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A. S. AMALIKSEN
COMPRESSED SPONGE PACKAGE

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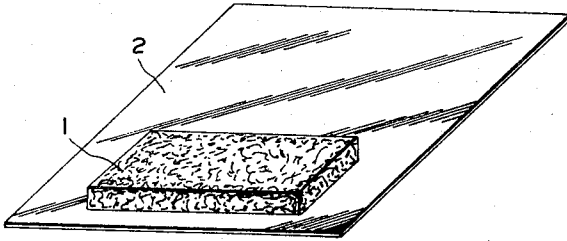


FIG. 1

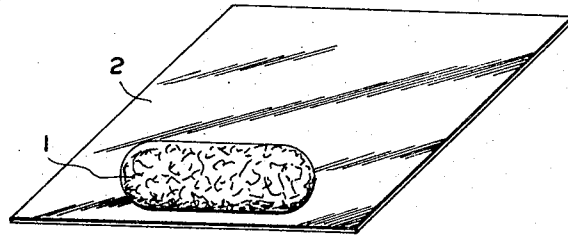


FIG. 2

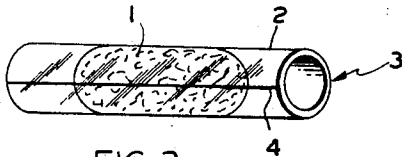


FIG. 3

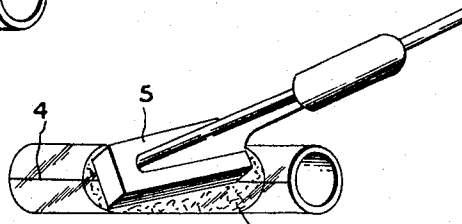


FIG. 4

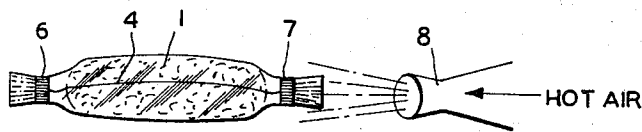


FIG. 5

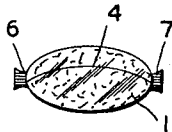


FIG. 6

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ATTORNEYS

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COMPRESSED SPONGE PACKAGE

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5 Claims. (Cl. 206—46)

This invention relates to a novel means of packaging a sponge in a compressed form.

Since the advent of foamed, synthetic thermoplastic materials and the development of inexpensive processes for their preparation, sponges in all shapes and forms have become one of the commonest means of applying one material to another. Among such uses for sponges are the personal application of cosmetics, the coating of metal with a lubricant, the application of a cleaner to a surface, the spreading of adhesive over a substrate, the covering of a surface with paint, and many other every day uses in industry and the home. Since many of these uses lend themselves to the modern day concept of "throw away" applicators, it is desirable to provide a small convenient package for a sponge designed for a particular use. The word "sponge," wherever used herein, is intended to include any variety of resilient, compressible, porous, absorbent material such as natural sponges, synthetic cellular sponges, felts, textile batting, fibrous pads, and other materials capable of holding liquids, semi-solids, or solids in the interstices or cells of the material.

It is an object of this invention to provide a packaged, compressed sponge. It is another object of this invention to provide a packaged, compressed sponge wherein the sponge is impregnated with a liquid or a solid. It is still another object of this invention to provide a packaged, compressed sponge in which the outer wrapping of the package is a shrunken film. It is still another object of this invention to provide a compressed sponge in a small package that can easily be included as an added component to a larger package of cosmetics, lubricant, cleaner, adhesive, paint, or the like. Still other objects will appear from the more detailed description of this invention which follows.

The foregoing objects are accomplished in accordance with this invention by providing a packaged, compressed sponge comprising a sponge tightly compressed into a small, rounded shape and contained by a heat-shrunken capsule of a synthetic thermoplastic film. In the preferred embodiment of this invention, the sponge is a polyurethane sponge impregnated with any suitable liquid or solid and the package is a shrunken film of polyvinyl chloride, polyvinylidene chloride, polyethylene, polypropylene, or a polyurethane. One particular object of this invention is accomplished by providing a process for preparing the above-described package by the sequential steps of partially compressing a sponge, wrapping it with at least two layers of a heat-shrinkable, synthetic thermoplastic film, heat-sealing the layers of film to form a capsule completely enclosing the sponge, and heating the capsule, causing it to shrink and to compress the sponge into a tightly bound package.

The invention is shown in some detail in the attached drawings which are isometric views of the steps involved in producing the package of this invention. FIGURE 1 shows a sponge and a film for use in preparing the package. FIGURE 2 shows the sponge in a precompressed condition prior to being wrapped in the film. FIGURE 3 shows the precompressed sponge wrapped in the film. FIGURE 4 shows the heat-sealing of the wrapping of FIGURE 3. FIGURE 5 shows the closed package being heated by hot air. FIGURE 6 shows the shrunken package of this invention.

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The drawings show the sequential operations of packaging a sponge material in a film so as to prepare the final product illustrated in FIGURE 6. In FIGURE 1 a sponge of any suitable size or shape is shown at 1 with a piece of suitable film material 2 sufficiently large in size to provide at least two layers of wrapping around the partially compressed sponge. Sponge 1 may or may not contain in its porous structure a liquid, a semi-solid, or a solid material.

