

UNITED STATES PATENT AND TRADEMARK OFFICE

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Ex parte LARRY D. BARKER,
BRENT EVERETT GREEN, and LEI XU

Appeal 2008-2119
Application 10/298,678
Technology Center 1600

Decided: June 30, 2008

Before, DEMETRA J. MILLS, and LORA M. GREEN, and
RICHARD M. LEBOVITZ, *Administrative Patent Judges*.

MILLS, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134. The Examiner has rejected the claims for obviousness. We have jurisdiction under 35 U.S.C. § 6(b).

The following claims are representative.

1. A process of preparing a protein isolate, which comprises:

(a) continuously extracting an oil seed meal at a temperature of at least about 5°C to cause solubilization of protein in said oil seed meal and to form an aqueous protein solution having a pH of about 5 to about 6.8, said continuous extraction step being effected by:

(i) continuously mixing the oil seed meal with an aqueous salt solution having an ionic strength of at least about 0.10 and a pH of about 5 to about 6.8 at a temperature of about 5°C to about 65°C, and

(ii) continuously conveying said mixture through a pipe while extracting protein from the oil seed meal to form an aqueous protein solution having a protein content of about 5 to about 40 g/L in a period of time up to about 10 minutes.

(b) continuously separating said aqueous protein solution from residual oil seed meal,

(c) continuously conveying said aqueous protein solution through a selective membrane operation to increase the protein concentration of said aqueous protein solution by ultrafiltration to at least about 200 g/L while maintaining the ionic strength substantially constant to provide a concentrated protein solution,

(d) continuously mixing said concentrated protein solution with chilled water having a temperature of below about 15°C to provide a dilution of the concentrated protein solution by 15 fold or less and to cause the formation of protein micelles in the aqueous phase,

(e) continuously flowing the resulting mixture into a settling vessel while permitting supernatant to overflow the vessel,

(f) continuously permitting said protein micelles to settle in the settling vessel while continuing to overflow supernatant from the vessel until a desired amount of amorphous sticky, gelatinous, gluten-like protein micellar mass has accumulated in said settling vessel, and

(g) recovering said protein micellar mass from the settling vessel, said protein micellar mass having a protein content, on a dry weight basis, of at least about 100 wt% as determined by Kjeldahl nitrogen x 6.25.

Cited References

| | | |
|--------|--------------|---------------|
| Jones | US 4,158,656 | Jun. 19, 1979 |
| Murray | US 5,844,086 | Dec. 1, 1998 |
| Murray | US 6,005,076 | Dec. 21, 1999 |

Grounds of Rejection

Claims 1, 3-7, 11-14, 17-19, 21-23, and 25-35 stand finally rejected under 35 U.S.C. § 103(a) as being unpatentable over Murray (US 6,005,076) or Murray (US 5,844,086) in view of Jones. We select claim 1 as representative of the rejection before us since Appellants have not separately argued the claims. 37 C.F.R. § 41.37(c)(1)(vii). We address both Murray references together as Appellants have done so in the Brief.

DISCUSSION

Background

The present invention relates to improved methods for manufacturing oil seed protein isolate. (Spec. 1.)

During patent examination, the PTO is permitted to adopt “the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art, taking into account whatever enlightenment by way of definitions or otherwise that may be afforded by the written description contained in the applicant's specification.” *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997); *In re Crush*, 393 F.3d 1253, 1256 (Fed. Cir. 2004). The claims are broadly directed to a process of preparing a protein isolate, which comprises extracting an oil seed meal, generally. Thus the claims are not directed to processing of a specific oil seed meal.

The Examiner finds that

[b]oth Murray [patents]... teach a method of preparing a protein isolate which comprises extracting an oil seed meal (i.e. canola oil seed or rapeseed meal) to cause solubilization (i.e. solubilization is done with the same solvent such as a food grade salt of sodium chloride, agitation of the food grade salt at the same time range and solubilization is also done at a similar temperature and pH) of a protein to form a similar concentration of an aqueous protein solution, separating the aqueous protein solution from oil seed or canola oil seed or rapeseed, increasing the protein concentration by the same method of ultrafiltration to intrinsically produce the same concentrated solution, diluting or continuously mixing the protein solution with water at a similar temperature to cause formation of protein micelles, settling the protein micelles, and recovering the protein micellar mass whereas to produce a dried product (i.e. proteinaceous powder) of a similar protein content.

