Patent Right	Date	January 28, 2019	Court	Intellectual Property High Court, Third Division
	Case number	2018 (Gyo-Ke) 10027		
- A case in which, with regard to a patent for the invention titled "PROCESS FOR DECREASING ENVIRONMENTAL POLLUTANTS IN OIL OR FAT, VOLATILE ENVIRONMENTAL POLLUTANTS DECREASING WORKING FLUID, HEALTH SUPPLEMENT, AND ANIMAL FEED PRODUCT", the court has determined that a person ordinarily skilled in the art who read a cited document could have easily conceived of at least the inventions according to Claims 1 and 19 in view of the common technical knowledge and well-known matters about the circumstances of distillation and environmental pollution as of the priority date.				

Case type: Rescission of Trial Decision to Partially Maintain

Result: Granted

References: Article 29, paragraph (2) of the Patent Act

Number of related rights, etc.: Invalidation Trial No. 2013-800118, Patent No. 3905538

Summary of the Judgment

1 The case is a suit against a trial decision that partially dismissed a claim for invalidation in an invalidation trial of a patent according to the invention titled "PROCESS FOR DECREASING ENVIRONMENTAL POLLUTANTS IN OIL OR FAT, VOLATILE ENVIRONMENTAL POLLUTANTS DECREASING WORKING FLUID, HEALTH SUPPLEMENT, AND ANIMAL FEED PRODUCT". The issue is the presence or absence of inventive step.

2 The court decision has rescinded a part of the JPO decision in summary as follows.

(1) Errors in the determination about whether a different feature was easily conceivable on the basis of the invention described in Exhibit Ko 2

A. Errors in the finding of different feature

The volatile working fluids of the Invention 1 differ from linoleic acid of Exhibit Ko 2 invention 1 in whether substances for removal are environmental pollutants or cholesterols. However, they have in common that they have high volatility compared to triglycerides and they are liquids evaporated together with a substance for removal. Further, linoleic acid corresponds to "C10 to C22 free fatty acids" exemplified as a volatile working fluid in the description. Therefore, it is reasonable to find that linoleic acid of Exhibit Ko 2 invention 1 corresponds to a volatile working fluid in Invention 1.

Therefore, the trial decision by the JPO made an error in finding it indefinite as to whether or not linoleic acid of Exhibit Ko 2 invention 1 could be said to be a volatile working fluid.

B. Errors in the determination about whether a different feature was easily conceivable

It can be seen from the description of a publication distributed before and after the priority date that as of the priority date it was a well-known objective matter that almost all marine oils before purification include PCB and brominated flame retardants. Therefore, it must be said that a person ordinarily skilled in the art could have easily conceived of a salmon head oil of Exhibit Ko 2 invention 1 including "environmental pollutants selected from a group consisting of brominated flame retardants and PCB".

Further, it must be said that PCB and brominated flame retardants having higher volatility are also gasified in a temperature range where cholesterols are gasified. Thus the environmental pollutants are separated together with linoleic acid added to a salmon head oil by use of the salmon head oil including "environmental pollutants selected from a group consisting of brominated flame retardants and PCB" when a method specified by Exhibit Ko 2 invention 1 is implemented. Further, the degrees of volatility of cholesterols, PCB, and brominated flame retardants was well-known objective matters as of the priority date. Therefore, a person ordinarily skilled in the art could have easily understood that PCB and brominated flame retardants contained in a salmon head oil might be separated together with linoleic acid added to the salmon head oil when a method specified in Exhibit Ko 2 invention 1 is implemented.

Furthermore, in view of Exhibit Ko 2 and the evaporation temperatures of cholesterols, PCB, and brominated flame retardants, it must be said that a person ordinarily skilled in the art could have easily conceived of adjusting the temperature range to at least a range of 175 to 260°C in a case where PCB and brominated flame retardants are to be removed from a salmon head oil of Exhibit Ko 2 invention 1 by molecular distillation. Further, the temperature range (175 to 260°C) is encompassed into a temperature range (150 to 270°C) specified in Invention 1.

C. Therefore, it is reasonable to find that Invention 1 was easily conceivable by a person ordinarily skilled in the art on the basis of an invention of Exhibit Ko 2 as well as the common technical knowledge and well-known matters as of the priority date. The same can also apply to Invention 19.

(2) Errors in the determination about whether a different feature was easily

conceivable on the basis of the invention described in Exhibit Ko 3

A. Errors in the finding of different features

The volatile working fluids of Invention 1 differs from simple esters of Exhibit Ko 3 invention 1 in whether substances for removal are environmental pollutants or odor substances, whereas they have in common that they both have high volatility compared to triglycerides, and are liquids evaporated together with substances for removal. Further, simple esters correspond to "an ester of C10 to C22 fatty acids and C1 to C4 alcohols" exemplified as a volatile working fluid in the description. Therefore, it is reasonable to find that simple esters of Exhibit Ko 3 invention 1 correspond to a volatile working fluid in Invention 1.

Therefore, the trial decision by the JPO made an error in finding it indefinite as to whether or not simple esters of Exhibit Ko 3 invention 1 could be said to be a volatile working fluid.

B. Errors in the determination about whether a different feature was easily conceivable

Similarly to the above item (1)B, it must be said that a person ordinarily skilled in the art could have easily conceived of a fish oil of Exhibit Ko 3 invention 1 including "environmental pollutants selected from a group consisting of brominated flame retardants and PCB".

Further, it must be said that PCB and brominated flame retardants having high volatility are also gasified in a temperature range (200 to 260°C) where an odor substance is gasified. Therefore, a person ordinarily skilled in the art could have easily understood that "environmental pollutants selected from a group consisting of brominated flame retardants and PCB" included in a fish oil are separated together with simple esters added to the fish oil when a method specified by Exhibit Ko 3 invention 1 is implemented.

Furthermore, in view of Exhibit Ko 3 and the evaporation temperatures of odor substances, PCB, and brominated flame retardants, it must be said that a person ordinarily skilled in the art could have easily conceived of adjusting the temperature range to at least a range of 175 to 260°C in a case where PCB and brominated flame retardants are to be removed from a fish oil of Exhibit Ko 3 invention 1 by stripping. Further, the temperature range (175 to 260°C) is encompassed into a temperature range (150 to 270°C) specified in Invention 1.

C. Therefore, it is reasonable to find that Invention 1 was easily conceivable by a person ordinarily skilled in the art on the basis of an invention of Exhibit Ko 3 as well as the common technical knowledge and well-known matters as of the priority date.

The same can also apply to Invention 19.

Judgment rendered on January 28, 2019
2018 (Gyo-Ke) 10027 A case of seeking rescission of Trial the JPO Decision
Date of conclusion of oral argument: December 6, 2018

Judgment

Plaintiff: Nippon Suisan Kaisha, Ltd.

Defendant: BASF AS

Main text

1 In a trial decision that JPO made on January 18, 2018 for Invalidation Trial No. 2013-800118, the parts of "the description and the scope of the claims of Patent No. 3905538 may be corrected with regard to Claim 21 after the correction as per the corrected description and the scope of claims attached to the claim for correction." and "the claim for trial with regard to the patents for the inventions according to Claims 1, 2, 4 to 6, 9, and 12 to 21 of Patent No. 3905538 should be dismissed." shall be rescinded.

2 The court costs shall be borne by Defendant.

3 The additional period for filing a final appeal and a petition for acceptance of final appeal against this judgment shall be 30 days.

Facts and reasons

No. 1 Claim

The same as item 1 of the main text.

No. 2 The facts used as premise (a fact without evidence is recognized as a fact without dispute between parties or a fact found from the overall gist of oral proceedings.)

1 History of the procedures, etc. in Japan Patent Office

(1) Defendant filed a patent application for the invention titled "PROCESS FOR DECREASING ENVIRONMENTAL POLLUTANTS IN OIL OR FAT, VOLATILE ENVIRONMENTAL POLLUTANTS DECREASING WORKING FLUID, HEALTH SUPPLEMENT, AND ANIMAL FEED PRODUCT" with an international filing date of July 8, 2003 (Japanese Patent Application No. 2004-520966, claiming priority benefit of July 11, 2002 (hereinafter referred to as "the priority date") Sweden), and a patent was registered on January 19, 2007 (Patent No. 3905538, the number of claims

as of the registration is 28, hereinafter referred to as "the Patent" Exhibits Ko 53, 54).

(2) Plaintiff claimed an invalidation trial seeking for invalidating a patent for the invention recited in Claim 3 of the scope of the claims of the Patent on August 31, 2007 (Invalidation Trial No. 2007-800186).

The Japan Patent Office made a trial decision for the above claim on September 18, 2008 to the effect that "The patent regarding the invention according to Claim 3 of Patent No. 3905538 shall be invalidated.", which was then made final and binding (Exhibit Ko 54).

(3) Plaintiff claimed a trial for invalidating the patents granted for the inventions recited in Claims 1, 2, and 4 to 28 of the scope of claims of the Patent on July 5, 2013 (Invalidation Trial No. 2013-800118, hereinafter referred to as "the claim for invalidation trial" Exhibit Otsu 3).

Defendant claimed a correction of the description and the scope of claims of the Patent on December 16, 2014 (hereinafter the correction according to this claim for correction is referred to as "the Correction" Exhibit Otsu 21).

JPO made the following decision for the claim for invalidation trial on May 13, 2015 (hereinafter referred to as "First trial decision".):

"The correction shall be accepted as per the claim.

The patents regarding the inventions for Claims 1, 2, 4 to 6, 9, and 12 to 27 of Patent No. 3905538 shall be invalidated.

A non-compliant claim for trial with respect to the inventions according to Claims 7, 8, 10, 11, and 28 of Patent No. 3905538 should be dismissed by a decision."

Further, in the first trial decision, a part of accepting a correction to cancel Claims 7, 8, 10, 11, and 28 has been made final and binding.

(4) Defendant filed a suit seeking for the rescission of the first trial decision against the Intellectual Property High Court on September 17, 2015 (2015(Gyo-Ke)10190).

The court made a decision on February 22, 2017 "in a trial decision that JPO has made on May 13, 2015 with regard to the case of Invalidation Trial No. 2013-800118, a part corresponding to Claims 1, 2, 4 to 6, 9, and 12 to 21 of Patent No. 3905538 shall be rescinded. The remaining claims from Plaintiff shall be dismissed." (Hereinafter, referred to as "previous court decision") and then the previous court decision was made final and binding.

(5) JPO reopened the proceeding of the claim for invalidation trial of the case.

Further, in the first trial decision, a part according to Claims 22 to 27 of the scope of the claims of the Patent that has not been rescinded in the previous court decision forms a group of claims with a part according to Claims 1, 2, 4 to 6, 9, and 12 to 18 that has been rescinded. Therefore, a part of "The patents regarding the inventions for Claims 22 to 27 of Japanese Patent No. 3905538 shall be invalidated." of the first trial decision should not be made final and a trial examination was made again with respect to "the claim for trial with regard to the patents for the inventions according to Claims 1, 2, 4 to 6, 9, and 12 to 27 of Patent No. 3905538".

JPO made a following decision (hereinafter referred to as "the trial decision") with respect to the claim for the invalidation trial on January 18, 2018:

"The specification and the scope of the claims of Patent No. 3905538 may be corrected in accordance with Claims [1, 2, 4 to 6, 9, 12 to 18, and 22 to 27] and [19 to 21] after the correction as per the corrected description and the scope of claims attached to a claim for correction.

The patents regarding the inventions for Claims 22 to 27 of Japanese Patent No. 3905538 shall be invalidated.

A claim for trial with regard to the patents for the inventions according to Claims 1, 2, 4 to 6, 9, and 12 to 21 of Patent No. 3905538 shall be dismissed.

A non-compliant claim for trial with respect to the inventions according to Claims 7, 8, 10, 11 and 28 of Patent No. 3905538 shall be dismissed by a decision."

Eight-elevenths of the costs for trial shall be borne by Demandant, whereas three-eleventh shall be borne by Demandee."

Its certified copies were served for Plaintiff on January 26, 2018.

(6) Plaintiff filed a suit on February 23, 2018.

2 The recitation of the Claims

The recitation of Claims 1, 2, 4 to 6, 9, and 12 to 27 of the scope of the claims after the Correction is as in the following (The invention of Claim 1 after the correction is hereinafter referred to as "Invention 1" corresponding to the claim number, and together with Invention 2, is collectively referred to as "the Invention" in some cases).

[Claim 1]

A process for decreasing the amount of environmental pollutants in a marine oil being edible or for use in cosmetics,

the environmental pollutants being selected from a group consisting of brominated flame retardants and PCB,

- the process comprises the steps of externally adding a volatile working fluid to the marine oil, where the volatile working fluid comprises at least one of a fatty acid ester, a fatty acid amide, and a free fatty acid;

and
- subjecting the marine oil with the added volatile working fluid to at least one stripping processing step which is carried out at temperatures in the interval of 150 to 270 °C, and in which an amount of environmental pollutant present in the marine oil, being edible or for use in cosmetics, is separated from the marine oil together with the volatile working fluid.

[Claim 2]

The process of Claim 1, wherein the volatile working fluid is essentially equally or less volatile than the environmental pollutants that are to be separated from the fat or oil mixture, and the environmental pollutants are brominated flame retardants.

[Claim 4]

The process of Claim 1, wherein at least one of a fatty acid ester, a fatty acid amide, and a free fatty acid are obtained from at least one of plants, microorganisms, and animal fat or oil, and said environmental pollutants are brominated flame retardants to be selected from the group consisting of 2,2',4,4'-tetrabromodiphenylether (BDE47), 2,2',4,4',5-pentabromodiphenylether (BDE99) and 2,2', 4,4',6-pentabromodiphenylether (BDE100).

[Claim 5]

The process of Claim 4, wherein said animal fat or oil is an oil obtained from a fish oil and/or an oil from sea mammal, and said environmental pollutants are BDE47.

