



NOTICE OF ALLOWANCE AND FEE(S) DUE

74739 7590 11/03/2014
MILES & STOCKBRIDGE P.C.
Oracle International Corporation
1751 Pinnacle Drive
Suite 1500
Tysons Corner, VA 22102-3833

Table with 2 columns: EXAMINER (DANNEMAN, PAUL), ART UNIT (3627), PAPER NUMBER

DATE MAILED: 11/03/2014

Table with 5 columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO., CONFIRMATION NO.

13/673,347 11/09/2012 Kresimir MIHIC T9049-19435US01 8522
TITLE OF INVENTION: SHELF SPACE PRODUCT PLACEMENT OPTIMIZER

Table with 7 columns: APPLN. TYPE, ENTITY STATUS, ISSUE FEE DUE, PUBLICATION FEE DUE, PREV. PAID ISSUE FEE, TOTAL FEE(S) DUE, DATE DUE

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.
If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.
If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".
For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
 Commissioner for Patents
 P.O. Box 1450
 Alexandria, Virginia 22313-1450
 or Fax (571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

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 Suite 1500
 Tysons Corner, VA 22102-3833

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/673,347	11/09/2012	Kresimir MIHIC	T9049-19435US01	8522

TITLE OF INVENTION: SHELF SPACE PRODUCT PLACEMENT OPTIMIZER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$960	\$0	\$0	\$960	02/03/2015

EXAMINER	ART UNIT	CLASS-SUBCLASS
DANNEMAN, PAUL	3627	705-028000

<p>1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).</p> <p><input type="checkbox"/> Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.</p> <p><input type="checkbox"/> "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.</p>	<p>2. For printing on the patent front page, list</p> <p>(1) The names of up to 3 registered patent attorneys or agents OR, alternatively, _____ 1</p> <p>(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. _____ 2</p> <p>_____ 3</p>
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3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE _____ (B) RESIDENCE: (CITY and STATE OR COUNTRY) _____

Please check the appropriate assignee category or categories (will not be printed on the patent) : Individual Corporation or other private group entity Government

<p>4a. The following fee(s) are submitted:</p> <p><input type="checkbox"/> Issue Fee</p> <p><input type="checkbox"/> Publication Fee (No small entity discount permitted)</p> <p><input type="checkbox"/> Advance Order - # of Copies _____</p>	<p>4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)</p> <p><input type="checkbox"/> A check is enclosed.</p> <p><input type="checkbox"/> Payment by credit card. Form PTO-2038 is attached.</p> <p><input type="checkbox"/> The Director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).</p>
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5. **Change in Entity Status** (from status indicated above)

Applicant certifying micro entity status. See 37 CFR 1.29

Applicant asserting small entity status. See 37 CFR 1.27

Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

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3627

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Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)

(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. 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 12 minutes 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, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
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.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 13/673,347	Applicant(s) MIHIC ET AL.	
	Examiner PAUL DANNEMAN	Art Unit 3627	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. This communication is responsive to 16 October 2014.
 A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.
2. An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. The allowed claim(s) is/are 1-20. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

- a) All b) Some *c) None of the:
1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date 07/16/2014.
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Examiner's Amendment/Comment |
| 2. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ | 6. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| 3. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 7. <input type="checkbox"/> Other _____. |
| 4. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. | |

/PAUL DANNEMAN/
Primary Examiner, Art Unit 3627

DETAILED ACTION

Response to Amendment

1. This Office Action is in response to the Amendment filed on 16 October 2014.
2. Claims 1, 7-8, 14-15 and 20 have been amended.
3. No claims have been cancelled.
4. The present application is being examined under the pre-AIA first to invent provisions.
5. The rejection of Claims 1-20 under 35 U.S.C. § 101 as being directed to an abstract idea is respectfully withdrawn as Applicant's argument is convincing.

Drawings

New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because **Fig.2A, Figs.4-10** are shaded in a manner that when reproduced (copied) the figures are not legible. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

EXAMINER'S STATEMENT OF REASONS FOR ALLOWANCE

6. **Best U.S. References: Delurgio et al., US Patent 7,092,896 ("Delurgio") in combination with NPL_GAMS and Capek et al., US Patent Publication 2003/0204474 A1 ("Capek")** teaches a method for creating a merchandise promotion optimization plan based on a user specified optimization scenario, a modeled market for the products and the calculated demand product costs.

