Patented Feb. 18, 1936 2,031,233

UNITED STATES PATENT OFFICE

2,031,233

CONTAINER

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No Drawing. Application April 25, 1934, Serial No. 722,361

11 Claims. (Cl. 167—82)

This invention relates to containers made of a paraffin composition having a softening point higher than the natural softening point of the paraffin, and more particularly to bottles or capsules made from such composition, as well as to the composition itself.

The most common type of container is, of course, the glass bottle, but they are somewhat expensive and very fragile. Capsules are usually made of gelatin and are intended to be taken internally whereupon the gelatin dissolves. Bottles have been made of pure paraffin heretofore and even capsules, but no thought seems to have been given to the construction of a paraffin container which would have a softening point sufficiently higher than the natural softening point of the paraffin to be of any utility for general purposes.

It is, therefore, an object of my invention to provide a container for liquids, pastes, powders or the like which container is composed of a paraffin composition having a softening point considerably higher than the natural softening point of the pure paraffin therein so that the container will not soften or collapse under ordinary conditions of shipment, storage, and/or use. Another object is to provide such a container in the form of a bottle or capsule. A further object is to provide a capsule of a paraffin composition having greater "chewability" than the paraffin alone, as well as an increased softening point. Another object is to provide a capsule having greater heat resisting properties than pure paraffin without, at the same time, sacrificing chewability. A further object is to provide a novel paraffin composition. Other objects will hereinafter appear.

In its broader concept, my invention comprises a container made of a paraffin composition containing a large proportion of paraffin and a large proportion of a chemically inert but physically active filler of a selected type so that the softening point of the paraffin has been considerably increased. Another concept is a capsule which has increased chewability. The capsule may contain a charge of mouth medicament so that it can be deposited in the mouth, crushed and chewed—either after expectorating the mouth medicament or even while retaining some of the mouth medicament in the mouth.

Broadly, a chewable paraffin capsule containing a mouth medicament is the invention of Arthur J. Messner (see application Serial No. 722,361 of even date), but the provision of a capsule having greater chewability and greater resistance to softening than paraffin is my invention, as described herein. Many of the advantages of such a capsule are set forth in that application and need not be repeated here.

Bottles of my improved composition are, of course, constructed in hollow shapes either by blowing the composition in a manner somewhat similar to that in which glass is blown into a form or by coating the inside of a multi-piece form of the desired shape with the composition. If the bottle is to be of cylindrical shape, it may be constructed by immersing a hollow "form" of that shape in the paraffin composition one or more times, warming the form and slipping the bottle from the form. The thickness of the bottle shell will depend upon its size and use, but from $\frac{1}{16}$ to $\frac{1}{4}$ inch thickness is regarded as satisfactory.

The capsule is, of course, hollow and may be of any desired form, such as in the form of a short cylinder with closed ends, a sphere, a cube, a fruit, flower, or in fact any form desired. For a form (such as a cylinder, sphere or the like) requiring an inside diameter of approximately $\frac{1}{4}$ of an inch, the walls of the capsule should, I have found, be from about $\frac{1}{16}$ to $\frac{1}{8}$, and preferably approximately $\frac{3}{32}$, of an inch in thickness, more or less, depending upon the rigidity of the paraffin composition. A capsule $1\frac{1}{2}$ inches long has about the right volume to contain a sufficient charge of mouth medicament for one treatment, the mouth medicament being either a liquid, paste, or a powder.

Containers in accordance with my invention may also be made in other sizes and shapes as will be apparent. They may be closed by the composition itself, such as by sealing with a hot iron (particularly in the case of the capsule) or, as in the case of a bottle, a stopper may be provided of, for instance, wood, bakelite or the like.

Containers made in accordance with my invention have the advantage of being light, inexpensive, and—generally speaking—unbreakable, unless given a crushing blow. They do not soften in the warmest climate nor under ordinary conditions of storage, shipment or handling. In general, the softening point of my containers is above 115° F. and usually about 120° F., or sometimes even higher.