(Ans. 5-6.)

The Examiner acknowledges that both Murray patents do not expressly

teach using water extraction subsequent to using the food grade product, after the passing step conducting a pigment removal step....

(Ans. 6.)

The Examiner relies on Jones as teaching that “pigment removed from an oil seed meal is beneficial because color is highly undesirable in many food products.” (Ans. 6 (citing Jones, col. 3, ll. 43-45).)

The Examiner concludes that:

It would have been obvious to one of ordinary skill in the art of creating a method of preparing a protein isolate and/or preparing a canola protein isolate to modify both Murray's method of preparation to include the beneficial teaching of Jones's pigment removal step within Murray's method of preparation because the above combined teachings would create an improved protein isolate and/or a canola protein isolate of reduced pigment. Furthermore, Murray does not specifically teach isolating additional protein from the supernatant at the end of their extraction procedure. However, the reference does teach using ultrafiltration to obtain the maximum amount of protein (see, e.g. column 5, lines 12-26 of US '076). Thus, it would be obvious to modify the extraction of both Murrrays to include additional purification of the proteins by ultrafiltration of the supernatant. Motivation stems from a reasonable expectation of increased protein yield. Moreover, the adjustment of other conventional working conditions (i.e. the water extraction step, continuously conveying said mixture through a pipe while extracting the protein, continuously flowing the resulting mixture into a settling vessel and the substitution of one oil seed for another), is deemed merely a matter of judicious selection and routine optimization which is well within the purview of the skilled artisan. Furthermore, as the references indicate the various different steps used by the claimed method is result variable, therefore, they could be routinely optimized by one of ordinary skill in the art of practicing the invention disclosed by the references.

(Ans. 6-7.)

In making an obviousness determination over a combination of prior art references, it is important to identify a reason why persons of ordinary skill in the art would have attempted to make the claimed subject matter. *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741 (2007). When making such a determination, the scope of the prior art and level of ordinary skill

must be considered. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). We find no error in the Examiner's prima facie case of obviousness as the Examiner has indicated a reason why persons of ordinary skill in the art would have attempted to make the claimed subject matter.

Appellants agree with the Examiner that the Murray references generally disclose a process of preparing an oil seed protein isolate, particularly a canola protein isolate, having a protein content of at least about 90 wt% (N x 6.25) which comprises:

- extracting an oil seed meal using an aqueous salt solution to form an aqueous protein solution.
- separating the aqueous solution from residual oil seed meal
- concentrating the aqueous protein solution
- diluting the concentrated protein solution to form protein micelles
- settling the protein micelles to form PMM
- separating PMM from the supernatant
- drying the PMM.

(Reply Br. 3.)

However, Appellants argue that the references do not describe or suggest

- a continuous process
- how to effect the extraction step in a continuous operation
- concentration of the aqueous protein solution by ultrafiltration to a concentration of at least about 200 g/L
- formation of an oil seed protein isolate having a protein content of at least about 100 wt%,
all as required by claim 1.

(Reply Br.3-4.)

We are not persuaded by Appellants arguments. In particular, as to the continuous processing of steps in claims 1 and 25, we find that "it is well

settled that it is not ‘invention’ to broadly provide a mechanical or automatic means to replace manual activity which has accomplished the same result.” *In re Venner*, 262 F.2d 91, 95 (CCPA 1958). We find that it is *prima facie* obvious to convert a known batch process into a continuous process. *In re Dilnot*, 319 F.2d 188 (CCPA 1963)(the court held the claimed continuous operation would have been obvious in light of the batch process of the prior art.)