[Claim 6]

The process of Claim 1, wherein the volatile working fluid comprises at least one fatty acid ester of C10 to C22 fatty acids and C1 to C4 alcohols, or a combination of two or more fatty acid esters, each consisting of C10 to C22 fatty acids and C1 to C4 alcohols, and said environmental pollutants are brominated flame retardants.

[Claim 9]

The process of Claim 1, wherein said marine oil is obtained from fish or sea mammals, containing saturated and unsaturated fatty acids in the form of triglycerides, and said environmental pollutants are brominated flame retardants.

[Claim 12]

The process of Claim 1, wherein a ratio of (volatile working fluid) to (marine oil being edible or for use in cosmetics) is 1:100 to 15:100, and said environmental pollutants are brominated flame retardants.

[Claim 13]

The process of Claim 12, wherein a ratio of (volatile working fluid) to (marine oil being edible or for use in cosmetics) is 3:100 to 8:100, and said environmental pollutants are BDE47, BDE99, and BDE100.

[Claim 14]

The process of Claim 1, wherein said stripping processing step is carried out at a temperature of 150 to 200 °C, and said environmental pollutants are brominated flame retardants selected from the group consisting of BDE47, BDE99, and BDE100.

[Claim 15]

The process of Claim 1, wherein said stripping processing step is carried out at a temperature of 150 to 200 °C, and said environmental pollutants are decachlorobiphenyl.

[Claim 16]

The process of Claim 1, wherein said stripping processing step is carried out at a pressure lower than 1 mbar, and said environmental pollutants are BDE47.

[Claim 17]

The process of Claim 1, wherein at least one of said processing step is one of thin-film evaporation process, molecular distillation, and short-path distillation, and any combination thereof, and said environmental pollutants are brominated flame retardants selected from the group consisting of BDE47, BDE99, and BDE100.

[Claim 18]

The process of Claim 17, wherein at least one of said thin-film evaporation process is carried out at a flow rate of marine oil of 10 to 300 kg/h/m^2, and said marine oil is a fatty acid in the form of triglycerides.

[Claim 19]

A use of volatile environmental pollutants decreasing working fluid comprising at least one kind of fatty acid ester, a fatty acid amide, and a free fatty acid, and any combination thereof in a process for decreasing the amount of environmental pollutants in a marine oil being edible or for use in cosmetics, said marine oil comprising environmental pollutants, and the environmental pollutants being brominated flame retardants, and in the process, the volatile environmental pollutants decreasing working fluid is externally added to the marine oil, and then the marine oil is subjected to at least one stripping processing step, the stripping processing step is carried out at a temperature of 150 to 270 °C, and an amount of environmental pollutant present in the marine oil, being edible or for use in cosmetics, is separated from the marine oil together with the volatile environmental pollutants decreasing working fluid.

[Claim 20]

The use of Claim 19, wherein said stripping processing step is one of thin-film evaporation process, molecular distillation, or short-path distillation, or any combination thereof, and said marine oil is fatty acids in the form of triglycerides, and said environmental pollutants are brominated flame retardants selected from the group consisting of BDE47, BDE99, and BDE100.

[Claim 21]

The use of Claim 19 or Claim 20, wherein the volatile environmental pollutants decreasing working fluid is a by-product derived from a process for production of ethyl and/or methyl ester concentrates, wherein in the process for production of ethyl and/or methyl ester concentrates, an edible or non-edible fish oil is subjected to ethylation and/or methylation process and subsequent two-step molecular distillation in which a volatile fraction from the first distillation process is distilled once more in the second distillation process and wherein the by-product is a volatile fraction from the second distillation process.

[Claim 22]

A marine oil product prepared in accordance with the process of Claim 1.

[Claim 23]

The marine oil product of Claim 22, wherein said marine oil product is a pharmaceutical product.

[Claim 24]

The marine oil product of Claim 22, wherein said marine oil product is a health supplement.

[Claim 25]

The marine oil product of Claim 22, wherein said marine oil product is an animal feed product.

[Claim 26]

The marine oil product of Claim 25, wherein said animal feed product is a fish feed product.

[Claim 27]

The marine oil product of Claim 22, wherein said marine oil product is a cosmetic product.

3 Reasons for the trial decision

The reason for trial decision is as per described in the copy of the attached written trial decision. The summary is set forth below (note that only a part related to the issue of the case is listed.).

(1) Inventions 1, 2, 9, 12, 17, 19, and 20 are not the same inventions as the inventions

(two inventions of "Exhibit Ko 2 invention 1" and "Exhibit Ko 2 invention 2" are described) described in the item of "3. Removal of Cholesterol from Salmon Head Oil with a Codistillate" (page 88) of V. F. Stout et al., "Chapter 4 FRACTIONATION OF FISH OILS AND THEIR FATTY ACIDS", Fish Oils in Nutrition (Ed. M. E. Stansby, van Norstrand Reinhold, 1990. Exhibit Ko 2).

(2) Inventions 1, 2, 4 to 6, 9, and 12 to 21 were not easily conceivable by a person ordinarily skilled in the art on the basis of Exhibit Ko 2 invention 1 and Exhibit Ko 2 invention 2 as well as well-known art.

(3) Inventions 1, 2, 4 to 6, 9, and 12 to 21 were not easily conceivable by a person ordinarily skilled in the art on the basis of the invention described in United States Patent No. 3082228 specification (Exhibit Ko 3) (two inventions of "Exhibit Ko 3 invention 1" and "Exhibit Ko 3 invention 2" are described) and the above well-known technique.

4 Cited invention that a trial decision found and common points and different features between the Invention and the cited invention

(1) Comparison with Exhibit Ko 2 invention 1

A. Exhibit Ko 2 invention 1

A process for the removal of cholesterols in edible salmon head oil, comprising:

- externally adding linoleic acid to the salmon head oil; and
- subjecting the salmon head oil to molecular distillations together with added linoleic acid,

in which cholesterols present in the edible salmon head oil are removed from the salmon head oil together with linoleic acid.

B. Common points and Different features between Invention 1 and Exhibit Ko 2 invention 1

<Common Points>

A process comprising:

- externally adding fatty acids to the edible marine oil;

and

- subjecting the marine oil to the stripping processing step at least one time together with added fatty acids.

<Different feature 6>

Invention 1 is a process for decreasing an amount of environmental pollutants in a marine oil containing environmental pollutants, wherein the environmental pollutants are selected from a group consisting of brominated flame retardants and

PCB, and the marine oil comprises at least one of a fatty acid ester, a fatty acid amide, and a free fatty acid, and an amount of environmental pollutant present in the marine oil is separated from the marine oil together with the volatile working fluid, whereas Exhibit Ko 2 invention 1 is a process for removing cholesterols in a salmon head oil, comprising the step of separating from the salmon head oil a certain amount of cholesterols present therein together with linoleic acid; however, it is indefinite as to whether or not a marine oil comprises environmental pollutants selected from the group consisting of brominated flame retardants and PCB, and as to whether or not the environmental pollutants comprises a step of separating the environmental pollutants from the salmon head oil together with linoleic acid added to the salmon head oil, and further as to whether or not linoleic acid can be said to be a volatile working fluid.

<Different feature 7>

Regarding a temperature range in which the "stripping processing step" is carried out, Invention 1 specifies "at temperatures in the interval of 150 to 270 °C", whereas Exhibit Ko 2 invention 1 fails to specify the temperatures at which the molecular distillation corresponding to the "stripping processing step" is carried out.

(2) Comparison with Exhibit Ko 2 invention 2

A. Exhibit Ko 2 invention 2

A use of linoleic acid in a process for removing cholesterols in an edible salmon head oil, wherein linoleic acid is externally added to the salmon head oil, and then the salmon head oil is subjected to molecular distillation, and cholesterols present in the edible salmon head oil are separated from the salmon head oil together with linoleic acid.

B. Common points and Different features between Invention 19 and Exhibit Ko 2 invention 2

<Common Point>

A use of fatty acids, wherein fatty acids are externally added to edible marine oil, and then the marine oil is subjected to at least one stripping processing step.

<Different feature 6'>

Invention 19 is a use of a volatile environmental pollutants decreasing working fluid comprising at least one kind of fatty acid ester, a fatty acid amide, and a free fatty acid, and any combination thereof in a process for decreasing the amount of environmental pollutants in a marine oil, wherein the marine oil comprises environmental pollutants, and the environmental pollutants are brominated flame retardants, and an amount of environmental pollutants present in the marine oil is separated from the marine oil together with the volatile environmental pollutants decreasing working fluid, whereas Exhibit Ko 2 invention 2 is a use of linoleic acid in a process for reducing an amount of cholesterols in a salmon head oil, in which an amount of cholesterols present in the edible salmon head oil is separated from the salmon head oil together with linoleic acid from the salmon head oil; however, it is indefinite as to whether or not a marine oil comprises environmental pollutants of brominated flame retardants, and as to whether or not an amount of the environmental pollutants present in the marine oil is separated from the salmon head oil together with linoleic acid added to the salmon head oil, and further as to whether or not linoleic acid can be said to be a volatile environmental pollutants decreasing working fluid.

<Different feature 7'>

Regarding a temperature range in which the "stripping processing step" is carried out, Invention 19 specifies "at temperatures in the interval of 150 to 270 °C", whereas Exhibit Ko 2 invention 2 fails to specify a temperature of molecular distillations corresponding to "stripping processing step".

(3) Comparison with Exhibit Ko 3 invention 1

A. Exhibit Ko 3 invention 1

A process for the removal of odor substances in edible fish oil, comprising:

- externally adding simple esters to the fish oil;
- subjecting the fish oil to stripping processing together with the added simple esters,

in which odor substances present in the edible fish oil are removed from the fish oil together with simple esters.

B. Common points and Different features between Invention 1 and Exhibit Ko 3 invention 1

<Common Points>

A process comprising:

- externally adding fatty acid esters to the edible marine oil;

and

- subjecting the marine oil to the stripping processing step at least one time together with the added fatty acids esters.

<Different feature 8>

Invention 1 is a process for reducing an amount of environmental pollutants in a marine oil containing environmental pollutants, wherein the environmental pollutants are selected from the group consisting of brominated flame retardants and PCB, and a certain amount of environmental pollutants present in the marine oil is separated from the marine oil together with volatile working fluids, whereas Exhibit Ko 3 invention 1 is a process for the removal of odor substances in a fish oil, comprising the step of separating from the fish oil a certain amount of odor substances present in the fish oil together with simple esters, and it is indefinite as to whether or not a fish oil comprises environmental pollutants selected from the group consisting of brominated flame retardants and PCB, and as to whether or not reducing the environmental pollutants comprises a step of separating the environmental pollutants from the fish oil together with simple esters added to the fish oil, and further as to whether or not simple esters can be said to be a volatile working fluid.

<Different feature 9>

Regarding a temperature range in which the "stripping processing step" is carried out, Invention 1 specifies "at temperatures in the interval of 150 to 270 °C", whereas Exhibit Ko 3 invention 1 fails to specify the temperature of the stripping processing.

(4) Comparison with Exhibit Ko 3 invention 2

A. Exhibit Ko 3 invention 2

A use of simple esters in a process for the removal of odor substances in an edible fish oil, wherein simple esters are externally added to the fish oil, and then the fish oil is subjected to a stripping processing to remove odor substances present in the edible fish oil together with simple esters from the fish oil.

B. Common points and Different features between Invention 19 and Exhibit Ko 3 invention 2

<Common Points>

A use of fatty acid esters, wherein fatty acid esters are externally added to a marine oil, and then the marine oil is subjected to at least one round of processing step.

<Different feature 8'>

Invention 19 is a use of volatile environmental pollutants decreasing working fluid comprising at least one kind of fatty acid ester, a fatty acid amide, and a free fatty acid, and any combination thereof in a process for decreasing the amount of environmental pollutants in a marine oil, wherein the marine oil comprises environmental pollutants, and the environmental pollutants are brominated flame retardants, and an amount of environmental pollutants present in the marine oil is separated from the marine oil together with the volatile environmental pollutants decreasing working fluid, whereas Exhibit Ko 3 invention 2 is a use of simple esters in a process for reducing an amount of odor substances in a fish oil, in which an amount of odor substances present in the edible fish oil is separated from the fish oil together with simple esters from the fish oil; however, it is indefinite as to whether or not a fish oil comprises environmental pollutants of brominated flame retardants, and as to whether or not an amount of the environmental pollutants present in the fish oil is separated from the fish oil together with simple esters added to the fish oil, and further as to whether or not simple esters can be said to be a volatile environmental pollutant decreasing working fluid.

<Different feature 9'>

Regarding a temperature range in which the "stripping processing step" is carried out, Invention 19 specifies "at a temperature in the interval of 150 to 270 °C", whereas Exhibit Ko 3 invention 2 fails to specify the temperature of the stripping processing.

(omitted)

No. 5 Judgment of this court

The court determines that each reason for rescission as Plaintiff argues has a point, and thus the trial decision contains illegality to be rescinded. The reasons are set forth as below.

1 The Invention

(1) The scope of Claims

The scope of the claims of the Invention is as per described in the above No. 2-2.

(2) The description

The description generally has the following descriptions (Exhibit Ko 53):

A. Technical Field

[0001] This invention relates to a process for decreasing the amount of environmental pollutants in a mixture comprising a fat or an oil, being edible or for use in cosmetics. The present invention also relates to a volatile environmental pollutant decreasing working fluid. In addition, the present invention relates to a health supplement, a pharmaceutical, a cosmetic product, and an animal feed product prepared according to the process mentioned above.

B. Background Art

[0002] DDT (2,2bis-(p-chlorophenyl)-1,1,1-trichloroethane) and its degradation products are today found almost everywhere in the global environment. Numerous studies also report on the accumulation of often relatively high concentrations of environmental pollutants such as PCB, dioxins, and brominated flame retardants, and pesticides such as toxaphenes and DDT and its metabolites in the deposit of, e.g., marine organisms. The hazard of these compounds for both humans and animals has caused a growing concern about the content of toxic substances in food and food stuff. ...