7. **The following is an Examiner's Statement of Reasons for Allowance:** No prior art cited here or in any previous Office Action fully anticipates nor renders the claims obvious either alone or in combination. Independent Claims 1, 8 and 15 teach a system and method for optimizing the shelf space placement for an item in a store wherein a set of input decision variables and constraints are received and a Randomized Search (RS) is performed until an RS solution (RS solution decision variables) is

Art Unit: 3627

below a predetermined improvement threshold. The RS solution is used as a starting point for generating a Mixed Integer Linear Program (MILP) solution (MILP decision variables). When the MILP solution is not within a predetermined accuracy or does not exceed a predetermined time period a second RS is performed based on the MILP solution to generate a second RS solution that is below the predetermined improvement threshold. A second MILP solution is determined from the second RS solution until the MILP solution is within the predetermined accuracy or does not exceed the predetermined time duration and based on the MILP solution a shelf position is output with a number of item facings. Furthermore, the Examiner is in agreement with Applicant's argument that ***"the result of claim 1 is to output "a shelf position and a number of facings for the product" which can be considered a tangible non-abstract outcome.***

Further, even if the claims are considered an abstract idea, in accordance with "Part 2" of the June 25, 2014 Memorandum, if "significantly more" is recited in the claim with the abstract idea, the abstract idea is eligible manner. For at least two reasons, the claims of the present application recite significantly more. For one, as previous discussed, the output of "a shelf position and a number of facings for the product" in order to "optimize shelf space placement" is significantly more than the mere execution of mathematical algorithms. Further, the recited limitations, in which the RS solution is used as an input to a MILP problem, and the MILP solution is used as an input to an RS, provides "improvements to the functioning of the computer itself." For example, the present specification discloses that: "At 306, the solution of the RS algorithm is used as starting point of a MILP solver to speed up its performance. In other words, the RS algorithm solution is converted to a MILP solution." See specification at paragraph [0074] (emphasis added). The Claims are Allowable because the Prior Art Fails to Disclose Outputting a Shelf Position and a Number of Facings for a Product as a Result of Alternating an RS and an MILP, and Using Solutions of Each as Decision Variables of the Other." Therefore, the combinations of limitations, clearly presented in the claims of this application are novel, unobvious and allowable.

Conclusion

Art Unit: 3627

8. Any comments considered necessary by Applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled **“Comments on Statement of Reasons for Allowance.”**

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAUL DANNEMAN whose telephone number is (571)270-1863. The examiner can normally be reached on Mon.-Thurs. 6AM-5PM Fri. off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Florian Zeender can be reached on 571-272-6790. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PAUL DANNEMAN/
Primary Examiner, Art Unit 3627



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/673,347	11/09/2012	Kresimir MIHIC	T9049-19435US01	8522
74739	7590	10/16/2014	EXAMINER	
MILES & STOCKBRIDGE P.C. Oracle International Corporation 1751 Pinnacle Drive Suite 1500 Tysons Corner, VA 22102-3833			DANNEMAN, PAUL	
			ART UNIT	PAPER NUMBER
			3627	
			NOTIFICATION DATE	DELIVERY MODE
			10/16/2014	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

Ipdocketing@MilesStockbridge.com
bgoldsmith@milesstockbridge.com
smevean@milesstockbridge.com

Applicant-Initiated Interview Summary	Application No. 13/673,347	Applicant(s) MIHIC ET AL.	
	Examiner PAUL DANNEMAN	Art Unit 3627	

All participants (applicant, applicant's representative, PTO personnel):

- (1) PAUL DANNEMAN. (3) _____.
- (2) BARRY GOLDSMITH, Reg. No. 39,690. (4) _____.

Date of Interview: 14 October 2014.

Type: Telephonic Video Conference
 Personal [copy given to: applicant applicant's representative]

Exhibit shown or demonstration conducted: Yes No.
If Yes, brief description: _____.

Issues Discussed 101 112 102 103 Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: 1.

Identification of prior art discussed: _____.

Substance of Interview

(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

We discussed arguments that explained how the RS algorithm and Mixed-Integer Linear Program (MILP) are combined and used to optimize the placement of products on a merchant's shelf based on achieving a key performance indicator (KPI). Regarding the Alice § 101 rejection the Examiner recommended that a positive recitation of determining and outputting a product's shelf position using a processor might be sufficient to overcome the rejection.

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

Attachment

/PAUL DANNEMAN/
Primary Examiner, Art Unit 3627

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record

A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews

Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.

All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,
- 2) an identification of the claims discussed,
- 3) an identification of the specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner,
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

IN THE U.S. PATENT AND TRADEMARK OFFICE

Application No.: 13/673,347	Confirmation No.: 8522
Application of: Kresimir MIHIC et al.	Group Art Unit: 3627
Filing Date: November 9, 2012	Examiner: Paul DANNEMAN
Title: SHELF SPACE PRODUCT PLACEMENT OPTIMIZER	Docket No.: T9049-19435US01 Customer No.: 74739

AMENDMENT

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

Commissioner:

In response to the Office Action dated July 16, 2014, please amend the above-identified application as follows.

Amendments to the Claims are reflected in the listing of the claims which begin on page 2 of this paper.

Remarks/Arguments begin on page 8 of this paper.

