

Sept. 3, 1940.

L. NAST

2,213,404

PORTABLE OIL CAN

Filed Feb. 10, 1939

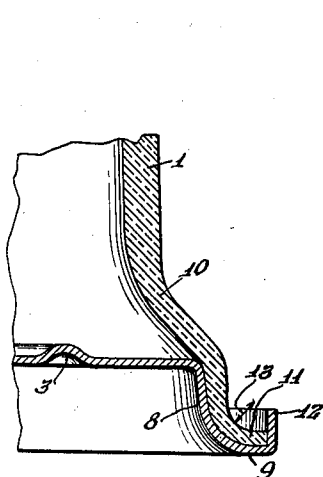


Fig. 2

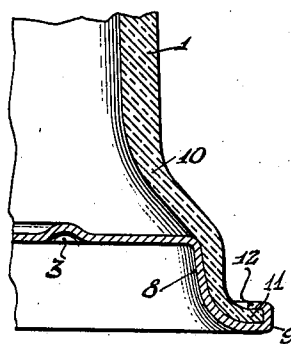


Fig. 3

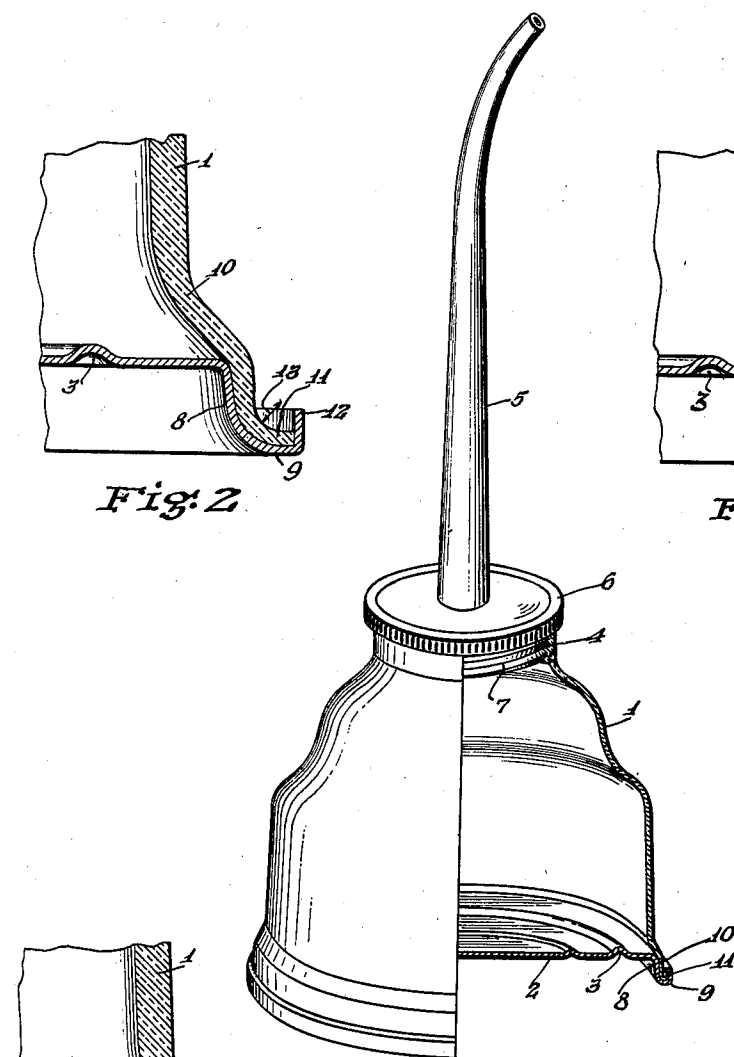


Fig. 1

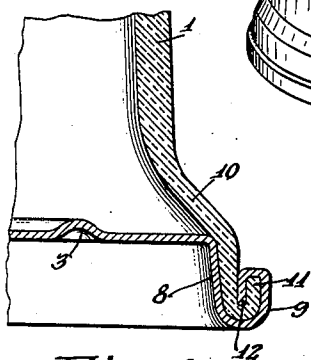


Fig. 4

BY

INVENTOR.
Leo Nast
J. Appenheimer
ATTORNEY.

UNITED STATES PATENT OFFICE

2,213,404

PORTABLE OIL CAN

Leo Nast, New Brunswick, N. J.

Application February 10, 1939, Serial No. 255,598

14 Claims. (Cl. 221—32)

This invention relates to oil cans, in particular those of the portable type and in which a stiff container is provided with a bottom which is either springy or provided with a pump or any other suitable device for discharging the content of the container through a spout detachably secured to it.

