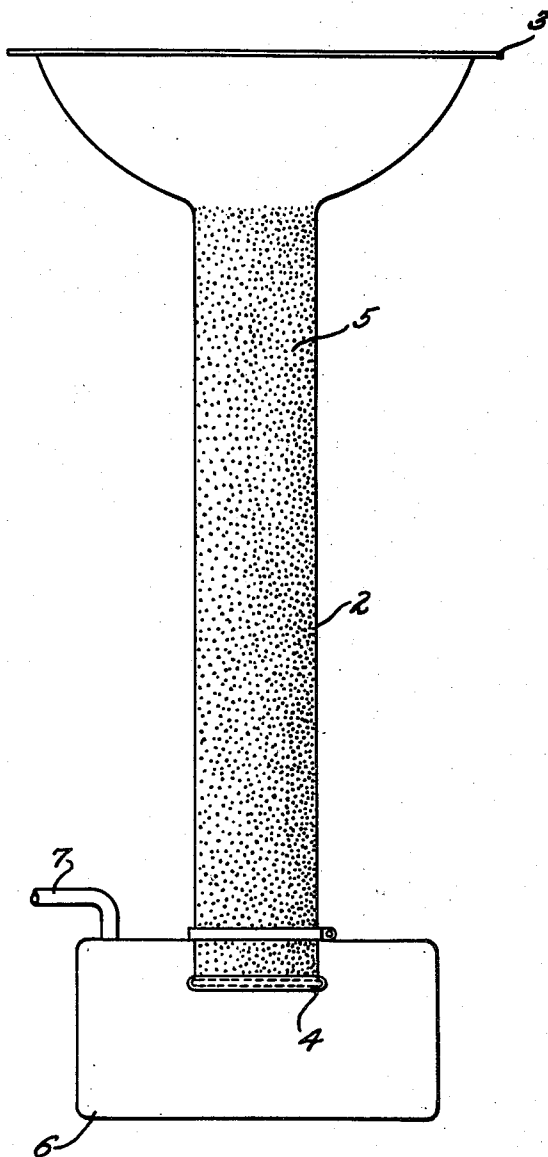


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M. R. COE ET AL
PROCESS FOR REFINING OILS AND FATS TO CHECK
THE DEVELOPMENT OF RANCIDITY
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PROCESS FOR REFINING OILS AND FATS
TO CHECK THE DEVELOPMENT OF RAN-
CIDITYMayne R. Coe and Mayne R. Coe, Jr., Washing-
ton, D. C., dedicated to the free use of the
People of the United States of America

Application June 29, 1938, Serial No. 216,538

4 Claims. (Cl. 210—203)

(Granted under the act of March 3, 1883, as
amended April 30, 1928; 370 O. G. 757)

This application is made under the act of March 3, 1883, as amended by the act of April 30, 1928, and the invention herein described, if patented, may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment to us of any royalty thereon.

We hereby dedicate the invention herein described to the free use of the people of the United States of America to take effect on the granting of a patent to us.

This invention relates to a method of refining vegetable oils and animal fats which are liable to become rancid.

Vegetable oils contain certain pigments such as the chlorophyll pigments while animal fats contain pigments such as hemoglobin, the presence of which have been found by us to be the cause of the development of rancidity in these oils and fats respectively. More specifically, we have found that by removing these pigments from said oils and fats that they remain sweet and edible for a much longer period of time without becoming rancid, than do untreated oils or fats.

In carrying out our invention we have developed several processes more specifically described in the following examples.

Example 1.—In describing this method reference is made to the accompanying drawing which illustrates diagrammatically a vertical column 2, preferably of an opaque material or of a transparent material having a spectral transmission between substantially 4900 and 5800 Angstrom units of the spectrum. The top of the column is provided with a flanged portion substantially funnel shaped on top of which it is preferable to dispose a cover 3 either of an opaque material or one having a spectral transmission between substantially 4900 and 5800 Angstrom units. The bottom of column 2 is fitted with a close-meshed screen 4 and the column 2 is filled with chlorophyll absorbed material 5, such as sugar, powdered as fine as possible, powdered aluminum oxide, powdered talc or soapstone, and so forth. Through this column the oil or fat to be refined is percolated or passed through from the top and is received by container 6 at the bottom. If desired, the end of the column 2 may be hermetically sealed within the container 6 and an outlet 7 provided for attachment to a suction pump. The outlet 7 should, manifestly, be disposed above the maximum level of the liquid in the container 6. The oil or fat percolating through the column of sugar, aluminum oxide or talc is affected in a way that the photosensitiz-

