

# UNITED STATES PATENT OFFICE.

JAMES S. GWYNNE, OF PITTSBURG, PENNSYLVANIA.

## IMPROVEMENT IN SEPARATING OLEIC AND STEARIC ACIDS.

Specification forming part of Letters Patent No. 4,735, dated September 3, 1846.

*To all whom it may concern:*

Be it known that I, JAMES S. GWYNNE, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in the Method of Separating the Oleic from the Stearic Acid, with a view to obtain stearic acid for the manufacture of candles; and I do hereby declare that the following is a full, clear, and exact description of my said improvement.

It is unnecessary for me to describe the process by which the tallow, lard, &c., from which it is desired to obtain the stearic acid are resolved into their component parts of stearic, oleic, and margaric acid, so as to allow of their separation by mechanical means, as this is fully described in the books, and is well known to those skilled in the art of making what are termed "stearic-acid candles." I propose to begin, therefore, by describing the process of mechanical separation as employed to the best of my knowledge and belief up to the time when the invention which I am now about to patent was put into use.

The mixture consisting of the stearic, oleic, and margaric acids is first placed in bags or folders of cotton or hemp and laid in strata alternating with iron plates, to the faces of which flats or mats of coarse horse-hair are fastened, the whole forming a mass or pile of about two feet square and as deep as may be required by the quantity to be pressed. This is then placed under the hydraulic or other press to receive the "cold-press," as it is termed—that is, a pressure very gradually and slowly increased during several days, the effect of which is to express all that portion of the oleic acid which is fluid at the temperature of the atmosphere. The mass is then taken apart, remelted or reground, or both, and reconstructed, so to speak—that is to say, put together again in the same manner, except that now the iron plates are sometimes heated to a degree sufficient to melt the oleic acid, which melts at a temperature varying from 80° to 130° of Fahrenheit, but not sufficient to melt the stearic acid, which cannot be melted at a lower temperature than 158°. The mass thus prepared is placed in the press, where it is surrounded by an apparatus varying in description, into which steam is admitted for the purpose of keep-

ing up the heat of the mass during the operation of pressure. Sometimes this apparatus alone is used, the iron plates not being previously heated. The pressure is then applied and continued until the oleic acid no longer flows from the mass. This is called the "hot-pressure," and occupies from a few hours to several days, according to circumstances. The cold-pressure already referred to occupies from one to six days, also according to the state of the weather and circumstances. Now, it will be at once perceived that there is here a great loss of time after the chemical process of resolving the tallow, &c., into their elements has been performed before the stearic acid can be obtained; and it will be further seen that the mode of preparing the mass for the hot-pressure is necessarily a defective one. The plates of iron, where they are used, on which a part of the duty of heating the mass throughout and melting the oleic acid devolves, cannot properly be heated to a higher temperature than 158°; otherwise there would be a risk of melting the stearic as well as the oleic acid, which is to be avoided, and the plates, after being heated, have a part of this heat abstracted before it reaches the mixture by the cotton, hair, or hemp in contact with them, and while the heat is thus imperfectly diffused throughout the mass the temperature of the steam admitted into the casing for the purpose of keeping the mass hot during pressure, being about two hundred and twelve degrees, (212°,) is greater than that at which the stearic acid remains solid, and this last therefore is melted at the outside of the mass and for a greater or less distance within it. A part of the stearic acid thus runs off with the oleic, which has to be remanufactured to separate the two.

Now, the manner in which I propose to remedy the objections here suggested is to make the heating more uniform and perfect, and thereby accomplish the object in far less time, as follows: I prepare a vat convenient to the press and large enough to contain easily the mass to be pressed, made up as aforesaid, as if for the cold-pressure. In this vat the mass is entirely surrounded and covered with water. Into the water I introduce steam until the water and mass are heated to a temperature within that at which stearic acid will melt,

and varying from eighty to one hundred and thirty degrees, according to the character of the material used (tallow, for instance, requiring more heat than lard) and the temperature of the atmosphere. I ascertain the proper heat by the thermometer remaining at the same mark after the steam is shut off, for until the whole mass is brought up to the uniform temperature of the surrounding water the thermometer will fall immediately on the steam being shut off, the mass abstracting the heat from the water. As soon as the equilibrium of heat is established between the mass throughout and the surrounding water the thermometer will remain stationary after the steam is shut off. A very little experience renders this a very easy matter to determine when a uniform heat is given to the mass throughout. Where the mass to be pressed is of the square already mentioned and four feet high it can be heated in this way uniformly throughout in from thirty minutes to an hour, according to the heat of the weather. As soon as the mass is properly and uniformly heated, as above, it is lifted by a crane and suitable fixtures out of the vat and swung round to its place in the press, and the pressure instantly applied, without jacket, casing, or other contrivance around it. The pressure, if done by a hydraulic press of sufficient power, can be accomplished in fifteen minutes, when the stearic acid will be found, on opening the mass and removing the coverings, fit to be manufactured into candles. A purer article, still more free from oleic acid, may be made by a second

pressure after remelting or regrinding the product first obtained. I attribute the facility and quickness with which I thus express the oleic acid at one operation—for I dispense altogether with the cold-pressure—to the proper and uniform temperature which I thus impart to the mass to be pressed before subjecting it to pressure. The placing of the mass to be heated in a chamber or vat containing air kept at such a temperature as to heat the mass uniformly throughout, though inferior to the water-vat described above, might be made to answer the purpose in view, and, if used, would be a violation of my rights, the substitution of an aeriform for a liquid medium not affecting the principle and mode of operation of my invention.

What I claim as new, and desire to secure by Letters Patent, is—

The application of heat through a liquid or aeriform medium to the mass to be pressed in such a manner that the said mass, before it is subjected to pressure, shall be heated gradually and uniformly throughout to such a degree that, while the stearic acid is at no time during the process melted, the oleic acid is rendered fluid enough to be afterward expressed in the manner above described.

In testimony whereof I, the said JAMES S. GWYNNE, hereunto subscribe my name in the presence of the witnesses whose names are hereunto subscribed.

JAS. S. GWYNNE.

In presence of—

JNO. H. B. LATROBE,  
HY. WEBSTER.