IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:

Jason Arthur Taylor *et al.*	)	Confirmation No.: 2498
Application No.: 14/773,837	)	Art Unit: 3742
Filed: August 9, 2015	)	Examiner: Maye, Ayub A
For: Preferentially Directing Electromagnetic Energy Towards Colder Regions of Object Being Heated by Microwave Oven	)	Atty. Dock. #: TAL-2013-002

REPLY UNDER 37 CFR §1.111 BY APPLICANTS TO DECEMBER 14, 2016 NON-FINAL OFFICE ACTION

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Honorable Commissioner:

In reply to the Office Action dated December 14, 2016, Applicants submit the following:

An **Abstract** begins on page 2 of this paper.

Remarks begin on page 3 of this paper.

ABSTRACT

The instant invention provides systems and/or techniques for preferentially directing electromagnetic energy towards colder regions of an object. During at least a portion of a heat treatment via a microwave oven, temperature measurements of the object are acquired to identify colder regions of the object. A controller varies the intensity of electromagnetic energy output by a position-sensitive heating apparatus to preferentially direct electromagnetic energy towards the colder food regions, such as when the colder regions of rotating food are facing the magnetron. Some embodiment classes have multiple magnetrons or a phased array. The temperature of the colder food regions is increased until the temperature profile of the object is uniform to within a specified stopping criteria, such as when a previously identified colder region is within 15° of a previously identified warmer region, or when a time duration has been met.

REMARKS

I. Preliminary Remarks

The Office Action dated December 14, 2016 (hereafter, "Office Action") indicates that an IDS containing the references cited in background section of the specification were not submitted in accordance with 37 CFR 1.98(b) and MPEP §609.04(a). The Examiner is hereby thanked for indicating this omission. Pursuant to 37 CFR §1.97 and 37 CFR §1.98, an IDS is being concurrently submitted herewith along with the fee potentially required under 37 CFR §1.17(p).

The Office Action also noted that the prior Abstract was not compliant with MPEP §608.01(b) and 37 CFR §1.72(b).

Claims 3, 12, 16, 17, 21 of the original 25 claims were canceled by preliminary amendment to reduce the number of pending claims to 20. All other claims of the instant patent application were rejected by the Office Action. More specifically, Claims 1, 2, 9, 10, 14, 22, and 24-25 stand rejected under pre-AIA 35 U.S.C. §102(b). Claims 4-8, 11, 13, 15, 18-20, and 23 stand rejected under pre-AIA 35 U.S.C. §103(a).

The Remarks that follow and corresponding evidence being submitted herewith respectfully traverse all the grounds for these rejections. More specifically, they show that the Office Action does not establish a proper *prima facie* case for anticipation of the two independent claims, Claims 1 and 22, in part because the prior art as cited does not supply all the limitations of these claims under the BRI[1] claim construction that was adopted.

[1] Broadest Reasonable Interpretation. *See, e.g., In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (70 USPQ2d 1827, 1830) (Fed. Cir. 2004).

Additionally, Applicants are submitting herewith a Declaration under 37 CFR 1.132 by Dr. Mariam Akhalkatsi. This Declaration discusses certain technical aspects of the rejections made using the Bu prior art reference.

II. IDS

An IDS is being submitted concurrent to this Reply in accordance with 37 CFR 1.98(b) and MPEP §609.04(a). It is believed that this IDS resolves the issue raised by the Office Action.

III. Abstract

An abstract that is believed to be compliant with MPEP §608.01(b) and 37 CFR §1.72(b) has been supplied on page 2 of this reply. This instant abstract is 143 words long, which is below the 150-word limit. Any sentences regarding the problem being addressed by the alleged invention or the prior art have been removed. This instant abstract contains no new matter, and is based entirely upon what is stated in the specification as would be understood by one skilled in the art at the time of invention.

IV. Rejection of Claims 1, 2, 9, 10, 14, 22, and 24-25 are rejected under pre-AIA 35 U.S.C. 102 (b) as being anticipated by Bu

IV.A. Rejection of Claim 1 Under 35 U.S.C. §102(b) as Being Anticipated by Bu

Claim 1 stands rejected under pre-AIA 35 U.S.C. §102(b) as being anticipated by Bu *et al.*, U.S. Patent No. 5,693,247 (hereafter, "Bu"). (Office Action at 4) In order for a reviewing court to not reverse a *prima facie* case of anticipation made by this agency, it must reveal how a single prior art reference clearly discloses of all of the elements of a claimed invention as arranged in the

claim. *Soundscriber Corp. v. U.S.*, 360 F.2d 954, 960, 148 USPQ 298, 301 (Ct.Cl. 1966). Also,

> [T]he [prior art] reference must clearly and unequivocally disclose the claimed [invention] or direct those skilled in the art to the [invention] without any need for picking, choosing, and combining various disclosures not directly related to each other by the teachings of the cited reference.