The capsule embodiment of my invention has great utility, particularly when made of a paraffin composition having greater chewability than the paraffin itself. Such a capsule, containing a small charge of mouth medicament, is merely deposited in the mouth and crushed by the teeth whereupon the mouth medicament flows about the mouth and cleanses it, being

assisted by slushing it through the teeth by means of the tongue and cheeks. At the same time the crushed paraffin composition is gathered into a coherent mass by means of the tongue. The mouth medicament is then expectorated and the paraffin chewed briefly to "finish off" the cleansing of the teeth, after which it is discarded. All of this requires but a few seconds to accomplish and may be done while a person is making some other portion of his toilet. Even more advantageously, these capsules may be carried in the pocket or purse to be used "between smokes", during the day, while traveling, after dining, or in fact upon any occasion where cleansing, refreshing, deodorizing or perfuming of the mouth and/or breath is desired. Above all, the use of these capsules is far more sanitary than the use of the tooth brush or a bottle.

Probably the more prominent medicaments sold today are those bearing the trade name of "Pepsodent" or "Listerine" or "Lavoris". It is not important that the formulæ thereof be set forth here or even be known. A suitable mouth medicament for use in my invention may, however, be compounded as follows:

Zinc chloride	2 gr.
Formalin	2 min.
Menthol	½ gr.
Oil cassia	¾ min.
Oil caryophylus	¼ min.
Alcohol	6%

The construction of useful containers of a paraffin composition has been made possible by my discovery that certain fillers, when added to paraffin, will increase its natural softening point by several degrees. As a matter of fact, finely divided fillers of certain kinds may be mixed with the paraffin in proportions of from a few per cent to 20 or 50 or even 60 per cent and thereby raise the natural softening point of the paraffin and increase its resistance to softening or collapse at higher temperatures so as to give an added factor of safety against collapse of the container under storage conditions where higher temperatures might be encountered.

I have discovered that fillers which may be employed to increase the softening point, as well as to increase the chewability, of the paraffin form a class which are wetted more readily by molten paraffin than by water and which have unusual advantages. These, I term physically active fillers. Oddly enough, those fillers which are wetted more readily by water than by molten paraffin are not as satisfactory in that, while the softening point of the paraffin is increased somewhat by their addition thereto, they add little if any to the chewability of the paraffin in any proportions and actually decrease the chewability of the paraffin if added in very large proportions such as in excess of 20 to 30 per cent; fillers in this class are, for instance, calcium phosphate, plaster of Paris, gypsum and silica. I term this class physically inactive fillers.

Fillers which come within the class of those which are wetted more readily by molten paraffin than by water and which I employ in my invention are— chalk (calcium carbonate), anhydrite, asbestine (talcous agalite), talc, koalin, asbestos and adsorbent carbon. These are best utilized in finely divided dry or substantially dry form—either ground to a powder or precipitated as a fine powder. Material which will pass a 100 mesh to a 400 mesh sieve are most satisfactory, 200 mesh material being preferable. While my paraffin composition may comprise from a few per cent to 50, 60 or even 70 per cent of any of these fillers, I have found that from about 20 to 50 per cent is the most useful range with approximately 40 per cent being the preferred proportion.

Of these fillers I have found that chalk is unusual. Indeed I have found that the addition of various percentages of finely divided or precipitated chalk (calcium carbonate) to paraffin, for instance approximately 20 to 40 parts, and preferably 40 parts, of 200 mesh chalk to 60 parts of paraffin will not only increase the softening point of the paraffin several degrees (about 3° to 5° F.) over the natural softening point thereof, but that, in the case of the higher melting paraffins, the "chewability" of the paraffin and the facility with which it will gather in the mouth, is thereby considerably increased. Thus a mixture of 60 parts of higher melting paraffin and about 40 parts of powdered chalk has the advantage of having greater resistance to softening and greater "chewability", than pure paraffin, as well as furnishing a mild abrasive for the teeth (when used as a mouth medicament capsule) to assist in removing tartar and stain therefrom. More specifically, 25 to 50 parts of powdered chalk with 75 to 50 parts of 120°–127° F. melting range paraffin, or 20 to 40 parts of powdered chalk with 80 to 60 parts of 127–133° F. melting range paraffin gives a composition which will resist softening at temperatures as high as 118° to 120° F. or even higher and which has markedly increased chewability over that of the paraffin alone. With somewhat lower melting point paraffins, a somewhat larger percentage of chalk will bring the softening point up to or above 115° F.; the chewability of such compositions is very good as these paraffins will permit the addition of higher percentages of physically active fillers and still retain chewability.

