METHOD OF PACKAGING HYGROSCOPIC SPONGES

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This invention relates to a new method of packaging natural and artificial hygroscopic sponges for shipment, and more particularly to the packaging of what is commonly known as cellulose sponge.

The method of manufacturing artificial sponges from a cellulose xanthogenate solution, such as outlined in Patents Nos. 1,909,629 and 1,974,393, and many other patents, is well known. In most of the known processes, a mixture of a viscose solution, a pore forming soluble or melt-able salt, and reinforcing fibrous material is subjected to one of many known processes for coagulating and regenerating the viscose mixture into cellulose hydrate. The general procedure is to pack the viscose mixture in a mold of suitable size and shape and then coagulate and regenerate the mixture to cellulose hydrate. When the coagulation and regeneration is completed the sponge mass is removed from the mold, washed and treated. The blocks of sponge are then dried, trimmed of its skin, cut into smaller blocks of desired size, and packaged for shipment and sale in a dry condition.

It has been found that the cut blocks of dry sponge will gradually shrink, warp out of shape, and get hard, when they remain in the open for some length of time. In some cases the smaller blocks of cellulose sponge are compressed in a dry state in order to reduce shipping costs and to save space. However, when cellulose sponge has been compressed in a dry state for any length of time it will not regain its original shape again until it has been moistened. These properties are very undesirable from a sales point of view and may be avoided if the cellulose sponge is packaged in accordance with this invention.

In the importation and exportation of cellulose sponge it has been tried in some cases to ship uncut blocks of dry cellulose sponge in a compressed state in order to reduce the cost of shipping. After the compressed sponge reaches its destination it is subjected to a moisture treatment to restore the block of sponge to its original size, again dried, trimmed, and cut to sizes desired. From a cost point of view this method of packaging sponge has not been found satisfactory.

The principal object of this invention is to provide a cheap and efficient method of packaging cellulose sponge in a compressed state to reduce the cost of shipping, and in such a manner that the sponge will regain its original shape when unpacked. This object is accomplished by compressing the cellulose sponge while in a wet condition and packaging it in a substantially air tight container, or a container that will retard the drying out of the sponge, approximately the size of the compressed block of sponge. It has been found that the cellulose sponge will remain wet in the container for a considerable period of time and that when the sponge is removed from its package in a wet condition it will retain readily its original shape and size.

Another object of this invention is to provide a simple method of packaging wet (hygroscopic) cellulose sponge articles in an uncompressed state in a substantially air tight and transparent container to maintain the sponge in a wet condition and to increase the sales appeal of the article. Heretofore, un-packaged cellulose sponge articles have been sold over the counter in a relatively dry and hard condition which offers little sales appeal to those unfamiliar with the physical properties of cellulose sponge. It has been proven that the packaging of cellulose sponge articles in a moist and soft condition in a substantially air tight transparent and flexible container increases the sales of the article to a considerable extent.

Referring to the accompanying drawings, Fig. 1 illustrates an uncompressed block of wet hygroscopic sponge sealed in a substantially air tight and flexible container; Fig. 2 illustrates compressed blocks of wet hygroscopic sponge sealed in individual flexible containers which are compressed and packaged in a shipping carton; and Fig. 3 illustrates a large uncut compressed block of wet hygroscopic sponge sealed in a substantially air tight and waterproof shipping container.

The following methods serve to illustrate the invention:
(a) Wet cellulose sponge is compressed and packaged in a pliable and substantially air tight container made of cellophane, or other suitable material, of a size approximately the size of the compressed block of sponge to maintain the sponge in a compressed state. When so packaged the sponge will remain soft and pliable for a considerable length of time and will regain its original shape and size when unpacked in a wet state. This property is a very desirable feature from a sales point of view. If desired, a plurality of moist sponges may be compressed and shipped in a single substantially air tight container.
(b) Wet cellulose sponge is packaged in an uncompressed state in a pliable and substantially air tight container made of cellophane or other suitable material. The packaged sponge is then compressed and packaged in another substantially air tight container of a size that will retain
the sponge in a compressed state. When the latter container is unpacked the compressed filled container will regain its original shape and the sponge will remain soft and pliable for a considerable length of time.

(c) When it is desired to ship large quantities of uncut blocks of cellulose sponge as it comes from the molds, another method is to squeeze the water out of the sponge after it has been treated with an emollient, leaving it in a wet condition, and compressing the sponge into a substantially air tight shipping container which will retain the sponge in a compressed state. When the sponge reaches its destination, the uncut blocks of sponge may be removed from the shipping container and allowed to regain their original shape. When the blocks of sponge have regained their original shape, they may be trimmed while in a wet condition, cut to desired sizes, and relabeled in a wet condition by either of the methods outlined above. It has been found that cellulose sponge can be cut with a sharp knife when in a wet condition just as easily as when it is dry. This method of packaging sponge for large shipments will reduce materially the shipping costs.

(d) Moist and soft cellulose sponge articles may be packaged in an un compressed state in a substantially air tight transparent and flexible container to maintain the moisture content and softness of the sponge.

It will be here noted that the degree of moisture defined herein describing the sponge as in wet, soft condition is sufficient to prevent the sponge from becoming dry and harsh in texture when packaged in a substantially air tight container. The wet condition of the sponge referred to is a condition in which the sponge includes a moisture content substantially greater than induced moisture content of such sponge when exposed to atmosphere having one hundred per cent humidity.