In re Arkley, 455 F.2d 586, 587 (CCPA 1972). Moreover, the agency's rationale revealing this must contain "sufficient findings and reasoning to permit meaningful appellate scrutiny." *Gechter v. Davidson*, 116 F.3d 1454, 1458 (Fed. Cir. 1997).

Claim 1 of the instant patent application reads:

> 1. A microwave oven, comprising:
> a position sensitive heating apparatus for preferentially directing electromagnetic energy towards colder regions of an object.

Page 4 of the Office Action states that Bu discloses a microwave oven comprising a position sensitive heating apparatus for preferentially directing electromagnetic energy towards colder regions of an object. The language is not reduced or changed. This means that the Office Action, which uses ordinary English in which all words carry their ordinary meaning assumes that all of the words in Claim 1 are limiting,[2] carry patentable weight, and that all of these claim limitations/elements are located within Bu.

Under the BRI standard that this agency is required to adhere to, this claim construction assumed by the Examiner is correct.

Also, this part of the Office Action also implies that the elements of Claim 1 are explicitly revealed at the exact locations indicated. This is because implicit or

[2] *Cf., e.g., Pacing Techs., LLC v. Garmin Int'l, Inc.*, 778 F.3d 1021 (Fed. Cir. 2015) (Discussing when a claim preamble might not carry patentable weight but holding it does if a dependent claim requires so.)

inherent features of an invention are, by assumption, *not* explicitly disclosed. Therefore, such features needed to match the words of Claim 1 hypothetically inherent in Bu would not be disclosed in any specific location, in contrast to Page 4 of the Office Action. Therefore, the Office Action implies that none of the Claim 1 elements are implicitly disclosed within Bu.

In light of these facts and in accordance with, *inter alia*, *Arkley* and *Gechter*, the Office Action's rejection of Claim 1, for it to be valid, thus requires that Bu explicitly discloses "a position sensitive heating apparatus for preferentially directing electromagnetic energy towards colder regions of an object." To not be reversed upon review, the Office Action requires that this entire apparatus is clearly revealed within Bu column 1, lines 40-68 and Bu column 2, lines 40-60.

However, these sections of Bu mostly discuss sensors, not energy direction to colder or warmer regions of an object. To avoid being reversed in accordance with *Gechter* upon appeal, the Examiner's rejection of Claim 1 requires that "Bu teaches of using sensors for detecting the temperature of the food and controlling the temperatures of food" somehow equates to and explicitly contains all the potential features of "a position sensitive heating apparatus for preferentially directing electromagnetic energy towards colder regions of an object."

This potential equality does not appear to be valid. More particularly, these sections of Bu do not allow for any "preferentially directing electromagnetic energy" as the Office Action's implicit construction of Claim 1 requires.

Because of my own failure in being able to locate within Bu where the "position sensitive heating apparatus for preferentially directing electromagnetic energy towards colder regions of an object" might be, two things were done.

First, the Examiner was called. These calls were not apparently answered or returned.

Second, an expert and one skilled in the art, Dr. Mariam Akhalkatsi, was hired. Her declaration (hereafter, "Akhalkatsi") is being submitted concurrently.

Unfortunately, Dr. Akhalkatsi also had problems locating the Claim 1 apparatus within Bu. Her declaration reads, *inter alia*:

> 17. I think this sentence [rejecting Claim 1] contains several errors, and it is unreasonable to me. … In contrast to what this Office Action statement says about claim 1, the Bu reference (abstract, Fig. 1-5 , col.1, lines 40-68 and col.2, lines 40-60) does not contain any information about "a position sensitive heating apparatus..." I have no solid explanation of how the patent examiner could have stated otherwise. 19. The Office Action's above sentence is also wrong because the Bu reference (abstract, Fig. 1-5, col.1, lines 40-68 and col.2, lines 40-60) does *not* contain any information about "...preferentially directing the electromagnetic energy..." Bu does not disclose any active methods of preferentially directing heat to any colder food regions. If anything, it implies the opposite.

Akhalkatsi at ¶¶16-21.

Akhalkatsi also pointed out that the word "directing" in Claim 1 requires an active technology alien to Bu. Akhalkatsi at ¶20. See Exhibit A for a dictionary definition of "directing" dated to 2003. It implies that one skilled in the art would understand that this word means regulating the activities or course of.

Given that multiple people who are skilled in this art disagree with the required assumptions of the Office Action and for the above reasons, and in light of all information currently available, it is believed that amending Claim 1 to narrow its scope, as is commonly done in response to an Office Action, would not alter the rationale or flow of logic employed by the Office Action's rejection, nor bring the Claim any closer to allowability than it already is.[3]

[3] For example, if neither *X* nor *Y* are in Bu, and Claim 1 requires *X*, and the Examiner rejects the claim because he says that Bu has *X* at line 100, yet *X* is clearly not at line 100, then if the Claim is amended to further include *Y*, which is not at line 100 either, then there is arguably little preventing the Examiner from also saying that *Y* is at line 100. Indeed, a respectable forecasting method is to extrapolate the known historical data into the future. It suggests adding *Y* would

Rather, it is believed that the Office Action fails to satisfy the requirements of a making a *prima facie* case of anticipation as would be interpreted by courts reviewing the Patent and Trademark Office's decisions. For example, the assertion that Bu contains "a position sensitive heating apparatus for preferentially directing electromagnetic energy towards colder regions of an object" is incorrect. Since this was the exclusive rationale supplied for the rejection, 100 percent of the supplied rationale required by the Office Action appears to be and has now been shown to be incorrect, and, therefore, the Office Action is currently in conflict with precedent binding this agency.

