UNITED STATES PATENT OFFICE.

HUGO LIEBER, OF NEW YORK, N. Y.

RADIO-ACTIVE SALVE.

No. 804,610. Specification of Letters Patent. Patented Nov. 14, 1905.

Application filed June 17, 1904. Serial No. 213,046.

To all whom it may concern:

Be it known that I, HUGO LIEBER, a citizen of the United States, residing in the city, county, and State of New York, have invented a certain new and useful Improvement in Radio-Active Salves, of which the following is a description.

This invention relates to radio-active salves consisting of a salve vehicle or material impregnated with the emanations from a radio-active substance, and has for its object the production of a new article of manufacture—to wit, radio-active salve—that is to say, a salve vehicle or material impregnated with emanations from a radio-active substance and of such character that it can readily be applied and used in the treatment of disease and for other purposes in the manner, for example, in which vaseline, ointments, and like compositions of matter in which there is sufficient moisture or liquid to soften the mass of which they are composed are applied.

As set forth in my application, filed March 12, 1904, Serial No. 197,838, for Letters Patent for improvement in radio-active matter impregnated with thorium emanations and in the manufacture thereof, thorium is a radio-active substance, and it emits and radiates rays called "Becquerel" rays. In addition to the emission of Becquerel rays thorium gives off emanations of gaseous particles. The emanations from thorium can be utilized to render other substances radio-active. Other substances rendered radio-active by means of thorium emanations may be said to be secondarily radio-active. As set forth in my said application, I have discovered that solid and liquid substances can be impregnated with thorium emanations and can thereby be rendered persistently radio-active or radio-active in such degree that they retain their radio-activity for a considerable length of time and that a satisfactory method of obtaining the emanations from thorium and of utilizing them is by heating thorium oxid below red heat and then by means of an air-current or other similar device blowing the emanations into the matter to be impregnated or made radio-active or otherwise bringing the thorium emanations into intimate contact therewith. Heat is preferably applied in order to facilitate the giving off of thorium emanations; but thorium gives off the emanations without heat. Instead of thorium oxid there can be used in like manner for the obtaining of emanations other forms of thorium—for example, thorium nitrate, preferably in solution with water. Should thorium nitrate be used, the use for which the impregnated radio-active substance may be intended may require the neutralization of any free nitric acid present. For the purpose for which my present invention is primarily intended—the production of a radio-active salve impregnated with thorium emanations—that is to say, a radio-active substance impregnated with thorium emanations of such character that it can be readily applied in the treatment of disease—I prefer, therefore, to use thorium oxid for the obtaining of the thorium emanations. As described in my said application, filed March 12, 1904, the thorium emanations being blown into or otherwise brought into intimate contact with the substance to be impregnated therewith the substance is impregnated with the thorium emanations and rendered persistently radio-active—that is, radio-active to such an extent and degree that the radio-activity will be retained for a considerable length of time and will enable the radio-active substance impregnated with the thorium emanations to be used for many purposes.

I have discovered that the impregnation of substances with emanations from a radio-active substance, thereby rendering the substances radio-active, can be utilized for the production of a radio-active salve impregnated with emanations from a radio-active substance that can be readily applied in the treatment of disease and for other purposes, and this discovery forms the basis of my present application. Salves, cerates, ointments, and salve vehicles or materials generally can be impregnated with thorium emanations and rendered radio-active in the manner above described, for example, and when so impregnated with thorium emanations and rendered radio-active can be readily applied in the treatment of disease and for other purposes. A convenient and satisfactory manner of impregnating salves is to heat them sufficiently to make them liquid and while liquid to blow the thorium emanations into them or otherwise to bring the thorium emanations into contact therewith, thus causing the emanations to enter into and impregnate them. By the term "salve," employed in the description and claims of this application, I intend to include ointments, cerates, and

all liquid and solid materials suitable for use as salve-vehicles.

Radium is a radio-active substance, which, like thorium, emits and radiates Becquerel rays and in addition gives off emanations similar to those given off by thorium. The emanations from radium can be used, according to my invention, in the manner described for the use of thorium emanations for the impregnation of substances, thereby rendering them radio-active, and for the production of a radio-active salve and the like that can be readily applied in the treatment of disease and for other purposes.

I am aware that thorium salts and radium salts have been dissolved in water previous to my invention, and such is not my invention. When a salt of thorium or a salt of radium is dissolved in water or other liquid, the thorium salt or the radium salt permeates the water or other liquid in which it is dissolved. When, however, according to my invention, as above described, thorium emanations or radium emanations are given off, the emanations are separate and free from the thorium or radium from which they were obtained, and when the emanations so obtained are brought into intimate contact with the salve-vehicle to be rendered radio-active and impregnate the salve vehicle or material combining with the particles of the material throughout the mass of the material the material so impregnated is free from the thorium or radium from which the emanations were obtained and is radio-active by reason of the emanations separated from the thorium or radium by which they were given off and combined with the particles of the material throughout its mass.

By the expression "radio-active substance" employed in the description and claims of this application I intend to include thorium and radium only.

What I claim is—

1. A radio-active salve, consisting of a salve-vehicle and emanations from a radio-active substance in combination with the particles of the salve-vehicle throughout its mass, the salve being free from the radio-active substance from which the emanations were obtained and radio-active by reason of the emanations in combination with the particles of the salve-vehicle throughout its mass, substantially as described.

2. A radio-active salve, consisting of a salve-vehicle and thorium emanations in combination with the particles of the salve-vehicle throughout its mass, the salve being free from the thorium from which the emanations were obtained and radio-active by reason of the thorium emanations in combination with the particles of the salve-vehicle throughout its mass, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HUGO LIEBER.

Witnesses:
REBECCA BALLIESEN,
CATHERINE M. BEHAN.