In FIGURES 2 and 3 the sponge 1 is precompressed by rolling it into a small size which normally results in an irregularly rounded shape, as shown in FIGURE 2. Sponge 1 in its precompressed, rounded shape is then partially wrapped by rolling it into film 2 which completely enclosed the compressed sponge. The resulting tubular article 3 is shown with the outside edge 4 of film 2 forming a longitudinal lap ready to be sealed.

FIGURE 4 illustrates the operation of heat-sealing the tubular package 3 along edge 4 by the application of a hot iron 5 or other equivalent apparatus. By means of the same type of heating iron lateral heat seals 6 and 7 are then applied to the package. The two seals 6 and 7, as shown in FIGURE 5, are made a short distance, perhaps a quarter of an inch, away from the nearest portion of sponge 1 so that there will be room for the film to shrink and the seals to contract around the sponge. The three seals at 4, 6, and 7 close the entire package so that there is no possible communication between the outside and inside of the package.

FIGURE 5 shows the package, after preparation of seals 4, 6, and 7, being heated by hot air from nozzle 8. Since the package is wrapped in a heat-shrinkable film, sufficient heat must be supplied to cause the film around the package to shrink and to compress sponge 1 further, so as to produce a tightly bound package as shown in FIGURE 6. This package may occupy only about 10% to about 30% of the volume of sponge 1 before compression.

The sponge which is to be packaged in accordance with this invention may be any of the types available today, including natural sponges and the sponges made of synthetic materials such as cellulose, nylons, rubbers, polyurethanes, polyolefins, etc. Furthermore, any other resilient, compressible, porous, absorbent material may be employed, e.g. wool felt, cotton batting, gauze pads, fibrous structures, textile materials, etc. There is nothing critical about the sponge which is employed except that it must be one which is sufficiently resilient to be compressed into a small package, and upon release of the restraining forces will return to its original condition and shape. Because of the widespread use of synthetic sponge materials this invention is particularly applicable to the synthetic sponge rather than the natural sponge.

The sponge may or may not be impregnated with a liquid or solid material prior to its packaging. Many consumer products today are designed to provide in a single combination package the materials to perform a job consisting of two or three steps employing different materials in each step. For example, in the cleaning field a single package might contain a cleaner for removing the corrosion or deposit from a surface, and a wax or polish to be applied to the cleaned surface. The cleaner might be in a can and the wax impregnated in a sponge and packaged in accordance with this invention. Alternatively, it might be desirable to market a small container of sprayable lacquer to be applied to a polished brass surface, and to include small packages of sponges impregnated with a brass cleaner. In still other instances, it might be desirable to market a can of material for cleaning deposits on the walls of ovens, and to include small packages of sponges impregnated with silicone oil to be

applied to the cleaned walls to make subsequent deposits easy to remove. In other instances, one might wish to market a container of a polish or a cleaner and to include sponges filled with an abrasive powder which could be used to scour the surface before the polish or cleaner was applied. The impregnating material might be any of many types of liquid or solid materials such as greases, oils, powders, crystals, fibers, small pieces of wire, and the like. If the impregnating material is a solvent or a reactive chemical, it is, of course, necessary to select the proper type of sponge material so that neither will react with the other. Polyurethanes are particularly good in many applications because they are both inert and inexpensive.

The sponge may be of any size or shape. Normally, sponges are made in the shape of a rectangular solid as shown in FIGURE 1 of the attached drawings, but equally usable in the package of this invention are any other shapes, e.g., rounded, elongated, or irregularly molded shapes, since the sponge must be folded and compressed into a rounded shape for packaging.

The film which functions as the container of the package is any heat-shrinkable thermoplastic film. For the most part these materials are transparent and thus permit the consumer to see the packaged contents. The materials in the group of heat-shrinkable films include, but are not limited to, polyvinyl chloride, polyvinylidene chloride, polyethylene, polypropylene, polyurethane, and others. The amount of film which is employed is only that necessary to prepare a completely enclosed package. In certain embodiments of this invention, it is preferred if at least two layers of film surround the compressed sponge to provide adequate film for heat-sealing and to retain the impregnated liquid or solid without permitting it to be squeezed out around the layers of film in the package. Furthermore, the presence of some impregnating materials, such as silicone oils, on the contacting surfaces of the films makes the heat-sealing operation ineffective, and thus at least two layers of film are necessary to make it certain that silicone oil is confined to the compressed sponge.

In the process of this invention, a heat-sealing process has been employed to bind the package. It is not necessary to employ heat-sealing since the use of adhesives or

solvents for softening the film are capable of producing a totally enclosed, preshrunk package. The shrinking operation may also be accomplished by any convenient alternate method of heating the film quickly and efficiently, e.g., hot air, steam, hot water, etc., supplied by any convenient apparatus.

Although the invention has been described in considerable detail with reference to certain preferred embodiments thereof, it will be understood that variations and modifications can be effected within the spirit and scope of the invention as described hereinabove and as defined in the appended claims.

What is claimed is:

1. A packaged, compressed sponge comprising a porous sponge, impregnated with an impregnating material, tightly compressed into a small size and totally enclosed by and sealed in a shrunken capsule of a synthetic thermoplastic film.

2. The package of claim 1 wherein the sponge is impregnated with a liquid.

3. The package of claim 1 wherein the sponge is impregnated with a semi-solid.

4. The package of claim 1 wherein the sponge is impregnated with a powdered solid.

5. The package of claim 1 wherein the sponge is polyurethane material and the synthetic thermoplastic is polyvinyl chloride, polyvinylidene chloride, polyethylene, polypropylene, or polyurethane.

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