For the above reason, the rejection of Claim 1 under 35 U.S.C. §102(b) is invalid. The rejection of Claim 1 should be withdrawn, the Claim allowed, or a different basis for rejecting it should be supplied that is compliant with the MPEP and precedent binding this agency.

IV.B. Rejection of Claims 2, 9-10, and 14 Under 35 U.S.C. §102(b) as Being Anticipated by Bu

Claims 2, 9, 10, and 14 stand rejected under 35 U.S.C. §102(b) as being anticipated by Bu. (Office Action at 4-5) Each of these claims is a dependent claim. Therefore, they are all narrower in scope than the sole independent claim, Claim 1, that these claims reference.[4]

Also, 35 U.S.C. §102 requires that, "A person shall be entitled to a patent *unless*—…," with this italicized word implying allowance if there is failure in a finding invalidity. Although the Office Action gave a reason for the rejection of Claim 1, §IV.A. of this Paper showed that the reason was not congruent with

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yield the same type of rejection as was obtained with just *X*.

[4] (*See*, *e.g.*, *Glaxo Grp. Ltd. v. Ranbaxy Pharms., Inc.*, 262 F.3d 1333, 1336 (Fed. Cir. 2001), *ClearstreamWastewater Sys. v. Hydro-Action, Inc.*, 206 F.3d 1440, 1446 (Fed. Cir. 2000), *etc.*)

current courts' interpretations of law. As such, Claim 1 should, for the current purposes of an allowability analysis, be assumed to become allowable.

However, because Claim 1 is broader than the narrower dependent claims that were rejected, all its dependent claims are also allowable; if the elements of Claim 1 are not within Bu, each of the claims dependent upon Claim 1, each containing additional limitations beyond those already not in Bu, are also not within Bu. Therefore, the rejections of Claims 2, 9, 10, and 14 are also invalid.

For the above reasons, to avoid reversal of the rejection upon appeal, Claims 2, 9, 10, and 14 should either be allowed, their rejections withdrawn, or the Claims should be rejected on a different basis that is actually compliant with the MPEP and precedent binding the agency.

IV.C. Rejection of Claim 22 under 35 U.S.C. §102(b) as being anticipated by Bu

Claim 22 stands rejected under 35 U.S.C. §102(b) as being anticipated by Bu. (Office Action at 5.) Claim 22 is an independent method claim. It reads,

> A method preferentially directing electromagnetic energy towards colder regions of an object, comprising: identifying the colder regions of the object undergoing a heat treatment in a microwave oven; and preferentially directing the electromagnetic energy towards the colder regions.

Page 5 of the Office Action states that Bu also disclosed a method preferentially directing electromagnetic energy towards colder regions of an object comprising identifying the colder regions of the object undergoing a heat treatment in a microwave oven and preferentially directing the electromagnetic energy towards the colder regions. As argued in §IV.A., this implies a claim construction in which all words of Claim 22 carry patentable weight and that all the corresponding claim elements are explicitly and not inherently within the Bu reference.

Under the BRI standard this agency is required to employ, this claim

construction is correct.

However, it is not clear where this method is disclosed within Bu. The Office Action claims it is within the Bu Abstract, Figs. 1-5, column 1, lines 40-68, column 2, lines 1-4, and 25-68. However, these areas of Bu mostly apparently concern a plurality of sensors to solve a distance error that can occur using only a single sensor. No method of preferentially directing electromagnetic energy towards colder regions of an object that comprises identifying the colder regions of the object undergoing a heat treatment in a microwave oven and preferentially directing the electromagnetic energy towards the colder regions is revealed.

As explained in §IV.A., an expert was retained to hopefully discover how Bu might contain this method of Claim 22. Unfortunately, the expert again failed. Akhalkatsi at ¶¶27-30. She wrote:

> In contrast to what this Office Action statement says about claim 22 of 14/773,837, Bu … does *not* contain … a "method preferentially directing electromagnetic energy towards colder regions of an object...", "identifying the colder regions of the object...", or "...preferentially directing electromagnetic energy towards colder regions." 29. Bu does *not* make any attempt to either identify colder vs. hotter regions of food nor heating the colder regions preferentially. Bu does *not* teach any method preferential direction of energy to colder regions of the food. … For the above reasons, I think this sentence in the Office Action regarding Claim 22 of 14/773,837 is both incorrect and inconsiderate of the facts.