ing rancidity producing pigments are absorbed. It is to be understood that in practising this process the oil or fat subjected to the process should first of all be non-rancid. Best results are obtained when the oil or fat is freshly pressed or extracted. Since the pigments as photosensitizers cause the rancidity, it is desirable throughout the process to exclude any light from the oil. This may be done, as above stated, by either making the apparatus entirely opaque or in the event that it is desired to use a transparent apparatus for the purpose of watching the progress of the process, a transparent material may be used having the properties of a light filter for excluding harmful light, which has been determined to be outside of the range between substantially 4900-5800 Angstrom units. To provide for greater rapidity of percolation through the column of absorbent, a volatile solvent, such as, carbon tetrachloride, petroleum ether, acetone, and so forth, may be added to the oil before it is subjected to the process and volatilized therefrom after the process is completed.

The method described in the above example is satisfactory in so far as its effectiveness is concerned but is often too slow for many purposes and a modification thereof is as follows.

Example 2.—The oil or fat to be treated is mixed with a quantity of the finely powdered sugar, aluminum oxide or powdered talc as above mentioned in Example 1 and this mixture is thoroughly agitated. While the proportions are not critical, it has been found desirable to use approximately one-third of the absorbent material to two-thirds of the oil or fat to be treated. If too much sugar is added a thorough agitation is difficult to accomplish and accordingly it is suggested just enough absorbent material be used to meet the particular conditions at hand. After the mixture is thoroughly agitated and a sufficient time has been permitted for maximum absorption to take place, the mixture is then centrifuged by virtue of which the absorbent material together with the pigments extracted from the oils are separated from the treated oil or fat. If necessary this process may be repeated over and over with new absorbent material until the oil or fat is found to be free from the photosensitizers as shown by chemical tests or preferably by spectroscopic methods. In this process it is also desirable to exclude harmful light as pointed out in Example 1. Also solvents, such as those mentioned in Example 1 may be added to the oil or fat to reduce viscosity, thereby ef-

fecting a more complete agitation with the absorbent.

It should also be understood that in either of the two processes described, the apparatus used should not be fabricated of materials which induce rancidity, such as copper, iron, nickel and so forth. Materials such as glass, aluminum and tin have been found to be satisfactory inasmuch as they are inert to the development of rancidity. When the above processes are carried out with aluminum oxide or talc, as above suggested, instead of sugar they may be reactivated by the simple process of heating them for a sufficient length of time. However, when the process is carried out with sugar, the sugar may be reactivated by dissolving out the pigment adsorbed on the sugar by means of a suitable solvent such as petroleum ether, ethyl ether, acetone, and so forth. This renders the process economically more efficient.

Having thus described our invention, we claim:

1. A process for refining oils and fats containing photosensitizing pigments to check the development of rancidity comprising percolating the oil or fat through a column of finely powdered sugar, whereby said pigments are absorbed in the sugar and removed from the oil or fat, and thence recovering the oil or fat product free of said pigments.

2. A process for refining oils and fats containing photosensitizing pigments to check the development of rancidity comprising dissolving the oil or fat in a highly volatile solvent, thence percolating the solution through a column of finely powdered sugar, thence recovering the resulting solution, thence evaporating the solvent and recovering the oil or fat free of said pigments.

3. A process for refining oils and fats containing photosensitizing pigments to check the development of rancidity comprising dissolving the oil or fat in a highly volatile solvent, thence percolating the solution through a column of finely powdered talc, thence recovering the resulting solution, thence evaporating the solvent and recovering the oil or fat free of said pigments.

4. A process for refining oils and fats containing photosensitizing pigments to check the development of rancidity comprising agitating the oil or fat with sugar in finely divided form until the photosensitizing pigments are absorbed by the sugar, thence separating the sugar from the oil or fat and recovering the oil or fat free of said pigments.

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