This application forms a continuation in part of my copending application Ser. No. 162,493, filed September 4, 1937 and of my copending application Ser. No. 198,214, filed March 26, 1938, both relating to portable oil cans. There I have disclosed a portable oil can comprising a container and a spout, a portion of which consists of solidified plastic material which is insoluble in oil, transparent or translucent, non-inflammable, unbreakable and shock-proof, and the metal bottom of which is directly and liquid-tightly attached to and gripping that container.

A moldable plastic material as comprised by the present invention is solid at room- and somewhat elevated temperatures, but becomes plastic above about 80° C. and can be readily molded at higher temperatures usually up to about 120° C.; such material solidifies again upon cooling and is stiff or somewhat resilient, the latter substantially depending upon its shape and particularly upon its thickness. Such materials are commonly called thermoplastic and exemplified by cellulose acetates. The invention also comprises moldable plastic materials which are solid at room-temperature and become plastic when heat of suitable temperature is applied but solidify upon continued application of such heat for a sufficient period of time; also pressure may be applied simultaneously. Such materials are exemplified by resins on a phenol-formaldehyde basis. They cannot be plastified again upon renewed application of heat as it is the case with the first mentioned thermoplastic materials.

It is an object of the invention to permit the user to observe during oiling whether the can, and if so, to what degree is still filled with oil or other lubricant, and during filling of the container to what degree it is filled.

It is another object of the invention to reduce the number of pieces and kinds of material used for making and assembling the oil can.

It is a further object of the invention to reduce possible leakage by simplifying the structure of the oil can.

It is still another object of the invention to make an inexpensive and practically unbreakable oil can which permits the user to control

the amount of oil, if any, still in the can and its purity and flow into the place to be oiled.

It is still another object of the invention to simplify the manufacture of oil cans of this type by attaching the metal bottom directly to the container without interposing packings, and particularly to render such a direct connection impervious even to oil or other lubricants which are or when used become very liquid and therefore of low viscosity.

These and other objects of the invention will be more clearly understood as the specification proceeds with reference to the drawing in which some exemplifications of the invention are shown.

Fig. 1 shows in perspective view and with a part broken away a portable oil can in its preferred feature according to the invention, and Figs. 2 to 4 at an enlarged scale some steps in which the edge of the metal bottom is bent over the flange of a container of plastic material and final connections are obtained.

In Fig. 1, 1 is a cup-shaped molded container which is to be filled with oil or other liquid for lubricating and similar purposes.

The container consists of transparent or translucent solidified plastic material of a type referred to above, preferably of thermoplastic material which softens and becomes plastic if heated considerably above about 80° to 120° C. and solidifies in the shape imparted to it upon cooling. The walls of the container must be made of sufficient thickness and suitably reinforced to insure stiffness. To this end, a rim of the container forms a flange 11 which the edge 9 of the metal bottom directly contacts and tightly grips, thereby reinforcing the container at its largest circumference to retain its shape. Simultaneously a liquid-tight seal without any intermediary such as a rubber packing, is established between the flange and the bottom. This direct, rigid and tight connection between the metal bottom and the container is particularly possible because such solidified plastic material does not break or crack even if high pressure is used in securing the bottom to the container. Furthermore, under such high pressure thermoplastic material becomes but slightly pliable so that the turned over edge of the bottom closely and tightly contacts the flange all over.

As is shown in Fig. 2, the outer part 9 of the metal bottom is provided with a portion 8 near its edge which is preferably shaped to contact the inside of wall 1 and then follows the outline of flange 11 and ends in an upright rim 12. The

wall 1 is of a thickness sufficient to give the container a desired stiffness. It has been found in extended experiments and manufacture of oil cans of this type, however, that the thickness of wall portion 10 adjacent to the flange is to be reduced by about $\frac{1}{4}$ to $\frac{1}{2}$ of that thickness of wall 1 in order to give that portion 10 of the container sufficient resiliency or flexibility so that the rim 12 of the metal bottom can be bent or spun over flange 11 under pressure in the shape shown in Fig. 3, and can tightly contact and grip that flange and give a liquid-tight closure. Though a flange or bead of equal or even larger thickness or diameter, respectively, than the wall 1 of the container has proved satisfactory if relatively viscous oil was used, it was found preferable and safer to use a thinner protruding flange over which the end of the metal bottom is bent and to reduce also the thickness of the adjacent wall portion in order to secure a liquid-tight closure also in case oil of relatively low viscosity, or other lubricating liquids of similar consistency are to be used.

