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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/587,548	12/31/2014	Alison N. Leonard	MBOT-0070-P01

CONFIRMATION NO. 6946

27367
WESTMAN CHAMPLIN & KOEHLER, P.A.
121 South Eighth Street
Suite 1100
Minneapolis, MN 55402

POA ACCEPTANCE LETTER

OC000000080822547

Date Mailed: 11/19/2024

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 11/13/2024.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/nhassani/

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/587,548	12/31/2014	Alison N. Leonard	MBOT-0070-P01

CONFIRMATION NO. 6946

43520
STRATEGIC PATENTS P.C.
P.O. BOX 920629
NEEDHAM, MA 02492

POWER OF ATTORNEY NOTICE

OC000000080822415

Date Mailed: 11/19/2024

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 11/13/2024.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/nhassani/

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
14/587,548	**11/13/2024 04:28:38 PM Z ET**	**MBOT-0070-P01**

Title of Invention

DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	10421238
CONFIRMATION #	6946	FILED BY	LYNNELLE SWAJA
PATENT CENTER #	67953321	FILING DATE	12/31/2014
CUSTOMER #	43520	FIRST NAMED INVENTOR	Alison N. Leonard
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Peter Ims

Documents

TOTAL DOCUMENTS: 3

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
2024-11-13 POA.pdf	2	Power of Attorney	76 KB
2024-11-13 Statement Under 373c.pdf	17	Assignee showing of ownership per 37 CFR 3.73	541 KB
2024-11-13Change of Correspondence Address.pdf	2	Change of Address	418 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
2024-11-13 POA.pdf	B767B81E6A5F423E8D3EFFD46333904EF71E97782A11B6DFF C4B49C1506D2A929BCE9813FA95E61C8B33AA6296D058980B E607493F9110E123670A84182ADE7A

2024-11-13 Statement Under 373c.pdf	A820D77FEF2150CFF67F718AAA4B8322C9BD6FAA42EB33B9 8BDCA2B896E382C2EC3F22CBA76E573B41A0D4661658CB6C 4222E34BE390F30ABE5D9ACAEF0A8BDC
2024-11-13Change of Correspondence Address.pdf	D2498B49044B50A383354648BA4E20233DB4696636553BAABF 3AA03D29FEC06D15793A95FC1B0D3A240F53D631BD4D6B4B DC76297A8D61F1F0F4D5944830447C

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for 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.

PTO/AIA/96 (08-12)
Approved for use through 01/31/2013. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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.

STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: Stratasys, Inc.

Application No./Patent No.: 10421238 Filed/Issue Date: September 24, 2019

Titled: DETECTON AND USE OF PRINTER CONFIGURATION INFORMATION

Stratasys, Inc., a corporation

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☑ The assignee of the entire right, title, and interest.

2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):

☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (*e.g.*, bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

B. ☑ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: Alison Leonard and Joseph Sadusk To: Makerbot Industries, LLC

The document was recorded in the United States Patent and Trademark Office at
Reel 036095, Frame 0144, or for which a copy thereof is attached.

2. From: Makerbot Industries, LLC To: Stratasys, Inc.

The document was recorded in the United States Patent and Trademark Office at
Reel 060731, Frame 0077, or for which a copy thereof is attached.

This collection of information is required by 37 CFR 3.73(b). 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 1.11 and 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, 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**.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PTO/AIA/96 (08-12)
Approved for use through 01/31/2013. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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.

STATEMENT UNDER 37 CFR 3.73(c)

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

4. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☐ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Peter J. Ims/	2024-11-13
Signature	Date
Peter J. Ims	48,774
Printed or Typed Name	Title or Registration Number

[Page 2 of 2]

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.

UNITED STATES
PATENT AND TRADEMARK OFFICE

Patent assignment 060731/0077

ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

Date recorded
Jul 19, 2022

Reel/frame
060731/0077

Pages
11

Assignors
MAKERBOT INDUSTRIES, LLC

Execution Date
Jun 30, 2022

Assignee
STRATASYS, INC.
7665 COMMERCE WAY
EDEN PRAIRIE, MINNESOTA 55344

Correspondent
PETER J. IMS
121 SOUTH EIGHTH STREET
SUITE 1100
MINNEAPOLIS, MN 55402

Properties (25 of 46 total)

Patent	Publication	Application	PCT	International registration
1. AUTOMATED 3D BUILD PROCESSES Inventors: Charles Pax, Zach Smith, Adam Mayer, Nathaniel Pettis				
8282380 Oct 09, 2012	20120046779 Feb 23, 2012	12858622 Aug 18, 2010		
2. AUTOMATED 3D BUILD PROCESSES Inventors: Charles Pax, Zach Smith, Adam Mayer, Nathaniel Pettis				
8287794 Oct 16, 2012	20120059504 Mar 08, 2012	13292209 Nov 09, 2011		
3. AUTOMATED 3D BUILD PROCESSES Inventors: Charles Pax, Zach Smith, Adam Mayer, Nathaniel Pettis				
8226395 Jul 24, 2012	20120059503 Mar 08, 2012	13292369 Nov 09, 2011		
4. NETWORKED THREE-DIMENSIONAL PRINTING Inventors: Nathaniel B. Pettis				
8425218 Apr 23, 2013	20120113473 May 10, 2012	13348728 Jan 12, 2012		
5. NETWORKED THREE-DIMENSIONAL PRINTING Inventors: Nathaniel B. Pettis				
8414280 Apr 09, 2013	20120113457 May 10, 2012	13348863 Jan 12, 2012		
6. NETWORKED THREE-DIMENSIONAL PRINTING Inventors: Nathaniel B. Pettis				
8562324 Oct 22, 2013	20120105903 May 03, 2012	13348896 Jan 12, 2012		
7. NETWORKED THREE-DIMENSIONAL PRINTER WITH WEB-BASED VIDEO FEED Inventors: Nathaniel B. Pettis				

9430169	20120287259	13556315
Aug 30, 2016	Nov 15, 2012	Jul 24, 2012

8. NETWORKED THREE-DIMENSIONAL PRINTER WITH THREE-DIMENSIONAL SCANNER
Inventors: Nathaniel B. Pettis

8747097	20120286453	13556368
Jun 10, 2014	Nov 15, 2012	Jul 24, 2012

9. WEB-BASED DESIGN TOOLS FOR THREE-DIMENSIONAL PRINTING
Inventors: Nathaniel B. Pettis

9022770	20120287470	13556515
May 05, 2015	Nov 15, 2012	Jul 24, 2012

10. SOCIAL NETWORKING FOR THREE-DIMENSIONAL PRINTERS
Inventors: Nathaniel B. Pettis

8992202	20120287472	13557353
Mar 31, 2015	Nov 15, 2012	Jul 25, 2012

11. FABRICATION OF OBJECTS WITH ENHANCED STRUCTURAL CHARACTERISTICS
Inventors: Hugo Boyer, Ariel Douglas, Nathaniel B. Pettis

9308690	20140039659	13624067
Apr 12, 2016	Feb 06, 2014	Sep 21, 2012

12. AUTOMATED 3D BUILD PROCESSES
Inventors: Nathaniel B. Pettis

8668859	20130073073	13652608
Mar 11, 2014	Mar 21, 2013	Oct 16, 2012

13. DOWNLOADABLE THREE-DIMENSIONAL MODELS
Inventors: Nathaniel B. Pettis, Anthony James Buser, Justin Day, Jonah Gold, Bryan Vaccaro, Joseph Neal

9844914	20130329243	13914448
Dec 19, 2017	Dec 12, 2013	Jun 10, 2013

14. AUTOMATED MODEL SELECTION
Inventors: Nathaniel B. Pettis, Joseph Neal

9626142	20150036174	13958701
Apr 18, 2017	Feb 05, 2015	Aug 05, 2013

15. THREE-DIMENSIONAL PRINTING OF LARGE OBJECTS
Inventors: Ariel Douglas, Theodore Brandston

9878495	20140074274	14020658
Jan 30, 2018	Mar 13, 2014	Sep 06, 2013

16. TAGGED BUILD MATERIAL FOR THREE-DIMENSIONAL PRINTING
Inventors: Ariel Douglas, Robert J. Steiner, Aric Lynn Jennings, William B. Buel, Anthony D. Moschella

9233504	20140117585	14064974
Jan 12, 2016	May 01, 2014	Oct 28, 2013

17. THREE-DIMENSIONAL FABRICATION WITH CAVITY FILLING
Inventors: Peter Joseph Schmehl

9475233	20140121813	14065449
Oct 25, 2016	May 01, 2014	Oct 29, 2013

18. THREE-DIMENSIONAL PRINTER WITH FORCE DETECTION
Inventors: Aljosa Kemperle, Filipp Gelman, Peter Joseph Schmehl

9168698	20140117575	14065516
Oct 27, 2015	May 01, 2014	Oct 29, 2013

19. CONTROLLING BUILD CHAMBER TEMPERATURE
Inventors: James Griszbacher, Samuel Holland

9561626	20150190966	14147567
Feb 07, 2017	Jul 09, 2015	Jan 05, 2014

20. PURGE WALL FOR THREE-DIMENSIONAL PRINTING
Inventors: Filipp Gelman, Joseph Sadusk, Andrey V. Patrov

9545756	20150093588	14499464
Jan 17, 2017	Apr 02, 2015	Sep 29, 2014

21. THREE-DIMENSIONAL PRINTER TOOL SYSTEMS
Inventors: Peter Joseph Schmehl, Aljosa Kemperle, Stewart Schmehl

9481132	20150140151	14580530
Nov 01, 2016	May 21, 2015	Dec 23, 2014

22. THREE-DIMENSIONAL PRINTER TOOL SYSTEMS
Inventors: Peter Joseph Schmehl, Aljosa Kemperle, Stewart Schmehl

9469072	20150137402	14580711
Oct 18, 2016	May 21, 2015	Dec 23, 2014

23. DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION
Inventors: Joseph Sadusk, Alison N. Leonard

10421238	20160185044	14587548
Sep 24, 2019	Jun 30, 2016	Dec 31, 2014

24. THREE-DIMENSIONAL PRINTER WITH FORCE DETECTION
Inventors: Aljosa Kemperle, Filipp Gelman, Peter Joseph Schmehl

10556381	20160039150	14922267
Feb 11, 2020	Feb 11, 2016	Oct 26, 2015

25. TAGGED BUILD MATERIAL FOR THREE-DIMENSIONAL PRINTING
Inventors: Ariel Douglas, Robert J. Steiner, Aric Lynn Jennings, William B. Buel, Anthony D. Moschella

10093061	20160121550	14992127
Oct 09, 2018	May 05, 2016	Jan 11, 2016

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

EPAS ID: PAT7439278

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
MAKERBOT INDUSTRIES, LLC	06/30/2022

RECEIVING PARTY DATA

Name:	STRATASYS, INC.
Street Address:	7665 COMMERCE WAY
City:	EDEN PRAIRIE
State/Country:	MINNESOTA
Postal Code:	55344

PROPERTY NUMBERS Total: 47

Property Type	Number
Patent Number:	8282380
Patent Number:	8287794
Patent Number:	8226395
Patent Number:	8668859
Patent Number:	8425218
Patent Number:	8414280
Patent Number:	8562324
Patent Number:	9430169
Patent Number:	8747097
Patent Number:	9022770
Patent Number:	8992202
Patent Number:	10114591
Patent Number:	10908849
Patent Number:	9308690
Patent Number:	10800105
Patent Number:	9844914
Patent Number:	10005226
Patent Number:	10150248
Patent Number:	9626142
Patent Number:	9878495

Property Type	Number
Patent Number:	9481132
Patent Number:	9469072
Patent Number:	10214004
Patent Number:	11285649
Patent Number:	9233504
Patent Number:	10093061
Patent Number:	10569466
Patent Number:	11167464
Patent Number:	9475233
Patent Number:	9884450
Patent Number:	10836090
Patent Number:	9168698
Patent Number:	10556381
Patent Number:	10994462
Patent Number:	9561626
Patent Number:	9545756
Patent Number:	10421238
Patent Number:	10987878
Patent Number:	10532511
Patent Number:	10532552
Patent Number:	10500837
Patent Number:	10773511
Application Number:	17516974
Application Number:	17690334
Application Number:	17163795
Application Number:	17239885
PCT Number:	US1268429

CORRESPONDENCE DATA

Fax Number:

Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.

Phone: 6123343222
Email: epeters@wck.com
Correspondent Name: PETER J. IMS
Address Line 1: 121 SOUTH EIGHTH STREET
Address Line 2: SUITE 1100
Address Line 4: MINNEAPOLIS, MINNESOTA 55402

ATTORNEY DOCKET NUMBER:	S697.01-0001

NAME OF SUBMITTER:	PETER J. IMS
SIGNATURE:	/Peter J. Ims/
DATE SIGNED:	07/19/2022
Total Attachments: 8 source=Executed Assignment#page1.tif source=Executed Assignment#page2.tif source=Executed Assignment#page3.tif source=Executed Assignment#page4.tif source=Executed Assignment#page5.tif source=Executed Assignment#page6.tif source=Executed Assignment#page7.tif source=Executed Assignment#page8.tif	

ASSIGNMENT

WHEREAS, MakerBot Industries, LLC (the ASSIGNOR), a New York corporation having a place of business at 1 Metrotech Center, 21st Floor, Brooklyn, NY 11201, desires to convey its entire right, title, and interest in and to the patents and patent applications set forth in Exhibit A hereto, along with any subsequent reissues or extensions thereof, and any and all resulting patents in any jurisdiction worldwide, along with all rights of priority, all rights and benefits under any applicable treaty or convention, and rights to sue for past, present, and future infringement including all rights to and claims for damages, restitution, and injunctive and other legal and equitable relief (collectively, the "Patents"), and the ASSIGNOR owns the entire right, title, and interest in and to the Patents, and has full right to convey the entire interest, both legal and equitable, in and to said Patents free from all prior assignments, agreements, licenses, mortgages, security interests, or other encumbrances whatsoever; and

WHEREAS, Stratasys, Inc. (the ASSIGNEE), an entity organized and existing under the laws of the State of Delaware, and having a place of business at 7665 Commerce Way, Eden Prairie, MN 55344, is desirous of acquiring the entire right, title, and interest in and to the Patents;

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged by the ASSIGNOR, the ASSIGNOR hereby sells, assigns, and transfers unto the ASSIGNEE, its successors and assigns, the ASSIGNOR's entire right, title, and interest in and to the Patents;

AND the ASSIGNOR hereby authorizes and requests the issuing authority to issue any and all patents issuing from any of the forgoing to the ASSIGNEE or its successors and assigns;

AND the ASSIGNOR represents to the ASSIGNEE, its successors, and assigns, that Assignor has not and shall not execute any writing or do any act whatsoever conflicting with this Assignment;

AND the ASSIGNOR further agrees, with reasonable compensation by the ASSIGNEE or its successors and assigns, to communicate to the ASSIGNEE, its representatives or agents or its successors and assigns, any facts relating to the Inventions including evidence for administrative or legal proceedings whenever requested; to testify in any administrative or legal proceedings, whenever requested; to execute and deliver, on request, all lawful papers required to make any of the foregoing provisions effective; and to generally do everything possible to aid the ASSIGNEE, its successors or assigns and nominees to secure, obtain, defend, and enforce proper patent protection for the Inventions in this or any foreign country.

The ASSIGNOR and ASSIGNEE hereby authorize the attorneys and agents associated with Patent Office Customer Number 43520 to insert hereon any further information necessary or desirable for recordation of this document.

AGREED by the ASSIGNOR

MakerBot Industries, LLC
1 Metrotech Center
Brooklyn, NY 11201

By: _____
Nadav Goshen
~~Chief~~ Executive Officer

Date: 6.30.2022

Witness Signature: _____
Witness Name: Pooja Hoffman

AGREED and ACCEPTED by the ASSIGNEE

Stratasys, Inc.
7665 Commerce Way
Eden Prairie, MN 55344

By: _____
Vered Ben Jacob
~~General Counsel~~ & Head of Intellectual Property
Chief Legal Officer

Date: July 7, 2022

Witness Signature: _____
Witness Name: ~~Eldad Itzhak~~

Exhibit A

Country	File Number	Title	App. Number	Filing Date	Patent Number
U.S.A.	MBOT-0001-P01	AUTOMATED 3D BUILD PROCESSES	12/858,622	August 18, 2010	8282380
U.S.A.	MBOT-0001-P02	AUTOMATED 3D BUILD PROCESSES	13/292,209	November 9, 2011	8287794
U.S.A.	MBOT-0001-P03	AUTOMATED 3D BUILD PROCESSES	13/292,369	November 9, 2011	8226395
U.S.A.	MBOT-0001-P04	AUTOMATED 3D BUILD PROCESSES	13/652,608	October 16, 2012	8668859
U.S.A.	MBOT-0002-P02	NETWORKED THREE-DIMENSIONAL PRINTING	13/348,728	January 12, 2012	8425218
U.S.A.	MBOT-0002-P03	NETWORKED THREE-DIMENSIONAL PRINTING	13/348,863	January 12, 2012	8414280
U.S.A.	MBOT-0002-P04	NETWORKED THREE-DIMENSIONAL PRINTING	13/348,896	January 12, 2012	8562324
U.S.A.	MBOT-0002-P05	NETWORKED THREE-DIMENSIONAL PRINTER WITH WEB-BASED VIDEO FEED	13/556,315	July 24, 2012	9430169
U.S.A.	MBOT-0002-P06	NETWORKED THREE-DIMENSIONAL PRINTER WITH THREE-DIMENSIONAL SCANNER	13/556,368	July 24, 2012	8747097
U.S.A.	MBOT-0002-P07	WEB-BASED DESIGN TOOLS FOR THREE-DIMENSIONAL PRINTING	13/556,515	July 24, 2012	9022770
U.S.A.	MBOT-0002-P09	SOCIAL NETWORKING FOR THREE-DIMENSIONAL PRINTERS	13/557,353	July 25, 2012	8992202

Country	File Number	Title	App. Number	Filing Date	Patent Number
U.S.A.	MBOT-0002-P11	NETWORKED THREE-DIMENSIONAL PRINTING SYSTEM WITH A DRAG-AND-DROP INTERFACE FOR QUEUE MANAGEMENT	15/233,287	August 10, 2016	10114591
U.S.A.	MBOT-0002-P12	NETWORKED THREE-DIMENSIONAL PRINTING	16/171,449	October 26, 2018	10908849
U.S.A.	MBOT-0002-P13	NETWORKED THREE-DIMENSIONAL PRINTING	17/163,795	February 1, 2021	
Australia	MBOT-0002-PAU	NETWORKED THREE-DIMENSIONAL PRINTING	2012347683	December 7, 2012	2012347683
China	MBOT-0002-PC1	NETWORKED THREE-DIMENSIONAL PRINTING	201710343314.5	December 7, 2012	ZL201710343314.5
China	MBOT-0002-PCN	NETWORKED THREE-DIMENSIONAL PRINTING	201280069378.6	December 7, 2012	ZL201280069378.6
Germany	MBOT-0002-PDE	NETWORKED THREE-DIMENSIONAL PRINTING	12856556.1	December 7, 2012	602012071788.2
Europe	MBOT-0002-PE1	NETWORKED THREE-DIMENSIONAL PRINTING	20190330.9	December 7, 2012	
Europe	MBOT-0002-PEP	NETWORKED THREE-DIMENSIONAL PRINTING	12856556.1	December 7, 2012	2788910
France	MBOT-0002-PFR	NETWORKED THREE-DIMENSIONAL PRINTING	12856556.1	December 7, 2012	2788910
United Kingdom	MBOT-0002-PGB	NETWORKED THREE-DIMENSIONAL PRINTING	12856556.1	December 7, 2012	278891C

Country	File Number	Title	App. Number	Filing Date	Patent Number
Japan	MBOT-0002-PJP	NETWORKED THREE-DIMENSIONAL PRINTING	2014-546114	December 7, 2012	6159734
Republic of Korea	MBOT-0002-PKR	NETWORKED THREE-DIMENSIONAL PRINTING	10-2014-7017129	December 7, 2012	10-2157637
New Zealand	MBOT-0002-PNZ	NETWORKED THREE-DIMENSIONAL PRINTING	626212	December 7, 2012	626212
PCT	MBOT-0002-PWO	NETWORKED THREE-DIMENSIONAL PRINTING	PCT/US12/68429	December 7, 2012	
U.S.A.	MBOT-0016-P01	FABRICATION OF OBJECTS WITH ENHANCED STRUCTURAL CHARACTERISTICS	13/624,067	September 21, 2012	9308690
U.S.A.	MBOT-0017-P04	AUGMENTED THREE-DIMENSIONAL PRINTING	15/854,695	December 26, 2017	10800105
U.S.A.	MBOT-0027-P01	DOWNLOADABLE THREE-DIMENSIONAL MODELS	13/914,448	June 10, 2013	9844914
U.S.A.	MBOT-0027-P04	DOWNLOADABLE THREE-DIMENSIONAL MODELS	15/844,744	December 18, 2017	10005226
U.S.A.	MBOT-0027-P05	DOWNLOADABLE THREE-DIMENSIONAL MODELS	16/013,066	June 20, 2018	10150248
U.S.A.	MBOT-0034-P01	AUTOMATED MODEL SELECTION	13/958,701	August 5, 2013	9626142
U.S.A.	MBOT-0044-P01	THREE-DIMENSIONAL PRINTING OF LARGE OBJECTS	14/020,658	September 6, 2013	9878495
U.S.A.	MBOT-0046-P03	THREE-DIMENSIONAL PRINTER TOOL SYSTEMS	14/580,530	December 23, 2014	9481132

Country	File Number	Title	App. Number	Filing Date	Patent Number
U.S.A.	MBOT-0046-P04	THREE-DIMENSIONAL PRINTER TOOL SYSTEMS	14/580,711	December 23, 2014	9469072
U.S.A.	MBOT-0046-P05	THREE-DIMENSIONAL PRINTER TOOL SYSTEMS	15/337,477	October 28, 2016	10214004
U.S.A.	MBOT-0046-P08	THREE-DIMENSIONAL PRINTER TOOL SYSTEMS	16/733,871	January 3, 2020	11285649
U.S.A.	MBOT-0046-P09	THREE-DIMENSIONAL PRINTER TOOL SYSTEMS	17/690,334	March 9, 2022	
Germany	MBOT-0046-PD1	THREE-DIMENSIONAL PRINTER TOOL SYSTEMS	19189799.0	November 10, 2014	60 2014 079 474.2
Europe	MBOT-0046-PE1	THREE-DIMENSIONAL PRINTER TOOL SYSTEMS	19189799.0	November 10, 2014	3581365
United Kingdom	MBOT-0046-PG1	THREE-DIMENSIONAL PRINTER TOOL SYSTEMS	19189799.0	November 10, 2014	3581365
Netherlands	MBOT-0046-PN1	THREE-DIMENSIONAL PRINTER TOOL SYSTEMS	19189799.0	November 10, 2014	3581365
U.S.A.	MBOT-0049-P01	TAGGED BUILD MATERIAL FOR THREE-DIMENSIONAL PRINTING	14/064,974	October 28, 2013	9233504
U.S.A.	MBOT-0049-P02	TAGGED BUILD MATERIAL FOR THREE-DIMENSIONAL PRINTING	14/992,127	January 11, 2016	10093061
U.S.A.	MBOT-0049-P03	TAGGED BUILD MATERIAL FOR THREE-DIMENSIONAL PRINTING	16/153,224	October 5, 2018	10569466

Country	File Number	Title	App. Number	Filing Date	Patent Number
U.S.A.	MBOT-0049-P04	TAGGED BUILD MATERIAL FOR THREE-DIMENSIONAL PRINTING	16/796,122	February 20, 2020	11167464
U.S.A.	MBOT-0049-P05	TAGGED BUILD MATERIAL FOR THREE-DIMENSIONAL PRINTING	17/516,974	November 2, 2021	
U.S.A.	MBOT-0050-P01	THREE-DIMENSIONAL FABRICATION WITH CAVITY FILLING	14/065,449	October 29, 2013	9475233
U.S.A.	MBOT-0050-P02	DEVICE FOR THREE-DIMENSIONAL FABRICATION WITH CAVITY FILLING	15/332,653	October 24, 2016	9884450
U.S.A.	MBOT-0050-P03	THREE-DIMENSIONAL FABRICATION WITH CAVITY FILLING	15/866,990	January 10, 2018	10836090
U.S.A.	MBOT-0051-P01	THREE-DIMENSIONAL PRINTER WITH FORCE DETECTION	14/065,516	October 29, 2013	9168698
U.S.A.	MBOT-0051-P02	THREE-DIMENSIONAL PRINTER WITH FORCE DETECTION	14/922,267	October 26, 2015	10556381
U.S.A.	MBOT-0051-P03	PLANARIZING BUILD SURFACES IN THREE-DIMENSIONAL PRINTING	16/784,889	February 7, 2020	10994462
U.S.A.	MBOT-0054-P01	CONTROLLING BUILD CHAMBER TEMPERATURE	14/147,567	January 5, 2014	9561626
U.S.A.	MBOT-0067-P01	PURGE WALL FOR THREE-DIMENSIONAL PRINTING	14/499,464	September 29, 2014	9545756
U.S.A.	MBOT-0070-P01	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION	14/587,548	December 31, 2014	10421238
U.S.A.	MBOT-0070-P02	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION	16/576,044	September 19, 2019	10987878

Country	File Number	Title	App. Number	Filing Date	Patent Number
U.S.A.	MBOT-0070-P03	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION	17/239,885	April 26, 2021	
U.S.A.	MBOT-0074-P01	INFILL TECHNIQUES IN THREE-DIMENSIONAL PRINTING	15/167,422	May 27, 2016	10532511
U.S.A.	MBOT-0078-P01	BUILD PATTERNS FOR SURFACES OF A THREE-DIMENSIONALLY PRINTED OBJECT	15/331,290	October 21, 2016	10532552
U.S.A.	MBOT-0081-P01	FILAMENT SWAPPING IN THREE-DIMENSIONAL PRINTING	15/395,230	December 30, 2016	10500837
U.S.A.	MBOT-0081-P02	FILAMENT SWAPPING IN THREE-DIMENSIONAL PRINTING	16/676,885	November 7, 2019	10773511

PTO/AIA/123 (08-12)
Approved for use through 09/30/2025. OMB 0651-0035
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Patent

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Patent Number	10421238
Issue Date	2019-09-24
Application Number	14587548
Filing Date	2014-12-31
First Named Inventor	Alison N. Leonard
Attorney Docket Number	

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☐ Patentee.

☐ If the Patentee was not the applicant for patent (37 CFR 1.42), then a Statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is enclosed or was filed on _____. See 37 CFR 3.71.

☑ Attorney or agent of record. Registration Number 48774.

☐ Patent practitioner acting in a representative capacity whose correspondence address is the correspondence address of record. Notice has been given to the patentee or owner. Registration Number 48774.

Signature /Peter J. Ims/

Typed or Printed Name Peter J. Ims

Date 2024-11-13 | Telephone 612/334-3222

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.

☑ *Total of 1 forms are submitted.

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TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

Note: This form is to be submitted with a Power of Attorney to identify the application to which the Power of Attorney is directed.

Application Number	14/587,548
Filing Date	December 31, 2014
First Named Inventor	Alison N. Leonard
Title	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION
Art Unit	2119
Examiner Name	JOSHUA T. SANDERS
Attorney Docket Number	---

SIGNATURE of Patent Practitioner

Signature	/Peter J. Ims/	Date	2024-11-13
Name	PETER J. IMS	Telephone	612/334-3222
Registration Number	48774		

POWER OF ATTORNEY

Principal's Name: Stratasys, Inc.

Principal's Address: 7665 Commerce Way, Eden Prairie, MN 55344

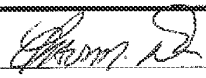
Principal hereby revokes all previous powers of attorney given in the application identified in the attached transmittal letter (the APPLICATION).

Principal hereby appoints Practitioner(s) associated with the following Customer Number as its attorney(s) or agent(s) to prosecute the APPLICATION and to transact all business in the United States Patent and Trademark Office connected therewith. Principal hereby ratifies all previous actions taken by the Practitioner(s) in connection with the APPLICATION:

27,367

Principal is empowered to act in the APPLICATION because Principal is the sole owner of the entire right, title and interest of the APPLICATION, one owner of a collection of owners of the entire right, title and interest of the APPLICATON, a person to whom at least one inventor is under an obligation to assign the APPLICATION, and/or a person who otherwise has sufficient proprietary interest to act as Applicant for the APPLICATION.

SIGNATURE of Principal

Signature		Date	April 2, 2013
Name	Larry Doerr		
Title	Executive Vice President		

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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/587,548	09/24/2019	10421238	MBOT-0070-P01	6946

43520 7590 09/04/2019

STRATEGIC PATENTS P.C.
P.O. BOX 920629
NEEDHAM, MA 02492

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 377 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

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 Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Alison N. Leonard, Brooklyn, NY;
MakerBot Industries, LLC, Brooklyn, NY;
Joseph Sadusk, New York, NY;

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IR103 (Rev. 10/09)

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(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/587,548	12/31/2014	Alison N. Leonard	MBOT-0070-P01	6946

TITLE OF INVENTION: DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$0.00	$1000	08/16/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
SANDERS, JOSHUA T	2119	700-098000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(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.

1 Strategic Patents, P.C.
2
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PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: MakerBot Industries, LLC

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Brooklyn, NY

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

4a. Fees submitted: ☒ Issue Fee ❑ Publication Fee (if required) ❑ Advance Order - # of Copies _____

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❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

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Authorized Signature /Thomas J. Bassolino/ Date August 13, 2019

Typed or printed name Thomas J. Bassolino Registration No. 65946

Electronic Patent Application Fee Transmittal

Application Number:	14587548
Filing Date:	31-Dec-2014
Title of Invention:	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION
First Named Inventor/Applicant Name:	Alison N. Leonard
Filer:	Thomas John Bassolino/Paula Ng
Attorney Docket Number:	MBOT-0070-P01

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

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:				
UTILITY APPL ISSUE FEE	1501	1	1000	1000

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**1000**

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EFS ID:	36855709
Application Number:	14587548
International Application Number:	
Confirmation Number:	6946
Title of Invention:	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION
First Named Inventor/Applicant Name:	Alison N. Leonard
Customer Number:	43520
Filer:	Thomas John Bassolino/Paula Ng
Filer Authorized By:	Thomas John Bassolino
Attorney Docket Number:	MBOT-0070-P01
Receipt Date:	13-AUG-2019
Filing Date:	31-DEC-2014
Time Stamp:	10:52:13
Application Type:	Utility under 35 USC 111(a)

Payment information:

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Payment Type	CARD
Payment was successfully received in RAM	$1000
RAM confirmation Number	E20198CA52316094
Deposit Account	504262
Authorized User	Paula Ng
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37 CFR 1.20 (Post Issuance fees)

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1	Issue Fee Payment (PTO-85B)	MBOT-0070-P01_20190813_IssueFeeTrans.pdf	104621 8394281462d326b6d6dbc4a532fa9371887fe8eb	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30178 7f8374ba58574cfbb8d603ac759076daf9d9e76e	no	2
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43520 7590 05/16/2019
STRATEGIC PATENTS P.C.
P.O. BOX 920629
NEEDHAM, MA 02492

EXAMINER
SANDERS, JOSHUA T

ART UNIT	PAPER NUMBER
2119	

DATE MAILED: 05/16/2019

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/587,548	12/31/2014	Alison N. Leonard	MBOT-0070-P01	6946

TITLE OF INVENTION: DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$0.00	$1000	08/16/2019

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: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (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)

43520 7590 05/16/2019
STRATEGIC PATENTS P.C.
P.O. BOX 920629
NEEDHAM, MA 02492

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.

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 transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/587,548	12/31/2014	Alison N. Leonard	MBOT-0070-P01	6946

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APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$0.00	$1000	08/16/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
SANDERS, JOSHUA T	2119	700-098000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(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.

1_____
2_____
3_____

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 must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). 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

4a. Fees submitted: ❑Issue Fee ❑Publication Fee (if required) ❑Advance Order - # of Copies _____

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

❑ Electronic Payment via EFS-Web ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/587,548	12/31/2014	Alison N. Leonard	MBOT-0070-P01	6946

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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 30 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. 14/587,548	Applicant(s) Leonard et al.	
	Examiner JOSHUA T SANDERS	Art Unit 2119	AIA (FITF) Status Yes

-- 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 Request for Continued Examination filed 26 March 2019.
   ☐ 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 See Continuation Sheet . 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 areply 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 _____ .

   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. ☐ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☑ Interview Summary (PTO-413), Paper No./Mail Date. 20190508.
5. ☑ Examiner's Amendment/Comment
6. ☑ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/JOSHUA T SANDERS/ Examiner, Art Unit 2119	/MOHAMMAD ALI/ Supervisory Patent Examiner, Art Unit 2119

Continuation of 3. The allowed claim(s) is/are: 1-6,8-12,15-17,20 and 32-35

DETAILED ACTION

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

2. Claims 6-8 have been added by way of amendment by applicant on 20 January 2017.

3. An Examiner's Amendment has been entered with this office action.

4. Claim 13 has been canceled, per the Examiner's Amendment

5. Claims 1-6, 8-12, 15-17, 20, and 32-35 are allowed, reasons follow.

EXAMINER'S AMENDMENT

6. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

7. Authorization for this examiner's amendment was given in a telephonic interview with Attorney Thomas Bassalino (Reg #65,946) on May 3, 2019.

8. The application has been amended as follows:

Claim 13 Has Been Canceled.

(end of examiners amendment)

Allowable Subject Matter

9. Claims 1-6, 8-12, 15-17, 20, and 32-35 are allowed.

10. The following is an examiner's statement of reasons for allowance: While **Pettis, et al., US Pg-Pub 2013/0329258** teaches a method of receiving a request to fabricate a 3D object at a server remote from the printing system, determining a target printer suitable for fabrication of the object, creating a fabrication profile based on the properties of the target printer, determining whether a suitable machine-ready model has previously been generated, generating a machine-ready model when it has not been previously generated, and transmitting the model to the printer for fabrication, and **Mahdavi, et al., US Pg-Pub 2014/0156053** teaches a similar method which also retrieves a dictionary of printer properties stored in a location remote from the printer based upon a printer identifier, and non-patent literature **"PrintToPeer: Your 3D printer on the web" (indiegogo campaign)** teaches that printer properties may be automatically detected, none of the references of record, alone or in reasonable combination, teach or fairly suggest all of the limitations of the claimed invention, particularly:

(Claim 1)

querying the target printer from the remote print server for configuration information of the target printer relevant to creation of a printable model for fabrication of the object on the target printer;

receiving, *from the target printer,* a dictionary of configuration information containing one or more properties of the target printer that affect fabrication capabilities of the target printer

(excerpted, emphasis added)

...in combination with the remaining features and elements of the claimed invention.

11. The dependent claims, being definite, fully enabled, further limiting, and dependent from the independent claims, are likewise persuasive over the prior art of record.

12. It is for these reasons that applicant's invention defines over the prior art.

Conclusion

13. 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."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOSHUA T SANDERS whose telephone number is (571)272-5591. The examiner can normally be reached on Generally Monday through Thursday and Alternate Fridays.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ali can be reached on 571-272-4105. 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.

