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J. B. EISEN

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CONTAINER CLOSURE

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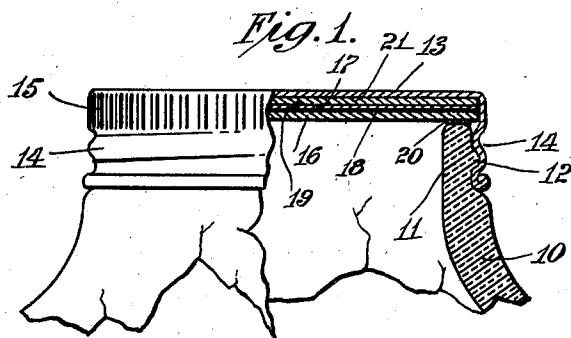
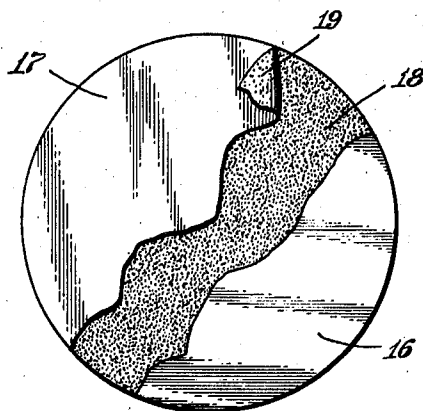


Fig. 2.



Jay Bernard Eisen
INVENTOR

Graun & Wentworth
ATTORNEY,

UNITED STATES PATENT OFFICE

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CONTAINER CLOSURE

Jay Bernard Elsen, Yonkers, N. Y., assignor to
Ferdinand Gutmann & Co., Brooklyn, N. Y., a
corporation of New York

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7 Claims. (Cl. 215—43)

The invention relates to container closures, and more particularly to a closure of the type having an inner seal disk adapted to be cemented permanently to the top of the neck of a container for the purpose of preventing access to the container and for preventing the escape of volatile constituents of such contents.

Closures of the general type to which the invention relates are extensively used in the packaging of drugs, medicines and various medicinal compounds, whether liquid, plastic or dry. Such closures are not only effective in preventing deterioration of the contents of a container, but afford an effective safeguard against dilution or adulteration of the contents of a container or a substitution of the products from one source for those from another source.

The character of the inner seal disk varies according to the nature of the material being packaged, as does the character of the adhesive used in cementing the disk to the mouth of the container. In packaging liquids, a disk of non-absorbent material must be used, and this material must be such as to prevent chemical reaction between the contents of the container and the material of the inner seal disk. When packaging materials having a highly volatile content, the construction of the inner seal disk must be such as to make the portion of the disk exposed through the mouth of the container impermeable to such volatile matter, while affording a suitable area which is sufficiently porous to secure an effective bond between the disk and the neck of the container. With some liquids the structure of the disk must be such as to avoid absorption of the liquids by that portion of the disk which comes in contact with the contents of the container.

Closures employing an inner seal disk are not employed in the packaging of liquids charged with gas, or with other liquids in which any substantial pressure is developed within a container as a result of the separation of gas from the liquid.

The closure of my present invention is of the general type of closures above referred to, differing therefrom, however, in the respect that its construction is such as to particularly adapt it to the packaging of cosmetics such as facial creams, salves and similar non-flowing compounds, or powdered or crystalline pharmaceutical and chemical preparations which may or may not contain highly scented volatile constituents. With such merchandise, deterioration of the inner seal disk from contact with the

contents of the container does not have to be guarded against, but deterioration of the contents of the container may result from the escape of the volatile constituents thereof through an inner seal disk if the construction of this disk is not such as to make it impermeable to such gaseous matter.

The portions of the inner disk presented toward the container contents must be of a material which will not react with chemicals in the container contents, or set up electrolytic action which may impair the quality or the therapeutic action of said contents, or, by decomposition of the facing of the inner seal disk, destroy its effectiveness in sealing the container.

An inner seal disk forming a part of the closure embodying the invention has the further advantage that an odorless adhesive may be used in bonding the disk to the mouth of a container, a highly desirable practice with some products.