In cases where particularly thin oils or other very easily flowing lubricant liquids are to be used, it has been found advantageous to bend again the flange with the pressed or spun-over edge of the metal bottom into the shape shown in Fig. 4 where the flange 11 is bent upward and pressed against the outside of wall portion 10, and the end of the rim 12 enters within the space between wall portion 10 and the upwardly pressed flange 11. In such a case the flange 11 must still be resilient enough to permit such bending in the cold without cracking, and to this end the thickness of the flange is further reduced below that of wall portion 10, by about 10% to 25%. There has been further found that the curved portion connecting wall portion 10 with flange 11 has to be of a certain minimum radius in order to be flexible enough to permit flange 11 to be bent into the shape according to Fig. 4. This inner radius 13, Fig. 2, should preferably be approximately one to five times the reduced thickness of wall portion 10.

If these rules established by the invention are observed there can be obtained even in the cold a connection between the metal bottom and the edge of the container which is liquid-tight for any lubricant liquids of any nature and viscosity, and reinforces the container.

A spout comprising a nozzle 5 is connected with the narrow part of the container 1 in any suitable and easily detachable way. The spout consists in this example of metal although it may consist also of solidified transparent or translucent thermoplastic material which is capable of retaining its shape during use and which is not attacked by oil or other lubricants for which the can is used, as it is described in more detail in my copending application Ser. No. 198,214.

The spout is connected with an enlarged part 6 which in turn is provided with an outside screw thread 7 by means of which it is screwed into the screw thread 4 of container 1.

The metal bottom consists in this exemplification of the invention, Fig. 1, of a center portion 2 which is springy and slightly bent outwardly to this effect. There are provided one or two circular grooves 3 which assist this spring action. The outer portion of the bottom is finally shaped in any desired way as described above. In Fig. 1 the connection as described more in detail with reference to Fig. 4 is adopted. In particular, the center portion of the bottom may consist of plas-

tic and transparent material thus facilitating the observation of the interior of the can.

In a preferred feature of the invention according to Figs. 1 and 4 the wall 1 of thermoplastic material is of a thickness of about 0.04" to 0.05", the reduced portion 10 of a thickness of about 0.025" to 0.035", and the flange itself either of the same thickness as wall portion 10 or further reduced to a thickness of about 0.02" to 0.03"; the radius 13 is then preferably of about 0.03" to 0.15".

It will be appreciated from the above that the cup-shaped container 1 permits to observe the amount of oil or other lubricant, if any, still present in the container, and that the spout, if made of transparent thermoplastic material also permits to observe the purity and consistency of the oil and whether it is still flowing into the place to be oiled.

After removal of the spout 5 the container 1 is placed on its bottom and refilled. During filling the level of the liquid being filled into the container can be observed and any overflow can readily be avoided. After the container is filled and the spout is screwed on to the container, the user can always observe and control the amount of liquid still in the container and its flow to the place to be lubricated. Thereby the frequent occurrence can be avoided that an empty can is used, or that the can is emptied during continuous use, or that no lubricant flows out due to an obstruction e. g. in the nozzle. The container retains its shape during use and repeated fillings, is not affected or impaired by heat at degrees normally prevailing at the home or in the workshop when the container is put to use, and in non-inflammable. It can stand rough handling during manufacture and use, will not break when dropped as is the case with containers of glass, and is of considerable strength.

In addition thereto the shape of the nozzle if made of thermoplastic material can be adjusted at any time.

The parts of the oil can can easily and at low costs be made in mass production and their assembly is very simple too.

It is understood that the invention is not limited to any exemplification described above, but is to be derived in its broadest scope from the appended claims.

What I claim is:

1. An oil can comprising a cup-shaped container, a bottom attached thereto and a spout detachably connected therewith, said container consisting of solidified and stiff plastic material which is insoluble in oil, noninflammable, transparent and shockproof and having a wall of a thickness sufficient to render it stiff, said container provided with a flange where said bottom is to be attached, said flange being of considerably less thickness than the adjacent wall portion of said container so as to be flexible and pliable, said bottom consisting of metal at least in its outer portion, said portion directly pressed against and bent over said flexible and pliable flange so as to grip it rigidly and liquid-tightly and reinforce said container.

2. An oil can comprising a cup-shaped container, a bottom attached thereto and a spout detachably connected therewith, said container consisting of solidified and stiff plastic material which is insoluble in oil, non-inflammable, transparent and shockproof and having a wall of a thickness sufficient to render it stiff, said container provided with a flange where said bottom

is to be attached, said flange and the adjacent portion of the wall of said container being of considerably less thickness than the balance of the wall of said container so as to be flexible and pliable, said bottom consisting of metal at least in its outer portion, said portion directly pressed against and bent over said flexible and pliable flange so as to grip it liquid-tightly and reinforce said container.

