THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 17

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

_____

Ex parte AKIKAZU NARA

_____

Appeal No. 96-0661
Application 08/189,833[1]

_____

ON BRIEF

_____

Before CALVERT, FRANKFORT and STAAB, Administrative Patent Judges.

FRANKFORT, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's refusal to allow claims 1, 4, 5, 8 through 18, 21 and 22 as

[1] Application for patent filed February 1, 1994.

amended subsequent to the final rejection in a paper filed November 15, 1994 (Paper No. 9). Claims 2, 3, 6, 7, 19 and 20 have been canceled.

Appellant's invention relates to a heating apparatus utilizing microwaves to heat a heating element which is capable of absorbing the microwaves and thus being heated to a high temperature, i.e., to an operating temperature in the range of about 30°C to about 2,000°C. Claim 1 is representative of subject matter on appeal and reads as follows:

1. A heating apparatus utilizing microwaves comprising:

(a) a heating element for heating a fluid passing therethrough, mainly made of carbon powder, alumina powder and silicon carbide powder in proportions preselected to provide an operating temperature in the range of about 30EC to about 2,000EC, and sintered in a honeycomb structure, (b) a microwave generator irradiating microwaves to said heating element and (c) an air blower blowing air to the said heating element.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Matsubara et al. (Matsubara)	4,822,966	Apr. 18, 1989
Nitta et al. (Nitta) (Japanese Kokai)[2]	4-298623	Oct. 22, 1992
Fukuda et al. (Fukuda) (Japanese Kokai)	4-301122	Oct. 23, 1992

Claims 1, 4, 5, 8 through 18, 21 and 22 stand rejected under 35 U.S.C. § 103 as being unpatentable over Fukuda (Japanese ‘122) or Nitta (Japanese ‘623) in view of Matsubara.

Rather than reiterate the examiner's full explanation of the above-noted rejection and the conflicting viewpoints advanced by the examiner and appellant regarding those rejections, we make reference to the examiner's answer (Paper No. 14, mailed May 12, 1995) and supplemental examiner’s answer (Paper No. 16, mailed September 18, 1995) for the examiner's reasoning in support of the rejection, and to appellant's brief (Paper No. 12, filed February 16, 1995) and

[2]A copy of a translation of each of these Japanese documents prepared for the U.S. Patent and Trademark Office is appended to this decision.

reply brief (Paper No. 15, filed July 12, 1995) for appellant's arguments thereagainst.

OPINION

In reaching our decision in this appeal, we have given careful consideration to appellant's specification and claims, to the applied prior art references, and to the respective positions articulated by appellant and the examiner. As a consequence of this review, we have made the determinations which follow.

Looking first to independent claim 1, it is the examiner's position that Fukuda (Japanese '122) or Nitta (Japanese '623) discloses the claimed invention except for the particular composition of the heating element required in appellant's claim 1 on appeal. Appellant has not indicated or urged otherwise and, in fact, references these two documents on pages 1 and 2 of the specification as being representative

of the known prior art. Appellant acknowledges that the filter (e.g., 18 of Fukuda) constructed of a honeycomb structure of porous ceramic material and the microwave absorption materials therein (e.g., 29) are heated by being irradiated with microwaves, but urges that such materials are not heated to a temperature in the vicinity of 1000°C because the usual microwave absorption materials are not stable at such a high temperature. Fukuda (translation, page 11) indicates that the microwave absorbing material therein is comprised of

> "at least one type of metallic oxide of zinc, copper, manganese, cobalt, iron, tin, or titanium, complex metallic oxide that has a perovskite crystal structure, or silicon carbide."

To address the particular material of construction of the heating element in appellant's claim 1 on appeal, the examiner turns to Matsubara and notes that this patent teaches that it is well known in the art of microwave heating to use a microwave absorption heating element that is mainly made of carbon powder, alumina powder and silicon carbide powder in proportions preselected to provide an operating temperature within the claimed range of "about 30°C to about 2,000°C."

Matsubara discloses that the microwaveable heating elements (e.g., 12 or 25) therein may be formed by "sintering" (col. 5, line 1) and that such heating elements may be comprised of

> "a microwave absorption material mainly composed of carbon and silicon carbide capable of sufficiently absorbing microwaves, and proper metal particles such as casting powder, brass powder, and alumina powder, etc"(col. 5, lines 53-57).

Matsubara (col. 7, lines 31-36) makes note of a composition for the heating element therein which can reach a temperature of about 900°C in a short time, while column 9, lines 21-28, thereof describes a heating element for a home kiln that is capable of raising the temperature in the kiln to about 1000°C.

After a careful review of the collective teachings of the applied references and of the specific combination thereof posited by the examiner, particularly the teachings of Fukuda and Matsubara, we must agree with the examiner that it would have been obvious to one of ordinary skill in the art at the time of

appellant's invention to utilize a microwave absorption material having a composition like that taught in Matsubara in place of the microwave absorption material (e.g., 29) of Fukuda so as to improve the speed of temperature rise of the heating element therein (e.g., Matsubara, col. 7, lines 41-45) and so as to allow such heating element of Fukuda to attain a temperature level of 1000°C or above.

Contrary to appellant's assertion on page 7 of the brief, we see no reason why it would have been improper to combine Fukuda and Matsubara in the manner noted *supra*. In our opinion, one of ordinary skill in the art would have found ample motivation in the collective teachings of Matsubara and Fukuda (as we have noted above) for using a heating element having a composition such as that taught in Matsubara in Fukuda. As for appellant's assertion (brief, page 6) that Matsubara does not describe the specific claimed combination of carbon, silicon carbide and alumina powders nor selecting the proportions of each to provide an operating temperature in the range of about 30°C to about 2000°C, we note column 4, lines 21-22 and column 6, lines 53-57, of Matsubara wherein it

is indicated that the heating element

therein may be mainly composed of powdered carbon and silicon carbide mixed and proper metal particles such as alumina powder, and column 9, lines 21-28, which notes that a heating element of
the composition disclosed in Matsubara is capable of attaining a temperature of about 1000°C, a temperature well within appellant's claimed range.