Using the rationale previously supplied in §IV.A. *supra* regarding Claim 1, the rejection of Claim 22 under 35 U.S.C. §102(b) is also invalid. The rejection of Claim 22 should be withdrawn, the claim allowed, or a different basis for rejecting the claim should be supplied that is compliant with the MPEP and precedent binding the agency.

IV.D. Rejection of Claims 24-25 under pre-AIA 35 U.S.C. 102(b) as being anticipated by Bu

Claims 24 and 25 are dependent from independent Claim 22, the rejection of which is not congruent with U.S. patent law for reasons described in §IV.C. *supra*. According to §§IV.B-IV.C., Claim 22 is therefore allowable for the purposes of analyzing the other pending claims. Section IV.B. supplies legal reasons that any dependent claim of an allowable claim must also be allowable. It implies that because Claims 24 and 25 are dependent claims of an allowable claim they are also allowable in light of the recent Office Action ironically rejecting them.

Therefore, to avoid reversal of the rejection upon appeal, the rejections of Claims 24 and 25 should be withdrawn, the Claims should be allowed, or they should be rejected on a different basis that is actually compliant with the MPEP and precedent binding the agency.

V. Rejection of Claims 4-8, 11, 13, 15, 18-20, and 23 under pre-AIA 35 U.S.C. §103(a)

Claims 4-8, 11, 13, 15, 18-20, and 23 were rejected under pre-AIA 35 U.S.C. §103(a) as being obvious in light of various prior art references. All of these claims are dependent from either Claim 1 or Claim 22. Therefore, in accordance with the rationale discussed *supra* in §§IV.A-IV.D, the rejection of Claims 4-8, 11, 13, 15, 18-20, and 23 should be withdrawn, the claims should be allowed, or they should be rejected on a different basis that is actually compliant with the MPEP and precedent binding the agency.

IV. Conclusion

A full and complete response is believed to have been made to all issues kindly noted in the Office Action. Applicants have taken substantial steps in

efforts to advance prosecution of the present application. Thus, Applicants respectfully request that a timely Notice of Allowance issue for the present case.

However, if this is not the case, or should there be any outstanding matters within the present application that need to be resolved, the Examiner is respectfully requested to contact Applicants' representative at the telephone number of the undersigned below to conduct an interview in an effort to expedite prosecution in connection with the present application.