Amendments to the Claims:

The listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) A computer-readable medium having instructions stored thereon that, when executed by a processor, cause the processor to optimize shelf space placement for a product, the optimization comprising:

receiving input decision variables and constraints;

executing a Randomized Search (RS) using the input decision variables and constraints until an RS solution is below a pre-determined improvement threshold, wherein the RS solution comprises first RS solution decision variables;

solving a Mixed-Integer Linear Program (MILP) problem using the first RS solution decision variables and constraints, wherein the RS solution is a starting point of the solving to generate a MILP solution by transforming the first RS solution decision variables into MILP decision variables;

when the MILP solution is not within a predetermined accuracy or does not exceed a predetermined time duration, alternatingrepeating the executing a second RS based on the previous MILP solution until a second RS solution comprising second RS solution decision variables is below the pre-determined improvement threshold and executing and the solving the MILP problem by transforming the second RS solution decision variables into MILP decision variables, until the MILP solution is within the predetermined accuracy or does exceed the predetermined time duration~~when the MILP solution is not within a predetermined accuracy or does not exceed a predetermined time duration;~~ and

based on the MILP solution, outputting a shelf position and a number of facings for the product.

2. (Original) The computer-readable medium of claim 1, further comprising receiving for a store a set of products in a selected store area, wherein the output shelf position and the number of facings optimizes a key performance indicator for the store.

3. (Original) The computer-readable medium of claim 2, wherein the key performance indicator comprises at least one of revenue, profit or sales.

4. (Original) The computer-readable medium of claim 1, wherein the product comprises a vertical blocking attribute.

5. (Original) The computer-readable medium of claim 1, wherein the product comprises a horizontal boundary attribute.

6. (Original) The computer-readable medium of claim 1, wherein the constraints comprise at least one of: usable shelf capacity, attribute-based blocking, assortment-based group constraints, placement constraints or shelf uniqueness.

7. (Currently Amended) The computer-readable medium of claim 1, ~~wherein the solving MILP problem using the decision variables and the constraints comprises transforming the RS solution into variables of the MILP problem~~ further comprising optimizing the shelf space placement for a plurality of products, wherein further outputting based on the MILP solution, for each of the plurality of products, whether to keep the product among a product assortment.

8. (Currently Amended) A computer-implemented method for optimize shelf space placement for an item in a store, the method comprising:
receiving input decision variables and constraints;
executing a Randomized Search (RS) using the input decision variables and the

constraints until an RS solution is below a predetermined improvement threshold,
wherein the RS solution comprises first RS solution decision variables;

solving a Mixed-Integer Linear Program (MILP) problem using the first RS solution decision variables and the constraints, wherein the RS solution is a starting point of the solving to generate a MILP solution by transforming the first RS solution decision variables into MILP decision variables;

when the MILP solution is not within a predetermined accuracy or does not exceed a predetermined time duration, alternating executing a second RS based on the previous MILP solution until a second RS solution comprising second RS solution decision variables is below the pre-determined improvement threshold and solving the MILP problem by transforming the second RS solution decision variables into MILP decision variables, until the MILP solution is within the predetermined accuracy or does not exceed the predetermined time duration~~repeating the executing and the solving when the MILP solution is not within a predetermined accuracy or does not exceed a predetermined time duration;~~ and

based on the MILP solution, outputting a shelf position and a number of facings for the item.

9. (Original) The computer-implemented method of claim 8, further comprising receiving for the store a set of items in a selected store area, wherein the output shelf position and the number of facings optimizes a key performance indicator for the store.

10. (Original) The computer-implemented method of claim 9, wherein the key performance indicator comprises at least one of revenue, profit or sales.

11. (Original) The computer-implemented method of claim 8, wherein the item comprises a vertical blocking attribute.

12. (Original) The computer-implemented method of claim 8, wherein the item comprises a horizontal boundary attribute.

13. (Original) The computer-implemented method of claim 8, wherein the constraints comprise at least one of: usable shelf capacity, attribute-based blocking, assortment-based group constraints, placement constraints or shelf uniqueness.

14. (Currently Amended) The computer-implemented method of claim 8, further comprising optimizing the shelf space placement for a plurality of items, wherein further outputting based on the MILP solution, for each of the plurality of items, whether to keep the item among an item assortment~~wherein the solving MILP problem using the decision variables and the constraints comprises transforming the RS solution into variables of the MILP problem.~~

15. (Currently Amended) A shelf space product optimizer system that optimizes shelf space placement for a product in a store, the system comprising:

a processor;

a storage device coupled to the processor storing instructions that when executed by the processor implements system modules comprising:

a randomized searcher that receives input decision variables and constraints and executes Randomized Search (RS) using the input decision variables and constraints until an RS solution is below a predetermined improvement threshold, wherein the RS solution comprises first RS solution decision variables;

a Mixed-Integer Linear Program (MILP) solver that receives the RS solution when it is below the predetermined improvement threshold and solves a formulated MILP problem using the first RS solution decision variables and constraints, wherein the RS solution is a starting point of the solving to generate a MILP solution by transforming the first RS solution decision variables into MILP decision variables; and

a solution module that when the MILP solution is not within a predetermined accuracy or does not exceed a predetermined time duration, alternates executing a second RS based on the previous MILP solution until a second RS solution comprising second RS solution decision variables is below the pre-determined improvement threshold and solves the MILP problem by transforming the second RS solution decision variables into MILP decision variables, until the MILP solution is within the predetermined accuracy or does exceed the predetermined time duration~~alternates between executing the RS and solving the MILP solution until the MILP solution is within a predetermined accuracy or does not exceed a predetermined time duration, and based on a final MILP solution, outputs a shelf position and a number of facings for the product.~~

