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BLEACHING OF SPONGES

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The present invention relates to the cleaning and bleaching of sponges and more particularly to a treatment wherein sponges of exceptionally light color may be produced.

Sponges, as they appear on the market in the crude state, are very dark in color and are filled with a considerable amount of inorganic foreign material.

It has been proposed heretofore to prepare sponges of a leveled color by treatments which eliminate a considerable portion of colored material from the sponge and, in addition, remove some of the inorganic coloring material. These treatments, however, are not for the production of a sponge of light color but for the production of a sponge of even level color. In general, such treatments were carried out by first treating the sponge with acid and thereafter with permanganate. The resulting sponge was brown in color and relatively free of inorganic material.

It is an object of the present invention to provide a method for preparing sponges of very light color as demanded by certain types of market.

In accordance with the procedure of the present invention, the sponge in the unbleached condition is soaked in water for a considerable period of time under conditions wherein inorganic matter is rendered soluble and is removed from the sponge. Due to the large apparent volume of the sponge in the wet condition, extremely large liquor ratios are employed and in general a ratio of treating solution to sponge of about 20 to 1 is found to be suitable. In order to remove the inorganic material from the sponge, the treating solution should contain in 1,000 ccs. sufficient acid, such as hydrochloric or other mineral acid to form soluble salts with the inorganic material. In general, 5 ccs. of concentrated hydrochloric acid to 1,000 ccs. of solution will be found suitable. This acid attacks lime and calcium salts as well as other minerals occurring in the sponge to produce soluble chlorides thereof. In order to eliminate certain combinations of iron, a fluoride, such as sodium fluoride or sodium bifluoride, is added in desirable quantities, and in general about 5 grams of sodium bifluoride will be found sufficient. After the sponges have steeped in the bath for about three hours at room temperature, or moderately elevated temperature, or in any event for a time sufficient to dissolve the inorganic impurities, the solution is drained off and the sponges rinsed and squeezed out in water.

After the cleaning action of the acidified solution upon the sponge is complete, the sponge is

then given a preliminary treatment which, in itself, is not a bleaching treatment for the reason that, although the color of the sponge is lightened, color returns in the sponge upon standing.

5 This preliminary treatment comprises a treatment of the sponge at room or slightly elevated temperatures by immersion in a high liquor ratio bath of about 20 to 1 containing in 1,000 ccs. about 3 grams of a soluble chlorite and acidified with an acid, as, for instance, sulfuric acid or other suitable acid. The amount of acid will be sufficient to reduce the pH of the bath to a point at which the chlorite forms ClO_2 at the temperature employed, and for the amount of chlorite suggested above, 2 ccs. concentrated sulfuric acid will be found sufficient. It will be understood that where sponges contain very considerable amounts of the dark red colors, the amount of chlorite may be increased to about 5 grams per liter. After steeping for about three hours, the sponges are removed, rinsed and squeezed out with water. Although some lightening in color is obtained, it is not possible to obtain fully bleached sponges by the employment of the soluble chlorite alone. Furthermore, colors obtained by the chlorite treatment are not stable since the sponge gradually reacquires color on standing.

10 In accordance with the procedure of the present invention, bleached stable end colors in the sponge are obtained by treating the sponge, subsequent to the preliminary treatment with the soluble chlorite, with a peroxide or percompound, such as peroxides of hydrogen, sodium, potassium, or other alkali metals, or the peroxides of alkaline earth metals, as well as persalts, such as soluble perborates, percarbonates, persulfates, and the like, all designated herein as peroxides. The sponge, after being treated with the chlorite and rinsed, is steeped at a liquor ratio of about 20 to 1 in a peroxide bleach bath at a moderate temperature, i. e., either room temperature or temperatures up to about 60° C. This steeping is carried out until the proper bleached condition is obtained and in general requires about 2 to 20 hours, more or less. The bleach bath should, in addition to the peroxide, contain some material rendering the bath slightly alkaline but not so alkaline as to damage the sponge. In general, mild alkalies are suitable for this purpose, such as ammonia, bicarbonate, pyrophosphate, and the like. Additionally, certain salts aiding the bleaching action may be present. A formulation that has been found eminently suitable and has been

given for purposes of illustration only is as follows:

In 1,000 cc. solution—

100-volume hydrogen peroxide-----cc--	20
Sodium pyrophosphate -----g--	5
Sodium oxalate -----g--	5

It will of course be understood that this composition may be varied within rather wide limits, keeping in mind that the alkalinity should not be too great and that the temperature should not be so high as to produce damage in the sponge structure or fiber. After steeping for the requisite time in the peroxide bleach bath, the sponge is rinsed and squeezed out. It is an excellent, even, level color with a very slight yellow cast of the type demanded in certain trades and, furthermore, is of a color permitting the sponge to be dyed with fast colors and particularly the desirable pastel shades.

From the foregoing it will be seen that the present invention provides a method for the

production of sponges of very light, level colors and in excellent bleached condition without damage to the sponge while at the same time foreign, inorganic matter is removed from the sponge.

What is claimed is:

1. The method of treating sponges to lighten the color thereof which comprises washing the sponge with dilute acid to remove inorganic matter and then immersing the sponge in an acidified solution of a soluble chlorite and thereafter steeping the sponge in a slightly alkaline peroxide solution.
2. The method of treating sponges to lighten the color thereof which comprises washing the sponge with dilute acid to remove inorganic matter and then immersing the sponge in an acidified solution of a soluble chlorite and thereafter steeping the sponge in a slightly alkaline peroxide solution at a moderate temperature and until the sponge is bleached.

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