[0003] Food products that have no or reduced amounts of pollutants are gaining popularity as well as an increasing share of the market. Consequently, removal or reduction of pollutants in food products has the potential to substantially increase marketability and value.

[0004] The commercially important polyunsaturated fatty acids in marine oils, such as fish oil, are preferably EPA (eicosapentaenoic acid, C20: 5n-3) and DHA (docosahexaenoic acid, C22: 6n-3). ... For many purposes it is necessary that the marine oils should be refined in order to increase the content of EPA and/or DHA to suitable levels, or to reduce the concentrations of, or even eliminate, certain other substances that occur naturally in the raw oil.

[0005] The fatty acids EPA and DHA are also proving increasingly valuable, particularly in the pharmaceutical and food supplement industries. It is also very important for fish oils and other temperature sensitive oils (e.g. oils that contain long chain polyunsaturated fatty acids) to keep the temperature in some of the processes as low as possible.

[0006] The demand for marine oils of high quality is increasing. ... If environmental pollutants can be successfully removed from such fish oils, they would be appropriate for use in the animal feed industry, e.g. in animal feed products.

[0007] From the literature it is known that molecular distillation, or short path distillation as the technique alternatively may be named, can be used to remove the pesticides DDT and its metabolites from fish oil... A practical upper limit was 65% removal together with a loss of about 25% of vitamin A. In many industrial fish oil refining processes a removal of DDT up to 65% is not satisfactory.

C. Problem to be solved by the invention

[0013] One object of the present invention is to offer an effective process for decreasing the amount of environmental pollutants in a fat or an oil, being edible or for use in cosmetics.

D. Means for solving the problem

[0014] According to a first aspect of the invention, this and other objects are achieved with a process for decreasing the amount of environmental pollutants in a mixture comprising a fat or an oil, being edible or for use in cosmetics, the fat or oil containing the environmental pollutants, which process comprises the steps of adding a volatile working fluid to the mixture, where the volatile working fluid comprises at least one of a fatty acid ester, a fatty acid amide, a free fatty acid, and a hydrocarbon, and subjecting the mixture with the added volatile working fluid to at least one stripping processing step, in which an amount of environmental pollutants present in the fat or oil, being edible or for use in cosmetics, is separated from the mixture together with the volatile working fluid. Herein, "an amount" is interpreted to include decreasing of an amount up to 95 to 99% of some environmental pollutants; i.e., a substantial removal of specific pollutants and/or toxic components from a fat or oil composition.

[0016] An advantage of using a volatile working fluid in a process comprising at least one stripping processing step is that an amount of environmental pollutants in the mixture can more easily be stripped off together with the volatile working fluid; i.e., the environmental pollutants present in the fat or oil mixture are separated from the mixture together with the working fluid. Preferably this is possible as long as the volatile working fluid is essentially equally or less volatile than the environmental pollutants that are to be removed from the fat or oil mixture...

[0017] In addition, the use of a volatile working fluid comprising at least one of a fatty acid ester, a fatty acid amide, a free fatty acid, and a hydrocarbon in at least one stripping process step results in use of the inventive process decreasing the amount of dioxins in a fish oil of more than 95%. By using the inventive process it is also possible to decrease the amount of chlorinated organic pesticides (or pollutants), which pollutants are even less volatile than DDT, such as dioxines, toxaphenes, and/or PCB. Separation of such heavy and undesirable components from the fat or oil mixture according to the invention, using mild conditions that do not decompose even very unsaturated oils, is surprising. Further, according to the present stripping process it is possible to decrease an effective amount of PAH at much lower temperatures as compared to the techniques known from the prior art.

[0018] Another advantage of adding a volatile working fluid to an oil or fat mixture prior to a stripping process is that removal of free fatty acids is facilitated, which will result in a higher quality of the oil product.

[0020] In a preferred embodiment of the present invention, the volatile working fluid is an organic solvent or solvent mixture or a composition with a suitable volatility. The volatile working fluid of the present invention is at least one of a fatty acid ester, a fatty acid amide, a free fatty acid, bio-diesel, and a hydrocarbon, also including any combination thereof.

[0021] In another preferred embodiment the volatile working fluid comprises at least one fatty acid ester composed of C10-C22 fatty acids and C1-C4 alcohols, or a combination of two or more fatty acid ester each composed of C10-C22 fatty acids and C1-C4 alcohols. Preferably, the volatile working fluid is at least one of amides composed of C10-C22 fatty acids and Cl-C4 amines, C10-C22 free fatty acids, and hydrocarbons with a total number of carbon atoms from 10 to 40. Most preferably, the volatile working fluid is a mixture of fatty acids from marine oils, e.g. fish body oil and/or fish liver oil, and/or ethyl or methyl esters of such marine fatty acids.

[0026] Further, in another preferred embodiment of the invention ... Preferably, the fat or oil, being edible or for use in cosmetics, is a marine oil. Marine oils that have no or reduced amounts of environmental pollutants are gaining popularity as well as an increasing share of the market... Therefore, in a more preferred embodiment of the invention, the marine oil is obtained from fish or sea mammals, containing at least saturated and unsaturated fatty acids in the form of triglycerides....

[0030] In a preferred embodiment of the invention, said stripping processing step is carried out at a temperature in the interval of 120 to 270 °C.

[0031] In a most preferred embodiment, the stripping processing step is carried out at a temperature in the interval of 150 to 200 °C. By adding a volatile working fluid to the fat or oil mixture at this temperature the invention surprisingly shows that even thermolabile polyunsaturated oils can be treated with good effect, without causing degradation of the quality of the oil.

[0040] Preferably, the volatile environmental pollutants decreasing working fluid is generated as a fractionation product. Additionally, the volatile environmental pollutants decreasing working fluid is a by-product, such as a distillation fraction, from a regular process for production of ethyl and/or methyl ester concentrates. This by-product according to the invention can be used in a new process for decreasing the amount of environmental pollutants in a fat or an oil. More preferably, the volatile environmental pollutant decreasing working fluid ... can be a by-product (a distillate fraction) from a regular process for production of ethyl ester concentrates, wherein ... preferably a fish oil, is subjected to an ethylating process and preferably two-step molecular distillation. In the two-step molecular distillation process a mixture consisting of many fatty acids in ethyl ester form is separated into; a volatile (light fraction), a heavy (residuum fraction), and a product fraction. The volatile fraction from the first distillation is distilled once more and the volatile fraction from the second distillation process is then at least composed of the volatile working fluid, preferably a fatty acid ethyl ester fraction. This fraction ... can be redistilled one or more times if that is deemed suitable. This prepared working fluid can then be used as a working fluid in a new process for decreasing the amount of environmental pollutants in a fat or an oil...

[0047] Further, the present invention also discloses a marine oil product, prepared according to at least one of the previously mentioned processes. Preferably, the marine oil product is based on fish oil or a fish oil composition.

[0048] In addition, there is demand for marine oils of high quality. This issue forces the fish oil industry to consider alternative refining techniques. Further, by using one of the processes according to the invention it is now possible to simultaneously decrease the amount of environmental pollutants and/or to decrease the amount of free fatty acids in, e.g., marine oils with inferior quality with a good result. Such oils are appropriate to be used in, e.g., animal feed products. If the oil or fat is constituted by high amounts of free fatty acids, said free fatty acids may act as the volatile working fluid in the stripping process.

[0049] In another preferred embodiment of the invention, an animal feed product, containing at least a marine oil, which marine oil is prepared according to one of the processes presented before, in order to decrease the amount of environmental pollutants and/or the amount of free fatty acids in the marine oil. Preferably the animal feed product is a fish feed product.

E. Definitions

[0056] [Definitions]

As used herein the term environmental pollutants preferably means toxic components and/or pesticides such as polychlorinated biphenyls (PCB), DDT and its metabolites, organic compounds found in the sea environment and identified as potentially harmful and/or toxic; Polychlorinated triphenyls (PCTs), dibenzo-dioxins (PCDDs), dibenzo-furans (PCDFs), Chlorophenols and hexachlorocyclohexanes (HCHs), toxaphenes, dioxins, brominated flame retardants, polyaromatic hydrocarbons (PAH), organic tin-compounds (e.g. tributyltin, triphenyltin), and organic mercury-compounds (e.g. Methyl-Mercury).

[0057] As used herein the term oil and fat means fatty acids in at least one of the triglyceride and phospholipid forms... if the starting material in the stripping process is a marine oil, the oil may be any of raw or partially treated oil from fish or other marine sources and which contains fatty acids, including polyunsaturated fatty acids, in the form of triglycerides. Typically, each triglyceride molecule in such a marine oil will contain, more or less randomly, different fatty acid ester moieties, be they saturated, monounsaturated or polyunsaturated, or long chain or short chain... Further, the fat or oil may be preprocessed in one or several steps before constituting the starting material in the stripping process as described above. An example of such a pre-processing step is a deodorization process. It shall also be noted that the fat or oil may be edible in one or several such pre-processing steps and/or in the processing steps according to the invention.

[0059] As used herein the term working fluid is interpreted to include a solvent, a solvent mixture, a composition, and a fraction, e.g. a fraction from a distillation process, that has a suitable volatility, comprising at least one of esters composed of C10-C22 fatty acids and C1-C4 alcohols, amides composed of C10-C22 fatty acids and C1-C4 amines, C10-C22 free fatty acids, mineral oil, hydrocarbons, and bio-diesel.

[0060] As used herein the term "essentially equally or less volatile" is interpreted to include the case where the volatile working fluids have a suitable volatility in relation to the volatility of the environmental pollutants that are to be stripped off from a fat or oil mixture. Further, commonly this is the case when the volatility of the working fluid is the same or lower than the volatility of the environmental pollutants. However, the term "essentially equally or less volatile" is also intended to include the case where the volatile working fluid is somewhat more volatile than the environmental pollutant.

[0061] Further, as used herein the term stripping is interpreted to include a general method for removing, separating, forcing, or flashing off gaseous compounds from a liquid stream. In addition, the term "stripping processing step" preferable herein is related to a method/process for decreasing the amount of environmental pollutants in an oil or fat by one or more distilling or distillation processes, e.g. short path distillations, thin-film distillations (thin-film stripping or thin-film (steam) stripping), falling-film distillations, and molecular distillations, and evaporation processes.

[0064] As used herein the term marine oils includes oil from fish, shellfish (crustaceans), and sea mammals. Non limiting examples of fish oils are e.g. Menhaden oil, Cod Liver oil, Herring oil, Capelin oil, Sardine oil, Anchovy oil, and Salmon oil. The fish oils mentioned above may be recovered from fish organs, e.g. cod liver oil, as well as from the meat of the fish or from the whole fish.

F. Best Mode for Carrying Out the Invention

[0076] A first embodiment of a process for decreasing the amount of environmental pollutants in a fat or an oil, being edible or for use in cosmetics, by adding a volatile working fluid prior to a molecular distillation is presented in figure 1 (the court's note:

omitted; the same shall apply hereinafter). The starting fat or oil, being edible or for use in cosmetics, in the first embodiment of the invention is a fish oil whether freshly refined, reverted, or mixtures thereof, characterized by a level of environmental pollutants. The exact amount of environmental pollutants varies depending upon such factors as fish species, seasonality, geographical catch location, and the like.

[0077] As used herein the term molecular distillation is a distillation process performed at high vacuum and preferably low temperature (above 120 °C). Herein, the condensation and evaporation surfaces are within a short distance from each other, so as to cause the least damage to the oil composition. This technique is also called short-path distillation, and commercial equipment is readily available.

[0078] The molecular distillation plant (1) illustrated in figure 1 comprises a mixer (2), a pre-heater (3), a de-gasser (4), a distillation unit (5), and a vacuum pump (6). In accordance to this embodiment, a volatile working fluid comprising an ethyl ester fraction (6% relative to the oil) is added to a fish oil mixture and blended in a mixer (2). The oil mixture is then optionally passed through a means (3) for controlling the oil feed rate (herein about 400 kg/h), such as an ordinary throttling valve. The fish oil mixture is then preheated with a pre-heating means (3) such as a plate heat exchanger to provide a preheated fish oil mixture. The mixture is then passed through a degassing step (4) and admitted into the molecular path distance evaporator (5), and a tube (7) including the condensation (8) and evaporation (9) surface. The stripping process is carried out at a pressure between 0.1 and 0.001 mbar and at a temperature of about 200 °C. The fish oil mixture to be concentrated is picked up as it enters the tube (7a) by rotating blades. The blades extend nearly to the bottom of the tube and mounted so that there is a clearance of about 1.3 mm between their tips and the inner surface of the tube. In addition, the blades are driven by an external motor. The fish oil mixture is thrown against the tube wall and is immediately spread into a thin film and is forced quickly down the evaporation surface. The film flows down by gravity and becomes concentrated as it falls. Heated walls and high vacuum strip off the volatile working fluid together with the environmental pollutants; i.e., the more volatile components (distillate) are derived to the closely positioned internal condenser (8), the less volatile components (residue) continue down the cylinder. The resulting fraction, the stripped fish oil mixture containing at least the fatty acids EPA and DHA is separated, and the separated components exit through an individual discharge outlet (10).

G. Examples

[0082] ... The examples below summarize some results from different purification processes of fish oils by molecular distillation.

[0083] [Equipment and conditions for laboratory experiments]

In examples 1 to 3 below, decachlorobiphenyl, 0.60 mg/kg, was added to a fish oil composition as a pollutant model substance. The high chlorine content in decachlorobiphenyl ensures that this compound is less volatile than environmental pollutants such as PCB, DDT and its metabolites, toxaphenes, dioxins, and brominated flame retardants.

[0084] Unless otherwise stated, in all the examples the pressure was 0.001 mbar. However, as this is the lower limit of the pressure indicator, the real pressure will vary. That is the reason for somewhat varying results from one example to the next. When the distillation equipment is running under stable conditions, no significant variations are expected. However, this points out that constant pressure is not a very strong condition for carrying out the present invention.