/J.T.S./
Examiner, Art Unit 2119

/MOHAMMAD ALI/
Supervisory Patent Examiner, Art Unit 2119

Examiner-Initiated Interview Summary	**Application No.** 14/587,548	**Applicant(s)** Leonard et al.		
	Examiner JOSHUA T SANDERS	**Art Unit** 2119	**AIA (First Inventor to File) Status** Yes	**Page** **1 of** 1

All participants (applicant, applicants representative, PTO personnel):

1. JOSHUA T SANDERS (Examiner); Telephonic

2. THOMAS BASSALINO (Attorney); Telephonic

Date of Interview: 02 May 2019

Claims Discussed: 1, 13

Amendment proposed: Cancellation of Claim 13

Issues Discussed:

Proposed Amendments:
Examiner proposed cancellation of claim 13 in order to put the application into condition for allowance. (Previously authorized by Primary Examiner Ziaul Karim, who was not available at the time of the interview).

Applicant's representative indicated that this was acceptable to their applicant on May 3. Accordingly an Examiner's amendment and allowance is issued herewith.

/JOSHUA T SANDERS/ Examiner, Art Unit 2119	/MOHAMMAD ALI/ Supervisory Patent Examiner, Art Unit 2119

Applicant is reminded that a complete written statement as to the substance of the interview must be made of record in the application file. It is the applicants responsibility to provide the written statement, unless the interview was initiated by the Examiner and the Examiner has indicated that a written summary will be provided. See MPEP 713.04
Please further see:
MPEP 713.04
Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews, paragraph (b)
37 CFR § 1.2 Business to be transacted in writing

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of 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.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/587,548	Leonard et al.
	Examiner	Art Unit
	JOSHUA T SANDERS	2119

CPC - Searched*		
Symbol	**Date**	**Examiner**
B29C67/0088;	12/23/2016	JS
G05B15/02;	12/23/2016	JS
G06F17/50;	12/23/2016	JS
B33Y50/02;	12/23/2016	JS
refreshed search of record see EAST search notes	8/15/2017	JS
refreshed search for RCE	5/21/2018	JS
refreshed search for amendment	12/18/2018	JS
refreshed search for RCE	05/09/2019	JS

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**
700	98	12/23/2016	JS
	refreshed search of record, see EAST search notes	8/15/2017	JS
	refreshed search for RCE	5/21/2018	JS
	refreshed search for amendment	12/18/2018	JS
	refreshed search for RCE	05/09/2019	JS

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

	/JOSHUA T SANDERS/ Examiner, Art Unit 2119

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/587,548	Leonard et al.
	Examiner	Art Unit
	JOSHUA T SANDERS	2119

Search Notes		
Search Notes	**Date**	**Examiner**
EAST keyword, inventor, classification and assignee search performed	12/23/2016	JS
PLUS search performed	12/23/2016	JS
IEEEXplore metadata and author search performed	12/23/2016	JS
Google Web NPL search performed	12/23/2016	JS
IP com publication search performed	12/23/2016	JS
Google Patent keyword and classification search performed	12/23/2016	JS
Refreshed Search of Record, see attached search notes	8/15/2017	JS
Refreshed Search for RCE	5/21/2018	JS
Refreshed Search for Amendment	12/18/2018	JS
Consult with Primary Examiner Ziaul Karim	12/18/2018	JS
Refreshed Search for RCE	05/09/2019	JS
Consult with Primary Examiner Ziaul Karim	05/09/2019	JS

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**
	USPAT and USPGPUB claim text search, see EAST search notes labeled "infr"	05/09/2019	JS

	/JOSHUA T SANDERS/ Examiner, Art Unit 2119

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
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	Examiner	**Art Unit**
	JOSHUA T SANDERS	2119

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/29/2016	08/08/2017	05/21/2018	12/18/2018	05/09/2019				
1	1	✓	✓	✓	✓	=				
2	2	✓	✓	✓	✓	=				
3	3	✓	✓	✓	✓	=				
4	4	✓	✓	✓	✓	=				
5	5	✓	✓	✓	✓	=				
6	6	✓	✓	✓	✓	=				
-	7	✓	✓	✓	✓	-				
7	8	✓	✓	✓	✓	=				
8	9	✓	✓	✓	✓	=				
9	10	✓	✓	✓	✓	=				
10	11	✓	✓	✓	✓	=				
11	12	✓	✓	✓	✓	=				
-	13	✓	✓	✓	✓	-				
-	14	✓	-	-	-	-				
12	15	✓	✓	✓	✓	=				
13	16	✓	✓	✓	✓	=				
14	17	✓	✓	✓	✓	=				
-	18	✓	-	-	-	-				
-	19	✓	-	-	-	-				
15	20	✓	✓	✓	✓	=				
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-	30	-	-	-	-	-				
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16	32			✓	✓	=				
17	33			✓	✓	=				
18	34				✓	=				
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Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/587,548	Leonard et al.
	Examiner	**Art Unit**
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CPC						
Symbol					**Type**	**Version**
B29C	/	67	/	0088	F	2013-01-01
G06F	/	17	/	50	I	2013-01-01
G05B	/	15	/	02	I	2013-01-01
B29C	/	64	/	386	I	2017-08-01
B33Y	/	50	/	02	A	2014-12-01

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/JOSHUA T SANDERS/ Examiner, Art Unit 2119	09 May 2019	**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	19	
/MOHAMMAD ALI/ Supervisory Patent Examiner, Art Unit 2119		O.G. Print Claim(s)	O.G. Print Figure
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Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/587,548	Leonard et al.
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INTERNATIONAL CLASSIFICATION				
CLAIMED				
B29C	/	67	/	00
G05B	/	15	/	02
G06F	/	17	/	50

NON-CLAIMED				
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US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS
700	98

CROSS REFERENCES(S)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					

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☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIMS

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1	1	9	10	-	19	-	28								
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1. **Networked three-dimensional printer with three-dimensional scanner**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20120286453 | US APPLICATIONS | 15-NOV-2012

2. **Networked three-dimensional printing**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20120113457 | US APPLICATIONS | 10-MAY-2012

3. **Networked three-dimensional printing**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20120105903 | US APPLICATIONS | 03-MAY-2012

4. **Web-based design tools for three-dimensional printing**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20120287470 | US APPLICATIONS | 15-NOV-2012

5. **Social networking for three-dimensional printers**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20120287472 | US APPLICATIONS | 15-NOV-2012

6. **Networked three-dimensional printer with three-dimensional scanner**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US8747097 | US PATENTS | 10-JUN-2014

7. **Web-based design tools for three-dimensional printing**

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Practical **3D printers**: The science and art of **3D printing**

B Evans - 2012 - books.google.com
... 37 **Slicers** ... 136 File **Setup** ... toolchain, before wrapping up with some useful tips for making your fi fi rst **3D prints** and fi ...
☆ 99 Cited by 132 Related articles All 7 versions »

3D U-Net: learning dense volumetric segmentation from sparse annotation

Ö Çiçek, A Abdulkadir, SS Lienkamp, T Brox... - ... conference on medical ..., 2016 - Springer
... introduced an end-to-end learning method that semi-**automatically** and fully-**automatically** segments a ... In a fully-**automated setup** we demonstrate the performance gain of the **3D** architecture to an ... Pujol, S., Bauer, C., Jennings, D., Fennessy, F., Sonka, M., et al.: **3D slicer** as an ...
☆ 99 Cited by 667 Related articles All 9 versions »

Printing 3d objects with **automatic** dimensional accuracy compensation

TL Bennett, GM Gheorghescu - US Patent App. 14/996,210, 2017 - Google Patents
US20170203515A1 - **Printing 3d** objects with **automatic** dimensional accuracy compensation - Google Patents. **Printing 3d** objects with **automatic** dimensional accuracy compensation. Download PDF Info. Publication number ...
☆ 99 Cited by 3 Related articles All 2 versions »

Influence of slicing tools on quality of **3D printed** parts

F Baumann, H Bugdayci, J Grunert... - ... -Aided Design and ..., 2016 - Taylor & Francis
... are intended to be performed manually “ex post” but the further goal is to implement them to be performed **automatically** so they ... Slicing tool **configuration** ... With good slicing tool **configurations** and a well-adjusted **printer** there is no need for a raft which also decreases the **print** ...
☆ 99 Cited by 11 Related articles »

Maintaining and troubleshooting your **3D printer**

C Bell - 2014 - Springer
... The first part covers general topics, including a short introduction to **3D printing**, build tips, **configuration**, and calibration ... It also presents a detailed look at how to **configure** the Marlin firmware for your **printer** ... I routinely use a **3D printer** controller as part of my normal **setup** routine ...
☆ 99 Cited by 20 Related articles All 8 versions »

3D printing with RepRap cookbook

R Salinas - 2014 - books.google.com
... of creating original content and at the same time, expose you to the technical aspects ofthe **3D printing** process ... For thosewho aremore experienced, this book will provide a handy reference for comparing the two **slicers**, Skeinforge and Slic3r ... Overall, thisis my **3Dprinting** bible ...
☆ 99 Cited by 6 Related articles All 5 versions »

Simple and versatile **3D printed** microfluidics using fused filament fabrication

AJL Morgan, LH San Jose, WD Jamieson, JM Wymant... - PloS one, 2016 - journals.plos.org
... optimisation of the surface roughness may be achievable, either through further optimisation of **print** parameters or ... As **printing** resolution improves, and fabrication dimensions reduce, surface roughness optimisation may become of greater ... Fig 4. **3D printer** fidelity measurements ...
☆ 99 Cited by 61 Related articles All 13 versions »

3D printing: clinical applications in orthopaedics and traumatology

F Auricchio, S Marconi - EFORT open reviews, 2016 - online.boneandjoint.org.uk
... b) **automatic**, where the algorithm **automatically** divides the image into regions that show similar characteristics within ... thus they can be simply segmented from medical images using **automatic** or semi-**automatic** algorithms ... **Automated** medical image segmentation techniques ...
☆ 99 Cited by 28 Related articles All 6 versions »

3D printer based slot-die coater as a lab-to-fab translation tool for solution-processed solar cells

D Vak, K Hwang, A Faulks, YS Jung... - Advanced energy ..., 2015 - Wiley Online Library
... **printed** perovskite devices using the **3D printer** to rapidly assay **printing** conditions and **configurations** ... J–V curve of an organometal halide perovskite solar cell with a **configuration** of ITO ... demonstrates the versatility of the **printer** and the potential of fully **automated** production of ...
☆ 99 Cited by 125 Related articles All 2 versions »

Three-dimensional **printing** to facilitate anatomic study, device development, simulation, and planning in thoracic surgery

SN Kurenov, C Ionita, D Sammons... - The Journal of thoracic and ..., 2015 - Elsevier

... **3D** surfaces of anatomic organs can be processed manually, semiautomatically, or fully **automatically** ... A fully **automated** process of PA reconstruction and STL file preparation is ... With the advent of specialized software packages allowing **automatic** segmentation and triangulated ...

☆ 99 Cited by 114 Related articles All 11 versions

Related searches

3d printing **structural integrity**

Prediction of moisture, color and pH in cooked, **pre-sliced** turkey hams by NIR hyperspectral imaging system

A Iqbal, DW Sun, P Allen - Journal of Food Engineering, 2013 - Elsevier

... 1700 nm) to predict the moisture content, pH and color in cooked, **pre-sliced** turkey hams ... In this investigation the best PLSR calibration **model** were used for selecting the optimal ... is emerging as the most robust and reliable chemometric method for constructing **models** when the ...

☆ 99 Cited by 105 Related articles All 5 versions

Colour calibration of a laboratory computer vision system for quality evaluation of **pre-sliced** hams

NA Valous, F Mendoza, DW Sun, P Allen - Meat science, 2009 - Elsevier

... image analysis is a non-destructive tool that has interesting applications for the overall surface characterization and quality inspection of **pre-sliced** hams (Zheng et al ... In this sense, one way to use a digital camera as a colorimeter is to find a **model**, often some type of regression ...

☆ 99 Cited by 213 Related articles All 10 versions

Classification of **pre-sliced** pork and Turkey ham qualities based on image colour and textural features and their relationships with consumer responses

A Iqbal, NA Valous, F Mendoza, DW Sun, P Allen - Meat Science, 2010 - Elsevier

... for characterizing and classifying three different qualities of pork and Turkey **pre-sliced** hams typically ... package StatGraphics Plus v5.1. In order to derive quantitative classification **models**, LDA was ... The logistic regression procedure is designed to fit a regression **model** in which ...

☆ 99 Cited by 43 Related articles All 10 versions

Characterization of fat-connective tissue size distribution in **pre-sliced** pork hams using multifractal analysis

F Mendoza, NA Valous, DW Sun, P Allen - Meat science, 2009 - Elsevier

... provide more information about a distribution of a physical system than fractal **models** (Voss, 1988) ... 2. Representative **pre-sliced** pork ham images per quality type ... Quantification and **modeling** of geometrical features and lacunarity metrics of fat-connective tissue structures from ...

☆ 99 Cited by 15 Related articles All 9 versions

Pre-sliced or do it yourself?–Determinants of schoolchildren's acceptance of convenience fruits and vegetables

JP von Germeten, S Hirsch - Food quality and preference, 2015 - Elsevier

... Volume 44, September 2015, Pages 1-11. Food Quality and Preference. **Pre-sliced** or do it yourself? – Determinants of schoolchildren's acceptance of convenience fruits and vegetables ... We examined 8–10-year-olds' **pre-sliced** fruit and vegetable (F&V) liking in school. • ...

☆ 99 Cited by 7 Related articles All 5 versions

Supervised neural network classification of **pre-sliced** cooked pork ham images using quaternionic singular values

NA Valous, F Mendoza, DW Sun, P Allen - Meat science, 2010 - Elsevier

... Please enable JavaScript to use all the features on this page. Elsevier. Meat Science. Volume 84, Issue 3, March 2010, Pages 422-430. Meat Science. Supervised neural network classification of **pre-sliced** cooked pork ham images using quaternionic singular values ...

☆ 99 Cited by 24 Related articles All 9 versions

Detecting fractal power-law long-range dependence in **pre-sliced** cooked pork ham surface intensity patterns using Detrended Fluctuation Analysis

NA Valous, K Drakakis, DW Sun - Meat science, 2010 - Elsevier

... nature of real images by describing them in terms of an fBm **model** (Valous, Mendoza ... differencing parameter arising from the generalization of the Box–Jenkins ARIMA **models** (Rea, Reale, & ... it is necessary to consider the variability in colour and visual texture of **pre-sliced** hams ...

☆ 99 Cited by 10 Related articles All 9 versions

Development of simplified **models** for nondestructive hyperspectral imaging monitoring of TVB-N contents in cured meat during drying process

Q Yang, DW Sun, W Cheng - Journal of food engineering, 2017 - Elsevier

... select a robust and reliable multivariable data analytical method to process and build a calibration **model** for quantitative ... It is known that PLSR, as one of the typical linear **modeling** methods, has been widely used for the establishment of prediction **models** between spectral ...

☆ 99 Cited by 85 Related articles All 6 versions

The use of lacunarity for visual texture characterization of **pre-sliced** cooked pork ham surface intensities

NA Valous, DW Sun, P Allen, F Mendoza - Food Research International, 2010 - Elsevier

... Thus, for objective characterization, it is required to consider the high variability in colour and textural appearance of **pre-sliced** hams ... information regarding spatial nonstationarity, suitable measurements of complex textures may allow the construction of statistical **models** or the ...

☆ 99 Cited by 27 Related articles All 6 versions

Support generation for fused deposition **modeling**

K Chalsani, L Jones, L Roscoe - 1995 International ..., 1995 - repositories.lib.utexas.edu

... An inherently weaker bond is created between the .release and primary **modeling** materials material, thus ... 1. operator expertise and care in creating a 3D CAD **model**; 2. the triangulation algorithm ... as a simple method of data exchange with scanners and other **pre-sliced** data ...

☆ 99 Cited by 44 Related articles »

From 3D **models** to 3D **prints**: an overview of the processing pipeline

M Livesu, S Ellero, J Martínez… - Computer Graphics …, 2017 - Wiley Online Library

… Similar cost **models** have been proposed in [BL06b, BL06a, TPR04, PDG99, XLW99 … The typical cost **model** is defined as the sum of three major components: pre-build, build, and … of the prototype, which, to a certain extent, can be quantitatively estimated before **printing**, and the …

☆ 99 Cited by 30 Related articles All 14 versions

Colour calibration of a laboratory computer vision system for quality evaluation of **pre-sliced** hams

NA Valous, F Mendoza, DW Sun, P Allen - Meat science, 2009 - Elsevier

… image analysis is a non-destructive tool that has interesting applications for the overall surface characterization and quality inspection of **pre-sliced** hams (Zheng et al … In this sense, one way to use a digital camera as a colorimeter is to find a **model**, often some type of regression …

☆ 99 Cited by 213 Related articles All 10 versions

Method for building three-dimensional **models** with extrusion-based additive manufacturing systems

WJ Swanson, KC Johnson, TA Hjelsand… - US Patent …, 2014 - Google Patents

… 3). However, method 84 is applicable for building 3D **models** and corresponding support structures … 86-100, and initially involves receiving a digital representation of 3D **model** 24 (step … and into multiple layers (step 88), and generating one or more **pre-sliced** support structures …

☆ 99 Cited by 74 Related articles All 4 versions »

Platen planarizing process for additive manufacturing system

JE LaBossiere, MD Bosveld, DF Mannella… - US Patent …, 2017 - Google Patents

… In some embodiments, the slicing operations for the digital **models** of 3D part 30 and … system 44 may generate the digital **model** of planarizing part 34 as a **pre-sliced** set of … In yet a further alternative embodiment, controller system 44 may generate the digital **model** of planarizing …

☆ 99 Cited by 22 Related articles All 4 versions »

Assessment of visible near-infrared hyperspectral imaging as a tool for detection of horsemeat adulteration in minced beef

M Kamruzzaman, Y Makino, S Oshita, S Liu - Food and bioprocess …, 2015 - Springer

… The predictability of these **models** was similar to the PLSR **models** established based on full … Without a good calibration **model** misleading prediction maps might be obtained … Prediction of moisture, color and pH in cooked, **pre-sliced** turkey hams by NIR hyperspectral imaging …

☆ 99 Cited by 67 Related articles All 3 versions »

Slice data representation and format for multi-material objects for additive manufacturing processes

Z Zhang, S Joshi - Rapid Prototyping Journal, 2017 - emeraldinsight.com

… CAD **models** that are sliced and another based on using the directly available **pre-sliced model** … To represent complex 3D **models** with material information, extensive numbers of voxels were required … and topology were represented by a well-established B-Rep **model**, and the …

☆ 99 Cited by 3 Related articles All 2 versions

Patenting Physibles: A Fresh Perspective for Claiming 3D-Printable Products

DH Brean - Santa Clara L. Rev., 2015 - HeinOnline

… To prepare a digital file [created in a 3D **modeling** program] for **printing**, the 3D **modeling** software "slices" the final **model** into hundreds … would be to somehow patent the CAD files per se- untethered to a digital storage medium and not requiring that the files be **pre-sliced** …

☆ 99 Cited by 15 Related articles All 7 versions

Thirty Thousand 3D **Models** from Thingiverse

F Baumann - Data, 2018 - mdpi.com

… Multiple **models** and other files, such as renderings or **pre-sliced** machine instructions, can be part of a … claims to have 981,600 **models** (https://www.thingiverse.com/about) indexed, the extracted 31,121 **models** are far … Rendering (GIF), the name of the GIF rendering of the **model** …

☆ 99 Related articles All 5 versions »

Detection and use of **printer** configuration information

AN Leonard, J Sadusk - US Patent App. 14/587,548, 2016 - Google Patents

... that create on-demand **models**, or services that look up and provide **pre-sliced**, machine-ready ... for determining **printer** capabilities and matching these capabilities to pre-existing machine-ready **models** ... The three-dimensional **model** may be located on the target **printer**, at a ...

☆ 99 Related articles All 2 versions »

Shelf-life kinetic **model** for freeze-dried oranges using sensory analysis and luminance determination

R Bailón-Moreno, V Olivares-Arias, JM Vicaria... - Journal of food science ..., 2018 - Springer

... 1 CrossRefGoogle Scholar. Ibarz A, Pagan J, Garza S (2000) Kinetic **models** of non ... A, Valous NA, Mendoza F, Sun D, Allen P (2010) Classification of **pre-sliced** pork and ... life of homogenized apple-based beikost storage at different temperatures using Weibull hazard **model** ...

☆ 99 Related articles All 6 versions »

Resolution-**Aware Slicing** of CAD Data for 3D **Printing**

I Onyeako - 2016 - ruor.uottawa.ca

... Page 17. 9 Create CAD **Slice** CAD **Print** model Figure 2-3: 3D Basic **Printing** Workflow [14] 2.3 3D **Printing** Methods ... This is to support the evolving applications of 3D **printing** that is including color components. Color helps to make the **printed** object more realistic ...

☆ 99 Cited by 1 Related articles »

... service network platformA Deadline-**Aware** Scheduling Scheme for Connected Car Services Using Mobile Networks with Quality FluctuationRAN **Slicing** to ...

Y SAKUMOTO, T KAMEYAMA, C TAKANO, M AIDA - search.ieice.org

... INVITED PAPER Open Access Paper Medical Healthcare Network **Platform** and Big Data Analysis Based on Integrated ICT and Data Science with Regulatory Science Ryuji Kohno Takumi Kobayashi Chika Sugimoto Yukihiro Kinjo Matti Hämäläinen Jari Iinatti ...

☆ 99 »

Experience report: OCaml for an industrial-strength static analysis framework

P Cuoq, J Signoles, P Baudin, R Bonichon... - ACM Sigplan ..., 2009 - dl.acm.org

... For some 64- bit-**aware platforms** (Mac OS X), it is a simple configure option to choose ... for comparison that Java or .NET/Mono do not come pre-installed on every **platform** either ... to be expressed with objects (or, for that matter, class types): equality, pretty- **printing**, hashconsing ...

☆ 99 Cited by 60 Related articles All 11 versions

MANTIS OS: An embedded multithreaded operating system for wireless micro sensor **platforms**

S Bhatti, J Carlson, H Dai, J Deng, J Rose... - Mobile Networks and ..., 2005 - dl.acm.org

... as QNX and VXWorks occupy too large of a memory foot- **print** to execute on micro ... across both physical sensor nodes as well as virtual sensor nodes run- ning on X86 **platforms** ... perimentation with the network stack in user space, and also enables cross-**platform** prototyping of ...

☆ 99 Cited by 648 Related articles All 25 versions »

RevoMaker: Enabling multi-directional and functionally-embedded 3D **printing** using a rotational cuboidal **platform**

W Gao, Y Zhang, DC Nazzetta, K Ramani... - Proceedings of the 28th ..., 2015 - dl.acm.org

... Once the remaining two partitioned geometries are **printed**, we snap off two handles for completing the **print**. Throughout the whole fabrication process, we calibrate the surface location of the cuboid twice before **printing** the first and the fifth facets ...

☆ 99 Cited by 45 Related articles All 3 versions »

SemSlice: Exploiting Relational Verification for Automatic Program **Slicing**

B Beckert, T Bormer, S Gocht, M Herda... - ... on Integrated Formal ..., 2017 - Springer

... Thus, SemSlice provides a **platform** for relational verification based **slicing** for the software **slicing** ... added and then subtracted) that each focus on a particular challenge for semantics-**aware slicing** ... 10.1007/978-3-319-66845-1_20; Publisher Name Springer, Cham; **Print** ISBN 978 ...

☆ 99 Related articles All 4 versions »

Creation of DICOM—**aware** applications using ImageJ

DP Barboriak, AO Padua, GE York, JR MacFall - Journal of Digital Imaging, 2005 - Springer

... The answer will depend to a large extent on local factors: familiarity with image-analysis **platforms**, flexibility of the ... The many advantages of using ImageJ as the **platform** to create image-processing applications are enhanced by ... **Print** ISSN 0897-1889; Online ISSN 1618-727X ...

☆ 99 Cited by 124 Related articles All 14 versions »

Inkjet **printing** of polymers: state of the art and future developments

BJ De Gans, PC Duineveld, US Schubert - Advanced materials, 2004 - Wiley Online Library

... A piezoelectric Microfab **print** head was utilized in combination with an Asymtek fluid dispenser **platform** ... ethylene gly- col) (PEG, Mw 6000, 20 g L±1) and poly(methyl methacrylate) (PMMA, Mw 14 400, 20 g L±1) were **printed** using a ... B.-J. de Gans et al./Inkjet **Printing** of Polymers ...

☆ 99 Cited by 1665 Related articles All 6 versions

Collaborative cloud **printing** service

F Baumann, J Eichhoff, D Roller - International Conference on ..., 2016 - Springer

... are intended where the user can track the number and nature of **printed** objects as ... 3. implement secure data storage for **print** related artefacts Those projects are to be incorporated in the ... Scholar. 4. Baumann, F., Roller, D.: Vision based error detection for 3D **printing** processes ...

☆ 99 Cited by 6 Related articles »

Exploration of economical 3D printer

M Yu, C Tan - 2017 7th International Conference on ..., 2017 - atlantis-press.com

... user in a certain period of time to understand and learn "fool" **print** operation [13 ... of various fields, Therefore, based on the above situations, the innovation of 3D **printing** technology will ... products **printed** by many existing 3D printers, whether we can finally repair and improve them ...

☆ 99 Related articles »

Related searches

printed **parts** slicing **tools**

Downloadable three-dimensional **models**

NB Pettis, AJ Buser, J Day, J Gold... - US Patent App. 13 ..., 2013 - Google Patents

... FIG. 5 shows a flow chart for providing machine-ready **models** of three-dimensional objects ... The following description emphasizes three-dimensional **printers** using fused deposition **modeling** or similar techniques ... or the like to form a three-dimensional object from a digital **model** ...

☆ 99 Cited by 26 Related articles All 2 versions »

A **3D** content cloud: sharing, trading and customizing **3D print-ready** objects

KC Ng, WM Pang - ... Conference on Multimedia Big Data (BigMM ..., 2016 - ieeexplore.ieee.org

... A web interface for customizing the **3D print-ready** contents ... in Figure 3. To allow better performance, the AAD histogram feature is precomputed for all the **3D models** in the ... While, the feature of **model** in query will be computed just in time, and compare similarities among the ...

☆ 99 Cited by 4 Related articles All 2 versions

Thingi10k: A dataset of 10,000 **3d-printing models**

Q Zhou, A Jacobson - arXiv preprint arXiv:1605.04797, 2016 - arxiv.org

... example, a simple frequency analysis indicates OpenSCAD is the most pop- ular **modeling** tool used ... Furthermore, due its fabrication-focused nature, many uploaded meshes are "**print-ready**" in the sense ... have tried to solve problems such as decompos- ing a large **model** to fit ...

☆ 99 Cited by 18 Related articles All 3 versions »

Downloadable three-dimensional **models**

NB Pettis, AJ Buser, J Day, J Gold, B Vaccaro... - US Patent ..., 2017 - Google Patents

... For example, a user may be authorized to print a **model** only when the user is ... for third party verification of identity, encryption or decryption of three-dimensional **models**, and so ... the other resources 216 may include online tools for three-dimensional design or **modeling**, as well ...

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Downloadable three-dimensional **models**

NB Pettis, AJ Buser, J Day, J Gold... - US Patent App. 13 ..., 2013 - Google Patents

... For example, a user may be authorized to print a **model** only when the user is ... for third party verification of identity, encryption or decryption of three-dimensional **models**, and so ... the other resources 216 may include online tools for three-dimensional design or **modeling**, as well ...

☆ 99 Cited by 10 Related articles All 2 versions »

3D printed molecules and extended solid **models** for teaching symmetry and point groups

VF Scalfani, TP Vaid - Journal of Chemical Education, 2014 - ACS Publications

... chemistry course.(17) More importantly, with **3D printing** technology, any **model** can be ... in the literature.(19, 20) Chakraborty and Zuckermann recently developed a custom **3D printed** design and fabrication procedure for representing physical **models** of biomacromolecules ...

☆ 99 Cited by 72 Related articles All 5 versions »

Programmatic conversion of crystal structures into **3D** printable files using Jmol

VF Scalfani, AJ Williams, V Tkachenko... - Journal of ..., 2016 - biomedcentral.com

... stereolithography file (STL) for single color **3D printing** or a virtual reality **modeling** language file ... 2d). In both examples, a VRML **3D model** file was created containing only the single ... quickly locate a large collection (>30,000) of crystal structures that are **3D print ready**; no further ...

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Semantic medical image to **3d** print of anatomic structure

SK Zhou, B Geiger - US Patent App. 14/539,051, 2016 - Google Patents

... **3D print ready model** of the predetermined representation of the anatomy is converted into a **3D print ready model** specific to ... Other **models** may be **printed** ... In other examples, a display is provided for displaying the transformed **3D printer model** of the anatomy or images derived ...

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Beginning design for **3D printing**

J Micallef - 2015 - books.google.com

... 93 EnSuring That **3D MOdels** Are **3D Print Ready** ... Having the design skills to **model** objects for **3D printing** is no trivial matter, and unfortunately ... lower left, and Meshmixer at the lower right) can help newcomers learn **3D modeling** skills right ...

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AutoConnect: computational design of **3D**-printable connectors

Y Koyama, S Sueda, E Steinhardt, T Igarashi... - ACM Transactions on ..., 2015 - dl.acm.org

... want a special kind of case or connector, chances are that this specific **3D model** will not ... Such an example- based approach to **modeling** is promising, especially to help novice users with ... is an implicit example-based method, since we use a **database** of parametric **models** of **3D** ...

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three dimensional 3d printing **chemical** models

materials science and engineering 3d printing

A university-wide collaborative effort to designing a makerspace at an academic health sciences **library**

J Herron, K Kaneshiro - Medical reference services quarterly, 2017 - Taylor & Francis

... and a Cube 3. The Cube **printers** operate using a fused deposition **modeling** (FDM) system ... which extrudes layer upon layer of melted plastic to create the final **3D model**.6 The ... As scanning **3D** objects and the software for creating **print-ready models** have a steep learning curve ...

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Improved understanding of brain morphology through **3D printing**: A brief guide

C Madan - Research Ideas and Outcomes, 2016 - riojournal.com

... Information for repairing meshes to make them **print-ready** was inspired by a tutorial from the University of Alberta **Library** website (https://**library**.ualberta.ca/ services/3dprinting/preparing-**3d-model**). The **3D models** were printed by the University of Alberta **Libraries** ...

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Clever support: Efficient support structure generation for digital fabrication

J Vanek, JAG Galicia, B Benes - Computer graphics forum, 2014 - Wiley Online Library

... In this work we will focus mainly on Fused Deposition **Modeling** (FDM) **printers** since they are very common, inexpensive, and widely used ... Most of them addressed the possible printability and structural problems of the **3D models** before they are printed ... the **model**. 7. Results ...

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3D printed molecules and extended solid **models** for teaching symmetry and point groups

VF Scalfani, TP Vaid - Journal of Chemical Education, 2014 - ACS Publications

... University **Libraries**, Rodgers **Library** for Science and ... in one piece directly from a digital **3D** design file, greatly simplifying the process of fabricating molecular **models** ... groups in an inorganic chemistry course.(17) More importantly, with **3D printing** technology, any **model** can be ...

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Semantic medical image to **3d** print of anatomic structure

SK Zhou, B Geiger - US Patent App. 14/539,051, 2016 - Google Patents

... The **3D print ready model** of the predetermined representation of the anatomy is converted into a **3D print ready model** specific to the patient ... Other **models** may be printed ... to be altered are identified, such as by a classifier or labeling stored for the template mesh or **3D** print **model** ...

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Investigating the implications of **3D printing** in special education

E Buehler, N Comrie, M Hofmann, S McDonald... - ACM Transactions on ..., 2016 - dl.acm.org

... Specifically, they were concerned that the planned **3D modeling** curriculum might prove a challenge for the vision ... goals for the **3D printer** are to create tactile graphics and hand-held **models** and provide ... of it is marketed as, 'Oh it will scan and you'll get a **print-ready model**' and I ...

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Preparation and fabrication of a full-scale, sagittal-sliced, **3D**-printed, patient-specific radiotherapy phantom

DF Craft, RM Howell - Journal of applied clinical medical ..., 2017 - Wiley Online Library

... Warping is most prevalent with **3D printers** that use fused deposition **modeling** technology, but other **printing** technologies, like ... The **print-ready** files were saved onto an SD card ... **models** of slice number 8. (a) The planning **model** used to print slice 8, and (b) the **model** based on ...

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Decentralization and localization of production: The organizational and economic consequences of additive manufacturing (**3D Printing**)

A Ben-Ner, E Siemsen - California Management Review, 2017 - journals.sagepub.com

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J Micallef - 2015 - books.google.com

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Dhaval Parmar ; Sabarish V. Babu ; Lorraine Lin ; Sophie Jörg ; Nikeetha D'Souza ; Alison E. Leonard ; Shaundra B. Daily
2016 Research on Equity and Sustained Participation in Engineering, Computing, and Technology (RESPECT)
Year: 2016
Pages: 1 - 2
IEEE Conferences
Abstract (3232 Kb)

Can embodied interaction and virtual peer customization in a virtual programming environment enhance computational thinking?