Respectfully submitted,

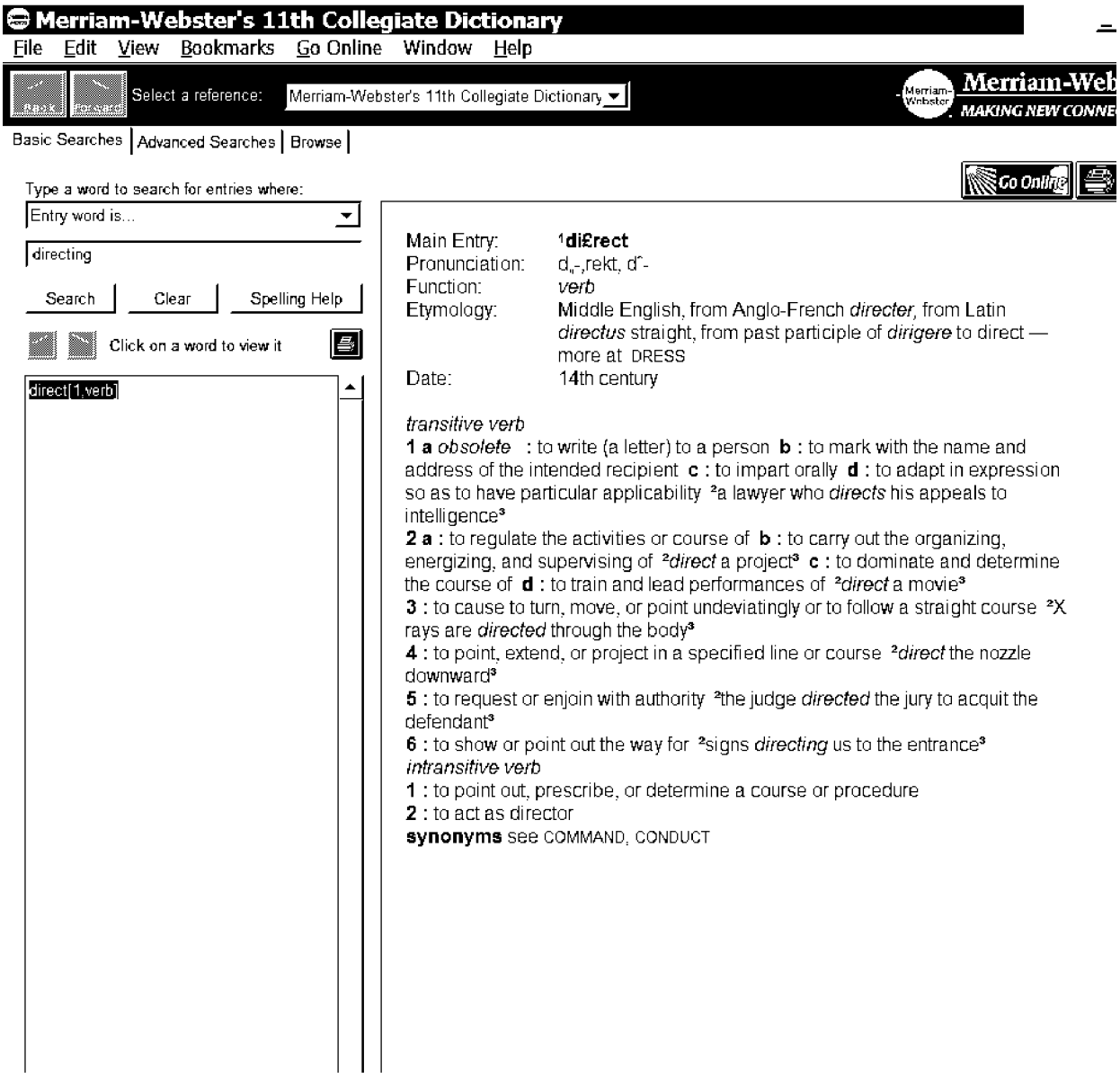
April 14, 2017 /Leslie R.J. Virany/

Date

Leslie R.J. Virany
Registration No.: 66,836
Patentek LLC
289 Scott Lane
Venetia, PA 15367
412-608-8791

Attachments:
Exhibit A – Definition of "directing"

Exhibit A


Merriam-Webster's 11th Collegiate Dictionary
File Edit View Bookmarks Go Online Window Help
Select a reference:
Merriam-Webster's 11th Collegiate Dictionary
Merriam-Webster
MAKING NEW CONNE
Basic Searches | Advanced Searches | Browse
Go Online
Type a word to search for entries where:
Entry word is...
directing
Search
Clear
Spelling Help
Click on a word to view it
direct [1 verb]
Main Entry: 1di£rect
Pronunciation: d„-'rekt, dˆ-
Function: verb
Etymology: Middle English, from Anglo-French directer, from Latin directus straight, from past participle of dirigere to direct — more at DRESS
Date: 14th century
transitive verb
1 a obsolete : to write (a letter) to a person b : to mark with the name and address of the intended recipient c : to impart orally d : to adapt in expression so as to have particular applicability ²a lawyer who directs his appeals to intelligence³
2 a : to regulate the activities or course of b : to carry out the organizing, energizing, and supervising of ²direct a project³ c : to dominate and determine the course of d : to train and lead performances of ²direct a movie³
3 : to cause to turn, move, or point undeviatingly or to follow a straight course ²X rays are directed through the body³
4 : to point, extend, or project in a specified line or course ²direct the nozzle downward³
5 : to request or enjoin with authority ²the judge directed the jury to acquit the defendant³
6 : to show or point out the way for ²signs directing us to the entrance³
intransitive verb
1 : to point out, prescribe, or determine a course or procedure
2 : to act as director
synonyms see COMMAND, CONDUCT

Electronic Patent Application Fee Transmittal

Application Number:	14773837
Filing Date:	09-Sep-2015
Title of Invention:	PREFERENTIALLY DIRECTING ELECTROMAGNETIC ENERGY TOWARDS COLDER REGIONS OF OBJECT BEING HEATED BY MICROWAVE OVEN
First Named Inventor/Applicant Name:	Jason Arthur Taylor
Filer:	Leslie R.J. Virany
Attorney Docket Number:	TAL-2013-002

Filed as Small Entity

Filing Fees for U.S. National Stage under 35 USC 371

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 1 month with $0 paid	2251	1	100	100
Miscellaneous:				
			Total in USD ($)	**100**

Electronic Acknowledgement Receipt

EFS ID:	28902288
Application Number:	14773837
International Application Number:	
Confirmation Number:	2498
Title of Invention:	PREFERENTIALLY DIRECTING ELECTROMAGNETIC ENERGY TOWARDS COLDER REGIONS OF OBJECT BEING HEATED BY MICROWAVE OVEN
First Named Inventor/Applicant Name:	Jason Arthur Taylor
Customer Number:	11826
Filer:	Leslie R.J. Virany
Filer Authorized By:	
Attorney Docket Number:	TAL-2013-002
Receipt Date:	14-APR-2017
Filing Date:	09-SEP-2015
Time Stamp:	23:56:45
Application Type:	U.S. National Stage under 35 USC 371

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Authorized User	
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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	IDS.pdf	799238 8ea811ccf94377d269fc03ac7e6faee71d0002cd	no	4
Warnings:					
Information:					
2	Affidavit-traversing rejectns or objectns rule 132	Declaration.pdf	62493 16662f3ef465df1f73f5473a63b271b0e0bf0362	no	7
Warnings:					
Information:					
3	Amendment/Req. Reconsideration-After Non-Final Reject	response4.pdf	111587 39b55e763ff06e3563175c900fb782632dfd4e85	no	13
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30803 acb64becc9138e0ff1e1e19ee0fbb6a5f9ca6c6e	no	2
Warnings:					
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		Total Files Size (in bytes):	1004121		

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14773837
Filing Date	2015-09-09
First Named Inventor	Jason Arthur Taylor
Art Unit	3742
Examiner Name	Maye, Ayub A
Attorney Docket Number	TAL-2013-002

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7514658	B2	2009-04-07	Ji Woong Kim	Entire reference.
	2	4553011	A	1985-11-12	Takeshi Nakata et al.	Entire reference.