[0085] [Example 1: The effect of adding a working fluid]

A fish oil composition containing fatty acids in triglyceride form and decachlorobiphenyl (0.60 mg/kg), with or without a working fluid, herein an ethyl ester, 8% relative to fish oil, (the ratio of (volatile working fluid): (fish oil) is about 8: 100) was distilled by a laboratory scale molecular distillation at a rate of 600 ml/h and a temperature of 180 °C. The used ethyl ester mixture was a by-product (distillate fraction) from production of EPA and DHA ethyl ester concentrates.

[0086][Table 1]

	Decachlorobiphenyl (mg/kg)	Decachlorobiphenyl (% start value)
With WF	0.43	72
Without WF	0.022	3.7

* WF = working fluid

Table 1: The effect of adding a volatile working fluid

[0087] The results in Table 1 show that addition of a volatile working fluid to a fish oil composition has a surprisingly and dramatic effect on the removal of decachlorobiphenyl. Here, more than 95% of the amount of decachlorobiphenyl has been removed ("stripped" off) from the fish oil mixture by molecular distillation.

[0095] [Example 4: Sardine oil full-scale industrial process]

This example shows an industrial scale process for decreasing the amount of pollutants in a fish oil mixture, which process comprises a step of adding a volatile working fluid to the fish oil mixture prior to a molecular distillation. To 63.9 tons of a sardine oil containing different environmental pollutants, there was added a volatile working fluid in the form of a fatty acid ethyl ester mixture (ethyl ester of fish oil

(8%)) before being subjected to a molecular distillation process. The molecular distillation process was then carried out at a temperature of 200 °C, a pressure of 0.04 mbar, and a mixture flow rate of 300 1/h with a heated surface of 3 m^2.

[0096] After treatment, 61.0 tons of purified product were collected. The results in Table 4 show the contents of vitamin A (trans-retinol), cholesterol, toxaphenes, and dioxins in the sardine oil before and after stripping, respectively.

[0097][Table 4]

	Before stripping	After stripping
Vitamin A	15.3 mg/g	13.0 mg/g
Cholesterols	3.6 mg/g	1.31 mg/g
Toxaphene	0.3 mg/g	<0.1 mg/g
Dioxin	4.1 pg/g	0.34 pg/g

Table 4: Toxaphenes, and dioxins in the sardine oil before and after stripping

[0098] The results confirm that adding a working fluid to an oil before stripping is effective in reducing the amounts of volatile pollutants at the same time, while the concentration of vitamin A, a valuable component in many fish oils, is not seriously affected. This means that this purification method can be used for products that contain vitamin A, e.g. cod liver oil.

[0099] In some cases a certain cholesterol level can be of value for some applications of fish oils, e.g. for fish feed, especially feed for fish larvae. In these applications it is important to perform a preferential removal of pollutants only.

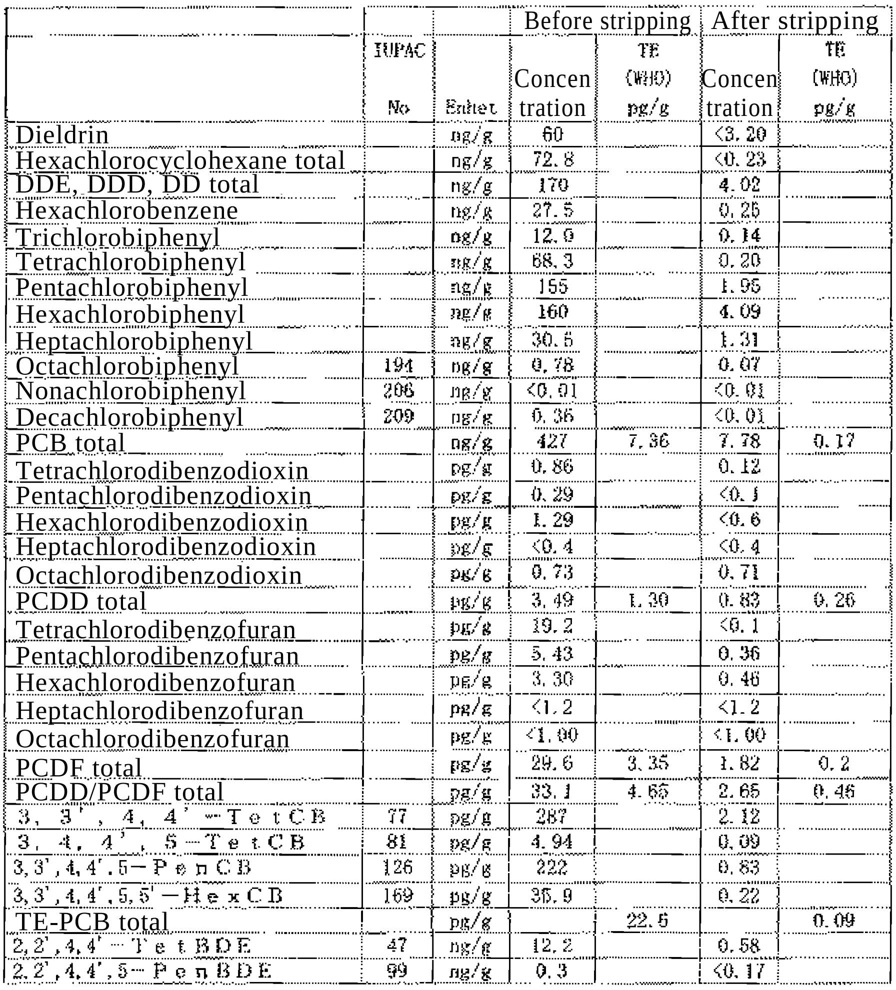
[0100] [Example 5: Fish oil mixture - full-scale industrial process]

This example also shows a full-scale industrial process for decreasing the amount of pollutants in a fish oil, which process comprises the steps of adding a volatile working fluid to the fish oil mixture and subjecting the mixture, with the added volatile working fluid, to a molecular distillation processing step, in which environmental pollutants present in the fish oil are separated from the mixture with the volatile working fluid.

[0101] To 30 tons of a fish oil mixture containing different environmental pollutants (see Figure 2), there was added a volatile working fluid in the form of a fatty acid ethyl ester mixture (ethyl ester of fish oil (6%)) before being subjected to a molecular distillation process. The molecular distillation process was then carried out at a temperature of 200 °C, a pressure of 0.005 mbar, and a mixture flow rate of 400 kg oil/h with a heated surface of 11 m^2. After treatment, 29.5 tons of purified product were collected. The results are shown in Figure 2. The results confirm that the content of environmental pollutants in the fish oil mixture was strongly reduced after the stripping process according to the invention. For instance, the content of PCB in the fish oil mixture was reduced by about 98%, the content of PCDD was reduced by approximately 80%, the content of PCDF by about 95%, and the amount of hexachlorocyclohexane TE-PCB was almost negligible after stripping. For a person ordinarily skilled in the art it is obvious that the same effect may be achieved according to the invention by using a volatile working fluid for decreasing an amount of pollutants in some other fat or oil compositions.

[Figure 2]

Removal of environmental pollutants in full-scale fish oil



			Before stripping		After stripping	
	IUPAC No	Enhet	Concentration	TE (WHO) pg/g	Concentration	TE (WHO) pg/g
Dieldrin		ng/g	60		<3.20	
Hexachlorocyclohexane total		ng/g	72.8		<0.23	
DDE, DDD, DD total		ng/g	170		4.02	
Hexachlorobenzene		ng/g	27.5		0.25	
Trichlorobiphenyl		ng/g	12.0		0.14	
Tetrachlorobiphenyl		ng/g	68.3		0.20	
Pentachlorobiphenyl		ng/g	155		1.95	
Hexachlorobiphenyl		ng/g	160		4.09	
Heptachlorobiphenyl		ng/g	30.5		1.31	
Octachlorobiphenyl	194	ng/g	0.78		0.07	
Nonachlorobiphenyl	206	ng/g	<0.01		<0.01	
Decachlorobiphenyl	209	ng/g	0.36		<0.01	
PCB total		ng/g	427	7.36	7.78	0.17
Tetrachlorodibenzodioxin		pg/g	0.86		0.12	
Pentachlorodibenzodioxin		pg/g	0.29		<0.1	
Hexachlorodibenzodioxin		pg/g	1.29		<0.6	
Heptachlorodibenzodioxin		pg/g	<0.4		<0.4	
Octachlorodibenzodioxin		pg/g	0.73		0.71	
PCDD total		pg/g	3.49	1.30	0.83	0.26
Tetrachlorodibenzofuran		pg/g	19.2		<0.1	
Pentachlorodibenzofuran		pg/g	5.43		0.36	
Hexachlorodibenzofuran		pg/g	3.30		0.46	
Heptachlorodibenzofuran		pg/g	<1.2		<1.2	
Octachlorodibenzofuran		pg/g	<1.00		<1.00	
PCDF total		pg/g	29.6	3.35	1.82	0.2
PCDD/PCDF total		pg/g	33.1	4.65	2.65	0.46
3,3',4,4'-TetCB	77	pg/g	287		2.12	
3,4,4',5-TetCB	81	pg/g	4.94		0.09	
3,3',4,4',5-PenCB	126	pg/g	222		0.83	
3,3',4,4',5,5'-HexCB	169	pg/g	35.9		0.22	
TE-PCB total		pg/g		22.5		0.09
2,2',4,4'-TetBDE	47	ng/g	12.2		0.58	
2,2',4,4',5-PenBDE	99	ng/g	0.3		<0.17	

[0102] [Example 6: Salmon oil]

In this example, oil from fresh by-products from Atlantic salmon was processed according to the invention. The process according to the invention comprises the steps of adding a volatile working fluid to the oil mixture and further subjecting the mixture, with the added volatile working fluid, to a molecular distillation processing step. 8% working fluid (the ratio of (volatile working fluid):(salmon oil) is here about 8:100) was added to the oil and the distillation process was performed at a pressure of 1 x 10^{-3} mbar, a temperature of 180 °C, and a mixture flow rate of 600 ml/hour.

[0103] Samples of the oil mixture were analyzed before and after distillation respectively, regarding the amount of brominated flame retardants, PCBs, and some chlorinated pesticides; see Tables 5 and 6 below.

[0104][Table 5]

Brominated flame retardants µg/kg	Before treatment	After distillation
ＢＤＥ２８	０．３	＜０．２
ＢＤＥ４７	５．３	＜０．２
ＢＤＥ６６	０．４	＜０．２
ＢＤＥ７１	＜０．２	＜０．２
ＢＤＥ７５	＜０．２	＜０．２
ＢＤＥ７７	＜０．２	＜０．２
ＢＤＥ８５	＜０．２	＜０．２
ＢＤＥ９９	１．２	＜０．２
ＢＤＥ１００	１．０	＜０．２
ＢＤＥ１１９	＜０．２	＜０．２
ＢＤＥ１３８	＜０．２	＜０．２
ＢＤＥ１５３	＜０．２	＜０．２
ＢＤＥ１５４	０．５	＜０．２
ＢＤＥ１８３	＜０．２	＜０．２
ＢＤＥ１９０	＜０．２	＜０．２
Ｍｅ－ＴＢＢＰ－Ａ	０．２	＜０．２
ＨＢＣＤ	＜１．１	＜１．２

Table 5 (the above): Brominated flame retardants before and after distillation process (µg/kg).

[0105][Table 6]

PCB and chlorinated pesticides (µg/kg)	Before treatment	After distillation
ＣＢ２８	＜３	＜３
ＣＢ５２	５	＜３
ＣＢ１０１	１１	＜７
ＣＢ１１８	＜９	＜９
ＣＢ１５３	１６	＜７
ＣＢ１０５	＜３	＜３
ＣＢ１３８	１３	＜７
ＣＢ１５６	＜３	＜３
ＣＢ１８０	４．８	＜４
Dieldrin	２２	＜４
Endrin	＜３	＜３
ＨＣＢ	１２	＜１
α－ＨＣＨ	３．８	＜１
γ－ＨＣＨ	５．３	＜１
β－ＨＣＨ	＜５	＜６
β－ＨＥＰＯ	＜２	＜３
ｐ，ｐ’－ＤＤＥ	３８	＜３
ｐ，ｐ’－ＤＤＤ	１５	＜３
ｐ，ｐ’－ＤＤＴ	ｎｄ＝ not detected	＜８

Table 6: PCB and chlorinated pesticides before and after distillation (µg/kg).

[0106] It is observed that the invention removes almost all of the analyzed environmental pollutants to a level below the analytical detection limit.

[0112] [Example 8]

A working fluid consisting of ethyl esters of fish oil (8%) was added to an oil produced from farmed salmon. A distillation process was carried out under the same conditions as in example 1, and a distillate fraction of 8.3% was collected. The acid value of the residual oil was reduced from 0.4 mgKOH/g before distillation to 0.1 mgKOH/g after distillation and the oil was analyzed for contaminants before and after processing.

[0113][Table 8]

	CB-28	CB-52	CB-101	CB-118	CB-153	CB-105	CB-138	CB-156	CB-180
Before treatment	<3	5	11	<9	16	<3	13	<3	4.8
After treatment	<3	<3	<7	<9	<7	<3	<7	<3	<4

Table 8: Salmon oil. Indication before and after treatment - PCB content (μg/kg).

[0114][Table 9]

	Dieldrin	Endrin	HCB	α-HCH	γ-HCH	β-HCH	β-HEPO	pp_DDE	pp_DDD	pp_DDT
Before treatment	22	<3	12	3.8	5.3	<6	<3	38	15	<8
After treatment	<4	<3	<1	<1	<1	<6	<3	<3	<3	<8

Table 9: Salmon oil. Organo-chlorine pesticides content before and after treatment (μg/kg).

[0115] The results show that adding a volatile working fluid prior to a stripping (distillation) process is effective in decreasing the amount of organo-chlorine pesticides in a fish oil composition. In addition, the volatile working fluid also facilitates removal of free fatty acids in the oil. Therein the acid value was decreased with 75%; i.e., from 0.4 to 0.1. It is hereby possible to decrease the amount of environmental pollutants and to reduce the amount of free fatty acids in an oil or a fat at the same time and in the same process.

