

Singapore

PATENT SPECIFICATION

(11) 1 473 208

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- (21) Application No. 43411/74 (22) Filed 7 Oct. 1974
(31) Convention Application No. 411 530
(32) Filed 31 Oct. 1973 in
(33) United States of America (US)
(44) Complete Specification published 11 May 1977
(51) INT CL² A23L 1/24
(52) Index at acceptance A2B 6G



(54) SALAD DRESSING COMPOSITIONS

(71) We, CPC INTERNATIONAL INC., a corporation organized and existing under the laws of the State of Delaware, United States of America, of International Plaza, City of Englewood Cliffs, State of New Jersey, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to mayonnaise and salad dressing compositions in which at least one of the oil components is a non-winterized, partially hydrogenated polyunsaturated oil.

In the current art, when cottonseed oil, corn oil, sunflower oil, rice bran oil and similar oils are prepared for use in mayonnaise and salad dressings, it is customary to submit such oils to a chilling and filtration process by which triglyceride fractions, waxes and other constituents which are solid at lower than ambient temperatures are separated from a liquid fraction. These latter liquid fractions constitute the salad oils of the current art.

Separation of the solid fractions results in the production of salad oils which remain completely melted and of clear appearance after relatively long periods of storage at the temperatures prevailing in home refrigerators. However, this is not the sole reason that a particular crystallization or winterization unit operation is included in the preparation of salad oils. Winterization has been an obligatory unit operation in the production of salad oils for use in mayonnaise and salad dressings because otherwise, the dressing compositions suffer emulsion breakage when exposed to temperatures at which crystallization of triglycerides or waxes occurs. Whether or not such separations occur above or below the freezing point of water, the instability of the emulsions of mayonnaise and salad dressings as a result of low environmental temperature is referred to as "freeze-breaking".

Hydrogenated oils of the prior art also have always been winterized because, if not winterized, mayonnaise and emulsified salad

dressings made therefrom are very prone to exhibit freeze-breaking upon exposure to a cold environment. The extent of emulsion damage may range from a noticeable softening of the consistency of a mayonnaise, through visible separation of oil droplets or to an extreme condition in which the product separates into oil and aqueous phases. The degree of separation has been related to the time, temperature and a quality of the salad oil expressed as the number of hours at which the oil remains free of the cloud or haze resulting from crystallization of non-liquid triglycerides or naturally-occurring constituents. If winterization results in a salad oil which does not cloud at a temperature of 32°F. in less than 5½ hours (American Oil Chemists Society Official Method Cc 11—53), the salad oil is judged to be satisfactorily winterized. Many winterized oils such as corn oil, sunflower oil and others may be easily produced having cold tests at 32°F. of 48 hours or more. Hydrogenated soybean oil having an iodine value of from 110 to 120 is customarily winterized to produce oils from 8 to 20 hours cold test, the value desired and achieved being entirely within control of the winterization procedure as to time allowed for crystallization at the temperature chosen.

An object of this invention is to provide an economical process for the manufacture of mayonnaise and salad dressings.

Another object is to avoid the manufacturing operation, winterization, in the preparation of an oil component for mayonnaise in salad dressings.

According to the present invention there is provided a mayonnaise or emulsified salad dressing composition containing a non-winterized and partially hydrogenated polyunsaturated oil in an amount sufficient to enable said mayonnaise or emulsified salad dressing composition to withstand exposure to air at a temperature of 15°F. for a period of at least 24 hours without physical or visible change, the hydrogenation being carried out at a temperature of from 250°F to 375°F

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and the oil, prior to hydrogenation, being a polyunsaturated oil which does not exhibit clouding in less than 5½ hours at 32°F.