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2016 Research on Equity and Sustained Participation in Engineering, Computing, and Technology (RESPECT)
Year: 2016

Programming moves: Design and evaluation of applying embodied interaction in virtual environments to enhance computational thinking in middle school students
Dhaval Parmar ; Joseph Isaac ; Sabarish V. Babu ; Nikeetha D'Souza ; Alison E. Leonard ; Sophie Jörg ; Kara Gundersen ; Shaundra B. Daily
2016 IEEE Virtual Reality (VR)
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Programming moves: Design and evaluation of applying embodied interaction in virtual environments to enhance computational thinking in middle school students

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I-Sheng Lin ; Tsai-Yen Li ; Fang-Chi Liang ; Yong-Teng Lin
2017 IEEE 17th International Conference on Advanced Learning Technologies (ICALT)
Year: 2017
Pages: 502 - 506
Cited by: Papers (1)
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A Collaborative Learning System for Sharing 3D Models: 3D Model Co-learning Space

I-Sheng Lin | Tsai-Yen Li | Fang-Chi Liang | Yong-Teng Lin
2017 IEEE 17th International Conference on Advanced Learning Technologies (ICALT)
Year: 2017

Proposal for 3D-printing regulation technique in fabricating illegal objects using feature-vector based matching algorithm of 3D shapes
Toshio Modegi
2016 55th Annual Conference of the Society of Instrument and Control Engineers of Japan (SICE)
Year: 2016
Pages: 877 - 883
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Proposal for 3D-printing regulation technique in fabricating illegal objects using feature-vector based matching algorithm of 3D shapes

Toshio Modegi
2016 55th Annual Conference of the Society of Instrument and Control Engineers of Japan (SICE)
Year: 2016

Human localization system using 3D two-dimension code
Jianhong Zou ; Qianchuan Zhao ; Chengjun Jia
2017 29th Chinese Control And Decision Conference (CCDC)
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Pages: 1819 - 1825
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Abstract (578 Kb)

Human localization system using 3D two-dimension code

Jianhong Zou | Qianchuan Zhao | Chengjun Jia
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Year: 2017

Material Optimization Method in 3D Printing
Md. Hazrat Ali ; GazizYerbolat ; ShynggysAmangeldi
2018 IEEE International Conference on Advanced Manufacturing (ICAM)
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Material Optimization Method in 3D Printing

Md. Hazrat Ali | GazizYerbolat | ShynggysAmangeldi
2018 IEEE International Conference on Advanced Manufacturing (ICAM)
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Statistical process control for solder deposition and yield enhancement
R. Muthaiyan ; V. Barba ; K. Srihari
4th Electronics Packaging Technology Conference, 2002.
Year: 2002
Pages: 212 - 217
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Statistical process control for solder deposition and yield enhancement

R. Muthaiyan | V. Barba | K. Srihari
4th Electronics Packaging Technology Conference, 2002.
Year: 2002

Workshop Rapid Prototyping - A new approach to introduce digital manufacturing in engineering education
Stefan Junk ; Rebecca Matt
2015 International Conference on Information Technology Based Higher Education and Training (ITHET)
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Workshop Rapid Prototyping - A new approach to introduce digital manufacturing in engineering education

Stefan Junk | Rebecca Matt
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Year: 2015

A performance evaluation of surface normals-based descriptors for recognition of objects using CAD-models
C. M. Mateo ; P. Gil ; F. Torres
2014 11th International Conference on Informatics in Control, Automation and Robotics (ICINCO)
Year: 2014 Volume: 02
Pages: 428 - 435
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A performance evaluation of surface normals-based descriptors for recognition of objects using CAD-models

C. M. Mateo | P. Gil | F. Torres
2014 11th International Conference on Informatics in Control, Automation and Robotics (ICINCO)
Year: 2014 Volume: 02

Virtual reality technologies as an interface of cognitive communication and information systems
Branislav Sobota ; František Hrozek ; Štefan Korečko ; Csaba Szabó
2011 2nd International Conference on Cognitive Infocommunications (CogInfoCom)
Year: 2011
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Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	8247	automatic$4 detect$3 hardware reconfiguration printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L2	1	automatic$4 detect$3 hardware reconfiguration printer and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L3	16	automatic$4 detect$3 hardware (reconfiguration|chang$3) printer and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L4	1	automatic$4 detect$3 hardware (reconfiguration|chang$3) printer and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2019/05/09 12:35
L5	1	automatic$4 detect$3 (hardware|equipment|settings) (reconfiguration|chang$3) and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2019/05/09 12:35
L6	1	automatic$4 detect$3 hardware (reconfiguration|chang$3) and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2019/05/09 12:35
L7	2	automatic$4 (hardware|equipment|settings) (reconfiguration|chang$3) and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2019/05/09 12:35
L8	3	monitor$3 (hardware|equipment|settings)	US-PGPUB;	SAME	ON	2019/05/09

		(reconfiguration|chang$3) and B29C67/0088.cpc.	USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			12:35
L9	3	monitor$3 (hardware|equipment|accessor$3) (reconfiguration|chang$3) and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2019/05/09 12:35
L10	3	monitor$3 (hardware|equipment|accessor$3) (reconfiguration|reconfiguration|chang$3|add|remove) and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2019/05/09 12:35
L11	3	(automatic$4|monitor$3|detect$3) (hardware|equipment|accessor$3) (reconfiguration|reconfiguration|chang$3|add|remove) and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2019/05/09 12:35
L12	29584	(automatic$4|monitor$3|detect$3) (hardware|equipment|accessor$3) (reconfiguration|reconfiguration|chang$3|add|remove) and printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2019/05/09 12:35
L13	819	(automatic$4|monitor$3|detect$3) (hardware|equipment|accessor$3) (reconfiguration|reconfiguration|chang$3|add|remove) and (3D|3-D|Three-D|Three-Dimensional|3-Dimensional|"Three Dimensional") with printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2019/05/09 12:35
L14	2530	automatic$4 detect$3 hardware reconfiguration (3D|3-D|Three-D|Three-Dimensional|3-Dimensional|"Three Dimensional") printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L15	44419	automatic$4 detect$3 hardware (reconfiguration|reconfiguration|chang$3|add$3|remov$3) (3D|3-D|Three-D|Three-Dimensional|3-Dimensional|"Three Dimensional") printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L16	78	automatic$4 detect$3 hardware (reconfiguration|reconfiguration|chang$3|add$3|remov$3) and (3D|3-D|Three-D|Three-Dimensional|3-Dimensional|"Three Dimensional") printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	SAME	ON	2019/05/09 12:35

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L17	1497	automatic$4 detect$3 hardware (re-configuration|reconfiguration|chang$3|add$3|remov$3) and printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2019/05/09 12:35
L18	1	automatic$4 detect$3 hardware reconfiguration and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L19	4	("20150331402" | "6227643" | "7639253" | "7052103").PN.	US-PGPUB; USPAT	AND	ON	2019/05/09 12:35
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L27	518	700/98.ccls. and printer and model	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L28	116	700/98.ccls. and printer and model and slice	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L29	1727	B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L30	644	B29C67/0088.cpc. and printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L31	238	B29C67/0088.cpc. and printer and model	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L32	46	B29C67/0088.cpc. and printer and model and slic$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L33	6	B29C67/0088.cpc. and printer and model and slic$3 and @ay<"2014"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L34	42828	G05B15/02.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	AND	ON	2019/05/09 12:35

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L35	463	G05B15/02.cpc. and G06F17/50.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L36	30	G05B15/02.cpc. and G06F17/50.cpc. and L29	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L37	16108	B33Y50/02.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L38	30	L37 and L36	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L39	2733	store and sliced and model and printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L40	354	store and sliced with model and printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L41	2206	automatic configuration slicing printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L42	1999	automatic configuration slicing printer (cloud|network)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L43	18	automatic configuration slicing printer (cloud|network) machine-ready	US-PGPUB; USPAT; USOCR; FPRS;	AND	ON	2019/05/09 12:35

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L44	5	automatic configuration slicing printer (cloud|network) pre-sliced	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L45	3693	automatic configuration slicing model (cloud|network)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L46	42589	automatic$4 (configuration|configured|configures) (slicing|slices|sliced) model (cloud|network|stored)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L47	67	automatic$4 with (configuration|configured|configures) with (slicing|slices|sliced) and model with (cloud|network|stored)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L48	126	automatic$4 with (configuration|configured|configures) same (gcode|slice|slicing|slicer|sliced|slices) and model with (cloud|network|stored)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L49	1608	automatic$4 with (configuration|configured|configures) same (gcode|slice|slicing|slicer|sliced|slices|printer|3D|three-dimensional) and model with (cloud|network|stored)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L50	47839	machine ready model library	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L51	49	machine ready model library	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2019/05/09 12:35
L52	2	"20140156053".pn.	US-PGPUB; USPAT;	SAME	ON	2019/05/09 12:35

			USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
L53	5	(20020041386|20120224755).pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L54	3	(makerbot adj industries).as,aanm. @ad="20141231"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L55	26159	(remote print server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2019/05/09 12:35
L56	2142	(remote print server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2019/05/09 12:35
L57	498	(remote print server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	WITH	ON	2019/05/09 12:35
L58	45	(remote print server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/05/09 12:35
L59	35	(remote print server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM) and @ad<"20141231"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/05/09 12:35
L60	24840	(remote server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM) and @ad<"20141231"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/05/09 12:35

L61	54219	(remote server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM) and @ad<"20141231"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	WITH	ON	2019/05/09 12:35
L62	347	(remote print server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM) and @ad<"20141231"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	WITH	ON	2019/05/09 12:35
L63	1417	(remote print$3 server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM) and @ad<"20141231"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	WITH	ON	2019/05/09 12:35
L64	100	(remote print$3 server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM) and @ad<"20141231"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/05/09 12:35
L65	9	("20020166220" | "20030105538" | "20050025354" | "20050157919" | "20060293906" | "20070084047" | "20130090894" | "20140121820" | "20140244433").PN.	US-PGPUB; USPAT; USOCR	AND	ON	2019/05/09 12:35

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L66	91	(request printer target (propert$3|parameter)).clm.	US-PGPUB; USPAT	AND	ON	2019/05/09 12:48
L67	101	(request$3 printer target (propert$3|parameter)).clm.	US-PGPUB; USPAT	AND	ON	2019/05/09 12:48
L68	104	(request$3 (printer|cnc|adm|sdm) target (propert$3|parameter)).clm.	US-PGPUB; USPAT	AND	ON	2019/05/09 12:48
L69	1187	(request$3 (printer|cnc|adm|sdm) (propert$3|parameter)).clm.	US-PGPUB; USPAT	AND	ON	2019/05/09 12:48
L70	101	(request$3 (printer|cnc|adm|sdm) model$3 (propert$3|parameter)).clm.	US-PGPUB; USPAT	AND	ON	2019/05/09 12:49

5/9/2019 12:53:46 PM
C:\Users\jsanders3\Documents\EAST\Workspaces\14587548.wsp

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Serial No.: 14/587,548
Filing Date: December 31, 2014
In re: LEONARD, Alison N., *et al.*
Art Unit: 2119
Examiner: SANDERS, Joshua T.
Conf. No.: 6946

Commissioner for Patents
PO Box 1450
Alexandria, Virginia 22313-1450

REQUEST FOR CONTINUED EXAMINATION

Dear Commissioner:

In response to the Final Office Action mailed December 26, 2018, the applicant requests continued examination of this application pursuant to 37 C.F.R. § 1.114. The fee of $1,900 as specified by 37 C.F.R. § 1.17(e)(2) accompanies this request.

Please enter the following before continued examination of this application:

Amendments to the Claims begin on page 2 of this paper.

Remarks begin on page 6 of this paper.

Electronic Patent Application Fee Transmittal					
Application Number:	14587548				
Filing Date:	31-Dec-2014				
Title of Invention:	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION				
First Named Inventor/Applicant Name:	Alison N. Leonard				
Filer:	Thomas John Bassolino/Paula Ng				
Attorney Docket Number:	MBOT-0070-P01				
Filed as Large Entity					
Filing Fees for Utility under 35 USC 111(a)					
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($)
Miscellaneous:				
RCE- 2ND AND SUBSEQUENT REQUEST	1820	1	1900	1900
		Total in USD ($)		**1900**

Electronic Acknowledgement Receipt	
EFS ID:	35530086
Application Number:	14587548
International Application Number:	
Confirmation Number:	6946
Title of Invention:	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION
First Named Inventor/Applicant Name:	Alison N. Leonard
Customer Number:	43520
Filer:	Thomas John Bassolino/Paula Ng
Filer Authorized By:	Thomas John Bassolino
Attorney Docket Number:	MBOT-0070-P01
Receipt Date:	26-MAR-2019
Filing Date:	31-DEC-2014
Time Stamp:	13:39:06
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		MBOT-0070-P01_20190326_RCE.pdf	151737 677a6f393da7d96ea3e7fdaf93fc742c351b2ac0	yes	10

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Applicant Arguments/Remarks Made in an Amendment	6	10
	Claims	2	5
	Request for Continued Examination (RCE)	1	1

Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30452 52bc8121432b9b8b649efd291bb012c2c14c9eb8	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	182189		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

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.

Remarks

Status of the Claims

Claims 1, 6 and 32 are amended. Claim 7 is canceled. New claim 35 is added. Claims 1–6, 8–13, 15–17, 20 and 32–35 are presented for examination, where claim 1 is independent.

No new matter is added.

Comment to the Examiner's "Response to Arguments"

As suggested by the examiner in the "Response to Arguments," the claims have been amended to clarify that the property contained in the dictionary comes from the target printer, and the claims have been amended to clarify that the property in question is itself from configuration information in the dictionary.[1] Specifically, the applicant has hereby amended independent claim 1 to recite: "querying the target printer from the remote print server for ~~one or more properties~~ *configuration information of the target printer* relevant to creation of a printable model for fabrication of the object *on the target printer*; receiving a *dictionary of configuration information from the target printer*, the configuration information containing [[the]] one or more properties ~~from~~ *of the target printer that affect fabrication capabilities of the target printer*; creating a fabrication profile for fabrication of the object *on the target printer based on the one or more properties, the fabrication profile specifying one or more parameters of the printable model consistent with the fabrication capabilities of the target printer* . . . ."

Claim Rejections – 35 U.S.C. § 103

Independent claim 1 stands rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Pat. Pub. No. 2013/0329258 to Pettis, *et al.* ("*Pettis*") in view of U.S. Pat. Pub. No. 2014/0156053 to Mahdavi, *et al.* ("*Mahdavi*"). This rejection is traversed for at least the following reasons.

[1] The "Response to Arguments" state that, "[u]nder Broadest Reasonable interpretation, the claim as presently presented does not appear to require that the information contained in the dictionary come *directly* from the printer, and the query to the printer does not appear to require that the property in question *be* the dictionary, or any of the contents of the dictionary, merely at least one property that is 'relevant to the fabrication of the object.'" Final Office Action mailed December 26, 2018 (hereinafter "Office Action"), pp. 2–3.

The applicant has devised a technique for using a remote print server to provide compatible 3D models based on a "dictionary" of information received from a target 3D printer, where the dictionary includes configuration information containing properties of the target 3D printer that affect fabrication capabilities thereof. "While a three-dimensional printer may know its own hardware and software configuration, a service providing machine-ready models may not."[2] To address this issue, the claimed invention provides "useful techniques for determining printer capabilities and matching these capabilities to pre-existing machine-ready models,"[3] and as necessary, "for the generation of a machine-ready representation of the three-dimensional model that is executable on the target printer."[4] The claims have been amended to clarify this inventive concept as well as to concretely recite that, unlike the cited art, configuration information of a target printer such as user customizations can be contained in a dictionary that is received from the target printer in response to a query from a remote print server.

Pettis is directed to "[a] server . . . stor[ing] a number of different models of an object in machine-ready form corresponding to a number of different three-dimensional printers having differing capabilities and/or hardware configurations."[5] "When a user at a . . . printer requests the object, the server automatically determines a printer type and selects a suitable, corresponding machine-ready model for immediate fabrication by the printer."[6] *Pettis* may teach a technique for providing suitable machine-ready models to target printers, however *Pettis* does not teach or suggest querying a target printer for properties relevant to creation of a printable model for fabrication of a particular object and receiving a dictionary of the properties in response, as claimed. The outstanding Office Action acknowledges this deficiency:

> However, PETTIS fails to clearly specify:
>
> • querying the target printer from the remote print server for one or more properties relevant to creation of a printable model for fabrication of the object;

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[2] As-filed Specification (hereinafter "Specification"), ¶ [0002].
[3] Specification, ¶ [0075].
[4] Specification, ¶ [0099]; *see also id.* at ¶ [0078] ("To this end, the machine-ready representation may be configured for use on the target printer based on the properties of the target printer.").
[5] *Pettis*, Abstract.
[6] *Pettis*, Abstract.

> • receiving a dictionary of the one or more properties from the target printer;[7]

Mahdavi does not fill the void left by *Pettis*. *Mahdavi* generally contemplates systems for content control in three-dimensional printing including "method of authenticating the printing of a three-dimensional (3D) article at a 3D printer."[8] In this process, *Mahdavi* contemplates a service provider that maintains a database of printer information from various manufacturers. "Once the manufacturer's database record 37 has been created, the server 31 requests information regarding the 3D printer's [sic] 45 that the manufacturer 19 would like to register with the service provider."[9] This process for registering printers at a service provider includes the acquisition of a unique identifier and printer information from the manufacturer:

> The unique identifiers associated with each 3D printer are received at step 87, along with the optional associated printer performance data. This data is stored in the registered manufacturer's database record 37, at step 89, and the registration process is completed.[10]

However, requesting information that a manufacturer would like to register as described in *Mahdavi* is different than *querying a target printer for configuration information thereof* as claimed, and receiving a unique identifier and performance data from the manufacturer in a registration process is different than, in response to a query to a target printer, *receiving, from the target printer, a dictionary of configuration information containing one or more properties of the target printer that affect fabrication capabilities of the target printer*, as presently claimed. Even if the technique described in *Mahdavi* could be adapted to facilitate a query for printer information affecting fabrication capabilities as claimed, which the applicant does not presently concede, this would fail to result in the claimed invention. For example, as a significant advantage, the applicant's technique for querying a printer for information before allocating a fabrication-ready model permits the print server to accurately account for end-user print settings, hardware customizations, and the like, any of which may be modified by the printer operator independently from the manufacturer.

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[7] Office Action, p. 7.
[8] *Mahdavi*, Abstract.
[9] *Mahdavi*, ¶ [0071].
[10] *Mahdavi*, ¶ [0073].

Mahdavi does not appear to teach or fairly suggest any step of "querying the target printer from the remote print server for configuration information of the target printer relevant to creation of a printable model for fabrication of the object on the target printer." *Mahdavi* also does not appear to teach or fairly suggest any responsive step of "receiving, from the target printer, a dictionary of configuration information containing one or more properties of the target printer that affect fabrication capabilities of the target printer." Because *Mahdavi* does not disclose these claimed features, *Mahdavi* cannot render claim 1 unpatentable, either alone or in combination with the remaining art of record.

For the foregoing reasons, independent claim 1 is believed to be patentable over the art of record. The remaining claims depend from an allowable base claim and are likewise in condition for allowance. The applicant respectfully requests reconsideration and withdrawal of the outstanding claim rejections under 35 U.S.C. § 103.

Conclusion

In view of the foregoing, the applicant believes that the currently pending claims are in condition for allowance and respectfully requests a corresponding Notice of Allowance.

The applicant believes that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed.

Nothing in this paper should be construed as intent to concede any issue with regard to any claim, except as specifically stated in this paper. The amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

The Director is hereby authorized to charge any fees or to credit any overpayments associated with this filing to Deposit Account No. 50-4262. If the examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned.

Respectfully submitted
STRATEGIC PATENTS, P.C.

/Thomas J. Bassolino/
Thomas J. Bassolino
Reg. No. 65,946
Tel.: (646) 238-1234

March 26, 2019

Amendments to the Claims

Please amend the claims according to the following claim listing, which replaces all prior versions and listings of the claims in this application:

1. (Currently amended) A method comprising:

receiving a request to fabricate an object from a three-dimensional model at a remote print server;

determining a target printer to fabricate the object at the remote print server;

querying the target printer from the remote print server for ~~one or more properties~~ configuration information of the target printer relevant to creation of a printable model for fabrication of the object on the target printer;

receiving, from the target printer, a dictionary of configuration information containing [[the]] one or more properties ~~from~~ of the target printer that affect fabrication capabilities of the target printer;

creating a fabrication profile for fabrication of the object on the target printer based on the one or more properties, the fabrication profile specifying one or more parameters of the printable model consistent with the fabrication capabilities of the target printer;

determining whether a suitable machine-ready model is available for the fabrication profile based on at least one of the one or more properties relevant to selection of a machine-ready model from a content source;

when a suitable machine-ready model is available from the content source, selecting the suitable machine-ready model for transmission to the target printer; and

when a suitable machine-ready model is not available from the content source, processing the three-dimensional model according to the fabrication profile, and generating a machine-ready representation of the processed three-dimensional model executable by the target printer to fabricate the object based on the one or more properties ~~relevant to the creation of a printable model~~.

2. (Previously presented) The method of claim 1 further comprising transmitting one or more of the suitable machine-ready model and the machine-ready representation to the target printer for fabrication.

3. (Original) The method of claim 1 further comprising fabricating the object with the target printer.

4. (Original) The method of claim 1 wherein the one or more properties include a hardware configuration of the target printer.

5. (Original) The method of claim 4 wherein the hardware configuration includes one or more of an extruder type, an extruder nozzle diameter, a build volume, a build platform type, a hardware version number, a top speed for linear movement of a tool, a step size for movement of the tool, a minimum z-axis step size, a gantry type, and a build material type.

6. (Currently amended) The method of claim 4 wherein the hardware configuration includes one or more of an automatically detected hardware reconfiguration and a manually specified hardware reconfiguration.

7. (Canceled)

8. (Original) The method of claim 1 wherein the one or more properties include a firmware configuration of the target printer.

9. (Original) The method of claim 1 wherein the one or more properties include one or more user settings on the target printer.

10. (Original) The method of claim 9 wherein the one or more user settings include user settings from a previous fabrication process.

11. (Original) The method of claim 1 wherein the one or more properties include an application used to operate the target printer.

12. (Original) The method of claim 1 wherein the one or more properties include a build material in the target printer.

13. (Original) The method of claim 1 further comprising receiving an identifier from the target printer and applying the identifier to retrieve the dictionary from a repository of printer information remote from the target printer.

14. (Canceled)

15. (Previously presented) The method of claim 1 wherein the suitable machine-ready model is selected from a plurality of stored machine-ready models.

16. (Original) The method of claim 15 further comprising:

determining whether one of the plurality of stored machine-ready models can be modified to meet the fabrication profile;

modifying the one of the plurality of stored machine ready models for use as the machine-ready representation if possible; and

generating a new machine-ready representation according to the fabrication profile for use as the machine-ready representation if not possible.

17. (Original) The method of claim 16 wherein modifying includes one or more of translating the machine-ready representation, rotating the machine-ready representation, scaling the machine-ready representation, and changing a top speed in a tool path for the target printer.

18–19. (Canceled)

20. (Previously presented) The method of claim 1 further comprising generating descriptive metadata to accompany one or more of the suitable machine-ready model and

the machine-ready representation, the descriptive metadata specifying one or more properties for comparison to properties of printers selected for fabricating the model.

21–31. (Canceled)

32. (Currently amended) The method of claim 1 wherein determining a target printer includes use of [[the]] one or more selection criteria ~~include~~ including one or more of information related to the three-dimensional model, information related to the object, a print queue, a prioritization, a location of the target printer, a timeline, and an attribute of the target printer.

33. (Previously presented) The method of claim 1 wherein the one or more properties include one or more of a user configuration, a user preference, and a hardware accessory added to the target printer by a user.

34. (Previously presented) The method of claim 1 further comprising, when the machine-ready model is received by the target printer, comparing metadata for the machine-ready model to one or more printer properties in the dictionary to ensure that the machine-ready model can be fabricated by the target printer.

35. (New) The method of claim 1 wherein the one or more properties include at least one customization made by a user to a hardware configuration or a software configuration of the target printer.

Electronic Patent Application Fee Transmittal					
Application Number:	14587548				
Filing Date:	31-Dec-2014				
Title of Invention:	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION				
First Named Inventor/Applicant Name:	Alison N. Leonard				
Filer:	Thomas John Bassolino/Paula Ng				
Attorney Docket Number:	MBOT-0070-P01				
Filed as Large Entity					
Filing Fees for Utility under 35 USC 111(a)					
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($)
Miscellaneous:				
RCE- 2ND AND SUBSEQUENT REQUEST	1820	1	1900	1900
		Total in USD ($)		**1900**

Electronic Acknowledgement Receipt	
EFS ID:	35530162
Application Number:	14587548
International Application Number:	
Confirmation Number:	6946
Title of Invention:	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION
First Named Inventor/Applicant Name:	Alison N. Leonard
Customer Number:	43520
Filer:	Thomas John Bassolino/Paula Ng
Filer Authorized By:	Thomas John Bassolino
Attorney Docket Number:	MBOT-0070-P01
Receipt Date:	26-MAR-2019
Filing Date:	31-DEC-2014
Time Stamp:	13:42:39
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$1900
RAM confirmation Number	032619INTEFSW13431100
Deposit Account	504262
Authorized User	Paula Ng
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Fee Worksheet (SB06)	fee-info.pdf	30451 3a9f7c4365879b869e245edc137f057bb3aeed92	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	30451		

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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
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PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/587,548	Filing Date 12/31/2014	☐ To be Mailed

ENTITY: ☑ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $80 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $420 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	03/26/2019	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0		x $100 =	0
	Independent (37 CFR 1.16(h))	* 1	Minus	*** 3	= 0		x $460 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/KIM R WATSON/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. 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, 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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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/587,548	12/31/2014	Alison N. Leonard	MBOT-0070-P01	6946

43520 7590 12/26/2018

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EXAMINER	
SANDERS, JOSHUA T	

ART UNIT	PAPER NUMBER
2119	

NOTIFICATION DATE	DELIVERY MODE
12/26/2018	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):

patents@stratpat.com

Office Action Summary	Application No. 14/587,548	Applicant(s) Leonard et al.	
	Examiner JOSHUA T SANDERS	Art Unit 2119	AIA Status Yes

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 01 October 2018.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☑ This action is **FINAL.** 2b) ☐ This action is non-final.

3)☐ 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.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☐ Claim(s) _____ is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-13,15-17 and 32-34 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, 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.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ 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)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

DETAILED ACTION

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

2. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

3. Claim 34 is newly added by the amendment.

4. Claims 1-13, 15-17, 20, and 32-34 are pending.

5. Claims 1-13, 15-17, 20, and 32-34 are rejected, grounds follow.

6. THIS OFFICE ACTION IS FINAL, see additional information at the conclusion of this action.

Response to Arguments

7. Applicant's arguments filed 01 October 2018 have been fully considered but they are not persuasive. Applicant argues (see Remarks, pages 7-9) that *Mahdavi* does not cure the acknowledged deficiency in the teaching of *Pettis* regarding the recited steps of "querying the target printer…" and "receiving a dictionary of the one or more properties from the target printer". However, Examiner is not persuaded. Under Broadest Reasonable interpretation, the claim as presently presented does not appear to require that the information contained in the dictionary come *directly* from the printer, and the

query to the printer does not appear to require that the property in question *be* the dictionary, or any of the contents of the dictionary, merely at least one property that is "relevant to the fabrication of the object". This interpretation is borne out by the embodiment recited in dependent claim 13 of the instant application, where the queried property is an identifier from the target printer, and the identifier is applied to retrieve "the dictionary" from a repository of information remote from the target printer; which examiner interprets as being, for example, a remote database. It is examiner's position that the combination of *Pettis* and *Mahdavi* meets at least this embodiment, which is an embodiment embraced by the broadest reasonable interpretation of claim 1. (that is, where the "querying the target printer … for one or more properties relevant to creation of a printable model…" is an identifier for a dictionary of data from a remote database; and "receiving a dictionary of the one or more properties from the target printer" is receiving a dictionary from said remote database containing "one or more properties from the target printer" including said identifier.) Accordingly, the rejection is maintained.

Claim Rejections - 35 USC § 103

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

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claims 1-5, 7-10, 12, 13, 15, 16, 20, and 32-34 is/are rejected under 35 U.S.C. 103 as being unpatentable over Pettis, et al., US Patent Application Publication 2013/0329258 (hereafter PETTIS) in view of Mahdavi, et al., US Patent Application Publication 2014/0156053 (hereafter MAHDAVI).**

Regarding Claim1, PETTIS teaches:

- receiving a request to fabricate an object from a three-dimensional model (fig. 5, 514; [0083] As shown in step 514, the method 500 may include receiving a request from a client for an object through a data network.) at a remote print server (PETTIS [0083]; method 500 may be hosted by a remote server, see [0028] "the user interface may be remotely served and presented on one of the client devices 206, such as where a print server 208 or one of the three-dimensional printers 204 includes a web server that provides information through one or more web pages or the like that can be displayed within a web browser or similar client executing on one of the client devices 206.")
- determining a target printer to fabricate the object at the remote print server; ([0085] As shown in step 516, the method 500 may include identifying a three-

dimensional printer associated with the client; see also [0030] "A print server 208 may also maintain a list of available three-dimensional printers 204, and may automatically select one of the three-dimensional printers 204 for a user-submitted print job")

- creating a fabrication profile based on the one or more properties; ([0072] "the selection engine 416 may select one of the two or more machine-ready models in the database 402 according to a predetermined criterion and transmit the one of the two or more machine-ready models to the client. This may be a criterion based on machine capabilities." Selecting based upon machine capabilities obviously implies a profile of the printer based upon properties (capabilities) of the printer) that the requirements of the model would be compared against.)
- determining whether a suitable machine-ready model is available for the fabrication profile based on at least one of the one or more properties relevant to selection of a machine ready model from a content source (PETTIS [0086] "When two or more of the machine-ready models are suitable for the three-dimensional printer associated with the client, this may further include selecting one machine-ready models according to a predetermined criterion, such as with the selection engine described above."; the repository of machine-ready models (see fig. 5, 512) of PETTIS is a content source, configuration elements such as those disclosed in [0077] as relevant to the selection engine are "one or more properties relevant to selection of a machine ready model".)
- when a suitable machine-ready model is available from the content source, selecting the suitable machine-ready model for transmission to the target printer

(PETTIS [0089] “As shown in step 522, the method 500 may include transmitting the machine-ready model from the client to the three-dimensional printer for fabrication”; which obviously implies ‘selecting said machine-ready model for transmission' first.)

- when a suitable machine-ready model is not available from the content source, processing the three-dimensional model according to the fabrication profile and generating a machine-ready representation of the processed three-dimensional model executable by the target printer to fabricate the object based on the one or more properties relevant to the creation of a printable model ([0076] “As shown in step 502, the method 500 may include receiving a digital model of an object through a data network.” [0077] “As shown in step 504, the method 500 may include creating a plurality of machine-ready models based upon the digital model. This may include machine-ready models for a variety of types of three-dimensional printers and/or hardware configurations as discussed above.” [0083]; “It will be understood that the term "object" as used herein is intended to refer to a three-dimensional object characterized by a three-dimensional model. For the purposes of this disclosure it does not matter whether the client request is for the object (e.g. "lamp") or for a machine-ready model that may be used to fabricate the object, as either request will be transferred to a server or similar resource in a machine-readable form that can result in the appropriate model being returned to the client.” [0081] “It will be understood that the method may be performed in parallel for any number of simultaneous users, and that steps such as creating individual machine-ready models may be readily parallelized for

greater performance" Obviously implying that if the User requests an object for which a machine ready model does not already exist; a machine-ready model can be created in parallel to satisfy the user request, resulting in "the appropriate model being returned to the client".)

However, PETTIS fails to clearly specify:

- querying the target printer from the remote print server for one or more properties relevant to creation of a printable model for fabrication of the object;
- receiving a dictionary of the one or more properties from the target printer;

(however, see PETTIS [0069])

But, MAHDAVI teaches:

- querying the target printer from the remote print server for one or more properties relevant to creation of a printable model for fabrication of the object; (MAHDAVI fig. 5, step 85; [0071] "the server 31 requests information regarding the 3D printer's 45 that the manufacturer 19 would like to register with the service provider, at step 85. … Further information which may be requested is printer performance data. For example, this might comprise information regarding any one or more of the following: the available printing volume, … the type of materials which may be used for printing; laser spot size, … laser output power; laser wavelength, … one or more different build algorithms the printer is configured to use.")

- receiving a dictionary of the one or more properties from the target printer; (MAHDAVI, fig. 5; step 87 [0073] "The unique identifiers associated with each 3D printer are received at step 87, along with the optional associated printer performance data.")

PETTIS and MAHDAVI are analogous art because they are from the same field of endeavor and contain overlapping structural and functional similarities. They both contain 3D Printers and Print Servers. Furthermore, they both automatically select appropriate printers for printing requests.

Therefore at the time the application was filed, it would have been obvious to a person of ordinary skill in the art to modify the above Method, as taught by PETTIS, by incorporating the query and receipt of printer properties from Printers, as taught by MAHDAVI.

Such a combination would involve verifying the capability of the printer after selection by comparing an identifier received from the printer to a database of printer performance and configuration data to determine the requirements for selecting or generating a machine ready model for the selected printer.

One of ordinary skill in the art would have been motivated to do this modification in order to determine which printer in a group of printers is best suited to manufacture a model, as suggested by MAHDAVI ([0059] "In this way, information comprised within a

manufacturer's database record 37 may be used by the server 31 to determine not only which manufacturer 19 is best suited to print the 3D object, but also which specific 3D printer 45 available to the manufacturer is best suited, by comparing the user-defined physical specifications with the defined printing capabilities of each printer 45.").

Regarding Claim 2, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 1,

PETTIS further teaches:

- further comprising transmitting one or more of the suitable machine-ready model and the machine- ready representation to the target printer for fabrication. (PETTIS [0089] "As shown in step 522, the method 500 may include transmitting the machine-ready model from the client to the three-dimensional printer for fabrication")

Regarding Claim 3, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 1,

PETTIS further teaches:

- further comprising fabricating the object with the target printer. ([0088] "In one aspect, the client may be a network-enabled three-dimensional printer that serves as a client device to directly receive machine-ready models for fabrication.")

Regarding Claim 4, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 1,

PETTIS further teaches:

- wherein the one or more properties include a hardware configuration of the target printer. (PETTIS [0077] "A predetermined configuration for one of the types of three-dimensional printers may also include one or more hardware components of the three-dimensional printer such as a display, a heated build platform, a camera, a conveyor, a color-mixer, or other optional hardware component, any of which may require specialized machine code for use in fabricating a model.")

Regarding Claim 5, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 4,

PETTIS further teaches:

- wherein the hardware configuration includes one or more of an extruder type, an extruder nozzle diameter, a build volume, a build platform type, a hardware version number, a top speed for linear movement of a tool, a step size for movement of the tool, a minimum z-axis step size, a gantry type, and a build material type. (PETTIS [0077] "...hardware components of the three-dimensional printer such as … a heated build platform" comprising at least a build platform type. See also MAHDAVI [0071])

Regarding Claim 7, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent Claim 4,

PETTIS further teaches:

- wherein the hardware configuration includes a manually specified hardware reconfiguration. (PETTIS [0085] "As shown in step 516, the method 500 may include identifying a three-dimensional printer associated with the client. This may be based on ... information manually provided by a user at the client." [0069] "a user of the client 406 may manually identify a type of three-dimensional printer and/or specific capabilities of the three-dimensional printer.")

Regarding Claim 8, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 1,

PETTIS further teaches:

- wherein the one or more properties include a firmware configuration of the target printer. (PETTIS [0073] – "This may also include software-enabled features such as firmware upgrades or the like, and the server 400 may detect such software-enabled features and where appropriate make modifications to the machine-ready code with the modification engine 414." Detecting Firmware configurations of the target printer)

Regarding Claim 9, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 1,

PETTIS further teaches:

- wherein the one or more properties include one or more user settings on the target printer. (PETTIS; [0066] "this may include machine-ready models 314 that accommodate a variety of possible user preferences concerning, e.g., print

resolution, size, infilling density, rafting or support structures, and so forth. ... "As another example, where a three-dimensional printer has a camera or the like, a corresponding machine-ready model 314 may enable the camera for remote viewing during a build." See also PETTIS [0032] "a print server 208 may store a user's preference on handling objects greater than a build volume of a printer. These preferences may control whether to resize the object, whether to break the object into multiple sub-objects for fabrication, and whether to transmit multiple sub-objects to a single printer or multiple printers. In addition, user preferences or requirements may be stored, such as multi-color printing capability, build material options and capabilities, and so forth.")

Regarding Claim 10, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 9,

PETTIS further teaches:

- wherein the one or more user settings include user settings from a previous fabrication process. ([0034] "the print server 208 may provide an interface for submission of objects from remote users, along with any suitable metadata such as … recommended printer settings", [0067] "a machine-ready model may be manually verified by fabricating the model with a printer and having a user confirm that the build is successful." See also PETTIS [0032])

Regarding Claim 12, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 1,

PETTIS further teaches:

- wherein the one or more properties include a build material in the target printer. (PETTIS [0066] "As another example, a printer may have ... an ability to select among various, different build materials either at the beginning of a build or during a build.")

