

(No Model.)

W. G. DAY & R. M. GLACKEN.
PROCESS OF TREATING OILS AND FATS.

No. 604,307.

Patented May 17, 1898.

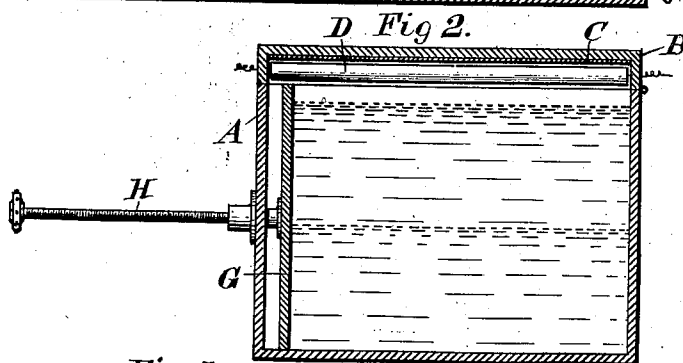
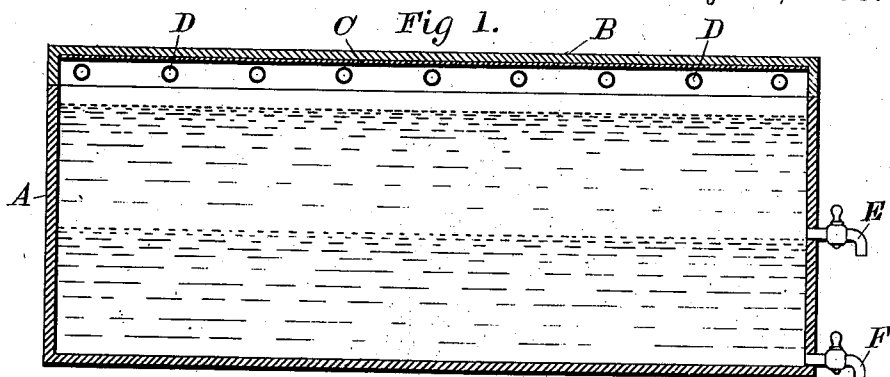
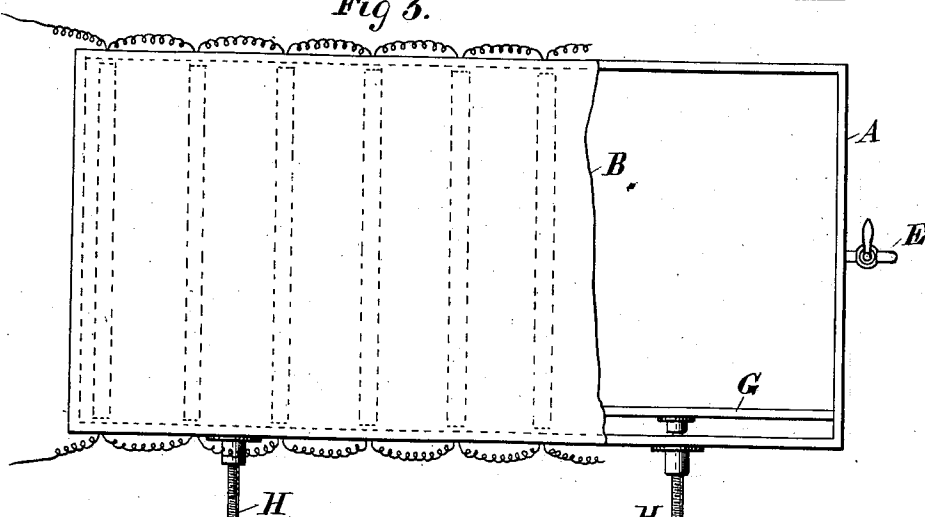


Fig 3.



-WITNESSES-

Dan'l Fisher

H. Constantine

-INVENTORS-

Willard G. Day

Raymond M. Glacken

by Wm. H. J. Howard atty.

UNITED STATES PATENT OFFICE.

WILLARD G. DAY AND RAYMOND M. GLACKEN, OF BALTIMORE, MARYLAND,
ASSIGNORS OF ONE-THIRD TO THOMAS A. BRYAN, OF SAME PLACE.

PROCESS OF TREATING OILS AND FATS.

SPECIFICATION forming part of Letters Patent No. 604,307, dated May 17, 1898.

Application filed February 9, 1897. Serial No. 622,685. (No specimens.)

To all whom it may concern:

Be it known that we, WILLARD G. DAY and RAYMOND M. GLACKEN, of the city of Baltimore, State of Maryland, have invented certain improvements in Processes of Treating Oils and Fats, of which the following is a specification.

