

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

RIMFROST AS
Petitioner,

v.

AKER BIOMARINE ANTARCTIC AS
Patent Owner.

Case IPR2018-01179

U.S Patent No. 9,375,453

Patent Owner's Sur-Reply to Petitioner's Reply

Mail Stop Patent Board
Patent Trial and Appeal Board
U.S. Patent and Trademark Office
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I. Introduction

The pending claims are directed to a method of extraction with specific levels of ether phospholipids, total phospholipids, triglycerides and astaxanthin esters (and other components in the dependent claims) from a denatured starting material and then formulating the krill oil for oral consumption. To arrive at the claimed method, Petitioner combines the processing steps and astaxanthin ester range from Breivik II with the ether and total phospholipid ranges from Catchpole and triglyceride range from Bottino II. However, the krill oils described in Breivik II and Catchpole were extracted by very different techniques from that utilized in Bottino. *Id.* at 6. Bottino utilized a non-selective Folch extraction which is intended to extract total lipids, including both neutral and polar lipids, from the source material. Ex. 1038 at 0001-2. Catchpole and Breivik II utilized selective supercritical fluid extraction methods. As will be shown by the evidence below, the rationale advanced by Petitioner to explain why the ranges for triglycerides from Bottino can be simply combined with the ether phospholipid range from Catchpole is flawed. Thus, a person having ordinary skill in the art (POSITA) would not combine the reference to arrive at the claimed process.

II. Collateral Estoppel

Petitioner argues that collateral estoppel stemming from the final written decisions in IPR2017-00745, IPR2017-00746, and IPR2018-00295 applies to

challenged claims 33-61 and that the claims have “materially identical ranges of ether phospholipids, triglycerides and astaxanthin esters.” Petitioner’s Reply to Patent Owner’s Response (Paper No. 18; Pet. Reply) at 4-5. For the purposes of this proceeding, Patent Owner will not dispute whether collateral estoppel applies to issues related to the Board’s findings regarding ranges for these components.

Patent Owner further notes that while Petitioner argues that while collateral estoppel may apply to Patent Owner’s “no triglycerides” and “PAF teaching away” arguments, Petitioner admits that Patent Owner’s arguments regarding combination of references teaching selective and non-selective lipid extraction procedures is in play.

III. There is no Motivation to Combine the Cited References

The claims as a whole are directed to using a polar solvent to extract a krill oil with defined lipid components from a denatured krill product. The polar solvent is selective for polar lipids. See, Petition (Paper 2) at 21. A POSITA would not combine lipid component ranges from non-selective lipid extraction techniques such as those used in Bottino with lipid component ranges obtained by selective extraction techniques utilizing polar solvents such as taught in Breivik II and Catchpole. The following chart from Dr. Hoem’s Declaration summarizes the different extraction techniques.

Reference	Extraction technique
Catchpole (Ex. 1009)	Selective - Two-step process - Ex. 1009 at 0024. Step 1 – extraction of neutral lipids from freeze dried krill powder by SFE with neat CO ₂ to provide a residual powder. Step 2 - Extraction of residual powder by SFE with CO ₂ plus 11% ethanol to yield Extract 2 (krill phospholipid extract)
Bottino II (Ex. 1038)	Non-selective – Single step extraction of total lipids in a single step process by the method of Folch et al. Lipids were extracted by homogenizing tissue with 2:1 chloroform-methanol (v/v). Ex. 1038 at 0001-2.
Breivik II (Ex. 1037)	Selective - Two-step process described in examples 6, 7 and 8 – Ex. 1037 at 0009. Step 1 – Ethanol wash of whole krill (heated or unheated) with ethanol. Step 2 – SFE with CO ₂ plus ethanol on ethanol washed whole krill.

Ex. 2001 (Hoem Decl.) ¶86. As summarized by Dr. Hoem:

A POSITA would understand that applying different extraction techniques to different krill starting materials will produce lipid extracts with different profiles depending on the solvents and extraction scheme. Thus, a POSITA would not combine ranges for lipid components obtained by different extraction techniques.

Id. at ¶86.

In response, Dr. Tallon opines that: “PO disregards the fact that a POSITA would not even have made the distinction between selective and non-selection extractions, as all extraction are selective by nature, to one extent or another – the aim of extraction is to separate some (i.e., selected) compounds, the soluble ones,

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