In packaging sponge in accordance with any of the above methods, the blocks of sponge as they come from the molds may be cut to sizes desired while in a wet condition, thus saving the cost of drying the sponge before being cut, as is now the practice.

In the manufacture of cellulose sponge the sponge is thoroughly washed and treated with an emollient after it is removed from the molds. In order to prevent the growth of bacteria and fungus in the sponge when it is packaged in a wet condition, it may be treated with a chemical that will prevent the growth of bacteria and fungus, at the time it is treated with an emollient, by placing the chemical in the emollient fluid.

Like numerals refer to like parts throughout the drawings.

Referring to the drawings, numeral 2 designates an un compressed block of wet hygroscopic sponge sealed in a substantially air tight transparent flexible container 1, which may be made of such materials as poly-ethylene, Pilofilm and celophane, in which are provided very small breather holes 3 (approximate pinpoint size) to allow for the escape of the air when the package is compressed and to allow for the intake of air when the package is decompressed. It is found by experiments over a long period of time that these small breather holes do not affect materially the evaporation of the moisture in the sponge through the walls of the container. In cases where the ends of the package are not completely hermetically sealed these breather holes will not be necessary.

Fig. 2 illustrates twelve packages of the foregoing package of hygroscopic sponge compressed to about one third (% of original thickness and packaged in a suitable shipping container. It is found that the sponge when so packaged will remain moist for long periods of time, and that the sponge will regain its original size and shape when removed from the shipping case.

Fig. 3 illustrates a large uncut block of wet hygroscopic sponge compressed to about one third (% of original size and packaged in a substantially air tight and waterproof container 5. The sponge will remain moist for a long period of time, and when unpackaged it will regain its original shape and size, after which it may be cut into smaller blocks of desired size. This method of packaging is desirable when shipments are made by water transportation where the size of the package determines to a great extent the freight costs.

My invention is not limited to the foregoing examples nor to the specific details therein given. Variations may be made in the packaging of cellulose sponge in a compressed and moist state without departing from the spirit of the invention as set forth in the following claims.

I claim:

1. A method of packaging a hygroscopic sponge, which includes adding to said sponge a moisture content substantially greater than induced moisture content of such sponge when exposed to atmosphere having one hundred per cent humidity, compressing the sponge with said moisture content, and packaging the compressed sponge in a substantially air tight container that will retain the sponge in a compressed state and a wet condition for a considerable length of time.

2. A method of packaging hygroscopic sponge, which includes adding to said sponge a moisture content substantially greater than induced moisture content of such sponge when exposed to atmosphere having one hundred per cent humidity, compressing a plurality of sponges with said moisture content, and packaging the compressed sponges in a substantially air tight container which will retain the sponges in a compressed state and a wet condition.

3. A method of packaging hygroscopic sponges, which includes packaging wet sponges in individual pliable containers which are substantially air tight, compressing the pliable container and the sponges therein, and packaging them in a substantially air tight container that will retain the filled pliable containers in a compressed state.

4. A method of packaging hygroscopic sponge which is cellular, compressible, resilient and highly flexible and retains its normal size and appearance when moist and which becomes stiff and has its resiliency materially impaired and may have its shape or size altered when dry, comprising imparting to the hygroscopic cellular sponge a moisture content substantially greater than the induced moisture content of such hygroscopic cellular sponge when exposed to the atmosphere having one hundred per cent humidity, then enclosing said hygroscopic cellular sponge while in said moist condition in a substantially air-tight container which is light transmitting and highly flexible and thereby retaining the moist hygroscopic cellular sponge in the moist condition for a long time, the flexible light transmitting container permitting the customer to observe the condition of the moist.
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hygroscopic cellular sponge and to feel its flexibility.

5. The method of packaging hygroscopic sponge which is cellular, compressible, resilient and highly flexible and retains its normal size and appearance when moist and which becomes stiff and has its resiliency materially impaired and may have its shape or size altered when dry, comprising taking the hygroscopic sponge having a moisture content substantially greater than the induced moisture content of such hygroscopic cellular sponge when exposed to the atmosphere having one hundred per cent humidity, then enclosing said hygroscopic cellular sponge having said substantially greater moisture content in a substantially air tight container which is light transmitting and highly flexible and thereby retaining the moist hygroscopic cellular sponge in the moist condition for a long time, the flexible light transmitting container permitting the customer to observe the condition of the moist hygroscopic cellular sponge and to feel its flexibility.

6. The method of packaging hygroscopic sponge which is cellular, compressible, resilient and highly flexible and retains its normal size and appearance when rendered suitably moist, comprising applying a volatile fluid moistening agent comprising water to said hygroscopic cellular sponge and thereby imparting to the hygroscopic cellular sponge a moisture content substantially greater than the induced moisture content of such hygroscopic cellular sponge when exposed to the atmosphere having one hundred per cent humidity, then severing said hygroscopic cellular sponge while having said imparted moisture content into smaller sections, then enclosing said smaller sections while having said imparted moisture content in substantially air tight containers which are light transmitting and highly flexible and thereby retaining said smaller sections in a moist condition for a long time, the flexible light transmitting containers permitting the customers to observe the condition of the moist smaller sections and feel their flexibility.

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The following references are of record in the file of this patent:

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