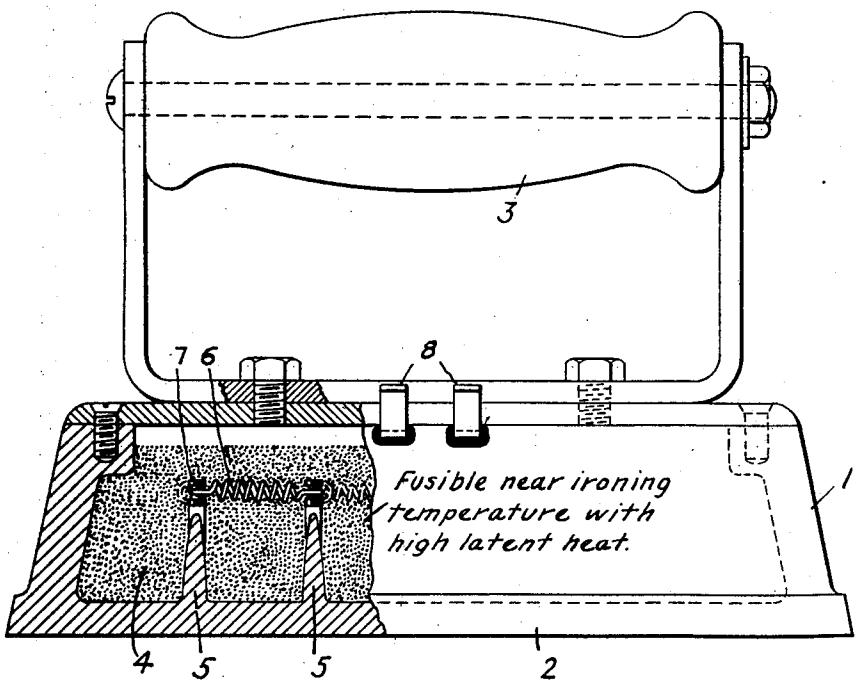
H. A. RAPELYE.

IRONING IMPLEMENT.

APPLICATION FILED OCT. 1, 1919.

1,379,721. Patented May 31, 1921.



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IRONING IMPLEMENT.

1,379,721. Specification of Letters Patent. Patented May 31, 1921.

Application filed October 1, 1919. Serial No. 327,804.

To all whom it may concern:

Be it known that I, HARRY A. RAPELYE, a citizen of the United States, and a resident of Edgewood Park, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Ironing Implements, of which the following is a specification.

My invention relates to ironing implements and it has for its object to provide apparatus of the character designated that shall permit the storage of a relatively large amount of heat in an ironing implement, and which shall permit the giving off of this heat at a substantially fixed temperature, at or near the optimum ironing temperature, thus permitting the production of work of the highest character because of the uniform heat conditions.

The single figure of the accompanying drawing is a side view, partially in section and partially in elevation, illustrating my invention as applied to a sad iron.

It has been proposed in the past to construct ironing implements having as large a heat storage capacity as possible, this result being obtained by the use of core members of copper and other similar devices. I find, however, that far superior results, from the viewpoint of the amount of heat stored, and from the rate at which this heat is given off, are obtained by the use of a filling for the ironing body of some substance fusing at or near the optimum ironing temperature and having a high latent heat of fusion.

By the use of a filling of this character, a large amount of heat is absorbed when heating the implement and this heat is given off at a substantially fixed temperature as the latent heat of fusion is lost. By the proper selection of solids or other filling materials, any desired operating temperature may be secured, it being desirable to employ somewhat lower temperatures for the ironing of laces and similar fabrics than for the pressing of heavy tailors' goods.

Referring to the accompanying drawing for a more detailed understanding of my invention, I show the body of a sad iron at 1, having the usual ironing surface 2 and a handle 3. The body member 1 is hollowed out as indicated and is nearly filled with a mass of material 4, this material preferably having a fusing temperature at or near the desired ironing temperature and further having a high latent heat of fusion. A suitable material for this purpose is sodium nitrate.

