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GLOBULAR SODIUM BISULPHATE AND METHOD OF MAKING THE SAME

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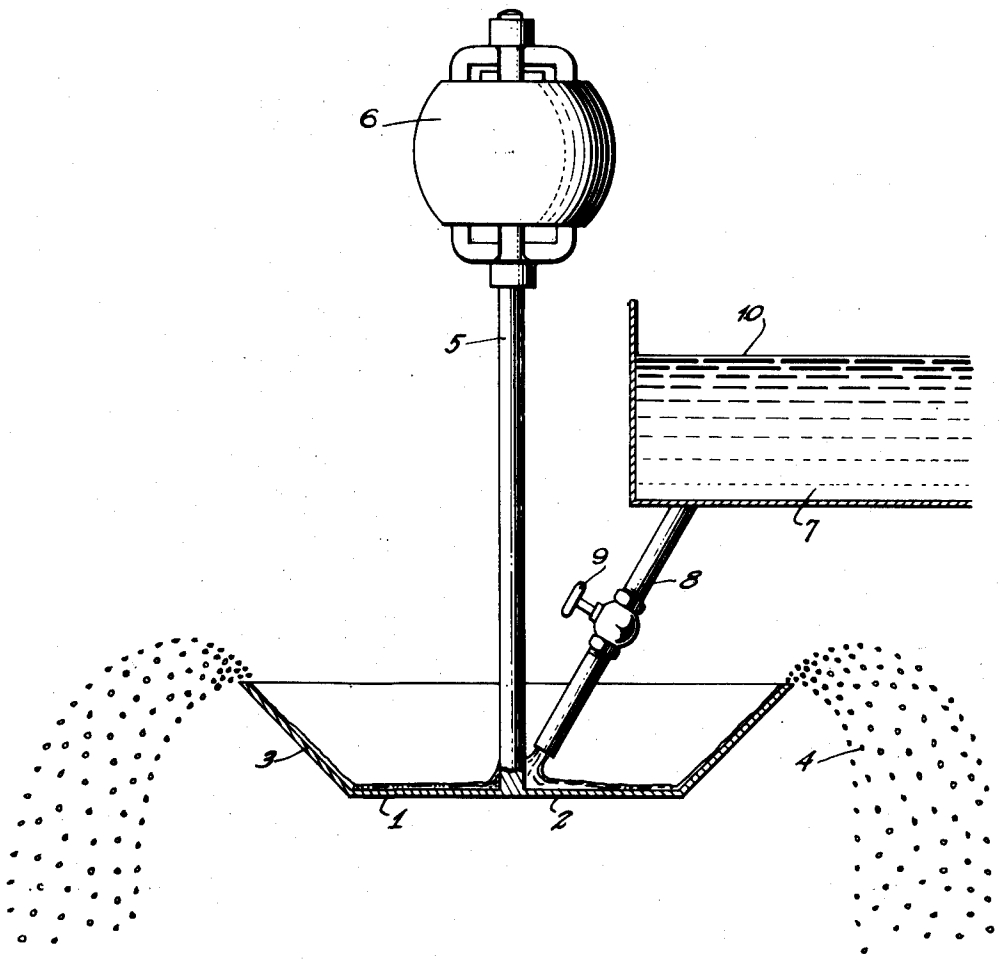

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UNITED STATES PATENT OFFICE.

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GLOBULAR SODIUM BISULPHATE AND METHOD OF MAKING THE SAME.

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This invention relates to an entirely new product, namely, sodium bisulphate in globular form and which is so distinctly novel as to impart to it distinct physical and chemical characteristics not possessed by any sodium bisulphate heretofore made. Moreover, the characteristics adverted to materially enhance the field of usefulness of the product as well as to pronouncedly increase its efficiency of operation, and, more particularly, as a cleansing agent.

Sodium bisulphate is extensively used as a general detergent and cleansing agent and has especial merit and utility in cleansing toilet bowls, because of its solvent action on the tenacious scums, residues and discolorations which accumulate thereon.

The commercial bisulphate usually carries some water of crystallization, and, moreover, it is quite hygroscopic. The result is that when packaged in the cans, as customary, and particularly after exposure to air, it packs and cakes so solidly as to render its use very troublesome, as well as to detract very materially from the efficient operation it possesses when used under favorable conditions. In fact, it must be "dug" out of the can by using a more or less pointed instrument.

Notwithstanding the enumerated disadvantages, and others, were well known, and that certain make-shift expedients were resorted to with a view to overcoming them, yet, the disadvantages, in the main, have persisted in the trade for upwards of twenty years and have strongly militated against a more general use of the product. The manufacturers, presumably, viewed the difficulties as ones necessarily inherent in the normal characteristics of its product, and, as such, looked upon the problem as unsolvable.

It is well known that bisulphate becomes anhydrous above 50° C., and fuses at about 300° C. Accordingly, the mere fusion of the salt has a pronounced benefit in diminishing the disadvantages adverted to.

As the result of extended, scientific investigation and experiment, we have discovered how to convert sodium bisulphate into a globular form, and possessing such physical and chemical characteristics as to entirely obviate the disadvantages inherent in the salt as now marketed. These globules of sodium sulphate have a hard, glazed exterior which precludes the occurrence of a detrimental hygroscopic action on them, and, moreover, what is of vital importance, the globular form results in a minimum of surface contact, there being, theoretically, point contact only among the little spheres, so that, on this account, and for the other reasons given, the new form of the salt can be packaged without in any wise massing, and, when it is desired to use the same, it can be fed or delivered from the ordinary sifter top can.