16. (Original) The system of claim 15, the randomized searcher further receiving for the store a set of products in a selected store area, wherein the output shelf position and the number of facings optimizes a key performance indicator for the store, and the key performance indicator comprises at least one of revenue, profit or sales.

17. (Original) The system of claim 15, wherein the product comprises a vertical blocking attribute.

18. (Original) The system of claim 15, wherein the product comprises a horizontal boundary attribute.

19. (Original) The system of claim 15, wherein the constraints comprise at least one of: usable shelf capacity, attribute-based blocking, assortment-based group constraints, placement constraints or shelf uniqueness.

20. (Currently Amended) The system of claim 15, wherein the MILP solver

further comprises optimizing the shelf space placement for a plurality of products,
wherein further outputting based on the MILP solution, for each of the plurality of
products, whether to keep the product among a product assortment~~solves the~~
~~formulated MILP problem by transforming the RS solution into variables of the MILP~~
problem.

REMARKS

Introduction

Claims 1, 7, 8, 14, 15 and 20 have been amended. The application continues to include claims 1-20. Reconsideration of the rejection of the application is respectfully requested in view of the claim amendments and the following remarks.

Applicants thank the Examiner for taking the time to conduct a telephone interview with the Applicants' representative on October 14, 2014. The substance of the interview is reflected in this Amendment.

The Claims are Directed to Statutory Subject Matter

Claims 1-20 are rejected under 35 U.S.C. §101 because the claims are "are determined to be directed to the abstract idea of a mathematical relationship or formula" consistent with the "Alice Corp." decision. Further, claims 15-20 are rejected under 35 U.S.C. §101 because the limitations recite a system per se. In response, claim 15 has been amended to recite physical structural elements.

In accordance to the "*June 25, 2014 Memorandum to the Examining Corps: Preliminary Examination Instructions in view of the Supreme Court Decision in Alice Corporation Pty. Ltd. v. CLS Bank International, et al.*", "Part 1" is to determine if the claim is directed to an abstract idea. Applicants disagree that, for example, claim 1 is directed to an abstract idea. Although claim 1 does recite mathematical relationships, the Office Action ignores the other meaningful limitations. For example, the result of

claim 1 is to output “a shelf position and a number of facings for the product” which can be considered a tangible non-abstract outcome.

Further, even if the claims are considered an abstract idea, in accordance with “Part 2” of the June 25, 2014 Memorandum, if “significantly more” is recited in the claim with the abstract idea, the abstract idea is eligible manner. For at least two reasons, the claims of the present application recite significantly more. For one, as previous discussed, the output of “a shelf position and a number of facings for the product” in order to “optimize shelf space placement” is significantly more than the mere execution of mathematical algorithms. Further, the recited limitations, in which the RS solution is used as an input to a MILP problem, and the MILP solution is used as an input to an RS, provides “improvements to the functioning of the computer itself.” For example, the present specification discloses that: “At 306, the solution of the RS algorithm is used as starting point of a MILP solver to **speed up its performance**. In other words, the RS algorithm solution is converted to a MILP solution.” See specification at ¶ [0074] (emphasis added).

Based at least on the foregoing, Applicants respectfully requests that the 35 U.S.C. §101 rejection be withdrawn.

The Claims are Allowable because the Prior Art Fails to Disclose Outputting a Shelf Position and a Number of Facings for a Product as a Result of Alternating an RS and an MILP, and Using Solutions of Each as Decision Variables of the Other

Claims 1-20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Delurgio et al., U.S. Pat. No. 7,092,896 (“Delurgio”), in view of NPL_GAMS and in view of Capek et al., U.S. Pat. Pub. No. 2003/0204474 (“Capek”). Reconsideration of these rejections is respectfully requested because the prior art fails to disclose outputting a shelf position and a number of facings for a product as a result of alternating an RS and an MILP, and using solutions of each as decision variables of the other.