Regarding Claim 13, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 1,

MAHDAVI further teaches:

- further comprising receiving an identifier from the target printer (MAHDAVI [0048] Accordingly, the server 43 may comprise a database 44 which contains a list 46 of the different unique identifiers associated with each operatively connected 3D printer 45.)
- applying the identifier to retrieve the dictionary from a repository of printer information remote from the target printer. (MAHDAVI [0059] "In turn, each one of the 3D printers 45 is also associated with a unique identifier, which may be stored in the manufacturer's record 37. In this way, each manufacturer's database record 37 comprises a full listing of each individual 3D printer 45 available to the manufacturer, along with the printing capabilities of each printer 45." Record 37 is in "Service Provider DB" which is remote from the 3D printer, see fig. 2)

Regarding Claim 15, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 1,

PETTIS further teaches:

- wherein the suitable machine-ready model is selected from a plurality of stored machine-ready models. (PETTIS [0086] "As shown in step 518, the method 500 may include selecting one of the machine-ready models corresponding to the three-dimensional printer associated with the client. The corresponding model may be located in and retrieved from the database 512.")

Regarding Claim 16, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 15,

PETTIS further teaches

- determining whether one of the plurality of stored machine-ready models can be modified to meet the fabrication profile; (PETTIS – fig. 5, Select machine-ready model 518)
- modifying the one of the plurality of stored machine ready models for use as the machine-ready representation if possible; (fig. 5, modify model 519)
- generating a new machine-ready representation according to the fabrication profile for use as the machine-ready representation if not possible. ([0076] "As shown in step 502, the method 500 may include receiving a digital model of an object through a data network." [0077] "As shown in step 504, the method 500 may include creating a plurality of machine-ready models based upon the digital model. This may include machine-ready models for a variety of types of three-

dimensional printers and/or hardware configurations as discussed above." [0083]; "It will be understood that the term "object" as used herein is intended to refer to a three-dimensional object characterized by a three-dimensional model. For the purposes of this disclosure it does not matter whether the client request is for the object (e.g. "lamp") or for a machine-ready model that may be used to fabricate the object, as either request will be transferred to a server or similar resource in a machine-readable form that can result in the appropriate model being returned to the client." [0081] "It will be understood that the method may be performed in parallel for any number of simultaneous users, and that steps such as creating individual machine-ready models may be readily parallelized for greater performance" Obviously implying that if the User requests an object for which a machine ready model does not already exist; a machine-ready model can be created in parallel to satisfy the user request, resulting in "the appropriate model being returned to the client".)

Regarding Claim 20, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 1;

PETTIS further teaches:

- further comprising generating descriptive metadata to accompany the machine-ready representation, the descriptive metadata specifying one or more properties for comparison to properties of printers selected for fabricating the model. (PETTIS - [0035] – describing generating metadata for a database of models)

Regarding Claim 32, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 1;

PETTIS further teaches:

- wherein the one or more selection criteria include one or more of information related to the three-dimensional model, information related to the object, a print queue, a prioritization, a location of the target printer, a timeline, and an attribute of the target printer. (PETTIS [0030] "Where the print server 208 selects the printer automatically, any number of criteria may be used such as geographical proximity, printing capabilities, current print queue, fees (if any) for use of a particular three-dimensional printer 204, and so forth.")

Regarding Claim 33, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 1;

PETTIS further teaches:

- wherein the one or more properties include one or more of a user configuration, a user preference, and a hardware accessory added to the target printer by a user. (PETTIS [0032] "Other user preferences may be usefully stored at the print server 208 to facilitate autonomous, unsupervised fabrication of content from content sources 210. For example, a print server 208 may store a user's preference on handling objects greater than a build volume of a printer." disclosing at least a property corresponding to a user preference.)

Regarding Claim 34, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 1;

PETTIS further teaches:

- when the machine-ready model is received by the target printer, comparing metadata for the machine-ready model to one or more printer properties in the dictionary to ensure that the machine-ready model can be fabricated by the target printer. ([0062] "For example, the analysis engine 310 may generate useful metadata concerning the size, printability, build material requirements, and so forth for the object based upon any suitable set of rules and populate the metadata 308 with results."; [0067] "A verification engine 316 may also be included to verify the suitability of machine-ready models 314 for fabrication on an intended device.")

9. **Claim 6 is rejected under 35 U.S.C. 103 as being unpatentable over PETTIS and MAHDAVI further in view of PrintToPeer, PrintToPeer: Your 3D printer on the Web, previously cited, IFW NPL 07/10/2015, 21 pages. (hereafter PRINTTOPEER).**

Regarding Claim 6, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 4,

However, the combination fails to clearly specify:

- wherein the hardware configuration includes an automatically detected hardware reconfiguration.

But, PRINTTOPEER from the same field of endeavor of 3D printer management, teaches:

- wherein the hardware configuration includes an automatically detected hardware reconfiguration. (PRINTTOPEER - page 6, “your 3D printer is recognized [automatically]")

PETTIS and PRINTTOPEER are analogous because they are from the same field of endeavor and contain overlapping structural and functional similarities, they both do cloud-hosted slicing, and store printing instructions, they both automatically manage printer settings. Further they both integrate with web-based functions.

A person having ordinary skill in the art at the time the invention was filed could have modified the method of PETTIS with the automatic hardware reconfiguration detection of PRINTTOPEER.

A person having ordinary skill in the art at the time the invention was filed could have been motivated to do this in order to implement plug-and-play capability as suggested by PRINTTOPEER. (page 6)

10. **Claim 11 is rejected under 35 U.S.C. 103 as being unpatentable over PETTIS and MAHDAVI, further in view of 3Dagogo – "AstroPrint Wireless 3D Printing software—- Kickstarter, May 26, 2014; archived by the internet archive project, (previously cited; IFW NPL 12/29/2016; 11 pages)**

Regarding Claim 11, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 1,

However, the combination fails to clearly specify:

- wherein the one or more properties include an application used to operate the target printer.

But, ASTROPRINT teaches:

- wherein the one or more properties include an application used to operate the target printer. (choose between slic3r, cura, and makerbot per tech specs diagram on page 9)

PETTIS and ASTROPRINT are analogous because they are from the same field of endeavor and contain overlapping structural and functional similarities, they both do cloud-hosted slicing, and store printing instructions, they both automatically manage printer settings. Further they both integrate with web-based functions.

A person having ordinary skill in the art at the time the invention was filed could have modified the method of PETTIS with the application selection user preference of ASTROPRINT.

A person having ordinary skill in the art at the time the invention was filed could have been motivated to do this in order to facilitate autonomous, unsupervised fabrication of content, as suggested by PETTIS ([0032] "Other user preferences may be usefully stored at the print server 208 to facilitate autonomous, unsupervised fabrication of content from content sources 210.")

11. **Claim 17 is rejected under 35 U.S.C. 103 as being unpatentable over PETTIS and MAHDAVI, further in view of AIRWOLF3D, Getting Started with Airwolf 3D Printer SLIC3R Configurations, previously cited, IFW NPL 07/10/2015, 12 pages. (hereafter SLIC3R).**

Regarding Claim 17, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 16,

However, the combination does not appear to teach:

- wherein modifying includes one or more of translating the machine-ready representation, rotating the machine-ready representation, scaling the machine-ready representation, and changing a top speed in a tool path for the target printer.

But, SLIC3R from the same field of endeavor of 3D model Printer management, teaches:

- wherein modifying includes one or more of translating the machine-ready representation, rotating the machine-ready representation, scaling the machine-ready representation, and changing a top speed in a tool path for the target printer. (SLIC3R page 4, describing settings that vary by at least tool speed)

PETTIS and SLIC3R are analogous because they are from the same field of endeavor and contain overlapping functional and structural similarities. Both create sliced machine ready models from 3D model files.

A person having ordinary skill in the art at the time the invention was filed could have modified the method of PETTIS with the tool speed adjustment of SLIC3R.

A person having ordinary skill in the art at the time the invention was filed could have been motivated to make this modification as ASTROPRINT specifically teaches incorporating SLIC3R into its method. (page 9).

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOSHUA T SANDERS whose telephone number is 571-272-5591. The examiner can normally be reached on generally Monday through Thursday and Alternate Fridays.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ali can be reached on 571-272-4105. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

13. 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.

/J.T.S./
Examiner, Art Unit 2119

/MOHAMMAD ALI/
Supervisory Patent Examiner, Art Unit 2119

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/587,548	Leonard et al.
	Examiner	**Art Unit**
	JOSHUA T SANDERS	2119

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/29/2016	08/08/2017	05/21/2018	12/18/2018					
	1	✓	✓	✓	✓					
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	6	✓	✓	✓	✓					
	7	✓	✓	✓	✓					
	8	✓	✓	✓	✓					
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	10	✓	✓	✓	✓					
	11	✓	✓	✓	✓					
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	13	✓	✓	✓	✓					
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	15	✓	✓	✓	✓					
	16	✓	✓	✓	✓					
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	31	-	-	-	-					
	32			✓	✓					
	33			✓	✓					
	34				✓					

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	Examiner	Art Unit
	JOSHUA T SANDERS	2119

CPC - Searched*		
Symbol	**Date**	**Examiner**
B29C67/0088;	12/23/2016	JS
G05B15/02;	12/23/2016	JS
G06F17/50;	12/23/2016	JS
B33Y50/02;	12/23/2016	JS
refreshed search of record see EAST search notes	8/15/2017	JS
refreshed search for RCE	5/21/2018	JS
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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
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A Collaborative Learning System for Sharing 3D Models: 3D Model Co-learning Space
I-Sheng Lin ; Tsai-Yen Li ; Fang-Chi Liang ; Yong-Teng Lin
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Year: 2016
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Human localization system using 3D two-dimension code
Jianhong Zou ; Qianchuan Zhao ; Chengjun Jia
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Human localization system using 3D two-dimension code

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Jianhong Zou | Qianchuan Zhao | Chengjun Jia
2017 29th Chinese Control And Decision Conference (CCDC)
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Statistical process control for solder deposition and yield enhancement
R. Muthaiyan ; V. Barba ; K. Srihari
4th Electronics Packaging Technology Conference, 2002.
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Statistical process control for solder deposition and yield enhancement

R. Muthaiyan | V. Barba | K. Srihari
4th Electronics Packaging Technology Conference, 2002.
Year: 2002

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Stefan Junk ; Rebecca Matt
2015 International Conference on Information Technology Based Higher Education and Training (ITHET)
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Stefan Junk | Rebecca Matt
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A performance evaluation of surface normals-based descriptors for recognition of objects using CAD-models
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A performance evaluation of surface normals-based descriptors for recognition of objects using CAD-models

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Virtual reality technologies as an interface of cognitive communication and information systems
Branislav Sobota ; František Hrozek ; Štefan Korečko ; Csaba Szabó
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Space reservation and ticket **printing** system



~~BE~~ ~~CA~~ ~~DE~~ ~~ES~~ ~~FR~~ ~~GB~~ ~~NL~~ ~~US~~ · Grant US3533084A · Robert G Cook · Computicket Corp
Priority 1968-02-20 · Filing 1968-02-20 · Grant 1970-10-06 · Publication 1970-10-06
It the central computer is linked to the remote stations via telephone lines, a suitable transmission control unit (not shown), such as 5 IBM **Model** ... LAMPS AND WARNING SYSTEM Ready lamp 116 is lit after a ticket **printing** cycle has been completed, or when a confirmatory message is received from the ...

Camera device incorporating a color **printer** with ink validation apparatus

~~US~~ · Grant US7656426B2 · Kia Silverbrook · Silverbrook Research Pty Ltd
Priority 1997-07-15 · Filing 2006-03-28 · Grant 2010-02-02 · Publication 2010-02-02
... the relative positioning of R, G, and B pixels changes with orientation. The processed image may also have to be rotated during the Print process in order to be in the correct orientation for **printing**. The **3D model** of the Artcam has 2 image sensors, with their inputs multiplexed to a single ISI 83

Combined camera and **printer** assembly with a card reader for image processing ...

~~CA~~ ~~DE~~ ~~EP~~ ~~US~~ ~~WO~~ · Grant US7483058B2 · Kia Silverbrook · Silverbrook Research Pty Ltd
Priority 1998-07-10 · Filing 2006-10-20 · Grant 2009-01-27 · Publication 2009-01-27
... the relative positioning of R, G, and B pixels changes with orientation. The processed image may also have to be rotated during the Print process in order to be in the correct orientation for **printing**. The **3D model** of the Artcam has 2 image sensors, with their inputs multiplexed to a single ISI 83

Method and apparatus for forming a stylized, **three-dimensional** object



~~US~~ · Grant US5398193A · Marshall M. Monroe · The Walt Disney Company
Priority 1992-10-30 · Filing 1992-10-30 · Grant 1994-01-18 · Publication 1994-01-18
... mask 20, of the individual 14 who served as the **model** for the mask. Importantly, the un-deformed styrene after it has been imbued with the **printer** .. said **printer** includes feeder means for feeding sheets of said flat, deformable, heat-settable material, from which more than one stylized, **three-** ...

Selective **deposition modeling** system and method



~~US~~ · Grant US6305576B1 · Jeffrey S. Thayer · 3D Systems, Inc.
Priority 1995-09-27 · Filing 1997-06-13 · Grant 2001-10-23 · Publication 2001-10-23
Docket No. USA-131 is directed to Build and Support styles and structures which can be used in a preferred Selective **Deposition Modeling** (SDM) system ... 285 c and shutdown 285 d which all reflect different modes of **printer** 40 . If any of the online, repeat job or test buttons are pushed, **printer** 40

Nozzle placement in monolithic drop-on-demand print heads



~~US~~ · Grant US5787564A · Kia Silverbrook · Eastman Kodak Company
Priority 1995-04-12 · Filing 1996-04-09 · Grant 1998-08-18 · Publication 1998-08-18
An improved print head construction for maintaining wafer strength along the line of nozzles at approximately 50% of the normal wafer strength. This is achieved by dividing each row of nozzles into segments, and by displacing some of those segments (preferably every alternate segment) in the print ...

Forms automation system implementation



~~CA~~ ~~US~~ · Grant US5568598A · Mary J. Yaksich · Moore Business Forms, Inc.
Priority 1990-10-19 · Filing 1990-10-19 · Grant 1996-10-08 · Publication 1996-10-08
... of checking accounts, time **deposit** accounts, and savings accounts will generate different forms that are ultimately printed. In addition to **printing** .. The **printer** profile file 159 has information regarding the **model** and manufacture of each of the **printers** that will be controlled by the computers of ...

Printer controller for object optimized **printing**



~~US~~ · Grant US5687293A · Margaret Motamed · Xerox Corporation
Priority 1994-05-18 · Filing 1995-06-07 · Grant 1997-11-11 · Publication 1997-11-11
In a first preferred embodiment, pixel data consisting of a mixture of color **models** is thus stored in the channel data structure. It is transformed .. **printer** controller command storage means for storing the **printer** controller commands corresponding to the print data stored in the print data storage ...

Three dimensional printing material system and method



~~BE~~ ~~EP~~ ~~JP~~ ~~US~~ ~~WO~~ · Grant US6610249B2 · James P. Bredt · Z Corporation
Priority 1996-09-04 · Filing 2001-04-10 · Grant 2003-08-26 · Publication 2003-08-26
The material system and method of the invention may be used to manufacture both appearance **models** and small numbers of functional parts in an office ... Two well-known methods for rapid prototyping include a selective laser sintering process and a liquid binder **Three Dimensional Printing** process (3DP ...

Method and system for generating a stereoscopic image of a garment

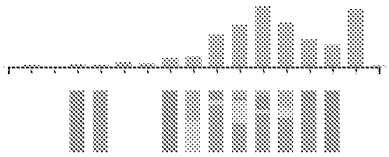
~~CA~~ ~~EP~~ ~~US~~ · Grant US6310627B1 · Yoshiyuki Sakaguchi · Toyo Boseki Kabushiki Kaisha



Priority 1998-01-20 • Filing 1999-01-14 • Grant 2001-10-30 • Publication 2001-10-30
is comprised of a **printer** for **printing** the generated images of the individual figure **model** M', special garment C' and images of a plurality of ... A **3D** image of an object **model** and images of patterns of a garment are generated. The images of the respective patterns are three-dimensionally ..

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3D printing materials and their use in medical education: a review of ...
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Patient-specific practice prior to an intervention could be improved with more representative ... Steps required in the creation of a 3D printed model in healthcare education. ... The first step in creating a new tool for medical education using 3D printing ... in our lab, we used a slice thickness of 0.625 mm in our reproduction of ...

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to refer to 3D printing or additive manufacturing forms or functions. ... A process of fabricating objects from 3D model data through depositing of ... stimulus they rearrange their shape according to pre-programmed patterns. ..... 3D LEARNING CONTENT GLOSSARY. Slice. (Synonym: Layer)—A horizontal cross-section of ...

What is 3D printing? The definitive guide | 3D Hubs
https://www.3dhubs.com/guides/3d-printing/
This model is sliced by the printer's software into thin, 2-dimensional layers and then ..... Powder Bed Fusion (SLS, DMLS & SLM): A high-energy source selectively ... but can be post processed to a smooth

and almost fully optically clear finish.

Printable 3D models - Prusa3D - 3D Printers from Josef Průša

https://www.prusa3d.com/printable-3d-models/

The only way you can manufacture this piece is 3D printing as the interlocking ... Sample files for Original Prusa i3 MK3 and MK2/MK2S (use the models ... a digital archive of fully 3D printable sculptures, artworks and landmarks from across ...

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The Idea Builder is an extremely well-built printer that was designed for PLA ... This page is designed to help you setup your Dremel® 3D Idea Builder for use ... Verify that the roll of filament is properly mounted on the spool and is being ... After completing the Configuration Assistant, import the 3D model you'd like to print.

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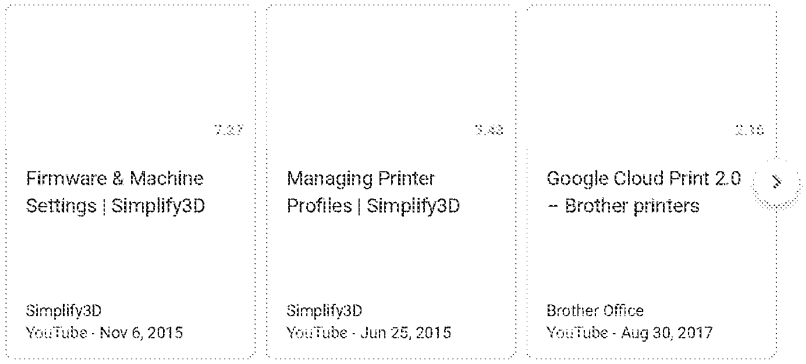
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Jun 22, 2017 - If your obsession with 3D printing is just beginning, check out these easy steps to ... and model and automatically have all the necessary settings filled in. .... When everything has been checked off, you're ready to get printing!

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1998 ACM Subject Classification D.2.4 Software/Program Verification, D.3.4 ... the print head of a 3D printer follows) from a CAD model is analogous to optimizing compilation, automatically tracking operations to ensure safety and halt before bogus .... However, work in this space is often targeted at an industrial setting.

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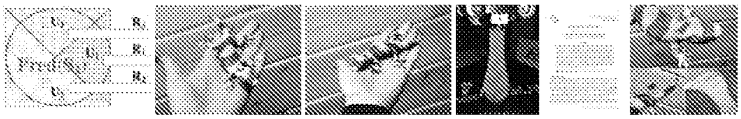
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Printable 3D models - Prusa3D - 3D Printers from Josef Průša
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Oct 16, 2013 - Verified Files are ready-to-print files for your MakerBot® Replicator® 2. They've been pre-sliced and tested on our machines. All you have to do is download the files to an SD card and start 3D printing!

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by A Iqbal - 2010 - Cited by 46 - Related articles
Oct 2, 2018 - Classification of pre-sliced pork and Turkey ham qualities based on ... to model the ham appearance grading and preference responses of a ...

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Since most 3D printers can print directly from a USB stick or SD card, Creative Tools now supplies pre-sliced print files of #3DBenchy for each 3D printer model ...

Organotypic Hippocampal Slice Cultures As a Model to Study ... - JoVE
https://www.jove.com/.../organotypic-hippocampal-slice-cultures-as-model-to-study
by U Grabiec - 2017 - Cited by 2 - Related articles
Aug 27, 2017 - Organotypic hippocampal slice cultures (OHSC) represent an in vitro model that simulates the in vivo situation very...

2018 Cura Tutorial - Deep Inside the Cura 3D Slicer Software | All3DP
https://all3dp.com › Tutorials & Guides
Feb 9, 2018 - It takes a 3D model and slices it into layers to create a file known as ... millions of pre-made and print-ready models (more file repositories here).

Software & Tools for 3D Printing | 3D Printing for Beginners
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These work with pre-existing models that you easily customize by modifying some simple .... Slicing generates the G-code necessary to feed into your 3D printer.

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https://www.hudsonlibrary.org/about/3d-printing/
Typically, 3D prints are ready for pick-up within a week the submission is received. ... Failure to pick-up a printed model within 7 days will result in the cost being ...

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3D Printing at the Library - Glen Ellyn Public Library
https://gepl.org/technology/3d-printing
The Glen Ellyn Public Library's 3D printers create three-dimensional plastic objects ... the library will not guarantee that a print job will be ready on a specific day. ... The first is the digital design portion, in which the 3D digital model is created ...

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Use an existing file from Ready-To-Print 3D Designs on our Resources page. ... Once your model is ready to be printed, submit a print request on our 3D Print ...

3D Printing | City of Portsmouth
https://www.cityofportsmouth.com/library/3d-printing
The Portsmouth Public Library is home to two hardworking 3D printers: a ... Library staff will print your file and notify you when it is ready to be picked up. ... If part of a model has nothing beneath it, like the wings of an airplane, the printer has to ...

Our 3D Printer | Merrimack Public Library
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The Library reserves the right to refuse any 3D printing request. ... Trader has both chargeable and free models, both those ready for 3D printing and those not.

3D Printing – Warren County Public Library
https://warrenpl.org/3dprinting/
WCPL uses MakerBot PLA filament for all of our 3D printing. Polylactic acid ... Staff will add the model to the printing queue. If there is high ... Due to a high number of submissions, 3D prints may not be ready for 2 weeks. Name*. First Last.

3D Printing | Westerville Public Library
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3D Printing - Harrison Public Library
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The 3D printer is now ready to create, or "print", the object by depositing melted plastic one layer at a time (this process is called fused deposition modeling).

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3D-printing of non-assembly, articulated **models**

J Call, DA Callan, C Amati, R Kleinberger... - ACM Transactions on ..., 2012 - dl.acm.org
... to validate our results we used two rapid prototyping pro- cesses to realize the calibration sets as well as the articulated mod- els: SLS using an EOS FORMIGA P 100 **printer**, and SLA using an Objet PolyJetTM **printer** ... **3- d printing** the history of mechanisms ... **3D** polyomino puzzle ...
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3D printing and neurosurgery—**ready** for prime time?

GT Klein, Y Lu, MY Wang - World neurosurgery, 2013 - Elsevier
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Dimensional error of selective laser sintering, three-dimensional **printing** and PolyJet™ **models** in the reproduction of mandibular anatomy

D Ibrahim, TL Broilo, C Heitz, MG de Oliveira... - Journal of Cranio ..., 2009 - Elsevier
... Recently developed technologies, such as selective laser sintering (SLS), three-dimensional **printing** (3DP™) [Campinas/SP ... In the 3DP™ technique, the **printer** has a reservoir for ceramic or polymeric powder ... A CAD-**3D**.STL file is virtually sectioned in 16-μm thick layers using ...
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From engineering drawings to **3D** CAD **models**: are we **ready** now?

D Dori, K Tombre - Computer Aided Design, 1995 - dori2.technion.ac.il
... 243-254, 1995 Copyright r; 1995 Elsevier Science Ltd **Printed** in Great Britain ... is proposed for achieving high-level conversion of technical documents of this type into **3D** cad **models** ... of the 1980s is becoming more remote with each newly developed type of **printer** and plotter ...
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Medical applications for **3D printing**: current and projected uses

CL Ventola - Pharmacy and Therapeutics, 2014 - ncbi.nlm.nih.gov
... 1 Many of these **printed** objects are comparable to traditionally manufactured items ... 11 A relatively sophisticated **3D printer** costs about $2,500 to $3,000, and simpler **models** can ... 8 , 11 For consumers who have difficulty **printing 3D models** themselves, several popular **3D printing** ...
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3-D printing: The new industrial revolution

B Berman - Business horizons, 2012 - Elsevier
... now in final products as opposed to prototypes ("**3-D Printing**: The **Printed** World," 2010 ... costs Alessi about 70% less than the traditional method of making prototypes ("**3D** Systems," 2011 ... would download digital music—and then download and print the part on his/her **3-D printer** ...
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Possibility of reconstruction of dental plaster cast from **3D** digital study **models**

M Kasparova, L Grafova... - Biomedical ..., 2013 - biomedical-engineering-online ...
... Finally, the STL model was sliced into individual layers, the path of **printing** nozzle was computed and the STL was converted to GCODE file by Slic3r (Alessandro Ranellucci ... Ten of the plaster casts were **3D printed** on RepRap (Czech Republic) **3D printer** (ABS plastic ...
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3D printed molecules and extended solid **models** for teaching symmetry and point groups

VF Scalfani, TP Vaid - Journal of Chemical Education, 2014 - ACS Publications
... **3D printed**. Our results show that the file preparation methods discussed within this article are both suitable routes to prepare **3D** printable digital files of chemical structures. Further, our results also suggest that **3D printing** is an excellent method for fabricating **3D models** of ...
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Using **3D printing** to create personalized brain **models** for neurosurgical training and preoperative planning

CC Ploch, CSSA Mansi, J Jayamohan, E Kuhl - World neurosurgery, 2016 - Elsevier
... City, California, USA) (Figure 3). The current price for the **3D printer** is $900 ... the plastic filament costs approximately $4 per hemisphere, and the **3D-printing** process takes ... The **3D-printed** hemispheres display a personalized, anatomically realistic surface topology (Figure 4). ABS ...
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Implementing a **3D printing** service in an academic library
S Pryor - Journal of Library Administration, 2014 - Taylor & Francis
... Comparison chart of all **3D printer** choices for approximately $20,000 or less ... Retrieved from http://lj.libraryjournal.com/2012/08/academic-libraries/u- nevada-library-offers-**3d-printing**-across-the-board/ Colegrove, T. (2013) ... University of Nevada-Reno library offers **3-D printing** ...
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B Evans - 2012 - books.google.com
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Three-dimensional **printing** of porous ceramic scaffolds for bone tissue engineering

H Seitz, W Rieder, S Irsen, B Leukers ... - Journal of Biomedical ..., 2005 - Wiley Online Library
... Caption Flexible **3D printing** test **setup** used for process investigation ... The software also allows basic data manipulations like rotation, translation, and **automatic** positioning ... test structures can be designed very precisely without rounding error, which can occur when **slicing** a **3D** ...
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3D U-Net: learning dense volumetric segmentation from sparse annotation

Ö Çiçek, A Abdulkadir, SS Lienkamp, T Brox... - ... Conference on Medical ..., 2016 - Springer
... We started using 1 annotated **slice** in each orthogonal direction and increased the number of ... an end-to-end learning method that semi-**automatically** and fully-**automatically** segments a ... In a fully-**automated setup** we demonstrate the performance gain of the **3D** architecture to an ...
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Development of a BIM-based **automated** construction system

L Ding, R Wei, H Che - Procedia Engineering, 2014 - Elsevier
... By analyzing the procedure of these largeYscale AM techniques, a new **automated** construction system ... With the CC process, it is possible to **automatically** build large scale architecture components ... Thus, to achieve **automatic** construction of buildings, it is bound to create a giant ...
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Continuous **3D-printing** for additive manufacturing

D Günther, B Heymel, J Franz Günther... - Rapid Prototyping ..., 2014 - emeraldinsight.com
... This **configuration** enables the unpacking of forms and cores during the ongoing **printing** process ... For the generation of long parts, the test **setup** is equipped with **automated** material supply ... The **print** head is supplied via a tubing system **automatically** from changeable reservoirs ...
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Automatic determination of the curved axis of a **3-D** tube-shaped object in image volume

B Xu, J Qian - US Patent 5,699,799, 1997 - Google Patents
... it is an object of the present invention to provide a method of **automatic** determination of ... is assumed that all processing steps in the description above are carried out **automatically**, by using ... like shaped object from **slicing** said image volume in accord with the **configuration** of said ...
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Holographic three-dimensional **printer**: new method

M Yamaguchi, N Ohyama, T Honda - Applied optics, 1992 - osapublishing.org
... 5 is the same **configuration** as that in Fig ... The whole system is controlled by the PC, and the hologram is **automatically** synthesized ... 902,24-30 (1988). 4. H. Kodama, "**Automatic** method for fabricating a three- dimensional plastic model with photo-hardening polymer," Rev. Sci ...
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Large-scale **3D printing** of ultra-high performance concrete–a new processing route for architects and builders

C Gosselin, R Duballet, P Roux, N Gaudillière... - Materials & Design, 2016 - Elsevier
... authors is also to take part in the redefinition of architecture and design in the light of integral computation and fully **automated** processes ... 2. Processing **setup** ... It consists in **slicing** the **3D** shape of an object in flat thin layers of constant thickness which can be layered one up onto ...
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CK Chua, KF Leong - 2014 - books.google.com
... SLS = Selective Laser Sintering SMS = Selective Mask Sintering SSM = **Slicing** Solid Manufacturing SOUP ... Chapter 2 Additive Manufacturing Process Chain 2.1 Fundamental **Automated** Processes 2.2 ... Systems **3D** Systems' Selective Laser Sintering (SLS) **3D** Systems' ...
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Automatic engraving method and apparatus

JH Payne - US Patent 5,329,381, 1994 - Google Patents

... **automatic** engraving method and apparatus that lower manufacturing cost because it is highly **automated** ... The result is that the tool **automatically** moves out of the way and engraving ... Expired - Lifetime US5329381A (en), 1992-02-20, 1992-02-20, **Automatic** engraving method and ...

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Prediction of moisture, color and pH in cooked, **pre-sliced** turkey hams by NIR hyperspectral imaging system

A Iqbal, DW Sun, P Allen - Journal of Food Engineering, 2013 - Elsevier

... infrared (NIR) region (900–1700 nm) to predict the moisture content, pH and color in cooked, **pre-sliced** turkey hams ... this point of view, important wavelengths were selected to improve the predictive power of the calibration **models** as well as to simplify the **model** by avoiding ...

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Colour calibration of a laboratory computer vision system for quality evaluation of **pre-sliced** hams

NA Valous, F Mendoza, DW Sun, P Allen - Meat science, 2009 - Elsevier

... image analysis is a non-destructive tool that has interesting applications for the overall surface characterization and quality inspection of **pre-sliced** hams (Zheng et al ... In this sense, one way to use a digital camera as a colorimeter is to find a **model**, often some type of regression ...

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Classification of **pre-sliced** pork and Turkey ham qualities based on image colour and textural features and their relationships with consumer responses

A Iqbal, NA Valous, F Mendoza, DW Sun, P Allen - Meat Science, 2010 - Elsevier

... for characterizing and classifying three different qualities of pork and Turkey **pre-sliced** hams typically ... package StatGraphics Plus v5.1. In order to derive quantitative classification **models**, LDA was ... The logistic regression procedure is designed to fit a regression **model** in which ...

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The use of lacunarity for visual texture characterization of **pre-sliced** cooked pork ham surface intensities

NA Valous, DW Sun, P Allen, F Mendoza - Food Research International, 2010 - Elsevier

... The use of lacunarity for visual texture characterization of **pre-sliced** cooked pork ham surface intensities ... Keywords. Computer vision. **Pre-sliced**. Cooked pork ham. Gliding box lacunarity. Fractal. Surface characterization. Texture appearance. Intensity image. Colour channel ...

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Supervised neural network classification of **pre-sliced** cooked pork ham images using quaternionic singular values

NA Valous, F Mendoza, DW Sun, P Allen - Meat science, 2010 - Elsevier

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Characterization of fat-connective tissue size distribution in **pre-sliced** pork hams using multifractal analysis

F Mendoza, NA Valous, DW Sun, P Allen - Meat science, 2009 - Elsevier

... Multifractal **models** provide more information about a distribution of a physical system than fractal **models** (Voss, 1988) ... The objective of this study was to apply multifractal techniques to characterize FSDs in three different qualities of **pre-sliced** cooked pork hams, typically ...

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Evaluation of Photoshop software potential for food colorimetry

H Afshari-Jouybari, A Farahnaky - Journal of Food Engineering, 2011 - Elsevier

... a ˙ ∗, a ∗ obtained by Equations and **models**, RMSD, Root mean square error. b ˙ ∗, b ∗ obtained by Equations and **models**, MSE, Mean Standard error. L p ∗, L ∗ measured by Photoshop ... Linear **model** is a simple **model** for the RGB to L ∗ a ∗ b ∗ transformation ...

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Detecting fractal power-law long-range dependence in **pre-sliced** cooked pork ham surface intensity patterns using Detrended Fluctuation Analysis

NA Valous, K Drakakis, DW Sun - Meat science, 2010 - Elsevier

... nature of real images by describing them in terms of an fBm **model** (Valous, Mendoza ... differencing parameter arising from the generalization of the Box–Jenkins ARIMA **models** (Rea, Reale, & ... it is necessary to consider the variability in colour and visual texture of **pre-sliced** hams ...

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Utilization of pea flour, starch-rich and fiber-rich fractions in low fat bologna

Z Pietrasik, JAM Janz - Food Research International, 2010 - Elsevier

... using the texture profile analysis (TPA) procedure of Bourne (1982) and an Instron Universal Testing System (**Model** 5565, Instron ... testing were delivered to Alberta Agriculture and Rural Development's Consumer Product Testing Center (CPTC) in a **pre-sliced**, packaged format ...

☆ 99 Cited by 79 Related articles All 7 versions

Pre-sliced or do it yourself?--Determinants of schoolchildren's acceptance of convenience fruits and vegetables

JP von Germeten, S Hirsch - Food quality and preference, 2015 - Elsevier

... Volume 44, September 2015, Pages 1-11. Food Quality and Preference. **Pre-sliced** or do it yourself? – Determinants of schoolchildren's acceptance of convenience fruits and vegetables ... We examined 8–10-year-olds' **pre-sliced** fruit and vegetable (F&V) liking in school. • ...

☆ 99 Cited by 6 Related articles All 5 versions

From 3D **models** to 3D prints: an overview of the processing pipeline

M Livesu, S Ellero, J Martínez… - Computer Graphics …, 2017 - Wiley Online Library

... the calculation of parallel slices, and the conversion of the slices into commands for the **printer** ... each leading to a different complexity for the conversion to an effective CAM **model**. In mechanical engineering, the vast majority of design **models** come as a collection of NURBS ...