If you wish to add additional U.S. Patent citation information please click the Add button. Add

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	1	20070007283	A1	2007-01-11	Jeon Kang; Sang Jeong	Entire reference.

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		

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Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14773837
Filing Date	2015-09-09
First Named Inventor	Jason Arthur Taylor
Art Unit	3742
Examiner Name	Maye, Ayub A
Attorney Docket Number	TAL-2013-002

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature		Date (YYYY-MM-DD)	
Name/Print		Registration Number	

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:		
Jason Arthur Taylor *et al.*	)	Confirmation No.: 2498
	)	Art Unit: 3742
Application No.: 14/773,837	)	Examiner: Maye, Ayub A
Filed: August 9, 2015	)	
For: Preferentially Directing Electromagnetic Energy Towards Colder Regions of Object Being Heated by Microwave Oven	)	

DECLARATION UNDER 37 CFR §1.132 OF DR. MARIAM AKHALKATSI

I, Mariam Akhalkatsi, declare as follows:

1. I live in Tbilisi, Georgia.
2. My education:

    a) Ph.D. in Astrophysics (Summa Cum Laude), Ilia State University, Tbilisi, Georgia, 2011.

    b) M.S. in Physics/Theoretical Physics (With Highest Honor), Ivane Javakhishvili Tbilisi State University, Tbilisi, Georgia, 1994.
3. My employment history:

    a) Teaching Assistant: Quantum Physics and Electrodynamics; Tbilisi State University, Tbilisi, Georgia, 1994-1996.

    b) Lecturer: Introductory course of physics: Cosmology; Ilia State University, Tbilisi, Georgia, 2010.

    c) Research Scientist; Institute of Theoretical Physics, Ilia State University, Tbilisi, Georgia, 2010-2012.

    d) Evaluation Committee Member; Shota Rustaveli National Science Foundation, Tbilisi, Georgia, 2016-Present.
4. My publications:

    a) Infrasound generation by turbulent convection, In Sound Waves: Propagation,

Frequencies and Effects, 2011, New York: Nova Science Publishers, 109-149.

b) Spectrum of infrasound radiation from supercell storms, 2011, Quarterly Journal of the Royal Meteorological Society 137(654): 229–235.

c) Infrasound generation by tornadic supercell storms, 2009, Quarterly Journal of the Royal Meteorological Society 135(641): 935–940.

d) Generation of electromagnetic waves in the electron-positron plasma in the vicinity of a pulsar, 2000. Astrophysics 43: 282–288.

5. I have been consulted to review documents relating to the rejection of Claims 1 and 22 of United States Patent Application 14/773,837 entitled, "Preferentially Directing Electromagnetic Energy Towards Colder Regions of Object Being Heated by Microwave Oven." I have been supplied with the original specification, claims, and drawings of this application.

6. I am being financially compensated for this review and my analysis. However, the amount of my compensation was fixed before I was made aware of this task, and it is independent of what I conclude.

7. I have been using microwave ovens for many years. I appreciate the benefits they offer. My knowledge of their operation grew as my knowledge of physics advanced. The main goal of microwave ovens is to convert household electrical current into high-frequency electromagnetic radiation which is capable of heating food.

8. A key component allowing this in most microwave ovens is the magnetron. It is a device in which accelerating electrons resonate in a strong magnetic field to emit high frequency electromagnetic radiation. As a theoretical physicist with an excellent knowledge of electromagnetism, wave theory, and related disciplines, I understand the basics of how microwave ovens operate. Also, one or more of the courses I have either taught or been involved with on the teaching side happened to have been related to current flow and/or electromagnetic radiation.

9. A frustrating thing about microwave ovens is non-uniform heating. When reheating food, I may have to mix it up two or three times to get evenly heated food. Therefore, I consider myself knowledgeable not only about microwave ovens but also some of the problems involved with using them as well.

10. Regarding U.S. intellectual property law, I am not a patent attorney nor an expert on this topic. However, I have been informed and understand that claim terminology must be given the

broadest reasonable interpretation during examination. I have been informed and understand that this means the claims should be interpreted as broadly as their terms reasonably allow by one skilled in the art, but that such interpretation should not be inconsistent with the patent application's specification.