One embodiment is a system 10 that optimizes shelf space placement for a product. See specification at ¶ [0019]; Fig. 1. The system receives input decision variables and constraints and executes a Randomized Search (“RS”) using the input decision variables and constraints until an RS solution is below a pre-determined improvement threshold, where the RS solution includes first RS solution decision variables. See *id.* at ¶ [0033], ¶ [0034]. The system solves a Mixed-Integer Linear Program (“MILP”) problem using the first RS solution decision variables and constraints, where the RS solution is a starting point of the solving to generate a MILP solution by transforming the first RS solution decision variables into MILP decision variables. See *id.* at ¶ [0035]. When the MILP solution is not within a predetermined accuracy or does not exceed a predetermined time duration, the system alternates executing a second RS based on the previous MILP solution until a second RS solution including second RS solution decision variables is below the pre-determined improvement threshold and

solves the MILP problem by transforming the second RS solution decision variables into MILP decision variables, until the MILP solution is within the predetermined accuracy or does exceed the predetermined time duration. See *id.* at ¶ [0036], ¶ [0037]. The system then, based on the MILP solution, outputs a shelf position and a number of facings for the product. See *id.* at ¶ [0038].

Delurgio discloses “providing a apparatus and methods that enable product managers to optimize promotion events for products within a product group.” *Delurgio* at col. 5, ll. 41-43. An “optimization engine 300 also includes a price optimization tool 304, a promotion optimization tool 306, a space optimization tool 308, a logistics optimization tool 310, and an assortment optimization tool 312.” *Delurgio* at col. 8, ll. 52-55. “The space tool 308 is employed to determine an optimum placement strategy within stores for products of a product category comprising a plurality of demand groups.” *Delurgio* at col. 9, ll. 8-11.

The Office Action admits that Delurgio fails to disclose using a MILP to determine an optimum placement strategy. See July 16, 2014 Office Action, p. 4. NPL_GAMS is then cited for the disclosure of a MILP solver. *Id.* Further, because Delurgio and NPL_GAMS fail to disclose RS, Capek is cited for a disclosure of RS. *Id.*

However, even if it was acceptable to pick and choose the separate features of the cited prior art, there is no disclosure of a motivation to combine these features, and there is no technical disclosure on how both a MILP and RS could be combined to optimize product placement. Further, the cited prior art fails to disclose using decision

variables of the solution of the RS for the MILP, and vice versa, as with embodiments of the present invention.

In contrast to the cited prior art, amended independent claim 1 recites “using the input decision variables and constraints until an RS solution is below a predetermined improvement threshold, wherein the RS solution comprises first RS solution decision variables” and “transforming the first RS solution decision variables into MILP decision variables.” For at least these reasons, amended independent claim 1, and amended independent claims 8 and 15, which recite similar limitations, should now be allowable over the cited prior art. The remaining claims depend from one of the above independent claims and should also be allowable for at least the above reasons.

Conclusion

Applicants respectfully request favorable action in connection with this application.

The Examiner is invited and urged to contact the undersigned to discuss any matter concerning this application.

No fee should be required for this submission. However, should any fee be required, the Commissioner is authorized to charge any such fee to Counsel's Deposit Account 50-1165.

Respectfully submitted,

Date: October 16, 2014

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/673,347	11/09/2012	Kresimir MIHIC	T9049-19435US01	8522
74739	7590	07/16/2014	EXAMINER	
MILES & STOCKBRIDGE P.C. Oracle International Corporation 1751 Pinnacle Drive Suite 1500 Tysons Corner, VA 22102-3833			DANNEMAN, PAUL	
			ART UNIT	PAPER NUMBER
			3627	
			NOTIFICATION DATE	DELIVERY MODE
			07/16/2014	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

Ipdocketing@MilesStockbridge.com
bgoldsmith@milesstockbridge.com
smevean@milesstockbridge.com

DETAILED ACTION

Status of the Claims

1. This Office Action is in response to the Application filed on 09 November 2012.
2. Claims 1-20 are pending and have been examined in this Office Action.
3. The present application is being examined under the pre-AIA first to invent provisions.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-20 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter because the claims as a whole, considering all claim elements both individually and in combination, do not amount to significantly more than an abstract idea. **Claims 1-20** are determined to be directed to the abstract idea of a mathematical relationship or formula. The additional elements or combination of elements in the claims other than the abstract idea per se amount to no more than mere instructions to implement the idea on a computer and/or a recitation of generic computer structure that serves to perform generic computer functions that are well-understood, routine and conventional activities previously known to the pertinent industry. Viewed as a whole, these additional claim elements do not provide meaningful limitations to transform the abstract idea into a patent eligible application of the abstract idea such that the claims amount to significantly more than the abstract idea itself. Therefore, the claims are rejected under 35 U.S.C. 101 as being directed to non-statutory subject matter. The rationale for this determination is explained below: The claims are directed to the use of "the use of a linear programming which is a mathematical method for optimizing a solution to an equation given a set of constraints" using a generic computer system. See Supreme Court Decision Alice Corporation Pty. Ltd v. CLS Bank International, et al. ("Alice Corp").

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Claims 15-20 are rejected under 35 U.S.C. 101 because the limitations recite a system per se which may be equated to that of interconnected devices which is defined by its physical structural elements and corresponding functionality. No physical structural elements are recited; the claims are directed to non-statutory subject matter. The bodies of the claims comprise software modules, which are virtual modules not physical structures.