In order to promote the rapid and effective interchange of heat between the lower surface and this mass of material, both during the heating and the ironing operations, the lower portion of the body member 1 may be provided with a plurality of spines or lugs 5—5 projecting up into the mass 4. These lugs may be formed integrally, as shown, or may be formed of some different material than the ironing member, such as copper, and suitably attached to the base member 2, as by being screwed into suitable tapped openings therein.

If desired, an electric heating winding 6 may be mounted in the mass 4, as by being strung on insulators 7—7 carried by the members 5—5, this heating coil being attached to suitable terminal members 8—8. Thus heat may be imparted intermittently to the mass 4 by this heating winding and the iron disconnected in the meantime for use away from an electric circuit or the electric heating element may be energized continuously while using the iron, the mass 4 operating as a temperature stabilizer. The use of the electric heating coil is not essential to the operation of my invention, however, and the beneficial effect of the mass 4 is equally exhibited if the iron be heated on a stove in the usual manner.

In the foregoing description and in the subjoined claims, I use the term "latent heat of fusion" in its broadest sense as indicative of any substance or phenomenon wherein, as heat is applied to the substance at a substantially uniform rate in the process of fusing the same, a point is reached where the temperature of the substance temporarily ceases to rise while heat is being absorbed for the modification of the molecular structure and internal energy of the substance. There are four distinct phenomena of this type, as follows, and I may make use of any one or more of these phenomena in carrying out my invention, contemplating that any or all of them are understood as included under and covered by the expression "latent heat of fusion."

First in importance among the phenomena of which I may make use is the action of a pure salt or of a mixture of pure salts which are solid below the temperature of

fusion and which take up a large amount of heat when melting, this being the case of strict latent heat of fusion.

Next may be considered a eutectic or molten mixture of two solids, such as bismuth-chlorid and ferric-chlorid, in which the latter salt occurs in proportion substantially 23% by weight. Above 171.5° C. this mixture is a fluid and, on cooling, both the bismuth-chlorid and the ferric-chlorid precipitate out but always remain in the proportion of 23% ferric-chlorid. Thus, since the composition of the remaining mixture does not change when heat is withdrawn, the mixture will remain at 171.5° C. until the whole mass has become solid.

Another class of substances and phenomena of which I may make use is a solution of hydrated salt having an indifferent point in its solubility curve. An example of this class of substance is a solution of zinc sulfate which is saturated at a given temperature. Above this temperature, it is a water solution of zinc sulfate. If heat is removed from such a substance at the critical temperature, the zinc salt precipitates out but crystallizes with seven molecules of water to cause the solid salt to have the same composition as the original solution. Thus, as the salt precipitates out, the remaining solution has the same composition, and therefore, since the melting point of a salt having such a composition is always the same, the temperature of the ironing device is maintained constant until the whole solution has been converted into a solid salt with the appropriate water of crystallization.

As a final phenomenon of which use may be made, there may be mentioned a eutectic mixture of a solid crystallizing with two different proportions of water in a water solution. An example of such a mixture is a solution of ferric-chlorid in water having the proportion of 17 gram molecules of ferric-chlorid to 100 gram molecules of water. Such a mixture is a true solution above a critical temperature and, when heat is removed therefrom at the critical temperature, a solid precipitate forms, which is a mixture of ferric-chlorid ($7H_2O$.) and ferric-chlorid ($5H_2O$.) in such proportions as to produce the same composition as the original solution. Thus, when part of such a solution solidifies, the remaining composition is not changed and the temperature thereof remains at the critical temperature until the whole is converted into a solid mixture of two hydrated iron salts.

While I have shown my invention as applied to a sad iron, it will be obvious to those skilled in the art that it is not so limited, but may be applied to all types of ironing implements where it is desirable that a large amount of heat be stored in a device and that this heat be given off from and at a given temperature, near the optimum ironing temperature.