[0116] [Example 9: Removal of free fatty acids]

A fish oil purchased for production of fish feed was distilled by a molecular distillation process under the same conditions as given in example 1, and the starting oil had an acid value of 6.8 mgKOH/g. After removal of a distillate corresponding to 4.3% by weight, the acid value of the residual oil was reduced to 0.2 mgKOH/g and the amount of environmental pollutants in the starting oil was decreased.

[0117] In an identical distillation procedure, an oil with an acid value of 20.5 mgKOH/g was distilled. After removal of a distillate of 10.6%, the acid value was reduced to about 1.0 mgKOH/g and the amount of environmental pollutants in the starting oil was decreased.

[0118] Due to the fact that the stripping process in example 8 also facilitates removal of free fatty acids in the oil and that the free fatty acids are volatile, it can be expected that even oils with a low quality; i.e., having a high content of free fatty acids, can be treated successfully according to the invention. Examples of oils with low quality are silage oils and oils that have been stored or transported for a long period of time. Fish oils with low quality may be used for production of fish feed.

[0119] This example therefore shows that a stripping process for decreasing the amount of environmental pollutants in a mixture comprising at least a fat or an oil with a high content of free fatty acids (a low quality oil or fat) is effective, since the free fatty acids in the oil or fat act as a working fluid. Further, the free fatty acids in the oil or fat also contribute to an additive effect in the stripping process by partially acting as an internal working fluid (or by being an active part of the working fluid) in the stripping process.

[0120] A person ordinarily skilled in the art will also realize that the same stripping effect can be obtained by adding a volatile working fluid containing a similar volume of suitable free fatty acids to an oil or fat containing environmental pollutants in order to decrease the amount of environmental pollutants in the fat or oil.

2 Document about distillation and circumstances of environmental pollutants

(1) United States Patent No. 2146894 Specification (1939. Exhibit Ko 4)

"If a material having a boiling point in the neighborhood of that of the desired distillate is added to the mixture to be distilled, it is found that a considerably lower temperature can be used for optimum results." (page 1, the right column, lines 14 to 18)

"Any material may be used as long as it has a boiling point in the neighborhood of that of the distillate desired under molecular distillation conditions and has no adverse effect on the material undergoing treatment. Thus, fatty acids, esters, mineral oil fractions ... and the like have been found to give useful results." (page 1, the right column, lines 41 to 48)

"entraining agent may have a boiling point the same as, above, or below that of the substance to be removed. Preferably an agent having a boiling point below that of the desired substance is used, since the lower boiling entraining agent generally gives better results at lower temperatures." (page 2, left column, lines 25 to 31)

(2) Anthony P. Bimbo, "Chapter 7 PROCESSING OF FISH OILS", FISH OILS IN NUTRITION (Ed. M. E. Stansby, van Nostrand Reinhold, 1990. Exhibit Ko 21)

"Steam deodorization"

"Perura (1987) assessed the change of cholesterols and cholesterol esters during vacuum steam deodorization of purified menhaden oils at various temperatures, and found that cholesterols did not significantly distillate at less than 200 °C, but distilled at 200 °C or more, and the removal progressed from 200 °C to 250 °C... He assessed the change of chlorinated pesticides and PCB in menhaden oils at many temperatures, and found that PCB was decreased to less than a detectable level at 175 °C. He also reported that organic chlorides and organic phosphates were easily removed in a mild condition." (page 218, line 6 from the bottom to page 219, line 8)

"Vacuum stripping"

"Vacuum stripping utilizes the fact that each chemical substance has a characteristic vapor pressure... The thin-film evaporator/molecular distillator technique has been successfully used over 40 years for the removal of free fatty acids from fat and oils, deodorization of oils, and removal of free cholesterols from oils...

National Institute of Health/the United States Department of Commerce drug master file for a fish oil ω-3 describes a manufacturing process of vacuum-deodorized fish oil. Menhaden oils purified to some extent are supplied to a first-stage distillator via a first-stage feed pump from a 55 gallon container under nitrogen pressure... Figures 7 to 16 (Court decision's note: omitted) show a cross-section of a wiped-film glass molecular distillator, and show a perforated wiper blade, a driving unit, and an inner condenser... Further, oils are entered into the second stage, in which carbon blade wipes oils to form a thin film, and moves downward. In this stage, oils are heated to 260 °C at 0.5 Torr vacuum. The second stage includes an internal condenser heated to 150 °C by circulating a heat exchange medium. In this stage, cholesterols, pesticides, and PCB are gasified to be recovered by a trap subsequent to a condenser. Non-volatile triglycerides go out of the second stage, pass through a stainless steel heat exchanger and 150 mm teflon filter, and after cooling, are recovered by a container purged with an inert gas (the United States Department of Commerce, 1989, in printing)." (page 219, line 10 to page 220, line 6 from the bottom)

(3) Kagaku Daijiten (Tokyo Kagaku Dojin, First Edition, 1989. Exhibit Ko 24)

"PCB level in the environment is generally set forth as below... 0.01 to 10 ppm for fish and shellfish ... and the like. As it goes towards the upper tier of the food chain, PCB gets concentrated." (page 2244, the right column, lines 21 to 28)

(4) E. M. Brevik, Organohalogen Compounds, Vol. 1, pp. 467-470 (1990. Exhibit Ko 29-1 and Exhibit Otsu 11)

"polychlorodibenzofuran (PCDF) and dibenzo-p-dioxine (PCDD) levels in crude and processed fish oils are determined. Crude fish oils from the southern Pacific Ocean were found to have a significantly lower level compared to those from the North Atlantic." (page 467, ABSTRACT. See Exhibit Ko 29-1 as a translation)

"This further shows that generally the south hemisphere has less environmental pollution of persistent organochlorine. However, the level variation may to some extent be caused by a difference in marine species used for the manufacture." (page 468, lines 28 to 31; See Exhibit Otsu 11 as a translation)

(5) D. Santillo., "The presence of brominated flame retardants and organotin compounds in dusts collected from Parliament buildings from eight countries" (Greenpease Research Laboratories. March 2001. Exhibit Ko 35)

"De Bohr (1989) reported the existence of PBDE in cod-liver oils from the North Sea, and recorded that these compounds were already present in the samples stored since 1977, and described an obvious, special trend of pollution level increasing from the northern part of the North Sea to the middle part, and then the southern part... It has been recently confirmed that PBDE is present in a biological system of the Canadian Arctic (Alaee et al., 1999). A time course analysis of PBDE level in white sturgeon from the SE Baffin area (Stern and Ikonomow, 2000) shows about a 6-fold increase over a period from 1982 to 1997. During this period, the decrease in the priority of tri- and tetra-BDE and the increase in the severity of penta- and hexa-BDE were observed. This probably reflects the market shift to higher brominated homologues." (page 3, lines 25 to 44)

(6) M. Alaee., Chemosphere, No. 46, pp. 579-582 (2002. Exhibit Ko 36)

"Almost all the environmental monitoring programs implemented for the past ten year shows a rapid increase of PBDE in wild animals, particularly in Nordic countries. This trend is in contrast to the fact that dioxine, PCB, and several chlorinated pesticides are generally decreasing in sea mammals and aquatic wildlife..." (page 580, left column, lines 11 to 18)

(7) OECD ENVIRONMENT MONOGRAPH SERIES NO. 102 (1995. Exhibit Ko 46)

"PeBDPO and TeBDPO are mainly confirmed in fishes and Crustacea in Japan and Northern Europe. Further, these are also found in a pooled sample of terrestrial mammals and sea mammals in Sweden." (page 16, lines 23 to 25)

(8) J. Peltola, Pentabromodiphenyl ether as a global POP (2001. Exhibit Ko 47)

"Persistent Organic Pollutants (POP) are described as degradation-resistant chemical substances, that are bioaccumulated and sometimes conveyed to a distant environment from a source thereof, and possibly have an adverse effect on human health and the environment." (page 14, lines 3 to 6)

"According to pooled samples of herring from the Baltic Sea ... and samples of sprat..., penta BDE analogues increase as the age of marine fish increases. This suggests high resistance to bioaccumulation and metabolism." (page 21, line 4 from the bottom to last line)

(9) Nutrifish Corp "ALASKAN SALMON AND WHITEFISH OIL MARKETING PROJECT 1989" (1989. Exhibit Ko 52)

"Future use of Alaskan fish oil" (page 7, line 19)

"Mr. Gwinn had several examples that analyzed PCBs, while he had no large-scale or systematical data, and showed that the examples were at a non-detectable level." (MEETING SUMMARY, page 3, fourth paragraph, lines 3 to 5)

(10) R.S. Lees., "Omega-3 Fatty Acids in Health and Disease" (1990. Exhibit Ko 58)

"PCB can be found in almost all the fish oils at 2 to 5 ppm (Addison and Ackmann, 1974). They are not affected by any purification process except for vacuum deodorization (Addison et al., 1974), however, vacuum deodorization allows PCB to be effectively removed to less than a detectable level." (page 219, lines 7 to 4 from the bottom)

"Our experience in Halifax utilizing wiped wall distillation having a 6-inch poop (operated as a stripper in vacuum.) was that PCB was easily removed from fish oils at a mild temperature (about 200 °C), and thermal risk against EPA and DHA may be removed." (page 220, lines 6 to 9)

(11) B. Hjaltason., "NEW PRODUCTS, PROCESSING POSSIBILITIES, AND MARKETS FOR FISH OIL" (MAKING PROFITS out of SEAFOOD WASTES. 1990. Exhibit Ko 60)

"Due to the increased marine pollution, fish oils produced from a fish caught in polluted water include undesirable pollutants such as pesticides and PCB." (page 136, left column, lines 19 to 22)

(12) E. M. Krummel., NATURE, Vol. 425, p. 255 (September 18, 2003. Exhibit Ko 76)

"Pollutants are widely distributed in the atmosphere and marine environment. Pollutants are conveyed by salmon, and may be amplified by the food chain. In this article, we show that migrating red salmon ... may act as a bulk conveying vector of sustained industrial pollutants known as polychlorinated biphenyls (PCB) (red salmon absorbs from the marine environment and brings back across a wide distance to a spawning lake for bearing)." (page 255, left column, lines 1 to 12)

"In 1995, 1997, 1998 and 2002, we sampled deposit cores from ... eight lakes... Surface deposits (0 to 2 cm thick)... were extracted for PCB analysis. We conducted a measurement of PCB level in muscle tissue of red salmon (n=5) and identified a sign of the source..." (page 255, middle column, lines 24 to 35)

"A surface deposits of an Alaskan lake shows a pattern of polychlorinated biphenyls (PCB) analogues similar to the one found in salmon returning home for spawning. PCB level in deposits is closely related to a return density of salmon." (page 255, left column, explanation of Figure 2, lines 1 to 4)

3 Reason 1 for Rescission (Errors in the finding of the different feature between the Invention and the invention of Exhibit Ko 2)

(1) Description of Exhibit Ko 2

A. "The procedure of crystallization, distillation, supercritical extraction, and chromatography is a major preparation method for the fractionation of fish oils and its components of free fatty acids. Fish oil mainly consists of triacylglycerol (generally called triglycerides.)... The mixture of triglycerides from fish oils are too complex for the effective separation of individual factors. At most, modest concentration may only be expected by fractionation. Therefore, most of the efforts are devoted to the fractionation of acid or its methyl or ethyl esters (easily obtained from oils). A major advantage is that the difference in chain length and a degree of unsaturation are effectively treated in a case where these simpler and single chain compounds are treated. In triglycerides, this difference may be minimized or completely offset by the other two acids in a molecule to be separated. A practical advantage is high volatility of acid or its simple esters compared to triglycerides." (page 73, "INTRODUCTION", lines 1 to 17, see Exhibit Ko 61 as a translation)

B. "2. Purification of Menhaden Oils

Two-stage distillation of wiped film molecular distillator removes non-triglycerides articles, organic pollutants, and cholesterols... Filler is a specially processed menhaden oil, and the manufacturer conducted dewaxing, alkaline purification, and low-temperature decoloration. The first stage (operated at 150 °C with a wiping speed of 150 rpm and vacuum of 400 μ) was used for degassing, dehydration, and preheating of oils. The second stage (260 °C, 250 rpm, 200 μ) reduced chlorinated hydrogen and polychlorinated biphenyls (PCB) to less than detection limits, and cholesterols from ~5 mg/g to ~2 mg/g. Yield was ~95% of supplied amount in a production speed of 8 to 10 kg/hr." (page 88, lines 1 to 12, see Exhibit Ko 61 as a translation)

C. "3. Removal of Cholesterol from Salmon Head Oil with a Codistillate

Linoleic acid added to the infusion facilitates the removal of cholesterol during the process in a 19-L centrifugal still (Gorgritz and Hunter, northwest fishers center, undisclosed data). One of the practical problems in removing cholesterol from salmon head oil with molecular distillation is that the salmon head oil contains so much cholesterol that it solidifies on the condenser and clogs the feed lines during distillation. Operational problems will be reduced by adding a liquid capable of distilling with cholesterol and dissolving cholesterol. Linoleic acid was selected because it is easily available with a purity suitable for the manufacture of food products grade. 200 ml linoleic acid was added to about 19L of raw salmon head oil, and as a result, the cholesterol content was reduced from 4.7 mg/g to <0.7 mg/g in the infusion, in 79% yield of product." (page 88, lines 13 to 24)

D. "4. Large Scale Fractionation of Triglycerides to Esters

... A distillation of menhaden oils themselves (triglycerides) changed EPA level from the initial 16.0% to 19.5% in a pot residue. A distillation of ethyl esters increased EPA content from 15.9 to 28.4%. Change in DHA level was more drastic. DHA increased triglycerides two-fold from 8.4 to 17.3%, and esters five-fold from 9% to 43.9%..." (page 88, lines 25 to 36, see Exhibit Ko 61 as a translation)

(2) Comparison with the Invention 1

A. Finding of Different feature 6

(A) Regarding Different feature 6, Plaintiff alleges that [i] it is indefinite as to whether or not salmon head oil comprises PCB or brominated flame retardants in Exhibit Ko 2 invention 1, [ii] it is indefinite as to whether or not PCB and brominated flame retardants in salmon head oil may be separated in a distillation condition when linoleic acid and cholesterols are separated in gas phase by adding linoleic acid to salmon head oil and subjecting it to distillation in Exhibit Ko 2 invention 1, [iii] the finding of the trial decision of it being indefinite as to whether or not linoleic acid can be said as a volatile working fluid in Exhibit Ko 2 invention 1 are erroneous. Accordingly, consideration is given hereinafter.