Claim Rejections - 35 USC § 103

The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under pre-AIA 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-20 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Delurgio et al., US Patent 7,092,896 B2 ("Delurgio") in view of NPL_GAMS and in view of Capek et al., US Patent Publication 2003/0204474 A1 ("Capek").

As per Claims 1-3 and 8-10 regarding "a method for optimizing shelf space placement for an item in a store using Mixed-Integer Linear Programming and outputting a shelf position and a number of

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facings for the item and performance indicators of revenue, profit or sales” Delurgio in at least the ABSTRACT discloses a method for optimizing a promotion plan for merchandising products utilizing a computer-based scenario/results processor within an optimization server based on the fixed and variable costs of the product. Delurgio in at least Fig.3 and Column 8, lines 46-63 discloses an optimization engine 300 which includes a space optimization tool 308. Delurgio in at least Column 8, lines 64-67 and Column 9, lines 1-25 discloses an optimization scenario configured by a user to direct the retrieval and/or upload of data from the client computer and using the space tool 308 to determine an optimum placement strategy within stores for product of a product category comprising a plurality of demand groups. Delurgio in at least Column 6, lines 21-35 discloses using a promotion strategy optimization where the objectives of the promotion may include maximizing volume, revenue, profit or some other merchandising figure of merit. Delurgio does not specifically disclose “using Mixed-Integer Linear Programming” however Delurgio in at least Column 9, lines 14-25 further discloses determining an optimum mix of products of a product category comprising a plurality of demand groups using the optimization engine 300 comprised of computer program modules coded for execution by an optimization analysis program such as GAMS and NPL_GAMS in the first three paragraphs on page 1 discloses the General Algebraic Modeling System (GAMS) as a high-level modeling system for mathematical optimization designed for modeling and solving linear, nonlinear and mixed integer optimization problems. Therefore, it would have been obvious, at the time of the invention, to one of ordinary skill to combine by known methods and to achieve predictable results the well-known elements of Delurgio’s optimization analysis with the equally well-known elements of NPL_GAMS with the motivation to use the latest optimization routines for Mixed Integer Linear Programming.

Regarding “executing a Randomized Search (RS) using the decision variables and the constrains until an RS solution is below a predetermined improvement threshold” Delurgio and NPL_GAMS do not specifically disclose Randomized Search (RS) however Capek in at least paragraph [22] discloses that optimization of two or more constraints may be performed using any one of a number of nontrivial mathematical techniques including inter programming, linear programming, deterministic optimization, priority-based search heuristics, **greedy algorithms**, **randomized algorithms**, local search methods,

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meta-heuristics, tabu search, evolutionary algorithms, genetic algorithms, simulated annealing, agent-based algorithms, portfolio optimization, simulation, stochastic optimization, forecasting analysis. Therefore, it would have been obvious, at the time of the invention, to one of ordinary skill, to combine by known methods and to achieve predictable results the well-known linear programming elements of the combination of Delurgio and NPL_GAMS with the equally well-known elements of Capek's optimization using greedy and randomized algorithms with the motivation to optimize a solution of two or more constraints.

As per Claims 4-5 and 11-12 which depend from Claims 1 and 8 respectively regarding "a vertical blocking attribute and a horizontal boundary attribute" Delurgio in at least Column 9, lines 14-25 further discloses determining an **optimum mix of products of a product category** comprising a plurality of demand groups using the optimization engine 300 comprised of computer program modules coded for execution by an optimization analysis program such as GAMS.

EXAMINER'S NOTE: Applicant's published specification in paragraph [25] discloses that a vertical blocking attribute is a product brand and a horizontal boundary attribute is related to product size.

As per Claims 6 and 13 which depend respectively from Claims 1 and 8 regarding "wherein the constraints comprise at least one of: usable shelf capacity, attribute-based blocking, assortment-based group constraints, placement constraints or shelf uniqueness" Delurgio in at least Fig. 1 and Column 6, lines 21-56 discloses that some of the constraints 103 used in the optimization analysis program include maximizing volume, revenue, profit or some other merchandising figure of merit.

As per Claims 7 and 14 which depend respectively from Claims 1 and 8 regarding "wherein the solving MILP problem using the decision variables and the constraints comprises transforming the RS solution into variable of the MILP problem" Delurgio and NPL_GAMS do not specifically disclose Randomized Search (RS) however Capek in at least paragraph [22] discloses that optimization of two or more constraints may be performed using any one of a number of nontrivial mathematical techniques including inter programming, linear programming, deterministic optimization, priority-based search

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heuristics, **greedy algorithms**, **randomized algorithms**, local search methods, meta-heuristics, tabu search, evolutionary algorithms, genetic algorithms, simulated annealing, agent-based algorithms, portfolio optimization, simulation, stochastic optimization, forecasting analysis. Therefore, it would have been obvious, at the time of the invention, to one of ordinary skill, to combine by known methods and to achieve predictable results the well-known linear programming elements of the combination of Delurgio and NPL_GAMS with the equally well-known elements of Capek's optimization using greedy and randomized algorithms with the motivation to optimize a solution of two or more constraints.