Appellant's apparent belief that the applied references must teach or suggest compositions for the heating elements therein that would allow for temperature variations covering the entire range of about 30°C to about 2000°C, and particularly the upper temperature level of about 2000°C, is misplaced given the broad recitations in claims 1 and 5 on appeal. These claims merely require that the heating element be "mainly made of carbon powder, alumina powder and silicon carbide powder in proportions preselected to provide an operating temperature in the range of about 30°C to about

2000°C" (emphasis added), not that the heating element must exhibit an operating temperature which encompasses the entire range set forth in the claims. Moreover, we note that such an understanding is belied by appellant's own specification (page 4) which indicates that

> "[b]y adjusting a mixture ratio of the carbon powder and the alumina powder, it is possible to adjust the generated temperature within a range from about 30°C to about 2000°C,"

and that the temperature of the heating element is changed in accordance with the mixture ratio (page 4, lines 16-18).

On the basis of the foregoing, we will sustain the examiner's rejection of claim 1 under 35 U.S.C. § 103. On page 4 of the brief appellant has grouped claims 1 and 5 together for purposes of this appeal, and thus we conclude that claim 5 will fall with claim 1.

On page 7 of the brief, appellant has argued that none of the applied references appear to disclose or suggest a honeycomb structure prepared by sinter forging as set forth in dependent claims 21 and 22 on appeal. However, we note that

Matsubara discloses (col. 5, line 1) that the heating element therein may be formed by sintering, while Fukuda discloses a similar heating element/filter (18) that is of a honeycomb construction. Given the collective teachings of these references we are convinced that it would have been obvious to one of ordinary skill in the art at the time of appellant's invention to form a heating element of the composition disclosed in Matsubara in a honeycomb form by sinter forging. Thus, we will also sustain the examiner's rejection of claims 21 and 22 under 35 U.S.C. § 103.

Claims 4 and 8 on appeal require that the surfaces of the heating elements of independent claims 1 and 5 be "covered with membranes to prevent a thermal oxidation." Claims 11 through 18 on appeal similarly require the surfaces of the heating elements of independent claims 1 and 5 to be "coated with a material to prevent thermal oxidation" and that such material be a fine metal oxide powder, such as an oxide of zirconium, aluminum or nitriding aluminum, and that the coating be coated to a thickness of "at least 20 microns." In

treating these claims, the examiner has taken the position (answer, page 6) that

> "the use of a coating of a metal oxide powder on a heating element used in a heating apparatus is considered well known and routine of which the Examiner takes judicial notice. The exact composition and the thickness of the coating would have been a matter of engineering design depending on the material to be heated and the desired heating temperature and obvious to an ordinary artisan and could be easily determined through routine trial and error experimentation."

The examiner has likewise taken "judicial notice" of the subject matter set forth in appellant's claim 9 on appeal, urging that tortuous channels in a fluid heating container are also well known in the art of fluid heaters.

In the brief, pages 6-7, appellant has argued that none of the applied references disclose or suggest the subject matter of claims 4, 8, 9 and 11 through 18 on appeal, and notes, in addition, that the references also do not teach or suggest a means to introduce jets of water to the exhaust gas which emanates from the heating element, as required in claim 10 on appeal. In the reply brief, pages 3-4, appellant has traversed the examiner's assertions based on "judicial notice" and requested that the examiner provide appropriate references

to support such contentions.

We note the examiner's citation in the supplemental answer (Paper No. 16, page 2) of several prior art patents which purportedly show features the examiner had previously taken "judicial notice" of, however, the examiner has not added any of these references to the rejection before us on appeal. Given that these patents have not been set forth in the statement of the § 103 rejection presently before us, or in any other rejection made by the examiner, they form no part of the issues presented for review by this panel of the Board. As pointed out by the Court in In re Hoch,428 F.2d 1341, 1342,166 USPQ 406, 407 n.3(CCPA 1970), where a reference is relied upon to support a rejection, whether or not in a minor capacity, there would appear to be no excuse for not positively including the reference in the statement of the rejection.

Since the subject matter of claims 4 and 8 through 18 on

appeal is not taught or suggested by the applied prior art references, and it has not been demonstrated by the examiner that such subject matter would have been obvious to one of ordinary
skill in the art in the context of the applied prior art references, it follows that the examiner's rejection of claims 4 and 8 through 18 before us on appeal is factually deficient and will therefore not be sustained.[3]

In light of the foregoing, the decision of the examiner to reject claims 1, 5, 21 and 22 under 35 U.S.C. § 103 is affirmed, while the decision to reject claims 4 and 8 through 18 on the same statutory basis is reversed.

[3] We note in particular that the examiner has, throughout the prosecution of this application, apparently not ever addressed the means to introduce jets of water as recited in appellant's claim 10 on appeal. As for the newly cited patents, if the examiner is of the view that they in fact render obvious the claimed subject matter as defined in claims 4 and 8 through 18 on appeal, then he should make the appropriate rejections and provide an appropriate explanation of those rejections as set forth in Sections 2141, 2142, 2143 and 2143.01 of the Manual of Patent Examining Procedure.

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

AFFIRMED-IN-PART

IAN A. CALVERT Administrative Patent Judge	)	
CHARLES E. FRANKFORT Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
LAWRENCE J. STAAB Administrative Patent Judge	)	

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