(B) Regarding point [i]

The trial decision found Exhibit Ko 2 invention 1 on the basis of the description of the item of "3. Removal of Cholesterol from Salmon Head Oil with a Codistillate" in Exhibit Ko 2 (the above (1)C). Further, as in the above (1)B and C, regarding menhaden oil described in the item "2. Purification of Menhaden Oil" of Exhibit Ko 2, there is a description that premises the inclusion of PCB; however, it is neither definitely nor implicitly described that the salmon head oil in the item of "3.

Removal of Cholesterol from Salmon Head Oil with a Codistillate" includes PCB and brominated flame retardants.

Accordingly, regarding salmon head oil of "3. Removal of Cholesterol from Salmon Head Oil with a Codistillate", it must be said to be indefinite as to whether or not to include PCB or brominated flame retardants, and thus it cannot be said that the finding of the trial decision on this point is erroneous.

(C) Regarding the above point [ii]

As is explained in the above item (B), regarding salmon head oil described in the item of "3. Removal of Cholesterol from Salmon Head Oil with a Codistillate" of Exhibit Ko 2, which constitutes a basis for the finding of Exhibit Ko 2 invention 1, it is indefinite as to whether or not to include PCB or brominated flame retardants.

Consequently, it is reasonable to find that it is indefinite as to whether or not to include the step of separating the PCB and brominated flame retardants from the salmon head oil together with linoleic acid added to the salmon head oil.

Therefore, it cannot be said that the finding of the JPO decision on this point is erroneous.

(D) Regarding the point [iii]

A volatile working fluid of Invention 1 is a liquid to be added to marine oil before subjecting to the stripping processing step, and in which a certain amount of environmental pollutant present in the marine oil is separated from the marine oil together with the volatile working fluid in the stripping processing step. In addition, the volatile working fluid includes C10 to C22 free fatty acids. Furthermore, the volatile working fluid is separated from oils in the stripping processing step, and thus "volatility" is construed as meaning higher volatility compared to an oil such as triglycerides (the description, paragraphs [0014], [0021], [0057], [0059] to [0061]).

In contrast, linoleic acid of Exhibit Ko 2 invention 1 is a liquid added to salmon head oil prior to stripping processing step, and in the stripping processing step, it is distilled together with cholesterols (the above (1)C). In addition, linoleic acid is C18 unsaturated fatty acid with higher volatility than triglycerides (the above item (1)A).

Consequently, the volatile working fluids of the Invention 1 differs from linoleic acid of Exhibit Ko 2 invention 1 in whether substances for removal are environmental pollutants or cholesterols, whereas they have in common that they both have high volatility compared to triglycerides, and are liquids evaporated together with substances for removal. Further, linoleic acid corresponds to "C10 to C22 free fatty acids" exemplified as a volatile working fluid in the description.

Therefore, it is reasonable to find that linoleic acid of Exhibit Ko 2 invention 1 corresponds to a volatile working fluid in Invention 1.

Therefore, the finding of the JPO decision on this point is erroneous.

(E) Summary

For the above reasons, a trial decision made an error in finding Different feature 6 indefinite as to whether or not linoleic acid could be said to be a volatile working fluid.

B. Common points and Different features between Invention 1 and Exhibit Ko 2 invention 1

As in the above item A, it is recognized that linoleic acid in Exhibit Ko 2 invention 1 corresponds to a volatile working fluid in the Invention 1. Further, Invention 1 and Exhibit Ko 2 invention 1 share their technical concepts in common that an amount of substance for removal in marine oil is reduced by use of a volatile working fluid.

Consequently, it is reasonable to find the common points and different features between Invention 1 and Exhibit Ko 2 invention 1 as set forth below:

<Common Points>

"A process for decreasing an amount of substance for removal in an edible marine oil, comprising the steps of:

- externally adding a volatile working fluid of fatty acids to the marine oil; and
- subjecting the marine oil to the stripping processing step at least one time together with volatile working fluids,

wherein a certain amount of the substances for removal present in the marine oil is separated from the marine oil together with the volatile working fluid"

<Different feature 6>

In Invention 1, a substance present in marine oil and to be separated from marine oil together with volatile working fluids is "environmental pollutants selected from the group consisting of brominated flame retardants and PCB", whereas in Exhibit Ko 2 invention 1, the substance for removal is "cholesterols", and it is indefinite as to whether or not the salmon head oil of Exhibit Ko 2 invention 1 comprises "environmental pollutants selected from the group consisting of brominated flame retardants and PCB", and as to whether or not the environmental pollutants are separated from the salmon head oil together with linoleic acid added to the salmon head oil.

<Different feature 7>

"Stripping processing step", i.e. a temperature range for implementing molecular distillations is "a temperature between 150 to 270 °C" in Invention 1, whereas Exhibit Ko 2 invention 1 does not specify the temperature range.

(3) Comparison with Invention 19

A. Finding of Different feature 6'

Similar to the explanation in the above (2)A, linoleic acid of Exhibit Ko 2 invention 2 corresponds to the volatile working fluids of Invention 19 (further, in Invention 19, a subject for removal is "environmental pollutants" selected from the group consisting of brominated flame retardants and PCB, and thus it is construed that a liquid to be added to marine oil before stripping processing step is referred to as "volatile environmental pollutants decreasing working fluid", it is construed from the description that the composition of the liquid and the function and effect caused are the same as those of Invention 1, and thus it is simply referred to as "volatile working fluids"). Therefore, the trial decision made an error in finding Different feature 6' indefinite as to whether or not linoleic acid could be said to be a volatile working fluid.

B. Common points and Different features between Invention 19 and Exhibit Ko 2 invention 2

As in the above A, it is recognized that linoleic acid of Exhibit Ko 2 invention 2 corresponds to a volatile working fluid of Invention 19. Further, Invention 19 and Exhibit Ko 2 invention 2 share their technical concepts in common that an amount of substance for removal in marine oil is reduced by use of a volatile working fluid.

Consequently, it is reasonable to find the common points and different features between Invention 1 and Exhibit Ko 2 invention 2 as set forth below:

<Common Points>

"A use of volatile working fluids including fatty acids in a method for reducing an amount of a substance for removal in an edible marine oil, wherein the marine oil includes the substance for removal, and in the method, the volatile working fluids are externally added to the marine oil, and then the marine oil is subjected to at least one stripping processing step, and an amount of the substance for removal present in the marine oil is separated from the marine oil together with the volatile working fluids"

<Different feature 6'>

In Invention 19, a substance present in marine oil and to be separated from marine oil together with volatile working fluids is "environmental pollutants selected from the group consisting of brominated flame retardants and PCB", whereas Exhibit Ko 2 invention 2 uses the substance for removal of "cholesterols", and it is indefinite as to whether or not a salmon head oil of Exhibit Ko 2 invention 2 comprises "environmental pollutants selected from the group consisting of brominated flame retardants and PCB", and as to whether or not the environmental pollutants are separated from the salmon head oil together with linoleic acid added to the salmon head oil.

<Different feature 7'>

In the "Stripping processing step", a temperature range for implementing molecular distillations is "a temperature between 150 to 270 °C" in Invention 19, whereas Exhibit Ko 2 invention 2 does not specify the temperature range.

(4) Therefore, the judgment of the JPO decision on this point is erroneous. Consideration is given in the following item as to whether the error affects the conclusion.

4 Reason 2 for Rescission (Errors in the determination of whether the Different features between the Invention and the invention of Exhibit Ko 2 were easily conceivable)

(1) Invention 1

A. Whether Different feature 6 was easily conceivable

(A) Salmon head oil of Exhibit Ko 2 invention 1 includes brominated flame retardants and PCB

a. As found in the above item 2, Exhibit Ko 24, which is a publication distributed before the priority date, discloses that PCB level is 0.01 to 10 ppm in fishes and shellfishes (the above 2(3)), and Exhibit Ko 58 respectively describes that 2 to 5 ppm PCB is found in almost all the fish oils (Id. (10)). Further, although it is a publication distributed after the priority date, Exhibit Ko 76 discloses that PCB is included in a muscle tissue of Alaskan red salmon caught from 1995 to 2002 (Id. (12)). It can be seen from the publication describing this and the published period that as of the priority date it was a well-known objective matter that almost all marine oils before purification include PCB.

Similarly, publications distributed before and after the priority date disclose that brominated flame retardants such as PBDE and BDPO are accumulated in marine organisms such as fishes and shellfishes (the above 2(5) to (8). Exhibits Ko 35, 36, 46 and 47); in view of this, it is reasonable to find that as of the priority date it was a well-known objective matter that almost all marine oils before purification include PCB and brominated flame retardants.

b. In this regard, Defendant alleges that it was a matter of common technical knowledge as of the priority date that the content of PCB in marine oil varied depending on inhabitation area of marine oil raw materials, individual species, and growth situation, and it is an objective fact that "crude salmon head oil" of Exhibit Ko 2 invention 1 does not include metal, hydrocarbons, pesticides residues, and PCBs.

Indeed, in some Alaskan fish oils, it is reported that PCBs were at the non-detectable level (the above 2(9)), and persistent organochlorine level of crude oil of fishes caught in the South Pacific Ocean is found to be significantly lower than in the fishes caught in the North Atlantic Ocean (id(4)). However, they only show circumstances of pollution in specific marine areas. Thus it must be said that it is insufficient to negate the fact that as of the priority date almost all marine oils before purification included PCB and brominated flame retardants.

Further, Defendant alleges that salmon caught in Alaskan Sea could be used for crude salmon head oil of Exhibit Ko 2 invention 1; however, there is not sufficient evidence to find this.

Therefore, the Defendant's allegation of this point is not acceptable.

c. As described above, it must be said that a person ordinarily skilled in the art could have easily conceived of a salmon head oil of Exhibit Ko 2 invention 1 including "environmental pollutants selected from the group consisting of brominated flame retardants and PCB".

(B) PCB and brominated flame retardants in salmon head oil are separated together with linoleic acid

a. Distillation temperature

Vacuum stripping is a technique in which a specific substance is separated from a liquid phase to a gas phase by use of each substance having a characteristic vapor pressure depending on a temperature (the aforementioned item 2(2); see Exhibits Ko 37, 56). Further, vapor pressure is objectively determined according to the substance. Therefore, when a specific substance is separated from a liquid phase to a gas phase at a certain temperature, a substance with higher vapor pressure compared to the substance (lower boiling point, or higher volatility) may also be separated into a gas phase at the temperature.

b. Distillation temperature of cholesterols

Exhibit Ko 21 discloses that [i] in vacuum steam deodorization, cholesterols are not significantly distilled at less than 200 °C, but the removal proceeds from 200 °C to 250 °C, [ii] in vacuum stripping, and cholesterols are gasified when heated to 260 °C in vacuum of 0.5 Torr (the above 2(2)). Further, Exhibit Ko 2 also discloses that cholesterols were reduced when menhaden oil was distilled at 260 °C by utilizing molecular distillation (the above 3(1)B).

Consequently, it is reasonable to find that cholesterols are distilled at a temperature of 200 to 260 °C in a normal vacuum molecular distillation, while it is affected by the pressure condition.

c. Degree of volatility of PCB and brominated flame retardants

(a) Exhibit Ko 21 discloses that [i] in vacuum steam deodorization, PCB was reduced to less than a detectable level at 175 °C, [ii] in vacuum stripping, PCB is gasified together with cholesterols in a condition of 0.5 Torr and 260 °C (the above 2(2)). Further, Exhibit Ko 2 also discloses that in the second stage (260 °C, 250 rpm, 200 μ), "polychlorinated biphenyls (PCB) were reduced to less than a detectable level" in the purification of menhaden oil by utilizing molecular distillations (the above 3(1)B).

According to these descriptions, PCB is allegedly reduced to less than a detectable level at 175 °C at which cholesterols are not significantly distilled, and thus is recognized as a substance with a higher volatility than cholesterols.

(b) Subsequently, when it comes to brominated flame retardants, one kind of brominated flame retardants of commercially available PBDE has a boiling point of 310 to 425 °C at a normal pressure (Environmental health Criteria 162 (published on 1994). Exhibit Ko 30).

In contrast, the distillation range of PCB (under normal pressure) is 325 to 366 °C for Arochlor 1242, 365 to 390 °C for Arochlor 1254, and 385 to 420 °C for Arochlor 1260 (The Merck Index, 12th Ed. (published on 1996). Exhibit Ko 28).

Consequently, it is reasonable to find that the volatility of brominated flame retardants is comparable to that of PCB.

d. For the above reasons, it must be said that PCB and brominated flame retardants having higher volatility are also gasified in a temperature range where cholesterols are gasified. Thus the environmental pollutants are separated together with linoleic acid added to a salmon head oil by use of the salmon head oil including "environmental pollutants selected from the group consisting of brominated flame retardants and PCB" when a method specified by Exhibit Ko 2 invention 1 is implemented.

Further, a degree of volatility of cholesterols, PCB, and brominated flame retardants was a well-known objective matter as of the priority date (Exhibits Ko 21, 28, and 30 are documents distributed about 6 years or more before the priority date.) Therefore, a person ordinarily skilled in the art could have easily understood that PCB and brominated flame retardants contained in a salmon head oil might be separated together with linoleic acid added to the salmon head oil when a method specified in Exhibit Ko 2 invention 1 is implemented.