As per Claims 15-16 regarding "a system comprising a randomized searcher, a Mixed-Integer Linear Program solver and a solution module for optimizing shelf space placement for an item in a store using Mixed-Integer Linear Programming and outputting a shelf position and a number of facings for the item and performance indicators of revenue, profit or sales" Delurgio in at least Fig.2 and Column 6, lines 57-67 And Column 7, lines 1-15 discloses an apparatus performing optimization according to the present invention.

Delurgio in at least the ABSTRACT discloses a method for optimizing a promotion plan for merchandising products utilizing a computer-based scenario/results processor within an optimization server based on the fixed and variable costs of the product. Delurgio in at least Fig.3 and Column 8, lines 46-63 discloses an optimization engine 300 which includes a space optimization tool 308. Delurgio in at least Column 8, lines 64-67 and Column 9, lines 1-25 discloses an optimization scenario configured by a user to direct the retrieval and/or upload of data from the client computer and using the space tool 308 to determine an optimum placement strategy within stores for product of a product category comprising a plurality of demand groups. Delurgio in at least Column 6, lines 21-35 discloses using a promotion strategy optimization where the objectives of the promotion may include maximizing volume, revenue, profit or some other merchandising figure of merit. Delurgio does not specifically disclose "using Mixed-Integer Linear Programming" however Delurgio in at least Column 9, lines 14-25 further discloses determining an optimum mix of products of a product category comprising a plurality of demand groups using the optimization engine 300 comprised of computer program modules coded for execution by an

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optimization analysis program such as GAMS and NPL_GAMS in the first three paragraphs on page 1 discloses the General Algebraic Modeling System (GAMS) as a high-level modeling system for mathematical optimization designed for modeling and solving linear, nonlinear and mixed integer optimization problems. Therefore, it would have been obvious, at the time of the invention, to one of ordinary skill to combine by known methods and to achieve predictable results the well-known elements of Delurgio's optimization analysis with the equally well-known elements of NPL_GAMS with the motivation to use the latest optimization routines for Mixed Integer Linear Programming.

Regarding "executing a Randomized Search (RS) using the decision variables and the constrains until an RS solution is below a predetermined improvement threshold" Delurgio and NPL_GAMS do not specifically disclose Randomized Search (RS) however Capek in at least paragraph [22] discloses that optimization of two or more constraints may be performed using any one of a number of nontrivial mathematical techniques including inter programming, linear programming, deterministic optimization, priority-based search heuristics, **greedy algorithms, randomized algorithms**, local search methods, meta-heuristics, tabu search, evolutionary algorithms, genetic algorithms, simulated annealing, agent-based algorithms, portfolio optimization, simulation, stochastic optimization, forecasting analysis. Therefore, it would have been obvious, at the time of the invention, to one of ordinary skill, to combine by known methods and to achieve predictable results the well-known linear programming elements of the combination of Delurgio and NPL_GAMS with the equally well-known elements of Capek's optimization using greedy and randomized algorithms with the motivation to optimize a solution of two or more constraints.

As per Claims 17-18 which depend from Claims 15 regarding "a vertical blocking attribute and a horizontal boundary attribute" Delurgio in at least Column 9, lines 14-25 further discloses determining an **optimum mix of products of a product category** comprising a plurality of demand groups using the optimization engine 300 comprised of computer program modules coded for execution by an optimization analysis program such as GAMS.

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EXAMINER'S NOTE: Applicant's published specification in paragraph [25] discloses that a vertical blocking attribute is a product brand and a horizontal boundary attribute is related to product size.

As per Claim 19 which depend from Claims 15 regarding "wherein the constraints comprise at least one of: usable shelf capacity, attribute-based blocking, assortment-based group constraints, placement constraints or shelf uniqueness" Delurgio in at least Fig. 1 and Column 6, lines 21-56 discloses that some of the constraints 103 used in the optimization analysis program include maximizing volume, revenue, profit or some other merchandising figure of merit.

