The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JAMES T.C. YUAN, JOHN S. NOVAK, EDWARD F. STEINER and VIJAY K. JUNEJA

Appeal 2007-2673
Application 10/354,981
Technology Center 1700

Decided: September 26, 2007

Before THOMAS A. WALTZ, JEFFREY T. SMITH, and LINDA M. GAUDETTE, *Administrative Patent Judges*.

SMITH, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134 from the Examiner's final rejection of claims 1, 3 through 14, and 18 through 28, all of the claims pending in the above-identified application. We have jurisdiction pursuant to 35 U.S.C. § 6.

STATEMENT OF THE CASE

The subject matter on appeal is directed to "processes for sanitizing a foodstuff, and particularly to sanitizing and improving the cooking efficiency of a foodstuff using a combination of ozone and heat treatment" (Specification 1, ll. 15-18). The examples at pages 12-15 of the Specification show exposing meat samples contaminated with disease producing strains (H6, H13, F5603) of *C. perfringens* to an aqueous solution containing 3 to 5 ppm dissolved ozone at 4 to 8°C for 5 minutes and then heat treating them at a temperature of 45°C, 55°C or 65°C for approximately 30 minutes to simulate cooking conditions. According to page 8 of the Specification:

> As used herein, the term "foodstuff" generally refers to all types of foods, including, but not limited to, meats, including ground meats, poultry, seafood, produce including vegetables and fruit, dry pasta, breads and cereals and fried or baked snack foods. The present invention may be generally used in conjunction with any foodstuff that is able to support microbial, i.e. fungal, bacterial or viral growth, including unprocessed or processed foods, and food products. The foodstuff must generally be compatible for treatment with an aqueous solution containing ozone.
>
> The terms "sanitize" and disinfect", as well as variations thereof, generally mean the reduction of the microbial content of food. The terms "substantially sanitize" and "substantially disinfect" refer to the attainment of a level of microorganisms in the foodstuff such that the foodstuff is safe for consumption by a mammal, particularly by humans. Generally, as used herein, these terms refer to the elimination of at least about 90.0 to 99.9% of all microorganisms, including pathogenic microorganisms, in the treated foodstuff. Preferably, at least about 99.0 to 99.99%, and more preferably

> at least about 99.9 to 99.999% of such microorganisms are eliminated.
>
> The term "cooking efficiency", as used in the context of the present invention, is associated with improving the quality of and enhancing the safety of heat-treated foodstuffs for consumption by mammals, particularly humans. More specifically, the "cooking efficiency" may be said to be synergistically improved when the content of microorganisms on or in such foodstuff, particularly those causing food-borne illnesses, is reduced compared with levels which would be expected for heat treatment and/or ozone treatment of the foodstuff alone.

Further details of the appealed subject matter are recited in representative claim 1 reproduced below:

> 1. A method of improving the cooking efficiency of a foodstuff comprising
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> sanitizing/disinfecting the foodstuff using an aqueous solution containing an effective amount of ozone, which comprises
>
> forming an aqueous solution of ozone, and
>
> contacting the foodstuff with the aqueous solution,
>
> wherein said foodstuff is contacted with said aqueous solution at a temperature and for a time sufficient to substantially sanitize the foodstuff;
>
> optionally, packaging the foodstuff; and
>
> subjecting the foodstuff to a cooking process,
>
> wherein said packaging of the foodstuff comprises placing said foodstuff in a container, optionally applying a vacuum to the container to

remove air from the container, optionally injecting purge gas into the container, and sealing the container, and

wherein the cooking efficiency of said foodstuff is synergistically improved as compared with ozone treatment alone and/or heat treatment alone of said foodstuff.

As evidence of unpatentability of the claimed subject matter, the Examiner has relied upon the following reference:

Ratna R. Sharma, Ali Demirci, Larry R. Beuchat, and William F. Fett, "*Inactivation of Escherichia coli O157:H7 on Inoculated Alfalfa Seeds with Ozonated Water and Heat Treatment,"* Journal of Food Protection, 65, No. 3, 447-451 (2002) (hereinafter referred to as "Sharma").

The Examiner has rejected claims 1, 3 through 14, and 18 through 28 under 35 U.S.C. § 103(a) as unpatentable over the disclosure of Sharma.

The Appellants appeal from the Examiner's decision rejecting the claims on appeal under 35 U.S.C. § 103(a).