I desire, therefore, that no limitations shall be placed upon my invention except such as are imposed by the prior art or as are specifically set forth in the appended claims.

I claim as my invention:

1. In an ironing implement, the combination with means providing an ironing surface, of a body of material disposed adjacent thereto and having a fusing temperature near the desired ironing temperature and a marked latent heat of fusion.

2. In an ironing implement, the combination with a hollow body providing an ironing surface, of a filling therefor embodying a substance having a fusing temperature near the desired ironing temperature and a marked latent heat of fusion.

3. In an ironing implement, the combination with means providing an ironing surface, of a body of material disposed adjacent thereto and having a fusing temperature near the desired ironing temperature and a marked latent heat of fusion, and means for promoting heat transfer between the interior of said material and said ironing surface.

4. In an ironing implement, the combination with means providing an ironing surface, of a body of material disposed adjacent thereto and having a fusing temperature near the desired ironing temperature and a marked latent heat of fusion, and heat-conducting members extending from the interior of said material to said ironing surface.

5. In an ironing implement, the combination with means providing an ironing surface, of a body of material disposed adjacent thereto and having a fusing temperature near the desired ironing temperature and a marked latent heat of fusion, and integral lugs extending from the ironing-surface member into the interior of said material.

6. In an ironing implement, the combination with a hollow body providing an ironing surface, of a filling therefor embodying a substance having a fusing temperature near the desired ironing temperature and a marked latent heat of fusion, and means for promoting heat transfer between said filling and the ironing surface.

7. In an ironing implement, the combination with a hollow body providing an ironing surface, of a filling therefor embodying a substance having a fusing temperature near the desired ironing temperature and a marked latent heat of fusion, and heat-conducting members extending from the interior of said filling into proximity to said ironing surface.

8. In an ironing implement, the combi-

nation with a hollow body providing an ironing surface, of a filling therefor embodying a substance having a fusing temperature near the desired ironing temperature and a marked latent heat of fusion and integral lugs extending from the member providing said ironing surface into the interior of said filling.

9. In a flat iron, a hollow body portion, and a filling therein having a fusing temperature near the desired ironing temperature and a marked latent heat of fusion.

10. In a flat iron, a hollow body portion, and a filling therein having a fusing temperature near the desired ironing temperature and a marked latent heat of fusion, and integral lugs extending from the bottom thereof into the interior of said filling.

11. In an ironing implement, the combination with means providing an ironing surface, of a body of material disposed adjacent thereto and having a fusing temperature near the desired ironing temperature and a marked latent heat of fusion, and heating means in operative proximity to said body material.

12. In an ironing implement, the combination with means providing an ironing surface, of a body of material disposed adjacent thereto and having a fusing temperature near the desired ironing temperature and a marked latent heat of fusion, an electric heating winding mounted in said body of material, and means for promoting heat transfer between the interior of said material and said ironing surface.

13. In an ironing implement, the combination with means providing an ironing surface, of a body of material disposed adjacent thereto and having a fusing temperature near the desired ironing temperature and a marked latent heat of fusion, an electric heating winding mounted in said body of material, and heat-conducting members extending from the interior of said material to said ironing surface.

14. In an ironing implement, the combination with a hollow body providing an ironing surface, of a filling therefor embodying a substance having a fusing temperature near the desired ironing temperature and a marked latent heat of fusion, an electric heating winding in operative proximity to said filling, and heat-conducting members extending from the interior of said filling into proximity to said ironing surface.

15. In a flat iron, a hollow body portion, and a filling therein having a fusing temperature near the desired ironing temperature and a marked latent heat of fusion, and an electric heating winding embedded in said filling.

16. In a flat iron, a hollow body portion, and a filling therein having a fusing temperature near the desired ironing temperature and a marked latent heat of fusion, an electric heating winding embedded in said filling, and integral lugs extending from the bottom thereof into the interior of said filling.

In testimony whereof I have hereunto subscribed my name this nineteenth day of September, 1919.

HARRY A. RAPELYE.