☆ 99 Cited by 22 Related articles All 14 versions

Patenting Physibles: A Fresh Perspective for Claiming 3D-Printable Products

DH Brean - Santa Clara L. Rev., 2015 - HeinOnline

... To prepare a digital file [created in a 3D **modeling** program] for **printing**, the 3D **modeling** software "slices" the final **model** into hundreds ... would be to somehow patent the CAD files per se- untethered to a digital storage medium and not requiring that the files be **pre-sliced** ...

☆ 99 Cited by 15 Related articles All 7 versions

A study of digital camera colorimetric characterization based on polynomial **modeling**

G Hong, MR Luo, PA Rhodes - … of Japan, Dutch Society for the …, 2001 - Wiley Online Library

... were used for characterization, and the number of reference samples needed to achieve a reasonable degree of **modeling** accuracy. Choice of characterization target and media and their effect on metamerism have been examined. It is demonstrated that a **model** is dependent ...

☆ 99 Cited by 458 Related articles All 7 versions »

Thirty Thousand 3D **Models** from Thingiverse

FW Baumann - Data, 2018 - mdpi.com

... The **models** are generally designed for 3D **printing** on a Fused Deposition **Modeling** (FDM) type 3D **printer** [11]. This work presents a dataset of digital **models**, **pre-sliced** machine instructions, **model** renderings and geometrical analysis, acquired from thingiverse ...

☆ 99 Related articles All 3 versions »

Methods, devices, and systems for part-to-build

N Béraud - US Patent App. 15/995,781, 2018 - Google Patents

... job generation block 1040 may take sliced data from either the slicing component 1044 or from **pre-sliced** nested part ... 2007, Adaptive direct slicing of a commercial CAD **model** for use in rapid prototyping. US20070013724A1 (en), 2007-01-18, Building of scaled physical **models** ...

☆ 99 »

Detection and use of **printer** configuration information

AN Leonard, J Sadusk - US Patent App. 14/587,548, 2016 - Google Patents

... that create on-demand **models**, or services that look up and provide **pre-sliced**, machine-ready ... The three-dimensional **model** may be located on the target **printer**, at a computer ... of the foregoing (eg, a service or webpage that provides three-dimensional **models** for fabricating ...

☆ 99 Related articles All 2 versions »

Platen planarizing process for additive manufacturing system

JE LaBossiere, MD Bosveld, DF Mannella… - US Patent …, 2017 - Google Patents

... In some embodiments, the slicing operations for the digital **models** of 3D part 30 and planarizing part 34 may be performed in the same operation, such as ... Alternatively, controller system 44 may generate the digital **model** of planarizing part 34 as a **pre-sliced** set of ...

☆ 99 Cited by 15 Related articles All 4 versions »

Method for building three-dimensional **models** with extrusion-based additive manufacturing systems

WJ Swanson, KC Johnson, TA Hjelsand… - US Patent …, 2014 - Google Patents

... 3). However, method 84 is applicable for building 3D **models** and corresponding support structures ... 86-100, and initially involves receiving a digital representation of 3D **model** 24 (step ... and into multiple layers (step 88), and generating one or more **pre-sliced** support structures ...

☆ 99 Cited by 58 Related articles All 4 versions »

Slice data representation and format for multi-material objects for additive manufacturing processes

Z Zhang, S Joshi - Rapid Prototyping Journal, 2017 - emeraldinsight.com

... CAD **models** that are sliced and another based on using the directly available **pre-sliced model** ... To represent complex 3D **models** with material information, extensive numbers of voxels were required ... and topology were represented by a well-established B-Rep **model**, and the ...

☆ 99 Cited by 2 Related articles All 2 versions

Seam concealment for three-dimensional **models**

PE Hopkins, DJ Holzwarth - US Patent 8,349,239, 2013 - Google Patents

... 2 and 3). However, method 66 is applicable for building 3D **models** and corresponding support ... steps 68-84, and initially involves receiving a digital representation of 3D **model** 24 (step ... and into multiple layers (step 70), and generating one or more **pre-sliced** support structures ...

☆ 99 Cited by 8 Related articles All 5 versions »

Establishment at a **remote** location of an internet/intranet user interface to a copier/**printer**

CG Wood, TR Hull, RE Sikorski, DH Adams - US Patent 6,453,127, 2002 - Google Patents

... print job is submitted to the copier/**printer**, the user will be able to **query** the system ... each of the computers 30, 30′ to set up **printing** jobs on the respective **printers** 15, 15 ... 2. In accordance with the invention, a **printer** user interface software package and specific operating system ...

☆ 99 Cited by 208 Related articles All 4 versions »

Network **printer** with **remote** print queue control procedure

ST Gase - US Patent 6,184,996, 2001 - Google Patents

... a linking to other pages and provide a capability to cause the **printer** to: respond with its **properties** (button 40 ... selecting a particular job in the job's list page, a request message is sent to **printer** 14 which ... Server 24, in turn, **queries** queue manager 32 for details of the selected job ...

☆ 99 Cited by 162 Related articles All 2 versions »

Displaying **printer property** sheets

TJ Otala - US Patent 6,222,638, 2001 - Google Patents

... a **property** sheet and adds General and Details **property** pages to it; shell 120 **queries** all registered ... Each such registered shell extension is then sequentially **queried** to provide **property** pages ... 8, in step S805, responding to shell 120's **query**, shell extension 122 within the **printer** ...

☆ 99 Cited by 22 Related articles All 2 versions »

Mobility support for **printing**

KK Yellepeddy, KE Carter - US Patent 6,288,790, 2001 - Google Patents

... For print operations which list jobs, **query** jobs, modify **properties** of jobs, and manage ... to the selected **remote printer** queue), mobile print connection manager 210 lists, **queries**, modifies, and ... For print operations which manage or modify **properties** of the network **printer** object for ...

☆ 99 Cited by 136 Related articles All 2 versions »

Synchronization of controlled device state using state table and eventing in data-driven **remote** device control model

WM Zintel, BS Christian, BA Christian - US Patent 6,725,281, 2004 - Google Patents

... and recorders) and recording, play-back and presentation devices (eg, a television, **printer**, and data ... maintain associations as a convenience for the customer (eg remembering commonly used networked **printers**) ... the browser can be considered to be a very rich **remote** terminal ...

☆ 99 Cited by 420 Related articles All 2 versions »

Printing system with pre-defined user modifiable forms and local and **remote printing**

RP Farros, JA Schuyler, GW Babcock, MJ Finn ... - US Patent ..., 1999 - Google Patents

... The process is then exited, causing the **printing** system to **query** the user if the **printing** system is to be ... US6330542B1 (en), 1999-11-24, 2001-12-11, Ecorporate **Printers**, Inc ... EP1182860A2 (en) *, 2000-08-15, 2002-02-27, Eastman Kodak Company, A color digital **printer** having a ...

☆ 99 Cited by 219 Related articles All 2 versions »

Method and apparatus for **remotely** inspecting **properties** of communicating devices

DL Donoho, DS Hindawi, LE Lippincott - US Patent 6,931,434, 2005 - Google Patents

... In effect, the list of **properties** of the environment which may be referred to in the ... 11 is a block diagram showing named **property** method dispatch according to the invention; ... These are, for example, attributes which can be determined after **querying** attached peripherals to learn ...

☆ 99 Cited by 65 Related articles All 2 versions »

System and method for a universal output driver

JT Lin, WC Li, CC Chen, CW Chen, HY Lin ... - US Patent ..., 2002 - Google Patents

... output; 207: **Query** the **properties** and functions provided by the selected output device; refer to FIG. 7 for details; 208: Specify the **properties** of the output devices from the **property** listing of the selected output device; 209 ...

☆ 99 Cited by 56 Related articles All 2 versions »

Providing local **printing** on a thin client

KE Carter, MJ Hamzy, P Nogay... - US Patent ..., 2001 - Google Patents

... During initialization, the client only **queries** the print system on the server for default ... request contains the print job in the device independent format, job **properties**, **printer properties** and routing ... US20020018234A1 (en) *, 2000-08-04, 2002-02-14, Arron Fu, **Printer** driver system for ...

☆ Cited by 123 Related articles All 2 versions »

System and method for transacting retrieval of real estate **property** listings using a **remote** client interfaced over an information network

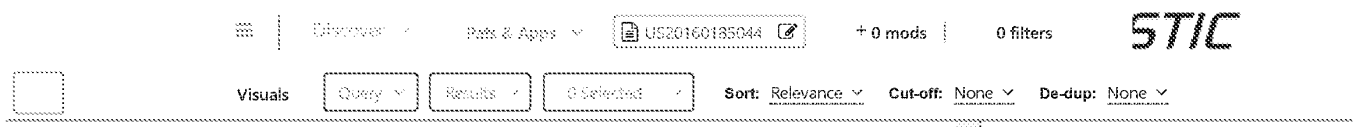
MD Sealand, G Gross, J Mizrahi - US Patent 7,430,555, 2008 - Google Patents

... The search method 33 processes search **queries** by sending sets of search parameters ... For example, a Structured **Query** Language (SQL) or Extensible Markup Language (XML) function ... Unique identifiers for particular **properties**, such as those shown in the example **properties** ...

☆ Cited by 54 Related articles All 4 versions »

Related searches

remote **location copier** printer



1 - 50 5,136,422 results

1. **Networked three-dimensional printer with three-dimensional scanner**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20120286453 | US APPLICATIONS | 15-NOV-2012

2. **Networked three-dimensional printing**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20120113457 | US APPLICATIONS | 10-MAY-2012

3. **Web-based design tools for three-dimensional printing**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20120287470 | US APPLICATIONS | 15-NOV-2012

4. **Networked three-dimensional printing**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20120105903 | US APPLICATIONS | 03-MAY-2012

5. **Social networking for three-dimensional printers**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20120287472 | US APPLICATIONS | 15-NOV-2012

6. **Networked three-dimensional printer with three-dimensional scanner**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

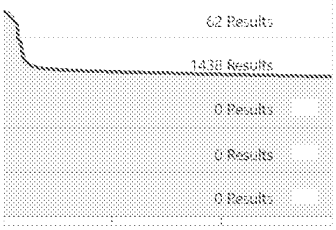
CURRENT ASSIGNEES: MAKERBOT IND LLC
US8747097 | US PATENTS | 10-JUN-2014

7. **Web-based design tools for three-dimensional printing**

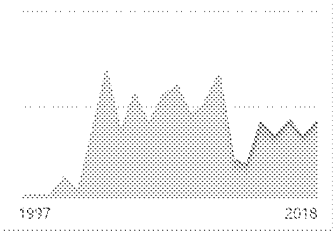
Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional

Top 1500 results

Relevance VIEW



Publication Date VIEW



Cur Assignee by Relevance VIEW

- MAKERBOT IND LLC **(144)**
- STRATASYS LTD **(2)**
- MEIKE BOTE IND CO LTD **(1)**
- QUALCOMM INC **(4)**
- PIRATE3DP PTE LTD **(2)**
- CITRIX SYS INC **(9)**
- FULL SPECTRUM LASER LLC **(2)**

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Result #1 PREV NEXT

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L6	7751	automatic$4 detect$3 hardware reconfiguration printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L7	3	automatic$4 detect$3 hardware reconfiguration printer and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L8	22	automatic$4 detect$3 hardware (reconfiguration|chang$3) printer and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L9	1	automatic$4 detect$3 hardware (reconfiguration|chang$3) printer and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2018/12/18 19:58
L10	1	automatic$4 detect$3 (hardware|equipment|settings) (reconfiguration|chang$3) and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2018/12/18 19:58
L11	1	automatic$4 detect$3 hardware (reconfiguration|chang$3) and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2018/12/18 19:58
L12	2	automatic$4 (hardware|equipment|settings) (reconfiguration|chang$3) and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2018/12/18 19:58
L13	3	monitor$3 (hardware|equipment|settings)	US-PGPUB;	SAME	ON	2018/12/18

		(reconfiguration|chang$3) and B29C67/0088.cpc.	USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			19:58
L14	3	monitor$3 (hardware|equipment|accessor$3) (reconfiguration|chang$3) and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2018/12/18 19:58
L15	3	monitor$3 (hardware|equipment|accessor$3) (reconfiguration|reconfiguration|chang$3|add|remove) and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2018/12/18 19:58
L16	3	(automatic$4|monitor$3|detect$3) (hardware|equipment|accessor$3) (reconfiguration|reconfiguration|chang$3|add|remove) and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2018/12/18 19:58
L17	28249	(automatic$4|monitor$3|detect$3) (hardware|equipment|accessor$3) (reconfiguration|reconfiguration|chang$3|add|remove) and printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2018/12/18 19:58
L18	692	(automatic$4|monitor$3|detect$3) (hardware|equipment|accessor$3) (reconfiguration|reconfiguration|chang$3|add|remove) and (3D|3-D|Three-D|Three-Dimensional|3-Dimensional|"Three Dimensional") with printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2018/12/18 19:58
L19	2249	automatic$4 detect$3 hardware reconfiguration (3D|3-D|Three-D|Three-Dimensional|3-Dimensional|"Three Dimensional") printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L20	41751	automatic$4 detect$3 hardware (reconfiguration|reconfiguration|chang$3|add$3|remov$3) (3D|3-D|Three-D|Three-Dimensional|3-Dimensional|"Three Dimensional") printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L21	73	automatic$4 detect$3 hardware (reconfiguration|reconfiguration|chang$3|add$3|remov$3) and (3D|3-D|Three-D|Three-Dimensional|3-Dimensional|"Three Dimensional") printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	SAME	ON	2018/12/18 19:58

			IBM_TDB			
L22	1452	automatic$4 detect$3 hardware (re-configuration|reconfiguration|chang$3|add$3|remov$3) and printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2018/12/18 19:58
L23	3	automatic$4 detect$3 hardware reconfiguration and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L24	4	("20150331402" | "6227643" | "7639253" | "7052103").PN.	US-PGPUB; USPAT	AND	ON	2018/12/18 19:58
L25	835	(machine-ready|machine near ready).ab.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L26	23	(machine-ready|machine near ready).ab. and printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L27	115	(makerbot adj industries).as.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L28	3	(leonard near2 alison).in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L29	10	(sadusk near2 joseph).in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L30	2782	700/98.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L31	628	700/98.ccls. and printer	US-PGPUB;	AND	ON	2018/12/18

			USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			19:58
L32	513	700/98.ccls. and printer and model	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L33	116	700/98.ccls. and printer and model and slice	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L34	2122	B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L35	752	B29C67/0088.cpc. and printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L36	295	B29C67/0088.cpc. and printer and model	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L37	61	B29C67/0088.cpc. and printer and model and slic$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L38	5	B29C67/0088.cpc. and printer and model and slic$3 and @ay<"2014"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L39	40133	G05B15/02.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	AND	ON	2018/12/18 19:58

			IBM_TDB			
L40	430	G05B15/02.cpc. and G06F17/50.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L41	36	G05B15/02.cpc. and G06F17/50.cpc. and L34	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L42	13841	B33Y50/02.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L43	36	L42 and L41	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L44	2572	store and sliced and model and printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L45	316	store and sliced with model and printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L46	2084	automatic configuration slicing printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L47	1884	automatic configuration slicing printer (cloud|network)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L48	17	automatic configuration slicing printer (cloud|network) machine-ready	US-PGPUB; USPAT; USOCR; FPRS;	AND	ON	2018/12/18 19:58

			EPO; JPO; DERWENT; IBM_TDB			
L49	5	automatic configuration slicing printer (cloud|network) pre-sliced	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L50	3489	automatic configuration slicing model (cloud|network)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L51	40352	automatic$4 (configuration|configured|configures) (slicing|slices|sliced) model (cloud|network|stored)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L52	61	automatic$4 with (configuration|configured|configures) with (slicing|slices|sliced) and model with (cloud|network|stored)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L53	116	automatic$4 with (configuration|configured|configures) same (gcode|slice|slicing|slicer|sliced|slices) and model with (cloud|network|stored)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L54	1474	automatic$4 with (configuration|configured|configures) same (gcode|slice|slicing|slicer|sliced|slices|printer|3D|three-dimensional) and model with (cloud|network|stored)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L55	45859	machine ready model library	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L56	43	machine ready model library	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2018/12/18 19:58
L57	2	"20140156053".pn.	US-PGPUB; USPAT;	SAME	ON	2018/12/18 19:58

			USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
L58	5	(20020041386|20120224755).pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L59	3	(makerbot adj industries).as,aanm. @ad="20141231"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L60	24938	(remote print server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/12/18 19:58
L61	1998	(remote print server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2018/12/18 19:58
L62	484	(remote print server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	WITH	ON	2018/12/18 19:58
L63	44	(remote print server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2018/12/18 19:58
L64	34	(remote print server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM) and @ad<"20141231"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2018/12/18 19:58
L65	24654	(remote server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM) and @ad<"20141231"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2018/12/18 19:58

L66	53868	(remote server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM) and @ad<"20141231"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	WITH	ON	2018/12/18 19:58
L67	346	(remote print server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM) and @ad<"20141231"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	WITH	ON	2018/12/18 19:58
L68	1409	(remote print$3 server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM) and @ad<"20141231"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	WITH	ON	2018/12/18 19:58
L69	99	(remote print$3 server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM) and @ad<"20141231"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2018/12/18 19:58
L70	9	("20020166220" | "20030105538" | "20050025354" | "20050157919" | "20060293906" | "20070084047" | "20130090894" | "20140121820" | "20140244433").PN.	US-PGPUB; USPAT; USOCR	AND	ON	2018/12/18 19:58

EAST Search History (Interference)

< This search history is empty>

12/ 18/ 2018 8:09:08 PM
C:\ Users\ jsanders3\ Documents\ EAST\ Workspaces\ 14587548.wsp

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Serial No.: 14/587,548
Filing Date: December 31, 2014
In re: LEONARD, Alison N., *et al.*
Art Unit: 2127
Examiner: SANDERS, Joshua T.
Conf. No.: 6946

Commissioner for Patents
PO Box 1450
Alexandria, Virginia 22313-1450

AMENDMENT AND REMARKS

Dear Examiner:

Please enter and consider the following Amendment and Remarks, which are responsive to the non-final Office Action mailed May 31, 2018:

A **Request for Extension of Time** appears on page 2 of this paper.

Amendments to the Claims begin on page 3 of this paper.

Remarks begin on page 7 of this paper.

Request for Extension of Time

The applicant requests a one-month extension of time from August 31, 2018 until October 1, 2018 (the next business day after September 30, 2018, which is a Sunday) for responding to the outstanding action. The fee of $200 as specified by 37 C.F.R. § 1.17(a)(1) accompanies this request.

Amendments to the Claims

Please amend the claims according to the following claim listing, which replaces all prior versions and listings of the claims in this application:

1. (Currently amended) A method comprising:

receiving a request to fabricate an object from a three-dimensional model at a remote print server;

~~automatically~~ determining a target printer to fabricate the object at the remote print server ~~based on one or more selection criteria~~;

querying the target printer from the remote print server for one or more properties relevant to creation of a printable model for fabrication of the object;

receiving a dictionary of the one or more properties from the target printer;

creating a fabrication profile based on the one or more properties;

determining whether a suitable machine-ready model is available for the fabrication profile based on at least one of the one or more properties relevant to selection of a machine-ready model from a content source;

when a suitable machine-ready model is available from the content source, selecting the suitable machine-ready model for transmission to the target printer; and

when a suitable machine-ready model is not available from the content source, processing the three-dimensional model according to the fabrication profile, and generating a machine-ready representation of the processed three-dimensional model executable by the target printer to fabricate the object based on the one or more properties relevant to the creation of a printable model.

2. (Previously presented) The method of claim 1 further comprising transmitting one or more of the suitable machine-ready model and the machine-ready representation to the target printer for fabrication.

3. (Original) The method of claim 1 further comprising fabricating the object with the target printer.

4. (Original) The method of claim 1 wherein the one or more properties include a hardware configuration of the target printer.

5. (Original) The method of claim 4 wherein the hardware configuration includes one or more of an extruder type, an extruder nozzle diameter, a build volume, a build platform type, a hardware version number, a top speed for linear movement of a tool, a step size for movement of the tool, a minimum z-axis step size, a gantry type, and a build material type.

6. (Original) The method of claim 4 wherein the hardware configuration includes an automatically detected hardware reconfiguration.

7. (Original) The method of claim 4 wherein the hardware configuration includes a manually specified hardware reconfiguration.

8. (Original) The method of claim 1 wherein the one or more properties include a firmware configuration of the target printer.

9. (Original) The method of claim 1 wherein the one or more properties include one or more user settings on the target printer.

10. (Original) The method of claim 9 wherein the one or more user settings include user settings from a previous fabrication process.

11. (Original) The method of claim 1 wherein the one or more properties include an application used to operate the target printer.

12. (Original) The method of claim 1 wherein the one or more properties include a build material in the target printer.

13. (Original) The method of claim 1 further comprising receiving an identifier from the target printer and applying the identifier to retrieve the dictionary from a repository of printer information remote from the target printer.

14. (Canceled)

15. (Previously presented) The method of claim 1 wherein the suitable machine-ready model is selected from a plurality of stored machine-ready models.

16. (Original) The method of claim 15 further comprising:

determining whether one of the plurality of stored machine-ready models can be modified to meet the fabrication profile;

modifying the one of the plurality of stored machine ready models for use as the machine-ready representation if possible; and

generating a new machine-ready representation according to the fabrication profile for use as the machine-ready representation if not possible.

17. (Original) The method of claim 16 wherein modifying includes one or more of translating the machine-ready representation, rotating the machine-ready representation, scaling the machine-ready representation, and changing a top speed in a tool path for the target printer.

18–19. (Canceled)

20. (Previously presented) The method of claim 1 further comprising generating descriptive metadata to accompany one or more of the suitable machine-ready model and the machine-ready representation, the descriptive metadata specifying one or more properties for comparison to properties of printers selected for fabricating the model.

21–31. (Canceled)

32. (Previously presented) The method of claim 1 wherein the one or more selection criteria include one or more of information related to the three-dimensional model, information related to the object, a print queue, a prioritization, a location of the target printer, a timeline, and an attribute of the target printer.

33. (Currently amended) The method of claim 1 wherein the one or more properties include one or more of a user configuration, a user preference, and a hardware accessory added to the target printer by a user.

34. (New) The method of claim 1 further comprising, when the machine-ready model is received by the target printer, comparing metadata for the machine-ready model to one or more printer properties in the dictionary to ensure that the machine-ready model can be fabricated by the target printer.

Remarks

Status of the Claims

Claims 1 and 33 are amended. Claim 34 is added. Claims 1–13, 15–17, 20 and 32–34 are presented for examination, where claim 1 is independent.

No new matter is added.

Claim Rejections – 35 U.S.C. § 103

Independent claim 1 stands rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Pat. Pub. No. 2013/0329258 to Pettis, *et al.* ("*Pettis*") in view of U.S. Pat. Pub. No. 2014/0156053 to Mahdavi, *et al.* ("*Mahdavi*"). This rejection is traversed for at least the following reasons.

The applicant has devised a technique for using a remote print server to provide compatible 3D models based on a "dictionary" of information received from a target 3D printer. "While a three-dimensional printer may know its own hardware and software configuration, a service providing machine-ready models may not."[1] To address this issue, the claimed invention provides "useful techniques for determining printer capabilities and matching these capabilities to pre-existing machine-ready models,"[2] and as necessary, "for the generation of a machine-ready representation of the three-dimensional model that is executable on the target printer."[3] The claims have been amended to clarify this inventive concept.

Pettis is directed to "[a] server . . . stor[ing] a number of different models of an object in machine-ready form corresponding to a number of different three-dimensional printers having differing capabilities and/or hardware configurations."[4] "When a user at a . . . printer requests the object, the server automatically determines a printer type and selects a suitable, corresponding machine-ready model for immediate fabrication by the printer."[5] *Pettis* may teach a technique for providing suitable machine-ready models to target printers, however *Pettis* does not teach or suggest querying a target printer for

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[1] Specification, ¶ [0002].
[2] Specification, ¶ [0075].
[3] Specification, ¶ [0099]; *see also id.* at ¶ [0078] ("To this end, the machine-ready representation may be configured for use on the target printer based on the properties of the target printer.").
[4] *Pettis*, Abstract.
[5] *Pettis*, Abstract.

properties relevant to creation of a printable model for fabrication of an object and receiving a dictionary of the properties in response, as claimed. The outstanding Office Action acknowledges this deficiency:

> PETTIS fails to clearly specify:
>
> • querying the target printer from the remote print server for one or more properties relevant to fabrication of the object;
>
> • receiving a dictionary of the one or more properties from the target printer;[6]

Mahdavi does not fill this void left by *Pettis*. *Mahdavi* generally contemplates systems for content control in three-dimensional printing including "method of authenticating the printing of a three-dimensional (3D) article at a 3D printer."[7] In this process, *Mahdavi* contemplates a service provider that maintains a database of printer information from various manufacturers. "Once the manufacturer's database record 37 has been created, the server 31 requests information regarding the 3D printer's [sic] 45 that the manufacturer 19 would like to register with the service provider."[8] This process for registering printers at a service provider includes the acquisition of a unique identifier and printer information from the manufacturer:

> The unique identifiers associated with each 3D printer are received at step 87, along with the optional associated printer performance data. This data is stored in the registered manufacturer's database record 37, at step 89, and the registration process is completed.[9]

However, requesting information that a manufacturer would like to register as described in *Mahdavi* is different than querying a target printer for properties as claimed, and receiving a unique identifier and performance data from the manufacturer in a registration process is different than receiving a dictionary of properties from a target printer. Even if the technique described in *Mahdavi* could be adapted to facilitate a query for printer information as claimed, which the applicant does not presently concede, this would fail to result in the claimed invention. For example, as a significant advantage, the applicant's technique for directly querying a printer for information before allocating a fabrication-ready model permits the print server to accurately account for end user print

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[6] Non-final Office Action mailed on May 31, 2018 (hereinafter "Office Action"), p. 6.
[7] *Mahdavi*, Abstract.
[8] *Mahdavi*, ¶ [0071].
[9] *Mahdavi*, ¶ [0073].

settings, hardware customizations, and the like, any of which may be modified by the printer operator independently from the manufacturer.

Mahdavi does not appear to teach or fairly suggest any step of "querying the target printer from the remote print server for one or more properties relevant to creation of a printable model for fabrication of the object." *Mahdavi* also does not appear to teach or fairly suggest any related step of "receiving a dictionary of the one or more properties from the target printer." Because *Mahdavi* does not disclose these claimed features, *Mahdavi* cannot render claim 1 unpatentable, either alone or in combination with the remaining art of record.

For the foregoing reasons, independent claim 1 is believed to be patentable over the art of record. The remaining claims depend from an allowable base claim and are likewise in condition for allowance. The applicant respectfully requests reconsideration and withdrawal of the outstanding claim rejections under 35 U.S.C. § 103.

Conclusion

In view of the foregoing, the applicant believes that the currently pending claims are in condition for allowance and respectfully requests a corresponding Notice of Allowance.

The applicant believes that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue, or comment does not signify agreement with or concession of that rejection, issue, or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed.

Nothing in this paper should be construed as intent to concede any issue with regard to any claim, except as specifically stated in this paper. The amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

The Director is hereby authorized to charge any fees or to credit any overpayments associated with this filing to Deposit Account No. 50-4262. If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned attorney.

Respectfully submitted
STRATEGIC PATENTS, P.C.

/Thomas J. Bassolino/
Thomas J. Bassolino
Reg. No. 65,946
Tel.: (646) 238-1234

October 1, 2018

Electronic Patent Application Fee Transmittal					
Application Number:	14587548				
Filing Date:	31-Dec-2014				
Title of Invention:	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION				
First Named Inventor/Applicant Name:	Alison N. Leonard				
Filer:	Thomas John Bassolino/Paula Ng				
Attorney Docket Number:	MBOT-0070-P01				
Filed as Large Entity					
Filing Fees for Utility under 35 USC 111(a)					
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 $0 paid	1251	1	200	200
Miscellaneous:				
			Total in USD ($)	**200**

Electronic Acknowledgement Receipt	
EFS ID:	33880347
Application Number:	14587548
International Application Number:	
Confirmation Number:	6946
Title of Invention:	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION
First Named Inventor/Applicant Name:	Alison N. Leonard
Customer Number:	43520
Filer:	Thomas John Bassolino/Paula Ng
Filer Authorized By:	Thomas John Bassolino
Attorney Docket Number:	MBOT-0070-P01
Receipt Date:	01-OCT-2018
Filing Date:	31-DEC-2014
Time Stamp:	14:39:54
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$200
RAM confirmation Number	100218INTEFSW14402800
Deposit Account	504262
Authorized User	Paula Ng
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		MBOT-0070-P01_20181001_OAResponse.pdf	155779 02d4df5f348f1567236074a7fedecfc2256c45ce	yes	10

Multipart Description/PDF files in .zip description

Document Description	Start	End
Amendment/Req. Reconsideration-After Non-Final Reject	1	1
Extension of Time	2	2
Claims	3	6
Applicant Arguments/Remarks Made in an Amendment	7	10

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	30654 f0fa797888c0b4aea3b4648ee5a5630519a7be6a	no	2

Warnings:

Information:

Total Files Size (in bytes):	186433

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

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.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/587,548	Filing Date 12/31/2014	☐ To be Mailed

ENTITY: ☑ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $80 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $420 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	10/01/2018	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0		x $100 =	0
	Independent (37 CFR 1.16(h))	* 1	Minus	*** 3	= 0		x $460 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	Brenda V Harrison
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. 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, 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.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/587,548	12/31/2014	Alison N. Leonard	MBOT-0070-P01	6946

43520 7590 05/31/2018

STRATEGIC PATENTS P.C.
P.O. BOX 920629
NEEDHAM, MA 02492

EXAMINER	
SANDERS, JOSHUA T	

ART UNIT	PAPER NUMBER
2127	

NOTIFICATION DATE	DELIVERY MODE
05/31/2018	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):

patents@stratpat.com

Office Action Summary	Application No. 14/587,548	Applicant(s) LEONARD ET AL.	
	Examiner JOSHUA SANDERS	Art Unit 2127	AIA (First Inventor to File) Status Yes

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 December 2017*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ 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.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-13; 15-17; 20; 32 and 33* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-13; 15-17; 20; 32 and 33* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, 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.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ 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)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

DETAILED ACTION

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

2. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

3. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 22 December 2017 has been entered.

4. Claims 1-13, 15-17, 20, 32 and 33 are pending.

5. Claims 1-13, 15-17, 20, 32 and 33 are rejected, grounds follow.

Response to Arguments

6. Applicant's arguments, see Remarks, page 7, filed 22 December 2017, with respect to the rejection(s) of claim(s) 1 under 35 USC 102 have been fully considered and are persuasive. Examiner concurs that the reference fails to disclose or clearly anticipate a remote print server in conjunction with the other elements of the claim. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made under 35 USC 103, over Pettis, et al., US PG-Pub 2013/0329258 in view of Mahdavi, et al., US PG-Pub 2014/0156053;

7. Examiner notes for the record that applicant has not elected to provide separate arguments for the dependent claims at this time; argument for eligibility relying on their dependence on the alleged eligible independent claim(s).

Claim Rejections - 35 USC § 103

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

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claims 1-5, 7-10, 12, 13, 15, 16, 20, 32 and 33 and is/are rejected under 35 U.S.C. 103 as being unpatentable over Pettis, et al., US Patent Application**

Publication 2013/0329258 (hereafter PETTIS) in view of Mahdavi, et al., US Patent Application Publication 2014/0156053 (hereafter MAHDAVI).

Regarding Claim1, PETTIS teaches:

- receiving a request to fabricate an object from a three-dimensional model (fig. 5, 514; [0083] As shown in step 514, the method 500 may include receiving a request from a client for an object through a data network.) at a remote print server (PETTIS [0083]; method 500 may be hosted by a remote server, see [0028] "the user interface may be remotely served and presented on one of the client devices 206, such as where a print server 208 or one of the three-dimensional printers 204 includes a web server that provides information through one or more web pages or the like that can be displayed within a web browser or similar client executing on one of the client devices 206.")
- automatically determining a target printer to fabricate the object; ([0085] As shown in step 516, the method 500 may include identifying a three-dimensional printer associated with the client; see also [0030] "A print server 208 may also maintain a list of available three-dimensional printers 204, and may automatically select one of the three-dimensional printers 204 for a user-submitted print job")
- creating a fabrication profile based on the one or more properties; ([0072] "the selection engine 416 may select one of the two or more machine-ready models in the database 402 according to a predetermined criterion and transmit the one of the two or more machine-ready models to the client. This may be a criterion

based on machine capabilities." Selecting based upon machine capabilities obviously implies a profile of the printer based upon properties (capabilities) of the printer) that the requirements of the model would be compared against.)

- determining whether a suitable machine-ready model is available for the fabrication profile. (PETTIS [0086] "When two or more of the machine-ready models are suitable for the three-dimensional printer associated with the client, this may further include selecting one machine-ready models according to a predetermined criterion, such as with the selection engine described above.")
- when a suitable machine-ready model is available, selecting the suitable machine-ready model for transmission to the target printer (PETTIS [0089] "As shown in step 522, the method 500 may include transmitting the machine-ready model from the client to the three-dimensional printer for fabrication"; which obviously implies 'selecting said machine-ready model for transmission' first.)
- when a suitable machine-ready model is not available, processing the three-dimensional model according to the fabrication profile and generating a machine-ready representation of the processed three-dimensional model executable by the target printer to fabricate the object. ([0076] "As shown in step 502, the method 500 may include receiving a digital model of an object through a data network." [0077] "As shown in step 504, the method 500 may include creating a plurality of machine-ready models based upon the digital model. This may include machine-ready models for a variety of types of three-dimensional printers and/or hardware configurations as discussed above." [0083]; "It will be

understood that the term "object" as used herein is intended to refer to a three-dimensional object characterized by a three-dimensional model. For the purposes of this disclosure it does not matter whether the client request is for the object (e.g. "lamp") or for a machine-ready model that may be used to fabricate the object, as either request will be transferred to a server or similar resource in a machine-readable form that can result in the appropriate model being returned to the client." [0081] "It will be understood that the method may be performed in parallel for any number of simultaneous users, and that steps such as creating individual machine-ready models may be readily parallelized for greater performance" Obviously implying that if the User requests an object for which a machine ready model does not already exist; a machine-ready model can be created in parallel to satisfy the user request, resulting in "the appropriate model being returned to the client".)

However, PETTIS fails to clearly specify:

- querying the target printer from the remote print server for one or more properties relevant to fabrication of the object;
- receiving a dictionary of the one or more properties from the target printer;

(however, see PETTIS [0069])

But, MAHDAVI teaches:

- querying the target printer from the remote print server for one or more properties relevant to fabrication of the object; (MAHDAVI fig. 5, step 85; [0071] “the server 31 requests information regarding the 3D printer's 45 that the manufacturer 19 would like to register with the service provider, at step 85. … Further information which may be requested is printer performance data. For example, this might comprise information regarding any one or more of the following: the available printing volume, … the type of materials which may be used for printing; laser spot size, … laser output power; laser wavelength, … one or more different build algorithms the printer is configured to use.”)
- receiving a dictionary of the one or more properties from the target printer; (MAHDAVI, fig. 5; step 87 [0073] “The unique identifiers associated with each 3D printer are received at step 87, along with the optional associated printer performance data.”)

PETTIS and MAHDAVI are analogous art because they are from the same field of endeavor and contain overlapping structural and functional similarities. They both contain 3D Printers and Print Servers. Furthermore, they both automatically select appropriate printers for printing requests.