With a view to partially overcoming the disadvantages inherent in ground sodium bisulphate, some manufacturers have admixed talc therewith, but this is a mere make-shift attendant with disadvantages, per se, and falling far short of solving the real difficulties in the problem which the present invention has solved.

The accompanying drawings illustrate, somewhat diagrammatically, a type of apparatus which has been successfully employed in making the novel product of this invention.

Referring to the drawings, 1 designates a centrifugal distributor, which, as shown, is of substantially bowl-shaped configuration. In the preferred form of the invention, said distributor comprises a flat bottom portion 2 having a circular periphery provided at its outer part with an upwardly and outwardly inclined wall 3. It will be noted that the bottom of the centrifugal distributor is shown as closed. This is an important feature of construction, since this element, in structures of the prior art, is usually provided with a stuffing box, the use of which, in operating on fused salts, is, manifestly, impractical.

The distributor 1 has affixed thereto an axial spindle 5, which is mounted in suitable bearings (not shown) for rapidly revolving the distributor, and while this rotation may be imparted to it by any suitable prime mover, a motor 6 positioned above the distributor is shown as illustrative.

The fused sodium bisulphate is contained in a reservoir 7 having an outlet pipe 8 leading to a point above the bottom of the rotor and near the axis of rotation thereof, and a valve 9 is preferably included in the pipe

8 for controlling the feed of the fused material through said pipe.

The operation of the apparatus will be apparent, but may be briefly described as follows:

If, for example, the mass 10 of the fused, sodium bisulphate is contained in the receptacle 7, with which suitable heating means may be associated to maintain the fluidity of the sulphate, it will be apparent that the opening of the valve 9 will allow this material to flow to the distributor. The distributor is preferably heated, prior to introducing the material thereon, so that such material upon engagement with the distributor is not unduly cooled. As the material is deposited at substantially the center of the bottom 2, it will respond to centrifugal force and will be driven over the flat bottom of the distributor as a film or layer until it reaches the base of the wall 3. Centrifugal force will cause it to continue the outward flow, but such further flow will be opposed by the inclined wall which will so retard it that the material will creep up the wall 3 in a relatively thin film which becomes thinner as it proceeds higher along the wall.

When the material reaches the upper edge of the wall, it will be thrown off in a finely divided globular form.

In the treatment of bisulphate of soda, the material, after being thrown off the distributor, and finely divided, will solidify during this falling movement. In practice, the operations described are preferably carried on within a suitable chamber or casing made sufficiently deep, that, by the time the material reaches the base of the chamber, it will have solidified in globules.

When the globules of sodium bisulphate are discharged into a liquid, they are uniformly soluble and enter into solution rapidly with the result that the dissolving operation is effected much more expeditiously, efficiently and uniformly than is the case with the commonly used ground material.

In using the new product, we may, if we desire, admix additional ingredients therewith to make cleaners for special purposes. We wish it understood that the term bisulphate of soda, used throughout the foregoing detail description and in the appended claims, does not necessarily imply that such material must be chemically pure, but, as a matter of fact, it may partake of any of its commercial forms, such, for example, as nitre cake, a by-product from nitric acid manufacture.

The scope of the present invention is commensurate with the appended claims.

Having thus fully described the invention, what we claim as new and desire to secure by Letters Patent is:

1. The herein described method of producing sodium bisulphate in fine globular form and substantially non-hygroscopic which consists in liquefying the salt by fusion, then filming it out by centrifugal force, then breaking it up into small substantially smooth globules by centrifugal force, and then permitting the globules to cool and harden throughout their entire surface.

2. The herein described method of producing sodium bisulphate in fine globular form and substantially non-hygroscopic which consists in liquefying the salt by fusion, then filming it out by centrifugal force, then breaking it up into small substantially smooth globules by centrifugal force, and then allowing the thus formed globules to fall a sufficient distance through space to cool and become hard throughout their entire surface.

3. The herein described method of producing sodium bisulphate in fine, smooth, hard surfaced globular form and substantially non-hygroscopic which consists in liquefying the salt by fusion and then breaking it up into globules by centrifugal action.

4. As a new product sodium acid sulfate in the form of globular, dense, hard, smooth, non-porous, discrete particles having a pearly appearance.

5. As a new article of manufacture, sodium bisulphate in the form of small globules, the surfaces of which are hard and glazed.

6. The method of producing sodium bisulphate in globular form having hard, smooth surfaces, which consists in liquefying the salt by fusion, breaking the liquid into small drops, scattering said drops unrestrictedly in different directions in a gaseous medium as soon as they are formed, and causing them to fall in spaced relation to one another for a sufficient distance to become cool and hard before they come into contact with one another.

7. The method of producing sodium bisulphate in globular form having hard, smooth surfaces, which consists in liquefying the salt by fusion, filming the liquid and breaking it into small drops, scattering said drops in different directions in a gaseous medium as soon as they are formed, and causing them to fall in spaced relation to one another for a sufficient distance to become cool and hard before they come into contact with one another.

8. As a new product, sodium bisulphate in the form of substantially spherical dense, hard, non-porous, discrete particles having smooth and uninterrupted surfaces.

In testimony whereof we have signed the foregoing specification.

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