

UNITED STATES PATENT OFFICE.

FREDERIC OTTO SPIESKE, OF BROOKLYN, NEW YORK.

HEAT-STORING COMPOUND.

No. 811,750.

Specification of Letters Patent.

Patented Feb. 6, 1906.

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To all whom it may concern:

Be it known that I, FREDERIC OTTO SPIESKE, a subject of the German Emperor, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Heat-Storing Compounds, of which the following is a specification.

This invention relates to improvements in heat-storing compounds, such as consist principally of crystalline salts possessing the ability to absorb heat while being reduced from a crystalline to a liquid condition and to give forth heat when returning from a liquid to a crystalline condition. Heat-storing compounds of the character indicated are usually employed in various warming devices, such as rubber bags, food-warmers, carriage-heaters, &c. The customary procedure is to place the heat-storing compound while in liquid condition in a soft-rubber bag or pillow. When it is desired to induce the generation of heat, any old and well-known operation—such, for example, as removing the stopper of the bag or pillow and replacing it as soon as its temperature has changed—is resorted to for starting recrystallization of the heat-storing compound.

One of the principal objections of the heat-storing compounds in general use is that they produce such hard crystals in the soft-rubber bag or pillow for medical purposes that not only is the patient subjected frequently to discomfort, but also the bag or pillow is damaged. It has been proposed heretofore to prevent the formation of hard crystals by mixing with the acetate of soda or other heat-storing salt a non-crystalline substance—such, for example, as glycerin, extract of sunflower-seed or of Greek hay-seed, and the like. The principal objection to the addition of non-crystalline substances of the character indicated is that in order to produce a soft crystal it is necessary to add so great a proportion of the non-crystalline substance that the heat-storing salt is deprived of a great part of its heat-storing property. If the quantity of non-crystalline substance be decreased, so as to prevent the same from seriously affecting the action of the heat-storing salt, it is found in practice that the acetate of soda or other salt forms generally into sharp needle-shaped crystals, which are sufficiently hard to damage the soft-rubber bag or pillow, as well as to cause discomfort to the patient. A further objection to the addition of non-crystalline substances of the character indi-

cated is that the cost of the heat-storing compound is increased by the necessity of adding comparatively expensive substances such as are generally employed.

The object of the present invention is to overcome the objections hereinbefore mentioned by combining with the heat-storing salt a substance adapted to cause the formation of a comparatively soft crystal without seriously affecting the heat-storing properties of the compound and without appreciably increasing the cost of the compound or causing it to injure the soft-rubber bag, pillow, or other receptacle; furthermore, to secure a longer heat-imparting capacity than in any other compound used for similar purposes.

In order to accomplish the object set forth, I depart radically from the methods heretofore devised to produce a soft crystal by discarding the use of non-crystalline substances of the character indicated or of poisonous crystalline salts and employing a non-poisonous crystalline substance. The soft crystalline non-poisonous substance which I prefer to combine with the heat-storing crystal in order to induce the formation of crystals which will be sufficiently soft to prevent serious injury to the india-rubber receptacle and to secure the long heat-imparting capacity is chlorid of calcium.

By reason of the fact that the chlorid of calcium such as employed costs but little the improved heat-storing compound of this invention is comparatively inexpensive to produce and costs less than any other thermophoric mixture or heat-storing compound. Furthermore, it is found in practice that the improved compound of this invention, consisting, as it does, of only non-poisonous crystalline substances, does not menace the health of the user nor injuriously affect the receptacle in which it is placed.

While the addition of the chlorid of calcium or other suitable soft crystalline substance to the sodium acetate, sodium hyposulfite, or other suitable heat-storing salt in sufficiently large quantities to produce a comparatively soft crystal does not materially affect the heat-storing qualities of the sodium acetate and the like, it is found in practice that by adding a larger quantity of the soft crystalline substance than is actually needed to produce a soft crystal the heat-storing quality of the sodium acetate or similar ingredient can be modified at will to produce any desired temperature in the bag, pillow, or other recepta-

cle—that is to say, by way of example, if the temperature of the compound consisting of a soft crystalline substance, such as chlorid of calcium and a heat-storing substance, when
5 mixed in suitable proportion is 55° centigrade and it is desired to produce a lower temperature a much larger proportion of the chlorid of calcium, which is devoid of heat-storing properties, can be mixed with the sodium
10 acetate or the like, it being understood that in order to lower the temperature as indicated a larger proportion of the chlorid of calcium than is actually needed to produce a soft crystal in the heat-storing compound is employed.
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I am aware that a heat-storing compound has been produced heretofore by the use of acetate of lead, and I make no claim thereto. Acetate of lead is objectionable because of
20 its poisonous nature. My invention resides in the combination, with a heat-storing salt, of a non-poisonous soft crystalline substance—such, for example, as chlorid of calcium.

Having described the invention, what is claimed as new is—

1. A heat-storing compound consisting of acetate of soda and chlorid of calcium. 25

2. A heat-storing compound consisting of acetate of soda, chlorid of calcium and hyp-sulfite of soda. 30

3. A heat-storing compound consisting of a heat-storing salt, and chlorid of calcium.

4. A heat-storing compound consisting of a heat-storing salt and a non-poisonous, soft, crystalline substance, adapted to cause the
35 formation of a comparatively soft crystal and to regulate the amount of heat to be generated by the compound without producing a poisonous mixture.

In testimony whereof I affix my signature 40 in presence of two witnesses.

FREDERIC OTTO SPIESKE.

Witnesses:

JAMES F. DUHAMEL,
W. H. CLARKE.