

UNITED STATES PATENT OFFICE.

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METHOD OF PREPARING SUBSTANCES IN FINELY-DIVIDED FORM.

No Drawing.

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To all whom it may concern:

Be it known that we, HAROLD S. BOOTH and GEORGE G. MARSHALL, citizens of the United States, and residents, respectively, of Cleveland, in the county of Cuyahoga and State of Ohio, and Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Methods of Preparing Substances in Finely-Divided Form, of which the following is a full, clear, and exact description.

The present invention relates to a method or process for obtaining a material which is dispersed in extremely finely divided condition throughout another material. This invention finds utility in numerous instances among which may be mentioned merely by way of example, colloidal solutions, emulsions and ointments.

In practicing the invention the material is initially prepared so that the molecules making up its structure are dispersed with respect to each other, and then the material with the molecules in the dispersed condition are introduced into another material which serves to receive the material in the dispersed molecular condition, and to maintain it in that dispersed condition.

The material which is operated upon may be placed in its dispersed condition by heating so that it is volatilized, or it may be atomized if it is a liquid, which while not representing as complete a dispersion of the molecules of the substance as may be realized in a volatilized condition, is nevertheless within the terms of this invention.

While we have mentioned volatilization and atomization as two means by which a material may be placed in what we may term its dispersed condition, we do not intend to limit ourselves in this particular.

In practicing the invention we have employed an apparatus having a small aperture through which the material to be dispersed is injected, and upon leaving the injector it is immediately introduced into the other material into which it is to be injected.

We have found that there are certain facts which control the fineness or the degree of dispersion of the particles or molecules of the substance being operated upon, such for instance, as the diameter of the injector aperture, the pressure of the material which is being dispersed, and also the rate at which the material is cooled or reconverted

into its original form in the material in which it is injected.

Under some circumstances it may be desirable to inject with the primary material which is being put in its dispersed forms one or more other components, and one of these additional components may be inert or inactive where this is desirable, and the degree of fineness of the material which is being dispersed after injection of the material in which it is received is somewhat affected by the presence of other components or inactive material.

It may under some circumstances be desirable to stir the material into which the dispersed substance is injected, but this has no material effect on the invention itself.

As an application of the method or process which has above been described, we will describe the same in connection with the preparation of mercury ointment.

This we have prepared by volatilizing mercury and passing the mercury vapor under pressure through an injector having a fine orifice and injecting the same into liquefied fats or a mixture of fats which fats are sufficiently cool to prevent cracking. The mercury on being injected into the liquefied fats is received therein and held in its finely divided and dispersed condition.

The foregoing process has been carried out by using injectors having various sizes of orifices. The fineness of the mercury can be controlled, and by employing the method suggested we have been able to obtain a mercury ointment in which the mercury was at least one hundred times finer than any commercial forms of mercury ointment with which we are familiar.

It goes without saying that an ointment in which the active material is thus finely divided is more active in its therapeutic uses than where the active material is not so finely divided.

It will be obvious that as before stated it is within the terms of this invention to dilute the mercury vapor with any desired diluting agent or gas.

It is obvious that this principle may be applied to the preparation of ointments, emulsions or colloidal solutions of all kinds wherever it is possible to volatilize or atomize or otherwise produce a dispersed condition of one of the components of the dispersoid system to be made, and to inject

this volatilized or otherwise dispersed material into another gaseous or liquid component which will act as a receiving, protecting and holding agent which keeps the substance which is being dispersed thereinto from coalescing, or in other words, maintain it in its dispersed condition. Many non-metals and also many compounds are capable of volatilization, and therefore of being injected in the above described manner so as to form emulsions or mixtures in which the volatilized component is finely divided, as an example of which may be mentioned sulphur ointments or iodine ointments.

Having described our invention, we claim:—

1. The method of preparing a substance in finely divided form, which consists in putting the substance in such form that the molecules thereof are in dispersed condition, and then injecting the substance in its dispersed condition into a suitable material which fixes and retains the said substance in its dispersed condition.

2. The method of preparing a substance in finely divided form, which consists in putting the substance in such form that the molecules thereof are in dispersed condition, and then injecting the substance in its dispersed condition into a suitable liquefied ma-

terial which fixes and retains the said substance in its dispersed condition.

3. The method of preparing a substance in finely divided form which consists in putting the substance in such form that the molecules thereof are in dispersed condition, and then in placing said substance while in dispersed condition under pressure, through a small orifice and into a suitable material which fixes and retains said substance in its dispersed condition.

4. A method of preparing a substance in finely divided form which consists in volatilizing the said substance and in injecting the substance while in volatilized condition into a suitable material which condenses the said volatilized substance but retains it and fixes it in its dispersed condition.

5. The method of preparing a substance in finely divided form which consists in volatilizing said substance and in placing the said substance while volatilized under pressure through a suitable orifice and into a liquefied material which condenses the said volatilized substance but retains it in its dispersed condition.

In testimony whereof, we hereunto affix our signatures.

HAROLD S. BOOTH.
GEORGE G. MARSHALL.