With a closure embodying the invention, the volatile constituents of highly scented compounds may be absorbed by the portion of the sealing disk presented toward the container contents, but the construction of this disk is such as to prevent the escape of such volatile constituents to any material extent, and to prevent such volatile matter escaping entirely through the container or attacking any portion of the inner seal disk in a manner to impair the efficiency of the seal throughout that portion of the disk exposed within the mouth of the container.

In a closure embodying the invention, the inner seal disk may serve as a liner for the metal shell where it is unnecessary to provide the usual compressible packing gasket between the inner seal disk and the top of the shell. The inner seal disk may be removed from a container without mutilating or rupturing same, so that it may, if removed with care, be replaced in the metal shell and be used as an ordinary liner for re-seal purposes. If desired, however, a thin liner may be interposed between the inner seal disk and the top of the shell to prevent the contents of a container from engaging the metal shell, if the inner seal disk is not replaced in the shell.

The invention consists primarily in a container closure embodying therein a shell having a skirt adapted to co-operate with securing means formed about the neck of a container, and a liner within and separable from said shell, consisting of an inner seal disk including a fibrous stratum presented toward the bottom of the skirt, a stratum of thin metal foil presented toward the

top of the shell, and a bonding stratum permanently uniting said fibrous and said metal foil strata, whereby said inner seal disk may be firmly cemented to the top of the neck of a container and the escape of volatile matter from the container through said fibrous stratum is prevented; and in such other novel features of construction and characteristics as are hereinafter set forth and described, and more particularly pointed out in the claims hereto appended.

Referring to the drawing,

Fig. 1 is a view upon an enlarged scale, partly in section, of the neck of a container having applied thereto a closure embodying the invention; and

Fig. 2 is a view of the inner seal disk broken away upon parallel planes.

Like numerals refer to like parts in both of said views.

In the accompanying drawing, the closure of the invention is shown as applied to a glass container 10, specifically a jar for packaging a facial cream. The neck 11 of this jar is provided with the usual exterior screw threads 12.

The closure proper comprises a skirted shell 13, the skirt of which is provided with means, as rolled screw threads 14 adapted to co-operate with the screw threads 12, or other securing means formed about the neck of the container. The manner of forming the screw threads 14 is such as to leave a ring 15 at the top of the shell of slightly greater diameter than the adjacent portion of the skirt.

Within, and separable from, the shell 13 is a laminated liner forming an inner seal disk adapted to be permanently cemented or bonded to the top of the neck 11 of the container.

The adaptability of the closure to particular uses arises from the construction of this inner seal disk, which is such as to permit the use of odorless adhesives in cementing or bonding the disk to the neck 11, and to prevent the escape of volatile matter through the disk where it may contact with the top of the shell, or escape between the top of the shell and the skirt. Non-absorptive properties in this disk are not required, since a closure, of which the disk forms a part, is not used in the packaging of liquids. It is required, however, that the disk embody therein slightly compressible material, and that the portion thereof presented towards the top of the shell 13 be impermeable by volatile matter.

The inner seal disk above referred to embodies therein a lower stratum 16 which, in the assembled closure, is presented towards the bottom of the skirt or the neck of the container when it is applied thereto, this stratum being composed of fibrous material such as a fairly soft paper which is porous to a limited extent and sufficiently absorbent to enable the effective bonding thereof to the neck of the bottle by means of any cement which will adhere to the glass of the container. This stratum may have a thickness of .01 or .02 of an inch, or may be even thicker if desired. Thickness in the stratum 16 is merely for the purpose of permitting slight compression thereof, particularly when the closure is used as a re-seal closure, or compensating for slight irregularities in the formation of different screw threads 12 or 14.

The face of the inner seal disk presented toward the top of the shell 13 consists of a metal foil stratum 17 which is bonded to the stratum 16 by an intermediate stratum 18 of any suitable adhesive which will act with both the material of the stratum 16 and the stratum 17. Preferably,

I employ a well known adhesive having a cellulose base, which adhesive is heat fusible so that a strip or sheet of the metal foil may be coated therewith and, while in a dry state, be bonded to a strip or sheet of the fibrous material by the application of heat and pressure. This adhesive is also sufficiently non-porous to retard volatile matter in its tendency to penetrate the fibrous stratum and possibly the metal foil. The strata 16, 17 and 18 are all of the same diameter.

