

UNITED STATES PATENT OFFICE.

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GERMANY; SAID FRANKE ASSIGNOR TO SAID SARASON.

OXYGEN BATH.

1,057,281.

No Drawing.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, LEOPOLD SARASON and EMIL FRANKE, subjects of the King of Prussia, German Emperor, and residing, respectively, at Berlin and Grünau, near Berlin, Germany, have invented certain new and useful Improvements in Oxygen Baths; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to oxygen baths.

The principal objects in the preparation of oxygen baths by a catalytic process are to decompose the peroxid, as evenly as possible during the continuance of the bath, to reduce the diameters of the free bubbles of oxygen as much as possible, and to obtain the highest possible degree of saturation of the water of the bath with oxygen. As the normal power of absorption of the water, at bath temperature, is very slight, sufficient quantities of oxygen, to precipitate on the skin of the bathing person in the form of adhesive bubbles, can only be brought into practical effect by the production of a high degree of super-saturation. For this reason, the selection of a suitable catalytic is very important.

Of all the catalytics which have been used for oxygen baths, peroxid of manganese, either in a finished state or *statu nascendi*, has proved to be the best. Even when this catalytic is used, it requires large quantities of it for effectively accomplishing the desired result. Furthermore, peroxid of manganese, as heretofore used, produces flocks of floating undecomposed material which are undesirable because they soil the skin and the bath receptacles. Under pre-existing conditions, a bath of 250 liters of water required from 8.75 grams to 12½ grams of peroxid of manganese and 300 grams of perborate of sodium, and the degree of super-saturation obtained was very slight, only from 2.2% to 3.5% of the volume after thirty minutes.

We have discovered that a better effect is obtained by the use of colloidal peroxid of manganese than by the use of any of the heretofore known catalytics. A very much smaller quantity of this new catalytic will suffice in the same proportions of water and perborate of sodium. For instance, in 250

liters of water and 300 grams of perborate of sodium, only 0.42 gram of colloidal peroxid of manganese is required. In spite of the small quantity of this catalytic which is employed, the degree of supersaturation obtained is about 5.1% of the volume and the bubbles are much smaller in diameter than when insoluble manganese dioxid is used. The hydrosol of manganese dioxid is only active with alkaline reaction of the water of the bath. It is particularly surprising that the hydrosol of manganese dioxid does not form flocks, as hereinbefore described, even when perborate, percarbonate, and the like, are used as electrolytes, although the metal-hydrosols, as is well known, do not act consistently with even small quantities of electrolytes.

The colloidal peroxid of manganese may be used in solution or in a dry state, and either alone or in combination with other substances. The finished hydrosol of manganese dioxid may be dissolved in the water of the bath or formed in the bath water from soluble salts of manganese, such as tartrate of manganese, chlorid of manganese, and sulfate of manganese, and also from potassium permanganate by the influence of the oxygen *in statu nascendi*, but only very small quantities of said ingredients should be used. For instance, from three to four grams of sulfate of manganese or tartrate of manganese, or 0.5 gram of potassium permanganate are usually sufficient for the formation of the hydrosol of manganese dioxid. If larger quantities of these ingredients are used, the manganese dioxid is not converted into the active colloidal solution but appears in the more inactive flocks.

The formation of the hydrosol, which can be seen from the yellow color of the water, is promoted by the presence of certain acids and salts, especially tartaric acid, tartrates, bisulfate, carbonate, bicarbonate and borax. The stability of the hydrosol is increased by using, at the same time, a so-called protective colloid such as albumen, gelatin, casein, dextrin, sugar, glycerin, gum, saponin, licorice, starchy substances, or compositions of the same.

One way of preparing a bath in accordance with our invention is to dissolve either 300 grams of perborate of sodium, 150 grams peroxid of sodium or 2½ liters of per-

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oxid of hydrogen, in 250 liters of water, and afterward add a colloidal solution of dioxid of manganese which contains 0.42 gram of dioxid of manganese. If preferred, in lieu
5 of the solution of dioxid of manganese, 0.5 gram of permanganate of potassium or 4 grams of sulfate of manganese may be used. As already explained, other acids and salts
10 and so-called protective colloids may be used. For instance, from 8 to 10 grams of tartaric acid, a tartrate or sodium bisulfate, or sodium carbonate, or borax, and 5 grams
15 of casein, albumen, saponin, or the like, may be used with the quantities of water, catalytics, etc., given in the above example.

It should be understood that the order in which the perborate and the catalytic are added to the water may be reversed. When peroxid of hydrogen is used, it is necessary

to add sodium carbonate, borax, or the like, 20 in order to obtain the alkaline reaction.

We claim:

A composition adapted for preparing oxygen baths, comprising a substance capable, on contact with water, of setting free
25 hydrogen peroxid, and a substance which, on contact with the water containing hydrogen peroxid, will be changed into hydrosol of manganese dioxid for breaking up the
30 hydrogen peroxid.

In testimony whereof, we affix our signatures, in presence of two witnesses.

LEOPOLD SARASON.
EMIL FRANKE.

Witnesses:

WOLDEMAR HAUPT,
ARTHUR SCHROEDER.