(C) Summary

Therefore, it is reasonable to find that a person ordinarily skilled in the art could easily conceive of the constitution according to the above Different feature 6.

B. Whether Different feature 7 was easily conceivable

(A) As in the above No. 2, 4(1)A, Exhibit Ko 2 invention 1 fails to specify a temperature of molecular distillation corresponding to stripping processing step.

(B) Incidentally, as in the above A(B)a, vacuum stripping is a technique in which a specific substance is separated from a liquid phase to a gas phase by use of each substance having a characteristic vapor pressure depending on a temperature. Thus it was a matter of common technical knowledge as of the priority date to adjust a temperature of stripping processing step according to a subject to be removed or reduced.

(C) Regarding this case, as in the above 2(2), it was known that cholesterols were removed from 200 °C to 250 °C, and gasified when heated to 260 °C in a vacuum of 0.5 Torr. In view of this, it is reasonable to find that a person ordinarily skilled in the art who read Exhibit Ko 2 would recognize that the molecular distillation of Exhibit Ko 2 invention 1 was also implemented generally in a temperature range of 200 to 260 °C.

Further, as in the above A(B)c, it was respectively known that PCB was reduced to less than a detectable level by distilling PCB at 175 °C, and that the volatility of PCB is comparable to that of brominated flame retardants.

(D) For the above reasons, it must be said that a person ordinarily skilled in the art could have easily conceived of adjusting the temperature range to at least a range of 175 to 260 °C in a case where PCB and brominated flame retardants are to be removed from a salmon head oil of Exhibit Ko 2 invention 1 by molecular distillation.

Consequently, the temperature range (175 to 260 °C) is encompassed into a temperature range (150 to 270 °C) specified by Invention 1. Therefore, it is reasonable to find that a person ordinarily skilled in the art could have easily conceived of the constitution according to the above Different feature 7.

C. Effects of Invention 1

According to the description, the effects of Invention 1 are allegedly to add volatile working fluids to marine oil, and subject it to stripping processing step at a temperature of 150 to 270 °C, thereby reducing environmental pollutants selected from the group consisting of brominated flame retardants and PCB without compromising the quality of the oil ([0017], [0030], [0031]).

In contrast, as in the above 3(1)C, Exhibit Ko 2 discloses that an added linoleic acid is distilled together with cholesterols, and cholesterols are removed.

Consequently, a person ordinarily skilled in the art who read Exhibit Ko 2 would recognize from the common general knowledge of the above 2(1) that linoleic acid used in Exhibit Ko 2 invention 1 functions as an entraining agent for "desired distillate" (substance to be separated by distillation); i.e., an agent promoting distillation of the distillate. Further, it must be said to be predictable that linoleic acid causes a similar effect in removing a substance with higher volatility than cholesterols (e.g. PCB and brominated flame retardants), and further a distillation may be carried out at a considerably low temperature (compared to cholesterols solidified at a normal pressure).

Therefore, it cannot be recognized that Invention 1 causes significant effects that cannot be unexpected from Exhibit Ko 2 invention 1 and the common technical knowledge as of the priority date.

D. Defendant's allegation

(A) Defendant alleges that a problem to be solved by Exhibit Ko 2 invention 1 is to prevent the solidification of salmon head oil in a condenser of molecular distillation and the clogging of a feed line, which is totally different from the problem to be solved by Invention 1 to provide a method effective for reducing an amount of environmental pollutants such as PCB in marine oils in a mild condition without compromising a substance.

However, both Invention 1 and Exhibit Ko 2 invention 1 use volatile working fluids such as linoleic acid for the purpose of reducing an amount of a substance for removal of marine oil. Therefore, the two inventions have their technical concepts in common and it cannot be said that the inventions are different from each other in terms of a problem to be solved by the Invention and a technical means.

(B) Further, pointing out an experimental result showing a relationship between a removal rate of DDT and vitamin A in cod-liver oil and distillation temperature, Defendant alleges that a person ordinarily skilled in the art could not expect that a substance present at high level such as cholesterols and a substance present in a very small amount, e.g., millionth part of cholesterol, such as PCB and brominated flame retardants show a similar behavior in molecular distillations.

However, as explained in the above A(B), since PCB and brominated flame retardants are highly volatile than cholesterols, a person ordinarily skilled in the art would recognize it as an ordinary behavior that PCB and brominated flame retardants are also gasified at a temperature where cholesterols are gasified. In contrast, there is no proper evidence sufficient to find that a distillation behavior largely varies depending on the content in a mixture, not high or low volatility (it is recognized that

DDT and vitamin A as Defendant pointed out have a large difference in volatility (Exhibits Ko 25, 65)).

(C) Furthermore, Defendant alleges that a person ordinarily skilled in the art who read Exhibit Ko 2 would recognize that a method of removing free fatty acids and then subjecting to molecular distillations in order to remove environmental pollutants such as PCB from fish oil should be selected and a method for adding volatile working fluids such as fatty acids before molecular distillations and then subjecting it to molecular distillations should be avoided, and it was well-known that various problems arose when externally adding liquid in purification of fish oils.

However, Exhibit Ko 2 invention 1 realizes the removal or reduction of a subject for removal by adding a fatty acid of linoleic acid. Thus it cannot be said that a person ordinarily skilled in the art who read Exhibit Ko 2 would recognize that free fatty acids should be removed before molecular distillations in removing a specific substance from a fish oil by utilizing molecular distillations. Further, there is no proper evidence sufficient to find that it was appreciated as of the priority date that, in removing PCB or brominated flame retardants from a fish oil, the goal might hardly be achieved unless free fatty acids were removed in advance.

(D) Therefore, the above Defendant's allegation is not acceptable.

E. Summary

For the above reasons, it is reasonable to find that Invention 1 was easily conceivable by a person ordinarily skilled in the art on the basis of an invention of Exhibit Ko 2 invention 1 as well as the common technical knowledge and well-known matters as of the priority date.

(2) Invention 19

Different features 6' and 7' are substantially identical to Different features 6 and 7. Therefore, similarly to the explanation in the above (1)A and B, it is reasonable to find that a person ordinarily skilled in the art could easily conceive of the constitution according to the above Different features 6' and 7'.

Further, it cannot be recognized that Invention 19 causes significant effects that cannot be unexpected from Exhibit Ko 2 invention 2 and the common technical knowledge as of the priority date, similarly to the explanation in the above (1)C.

For the above reasons, it is reasonable to find that Invention 19 was easily conceivable by a person ordinarily skilled in the art on the basis of an invention of Exhibit Ko 2 invention 2 as well as the common technical knowledge and well-known matters as of the priority date.

(3) Summary

Therefore, the judgment of the JPO decision on this point is erroneous, and the error affects the conclusion.

Therefore, Plaintiff's allegation of Reasons 1 and 2 for rescission has a point.

5 Reason 3 for Rescission (Errors in the finding of the different feature between the Invention and the invention of Exhibit Ko 3)

(1) Description of Exhibit Ko 3

A. Claims

"1. A process for producing a product comprising at least 60 percent of mono esters of polyunsaturated fatty acids having at least 20 carbon atoms which comprises subjecting a mixture consisting essentially of mono esters selected from the group consisting of lower alkyl esters and monoglycerides of substantially unconjugated fatty acids from natural glyceride oils to distillation in a short-path molecular still under a vacuum at least as high as one millimeter of mercury at a temperature below 100 °C, to produce said fraction of mono esters of poly-unsaturated acids of at least 20 carbon atoms.

2. A process according to claim 1 in which the esters are methyl esters.

3. A process according to claim 1 in which the esters are ethyl esters.

...

6. A process according to claim 1 in which the glyceride oil, before transformation into the corresponding mono esters, is deodorized by distillation with a small amount of a volatile inert organic liquid." (Column 10, lines 2 to 27)

B. "It is an advantage of the present invention that products can be produced simply and cheaply from various sources such as fish oils, and that these products are not only of high potency but also have little remaining odor." (Column 3, lines 38 to 41)

"Ordinary distillation, whether under a vacuum or not, involves bringing the material to a temperature at which the partial pressure of the constituents to be distilled equals the pressure maintained in the still and the residence in the still must be sufficiently long so that this evaporation takes place. Unfortunately, this is just what is undesirable, because heating promotes isomerization and other undesired reactions and is something to be avoided at all costs." (column 3, line 72 to column 4, line 5; see Exhibit Otsu 13 as a translation)

"While the molecular stills are of ordinary design and are not operated by any new technique, it is desirable to keep the distillation of the monoesters as gentle as possible, and their separation should be carried out at temperatures below 100 °C. This makes it desirable to use in the molecular still a very high vacuum, and I prefer to use pressures well below a millimeter of mercury and preferably of the order of 10 microns or less. Also, a very short-path molecular still should be used in order to effect a molecular distillation at minimum temperature and in the shortest time... It is not necessary that all of the distillation be completed in a single pass. By maintaining the desirable low temperatures and short times in the molecular still, it is possible to obtain the products of the present invention with less than one percent isomerism of the double bonds to form conjugated double bonds. This can be checked by the ultra-violet analysis. The gentle treatment also produces very little isomerism of cis compounds into trans compounds." (Column 4, lines 40 to 63; see Exhibit Otsu 13 as a translation)

"While the present invention is not limited in its broader aspects to any particular starting material, it is helpful to start with deodorized or partly deodorized natural oils. An improved method of deodorizing is included as a part of a preferred modification of the invention. Hitherto deodorization of natural oils, such as fish oils, has been effected by prolonged stripping with steam. I have found that these oils can be deodorized by stripping the oil with a small quantity of some material of reduced volatility. I have deodorized fish oil by distilling with 5% of a volatile hydrocarbon added to the oil. The same deodorizing effect can be accomplished by stripping the oil with even smaller quantities (2%) of simple esters. Most economically, I use the lower molecular weight esters separated from the highly unsaturated esters which comprise my product. However, the stripping agent may be a ketone, alcohol, or halide, or other inert material of low vapor pressure. An additional advantage to my method of deodorizing natural fats is that virtually all of the free acids that may be present are removed, and the temperature history of the fat is minimized. The latter effect is very important to the structural integrity of unsaturated fatty oils." (Column 5, lines 46 to 68)

C. Examples

"Example 1

A sample of 1200 parts of cold pressed menhaden oil was mixed with 1200 parts of absolute methanol (containing 4 parts of dissolved potassium hydroxide). The mixture was stirred and boiled under reflux for 1.5 hours. ...These crude methyl esters were distilled in a short-path, continuous, high vacuum molecular still of the accelerated film type (consisting of a vertical heated glass cylinder, the inside of which was an evaporation surface.) ...Diagram 1 below illustrates the partition of the crude esters by repeated distillations of the fractions. After four distillations, 32% of the crude esters were isolated as a concentrate having an iodine value in excess of 300 (Fraction G and H).

Example 2

A crude mixture of fatty acid methyl esters of menhaden oil (produced in the aforesaid Example 1) was subjected to repeated molecular distillations, employing only 3 distillations this time under the same conditions as in Example 1. ...

When the fraction was analyzed by gas chromatography in a polyester column, the distribution of fatty acids in terms of weight percent of each fatty acid ester are reported in Table 1 below.

Table 1

ANALYSIS OF METHYL ESTER SAMPLE TESTED PHARMACOLOGICALLY

	Percent
Docosahexaenoic acid ester	29.6
...	
Eicosapentaenoic acid	32.9

..." (column 6, line 3 to column 7, line 43)

"Example 5

Two gallons of methyl esters of C_{14}-C_{18} acids were added to 100 gallons of cold pressed menhaden oil and the mixture was stripped in a molecular still. By this means, all of the odor bodies and free acids were removed in the distillate. By this means, 772 lbs. of clean, acid-free, sweet smelling oil was obtained as residue and 25 lbs. of acids, odor bodies, and simple esters were collected as distillate." (Column 8, lines 16 to 25)

"Example 6

A sample of light pressed Herring oil was diluted with 5% of its weight of Nujol distillate which had been distilled at 160 to 180 °C at 30 μ pressure. The mixture was passed once through the molecular still at 200 °C at 20 μ pressure. The distillate contained all of the Nujol and most of the acid and odor components of the fish oil. The residue contained 96% of the Herring oil charged. By this means the free acid content of the fat has been reduced from 0.08 meq./g. to 0.01 meq./g." (Column 9, lines 21 to 31)

(2) Comparison with Invention 1

A. Finding of Different feature 8

(A) Plaintiff alleges that the following findings of Different feature 8 in the trial decision are erroneous: [i] Exhibit Ko 3 invention 1 is "a method for the removal of odor substances in fish oil"; [ii] it is indefinite as to whether or not Exhibit Ko 3 invention 1 comprises the step of separating the environmental pollutants from the fish oil together with simple esters added to the fish oil; and [iii] it is indefinite as to whether or not simple esters can be said to be a volatile working fluid.

(B) Regarding the above point [i]

Plaintiff alleges that not only odor substances but also the other volatile components are separated in a method of Exhibit Ko 3, and free fatty acids are volatile components in fish oil, and thus Exhibit Ko 3 invention 1 is not "a method for removing odor substances in fish oil", but should be found as "a method for the removal of odor substances, free fatty acids, and the other volatile components in fish oil".

However, as in the above (1)B and C, a part of Exhibit Ko 3 that the trial decision took it as a basis for the finding of Exhibit Ko 3 invention 1 is related to a deodorization method. Consequently, taking into account the fact that Example 5 discloses that odor substances and free fatty acids were distilled, it must be said as reasonable to specify Exhibit Ko 3 invention 1 as a method for removing odor substances, which is a cause of odor.

Further, Exhibit Ko 3 is silent about the description of "the other volatile components" as Plaintiff points out.

Therefore, it cannot be said that the finding of Exhibit Ko 3 invention 1 in the trial decision made an error, and thus Plaintiff's allegation of this point is not acceptable.