The stratum 17 of metal foil may be very thin, .001 of an inch or less. Its location adjacent the top of the shell 13, with the adhesive stratum 18 and the fibrous stratum 16 between it and the contents of the container, avoids any of those stresses resulting in the deformation of the liner and the development of voids through which volatile matter may escape. This metal foil is no factor in the formation of the seal about the top of the neck of the container, and any minute openings therethrough, because of the thinness of the metal foil, are closed by the adhesive, or are so minute as to not interfere in the effective sealing of the container. In fact, the presence of small voids in the stratum 18 or in the metal foil stratum 17 is not objectionable in the packaging of products with which the closure is ordinarily used.

With certain medicinal compounds, however, such voids are objectionable, since they permit of chemical reaction between the metal foil and the contents of a container.

To correct this condition, it is sometimes desirable to provide the metal foil, upon the face thereof to which the adhesive stratum is attached, with a protecting coating 19 of lacquer, preventing, at all times, possibility of volatile matter from the contents of the container reaching the metal foil. Such lacquer coating also bonds firmly to metal foil and provides an effective base for the cement used in bonding the metal foil to the fibrous stratum.

In the use of a closure embodying the invention, a suitable adhesive, selected from a wide range of such adhesives used in permanently bonding an inner sealing disk to the neck of a container, is applied to the top of the neck of the container.

A closure embodying the invention is then applied to the container by the usual machines, sufficient pressure being developed to form a continuous seal 20 of adhesive about the top of the neck of the container.

When opening a jar, the shell 13 may be readily removed from the neck of the jar, and the separability of the inner seal disk or liner from the shell permits this disk to remain upon the container to which it is bonded.

To remove any of the contents of the container, the user merely strips the inner seal disk from the neck of the container, the edge of the disk projecting outwardly of the top of the mouth of the container affording an adequate handhold to facilitate the removal of the disk. If care be used in removing the disk from the container, though fibers of the stratum 16 may adhere to the top of the mouth of the container, this disk may be replaced in the metal shell, thus permitting the closure to be used as a re-seal closure.

The thickness of the laminated inner seal disk or liner and the manner of forming same, gives this disk sufficient rigidity to cause it to remain in the metal shell, the enlarged portion 15 aiding in the retention of the disk in the shell, either during assembly of the closure or when it is being

used as a re-seal closure during the consumption of the contents of the container.

If desired, however, an additional liner 21 may be interposed between the metal foil stratum 17 and the top of the shell 13. This is immaterial, however, and when used, the additional liner is employed merely to permit the use of the closure in re-sealing a container when it is desired to avoid contact between the contents of the container and the metal shell.

The thin metal foil stratum 17 embodied in the inner seal disk in the manner described, prevents any of the volatile matter passing through the pores of the facing stratum 16, escaping between said stratum 16 and the shell 13.

A closure embodying the invention is particularly attractive in appearance when opening a container because of the presence of the metal foil at the top of the inner seal disk. This, however, is a mere incident, since the main utility of the device resides in the effective closure of a container and in affording protection against the escape of volatile matter therefrom.

A closure embodying the invention cannot be effectively used in the packaging of liquids.

It is obvious that the inner seal disk must possess sufficient flexibility to permit its insertion by hand, or by machine, in a metal shell, and the removal of the metal shell from a container without mutilating the laminated inner seal disk or disturbing the bond between same and the neck of a container.

It is not my intention to limit the invention to the use of any particular metal foil, or any particular adhesive, it being obvious that such may vary according to the character of the merchandise being packaged in a container with which the closure is used.

Having described the invention, what I claim as new and desire to have protected by Letters Patent, is:—

1. A container closure embodying therein a shell having a skirt adapted to co-operate with securing means formed about the neck of a container, and a liner within and separable from said shell, consisting of an inner seal disk including a fibrous stratum presented toward the bottom of the skirt, a stratum of thin metal foil presented toward the top of the shell, and a bonding stratum permanently uniting said fibrous and said metal foil strata, whereby said inner seal disk may be firmly cemented to the top of the neck of a container and the escape of volatile matter from the container through said fibrous stratum is prevented.