Therefore at the time the application was filed, it would have been obvious to a person of ordinary skill in the art to modify the above Method, as taught by PETTIS, by

incorporating the query and receipt of printer properties from Printers, as taught by MAHDAVI.

One of ordinary skill in the art would have been motivated to do this modification in order to determine which printer in a group of printers is best suited to manufacture a model, as suggested by MAHDAVI ([0059] “In this way, information comprised within a manufacturer's database record 37 may be used by the server 31 to determine not only which manufacturer 19 is best suited to print the 3D object, but also which specific 3D printer 45 available to the manufacturer is best suited, by comparing the user-defined physical specifications with the defined printing capabilities of each printer 45.”).

Regarding Claim 2, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 1,

PETTIS further teaches:

- further comprising transmitting one or more of the suitable machine-ready model and the machine- ready representation to the target printer for fabrication. (PETTIS [0089] “As shown in step 522, the method 500 may include transmitting the machine-ready model from the client to the three-dimensional printer for fabrication”)

Regarding Claim 3, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 1,

PETTIS further teaches:

- further comprising fabricating the object with the target printer. ([0088] “In one aspect, the client may be a network-enabled three-dimensional printer that serves as a client device to directly receive machine-ready models for fabrication.”)

Regarding Claim 4, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 1,

PETTIS further teaches:

- wherein the one or more properties include a hardware configuration of the target printer. (PETTIS [0077] “A predetermined configuration for one of the types of three-dimensional printers may also include one or more hardware components of the three-dimensional printer such as a display, a heated build platform, a camera, a conveyor, a color-mixer, or other optional hardware component, any of which may require specialized machine code for use in fabricating a model.”)

Regarding Claim 5, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 4,

PETTIS further teaches:

- wherein the hardware configuration includes one or more of an extruder type, an extruder nozzle diameter, a build volume, a build platform type, a hardware version number, a top speed for linear movement of a tool, a step size for movement of the tool, a minimum z-axis step size, a gantry type, and a build material type. (PETTIS [0077] "...hardware components of the three-dimensional printer such as … a heated build platform" comprising at least a build platform type. See also MAHDAVI [0071])

Regarding Claim 7, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent Claim 4,

PETTIS further teaches:

- wherein the hardware configuration includes a manually specified hardware reconfiguration. (PETTIS [0085] "As shown in step 516, the method 500 may include identifying a three-dimensional printer associated with the client. This may be based on ... information manually provided by a user at the client." [0069] "a user of the client 406 may manually identify a type of three-dimensional printer and/or specific capabilities of the three-dimensional printer.")

Regarding Claim 8, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 1,

PETTIS further teaches:

- wherein the one or more properties include a firmware configuration of the target printer. (PETTIS [0073] – "This may also include software-enabled features such as firmware upgrades or the like, and the server 400 may detect such software-enabled features and where appropriate make modifications to the machine-ready code with the modification engine 414." Detecting Firmware configurations of the target printer)

Regarding Claim 9, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 1,

PETTIS further teaches:

- wherein the one or more properties include one or more user settings on the target printer. (PETTIS; [0066] "this may include machine-ready models 314 that accommodate a variety of possible user preferences concerning, e.g., print resolution, size, infilling density, rafting or support structures, and so forth. ... "As another example, where a three-dimensional printer has a camera or the like, a corresponding machine-ready model 314 may enable the camera for remote viewing during a build." See also PETTIS [0032] "a print server 208 may store a user's preference on handling objects greater than a build volume of a printer. These preferences may control whether to resize the object, whether to break the

object into multiple sub-objects for fabrication, and whether to transmit multiple sub-objects to a single printer or multiple printers. In addition, user preferences or requirements may be stored, such as multi-color printing capability, build material options and capabilities, and so forth.")

Regarding Claim 10, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 9,

PETTIS further teaches:

- wherein the one or more user settings include user settings from a previous fabrication process. ([0034] "the print server 208 may provide an interface for submission of objects from remote users, along with any suitable metadata such as … recommended printer settings", [0067] "a machine-ready model may be manually verified by fabricating the model with a printer and having a user confirm that the build is successful." See also PETTIS [0032])

Regarding Claim 12, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 1,

PETTIS further teaches:

- wherein the one or more properties include a build material in the target printer. (PETTIS [0066] "As another example, a printer may have ... an ability to select among various, different build materials either at the beginning of a build or during a build.")

Regarding Claim 13, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 1,

MAHDAVI further teaches:

- further comprising receiving an identifier from the target printer (MAHDAVI [0048] Accordingly, the server 43 may comprise a database 44 which contains a list 46 of the different unique identifiers associated with each operatively connected 3D printer 45.)
- applying the identifier to retrieve the dictionary from a repository of printer information remote from the target printer. (MAHDAVI [0059] “In turn, each one of the 3D printers 45 is also associated with a unique identifier, which may be stored in the manufacturer's record 37. In this way, each manufacturer's database record 37 comprises a full listing of each individual 3D printer 45 available to the manufacturer, along with the printing capabilities of each printer 45.” Record 37 is in “Service Provider DB” which is remote from the 3D printer, see fig. 2)

Regarding Claim 15, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 1,

PETTIS further teaches:

- wherein the suitable machine-ready model is selected from a plurality of stored machine-ready models. (PETTIS [0086] “As shown in step 518, the method 500

may include selecting one of the machine-ready models corresponding to the three-dimensional printer associated with the client. The corresponding model may be located in and retrieved from the database 512.")

Regarding Claim 16, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 15,

PETTIS further teaches

- determining whether one of the plurality of stored machine-ready models can be modified to meet the fabrication profile; (PETTIS – fig. 5, Select machine-ready model 518)
- modifying the one of the plurality of stored machine ready models for use as the machine-ready representation if possible; (fig. 5, modify model 519)
- generating a new machine-ready representation according to the fabrication profile for use as the machine-ready representation if not possible. ([0076] "As shown in step 502, the method 500 may include receiving a digital model of an object through a data network." [0077] "As shown in step 504, the method 500 may include creating a plurality of machine-ready models based upon the digital model. This may include machine-ready models for a variety of types of three-dimensional printers and/or hardware configurations as discussed above." [0083]; "It will be understood that the term "object" as used herein is intended to refer to a three-dimensional object characterized by a three-dimensional model. For the purposes of this disclosure it does not matter whether the client request

is for the object (e.g. "lamp") or for a machine-ready model that may be used to fabricate the object, as either request will be transferred to a server or similar resource in a machine-readable form that can result in the appropriate model being returned to the client." [0081] "It will be understood that the method may be performed in parallel for any number of simultaneous users, and that steps such as creating individual machine-ready models may be readily parallelized for greater performance" Obviously implying that if the User requests an object for which a machine ready model does not already exist; a machine-ready model can be created in parallel to satisfy the user request, resulting in "the appropriate model being returned to the client".)

Regarding Claim 20, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 1;

PETTIS further teaches:

- further comprising generating descriptive metadata to accompany the machine-ready representation, the descriptive metadata specifying one or more properties for comparison to properties of printers selected for fabricating the model. (PETTIS - [0035] – describing generating metadata for a database of models)

Regarding Claim 32, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 1;

PETTIS further teaches:

- wherein the one or more selection criteria include one or more of information related to the three-dimensional model, information related to the object, a print queue, a prioritization, a location of the target printer, a timeline, and an attribute of the target printer. (PETTIS [0030] “Where the print server 208 selects the printer automatically, any number of criteria may be used such as geographical proximity, printing capabilities, current print queue, fees (if any) for use of a particular three-dimensional printer 204, and so forth.”)

Regarding Claim 33, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 1;

PETTIS further teaches:

- wherein the one or more properties include one or more of a user configuration, a user preference, and a hardware accessory added to the target printer. (PETTIS [0032] “Other user preferences may be usefully stored at the print server 208 to facilitate autonomous, unsupervised fabrication of content from content sources 210. For example, a print server 208 may store a user's preference on handling objects greater than a build volume of a printer.”)

1. **Claim 6 is rejected under 35 U.S.C. 103 as being unpatentable over PETTIS and MAHDAVI further in view of PrintToPeer, PrintToPeer: Your 3D printer on the Web, previously cited, IFW NPL 07/10/2015, 21 pages. (hereafter PRINTTOPEER).**

Regarding Claim 6, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 4,

However, the combination fails to clearly specify:

- wherein the hardware configuration includes an automatically detected hardware reconfiguration.

But, PRINTTOPEER from the same field of endeavor of 3D printer management, teaches:

- wherein the hardware configuration includes an automatically detected hardware reconfiguration. (PRINTTOPEER - page 6, “your 3D printer is recognized [automatically]")

PETTIS and PRINTTOPEER are analogous because they are from the same field of endeavor and contain overlapping structural and functional similarities, they both do cloud-hosted slicing, and store printing instructions, they both automatically manage printer settings. Further they both integrate with web-based functions.

A person having ordinary skill in the art at the time the invention was filed could have modified the method of PETTIS with the automatic hardware reconfiguration detection of PRINTTOPEER.

A person having ordinary skill in the art at the time the invention was filed could have been motivated to do this in order to implement plug-and-play capability as suggested by PRINTTOPEER. (page 6)

9. **Claim 11 is rejected under 35 U.S.C. 103 as being unpatentable over PETTIS and MAHDAVI, further in view of 3Dagogo – "AstroPrint Wireless 3D Printing software—- Kickstarter, May 26, 2014; archived by the internet archive project, (previously cited; IFW NPL 12/29/2016; 11 pages)**

Regarding Claim 11, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 1,

However, the combination fails to clearly specify:

- wherein the one or more properties include an application used to operate the target printer.

But, ASTROPRINT teaches:

- wherein the one or more properties include an application used to operate the target printer. (choose between slic3r, cura, and makerbot per tech specs diagram on page 9)

PETTIS and ASTROPRINT are analogous because they are from the same field of endeavor and contain overlapping structural and functional similarities, they both do cloud-hosted slicing, and store printing instructions, they both automatically manage printer settings. Further they both integrate with web-based functions.

A person having ordinary skill in the art at the time the invention was filed could have modified the method of PETTIS with the application selection user preference of ASTROPRINT.

A person having ordinary skill in the art at the time the invention was filed could have been motivated to do this in order to facilitate autonomous, unsupervised fabrication of content, as suggested by PETTIS ([0032] "Other user preferences may be usefully stored at the print server 208 to facilitate autonomous, unsupervised fabrication of content from content sources 210.")

2. **Claim 17 is rejected under 35 U.S.C. 103 as being unpatentable over PETTIS and MAHDAVI, further in view of AIRWOLF3D, Getting Started with Airwolf 3D Printer SLIC3R Configurations, previously cited, IFW NPL 07/10/2015, 12 pages. (hereafter SLIC3R).**

Regarding Claim 17, the combination of PETTIS and MAHDAVI teaches all of the limitations of parent claim 16,

However, the combination does not appear to teach:

- wherein modifying includes one or more of translating the machine-ready representation, rotating the machine-ready representation, scaling the machine-ready representation, and changing a top speed in a tool path for the target printer.

But, SLIC3R from the same field of endeavor of 3D model Printer management, teaches:

- wherein modifying includes one or more of translating the machine-ready representation, rotating the machine-ready representation, scaling the machine-ready representation, and changing a top speed in a tool path for the target printer. (SLIC3R page 4, describing settings that vary by at least tool speed)

PETTIS and SLIC3R are analogous because they are from the same field of endeavor and contain overlapping functional and structural similarities. Both create sliced machine ready models from 3D model files.

A person having ordinary skill in the art at the time the invention was filed could have modified the method of PETTIS with the tool speed adjustment of SLIC3R.

A person having ordinary skill in the art at the time the invention was filed could have been motivated to make this modification as ASTROPRINT specifically teaches incorporating SLIC3R into its method. (page 9).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOSHUA SANDERS whose telephone number is (571)272-5591. The examiner can normally be reached on generally: Monday through Thursday and alternate Fridays.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ali can be reached on 571-272-4105. 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.

/J. S./
Examiner, Art Unit 2127

/MOHAMMAD ALI/
Supervisory Patent Examiner, Art Unit 2127

Notice of References Cited	Application/Control No. 14/587,548	Applicant(s)/Patent Under Reexamination LEONARD ET AL.	
	Examiner JOSHUA SANDERS	Art Unit 2127	Page 1 of 1

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-2013/0329258 A1	12-2013	Pettis; Nathaniel B.	F16M11/12	358/1.15
*	B	US-2014/0156053 A1	06-2014	Mahdavi; Siavash Haroun	B29C67/0059	700/119
	C	US-				
	D	US-				
	E	US-				
	F	US-				
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
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	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14587548	LEONARD ET AL.
	Examiner	Art Unit
	JOSHUA SANDERS	2127

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/29/2016	08/08/2017	05/21/2018						
	1	✓	✓	✓						
	2	✓	✓	✓						
	3	✓	✓	✓						
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	30	-	-	-						
	31	-	-	-						
	32			✓						
	33			✓						

3D-printing of non-assembly, articulated models

J Cali, DA Calian, C Amati, R Kleinberger… - ACM Transactions on …, 2012 - dl.acm.org
… to validate our results we used two rapid prototyping pro- cesses to realize the calibration sets as well as the articulated mod- els: SLS using an EOS FORMIGA P 100 **printer**, and SLA using an Objet PolyJetTM **printer** … **3- d printing** the history of mechanisms … **3D** polyomino puzzle …
☆ 99 Cited by 165 Related articles All 12 versions

3D printing technologies in rehabilitation engineering

E Mikołajewska, M Macko, Ł Ziarnecki, S Stańczak… - 2014 - repozytorium.ukw.edu.pl
… compatible components: Why every MRI research group should have a low-budget **3D printer**. Med Eng Phys … **3D printed** bionic ears. Nano Lett … 18. Herbert N., Simpson D., Spence WD Ion W. A preliminary investigation into the development of **3-D printing** of prosthetic sockets …
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3D printing and neurosurgery—ready for prime time?

GT Klein, Y Lu, MY Wang - World neurosurgery, 2013 - worldneurosurgery.org
… **3D Printing** and Neurosurgery—**Ready** for Prime Time … years away from clinical application, Atala's group have explored several futuristic uses of **3D printing** employing heterogeneous … The group published a study in which 3 different cell types were **printed** into predetermined …
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From engineering drawings to 3D CAD models: are we ready now?

D Dori, K Tombre - Computer-Aided Design, 1995 - Elsevier
… Moreover, most experts agree that the 'paperless society' dream of the 1980s is becoming more remote with each newly developed type of **printer** and plotter and with each decline in their prices … From engineering drawings to **3D** CAD **models**: are we **ready** now', D Don …
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3-D printing: The new industrial revolution

B Berman - Business horizons, 2012 - Elsevier
… now in final products as opposed to prototypes ("**3-D Printing**: The **Printed** World," 2010 … costs Alessi about 70% less than the traditional method of making prototypes ("**3D** Systems," 2011 … would download digital music—and then download and print the part on his/her **3-D printer** …
☆ 99 Cited by 815 Related articles All 8 versions

Medical applications for 3D printing: current and projected uses

CL Ventola - Pharmacy and Therapeutics, 2014 - ncbi.nlm.nih.gov
… 1 Many of these **printed** objects are comparable to traditionally manufactured items … 11 A relatively sophisticated **3D printer** costs about $2,500 to $3,000, and simpler **models** can … 8 , 11 For consumers who have difficulty **printing 3D models** themselves, several popular **3D printing** …
☆ 99 Cited by 389 Related articles All 7 versions »

Dimensional error of selective laser sintering, three-dimensional printing and PolyJet™ models in the reproduction of mandibular anatomy

D Ibrahim, TL Broilo, C Heitz, MG de Oliveira… - Journal of cranio …, 2009 - jcmfs.com
… Recently developed technologies, such as selective laser sintering (SLS), three-dimensional **printing** (3DP™) [Campinas/SP … In the 3DP™ technique, the **printer** has a reservoir for ceramic or polymeric powder … A CAD-**3D**.STL file is virtually sectioned in 16-μm thick layers using …
☆ 99 Cited by 151 Related articles All 7 versions

Possibility of reconstruction of dental plaster cast from 3D digital study models

M Kasparova, L Grafova… - Biomedical …, 2013 - biomedical-engineering-online …
… Finally, the STL model was sliced into individual layers, the path of **printing** nozzle was computed and the STL was converted to GCODE file by Slic3r (Alessandro Ranellucci … Ten of the plaster casts were **3D printed** on RepRap (Czech Republic) **3D printer** (ABS plastic …
☆ 99 Cited by 68 Related articles All 16 versions »

Implementing a 3D printing service in an academic library

S Pryor - Journal of Library Administration, 2014 - Taylor & Francis
… Comparison chart of all **3D printer** choices for approximately $20,000 or less … Retrieved from http://lj.libraryjournal.com/2012/08/academic-libraries/u- nevada-library-offers-**3d-printing**-across-the-board/ Colegrove, T. (2013) … University of Nevada-Reno library offers **3-D printing** …
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3D printed molecules and extended solid **models** for teaching symmetry and point groups

VF Scalfani, TP Vaid - J. Chem. Educ, 2014 - ACS Publications

… **3D printed**. Our results show that the file preparation methods discussed within this article are both suitable routes to prepare **3D** printable digital files of chemical structures. Further, our results also suggest that **3D printing** is an excellent method for fabricating **3D models** of …

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3d printing **materials science and engineering**

laser sintering 3d printing **of** models

3D printing technologies in rehabilitation engineering

E Mikołajewska, M Macko, Ł Ziarnecki, S Stańczak… - 2014 - repozytorium.ukw.edu.pl

… 11. Huang W., Zhang X. **3D Printing**: **Print** the future of ophthalmology. Invest Ophthalmol Vis Sci … 17. Mannor MS i in. **3D printed** bionic ears … 18. Herbert N., Simpson D., Spence WD Ion W. A preliminary investigation into the development of **3-D printing** of prosthetic sockets …

☆ 99 Cited by 809 Related articles All 5 versions »

3-D printing: The new industrial revolution

B Berman - Business horizons, 2012 - Elsevier

… Alessi about 70% less than the traditional method of making prototypes ("**3D** Systems," 2011) … Since design and manufacturing can be easily outsourced in **3-D printing**, designers can contract with … as he/she would download digital music—and then download and **print** the part …

☆ 99 Cited by 815 Related articles All 8 versions

Three dimensional printing: rapid tooling and prototypes directly from a CAD model

E Sachs, M Cima, P Williams… - Journal of …, 1992 - … .asmedigitalcollection.asme.org

… When identical pat- terns are **printed** on successive layers of powder, a three-di- mensional part of finite thickness is formed … Fig. 5 Schematic of **3D Printing machine** tridge (part number 51608A) employs evaporative-bubble tech- nology, and can **print** 0.002 in …

☆ 99 Cited by 571 Related articles All 15 versions »

Fabricated: The new world of 3D printing

H Lipson, M Kurman - 2013 - books.google.com

… 'Revolutionary' **Machine** makes **3-D** objects from drawings By Kathleen … When most people first hear about **3D printing**, their mind leaps to their old, familiar desktop **printer** … **3D printers** make things by following instructions from a computer and stacking raw material into layers …

☆ 99 Cited by 759 Related articles All 7 versions »

Implementing a 3D printing service in an academic library

S Pryor - Journal of Library Administration, 2014 - Taylor & Francis

… a **print** after a cost estimate (which was for a large, complex **print**), and most … A further investigation into **3D printing** and **3D** scanning at the Dalhousie University … Emerging data visualization technologies for map and geography libraries: **3-D printing**, holographic imaging, **3-D** city …

☆ 99 Cited by 60 Related articles All 8 versions »

3D-printing of non-assembly, articulated models

J Call, DA Calian, C Amati, R Kleinberger… - ACM Transactions on …, 2012 - dl.acm.org

… (b) Hand **model** (input, articulated, **3D print**) (c) Elephant **model** (input, articulated, **3D print**) Figure 12: Results of joint fitting on three input **models** … LIPSON, H., MOON, F., HAI, J., AND PAVENTI, C. 2005. **3- d printing** the history of mechanisms … **3D** polyomino puzzle. ACM Trans …

☆ 99 Cited by 165 Related articles All 12 versions

3D printing: the dawn of a new era in manufacturing?

R Bogue - Assembly Automation, 2013 - emeraldinsight.com

… polypropylene components with dimensions of up to 2.2×2.2×3.5 m and the plan is to **print** the building … uses sand and a binder to produce a compact, stone-like material which can be **printed** to produce … An intriguing possibility is the production of custom robots by **3D printing** …

☆ 99 Cited by 114 Related articles All 3 versions

ABC and 3D: opportunities and obstacles to 3D printing in special education environments

E Buehler, SK Kane, A Hurst - Proceedings of the 16th international ACM …, 2014 - dl.acm.org

… Figure 5 illustrates some of the **models** that have been **printed** at this site … like so much of it is marketed as 'oh it will scan and you'll get a **print-ready model**' and I … Site C) 7. DISCUSSION These four case studies reveal that there is support and interest in using **3D printing** in special …

☆ 99 Cited by 53 Related articles »

Materializing information: 3D printing and social change

M Raito, R Ree - First Monday, 2012 - journals.uic.edu

… practices in the near future; while she could see niche markets for **3D printed** products, the … the tutorial in navigating the tools provided in order to successfully **print** a pendant of … information brought about by such technologies as digital desktop fabrication and **3D printing**, a key …

☆ 99 Cited by 99 Related articles All 10 versions »

Recent advances in **3D printing** of biomaterials

HN Chia, BM Wu - Journal of biological engineering, 2015 - jbioleng.biomedcentral.com

… In cases where materials can be **printed**, **3D Printing** is particularly advantages for one-of-a-kind, customized complex … **3D printing** of tissue engineering scaffolds … The general SFF process involves 1) creating a **3D** computer **model** (can be generated from medical imaging data …

☆ 99 Cited by 418 Related articles All 20 versions »

Related searches

3d printing **articulated** models

implications of 3d printing

dimensional printing **cad** model

Mastering **3D printing**

J Horvath - 2014 - books.google.com

… 175 Appendix A: Typical **Printer Settings** … is the nitty-gritty tutorial on the workflow of using a **3D printer**: developing a **3D** model, **slicing** it into … you will learn about in Chapter 5) to be simple yet robust and able to be **configured** in various …

☆ 99 Cited by 45 Related articles All 4 versions »

3d printing with metals

F Ribeiro - Computing & Control Engineering Journal, 1998 - IET

… In this process the slices are **automatically** created, the ARLA robot program generated completely **auto**- matically and it was not … This means that this process is very **automatic** with almost no intervention from the user (except for drawing the component in a CAD system) …

☆ 99 Cited by 29 Related articles All 7 versions

Lung imaging and computer aided diagnosis

A El-Baz, JS Suri - 2011 - books.google.com

… ix 1 A Novel Three-Dimensional Framework for **Automatic** Lung Segmentation from Low-Dose … Based Appearance Modeling for Robust Segmentation of Pulmonary Nodules in **3D** LDCT Chest … Torigian, Warren B. Gefter, and James Gee 7 Acquisition and **Automated** Analysis of …

☆ 99 Cited by 34 Related articles All 2 versions »

Automatic engraving method and apparatus

JH Payne - US Patent 5,329,381, 1994 - Google Patents

… **automatic** engraving method and apparatus that lower manufacturing cost because it is highly **automated** … The result is that the tool **automatically** moves out of the way and engraving … Expired - Lifetime US5329381A (en), 1992-02-20, 1992-02-20, **Automatic** engraving method and …

☆ 99 Cited by 43 Related articles All 2 versions »

Medical applications for **3D printing**: current and projected uses

CL Ventola - Pharmacy and Therapeutics, 2014 - ncbi.nlm.nih.gov

… a computer-aided design (CAD) file (Figure 1). 9 In a basic **setup**, the **3D** … to rapidly screen new potential therapeutic drugs on patient tissue, greatly **cutting** research costs … pharmacist could then **print** and dispense the personalized medication via an **automated 3D printing** system …

☆ 99 Cited by 389 Related articles All 7 versions »

Simple and versatile **3D printed** microfluidics using fused filament fabrication

AJL Morgan, LH San Jose, WD Jamieson, JM Wymant… - PloS one, 2016 - journals.plos.org

… ports and by the introduction of a Lego ® -like modular system facilitating rapid prototyping whilst offering the potential for novices to build microfluidic systems from a **database** of microfluidic … Full **print settings** can be found in S1 Table … Fig 4. **3D printer** fidelity measurements …

☆ 99 Cited by 37 Related articles All 13 versions »

A new rapid tooling method for sheet metal forming dies

DF Walczyk, DE Hardt - Proceedings of the 5th international conference on …, 1994

☆ 99 Cited by 46 Related articles

Method and apparatus for **automatic** fabrication of three-dimensional objects

M Burns - US Patent 5,514,232, 1996 - Google Patents

… material has the capability of depositing the required various compositions **automatically**, then the … The method of depositing the fabrication material is an **automatic** process acting under … from Roland Digital Group of Irvine, Calif., or the Signmaker® **automated** lettering system …

☆ 99 Cited by 111 Related articles All 2 versions »

Computer-aided diagnosis workstation and **database** system for chest diagnosis based on multihelical CT images

H Satoh, N Niki, K Mori, K Eguchi… - … 2006: PACS and …, 2006 - spiedigitallibrary.org

… Figure 4. Example of **automated** comparison of each **slice** in the CT scan and the earlier CT scan image … one monitor and simultaneously display a **3D** image showing the suspected lesion together with the **automatically** extracted pulmonary … **Automatic** history registration program …

☆ 99 Cited by 7 Related articles All 6 versions »

3D Printing with mattercontrol

J Horvath, R Cameron - 2015 - books.google.com

… how the hardware works, and introduces the MatterControl software, including downloading and **configuring** it for … 2014) is an extremely detailed hands-on review of buying, building, **setting** up, and … This type of **printer** now can be purchased in a variety of **configurations**, and the …

☆ Cited by 12 Related articles All 7 versions

Method and apparatus for **automatically detecting** the available network services in a network system

SD Romohr - US Patent 5,596,723, 1997 - Google Patents

… In the preferred embodiment the method determines this prevalence and then **automatically** configures the computer system 124 according to the most prevalent network operating system and … In the preferred embodiment, the **automatic** network **configuration** method of …

☆ Cited by 136 Related articles All 2 versions

Automatically selecting and downloading device drivers from a **server** system to a client system that includes one or more devices

SG Perlman, T Bucher - US Patent 6,023,585, 2000 - Google Patents

… Lifetime US6023585A (en), 1997-05-02, 1997-05-02, **Automatically** selecting and … Joseph Frank, Selecting content to be communicated based on **automatic detection** of communication … 2002-09-17, General Instruments Corporation, Dynamic **detection** of hardware **configuration** …

☆ Cited by 156 Related articles All 2 versions

Automatic selecting and downloading device drivers from a **server** system to a client system that includes one or more devices

SG Perlman, T Bucher - US Patent 6,269,481, 2001 - Google Patents

… 2000-01-07, 2004-07-01, Wayne Wang, System and method for **automatically** loading a … US6813670B1 (en) *, 2000-09-26, 2004-11-02, Microsoft Corporation, **Automatic server**-side plug-and … 04-20, 2004-11-04, Eric Bodnar, System and methodology for **automated** provisioning …

☆ Cited by 93 Related articles All 2 versions

Hybrid-type bioptical laser scanning and digital imaging system supporting **automatic** object motion **detection** at the edges of a **3D** scanning volume

SM Edmonds, SP Keaney - US Patent 8,561,905, 2013 - Google Patents

… of the system at about its image **detection** array 235, and to generate **auto**-exposure control … substantially normal to the horizontal scanning window 3B, so as to **automatically detect** when an … Also, the **automatic** object edge-motion **detection** subsystem 43 can be used to record …

☆ Cited by 170 Related articles All 4 versions

Bar code reader **configured** to read fine **print** barcode symbols

A Longacre Jr, RM Hussey - US Patent 6,264,105, 2001 - Google Patents

… Bar code reader **configured** to read fine **print** bar code symbols … US7654461B2 (en), 2003-11-13, 2010-02-02, Metrologic Instruments, Inc,, **Automatically**-triggered digital video imaging … US5120940A (en) *, 1990-08-10, 1992-06-09, The Boeing Company, **Detection** of …

☆ Cited by 126 Related articles All 2 versions

System for **automatic** unattended electronic information transport between a **server** and a client by a vendor provided transport software with a manifest list

RR Reisman - US Patent 5,694,546, 1997 - Google Patents

… Relevant **auto**-configuring capabilities and software that may be employed in practicing the invention … Updating can also be totally **automatic**, and other than an obviously desirable user … Where updates are made available on a known schedule, a totally **automated** product can …

☆ Cited by 756 Related articles All 2 versions

Automatic face **detection** and identity masking in images, and applications thereof

S Ioffe, L Williams, D Strelow, A Frome… - US Patent …, 2013 - Google Patents

… The present invention relates to identity masking by **automatically detecting** and processing face regions in an … en), 2014-07-17, 2017-06-13, At&T Intellectual Property I, LP, **Automated** obscurity for … **Automatic** face **detection** and identity masking in images, and applications thereof …

☆ Cited by 61 Related articles All 5 versions

Bar code reader **configured** to read fine **print** bar code symbols

A Longacre Jr, RM Hussey - US Patent 6,655,595, 2003 - Google Patents

… a region of interest within the initial image map based on the **detected** feature, interpolating … Related US6264105B1 (en), 1998-11-05, 1998-11-05, Bar code reader **configured** to read … Intelligent system for **automatically** recognizing objects at a point of sale (POS) station by omni …

☆ Cited by 136 Related articles All 2 versions

Voice-controlled three-dimensional fabrication system

AJ Buser, NB Pettis - US Patent 9,108,450, 2015 - Google Patents

… **server** 208 are described, this is intended to include corresponding functions or **configuration** (eg, by … may also store user preferences or criteria for filtering content, eg, for **automatic printing** or other … may be provided to the **print server** 208 and used to **automatically** direct new …

☆ Cited by 13 Related articles All 4 versions

Electronic bar code reader

FM Weaver, DE Goodner - US Patent App. 07/252,351, 1990 - Google Patents

… using control data derived from motion data collected from the **automated detection** of objects … **Automatically**-triggered digital video-imaging based code symbol reading system for use in a … video imaging based code symbol reading system employing an **automatic** object motion …

☆ Cited by 94 Related articles All 2 versions

Related searches

automatic **object motion** detection

automatic **face** detection

An approach for real world data modelling with the **3D** terrestrial laser scanner for built environment

Y Arayici - Automation in construction, 2007 - Elsevier

… cannot be found in the database, it can be created and annotated before **storing** into the … Discrete approaches differ in the selection of primitives and the **organisation** of the primitives for shape … This OO CAD **model** will be mapped into IFC schema to save and **store** the **model** in …

☆ 99 Cited by 153 Related articles All 9 versions

Spec2Fab: a reducer-tuner **model** for translating specifications to **3D prints**

D Chen, DIW Levin, P Didyk, P Sitthi-Amorn… - ACM Transactions on …, 2013 - dl.acm.org

… In this paper, we propose an abstraction mechanism that simplifies the design, development, implementation, and **reuse** of these … For instance, tuners can be completely uncon- nected (Figure 5 (left) or be **organized** into groups which … Tuner nodes **store** a list of their neighbors …

☆ 99 Cited by 72 Related articles All 14 versions »

Mass Customization: **Reuse** of Digital **Slicing** for Additive Manufacturing

TH Kwok, H Ye, Y Chen, C Zhou… - Journal of …, 2017 - … .asmedigitalcollection.asme.org

2.