The object of this invention is, first, to extract and purify oils and fats, and, secondly, to give to the purified oils and fats certain flavors and odors whereby they may be used as articles of food, in the manufacture of perfumery, and for various other purposes, as will hereinafter fully appear.

As a result of a large number of experiments we have found that lard, tallow, cotton-seed oil, olive-oil, and other oils and fats are altered in character by prolonged exposure to the radiant energy of either an arc or an incandescent or vacuum-tube light produced by an electric current, and this effect we utilize in the molecular separation of the pure oils or fats from combinations with their nitrogenous sheaths or envelops, as well as from other impurities existing in their surroundings. By the same operation we incidentally bleach the oils and fats and finally give them a characteristic granular structure. By the same process we at the same time incidentally bleach the palmitin, stearin, and wax substances which are associated with the oils prior to their separation.

It is well known that both animal and vegetable oils are associated with characteristic nitrogenous compounds existing in the sheaths and envelops surrounding and containing the oil and fat globules. These nitrogenous compounds not only give rise to the odors characteristic of lard, beef, or mutton tallow, &c., but if overheated in the process of rendering their unpleasant characteristics are intensified and imparted to the entire mass of oily substances, for which they have great affinity. The nitrogenous substances also interfered with the keeping qualities of oils and fats, because being unstable compounds they not only readily suffer decomposition themselves, but also assist ferments in bringing the adjacent oily particles into decay. Under our process of extraction, however, the

separation of the oily substances from their nitrogenous containants is complete and is accomplished without the destruction of nitrogenous tissue, which occurs as the effect of high temperature, of mechanical violence, or putrefactive decay. The oily substances which we secure are thus pure and do not give the odors characteristic of their nitrogenous compounds—as in lard, beef, or mutton tallow; nor do they give rise to putrefactive or other changes which are common in all classes of impure or improperly rendered animal and vegetable fats and oils. A further result of the complete separation of the nitrogenous sheaths from the oily substances effected by means of a powerful electric light is that as the oil is freed from nitrogenous surroundings so also the nitrogenous compounds being deprived of oil have no opportunity to decompose it, and thus the other substances, palmitin and stearin or wax, are not so easily decomposed or made rancid. While these substances are being separated from their oil by the action of the radiant energy from the electric lamp, they are also bleached by its heat, light, and actinic power, as may be accomplished in a smaller and less efficient degree by the relatively smaller radiant energy of ordinary sunlight. The use of heat, light, actinic power, and pressure combined gives the products pressed out additional immunity from the dangers caused by any inherent bacteria or other micro-organisms.

When it is desired to render or extract the animal oils—as from beef, lard, or mutton fats—the fats, after the usual washing for the purpose of cleansing from adherent impurities, may be reduced to a hashed or subdivided condition by any convenient means and then placed in a vat having an electric lamp in such relation thereto that the actinic power of the light will affect its contents.

In carrying out our invention we do not limit ourselves to any special form of apparatus, but that shown in the accompanying drawings, which is made a part of this specification, will accomplish the purpose.

Figure 1 is a longitudinal section of a vat for containing the emulsions of oil, fat, and

water. Fig. 2 is a cross-section of Fig. 1. Fig. 3 is a top view of Fig. 1 with a portion of the top or cover removed.

Referring now to the drawings, A is a vat for the oil, fat, and water. It is provided with a hinged top B, on the under side of which is a mirror C to reflect down light from a series of lamps D, which are placed beneath it.

About midway between the top and bottom of the vat is placed a stop-cock E to discharge the oil, and at the bottom is a second stop-cock F to draw off the water when desired.

G is a sliding board situated within and at one side of the vat, and HH are screws whereby the board may be forced inward to give a gentle pressure to the fluid mass or emulsion to assist in pressing out the oil from the nitrogenous sheaths. The board may be operated by hand or power. After removing the first product of oil the nitrogenous sheaths may be further pressed by any ordinary method in use to produce a second product of inferior value.

The heat from the lamp over the emulsion must never be sufficient to burn, scorch, or otherwise unfavorably affect the nitrogenous sheaths containing the oil-globules. On this account it is preferred to employ low-candle-power lamps—say sixteen-candle power—and these should be about one to two inches from the emulsion to be treated. If lamps of a higher candle-power are used, their distance from the emulsion should be increased. When the electric current is turned on, the heat from the lamp will warm the oily particles sufficiently to render them fluid, but not enough to cook, burn, or otherwise injure them or their surrounding nitrogenous tissues. These tissues will allow the oily particles to ooze or move under a slight pressure. The actinic power of the light will help to separate the oily particles from their tissue and to assist in granulating them. As the oil begins to harden it may be drawn from the cooling-vat into casks and taken away. As the pure animal oils procured in this manner are without the usual characteristics of lard, beef, or mutton tallow, but are similar to the oil of butter, they may be readily made into a very pure butter, which is superior both in flavor and in keeping qualities to the usual impure articles sold in commerce, by a secondary operation, hereinafter described.