- We have discovered that partial hydrogenation of the above polyunsaturated oils, if done at temperatures between 250°F. and 375°F., preferably 300° to 350°F produces oils which may be used in salad dressings such as mayonnaise without winterization; this despite the fact that such partially hydrogenated oils may cloud before or almost immediately upon reaching a temperature of 32°F. Oils such as cottonseed oil or rice bran oil which in their original state exhibit extensive crystallization at 32°F cannot be used. However, oils such as corn oil or sunflower oil which are essentially liquid at 32°F but which do exhibit clouding due to separation of crystalline waxes present in varying degrees as naturally occurring components may be used. Preferably the waxes in these oils (e.g. sunflower oil, corn oil) are removed by a cold filtration before hydrogenation. Such a filtration does not cause an important diminution in yield of oil as the waxes usually constitute no more than a fraction of one percent of the whole refined and bleached oil.

Amongst oils which are preferred for use in the present invention are soybean oil,

safflower oil, dewaxed corn oil and dewaxed sunflower oil.

The hydrogenated oil preferably has an iodine value of 100 to 125, more preferably 112 to 120.

The mayonnaise or emulsified salad dressing composition of the present invention has proportions of other constituents similar to those which can be found in prior art mayonnaise or emulsified salad dressing compositions.

The following Examples are included to illustrate the present invention.

Example 1.

Refined and bleached soybean oil having an iodine value of 134.9 was hydrogenated to an iodine value of 113.7 with a commercial nickel catalyst at a temperature beginning at 310°F. and ending at 375°F. The hydrogenation time was ½ hour at 15 p.s.i.g. The filtered oil had the following SCI values after 24 hours at each temperature:

24 Hours SCI Values

70°F	50°F	32°F
0.0	2.4	4.1

(Cold Test-30 minutes)

Fatty Acid Compositions by Gas Chromatography

	Palmitic C16:0	Stearic C18:0	Oleic C18:1	Linoleic C18:2	Linolenic C18:3	Other
Hydrogenated soybean oil-iodine value 113.7	10.3	3.8	40.0	38.7	5.5	Balance
51 parts hydrogenated soybean oil-iodine value 113.7	10.1	3.7	30.0	47.2	7.1	Balance
49 parts whole soybean oil-iodine value 134.9						

- Mayonnaise was prepared in the usual manner utilizing the deodorized blended oil. The product was of normal appearance and consistency. It withstood exposure to an air environment at 15°F without visible or physical change for 4 days. Experience has shown that this degree of resistance to freeze-breaking reflects sufficient stability in all normal conditions encountered in commerce.

generated with commercial nickel catalyst at 45 p.s.i.g. at a temperature below 250°F to an iodine value of 115.0. The product had the following characteristics:

24 Hours SCI Values

70°F	50°F	32°F
0.5	2.2	4.4

(Cold Test-1 Hour)

Example 2 (Comparative)
Refined and bleached soybean oil was hydro-

- Forty-nine parts of the hydrogenated soybean oil were blended with 51 parts of whole unhydrogenated soybean oil and the mixture was deodorized. The deodorized blended oil had the following characteristics:

24 Hours SCI Values

70°F	50°F	32°F
0.0	0.2	1.4

Fatty Acid Compositions by Gas Chromatography.

	Palmitic C16:0	Stearic C18:0	Oleic C18:1	Linoleic C18:2	Linolenic C18:3	Other
Hydrogenated soybean oil-iodine value 115.0	—	6.2	34.9	43.3	4.7	Balance
51 parts whole soybean oil-iodine value 136.6	10.0	5.0	28.8	48.9	6.5	Balance
49 parts hydrogenated soybean oil-iodine value 115.0						

- Mayonnaise prepared with the oil blend of Example 2 in the same manner and under the same conditions as that of Example 1 failed to withstand exposure to an air environment of 15°F for 24 hours. The mayonnaise was more firm than desirable and at 45°F its texture was very "cheesy".

Example 3.

Soybean oil having an iodine value of 133.8 was hydrogenated at 250°F to an iodine value of 120. The filtered oil exhibited a cold test of less than 1 hour and was of semi-solid consistency after 8 hours at 32°F.