☆ 99 Cited by 4 Related articles All 22 versions »

Semantic annotation of **3D** anatomical **models** to support diagnosis and follow-up analysis of musculoskeletal pathologies

I Banerjee, CE Catalano, G Patanè… - International journal of …, 2016 - Springer

… The paper is **organized** as follows … Open Annotation Community Group, to fulfil the main requirements of SemAnatomy3D annotation framework: **storing** the annotation of … World Health **Organization**, GenevaGoogle Scholar. 9. Spagnuolo M, Falcidieno B (2009) **3D** media and the …

☆ 99 Cited by 6 Related articles All 9 versions

Method and system for **reuse** of materials in additive manufacturing systems

A Teken, B Belocon - US Patent 9,688,020, 2017 - Google Patents

… The invention, however, both as to **organization** and method of operation, together with objects, features … EEPROMs), magnetic or optical cards, or any type of media suitable for **storing** electronic instructions … output units, a plurality of memory units, and a plurality of **storage** units …

☆ 99 Cited by 3 Related articles All 4 versions »

Fundamental Requirements for Data Representations in Laser-based Powder Bed Fusion

SC Feng, PW Witherell… - ASME 2015 …, 2015 - … .asmedigitalcollection.asme.org

… The **organization** of the paper is as follows … 3. PBF PROCESS DATA REQUIREMENTS To **organize** the exchange and flow of information among the various activities … in PBF, (2) analyzing process planning, fabrication, and in-process measurement, and (3) **organizing** the input …

☆ 99 Cited by 2 Related articles All 5 versions »

Investigation of a **3D printer**

H Junji - 2014 - diva-portal.org

… That meant that with a few extra items bought from a hardware **store** the RepRap was the world's first self replicating **3D printer** … The basic **organization** of a DXF file is as follows … endloop endfacet There are two **storage** formats available for STL files: ASCII and BINARY …

☆ 99 Cited by 1 Related articles »

Will **Model**-based Definition replace engineering drawings throughout the product lifecycle? A global perspective from aerospace industry

V Quintana, L Rivest, R Pellerin, F Venne… - Computers in …, 2010 - Elsevier

… user can choose to display only selected **3D** annotations in order to **organize**, capture and … drawings follow international standards in terms of how the data is **organized** and structured … are the management elements which are part of the drawing's arrangement and **organization** …

☆ 99 Cited by 142 Related articles All 7 versions

3d print technology for cellular agent-based growth models

KA Hawick, LAD Stockwell, LRF Odiam - Proc. Int. Conf. on Modelling … - digital.hull.ac.uk

… 2016}, Address = {Innsbruck, Austria}, Month = {15-16 February}, Number = {830-037}, **Organization** = {IASTED}, Pages … cluster, and probability ranked list of growth sites, rather than **storing** the system as … after **printing** the excess material is vacuumed back into the **storage** of the …

☆ 99 Cited by 3 Related articles All 2 versions »

Preloaded donor corneal lenticules in a new validated 3D printed smart storage glide for Descemet stripping automated endothelial keratoplasty

A Ruzza, M Parekh, S Ferrari, G Salvalaio… - British Journal of …, 2015 - bjo.bmj.com

… laboratory and clinical validation of a **3D printed** SSG which helps to **store** and deliver … in the surgical theatre easier for the surgeon, we developed the smart **storage** glide (SSG) … image to check the dimensions and performance applicability and (E) the final **organisation** of the …

☆ 99 Cited by 13 Related articles All 8 versions

Clever support: Efficient support structure generation for digital fabrication

J Vanek, JAG Galicia, B Benes - Computer graphics forum, 2014 - Wiley Online Library

… In this work we will focus mainly on Fused Deposition **Modeling** (FDM) **printers** since they are … Most of them addressed the possible printability and structural problems of the **3D models** before they are … are added at the ends of the support struts for easier removal from the **model** …

☆ 99 Cited by 95 Related articles All 9 versions

3D printed molecules and extended solid models for teaching symmetry and point groups

VF Scalfani, TP Vaid - J. Chem. Educ, 2014 - ACS Publications

… University **Libraries**, Rodgers **Library** for Science and … in one piece directly from a digital **3D** design file, greatly simplifying the process of fabricating molecular **models** … groups in an inorganic chemistry course.(17) More importantly, with **3D printing** technology, any **model** can be …

☆ 99 Cited by 58 Related articles All 5 versions »

A university-wide collaborative effort to designing a makerspace at an academic health sciences library

J Herron, K Kaneshiro - Medical reference services quarterly, 2017 - Taylor & Francis

… As scanning **3D** objects and the software for creating **print-ready models** have a steep … of filament (PLA or ABS), postprocessing techniques, and utilizing specialized **3D modeling** software with a … to determine how the location of support materials will affect the completed **model** …

☆ 99 Cited by 5 Related articles All 3 versions »

Investigating the implications of 3D printing in special education

E Buehler, N Comrie, M Hofmann, S McDonald… - ACM Transactions on …, 2016 - dl.acm.org

… Specifically, they were concerned that the planned **3D modeling** curriculum might prove a challenge for the vision … goals for the **3D printer** are to create tactile graphics and hand-held **models** and provide … of it is marketed as, 'Oh it will scan and you'll get a **print-ready model**' and I …

☆ 99 Cited by 17 Related articles All 3 versions

Programmatic conversion of crystal structures into 3D printable files using Jmol

VF Scalfani, AJ Williams, V Tkachenko… - Journal of …, 2016 - Springer

… **3D** printable crystal structures created in this work will allow researchers and educators to quickly locate a large collection (>30,000) of crystal structures that are **3D print ready**; no further … NIH **3D** Print Exchange: **3D model** scripts … The Virtual Reality **Modeling** Language Concepts …

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Beginning design for 3D printing

J Micallef - 2015 - books.google.com

… 93 EnSuring That **3D MOdels** Are **3D Print Ready** … Having the design skills to **model** objects for **3D printing** is no trivial matter, and unfortunately … lower left, and Meshmixer at the lower right) can help newcomers learn **3D modeling** skills right …

☆ 99 Cited by 13 Related articles All 6 versions »

Semantic medical image to 3d print of anatomic structure

SK Zhou, B Geiger - US Patent App. 14/539,051, 2016 - Google Patents

… [0038]. The **3D print ready model** of the predetermined representation of the anatomy is converted into a **3D print ready model** specific to the … [0045]. Other **models** may be … to be altered are identified, such as by a classifier or labeling stored for the template mesh or **3D** print **model** …

☆ 99 Cited by 2 Related articles All 2 versions »

Evaluation of the use of laser scanning to create key models for 3D printing separate from and augmenting visible light sensing

J Straub, S Kerlin - Multisensor, Multisource Information …, 2016 - spiedigitallibrary.org

… One common one is the fused deposition **modeling** (FDM) technique [3]. This technique sequentially fuses … While this resolution may be insufficient to generate a **print-ready model** of the key, its evaluation … none of the scans produces a workable key (or even a **model** that would …

☆ 99 Cited by 2 Related articles All 4 versions »

Decentralization and localization of production: The organizational and economic consequences of additive manufacturing (**3D Printing**)

A Ben-Ner, E Siemsen - California Management Review, 2017 - journals.sagepub.com

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☆ 99 Cited by 13 Related articles All 2 versions

Improved understanding of brain morphology through **3D printing**: A brief guide

C Madan - Research Ideas and Outcomes, 2016 - riojournal.com

... Information for repairing meshes to make them **print-ready** was inspired by a tutorial from the University of Alberta **Library** website (https://**library**.ualberta.ca/ services/3dprinting/preparing-**3d-model**). The **3D models** were printed by the University of Alberta **Libraries** ...

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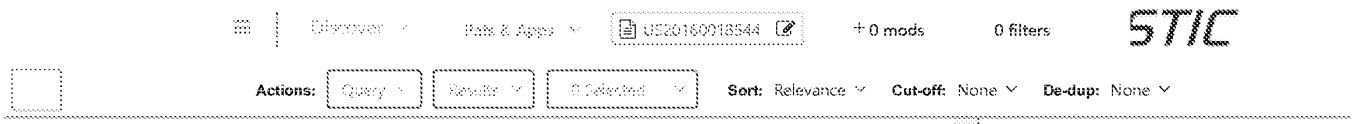
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1 - 50 28,731,129 results

1. **Marine vibrator doppler correction**

A method of processing seismic survey data includes: receiving seismic signatures emitted from a plurality of seismic sources during a frequency sweep as the sources are moved over a shot point; receiving a seismic trace generated by a seismic receiver, the seismic trace representing seismic signals...

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WO2016011236A1 | WIPO APPLICATIONS | 21-JAN-2016

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4. **Method for designature of seismic data acquired using moving source**

Methods of compensating for source signature effects in seismic data are described. One method includes a step of receiving seismic data recorded with a receiver; a step of receiving source data of the seismic waves generated by the moving source; a step of receiving position data of the source...

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US20100208554 | US APPLICATIONS | 19-AUG-2010

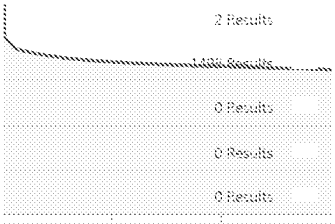
6. **Process for separating data recorded during a continuous data acquisition seismic survey**

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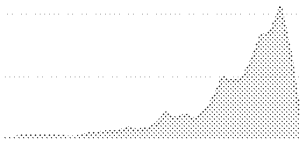
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A Collaborative Learning System for Sharing 3D Models: 3D Model Co-learning Space

I-Sheng Lin | Tsai-Yen Li | Fang-Chi Liang | Yong-Teng Lin

2017 IEEE 17th International Conference on Advanced Learning Technologies (ICALT)

Year: 2017

A Collaborative Learning System for Sharing 3D Models: 3D Model Co-learning Space

I-Sheng Lin; Tsai-Yen Li; Fang-Chi Liang; Yong-Teng Lin

2017 IEEE 17th International Conference on Advanced Learning Technologies (ICALT)

Year: 2017

Pages: 502 - 506

IEEE Conferences

Abstract (1297 Kb)

Proposal for 3D-printing regulation technique in fabricating illegal objects using feature-vector based matching algorithm of 3D shapes

Toshio Modegi

2016 55th Annual Conference of the Society of Instrument and Control Engineers of Japan (SICE)

Year: 2016

Proposal for 3D-printing regulation technique in fabricating illegal objects using feature-vector based matching algorithm of 3D shapes

Toshio Modegi

2016 55th Annual Conference of the Society of Instrument and Control Engineers of Japan (SICE)

Year: 2016

Pages: 877 - 883

IEEE Conferences

Abstract (383 Kb)

A performance evaluation of surface normals-based descriptors for recognition of objects using CAD-models

C. M. Mateo | P. Gil | F. Torres

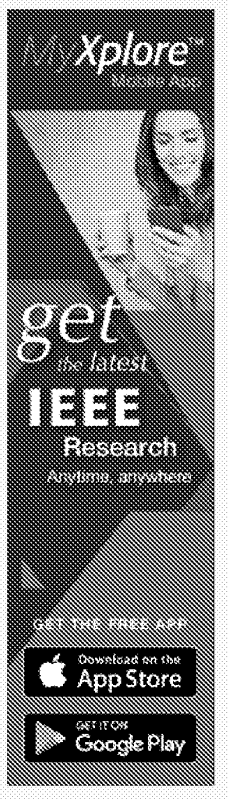
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A performance evaluation of surface normals-based descriptors for recognition of objects using CAD-models

C. M. Mateo; P. Gil; F. Torres

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Year: 2014, Volume: 02
Pages: 428 - 435
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Abstract (801 Kb)

Statistical process control for solder deposition and yield enhancement

R. Muthaiyan | V. Barba | K. Srihari
4th Electronics Packaging Technology Conference, 2002.
Year: 2002

Statistical process control for solder deposition and yield enhancement
R. Muthaiyan; V. Barba; K. Srihari
4th Electronics Packaging Technology Conference, 2002
Year: 2002
Pages: 212 - 217
Cited by: Papers (2) | Patents (1)
IEEE Conferences

Abstract (1016 Kb)

Workshop Rapid Prototyping - A new approach to introduce digital manufacturing in engineering education

Stefan Junk | Rebecca Matt
2015 International Conference on Information Technology Based Higher Education and Training (ITHET)
Year: 2015

Workshop Rapid Prototyping - A new approach to introduce digital manufacturing in engineering education
Stefan Junk; Rebecca Matt
2015 International Conference on Information Technology Based Higher Education and Training (ITHET)
Year: 2015
Pages: 1 - 6
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Abstract (444 Kb)

Virtual reality technologies as an interface of cognitive communication and information systems

Branislav Sobota | František Hrozek | Štefan Korečko | Csaba Szabó
2011 2nd International Conference on Cognitive Infocommunications (CogInfoCom)
Year: 2011

Virtual reality technologies as an interface of cognitive communication and information systems
Branislav Sobota; František Hrozek; Štefan Korečko; Csaba Szabó
2011 2nd International Conference on Cognitive Infocommunications (CogInfoCom)
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Publication Title

Supplemental Items

Conference Location

Programming moves: Design and evaluation of applying embodied interaction in virtual environments to enhance computational thinking in middle school students

Dhaval Parmar | Joseph Isaac | Sabarish V. Babu | Nikeetha D'Souza | Alison E. Leonard | Sophie Jörg | Kara Gundersen | Shaundra B. Daily
2016 IEEE Virtual Reality (VR)
Year: 2016

Programming moves: Design and evaluation of applying embodied interaction in virtual environments to enhance computational thinking in middle school students
Dhaval Parmar; Joseph Isaac; Sabarish V. Babu; Nikeetha D'Souza; Alison E. Leonard; Sophie Jörg; Kara Gundersen; Shaundra B. Daily
2016 IEEE Virtual Reality (VR)
Year: 2016
Pages: 131 - 140
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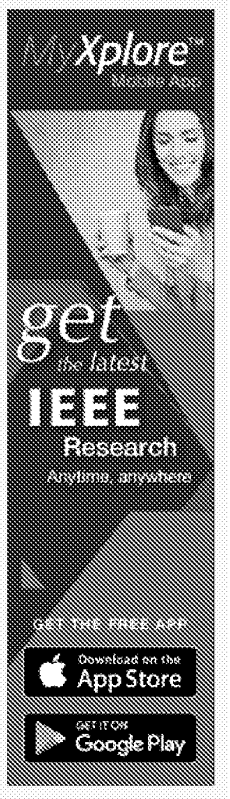
Abstract (1503 Kb) Media

Can embodied interaction and virtual peer customization in a virtual programming environment enhance computational thinking?

Dhaval Parmar | Sabarish V. Babu | Lorraine Lin | Sophie Jörg | Nikeetha D'Souza | Alison E. Leonard | Shaundra B. Daily
2016 Research on Equity and Sustained Participation in Engineering, Computing, and Technology (RESPECT)
Year: 2016

Can embodied interaction and virtual peer customization in a virtual programming environment enhance computational thinking?
Dhaval Parmar; Sabarish V. Babu; Lorraine Lin; Sophie Jörg; Nikeetha D'Souza; Alison E. Leonard; Shaundra B. Daily
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EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	7114	automatic$4 detect$3 hardware reconfiguration printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 20:43
L2	16	automatic$4 detect$3 hardware reconfiguration printer and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 20:44
L3	173	automatic$4 detect$3 hardware (reconfiguration|chang$3) printer and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 20:45
L4	5	automatic$4 detect$3 hardware (reconfiguration|chang$3) printer and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2018/05/23 20:45
L5	9	automatic$4 detect$3 (hardware|equipment|settings) (reconfiguration|chang$3) and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2018/05/23 20:45
L6	5	automatic$4 detect$3 hardware (reconfiguration|chang$3) and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2018/05/23 20:49
L7	14	automatic$4 (hardware|equipment|settings) (reconfiguration|chang$3) and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2018/05/23 20:49
L8	9	monitor$3 (hardware|equipment|settings)	US-PGPUB;	SAME	ON	2018/05/23

		(reconfiguration|chang$3) and B29C67/0088.cpc.	USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			20:51
L9	5	monitor$3 (hardware|equipment|accessor$3) (reconfiguration|chang$3) and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2018/05/23 20:52
L10	5	monitor$3 (hardware|equipment|accessor$3) (reconfiguration|reconfiguration|chang$3|add|remove) and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2018/05/23 20:52
L11	31	(automatic$4|monitor$3|detect$3) (hardware|equipment|accessor$3) (reconfiguration|reconfiguration|chang$3|add|remove) and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2018/05/23 20:53
L12	26550	(automatic$4|monitor$3|detect$3) (hardware|equipment|accessor$3) (reconfiguration|reconfiguration|chang$3|add|remove) and printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2018/05/23 20:54
L13	552	(automatic$4|monitor$3|detect$3) (hardware|equipment|accessor$3) (reconfiguration|reconfiguration|chang$3|add|remove) and (3D|3-D|Three-D|Three-Dimensional|3-Dimensional|"Three Dimensional") with printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2018/05/23 20:55
L14	1897	automatic$4 detect$3 hardware reconfiguration (3D|3-D|Three-D|Three-Dimensional|3-Dimensional|"Three Dimensional") printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 21:05
L15	38287	automatic$4 detect$3 hardware (reconfiguration|reconfiguration|chang$3|add$3|remov$3) (3D|3-D|Three-D|Three-Dimensional|3-Dimensional|"Three Dimensional") printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 21:05
L16	65	automatic$4 detect$3 hardware (reconfiguration|reconfiguration|chang$3|add$3|remov$3) and (3D|3-D|Three-D|Three-Dimensional|3-Dimensional|"Three Dimensional") printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	SAME	ON	2018/05/23 21:06

			IBM_TDB			
L17	1373	automatic$4 detect$3 hardware (re-configuration|reconfiguration|chang$3|add$3|remov$3) and printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2018/05/23 21:09
L18	16	automatic$4 detect$3 hardware reconfiguration and B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 21:09
L19	4	("20150331402" | "6227643" | "7639253" | "7052103").PN.	US-PGPUB; USPAT	AND	ON	2018/05/23 22:01
L20	805	(machine-ready|machine near ready).ab.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L21	19	(machine-ready|machine near ready).ab. and printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L22	108	(makerbot adj industries).as.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L23	3	(leonard near2 alison).in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L24	7	(sadusk near2 joseph).in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L25	2667	700/98.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L26	611	700/98.ccls. and printer	US-PGPUB;	AND	ON	2018/05/23

			USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			22:01
L27	504	700/98.ccls. and printer and model	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L28	115	700/98.ccls. and printer and model and slice	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L29	4774	B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L30	1834	B29C67/0088.cpc. and printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L31	1054	B29C67/0088.cpc. and printer and model	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L32	324	B29C67/0088.cpc. and printer and model and slic$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L33	36	B29C67/0088.cpc. and printer and model and slic$3 and @ay<"2014"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L34	34238	G05B15/02.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	AND	ON	2018/05/23 22:01

			IBM_TDB			
L35	374	G05B15/02.cpc. and G06F17/50.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L36	113	G05B15/02.cpc. and G06F17/50.cpc. and L29	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L37	9507	B33Y50/02.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L38	113	L37 and L36	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L39	2329	store and sliced and model and printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L40	233	store and sliced with model and printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L41	1941	automatic configuration slicing printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L42	1755	automatic configuration slicing printer (cloud|network)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L43	12	automatic configuration slicing printer (cloud|network) machine-ready	US-PGPUB; USPAT; USOCR; FPRS;	AND	ON	2018/05/23 22:01

			EPO; JPO; DERWENT; IBM_TDB			
L44	4	automatic configuration slicing printer (cloud|network) pre-sliced	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L45	3257	automatic configuration slicing model (cloud|network)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L46	37325	automatic$4 (configuration|configured|configures) (slicing|slices|sliced) model (cloud|network|stored)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L47	54	automatic$4 with (configuration|configured|configures) with (slicing|slices|sliced) and model with (cloud|network|stored)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L48	105	automatic$4 with (configuration|configured|configures) same (gcode|slice|slicing|slicer|sliced|slices) and model with (cloud|network|stored)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L49	1341	automatic$4 with (configuration|configured|configures) same (gcode|slice|slicing|slicer|sliced|slices|printer|3D|three-dimensional) and model with (cloud|network|stored)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L50	43306	machine ready model library	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L51	42	machine ready model library	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2018/05/23 22:01
L52	2	"20140156053".pn.	US-PGPUB; USPAT;	SAME	ON	2018/05/23 22:01

			USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
L53	5	(20020041386|20120224755).pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L54	3	(makerbot adj industries).as,aanm. @ad="20141231"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L55	23290	(remote print server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2018/05/23 22:01
L56	1816	(remote print server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2018/05/23 22:01
L57	458	(remote print server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	WITH	ON	2018/05/23 22:01
L58	43	(remote print server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2018/05/23 22:01
L59	34	(remote print server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM) and @ad<"20141231"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2018/05/23 22:01
L60	24294	(remote server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM) and @ad<"20141231"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2018/05/23 22:01

L61	53165	(remote server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM) and @ad<"20141231"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	WITH	ON	2018/05/23 22:01
L62	345	(remote print server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM) and @ad<"20141231"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	WITH	ON	2018/05/23 22:01
L63	1391	(remote print$3 server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM) and @ad<"20141231"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	WITH	ON	2018/05/23 22:01
L64	99	(remote print$3 server) and (3D|three$1D|3-D|three$1dimensional|"three dimensional" | "3 dimensional"|SDM|CNC|ADM) and @ad<"20141231"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2018/05/23 22:01
L65	9	("20020166220" | "20030105538" | "20050025354" | "20050157919" | "20060293906" | "20070084047" | "20130090894" | "20140121820" | "20140244433").PN.	US-PGPUB; USPAT; USOCR	AND	ON	2018/05/23 22:01

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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14587548	LEONARD ET AL.
	Examiner	Art Unit
	JOSHUA SANDERS	2127

CPC- SEARCHED		
Symbol	Date	Examiner
B29C67/0088;	12/23/2016	JS
G05B15/02;	12/23/2016	JS
G06F17/50;	12/23/2016	JS
B33Y50/02;	12/23/2016	JS
refreshed search of record see EAST search notes	8/15/2017	JS
refreshed search for RCE	5/21/2018	JS

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Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
700	98	12/23/2016	JS
	refreshed search of record, see EAST search notes	8/15/2017	JS
	refreshed search for RCE	5/21/2018	JS

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SEARCH NOTES		
Search Notes	Date	Examiner
EAST keyword, inventor, classification and assignee search performed	12/23/2016	JS
PLUS search performed	12/23/2016	JS
IEEEXplore metadata and author search performed	12/23/2016	JS
Google Web NPL search performed	12/23/2016	JS
IP com publication search performed	12/23/2016	JS
Google Patent keyword and classification search performed	12/23/2016	JS
Refreshed Search of Record, see attached search notes	8/15/2017	JS
Refreshed Search for RCE	5/21/2018	JS

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/587,548	Filing Date 12/31/2014	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	12/22/2017	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 19	Minus	** 20	= 0	X $80 =	0
	Independent (37 CFR 1.16(h))	* 1	Minus	***3	= 0	X $420 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
BRENDA TURNER

This collection of information is required by 37 CFR 1.16. 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, 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.**
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Serial No.: 14/587,548
Filing Date: December 31, 2014
In re: LEONARD, Alison N., *et al.*
Art Unit: 2127
Examiner: SANDERS, Joshua T.
Conf. No.: 6946

Commissioner for Patents
PO Box 1450
Alexandria, Virginia 22313-1450

REQUEST FOR CONTINUED EXAMINATION

Dear Commissioner:

In response to the final Office Action mailed August 23, 2017, the applicant requests continued examination of this application pursuant to 37 C.F.R. § 1.114. The fee of $1,200 as specified by 37 C.F.R. § 1.17(e)(1) accompanies this request.

Please enter the following before continued examination of this application:

A Request for Extension of Time appears on page 2 of this paper.

Amendments to the Claims begin on page 3 of this paper.

Remarks begin on page 7 of this paper.

Request for Extension of Time

The applicant requests a one month extension of time from November 23, 2017 until December 23, 2017 for responding to the outstanding Office Action. The fee of $200 as specified by 37 C.F.R. § 1.17(a)(1) accompanies this request.

Amendments to the Claims

Please amend the claims according to the following claim listing, which replaces all prior versions and listings of the claims in this application:

1. (Currently amended) A method comprising:

receiving a request to fabricate an object from a three-dimensional model at a remote print server;

automatically determining a target printer to fabricate the object at the remote print server based on one or more selection criteria;

querying the target printer from the remote print server for one or more properties relevant to fabrication of the object;

receiving a dictionary of the one or more properties from the target printer;

creating a fabrication profile based on the one or more properties;

determining whether a suitable machine-ready model is available for the fabrication profile;

when a suitable machine-ready model is available, selecting the suitable machine-ready model for transmission to the target printer; and

when a suitable machine-ready model is not available, processing the three-dimensional model according to the fabrication profile, and generating a machine-ready representation of the processed three-dimensional model executable by the target printer to fabricate the object.

2. (Previously presented) The method of claim 1 further comprising transmitting one or more of the suitable machine-ready model and the machine-ready representation to the target printer for fabrication.

3. (Original) The method of claim 1 further comprising fabricating the object with the target printer.

4. (Original) The method of claim 1 wherein the one or more properties include a hardware configuration of the target printer.

5. (Original) The method of claim 4 wherein the hardware configuration includes one or more of an extruder type, an extruder nozzle diameter, a build volume, a build platform type, a hardware version number, a top speed for linear movement of a tool, a step size for movement of the tool, a minimum z-axis step size, a gantry type, and a build material type.

6. (Original) The method of claim 4 wherein the hardware configuration includes an automatically detected hardware reconfiguration.

7. (Original) The method of claim 4 wherein the hardware configuration includes a manually specified hardware reconfiguration.

8. (Original) The method of claim 1 wherein the one or more properties include a firmware configuration of the target printer.

9. (Original) The method of claim 1 wherein the one or more properties include one or more user settings on the target printer.

10. (Original) The method of claim 9 wherein the one or more user settings include user settings from a previous fabrication process.

11. (Original) The method of claim 1 wherein the one or more properties include an application used to operate the target printer.

12. (Original) The method of claim 1 wherein the one or more properties include a build material in the target printer.

13. (Original) The method of claim 1 further comprising receiving an identifier from the target printer and applying the identifier to retrieve the dictionary from a repository of printer information remote from the target printer.

14. (Canceled)

15. (Previously presented) The method of claim 1 wherein the suitable machine-ready model is selected from a plurality of stored machine-ready models.

16. (Original) The method of claim 15 further comprising:

determining whether one of the plurality of stored machine-ready models can be modified to meet the fabrication profile;

modifying the one of the plurality of stored machine ready models for use as the machine-ready representation if possible; and

generating a new machine-ready representation according to the fabrication profile for use as the machine-ready representation if not possible.

17. (Original) The method of claim 16 wherein modifying includes one or more of translating the machine-ready representation, rotating the machine-ready representation, scaling the machine-ready representation, and changing a top speed in a tool path for the target printer.

18–19. (Canceled)

20. (Previously presented) The method of claim 1 further comprising generating descriptive metadata to accompany one or more of the suitable machine-ready model and the machine-ready representation, the descriptive metadata specifying one or more properties for comparison to properties of printers selected for fabricating the model.

21–31. (Canceled)

32. (New) The method of claim 1 wherein the one or more selection criteria include one or more of information related to the three-dimensional model, information related to the object, a print queue, a prioritization, a location of the target printer, a timeline, and an attribute of the target printer.

33. (New) The method of claim 1 wherein the one or more properties include one or more of a user configuration, a user preference, and a hardware accessory added to the target printer.

Remarks

Status of the Claims

Claim 1 is amended. Claims 32 and 33 are new. Claims 1–13, 15–17, 20, 32 and 33 are presented for examination, where claim 1 is independent.

The amendments to claim 1 and new claim 32 find support in at least the as-filed Specification at ¶¶ [0078]–[0079]. New claim 33 finds support in at least the as-filed Specification at ¶ [0075]. No new matter is added.

Interview Summary

The applicant thanks Examiner Sanders and Primary Examiner Karim for the courtesies extended to the applicant's representative, Thomas J. Bassolino (Reg. No. 65,946), during a telephone interview on November 2, 2017. During the interview, the invention in view of the prior art was discussed generally, but no specific agreement as to allowability was reached.

Claim Rejections – 35 U.S.C. § 102

Independent claim 1 stands rejected under 35 U.S.C. § 102 as anticipated by AstroPrint Wireless 3D Printing Software, Kickstarter (May 2014) ("*AstroPrint*").[1] This rejection is traversed for at least the following reasons.

The applicant has devised a technique for providing compatible 3D models from a remote print server to specific, target 3D printers. "While a three-dimensional printer may know its own hardware and software configuration, a service providing machine-ready models may not."[2] To this end, the claims "provide useful techniques for determining printer capabilities and matching these capabilities to pre-existing machine-ready models,"[3] and/or "for the generation of a machine-ready representation of the three-dimensional model that is executable on the target printer."[4] As such, claim 1 includes numerous steps that are not taught or suggested by *AstroPrint* (or any of the other cited

[1] Previously available at https://www.kickstarter.com/projects/306530051/astroprinttm- wireless-3dprinting-software.
[2] Specification, ¶ [0002].
[3] Specification, ¶ [0075].
[4] Specification, ¶ [0099]; *see also id.* at ¶ [0078] ("To this end, the machine-ready representation may be configured for use on the target printer based on the properties of the target printer.").

references, alone or in combination), such as "receiving a request to fabricate an object from a three-dimensional model at a remote print server," "automatically determining a target printer to fabricate the object at the remote print server based on one or more selection criteria," "querying the target printer from the remote print server for one or more properties relevant to fabrication of the object," as well as the steps related to providing the target printer with a suitable machine-ready model, which is generated when a suitable machine-ready model is otherwise not available at the remote print server. More specifically, and as described in more detail below, because *AstroPrint* is a local device only associated with a single, local printer (and print requests derived therefrom), *AstroPrint* is not suited to provide a determination of a target printer based on one or more selection criteria or to perform various steps to ensure that the target printer is provided with a suitable machine-ready model for printing an object.

AstroPrint is a software platform that provides a user with the capability for "Wireless 3D Printing"[5]—"AstroPrint allows you to use any smartphone or tablet as a beautiful and effective 3D printer interface."[6] In general, the *AstroPrint* system includes an "AstroBox" that connects a user's computing devices to a specific 3D printer, where the "AstroBox can be used standalone, or in conjunction with our free online cloud slicing and file storage services at AstroPrint.com."[7] Services that are advertised as available at "AstroPrint.com" include "slic[ing], organiz[ing], and stor[ing] your designs in the cloud."[8]

AstroPrint contemplates "automagically set[ting] the most ideal settings for each of your prints, reducing your failed prints. This is based on your printer and filament manufacturer's suggested settings as well as our expert experience."[9] Thus, at best, *AstroPrint* includes locally obtaining 3D printer and filament information (which appears to be collected through a user manually entering manufacturer information into the *AstroPrint* software, as there is no detection or querying disclosed in *AstroPrint*), to adjust the settings of a print. Completely missing from *AstroPrint* is any teaching or

[5] *AstroPrint*, p. 1 (page numbers reflect the PDF of the *AstroPrint* Kickstarter campaign provided in the Office Action).
[6] *AstroPrint*, p. 2.
[7] *AstroPrint*, p. 2.
[8] *AstroPrint*, p. 2.
[9] *AstroPrint*, p. 3.

suggestion of a remote print server that receives a print request, determines a target printer based on certain selection criteria, queries the target printer for properties relevant to fabrication (e.g., user settings or customizations), determines whether a suitable machine-ready model is available for the target printer, and creates a suitable machine-ready model when one is not available, all as currently claimed.[10]

In other words, because *AstroPrint* is a local device associated with only one printer in a manual configuration process, the *AstroPrint* system does not contemplate a remote print server that queries a target printer for properties relevant to fabrication, and does not appear to suggest a system that might include or benefit from such a remote query. Therefore, *AstroPrint* cannot anticipate claim 1 at least because *AstroPrint* does not disclose a method including a step of querying a target printer from a remote print server for one or more properties relevant to fabrication of an object.

For the foregoing reasons, independent claim 1 is believed to be patentable over the art of record. The remaining claims depend from an allowable base claim and are likewise in condition for allowance. The applicant respectfully requests reconsideration and withdrawal of the outstanding claim rejections under 35 U.S.C. § 102.

[10] The applicant notes that the other cited references used in combination with *AstroPrint* to reject dependent claims under 35 U.S.C. § 103 similarly lack these claimed features.

Conclusion

In view of the foregoing, the applicant believes that the currently pending claims are in condition for allowance and respectfully requests a corresponding Notice of Allowance.

The applicant believes that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed.

Nothing in this paper should be construed as intent to concede any issue with regard to any claim, except as specifically stated in this paper. The amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

The Director is hereby authorized to charge any fees or to credit any overpayments associated with this filing to Deposit Account No. 50-4262. If the examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned.

Respectfully submitted
STRATEGIC PATENTS, P.C.

/Thomas J. Bassolino/
Thomas J. Bassolino
Reg. No. 65,946
Tel.: (646) 238-1234

December 22, 2017

Electronic Patent Application Fee Transmittal

Application Number:	14587548
Filing Date:	31-Dec-2014
Title of Invention:	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION
First Named Inventor/Applicant Name:	Alison N. Leonard
Filer:	Thomas John Bassolino
Attorney Docket Number:	MBOT-0070-P01

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

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 $0 paid	1251	1	200	200
Miscellaneous:				
RCE- 1st Request	1801	1	1200	1200
		Total in USD ($)		**1400**

Electronic Acknowledgement Receipt	
EFS ID:	31316551
Application Number:	14587548
International Application Number:	
Confirmation Number:	6946
Title of Invention:	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION
First Named Inventor/Applicant Name:	Alison N. Leonard
Customer Number:	43520
Filer:	Thomas John Bassolino
Filer Authorized By:	
Attorney Docket Number:	MBOT-0070-P01
Receipt Date:	22-DEC-2017
Filing Date:	31-DEC-2014
Time Stamp:	10:35:04
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$1400
RAM confirmation Number	122217INTEFSW10360501
Deposit Account	504262
Authorized User	Thomas Bassolino
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		MBOT-0070-P01_20171222_RCE.pdf	136683 955b947ccf57eb4ac9e757cc7b5dcb8cd11f46cc	yes	10

Multipart Description/PDF files in .zip description

Document Description	Start	End
Request for Continued Examination (RCE)	1	1
Extension of Time	2	2
Claims	3	6
Applicant Arguments/Remarks Made in an Amendment	7	10

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	32262 4a611d2999f6d2b8cea49e028bd795e5739172bb	no	2

Warnings:

Information:

Total Files Size (in bytes):	168945

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

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.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/587,548	12/31/2014	Alison N. Leonard	MBOT-0070-P01	6946

43520 7590 11/13/2017

STRATEGIC PATENTS P.C.
P.O. BOX 920629
NEEDHAM, MA 02492

EXAMINER	
SANDERS, JOSHUA T	

ART UNIT	PAPER NUMBER
2127	

NOTIFICATION DATE	DELIVERY MODE
11/13/2017	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):

patents@stratpat.com

Applicant-Initiated Interview Summary	Application No.	Applicant(s)		
	14/587,548	LEONARD ET AL.		
	Examiner	Art Unit	AIA (First Inventor to File) Status	Page
	JOSHUA SANDERS	2127	Yes	1 of 1

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

1. JOSHUA SANDERS (Examiner); Telephonic
2. ZIAUL KARIM (Primary Examiner); Telephonic
3. Thomas Bassalino (Reg #65,946) (Attorney of Record); Telephonic

Date of Interview: 02 November 2017

Identification of prior art discussed: Astroprint NPL reference

Brief Description of main topic of discussion: Applicant's representative provided a brief description of the invention from the perspective of the applicant; Applicant's Representative and Examiner discussed proposals for ways to amend the claims in the direction of Applicant's invention; No Agreements as to allowability were reached in this interview.

Issues Discussed:

Proposed Amendments:
Applicant's representative and Examiner discussed several ways in which the independent claims might be expanded in the direction of the particular features believed to be distinct in applicant's invention, although no specific claim language was proposed.

Item(s) under 35 U.S.C. 101:
Examiner noted that, while 101 Practice is currently in flux, under current office Guidelines the claims as currently presented appear to be eligible under the Alice/Mayo framework, similar to McRo.

Nature of Invention and state of art:
Applicant's Representative provided an explanation of the particular features of the invention that were believed to be distinct from the art of record and the background art.

Other:
No Agreement as to allowability was reached as a result of this interview

Attachment(s): Agenda

/ZIAUL KARIM/ Primary Examiner, Art Unit 2127	/JOSHUA SANDERS/ Examiner, Art Unit 2127

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 time limit 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.

Applicant is reminded that a complete written statement as to the substance of the interview must be made of record in the application file. It is the applicant's responsibility to provide the written statement, unless the interview was initiated by the Examiner and the Examiner has indicated that a written summary will be provided. See MPEP 713.04

Please further see:

MPEP 713.04
Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews, paragraph (b)
37 CFR § 1.2 Business to be transacted in writing

Doc Code: M865 or FAI.REQ.INTV

PTOL-413A (07-16)
Approved for use through 08/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Applicant Initiated Interview Request Form

Application No.: 14/587,548 First Named Applicant: Alison N. Leonard
Examiner: SANDERS, JOSHUA T. Art Unit: 2127 Status of Application: Final Rejection Mailed

Tentative Participants:
(1) Examiner Joshua Sanders (2) Examiner Mohammad Ali (Supervisor)
(3) Attorney for Applicant - Thomas Bassolino (65,946) (4)

Proposed Date of Interview: Thursday, November 2, 2017 **Proposed Time:** 2:00 (◎AM◎PM)

Type of Interview Requested:
(1) ☑ Telephonic (2) ☐ Personal (3) ☐ Video Conference

Exhibit To Be Shown or Demonstrated: ☐ YES ☑ NO
If yes, provide brief description:

Issues To Be Discussed

Issues (Rej., Obj., etc)	Claims/ Fig. #s	Prior Art	Discussed	Agreed	Not Agreed
(1) 102 Rej.	1	Astroprint	☐	☐	☐
(2)			☐	☐	☐
(3)			☐	☐	☐
(4)			☐	☐	☐

☐ Continuation Sheet Attached ☐ Proposed Amendment or Arguments Attached

Brief Description of Arguments to be Presented: To discuss possible amendments, and whether they would qualify for a AFCP2.0 response or RCE; also to discuss the differences between the network/server arrangement of the present application and the local device of Astroprint.