When it is desirable to secure the oil of butter, the milk from which it is to be produced is placed in suitable vats of, say, from one to twelve inches in depth. Over the vats are placed powerful electric lights, which will rapidly effect the separation of the emulsion into its globules of oil, casein, and water. The oil will rise to the top, the globules of casein will lie beneath the oil, while the water and albumen will remain below. When treated in this way, the milk does not form the usual clabber, as it does when milk is allowed to sour, such souring causing the oil,

casein, albumen, and water to be more or less enmeshed together. As the butter-oil is agitated by the electric-light vibration while being gathered, it is granular when cold.

When it is desired to use the apparatus for the extraction and purification of vegetable oils direct from the seed or plant, the substances may be ground into the form of meal and saturated with water. They may then be allowed to stand for a time or until ready to be placed in the vat, when they are treated under the action of the light and actinic power in a manner similar to that required for animal oils.

We have described our process of obtaining pure oils from fats—that is to say, oils and fats which are freed from the nitrogenous sheaths or envelopes which contain or cover the fat-globules. We shall now proceed to describe how such oils and fats are flavored or have certain odors given to them to produce articles of diet, pomades, and various other substances. In carrying out this part of our invention we mix with oils or fats water to which has been added the substances having the flavor or odor desired and form an emulsion from which at the proper time the oily matter is separated.

Forms of butter are made by combinations of animal and vegetable oils with emulsions of grass, hay, growing corn, corn-fodder, and other articles on which cows and other herbivorous animals are commonly fed. When grass is to be used, it may be removed at any stage of its growth and thrown into a fermenting-vat partly filled with water, or the entire plant may be separated from the ground, and after thorough washing to remove the soil it is to be placed in the fermenting-vat. In from three to six days it will become ready to mix with the animal or vegetable oil. After standing from two to six days longer the emulsion will be found to have the flavor and odor of fresh or what is commonly called "spring" or "grass" butter. After thorough mixing the emulsion is strained and placed in a suitable vat and subjected to the influence of the electric lamps. The electric lights will warm the emulsion, causing the oils to combine with the odoriferous and nutritious particles from the grassy compound, and when this process is complete the oil is separated by expression or filtration, when a highly-palatable article of artificial butter is produced. It should be observed that if the grass contains the ordinary wild garlic or other varieties of the lily family, the characteristic odor will appear in the butter. When hay or dry corn-leaves are employed instead of grass, the ripening process will require longer time. In other respects the process will follow closely that employed with grass.

By employing a properly-prepared emulsion of a fruit or vegetable—as the apple, peach, or grape, or some odoriferous flower—the odor peculiar to it may be given to the oil or fat in the manner described.

As none but pure oils are obtained or employed by our method of treatment and the nitrogenous ferments are either excluded or killed, it is evident that the compounds will be stable and will therefore possess keeping qualities to a remarkable and unusual degree in all climates at ordinary temperatures.

We are aware that fats have been separated by means of an electric current being passed through a macerated emulsion or through water placed under the emulsion; but we do not employ the current for any kind of electrolysis, but merely to obtain the radiant energy in the form of heat, light, and actinic power which suffices to melt, bleach, purify, and granulate the oils, fats, or waxes and to kill their microbes. It is well known that sunlight is employed in bleaching processes; but we do not avail ourselves of this agent in our invention. It is known also that sunlight will destroy some kinds of bacteria if exposure to the sun's direct rays can be given for a sufficient length of time; but under the powerful electric light which we employ and which we can use at all hours of day and night all kinds of microbes are quickly destroyed.

Having described our invention, what we claim is—

1. The process of extracting and purifying oils and fats, which consists in subjecting them to the actinic power of an electric light to break down the nitrogenous sheaths or envelops of the fat-globules, and then separating the broken-down sheaths or envelops by expression or filtration, substantially as specified.

2. The process of imparting flavors and odors to purified oils and fats, which consists in making an aqueous solution of the flavor or odor giving material, then adding to the solution the purified oil or fat to make an emulsion, then subjecting the emulsion to the actinic power of an electric light, and then separating the oil or fat by decantation, expression or filtration, substantially as specified.

WILLARD G. DAY.
RAYMOND M. GLACKEN.

Witnesses:

WM. T. HOWARD,
GEO. E. TAYLOR.