2. A container closure embodying therein a shell having a skirt adapted to co-operate with securing means formed about the neck of a container, and a liner within and separable from said shell, consisting of an inner seal disk including a fibrous stratum presented toward the bottom of the skirt, a stratum of thin metal foil presented toward the top of the shell, a bonding stratum permanently uniting said fibrous and said metal foil strata, and a lacquer finish upon the surface of the metal foil presented toward said bonding stratum, whereby said inner seal disk may be firmly cemented to the top of the neck of the container, the escape of volatile matter from the container through said fibrous stratum is prevented, and chemical action of such volatile matter upon the metal of said foil stratum is prevented.

3. A container closure embodying therein a shell having a skirt adapted to co-operate with

securing means formed about the neck of a container, a liner within and separable from said shell, consisting of an inner seal disk including a fibrous stratum presented toward the bottom of the skirt, a stratum of thin metal foil presented toward the top of the shell, and a bonding stratum permanently uniting said fibrous and said metal foil strata, whereby said inner seal disk may be firmly cemented to the top of the neck of a container and the escape of volatile matter from the container through said fibrous stratum is prevented, and a liner between said inner seal disk and the top of the shell.

4. A container closure embodying therein a shell having a skirt adapted to co-operate with securing means formed about the neck of a container, a liner within and separable from said shell, consisting of an inner seal disk including a fibrous stratum presented toward the bottom of the skirt, a stratum of thin metal foil presented toward the top of the shell, a bonding stratum permanently uniting said fibrous and said metal foil strata, and a lacquer finish upon the surface of the metal foil presented toward said bonding stratum, whereby said inner seal disk may be firmly cemented to the top of the neck of the container, the escape of volatile matter from the container through said fibrous stratum is prevented, and chemical action of such volatile matter upon the metal of said foil stratum is prevented, and a liner between said inner seal disk and the top of the shell.

5. A container closure embodying therein a shell having a skirt adapted to co-operate with securing means formed about the neck of a container, said skirt adjacent the top of said shell having a ring of slightly greater diameter than the adjacent portion of the skirt, and a flexible liner within and separable from said shell, consisting of an inner seal disk including a fibrous stratum presented toward the bottom of the skirt, a stratum of thin metal foil presented toward the top of the shell, and a bonding stratum permanently uniting said fibrous and said metal foil strata, whereby said inner seal disk may be firmly cemented to the top of the neck of a container and the escape of volatile matter from the container through said fibrous stratum is prevented.

6. A container closure embodying therein a shell having a skirt adapted to co-operate with securing means formed about the neck of a container, said skirt adjacent the top of said shell having a ring of slightly greater diameter than the adjacent portion of the skirt, and a flexible liner within and separable from said shell, consisting of an inner seal disk including a fibrous stratum presented toward the bottom of the skirt, a stratum of thin metal foil presented toward the top of the shell, a bonding stratum permanently uniting said fibrous and said metal foil strata, and a lacquer finish upon the surface of the metal foil presented toward said bonding stratum, whereby said inner seal disk may be firmly cemented to the top of the neck of the container, the escape of volatile matter from the container through said fibrous stratum is prevented, and chemical action of such volatile matter upon the metal of said foil stratum is prevented.

7. A container closure embodying therein a shell having a skirt adapted to co-operate with securing means formed about the neck of a container, said skirt adjacent the top of said shell having a ring of slightly greater diameter than the adjacent portion of the skirt, a flexible liner

within and separable from said shell, consisting of an inner seal disk including a fibrous stratum presented toward the bottom of the skirt, a stratum of thin metal foil presented toward the top of the shell, a bonding stratum permanently uniting said fibrous and said metal foil strata, and a lacquer finish upon the surface of the metal foil presented toward said bonding stratum, whereby said inner seal disk

may be firmly cemented to the top of the neck of the container, the escape of volatile matter from the container through said fibrous stratum is prevented, and chemical action of such volatile matter upon the metal of said foil stratum is prevented, and a liner between said inner seal disk and the top of the shell.

JAY BERNARD EISEN.