3. An oil can comprising a cup-shaped container, a bottom attached thereto and a spout detachably connected therewith, said container consisting of solidified and stiff plastic material which is insoluble in oil, non-inflammable, transparent and shockproof and having a wall of a thickness sufficient to render it stiff, said container provided with a flange where said bottom is to be attached, said flange and the adjacent portion of the wall of said container being of considerably less thickness than the balance of the wall of said container so as to be flexible and pliable, said bottom consisting of metal at least in its outer portion, said portion directly pressed against and bent over said flexible and pliable flange, said flange with said bent over bottom portion being bent upwardly and pressed against the container wall thereby forming a liquid-tight connection and reinforcing said container.

4. An oil can comprising a cup-shaped container, a bottom attached thereto and a spout detachably connected therewith, said container consisting of solidified and stiff plastic material which is insoluble in oil, non-inflammable, transparent and shockproof and having a wall of a thickness sufficient to render it stiff, said container provided with a flange where said bottom is to be attached, said flange and the adjacent portion of the wall of said container being of considerably less thickness than the balance of the wall of said container so as to be flexible and pliable, the inner radius by which said flange is bent relative to the adjacent wall portion exceeding about one to five times the thickness of said wall portion, said bottom consisting of metal at least in its outer portion, said metal portion being directly pressed against and bent over said flexible and pliable flange to form a liquid-tight connection and to reinforce said container.

5. An oil can comprising a cup-shaped container, a bottom attached thereto and a spout detachably connected therewith, said container consisting of solidified and stiff plastic material which is insoluble in oil, non-inflammable, transparent and shockproof and having a wall of a thickness sufficient to render it stiff, said container provided with a flange where said bottom is to be attached, said flange being of considerably less thickness than the adjacent portion of the wall of said container so as to be flexible and pliable, said wall portion being of considerably less thickness than the balance of the wall of said container, the inner radius by which said flange is bent relative to said adjacent wall portion exceeding about one to five times the thickness of said wall portion, said bottom consisting of metal at least in its outer portion, said metal portion being directly pressed against and bent over said flexible and pliable flange so as to form a liquid-tight connection and to reinforce said container.

6. An oil can comprising a cup-shaped container, a bottom attached thereto and a spout detachably connected therewith, said container consisting of solidified and stiff plastic material which is insoluble in oil, non-inflammable, trans-

parent and shockproof and having a wall of a thickness sufficient to render it stiff, said container provided with a flange where said bottom is to be attached, said flange being of considerably less thickness than the adjacent portion of the wall of said container, said adjacent wall portion being of considerably less thickness than the balance of the wall of said container so as to be flexible and pliable, the inner radius by which said flange is bent relative to the adjacent wall portion exceeding about one to five times the thickness of said wall portion, said bottom consisting of metal at least in its outer portion, said metal portion being directly pressed against and bent over said flexible and pliable flange and said bent-over metal portion with the flange enclosed being bent upward and pressed against the outside of the adjacent wall portion of said container so as to form a liquid-tight connection and to reinforce said container.

7. An oil can comprising a cup-shaped container, a bottom attached thereto and a spout detachably connected therewith, said container consisting of solidified and stiff thermoplastic material which is insoluble in oil, non-inflammable, transparent and shockproof and having a wall of a thickness sufficient to render it stiff, said container provided with a flange where said bottom is to be attached, said flange being of considerably less thickness than the adjacent portion of the wall of said container so as to be flexible and pliable, said wall portion being of considerably less thickness than the balance of the wall of said container, the inner radius by which said flange is bent relative to the adjacent wall portion exceeding about one to five times the thickness of said wall portion, said bottom consisting of metal at least in its outer portion, said metal portion being directly pressed against and bent over said flexible and pliable flange so as to form a liquid-tight connection and to reinforce said container.

8. An oil can comprising a cup-shaped container, a bottom attached thereto and a spout detachably connected therewith, said container consisting of solidified and stiff thermoplastic material which is insoluble in oil, non-inflammable, transparent and shockproof and having a wall of a thickness sufficient to render it stiff, said container provided with a flange where said bottom is to be attached, said flange being of considerably less thickness than the adjacent portion of the wall of said container so as to be flexible and pliable, said wall portion being of considerably less thickness than the balance of the wall of said container, the inner radius by which said flange is bent relative to said adjacent wall portion exceeding about one to five times the thickness of said wall portion, said bottom consisting of metal at least in its outer portion, said metal portion being directly pressed against and bent over said flexible and pliable flange so as to form a liquid-tight connection and to reinforce said container.