Of the other fillers mentioned above, I have found that in approximately the same proportions as the chalk, the use of anhydrite or talcous agalite will increase the chewability of the paraffin as well as raise the softening point of the paraffin in a similar manner. The chewed paraffin composition has the advantage over chewing gum or chicle in that it will not stick to anything if dropped or carelessly disposed of.

The remaining fillers may also be added to paraffin in similar proportions to obtain a commensurate increase in the natural softening point of the paraffin. This increase in softening point varies slightly with the particular filler, but in general the increase amounts to about 5° F. when using from about 20 to 50 per cent of the filler. Mixtures of two or more of the fillers named may also be employed to produce the same effect.

Any of the fillers mentioned—whether physically active or inactive—may, therefore, be added to the paraffin in any proportions up to 60 or 70 per cent to increase the softening point of the paraffin, the increase in softening point being roughly proportional to the percentage of filler added. However, those which are wetted more readily by paraffin than by water are unusual and particularly advantageous in that the chewability of the paraffin is definitely increased with the addition of from 20 per cent up to about 50 per cent of the filler. Above that percentage, chewability decreases somewhat. Furthermore, fillers of the physically active class do not "chew out" from the paraffin (whereas fillers of the physi-

cally inactive class will chew out from the paraffin) it being characteristic of the physically active fillers that they are bound so closely by the paraffin that the saliva of the mouth does not release them.

It may be stated here that paraffin of any given melting range, as it is ordinarily found on the market, is composed of a number of hydrocarbons of different melting points. The lower melting hydrocarbons act to plasticize the higher melting ones. Therefore, when too much filler is added, the lower melting hydrocarbons in the paraffin are used up in wetting the filler (the lower ones wetting preferentially) and there are none left to plasticize the higher melting hydrocarbons, and chewability is decreased.

At the same time, too low melting hydrocarbons or too high a proportion of them in the paraffin may cause "sweating" out of such low melting hydrocarbons when the paraffin-filler composition is subjected to the higher temperatures to which it may be subjected in use. The paraffin may be presweated of some of these lower melting hydrocarbons, but I have also found that the physically active fillers have the characteristic of adsorbing these preferentially and the filler, therefore, has the additional function of reducing considerably the "sweating out" of the lower melting hydrocarbons from the paraffin.

I may, of course, add the above named fillers to any paraffin to raise the melting point thereof, such, for instance, as all the paraffins referred to in the above named Messner application. The low melting paraffins, for example those melting in the vicinity of 120° to 125° F., do not have their chewability increased greatly by such addition, as they are already quite chewable. The higher melting paraffins, i. e. those melting at about 130° to 136° F., which are in themselves noticeably less chewable than the lower melting paraffins, have their chewability considerably increased by such additions. Apart from the ability of the active fillers to increase the chewability of certain paraffins, a novel effect of these fillers is that they increase the softening point of any of the paraffins, high or low melting, without decreasing their chewability. The physically inactive fillers may likewise be added to all melting point ranges of paraffins to increase the softening point thereof. Such fillers are, however, admittedly inferior to the physically active fillers in that they may be added to paraffins only up to 30% by weight without a prohibitive decrease in chewability resulting, whereas as has been previously stated, the physically active fillers may be added to the extent of 50 or 60% by weight before chewability is decreased prohibitively. All of the percentages referred to in this application are by weight.

In this specification, by the term "softening point" of the paraffin is meant the collapsing point or the temperature at which a capsule of the size herein designated is soft enough to flow out of shape of its own volition. By "softening" is, of course, meant collapse and by resistance to softening is meant resistance to collapse.

Thus my paraffin-filler composition is characterized in that the lower melting hydrocarbons act to wet the filler and make it compatible with the paraffin as a whole so that it will be closely bound by the paraffin; the filler acts conversely to bind at least part of the lower melting hydrocarbons, thus decreasing sweating of the finished composition; the unbound lower melting hydrocarbons act to plasticize the higher melting hydrocarbons and lend chewability to the composition.