ISSUES

1. Would Sharma have taught or suggested exposing a foodstuff to an aqueous solution containing dissolved ozone "at a temperature and for a time sufficient to substantially sanitize the foodstuff" as required by claim 1 within the meaning of 35 U.S.C. § 103(a)?

FACTS, PRINCIPLES OF LAW, AND ANALYSES

Under 35 U.S.C. § 103, the factual inquiry into obviousness requires a determination of: (1) the scope and content of the prior art; (2) the differences between the claimed subject matter and the prior art; (3) the level

of ordinary skill in the art; and (4) secondary considerations (e.g., unexpected results). *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17-18, 148 USPQ 459, 467(1966). "[A]nalysis [of whether the subject matter of a claim would be obvious] need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *KSR Int'l v. Teleflex, Inc.*, 127 S. Ct. 1727, 1740-41, 82 USPQ2d 1385, 1396 (2007) *quoting In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336-37 (Fed. Cir. 2006); *see also DyStar Textilfarben GmBH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1361, 80 USPQ2d 1641, 1645 (Fed. Cir. 2006)("The motivation need not be found in the references sought to be combined, but may be found in any number of sources, including common knowledge, the prior art as a whole, or the nature of the problem itself."); *In re Bozek*, 416 F.2d 1385, 1390, 163 USPQ 545, 549 (CCPA 1969)("Having established that this knowledge was in the art, the examiner could then properly rely, as put forth by the solicitor, on a conclusion of obviousness 'from common knowledge and common sense of the person of ordinary skill in the art without any specific hint or suggestion in a particular reference.'").

Applying the above principles of law, the Examiner has found that Sharma "discloses continuously treating grain, e.g., alfalfa seeds or wheat, with an aqueous ozone solution at a time and temperature sufficient to substantially reduce the presence of E [.] coli, followed by heat treatment" (Answer 4). The Examiner has also found that the heat treatment taught by Sharma constitutes the claimed cooking process (*id*). Moreover, the

Examiner has determined that Sharma need not describe the claimed packaging step since it is recited as an optional step in claim 1 (*id*).

The Appellants only contend that Sharma fails to teach or suggest exposing a foodstuff to an aqueous solution containing dissolved ozone "at a temperature and for a time sufficient to substantially sanitize the foodstuff" as required by claim 1 (Br. 11 and Reply Br. 2-4).

The dispositive question is, therefore, whether Sharma teaches or would have suggested exposing a foodstuff to an aqueous solution containing dissolved ozone "at a temperature and for a time sufficient to substantially sanitize the foodstuff" within the meaning of 35 U.S.C. § 103(a)? On this record, we answer this question in the affirmative.

According to page 450 of Sharma:

> Table 3 lists the reductions in populations of *E. coli* O157:H7 on alfalfa seeds treated in water continuously sparged with ozone…. The lowest reduction in population was 1.12 $\log_{10}$ CFU/g *(92.1%)* on seeds treated for 2 min and the highest reduction was 2.21 $\log_{10}$ CFU/g *(99.4%)* on seeds treated for 64 min.
>
> ….
>
> Since ozone sparging did not eliminate *E. coli* O157:H7 on alfalfa seeds, sparging followed by heat was tested as a multihurdle approach….Water (control) and ozone sparging treatment followed by heating at 60°C for 3 h resulted in the highest reductions in population of *E. coli* O157:H7. No colonies were formed on TSAN, indicating less than 40 CFU/g of seeds. [Emphasis added.]

According to page 8 of the Specification, Sharma's ozone treatment temperature and time employed above are sufficient to meet the claimed

ozone treatment "temperature and for a time sufficient to substantially sanitize the foodstuff" as required by claim 1.

Even were we to determine that Sharma does not specifically teach elimination of more than 90% E. coli, our conclusion would not be altered. We find that Sharma teaches at pages 448 and 451 that the claimed ozone treatment conditions (e.g., temperature and contact time) are dependent on, *inter alia*, the microorganisms involved and the type of foodstuffs involved. Thus, we concur with the Examiner that the determination of optimum ozone treatment conditions (temperature and contact time) is well within the ambit of one of ordinary skill in the art. *In re Boesch*, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980) ("[D]iscovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art.").

Accordingly, based on the factual findings set forth in the Answer and above, we determine that substantial evidence supports the Examiner's finding that Sharma would have rendered the subject matter defined by the claims on appeal obvious to one of ordinary skill in the art within the meaning of 35 U.S.C. § 103.

ORDER

In view of the foregoing, the decision of the Examiner 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

tc/ls

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