9. An oil can comprising a cup-shaped container, a bottom attached thereto and a spout detachably connected therewith, said container consisting of solidified and stiff thermoplastic material which is insoluble in oil, non-inflammable, transparent and shockproof and having a wall of a thickness sufficient to render it stiff, said container provided with a flange where said bottom is to be attached, said flange being of considerably less thickness than the adjacent portion of the wall of said container so as to be flexible and pliable, said adjacent wall portion being of consid-

erably less thickness than the balance of the wall of said container, the inner radius by which said flange is bent relative to the adjacent wall portion exceeding about one to five times the thickness of said wall portion, said bottom consisting of metal at least in its outer portion, said metal portion being directly pressed against and bent over said flexible and pliable flange and said bent-over metal portion with the flange enclosed being bent upward and pressed against the outside of the adjacent wall portion of said container so as to form a liquid-tight connection and to reinforce said container.

10. An oil can comprising a cup-shaped container, a bottom attached thereto, and a spout detachably connected therewith, said container consisting of solidified and stiff thermoplastic material which is insoluble in oil, non-inflammable, transparent and shockproof and having a wall of a thickness sufficient to render it stiff, said container provided with a flange where said bottom is to be attached, said flange being of a thickness of about one half to three quarters of the wall of said container so as to be flexible and pliable, said bottom consisting of metal at least in its outer portion, said portion directly pressed against and bent over said flexible and pliable flange so as to form a liquid-tight connection and reinforce said container.

11. An oil can comprising a cup-shaped container, a bottom attached thereto, and a spout detachably connected therewith, said container consisting of solidified and stiff thermoplastic material which is insoluble in oil, non-inflammable, transparent and shockproof and having a wall of a thickness sufficient to render it stiff, said container provided with a flange where said bottom is to be attached, the thickness of said flange being about three quarters to nine tenths of the adjacent wall portion of said container so as to be flexible and pliable, the thickness of said wall portion being about one half to three quarters of the balance of the wall of said container, said bottom consisting of metal at least in its outer portion, said portion directly pressed against and bent over said flexible and pliable flange so as to form a liquid-tight connection and reinforce said container.

12. An oil can comprising a cup-shaped container, a bottom attached thereto and a spout detachably connected therewith, said container consisting of solidified and stiff thermoplastic material which is insoluble in oil, non-inflammable, transparent and shockproof and having a wall of a thickness sufficient to render it stiff, said container provided with a flange where said bottom is to be attached, said flange being of considerably less thickness than the adjacent portion of the wall of said container so as to be flexible and pliable, the inner radius by which

said flange is bent relative to the adjacent wall portion exceeding about one to five times the thickness of said wall portion, said bottom consisting of metal at least in its outer portion, said metal portion being directly pressed against and bent over said flexible and pliable flange and said bent-over metal portion with the flange enclosed being bent upward and pressed against the outside of the adjacent wall portion of said container so as to form a liquid-tight connection and to reinforce said container.

13. An oil can comprising a cup-shaped container, a bottom attached thereto, and a spout detachably connected therewith, said container consisting of solidified and stiff thermoplastic material which is insoluble in oil, non-inflammable, transparent and shockproof and having a wall of a thickness sufficient to render it stiff, said container provided with a flange where said bottom is to be attached, the thickness of said flange being about three quarters to nine tenths of the adjacent wall portion of said container so as to be flexible and pliable, the thickness of said wall portion being about one half to three quarters of the balance of the wall of said container, the inner radius by which said flange is bent relative to said adjacent wall portion exceeding about one to five times the thickness of said wall portion, said bottom consisting of metal at least in its outer portion, said portion directly pressed against the bent over said flexible and pliable flange so as to form a liquid-tight connection and reinforce said container.

14. An oil can comprising a cup-shaped container, a bottom attached thereto, and a spout detachably connected therewith, said container consisting of solidified and stiff thermoplastic material which is insoluble in oil, non-inflammable, transparent and shockproof and having a wall of a thickness sufficient to render it stiff, said container provided with a flange where said bottom is to be attached, the thickness of said flange being about three quarters to nine tenths of the adjacent wall portion of said container so as to be flexible and pliable, the thickness of said wall portion being about one half to three quarters of the balance of the wall of said container, the inner radius by which said flange is bent relative to said adjacent wall portion exceeding about one to five times the thickness of said wall portion, said bottom consisting of metal at least in its outer portion, said metal portion being directly pressed against and bent over said flexible and pliable flange and said bent-over metal portion with the flange enclosed being bent upward and pressed against the outside of the adjacent wall portion of said container so as to form a liquid-tight connection and reinforce said container.