The resistance of the paraffin to softening may also be increased by adding certain waxes or resins thereto which are compatible therewith, such as a fraction of one per cent to a few per cent of carnauba wax, ozokerite, candelilla wax or beeswax. From ½ per cent to 1 per cent has been found satisfactory, although more may be added. For instance, 2–5 per cent of carnauba wax raises the softening point of 119°–122° F. melting point paraffin to 114° F. and it is still chewy. Higher melting point paraffins tolerate less carnauba wax (and still retain chewability) as, for instance, ½ to 1 per cent of carnauba wax may be added to 130°–133° F. melting point paraffin and retain chewability although more may be added if increased softening point is the only concern. Carnauba wax also toughens the chewiness of the paraffin somewhat. Generally speaking, however, this is somewhat at the expense of the "chewability" of the paraffin composition, although this is offset somewhat by the addition of powdered chalk or its equivalent.

The above ratings of softening points are somewhat conservative and ordinarily may be regarded as one to three or four degrees higher. The smaller the container the better its resistance to softening. Also, when the container is filled, such as with mouth medicament, the softening point of the paraffin is increased somewhat.

While my invention preferably employs paraffin in the composition, I may also use halogenated paraffins or similarly substituted paraffins so long as they have the same essential properties as paraffin.

My novel composition is easy to prepare. The paraffin is merely brought to a molten state (preferably freely flowing) and the powdered filler added thereto (preferably gradually) while thoroughly stirring the paraffin, stirring being continued until the composition begins to set or until the composition is cast or formed into the finished article. The paraffin should not be heated more than a few degrees above its melting point (enough to make it freely flowing) as otherwise, pyrolysis or breakdown may occur. The filler is best employed in finely powdered dry or substantially dry condition, such as an impalpable powder of 100 to 400 mesh size and preferably fine enough to pass a 200 mesh sieve, although less preferably somewhat larger particles may be employed. If carnauba or other of the waxes mentioned are added, they are preferably melted in with the molten paraffin and thoroughly mixed therewith before the filler is added, although the wax may be added with the filler or even afterwards.

My paraffin composition in the form of a container has the advantage that it is insoluble in all known mouth medicaments, does not deteriorate on standing, is unaffected by moisture or other of the elements and is insoluble in substantially all liquids or gases with which it is liable to come into contact during handling, storage or use.

The paraffin composition may be colored by adding suitable harmless pigments or dyes thereto during the compounding of the paraffin prior to formation of the container, thus making it more attractive to the prospective user. The paraffin composition for capsules may also be flavored by adding sugar, essential oils and the like thereto during its preparation prior to formation of the capsule.

The cylindrical type of capsule or bottle is convenient and economical to produce as it may be formed by continuously extruding a tube of paraffin composition at about the plastic point of the composition (i. e. at about 95°–100° F.), cooling it somewhat, cutting the tube into suitable lengths and sealing one end of the length. The rounding, tapering, or flattening of the container end may be done by suitable forms maintained at a temperature slightly below the melting point of the paraffin, as, for instance, at about the softening point. The container may then be filled and sealed at the other end or it may be formed to receive a suitable stopper.

If desired, the container may be prepared by casting it in halves in suitable molds and uniting the halves, a suitable opening being left for charging the container, the opening then being sealed, for instance with a hot iron, or fashioned to receive a stopper. Or a cold tube (such as a small test tube) may be dipped in molten paraffin, withdrawn, heated upon the inside with water, and the container slipped off, charged and sealed at the open end. Other ways of forming, charging and sealing the container are known or will occur to those skilled in the art, and as the particular method of so doing forms no part of my invention, it need not be described further.

It is not necessary to illustrate my invention by a drawing. In the form of a capsule, its shape is similar to that illustrated in connection with the above named application of Arthur J. Messner. In the form of a bottle it appears as any glass bottle. In other forms it depends upon the shape desired, such as cubical, spherical and the like.

Thus it will be apparent that my invention has many advantages. In capsule form, the capsule acts to contain the mouth medicament and convey it into the mouth where the capsule is crushed. The mouth medicament there serves its purpose of cleansing, deodorizing, perfuming and invigorating the mouth and/or breath. The capsule may then be chewed either in the presence of the mouth medicament or after the latter has been expectorated. Thus the composition acts to "finish off" the mouth cleansing process and is discarded, or it may be retained as it constitutes an excellent "chew".