(C) Regarding the above point [ii]

As in the above (1)B and C, a part of Exhibit Ko 3 that the trial decision took it as a basis for the finding of Exhibit Ko 3 invention 1 fails to disclose explicitly or implicitly that fish oil includes PCB and brominated flame retardants. Consequently, it must be said as indefinite as to whether or not the fish oil comprises PCB or brominated flame retardants, and thus it is reasonable to find that it is indefinite as to whether or not to include the step of separating environmental pollutants selected from the group consisting of brominated flame retardants and PCB together with simple esters added to the fish oil from the fish oil.

Therefore, it cannot be said that the finding of the JPO decision on this point is erroneous.

(D) Regarding the above point [iii]

Simple esters of Exhibit Ko 3 invention 1 is a liquid added to a fish oil prior to stripping processing step, and in the stripping processing step, it is distilled together with odor substances (the above (1)B). Further, the simple esters were methyl esters of C_{14} to C_{18} acids, and in view of the residues and distillate, having higher volatility compared to oil (triglycerides) (the above (1)C, Example 5).

Taking into account the feature of volatile working fluids in Invention 1 explained in the above 3(2)A(D), the volatile working fluids of Invention 1 differs from simple esters of Exhibit Ko 3 invention 1 in whether substances for removal are environmental pollutants or odor substances, whereas they have in common that they both have high volatility compared to triglycerides, and are liquids evaporated together with substances for removal. Further, simple esters correspond to "an ester of C10 to C22 fatty acids and C1 to C4 alcohols" exemplified as a volatile working fluid in the description.

Therefore, it is reasonable to find that simple esters in Exhibit Ko 3 invention 1 correspond to a volatile working fluid in Invention 1.

Therefore, the finding of the JPO decision on this point is erroneous.

(E) Summary

For the above reasons, a trial decision made an error in finding the different feature 8 indefinite as to whether or not simple esters could be said to be volatile working fluids.

B. Common points and Different features between Invention 1 and Exhibit Ko 3 invention 1

As in the above item A, it is recognized that simple esters in Exhibit Ko 3 invention 1 corresponds to a volatile working fluid in Invention 1. Further, Invention 1 and Exhibit Ko 3 invention 1 share their technical concepts in common that an amount of substance for removal in marine oil is reduced by use of a volatile working fluid.

Consequently, it is reasonable to find the common points and different features between Invention 1 and Exhibit Ko 3 invention 1 as set forth below:

<Common Points>

"A process for decreasing an amount of substance for removal in an edible marine oil, comprising the steps of:

- externally adding a volatile working fluid of fatty acids esters to the marine oil;
- subjecting the marine oil to the stripping processing step at least one time together with volatile working fluids,

wherein a certain amount of the substances for removal present in the marine oil is separated from the marine oil together with the volatile working fluid"

<Different feature 8>

In Invention 1, a substance present in marine oil and to be separated from marine oil together with volatile working fluids is "environmental pollutants selected from the group consisting of brominated flame retardants and PCB", whereas in Exhibit Ko 3 invention 1, the substance for removal is "odor substances", and it is indefinite as to whether or not a fish oil of Exhibit Ko 3 invention 1 comprises "environmental pollutants selected from the group consisting of brominated flame retardants and PCB", and as to whether or not the environmental pollutants are separated from the fish oil together with simple esters added to the fish oil.

<Different feature 9>

A temperature range for implementing "stripping processing step" is "a temperature between 150 to 270 °C" in Invention 1, whereas Exhibit Ko 3 invention 1 does not specify the temperature range.

(3) Comparison with Invention 19

A. Finding of Different feature 8'

As is similarly explained in the above (2)A, it is reasonable to find that simple esters in Exhibit Ko 3 invention 2 correspond to a volatile working fluid in Invention 19 (in addition, see the above 3(3)A). Therefore, a trial decision made an error in finding Different feature 8' indefinite as to whether or not simple esters could be said to be volatile working fluids.

B. Common points and Different features between Invention 19 and Exhibit Ko 3 invention 2

As in the above item A, it is recognized that simple esters in Exhibit Ko 3 invention 2 corresponds to a volatile working fluid in Invention 19. Further, Invention 19 and Exhibit Ko 3 invention 2 share their technical concepts in common that an amount of substance for removal in marine oil is reduced by use of a volatile working fluid.

Consequently, it is reasonable to find the common points and different features between Invention 19 and Exhibit Ko 3 invention 2 as set forth below:

<Common Points>

"A use of volatile working fluids including simple esters in a method for reducing an amount of a substance for removal in an edible marine oil, wherein the marine oil includes the substance for removal, and in the method, the volatile working fluids are externally added to the marine oil, and then the marine oil is subjected to at least one stripping processing step, and an amount of the substance for removal present in the marine oil is separated from the marine oil together with the volatile working fluids"

<Different feature 8'>

In Invention 19, a substance present in marine oil and to be separated from marine oil together with volatile working fluids is "environmental pollutants selected from the group consisting of brominated flame retardants and PCB", whereas in Exhibit Ko 3 invention 2, the substance for removal is "odor substances", and it is indefinite as to whether or not a fish oil of Exhibit Ko 3 invention 2 comprises "environmental pollutants selected from the group consisting of brominated flame retardants and PCB", and as to whether or not the environmental pollutants are separated from the fish oil together with simple esters added to the fish oil.

<Different feature 9'>

A temperature range for implementing "stripping processing step" is "a temperature between 150 to 270 °C" in Invention 19, whereas Exhibit Ko 3 invention 2 does not specify the temperature range.

(4) Therefore, the judgment of the JPO decision on this point is erroneous. A consideration is given in the following item as to whether the error affects the conclusion.

6 Reason 4 for Rescission (Errors in the determination of whether the different feature between the Invention and the invention of Exhibit Ko 3 was easily conceivable)

(1) Invention 1

A. Whether Different feature 8 was easily conceivable

(A) Fish oil of Exhibit Ko 3 invention 1 includes brominated flame retardants and PCB

As in the above findings of 4(1)A(A)a, it is reasonable to find that as of the priority date it was a well-known objective matter that almost all marine oils before purification include PCB and brominated flame retardants.

Therefore, it must be said that a person ordinarily skilled in the art could have easily conceived of a fish oil of Exhibit Ko 3 invention 1 including "environmental pollutants selected from a group consisting of brominated flame retardants and PCB".

(B) The fact that PCB and brominated flame retardants in fish oil are separated together with simple esters

First, when it comes to a distillation temperature of odor substances, as in the finding of the above 5(1)C, Example 6 of Exhibit Ko 3 describes a distillation temperature of 200 °C in a deodorization process utilizing Nujol distillate (corresponding to "volatile hydrocarbons" of Claim 6 of the above 5(1)B), which is one example of "a small amount of volatile inert organic liquids" (Id. item A). Further, also in a review titled "Progress of purification technique of edible oils and fats" (published in February 1968, Exhibit Ko 69), it is described that deodorization is carried out at a temperature of 220 to 260 °C in high vacuum of about 6 mmHg. In view of this, it is reasonable to find that odor substances are distilled at a temperature of 200 to 260 °C in a normal vacuum molecular distillation, while it is affected by the pressure condition.

Further, it must be said that PCB and brominated flame retardants having high volatility are also gasified in a temperature range where an odor substance is gasified (the above 2(2), id(10)), as is similar to the explanation in the above 4(1)A(B), a person ordinarily skilled in the art could have easily understood that "environmental pollutants selected from a group consisting of brominated flame retardants and PCB" included in a fish oil is separated together with simple esters added to the fish oil when a method specified by Exhibit Ko 3 invention 1 is implemented.

(C) Summary

Therefore, it is reasonable to find that a person ordinarily skilled in the art could easily conceive of the constitution according to the above Different feature 8.

B. Whether Different feature 9 was easily conceivable

(A) As in the above No. 2, 4(3)A, Exhibit Ko 3 invention 1 fails to specify a temperature of stripping processing step.

(B) In this regard, as in the finding of the above 5(1)C, Example 6 of Exhibit Ko 3 describes a distillation temperature of 200 °C in a deodorization process utilizing Nujol distillate.

In Example 5 comprising deodorization step utilizing simple esters, a distillation temperature in the step is not definitely described; however, it is hardly believed that a series of experiments made a significant difference in distillation temperature according to the same step of removing odor substances, and as in the above A(B), it was a matter of common technical knowledge as of the priority date that the deodorization was usually carried out at a temperature of 220 to 260 °C in high vacuum of about 6 mmHg (Exhibit Ko 69).

Therefore, it is reasonable to find that a person ordinarily skilled in the art who read Exhibit Ko 3 would recognize that a stripping processing step of Exhibit Ko 3 invention 1 is also carried out generally in a temperature range of 200 to 260 °C.

(C) Further, as explained in the above 4(1)B, it was a matter of common technical knowledge as of the priority date to adjust a temperature of stripping processing step according to the subject to be removed or reduced. Further, it was respectively known that PCB was reduced to less than a detectable level by distilling PCB at 175 °C, and the volatility of PCB is comparable to that of brominated flame retardants.

(D) For the above reasons, it must be said that a person ordinarily skilled in the art could have easily conceived of adjusting the temperature range to at least a range of 175 to 260 °C in a case where PCB and brominated flame retardants are to be removed from a fish oil of Exhibit Ko 3 invention 1 by stripping.

Consequently, the temperature range (175 to 260 °C) is encompassed into a temperature range (150 to 270 °C) specified by Invention 1. Therefore, it is reasonable to find that a person ordinarily skilled in the art could have easily conceived of the constitution according to the above Different feature 9.

C. Effects of Invention 1

As in the above 4(1)C, the effects of Invention 1 are allegedly to add volatile working fluids to marine oil, and subject it to stripping processing step at a temperature of 150 to 270 °C, thereby reducing environmental pollutants selected from the group consisting of brominated flame retardants and PCB without compromising the quality of the oil ([0017], [0030], [0031]).

In contrast, as in the above 5(1)B, Exhibit Ko 3 has a problem of "Hitherto deodorization of natural oils, such as fish oils, has been effected by prolonged stripping with steam" and also refers to the advantage of "minimizing temperature history of the fat" and allowing for the deodorization of a fish oil by "distilling together with 5% volatile hydrocarbons added to an oil" or "using smaller amount (2%) of simple esters".

Consequently, a person ordinarily skilled in the art who read Exhibit Ko 3 could recognize that simple esters of Exhibit Ko 3 invention 1 have a function of removing odor substances by a short-time stripping, and thus simple esters also cause a similar effect on PCB, etc. known as being removed together with odor substances (the above 2(2), (10)). Further, simple esters used in Exhibit Ko 3 invention 1 correspond to an entraining agent, and it is predictable that a distillation is feasible at a considerably low temperature, as explained in the above 4(1)C.

Therefore, it cannot be recognized that Invention 1 causes significant effects that cannot be unexpected from Exhibit Ko 3 invention 1 and the common technical knowledge as of priority date.

D. Defendant's allegation

Defendant alleges that a person ordinarily skilled in the art who read Exhibit Ko 3 would recognize that it is disclosed that a deodorization treatment of Exhibit Ko 3 invention 1 is preferable at a temperature less than 100 °C.

However, a "deodorization" by "distillation with a small amount of a volatile inert organic liquid" of Claim 6 is carried out as a pretreatment of "to produce said fraction of mono esters" of Claim 1, which is obvious from the description of "before transformation into the corresponding mono esters" of Claim 6.

Further, Example 6 of Exhibit Ko 3 adopts a distillation temperature of 200 °C in the deodorization step utilizing Nujol distillate. In view of this, it cannot be said that a temperature less than 100 °C, which is suggested to apply exclusively in the production of fractionation of monoester, is a preferable temperature in deodorization treatment.

Rather, it is described in a review distributed in 1968 before the priority date that the deodorization is usually carried out at a temperature of 220 to 260 °C in high vacuum of about 6 mmHg (Exhibit Ko 69). In view of this, it is reasonable to construe that less than 100 °C was insufficient, but it was necessary to carry out at a temperature of 200 °C described in Example 6 of Exhibit Ko 3, or beyond this, at a temperature of 260 °C in order to remove odor substances in a fish oil of Exhibit Ko 3 invention 1.

Therefore, the Defendant's allegation of this point is not acceptable.

E. Summary

For the above reasons, it is reasonable to find that Invention 1 was easily conceivable by a person ordinarily skilled in the art on the basis of an invention of Exhibit Ko 3 invention 1 as well as the common technical knowledge and well-known matters as of the priority date.

(2) Invention 19

Different features 8' and 9' are substantially identical to Different features 8 and 9. Therefore, similarly to the explanation in the above (1)A and B, it is reasonable to find that a person ordinarily skilled in the art could have easily conceived of the constitution according to the above Different features 8' and 9'.

Further, it cannot be recognized that Invention 19 causes significant effects that cannot be unexpected from Exhibit Ko 3 invention 2 and the common technical knowledge as of the priority date, similarly to the explanation in the above (1)C.

For the above reasons, it is reasonable to find that Invention 19 was easily conceivable by a person ordinarily skilled in the art on the basis of an invention of Exhibit Ko 3 invention 2 as well as the common technical knowledge and well-known matters as of the priority date.

(3) Summary

Therefore, the judgment of the JPO decision on this point is erroneous, and the error affects the conclusion.

Therefore, Plaintiff's allegation of Reasons 3 and 4 for rescission has a point.

No. 6 Conclusion

For the above reasons, Reasons 1 to 4 for rescission as Plaintiff alleges have a point, and thus the trial decision should be rescinded at least with respect to a part according to Claims 1 and 19 of the scope of claims of the Patent. Further, a part according to Claims 1, 2, 4 to 6, 9, 12 to 18 (see the Correction 2) and a part according to Claims 19 to 21 (see the Correction 6) respectively form a group of claims in the Correction, and thus the court renders as in the main text.

Intellectual Property High Court, Third Division

Presiding Judge
TSURUOKA Toshihiko

Judge
TAKAHASHI Aya

Judge
MAGIRA Hiromitsu