11. I have been informed and understand that documents and materials that qualify as prior art can render a patent claim unpatentable as "anticipated." I have been informed and understand that all prior art references are to be looked at from the viewpoint of a person of ordinary skill in the art at the time of the invention.

12. I have been informed and understand that a claim is unpatentable as "anticipated" under 35 U.S.C. §102 if it is determined that all the limitations of the claim are described in a single prior art reference. I have been informed and understand that, to anticipate a claim, a prior art reference must disclose, either expressly or inherently, each and every limitation of that claim and enable one of ordinary skill in the art to make and use the invention.

13. Turning to my task at hand, I was also asked to read and analyse pages 3, 4, and 5 of the Office Action dated December 14, 2016 (hereafter, "Office Action") as they pertain to the rejection of these two independent claims deemed anticipated by Bu *et al.* (U.S. Patent 5,693,247) as described in the Abstract, Figs. 1-5, col. 1, lines 40-68; and col. 2, lines 1-4 & 25-68 of the Bu reference.

14. As a demonstration that I indeed reviewed and likely understood the Bu reference and that what I will conclude about it is not written in ignorance, let me point out an apparent error I discovered in Bu. According to Bu (col. 3, lines 35-38 and col. 4, lines 50-52),

$$(T_1\ T_2)X_1^2+2T_1\cdot X_2\cdot X_1+X_2^2\cdot T_1=0.$$

I think that this equation is incomplete and/or incorrect. I think a corrected equation should be

$$(T_1 - T_2)X_1^2 + 2T_1\cdot X_2\cdot X_1 + X_2^2\cdot T_1 = 0.$$

(It is apparently missing a minus sign between the T_1 and T_2 variables.)

15. It is perhaps relevant that these equations of Bu actually assume the food is a point source. The proportionality symbol, $\propto$, does not imply approximation. Therefore, these equations are not generally correct if a more complex surface temperature distribution is assumed in which there are both hotter and colder food regions.

16. Page 4 of the Office Action states:

> For claim 1, Bu discloses that a microwave oven (abstract) (fig.1-5), comprising: a position sensitive heating apparatus for preferentially directing electromagnetic energy towards colder regions of an object (col.1, lines 40-68 and col.2, lines 40-60) (examiner notes Bu teaches of using sensors for detecting the temperature of the food and controlling the temperatures of food).

17. I think this sentence contains several errors, and it is unreasonable to me. To start, the statement implies that Bu's inputs (sensors for detecting the temperature) are actually outputs (heating apparatus). This is an error because these devices would be opposite (even if they were both in Bu). The latter radiate heat outward and the former are used to detect the food temperature.

18. In contrast to what this Office Action statement says about Claim 1, the Bu reference (Abstract, Fig. 1-5, col. 1, lines 40-68 and col. 2, lines 40-60) does not contain any information about "a position sensitive heating apparatus..." I have no solid explanation of how the patent examiner could have stated otherwise.

19. The Office Action's above sentence is also wrong because the Bu reference (Abstract, Fig. 1-5, col. 1, lines 40-68 and col. 2, lines 40-60) does *not* contain any information about "...preferentially directing the electromagnetic energy..."

20. According to Merriam Webster's online dictionary, the word "directing" likely means the gerund of the verb, "to regulate the activities or course of." Therefore, the phrase "preferentially *directing*…toward" implies some sort of active and external directing mechanism, like, perhaps, to give an example, a motorized valve opening to control the flow of water or something.

21. The Bu reference (col. 1, lines 40-68 and col. 2, lines 40-60) teaches about controlling the heating of the food (a whole object) by turning off the magnetron once cooking is perhaps complete in accordance with the overall cooking status according to the Bu features. As I explained above regarding Bu's equations, the food in the Bu reference is not considered as an object with potentially colder and warmer regions. Therefore, Bu does *not* disclose any active methods of *preferentially directing* heat to any colder food regions. If anything, it implies the opposite. There is no directive/active capability within the Bu reference. This is incompatible with the notion that Bu is distinguishing between colder and hotter food regions as the patent examiner seemed to imply.

22. I have explained why the sentence in the Office Action has what appear to be mistakes and is not reasonable. However, it is also my opinion that the above mistakes are not ones a competent engineer would normally make. Therefore, not only do I think the quoted sentence of the Office Action statement for Claim 1 is wrong, but I am forced to question the patent examiner's motivations in writing it, since it is strange to me that this was written.

23. Claim 1 of Patent Application 14/773,837 reads:

> 1. A microwave oven, comprising: a position sensitive heating apparatus for preferentially directing electromagnetic energy towards colder regions of an object.

24. Unlike Bu, Patent Application 14/773,837 *does* teach the use of a position sensitive heating apparatus for preferentially directing electromagnetic energy towards colder regions of an object (¶¶6, 15, 19-20, 22, 25, 27-29, 32, 34; Figs. 1-2). The temperature detecting unit *does* measure the temperature at various points or regions of the object and the target identification component identifies colder regions of the object based upon the temperature measurements. The controller uses the temperature profile to determine which regions electromagnetic energy is preferentially directed toward.