The container of my invention is light, may be made into any desired form or color and may be of any suitable size. It has a softening point high enough to effectively resist softening under those conditions which it ordinarily encounters. The container is not in the class of a fragile article and is more durable in that respect than glass. The paraffin composition may be perfumed or flavored to add to the attractiveness of the capsule from the consumer's standpoint.

Not of least importance is the fact that by means of my invention mouth medicaments can be marketed in small attractive quantities which has not been practical heretofore with glass containers due to the expense thereof, the paraffin and fillers used in my invention being very cheap and available in unlimited quantities. Hence the mouth medicament may be sold in capsules in lots of one half or one dozen to a package where only a small quantity of the mouth medicament is desired. An entirely new outlet for distribution is thus offered the manufacturer because of this break-down into small and convenient units. Or capsules may be sold in lots of one hundred or five hundred where the customer is a regular user thereof. They are light and tough enough so that they will not break if accidentally dropped, such as on the bath room floor. The capsules themselves do not deteriorate and as they are air tight, the mouth medicament itself does not deteriorate, evaporate or become contaminated. The same, regarding distribution, may be said of many other commodities such as perfumes, antiseptics and the like. As a bottle or other form of container, its use is practically unlimited.

What I claim as my invention and desire to be secured by Letters Patent of the United States is:

1. A chewable container composed of a composition in which predominates paraffin and an inert filler which is wet more readily by paraffin than by water and which will not substantially chew out from the paraffin, said composition having a softening point higher than that of paraffin in its pure state and the ratio of the filler to the paraffin being sufficient to substantially increase the chewability of the paraffin but being less than 70 parts of the filler to 30 parts of paraffin.

2. A chewable container composed of a composition in which predominates paraffin and 20 to 50 percent of an inert filler which is wet more readily by paraffin than by water and which will not substantially chew out from the paraffin, said composition having a softening point higher than that of the paraffin in its pure state.

3. A chewable capsule composed of a composition in which predominates paraffin and chalk, said composition having a higher softening point than that of the paraffin in its pure state and the ratio of the chalk to the paraffin being sufficient to substantially increase the chewability of the paraffin but being less than 70 parts of chalk to 30 parts of paraffin.

4. A capsule composed of a composition in which predominates paraffin and 20 to 50 percent of chalk, said composition having a higher softening point and greater chewability than that of the paraffin in its pure state.

5. A capsule composed of a composition in which predominates paraffin and approximately 40 percent of chalk, said composition having a higher softening point and greater chewability than that of the paraffin in its pure state.

6. A chewable composition in which predominates paraffin and an inert filler which is wet more readily by paraffin than by water and which will not substantially chew out from the paraffin, said composition having a softening point higher than that of the paraffin in its pure state and the ratio of the filler to the paraffin being sufficient to substantially increase the chewability of the paraffin but being less than 70 parts of the filler to 30 parts of paraffin.

7. A chewable composition in which predominates paraffin and 20 to 50 percent of an inert filler which is wet more readily by paraffin than by water and which will not substantially chew out from the paraffin, said composition having a softening point higher than that of the paraffin in its pure state.

8. A chewable composition in which predominates paraffin and chalk, said composition having a higher softening point than that of paraffin in its pure state and the ratio of the chalk to the paraffin being sufficient to substantially increase the chewability of the paraffin but being less than 70 parts of chalk to 30 parts of paraffin.

9. A composition in which predominates paraffin and 20 to 50 percent of chalk, said composi-

tion having a higher softening point and greater chewability than that of the paraffin in its pure state.

10. A chewable composition which contains from approximately ½% to approximately 5% of a wax selected from the group consisting of carnauba, candelilla, ozokerite and beeswax and in which predominates paraffin and an inert filler which is wet more readily by paraffin than by water and which will not substantially chew out from the paraffin, said composition having a softening point higher than that of paraffin in its pure state and the ratio of the filler to the paraffin being sufficient to substantially increase the chewability of the paraffin but being less than 70 parts of the filler to 30 parts of paraffin.

11. A chewable composition which contains from approximately ½% to approximately 5% of beeswax and in which predominates paraffin and an inert filler which is wet more readily by paraffin than by water and which will not substantially chew out from the paraffin, said composition having a softening point higher than that of the paraffin in its pure state and the ratio of the filler to the paraffin being sufficient to substantially increase the chewability of the paraffin but being less than 70 parts of the filler to 30 parts of paraffin.

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