Its composition as determined by gas chromatography was as follows:

% Fatty Acids.

Palmitic C16:0	Stearic C18:0	Oleic C18:1	Linoleic C18:2	Linolenic C18:3	Other
10.6	4.5	30.1	48.2	4.5	Balance

- Mayonnaise prepared from the hydrogenated soybean oil having an iodine value of 120 was of normal consistency in appearance. It was also normal in all respects after storing at 15°F for 4 days and at 25°F for 3 weeks.

was hydrogenated to an iodine value of 125 with a copper-promoted nickel catalyst at 250°F. over a period of 26 minutes at 45 p.s.i.g. The product oil after filtration exhibited a cold test of about 1 hour and had a melting point of 43.7°F. This oil had the following characteristics:

Example 4.

Soybean oil having an iodine value of 134.1

Fatty Acid Composition by Gas Chromatography

Palmitic C16:0	Stearic C18:0	Oleic C18:1	Linoleic C18:2	Linolenic C18:3	Other
10.5	4.3	29.1	50.8	5.0	Balance

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When used as the sole oil component of mayonnaise, the resultant mayonnaise had excellent flavor stability and resistance to freeze breaking as evidenced by satisfactorily withstanding storage at 15°F.

WHAT WE CLAIM IS:—

1. A mayonnaise or emulsified salad dressing composition containing a non-winterized and partially hydrogenated polyunsaturated oil in an amount sufficient to enable the mayonnaise or emulsified salad dressing composition to withstand exposure at a temperature of 15°F for a period at least 24 hours without physical or visible change, the hydrogenation being carried out at a temperature from 250°F to 375°F and the oil, prior to hydrogenation, being a polyunsaturated oil which does not exhibit clouding in less than 5½ hours at 32°F.
2. The mayonnaise or emulsified salad dressing composition as claimed in claim 1 wherein the oil is hydrogenated at a temperature from 300°F. to 350°F.
3. The mayonnaise or emulsified salad dressing composition as claimed in either claim 1 or claim 2 wherein the hydrogenated oil has an iodine value from 100 to 125.

4. The mayonnaise or emulsified salad dressing composition as claimed in any one of claims 1 to 3 wherein the hydrogenated oil has an iodine value from 112 to 120.

5. The mayonnaise or emulsified salad dressing composition as claimed in any one of claims 1 to 4 wherein the polyunsaturated oil is soybean oil.

6. The mayonnaise or emulsified salad dressing composition as claimed in any one of claims 1 to 4 wherein the polyunsaturated oil is dewaxed corn oil.

7. The mayonnaise or emulsified salad dressing composition as claimed in any one of claims 1 to 4 wherein the polyunsaturated oil is dewaxed sunflower oil.

8. The mayonnaise or emulsified salad dressing composition as claimed in any one of claims 1 to 4 wherein the polyunsaturated oil is safflower oil.

9. The mayonnaise or emulsified salad dressing composition as claimed in any one of the preceding claims and substantially as hereinbefore described in any one of Examples 1, 3 and 4.

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3. The mayonnaise or emulsified salad dressing composition as claimed in either claim 1 or claim 2 wherein the hydrogenated oil has an iodine value from 100 to 125.

4. The mayonnaise or emulsified salad dressing composition as claimed in any one of claims 1 to 3 wherein the hydrogenated oil has an iodine value from 112 to 120.

5. The mayonnaise or emulsified salad dressing composition as claimed in any one of claims 1 to 4 wherein the polyunsaturated oil is soybean oil.

6. The mayonnaise or emulsified salad dressing composition as claimed in any one of claims 1 to 4 wherein the polyunsaturated oil is dewaxed corn oil.

7. The mayonnaise or emulsified salad dressing composition as claimed in any one of claims 1 to 4 wherein the polyunsaturated oil is dewaxed sunflower oil.

8. The mayonnaise or emulsified salad dressing composition as claimed in any one of claims 1 to 4 wherein the polyunsaturated oil is safflower oil.

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