickness than the remainder of the bottom of the container to facilitate the penetration of the punching tool therethrough.

In order to protect the container from deterioration by absorption of moisture, oil, etc., through the outside surface, I preferably coat such surface with a suitable protective film 13, this film being designed to render the container reasonably moisture and oil proof. This protective coating may be additionally employed as an adhesive by which advertising labels or the like may be stuck to the sides of the container. This film may be applied by dipping the container into a suitable bath of coating material or by brushing or spraying the material onto the outer surface where it hardens to form a protective outer coating. The coating material may comprise an aqueous solution of casein or the like containing ammonia and formaldehyde. For example, 10 parts of casein may be dissolved in 60 parts of water with the aid of 5 parts of ammonia, and 1 part of formaldehyde may be added. If desired, other materials, such as paint, varnish, lacquer, etc., can be employed for the same purpose, such materials being applied to the surface in a manner to form a flexible film on the surface of the container without penetrating the fiber body appreciably. This prevents the possibility of individual fiber ends projecting through the film. It is important that no fiber ends project through either the inner film or the outer film, as such fibers form channels for the ingress of moisture, oil, or other liquids which may come in contact therewith. If desired, the protective material used for the outer film or coating may be made of different colors by the use of suitable pigments, and may be applied in such a way as to form designs, lettering, or the like, in addition to acting as a protective coating.

Fiber bottles of the type described may be made substantially non-refillable, so that, when once used, they must be discarded. Thus a customer can be reasonably sure that he is purchasing an original package and that the oil purchased is in accordance with the marking on the bottle.

To this end, the mouth of the bottle may be closed by a metal cap 15 having a central portion 16 fitted into the mouth of the bottle. The central portion 16 is surrounded by a marginal portion 18, the edge of which is curled around the lip of the bottle and caused to penetrate into the wall of the bottle as at 19. It is practically impossible to remove such a cap, when its marginal edge is thus embedded in the fiber wall, without injuring the adjacent fiber to such an extent that the cap cannot be replaced. When the bottle is to be emptied, the cap may be ripped off by any suitable tool which preferably includes a punch to be used in pricking a vent hole through the boss 12 when the bottle has been inverted.

It is evident that various modifications and changes may be made in the details of structure illustrated and described herein without departing from the spirit or scope of the invention as defined in the following claims.

I claim:—

1. A hollow oil container having an uneven interior surface characterized by small elevations and depressions, and a continuous flexible film of substantially uniform thickness of oil-proof substance coating said interior surface and following said elevations and depressions, the bottom of said container having a small boss molded therein to project upwardly.

2. An article of the class described, comprising a hollow oil container of sized pulp fiber wet-molded to shape, said container having a non-smooth interior surface, and a glue-glycerine film of substantially uniform thickness covering the entire said inner surface and following the unevenness thereof, the bottom of said container having a small boss molded therein to project upwardly.

3. A hollow oil container of molded fiber having an uneven oil-proof interior surface characterized by small elevations and depressions, the bottom of said container being formed with an inwardly projecting boss resulting in an indentation in the exterior surface of said bottom.

4. A hollow oil container of molded fiber having an uneven oil-proof interior surface and a small indentation formed in its bottom to facilitate puncturing the bottom by a suitable tool, and a unitary continuous metal cap on said container affixed thereto so as to prevent removal of the cap without injuring the adjacent fiber.

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