25. Unlike Bu, Patent Application 14/773,837 therefore provides various systems and/or techniques for preferentially directing electromagnetic energy towards colder regions of an object (¶¶12, 24,-25, 27, 30-35; Figs. 2-3). For example, (¶30), in some embodiments, where the object is configured to rotate, a controller may cause the phased array magnetron to move the beam path to coincide spatially with the colder regions for a portion of the rotation (*e.g.*, causing the beam path to rotate substantially synchronously with the colder regions). In other embodiments, the magnetron heating is higher when the colder sides are facing the magnetron. To my knowledge, the Bu reference does not have comparable capabilities.

26. For these reasons, even if I were to ignore the Office Action's errors, I still would not think that the Bu reference contains the required features of Claim 1 of 14/773,837. This is true even using the broadest interpretation that is still reasonable to one skilled in the art.

27. The other claim rejection I am to review was Claim 22 of 14/773,837. Page 5 of the Office Action states:

> For claim 22, Bu discloses that method preferentially directing electromagnetic energy towards colder regions of an object (abstract) (fig.1-5), comprising:

> identifying the colder regions of the object undergoing a heat treatment in a microwave oven (col.1, lines 40-68) (detecting the temperature of the food); and preferentially directing the electromagnetic energy towards the colder regions (col.2, lines 1-4 and lines 25-68).

28. Many of the same errors already discussed regarding the rejection of Claim 1 of 14/773,837 are again repeated in this sentence. In contrast to what this Office Action statement says about Claim 22 of 14/773,837, Bu references (Abstract, Fig. 1-5, col. 1, lines 40-68, col. 2, lines 1-4 and lines 25-68) does *not* contain a "method preferentially directing electromagnetic energy towards colder regions of an object...", "identifying the colder regions of the object...", or "...preferentially directing electromagnetic energy towards colder regions."

29. Bu does *not* make any attempt to identify colder vs. hotter regions of food, nor to heat the colder regions preferentially. Bu does *not* teach any method of preferentially directing energy to colder regions of the food. Bu discloses only the method controlling the heating of the food in accordance with the recognized cooking status (Bu Abstract; Bu Figs. 1-5), comprising at least two sensors for detecting heat rays emitted from the food which is being heated, a signal processor for obtaining a precise surface temperature of food irrespective of the deviation of distances between the sensors and food, using output signals from the sensors, and a controller for receiving the output signal of the signal processor to recognize the cooking status of the food.

30. For the above reasons, I think this sentence in the Office Action regarding Claim 22 of 14/773,837 is both incorrect and inconsiderate of the facts.

31. Claim 22 of 14/773,837 reads:

> 22. A method preferentially directing electromagnetic energy towards colder regions of an object, comprising: identifying the colder regions of the object undergoing a heat treatment in a microwave oven; and preferentially directing the electromagnetic energy towards the colder regions.

Unlike Bu, Patent Application 14/773,837 teaches identifying the colder regions of the object undergoing a heat treatment in a microwave oven (¶¶16, 21, 31, 35). It *does* teach a temperature detecting unit measuring the temperature at various points or regions of the object and a target identification component identifies colder regions of the object based upon the temperature

measurements. The controller does use the temperature profile to determine which regions electromagnetic energy is preferentially directed toward.

32. The Patent Application 14/773,837 therefore does provide various systems and/or techniques for preferentially directing electromagnetic energy towards colder regions of an object (¶¶12, 24-25, 27, 30-35; Figs.2-3). For example, (¶30), in some embodiments, where the object is configured to rotate, a controller may cause the phased array magnetron to move the beam path to coincide spatially with the colder regions for a portion of the rotation (*e.g.*, causing the beam path to rotate substantially synchronously with the colder regions).

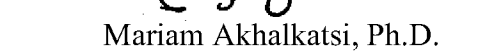
33. For the above reasons, even if one were not aware of the above errors in the Office Action, I would still think that it would be inconceivable that Bu could possess, directly or by inherent functionality, the required elements of Claim 22 of Patent Application 14/773,837.

34. Because, as previously explained, I am aware of the importance of non-even food heating problem associated with using microwave ovens, I think if Bu had any improvements about this problem that Bu would have featured them prominently instead of what was actually featured, which has to do with correcting a distance dependence, a potentially less important issue.

35. In conclusion, I think that the rejection of Claims 1 and 22 of 14/773,837 under pre-AIA 35 U.S.C. 102 (b) as being anticipated by Bu for the reasons supplied is both wrong and somewhat troubling.

36. I currently hold the opinions expressed in this declaration. My analysis may continue, however, and I may acquire additional information and/or attain supplemental insights that may result in added observations. Therefore, I reserve the right to amend or supplement this Declaration in the event that new information becomes available to me.

37. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Signature:  Date: April 15th, 2017

Mariam Akhalkatsi, Ph.D.