Claims 1 and 26-28

As to the concentration of the aqueous protein of at least about 200g/L in claim 1, and the concentration of 100 to about 400g/L in claims 26-28, we find that Murray ‘076 teaches “a protein concentration of about 40 to about 200g/l.” (Murray ‘076, col. 5, ll. 48-49.) In cases involving overlapping ranges, the Federal Circuit and their

predecessor court have consistently held that even a slight overlap in range establishes a *prima facie* case of obviousness. *E.g.*, *In re Woodruff*, 919 F.2d at 1578, 16 USPQ2d at 1936-37 (concluding that a claimed invention was rendered obvious by a prior art reference whose disclosed range (“about 1-5%” carbon monoxide) abutted the claimed range (“more than 5% to about 25%” carbon monoxide)); *In re Malagari*, 499 F.2d at 1303, 182 USPQ at 553 (concluding that a claimed invention was rendered *prima facie* obvious by a prior art reference whose disclosed range (0.020-0.035% carbon) overlapped the claimed range (0.030-0.070% carbon)); *see also In re Geisler*, 116 F.3d at 1469, 43 USPQ2d at 1365 (acknowledging that a claimed invention was rendered *prima facie* obvious by a prior art reference whose disclosed range (50-100 Angstroms) overlapped the claimed range (100-600 Angstroms)). We have also held that a *prima facie* case of obviousness exists when the claimed range and the prior art range do not overlap but are close enough such that one skilled in the art would have expected them to have the same properties. *Titanium Metals*

Corp. v. Banner, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985).

In re Peterson, 315 F.3d 1325, 1329 (Fed. Cir. 2003).

In the present case, we find a slight overlap in the claimed and the prior art range value of a concentration of 200g/L is sufficient to establish a prima facie case of obviousness.

Where the prior art, as here, renders obvious the claimed invention, the burden then falls on an appellants to rebut that prima facie case. Such rebuttal or argument can consist of “any other argument or presentation of evidence that is pertinent.” *In re Dillon*, 919 F.2d 688, 692-93 (Fed. Cir. 1990).

Appellants argue that the Murray references describe concentrations in a very wide range of 40 to about 200g/L. (Reply Br. 7.) Appellants argue their claimed concentration is at least about 200g/L, preferably at least about 250g/L (claim 17). (Reply Br. 7.) Appellants, however, do not deny that there is a slight overlap between the claimed ranges or provide any evidence of unexpected results as compared to the prior art process. We agree with the Examiner that both Murray references teaches the use of ultrafiltration to obtain the maximum amount of protein, and that one of ordinary skill in the art would have been motivated to obtain the maximum amount of protein. (Murray, col. 5, ll. 12-26.) Furthermore, Murray teaches that the protein concentration depends upon the initial protein concentration and the volume reduction factor used. (Murray, col. 5, ll. 46-54.) Thus, we find that protein concentration is a result effective variable dependent upon the above indicated factors. In view of the above, we are not persuaded by Appellants’ argument.

Similarly, Appellants argue that Murray does not disclose formation of an oil seed protein isolate having a protein content of at least about 100 wt%. Again we agree with the Examiner that one of ordinary skill in the art would have been motivated to increase protein yield and that Murray describes that protein yield is a result effective variable. (Ans. 10.) “[D]iscovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art,” *In re Boesch*, 617 F.2d 272, 276 (CCPA 1980).

Lastly, Appellants argue that it has been determined that “the canola protein isolate obtained from the supernatant is predominantly a 2S canola protein while the PMM-derived canola protein isolate is predominantly a 7S canola protein and that the supernatant-derived canola protein has a much higher lysine content than the PMM-derived canola isolate.” (Reply Br. 10-11.) Appellants are reminded that the claims broadly pertain to any “oil seed meal” and do not recite a canola oil. Appellants’ evidence is not commensurate in scope with the pending claims. Thus we are not persuaded by Appellants argument. The obviousness rejection is affirmed.

SUMMARY

The obviousness rejection is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

lp

Appeal 2008-2119
Application 10/298,678

SIM & MCBURNEY
330 UNIVERSITY AVENUE
6TH FLOOR
TORONTO ON M5G 1R7 CA CANADA