As per Claim 20 which depend respectively from Claims 15 regarding "wherein the solving MILP problem using the decision variables and the constraints comprises transforming the RS solution into variable of the MILP problem" Delurgio and NPL_GAMS do not specifically disclose Randomized Search (RS) however Capek in at least paragraph [22] discloses that optimization of two or more constraints may be performed using any one of a number of nontrivial mathematical techniques including inter programming, linear programming, deterministic optimization, priority-based search heuristics, **greedy algorithms, randomized algorithms**, local search methods, meta-heuristics, tabu search, evolutionary algorithms, genetic algorithms, simulated annealing, agent-based algorithms, portfolio optimization, simulation, stochastic optimization, forecasting analysis. Therefore, it would have been obvious, at the time of the invention, to one of ordinary skill, to combine by known methods and to achieve predictable results the well-known linear programming elements of the combination of Delurgio and NPL_GAMS with the equally well-known elements of Capek's optimization using greedy and randomized algorithms with the motivation to optimize a solution of two or more constraints.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAUL DANNEMAN whose telephone number is (571)270-1863. The examiner can normally be reached on Mon.-Thurs. 6AM-5PM Fri. off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Florian Zeender can be reached on 571-272-6790. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PAUL DANNEMAN/
Primary Examiner, Art Unit 3627

WHAT IS CLAIMED IS:

1. A computer-readable medium having instructions stored thereon that, when executed by a processor, cause the processor to optimize shelf space placement for a product, the optimization comprising:

receiving decision variables and constraints;

executing a Randomized Search (RS) using the decision variables and constraints until an RS solution is below a pre-determined improvement threshold;

solving a Mixed-Integer Linear Program (MILP) problem using the decision variables and constraints, wherein the RS solution is a starting point of the solving to generate a MILP solution;

repeating the executing and the solving when the MILP solution is not within a predetermined accuracy or does not exceed a predetermined time duration; and

based on the MILP solution, outputting a shelf position and a number of facings for the product.

2. The computer-readable medium of claim 1, further comprising receiving for a store a set of products in a selected store area, wherein the output shelf position and the number of facings optimizes a key performance indicator for the store.

3. The computer-readable medium of claim 2, wherein the key performance indicator comprises at least one of revenue, profit or sales.

4. The computer-readable medium of claim 1, wherein the product comprises a vertical blocking attribute.

5. The computer-readable medium of claim 1, wherein the product comprises a horizontal boundary attribute.

6. The computer-readable medium of claim 1, wherein the constraints comprise at least one of: usable shelf capacity, attribute-based blocking, assortment-based group constraints, placement constraints or shelf uniqueness.

7. The computer-readable medium of claim 1, wherein the solving MILP problem using the decision variables and the constraints comprises transforming the RS solution into variables of the MILP problem.

8. A computer-implemented method for optimize shelf space placement for an item in a store, the method comprising:

receiving decision variables and constraints;

executing a Randomized Search (RS) using the decision variables and the constraints until an RS solution is below a predetermined improvement threshold;

solving a Mixed-Integer Linear Program (MILP) problem using the decision variables and the constraints, wherein the RS solution is a starting point of the solving to generate a MILP solution;

repeating the executing and the solving when the MILP solution is not within a predetermined accuracy or does not exceed a predetermined time duration; and

based on the MILP solution, outputting a shelf position and a number of facings for the item.

9. The computer-implemented method of claim 8, further comprising receiving for the store a set of items in a selected store area, wherein the output shelf position and the number of facings optimizes a key performance indicator for the store.

10. The computer-implemented method of claim 9, wherein the key performance indicator comprises at least one of revenue, profit or sales.

11. The computer-implemented method of claim 8, wherein the item comprises a vertical blocking attribute.

12. The computer-implemented method of claim 8, wherein the item comprises a horizontal boundary attribute.

13. The computer-implemented method of claim 8, wherein the constraints comprise at least one of: usable shelf capacity, attribute-based blocking, assortment-based group constraints, placement constraints or shelf uniqueness.

14. The computer-implemented method of claim 8, wherein the solving MILP problem using the decision variables and the constraints comprises transforming the RS solution into variables of the MILP problem.

15. A shelf space product optimizer system that optimizes shelf space placement for a product in a store, the system comprising:

a randomized searcher that receives decision variables and constraints and executes Randomized Search (RS) until an RS solution is below a predetermined improvement threshold;

a Mixed-Integer Linear Program (MILP) solver that receives the RS solution when it is below the predetermined improvement threshold and solves a formulated MILP problem using the decision variables and constraints, wherein the RS solution is a starting point of the solving to generate a MILP solution; and

a solution module that alternates between executing the RS and solving the MILP solution until the MILP solution is within a predetermined accuracy or does not exceed a predetermined time duration, and based on a final MILP solution, outputs a shelf position and a number of facings for the product.

16. The system of claim 15, the randomized searcher further receiving for the store a set of products in a selected store area, wherein the output shelf position and the number of facings optimizes a key performance indicator for the store, and the key

performance indicator comprises at least one of revenue, profit or sales.

17. The system of claim 15, wherein the product comprises a vertical blocking attribute.

18. The system of claim 15, wherein the product comprises a horizontal boundary attribute.

19. The system of claim 15, wherein the constraints comprise at least one of: usable shelf capacity, attribute-based blocking, assortment-based group constraints, placement constraints or shelf uniqueness.

20. The system of claim 15, wherein the MILP solver solves the formulated MILP problem by transforming the RS solution into variables of the MILP problem.