An interview was conducted on the above-identified application on

NOTE: This form should be completed and filed by applicant in advance of the interview (see MPEP § 713.01). If this form is signed by a registered practitioner not of record, the Office will accept this as an indication that he or she is authorized to conduct an interview on behalf of the principal (37 CFR 1.32(a)(3)) pursuant to 37 CFR 1.34. This is not a power of attorney to any above named practitioner. See the Instruction Sheet for this form, which is incorporated by reference. By signing this form, applicant or practitioner is certifying that he or she has read the Instruction Sheet. After the interview is conducted, applicant is advised to file a statement of the substance of this interview (37 CFR 1.133(b)) as soon as possible. This application will not be delayed from issue because of applicant's failure to submit a written record of this interview.

/Thomas J. Bassolino/
Applicant/Applicant's Representative Signature

Examiner/SPE Signature

Thomas J. Bassolino
Typed/Printed Name of Applicant or Representative

646-238-1234
Applicant's/Applicant's Representative's Telephone Number

65,946
Registration Number, if applicable

This collection of information is required by 37 CFR 1.133. 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 1.11 and 1.14. This collection is estimated to take 24 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, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Doc Code: M865 or FAI.REQ.INTV

PTOL-413A (08-10)
Approved for use through 08/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Instruction Sheet for:
APPLICANT INITIATED INTERVIEW REQUEST FORM

(Not to be Submitted to the USPTO)

1. If this form is signed by a registered practitioner not of record, the authority to submit the Applicant Initiated Interview Request Form is pursuant to limited authority to act in a representative capacity under 37 CFR 1.34 and further proof of authority to act in a representative capacity may be required. *See* 37 CFR 1.34.

   The Office will accept the signed form as an indication that the registered practitioner not of record is authorized to conduct an interview on behalf of the principal in pursuant to 37 CFR 1.34.

   For more information, see the "Conducting an Interview with a Registered Practitioner Acting in a Representative Capacity" notice which is available on the USPTO Web site at: http://www.uspto.gov/patents/law/notices/2010.jsp.

2. This is not a power of attorney to any named practitioner. Accordingly, any registered practitioner not of record named on the form does not have authority to sign a request to change the correspondence address, a request for express abandonment, a disclaimer, a power of attorney, or other document requiring the signature of the applicant, assignee of the entire interest or an attorney of record. If appropriate, a separate power of attorney to the named practitioner should be executed and filed in the US Patent and Trademark Office.

3. Any interview concerning an unpublished application under 35 U.S.C. § 122(b) with a registered practitioner not of record who obtains authorization through use of the PTOL-413A will be conducted based on the information and files supplied by the practitioner in view of the confidentiality requirements of 35 U.S.C. § 122(a).

Privacy Act Statement

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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.

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EXAMINER	
SANDERS, JOSHUA T	

ART UNIT	PAPER NUMBER
2127	

NOTIFICATION DATE	DELIVERY MODE
08/23/2017	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):

patents@stratpat.com

Office Action Summary	Application No. 14/587,548	Applicant(s) LEONARD ET AL.	
	Examiner JOSHUA SANDERS	Art Unit 2127	AIA (First Inventor to File) Status Yes

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20170426*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ 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.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-13,15-17 and 20* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-13, 15-17 and 20* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, 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.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ 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)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

DETAILED ACTION

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

2. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

3. Claims 14, 18-19 and 21-31 have been canceled.

4. Claims 1-13 and 20 are pending.

5. Claims 1-13 and 20 are rejected, grounds follow.

6. THIS OFFICE ACTION IS FINAL, see additional information at the conclusion of this action.

Response to Arguments

7. Applicant's arguments, see Remarks page 6, filed 26 April 2017, with respect to rejections of claims 1-20 under 35 USC 101 for being directed to a judicial exception without significantly more ("*Mayo/Alice* rejection") have been fully considered and, in light of related amendments to claim 1, are persuasive. Upon further consideration, Examiner concurs that the claim as currently presented is drawn to a specific technique that amounts to a solution for a particular problem in the art of 3D printing, and

accordingly is not directed to an abstract idea under the 2A test, similar to the case in *McRo.* The rejection of record has been withdrawn.

Applicant's arguments, see Remarks page 13 filed 26 April 2017, with respect to the 102 rejection of independent claim 1 have been fully considered but they are not persuasive. Applicant argues that the reference fails to teach several limitations of the independent claim, particularly “querying the target printer for one or more properties relevant to fabrication of the object; receiving a dictionary of the one or more properties from the target printer; creating a fabrication profile based on the one or more properties; determining whether a suitable machine-ready model is available for the fabrication profile; when a suitable machine-ready model is available, selecting the suitable machine-ready model for transmission to the target printer; and when a suitable machine-ready model is not available, processing the three-dimensional model according to the fabrication profile, and generating a machine-ready representation of the processed three-dimensional model executable by the target printer to fabricate the object”. Examiner respectfully disagrees.

Examiner notes at the outset that while Astroprint does not clearly anticipate performing all of these functions without user input, the claims as currently presented are broad enough that they are not confined only to wholly automated processes. Although the claims are interpreted in light of the specification, limitations from the specification are

not read into the claims. See In re Van Geuns, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

“Querying the target printer for one or more properties relevant to fabrication of the object; receiving a dictionary of the one or more properties from the target printer; creating a fabrication profile based on the one or more properties” are anticipated by Astroprint 'automagically' configuring the automated slicer according to manufacturer settings – astroprint must query and receive at least the target printer manufacturer and the loaded filament manufacturer in order to carry out automatic configuration to develop a '1-click' print process as described in e.g. page 3 of astroprint. (see also “’simply plug your printer’s USB cable into the astrobox, connect to the ‘astrobox wifi’ network, and the box does the rest.” which does not recite any manual input of configuration input.)

“determining whether a suitable machine-ready model is available for the fabrication profile; when a suitable machine-ready model is available, selecting the suitable machine-ready model for transmission to the target printer;” are anticipated by astroprint page 3, ‘organizing gcodes in relation to the STLs they were sliced from. This lets you print hassle free from anywhere, anytime’ and more generally page 2, ‘astroprint.com slices, organizes, and stores your designs.’ Both of which anticipate that previously created machine-ready models may be reused, and the former of which clearly shows that gcodes are also stored, which anticipates that the stored model is machine ready

(comprising machine executable code). Although astroprint is silent as to whether or not the selection of previously created models is performed manually or automatically, the claim as currently presented does not require automatic selection of the previously created machine-ready model.

Finally, “when a suitable machine-ready model is not available, processing the three-dimensional model according to the fabrication profile, and generating a machine-ready representation of the processed three-dimensional model executable by the target printer to fabricate the object” is anticipated by astroprint page 3 'automagically set the most ideal settings for each of your prints' and page 9 referencing Slic3r commercial slicing utility, in conjunction with '1-click-print-device' and 'cloud slicing' 'slicing intelligence' on page 2. Although astroprint is silent as to whether or not the cloud slicing is performed entirely without user-input, the claim as currently presented does not require generating the machine-ready representation without any user input or assistance.

Accordingly, Examiner maintains the rejection of independent claim 1 under 35 USC 102 as anticipated by Astroprint.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a)(1) the claimed invention was patented, described in a printed publication, or in public use, on sale or otherwise available to the public before the effective filing date of the claimed invention.
>
> (a)(2) the claimed invention was described in a patent issued under section 151, or in an application for patent published or deemed published under section 122(b), in which the patent or application, as the case may be, names another inventor and was effectively filed before the effective filing date of the claimed invention.

1. **Claim(s) 1-5, 7, 9-12, 14, 15, 18 and 19 are rejected under 35 U.S.C. 102(a)(1) as being anticipated by 3Dagogo – "AstroPrint Wireless 3D printing software – Kickstarter, May 26, 2014, archived by the internet archive project, https://www.kickstarter.com/projects/306530051/astroprinttm-wireless-3d-printing-software, (hereafter ASTROPRINT)**.

Regarding Claim1, ASTROPRINT teaches:

- receiving a request to fabricate an object from a three-dimensional model; (Astroprint; user inputs command via tablet, see top figure, page 4)
- determining a target printer to fabricate the object; (Astroprint.com server identifies printer by account, see page 2, " AstroPrint.com slices, organizes, and stores your designs in the cloud. In addition, through AstroPrint.com, you can connect to your AstroBox to control your printer.")

- querying the target printer for one or more properties relevant to fabrication of the object; (e.g. model; to identify printer manufacturer's settings; see page 3, "Who is it For, a)", astroprint box considered as part of printer)
- receiving a dictionary of the one or more properties from the target printer; (page 3 "manufacturer and filament recommended settings")
- creating a fabrication profile based on the one or more properties; (page 3 "automagically set the most ideal settings for each of your prints")
- determining whether a suitable machine-ready model is available for the fabrication profile. (ASTROPRINT page 3 – b) power-users "we organize gcodes in relation to the STLs they were sliced from. This lets you print hassle free from anywhere, anytime;" anticipates future printing from previous STL slicing; and page 2, "astroprint.com slices, organizes, and stores your designs.)
- when a suitable machine-ready model is available, selecting the suitable machine-ready model for transmission to the target printer (ASTROPRINT page 3 – b) power-users "we organize gcodes in relation to the STLs they were sliced from. This lets you print hassle free from anywhere, anytime;" and page 2 "astroprint.com slices .. and stores your designs in the cloud." transmitting gcodes related to STLs – i.e. machine ready models – in the cloud inherent in enabling print[ing] from anywhere).
- when a suitable machine-ready model is not available, processing the three-dimensional model according to the fabrication profile and generating a machine-ready representation of the processed three-dimensional model executable by

the target printer to fabricate the object. (astroprint page 3 a) beginners to 3D printing- "AstroPrint makes your 3D printer a 1-click-print device. AstroPrint will automagically set the most ideal settings for each of your prints, reducing your failed prints. This is based on your printer and filament manufacturer's suggested settings as well as our expert experience."; see also ASTROPRINT page 9 - Slicing using a commercial slice utility such as Slic3r; see also page 2, "astroprint.com slices, organizes, and stores your designs in the cloud")

Regarding Claim 2, ASTROPRINT teaches all of the limitations of parent claim 1, ASTROPRINT further teaches:

- further comprising transmitting one or more of the suitable machine-ready model and the machine- ready representation to the target printer for fabrication. (cloud slices are downloaded to the astrobox for printing – see page 3, "When connected to the internet, the AstroBox uses your free AstroPrint.com account to slice, store/retrieve, and organize your files.")

Regarding Claim 3, ASTROPRINT teaches all of the limitations of parent claim 1, ASTROPRINT further teaches:

- further comprising fabricating the object with the target printer. (cloud slices are downloaded to the astrobox for printing – see page 3 "when connected to the internet")

Regarding Claim 4, ASTROPRINT teaches all of the limitations of parent claim 1, ASTROPRINT further teaches:

- wherein the one or more properties include a hardware configuration of the target printer. (page 3 - hardware configuration such as filament is part of the ideal settings - “This is based on your printer and filament manufacturer's suggested settings as well as our expert experience.”)

Regarding Claim 5, ASTROPRINT teaches all of the limitations of parent claim 4, ASTROPRINT further teaches:

- wherein the hardware configuration includes one or more of an extruder type, an extruder nozzle diameter, a build volume, a build platform type, a hardware version number, a top speed for linear movement of a tool, a step size for movement of the tool, a minimum z-axis step size, a gantry type, and a build material type. (page 3, - build material type at least from “filament manufacturer’s suggested settings”)

Regarding Claim 7, ASTROPRINT teaches all of the limitations of parent Claim 4, ASTROPRINT further teaches:

- wherein the hardware configuration includes a manually specified hardware reconfiguration. (ASTROPRINT page 3, - b) power-users; “…but gives you easy access to every advanced setting you could desire”)

Regarding Claim 9, ASTROPRINT teaches all of the limitations of parent claim 1, ASTROPRINT further teaches:

- wherein the one or more properties include one or more user settings on the target printer. (ASTROPRINT – page 3, - b) power-users "…but gives you easy access to every advanced setting you could desire")

Regarding Claim 10, ASTROPRINT teaches all of the limitations of parent claim 9, ASTROPRINT further teaches:

- wherein the one or more user settings include user settings from a previous fabrication process. (ASTROPRINT – b) power-users "we organize gcodes in relation to the STLs they were sliced from. This lets you print hassle free from anywhere, anytime"; anticipates future printing from previous STL slicing user user-customized g-codes)

Regarding Claim 11, ASTROPRINT teaches all of the limitations of parent claim 1, ASTROPRINT further teaches:

- wherein the one or more properties include an application used to operate the target printer. (choose between slic3r, cura, and makerbot per tech specs diagram on page 9)

Regarding Claim 12, ASTROPRINT teaches all of the limitations of parent claim 1, ASTROPRINT further teaches:

- wherein the one or more properties include a build material in the target printer. (page 3, - build material type at least from “filament manufacturer’s suggested settings”)

Regarding Claim 15, ASTROPRINT teaches all of the limitations of parent claim 1, ASTROPRINT further teaches:

- wherein the suitable machine-ready model is selected from a plurality of stored machine-ready models. (ASTROPRINT – page3 b) power-users “we organize gcodes in relation to the STLs they were sliced from. This lets you print hassle free from anywhere, anytime”; anticipates future printing from previous STL slicing; and page 2: “astroprint.com slices, organizes, and stores your designs in the cloud”)

Claim Rejections - 35 USC § 103

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

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claim 6 and 13 are rejected under 35 U.S.C. 103 as being unpatentable over ASTROPRINT and PrintToPeer, PrintToPeer: Your 3D printer on the Web, previously cited, IFW NPL 07/10/2015, 21 pages. (hereafter PRINTTOPEER).**

Regarding Claim 6, ASTROPRINT teaches all of the limitations of parent claim 4, ASTROPRINT does not appear to teach:

- wherein the hardware configuration includes an automatically detected hardware reconfiguration.

However, PRINTTOPEER from the same field of endeavor of 3D printer management, teaches:

- wherein the hardware configuration includes an automatically detected hardware reconfiguration. (PRINTTOPEER - page 6, “your 3D printer is recognized [automatically]")

ASTROPRINT and PRINTTOPEER are analogous because they are from the same field of endeavor and contain overlapping structural and functional similarities, they both

do cloud-hosted slicing, and store printing instructions, they both automatically manage printer settings. Further they both integrate with web-based functions.

A person having ordinary skill in the art at the time the invention was filed could have modified the method of ASTROPRINT with the automatic hardware reconfiguration detection of PRINTTOPEER.

A person having ordinary skill in the art at the time the invention was filed could have been motivated to do this in order to implement plug-and-play capability as suggested by PRINTTOPEER. (page 6)

Regarding Claim 13, ASTORPRINT teaches all of the limitations of parent claim 1, ASTROPRINT further teaches:

- applying the identifier to retrieve the dictionary from a repository of printer information remote from the target printer. (ASTROPRINT page 3, - configurations according to Manufacturer)

ASTROPRINT does not appear to explicitly teach:

- further comprising receiving an identifier from the target printer

However, PRINTTOPEER teaches:

- further comprising receiving an identifier from the target printer (PRINTTOPEER Page 6, PrintToPeer automatically recognizes your 3D printer)

ASTROPRINT and PRINTTOPEER are analogous because they are from the same field of endeavor and contain overlapping structural and functional similarities, they both do cloud-hosted slicing, store printing instructions, and they both automatically manage printer settings. Further they both integrate with web-based functions.

A person having ordinary skill in the art at the time the invention was filed could have modified the method of ASTROPRINT with the receiving of printer identifiers of PRINTTOPEER.

A person having ordinary skill in the art at the time the invention was filed could have been motivated to do this in order to implement plug and play functionality as suggested by PRINTTOPEER

3. **Claims 8, 16 and 20 are rejected under 35 U.S.C. 103 as being unpatentable over ASTROPRINT in view of Pettis, et al. US Patent Publication 2013/0329243 (hereafter PETTIS)**.

Regarding Claim 8, ASTROPRINT teaches all of the limitations of parent Claim 1, ASTROPRINT does not appear to teach:

- wherein the one or more properties include a firmware configuration of the target printer.

However, PETTIS from the same field of endeavor of 3D printer management teaches:

- wherein the one or more properties include a firmware configuration of the target printer. ([0073] – "This may also include software-enabled features such as firmware upgrades or the like, and the server 400 may detect such software-enabled features and where appropriate make modifications to the machine-ready code with the modification engine 414." Detecing Firmware configurations of the target printer)

ASTROPRINT and PETTIS are analogous because they contain overlapping structural and functional similarities, both manage 3D models and 3D printers, both use slicing engines to prepare models for printing. Further, both are designed to interact with a variety of printer configurations.

A person having ordinary skill in the art at the time the invention was filed could have modified the method of ASTROPRINT with the firmware configuration detection of PETTIS.

A person having ordinary skill in the art at the time the invention was filed could have been motivated to make this modification in order to optimize the machine-ready code as suggested by PETTIS. ([0073])

Regarding Claim 16, ASTROPRINT teaches all of the limitations of parent claim 15,

ASTROPRINT further teaches

- generating a new machine-ready representation according to the fabrication profile for use as the machine-ready representation if not possible. . (astroprint page 3 - a) beginners to 3D printing- “AstroPrint makes your 3D printer a 1-click-print device. AstroPrint will automagically set the most ideal settings for each of your prints, reducing your failed prints. This is based on your printer and filament manufacturer's suggested settings as well as our expert experience.”)

However, ASTROPRINT does not appear to teach:

- determining whether one of the plurality of stored machine-ready models can be modified to meet the fabrication profile;
- modifying the one of the plurality of stored machine ready models for use as the machine-ready representation if possible;

But, PETTIS, from the same field of endeavor of 3D printer management, teaches:

- determining whether one of the plurality of stored machine-ready models can be modified to meet the fabrication profile; (PETTIS – fig. 5, Select machine-ready model 518)
- modifying the one of the plurality of stored machine ready models for use as the machine-ready representation if possible; (fig. 5, modify model 519)

ASTROPRINT and PETTIS are analogous because they contain overlapping structural and functional similarities, both manage 3D models and 3D printers, both use slicing engines to prepare models for printing. Further, both are designed to interact with a variety of printer configurations.

A person having ordinary skill in the art at the time the invention was filed could have modified the method of ASTROPRINT with the firmware configuration detection of PETTIS.

A person having ordinary skill in the art at the time the invention was filed could have been motivated to make this modification in order to pre-populate the database with pre-sliced models as suggested by PETTIS. [0082]

Regarding Claim 20, ASTROPRINT teaches all of the limitations of parent claim 1, ASTROPRINT does not appear to teach:

- further comprising generating descriptive metadata to accompany the machine-ready representation, the descriptive metadata specifying one or more properties for comparison to properties of printers selected for fabricating the model. (but; astroprint teaches “organizing”)

However, PETTIS from the same field of endeavor of 3D printer management teaches:

- further comprising generating descriptive metadata to accompany the machine-ready representation, the descriptive metadata specifying one or more properties

for comparison to properties of printers selected for fabricating the model.

(PETTIS - [0035] – describing generating metadata for a database of models)

ASTROPRINT and PETTIS are analogous because they contain overlapping structural and functional similarities, both manage 3D models and 3D printers, both use slicing engines to prepare models for printing. Further, both are designed to interact with a variety of printer configurations.

A person having ordinary skill in the art at the time the invention was filed could have modified the method of ASTROPRINT with the metadata specification of PETTIS.

A person having ordinary skill in the art at the time the invention was filed could have been motivated to make this modification in order to provide additional information to users as suggested by PETTIS. ([0032] – “any criteria that can be used to identify models of potential interest by explicit type (e.g., labeled in model metadata), implicit type (e.g., determined based on analysis of the model)”)

4. **Claim 17 is rejected under 35 U.S.C. 103 as being unpatentable over ASTROPRINT in view of PETTIS, further in view of AIRWOLF3D, Getting Started with Airwolf 3D Printer SLIC3R Configurations, previously cited, IFW NPL 07/10/2015, 12 pages. (hereafter SLIC3R).**

Regarding Claim 17, the combination of ASTROPRINT and PETTIS teaches all of the limitations of parent claim 16,

However, the combination does not appear to teach:

- wherein modifying includes one or more of translating the machine-ready representation, rotating the machine-ready representation, scaling the machine-ready representation, and changing a top speed in a tool path for the target printer. (103; with slic3r NPL tool speed.)

But, SLIC3R from the same field of endeavor of 3D model Printer management, teaches:

- wherein modifying includes one or more of translating the machine-ready representation, rotating the machine-ready representation, scaling the machine-ready representation, and changing a top speed in a tool path for the target printer. (SLIC3R page 4, describing settings that vary by at least tool speed)

ASTROPRINT, PETTIS and SLIC3R are analogous because they are from the same field of endeavor and contain overlapping functional and structural similarities. Further, ASTROPRINT specifically incorporates SLIC3R in its method. (ASTROPRINT REF page 9).

A person having ordinary skill in the art at the time the invention was filed could have modified the method of the combination of ASTROPRINT and PETTIS with the tool speed adjustment of SLIC3R.

A person having ordinary skill in the art at the time the invention was filed could have been motivated to make this modification as ASTROPRINT specifically teaches incorporating SLIC3R into its method. (page 9).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOSHUA SANDERS whose telephone number is (571)272-5591. The examiner can normally be reached on generally: Monday through Thursday and alternate Fridays.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ali can be reached on 571-272-4105. 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.

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- Eugene T. Moore School of Education, Clemson University, 102 Tillman Hall, SC 29634, United States of America (1)
- Department of Computer & Information Science & Engineering, E301 CSE Building, PO Box 116120, Gainesville, FL 32611, United States of America (1)

Publication Title

Supplemental Items

Conference Location

Can embodied interaction and virtual peer customization in a virtual programming environment enhance computational thinking?
Dhaval Parmar; Sabarish V. Babu; Lorraine Lin; Sophie Jörg; Nikeetha D'Souza; Alison E. Leonard; Shaundra B. Daily
2016 Research on Equity and Sustained Participation in Engineering, Computing, and Technology (RESPECT)
Year: 2016
Pages: 1 - 2, DOI: 10.1109/RESPECT.2016.7836179
IEEE Conference Publications

Abstract (3232 Kb)

Programming moves: Design and evaluation of applying embodied interaction in virtual environments to enhance computational thinking in middle school students
Dhaval Parmar; Joseph Isaac; Sabarish V. Babu; Nikeetha D'Souza; Alison E. Leonard; Sophie Jörg; Kara Gundersen; Shaundra B. Daily
2016 IEEE Virtual Reality (VR)
Year: 2016
Pages: 131 - 140, DOI: 10.1109/VR.2016.7504696
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Abstract (1503 Kb) Media

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- P. Gil (1)
- Toshio Modegi (1)

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Affiliation

Publication Title

Conference Location

Proposal for 3D-printing regulation technique in fabricating illegal objects using feature-vector based matching algorithm of 3D shapes
Toshio Modegi
2016 55th Annual Conference of the Society of Instrument and Control Engineers of Japan (SICE)
Year: 2016
Pages: 877 - 883, DOI: 10.1109/SICE.2016.7749185
IEEE Conference Publications

Abstract (383 Kb)

Virtual reality technologies as an interface of cognitive communication and information systems
Branislav Sobota; František Hrozek; Štefan Korečko; Csaba Szabó
2011 2nd International Conference on Cognitive Infocommunications (CogInfoCom)
Year: 2011
Pages: 1 - 5
Cited by: Papers (2)
IEEE Conference Publications

Abstract (1253 Kb)

A performance evaluation of surface normals-based descriptors for recognition of objects using CAD-models
C. M. Mateo; P. Gil; F. Torres
2014 11th International Conference on Informatics in Control, Automation and Robotics (ICINCO)
Year: 2014, Volume: 02
Pages: 426 - 435, DOI: 10.5220/0005056504280435
Cited by: Papers (1)
IEEE Conference Publications

Abstract (801 Kb)

Statistical process control for solder deposition and yield enhancement
R. Muthaiyan; V. Barba, K. Srihari
4th Electronics Packaging Technology Conference, 2002.
Year: 2002
Pages: 212 - 217, DOI: 10.1109/EPTC.2002.1185670
Cited by: Papers (2) | Patents (1)
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Abstract (1016 Kb)

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Workshop Rapid Prototyping - A new approach to introduce digital manufacturing in engineering education
Stefan Junk; Rebecca Matt
2015 International Conference on Information Technology Based Higher Education and Training (ITHET)
Year: 2015
Pages: 1 - 6, DOI: 10.1109/ITHET.2015.7217965
IEEE Conference Publications

Abstract (444 Kb)

A Collaborative Learning System for Sharing 3D Models: 3D Model Co-learning Space
I-Sheng Lin; Tsai-Yen Li; Fang-Chi Liang; Yong-Teng Lin
2017 IEEE 17th International Conference on Advanced Learning Technologies (ICALT)
Year: 2017
Pages: 502 - 506, DOI: 10.1109/ICALT.2017.102
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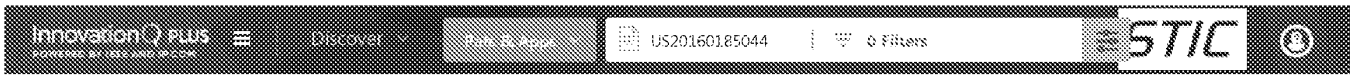
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CURRENT ASSIGNEES: MAKERBOT IND LLC
WO2013086309A1 | WIPO APPLICATIONS | 13-JUN-2013

2. **Networked three-dimensional printing**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

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EP2788910A1 | EUROPEAN APPLICATIONS | 15-OCT-2014

3. **Networked three-dimensional printing**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

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US20120092724 | US APPLICATIONS | 19-APR-2012

4. **Networked three-dimensional printing**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

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US8425218 | US PATENTS | 23-APR-2013

5. **Social networking for three-dimensional printers**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

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6. **Networked three-dimensional printer with three-dimensional scanner**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

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7. **Networked three-dimensional printing**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

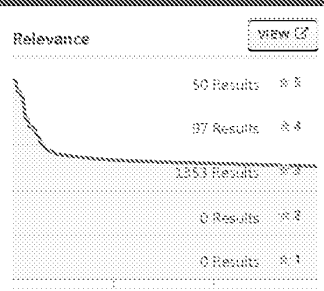
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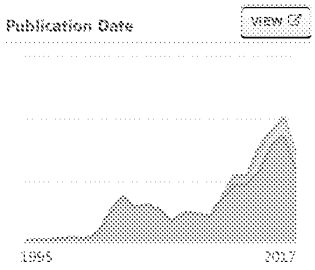
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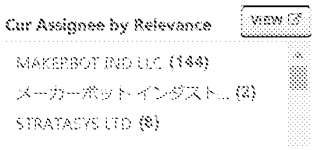
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9. **Networked three-dimensional printing**







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US8414280 | US PATENTS | 09-APR-2013

10. **Networked three-dimensional printing**

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CURRENT ASSIGNEES: MAKERBOT IND LLC
US20120113473 | US APPLICATIONS | 10-MAY-2012

11. **Networked three-dimensional printing**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20120105903 | US APPLICATIONS | 03-MAY-2012

12. **Web-based design tools for three-dimensional printing**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20120287470 | US APPLICATIONS | 15-NOV-2012

13. **Drag-and-drop interface for three-dimensional printing queue management**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20120287473 | US APPLICATIONS | 15-NOV-2012

14. **Networked three-dimensional printing system with a drag-and-drop interface for queue management**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20170031635 | US APPLICATIONS | 02-FEB-2017

15. **Networked three-dimensional printer with web-based video feed**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20120287259 | US APPLICATIONS | 15-NOV-2012

16. **Networked three-dimensional printing**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US8562332A | US PATENTS | 22-OCT-2013

17. **Networked three-dimensional printer with three-dimensional scanner**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US8747097 | US PATENTS | 10-JUN-2014

18. **Raft techniques in three-dimensional printing**

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20140371895 | US APPLICATIONS | 18-DEC-2014

19. **Networked three-dimensional printing**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

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AU2012347683A1 | AUSTRALIAN PATENT DOCUMENTS | 03-JUL-2014

20. **Automated model selection**

A server is configured to store a library of printable content and to select an item from the library in response to a user request. Instead of the user specifying a particular item, the server can automatically select from a number of different items. The server may automatically determine a...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US9626142 | US PATENTS | 18-APR-2017

21. **Displays for three-dimensional printers**

A variety of techniques are disclosed for incorporating displays into three-dimensional printers.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US9473760 | US PATENTS | 18-OCT-2016

22. **Automated model selection**

A server is configured to store a library of printable content and to select an item from the library in response to a user request. Instead of the user specifying a particular item, the server can automatically select from a number of different items. The server may automatically determine a...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20150036174 | US APPLICATIONS | 05-FEB-2015

23. **Displays for three-dimensional printers**

A variety of techniques are disclosed for incorporating displays into three-dimensional printers.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20140043630 | US APPLICATIONS | 13-FEB-2014

24. **Downloadable three-dimensional models**

A server is configured to store a number of different models of an object in machine-ready form corresponding to a number of different three-dimensional printers having differing capabilities and/or hardware configurations. When a user at a client device or a printer requests the object, the server...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20130329243 | US APPLICATIONS | 12-DEC-2013

25. **Downloadable three-dimensional models**

A server is configured to store a number of different models of an object in machine-ready form corresponding to a number of different three-dimensional printers having differing capabilities and/or hardware configurations. When a user at a client device or a printer requests the object, the server...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20130329258 | US APPLICATIONS | 12-DEC-2013

26. **Automated model customization**

A variety of computer automated tools are disclosed to assist consumers with using three-dimensional printers. Where a user also has access to a three-dimensional scanner, the tools may also support automated modifications to scanned subject matter.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20140129028 | US APPLICATIONS | 08-MAY-2014

27. **Automated model customization**

A variety of computer automated tools are disclosed to assist consumers with using three-dimensional printers. Where a user also has access to a three-dimensional scanner, the tools may also support automated modifications to scanned subject matter.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20140129021 | US APPLICATIONS | 08-MAY-2014

functional component and an interface component for the functional component.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US9707719 | US PATENTS | 18-JUL-2017

29. **Automated model customization**

A variety of computer automated tools are disclosed to assist consumers with using three-dimensional printers. Where a user also has access to a three-dimensional scanner, the tools may also support automated modifications to scanned subject matter.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20140046473 | US APPLICATIONS | 13-FEB-2014

30. **Downloadable three-dimensional models**

A server is configured to store a number of different models of an object in machine-ready form corresponding to a number of different three-dimensional printers having differing capabilities and/or hardware configurations. When a user at a client device or a printer requests the object, the server...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20130329257 | US APPLICATIONS | 12-DEC-2013

31. **Automated model customization**

A variety of computer automated tools are disclosed to assist consumers with using three-dimensional printers. Where a user also has access to a three-dimensional scanner, the tools may also support automated modifications to scanned subject matter.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20140129022 | US APPLICATIONS | 08-MAY-2014

32. **Social networking for three-dimensional printers**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US8992202 | US PATENTS | 31-MAR-2015

33. **Tagged build material for three-dimensional printing**

A supply of build material such as a spool or cartridge is instrumented with a data tag that includes information about the build material. A three-dimensional printer can read the information from the tag and determine how to use the build material during fabrication of a three-dimensional object.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20140117585 | US APPLICATIONS | 01-MAY-2014

34. **Tagged build material for three-dimensional printing**

A supply of build material such as a spool or cartridge is instrumented with a data tag that includes information about the build material. A three-dimensional printer can read the information from the tag and determine how to use the build material during fabrication of a three-dimensional object.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US9233504 | US PATENTS | 12-JAN-2016

35. **Web-based design tools for three-dimensional printing**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US9022770 | US PATENTS | 05-MAY-2015

36. **Tagged build material for three-dimensional printing**

A supply of build material such as a spool or cartridge is instrumented with a data tag that includes information about the build material. A three-dimensional printer can read the information from the tag and determine how to use the build material during fabrication of a three-dimensional object.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20160121550 | US APPLICATIONS | 05-MAY-2016

37. **Voice-controlled three-dimensional fabrication system**

CURRENT ASSIGNEES: MAKERBOT IND LLC
US9108456 | US PATENTS | 18-AUG-2015

38. **Voice-controlled three-dimensional fabrication system**

An additive three-dimensional fabrication system includes voice control for user interaction. This voice-controlled interface can enable a variety of voice-controlled functions and operations, while supporting interactions specific to consumer-oriented fabrication processes.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20130297320 | US APPLICATIONS | 07-NOV-2013

39. **Voice-controlled three-dimensional fabrication**

An additive three-dimensional fabrication system includes voice control for user interaction. This voice-controlled interface can enable a variety of voice-controlled functions and operations, while supporting interactions specific to consumer-oriented fabrication processes.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20150348557 | US APPLICATIONS | 03-DEC-2015

40. **Voice-controlled three-dimensional fabrication**

An additive three-dimensional fabrication system includes voice control for user interaction. This voice-controlled interface can enable a variety of voice-controlled functions and operations, while supporting interactions specific to consumer-oriented fabrication processes.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US9349374 | US PATENTS | 24-MAY-2016

41. **Networked three-dimensional printing**

Add a networking capability to a three-dimensional printer offers a wide range of tools for network connected to the use of 3-D printers 3D is improved by making the resource . Web - based server , etc. On the one hand, able to manage access to the content is distributed to the remote user , on the...

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KR20140102240A | KOREAN APPLICATIONS | 21-AUG-2014

42. **Photo booth for three-dimensional images**

A photo booth is configured with a three-dimensional scanner, a display with a user interface coupled to the photo booth, a network interface configured to couple the photo booth in a communicating relationship with a remote processing resource, and processing circuitry. The processing circuitry may...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US9421716 | US PATENTS | 23-AUG-2016

43. **Photo booth for three-dimensional images**

A photo booth is configured with a three-dimensional scanner, a display with a user interface coupled to the photo booth, a network interface configured to couple the photo booth in a communicating relationship with a remote processing resource, and processing circuitry. The processing circuitry may...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US9440399 | US PATENTS | 13-SEP-2016

44. **Voice-controlled three-dimensional fabrication**

An additive three-dimensional fabrication system includes voice control for user interaction. This voice-controlled interface can enable a variety of voice-controlled functions and operations, while supporting interactions specific to consumer-oriented fabrication processes.

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US20160260432 | US APPLICATIONS | 08-SEP-2016

45. **Photo booth for three-dimensional images**

A photo booth is configured with a three-dimensional scanner, a display with a user interface coupled to the photo booth, a network interface configured to couple the photo booth in a communicating relationship with a remote processing resource, and processing circuitry. The processing circuitry may ...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20140042670 | US APPLICATIONS | 13-FEB-2014

46. **Photo booth for three-dimensional images**

...remote processing resource, and processing circuitry. The processing circuitry may...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20140249662 | US APPLICATIONS | 04-SEP-2014

47. **Photo booth for three-dimensional images**

A photo booth is configured with a three-dimensional scanner, a display with a user interface coupled to the photo booth, a network interface configured to couple the photo booth in a communicating relationship with a remote processing resource, and processing circuitry. The processing circuitry may...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20140240794 | US APPLICATIONS | 28-AUG-2014

48. **Mobile device accessory for three-dimensional scanning**

A variety of techniques are disclosed for enabling three-dimensional scanning with mobile devices. In general, an accessory provides additional optics, image sensors, lighting and/or processing to complement preexisting device hardware in support of a variety of three-dimensional imaging techniques.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20140043441 | US APPLICATIONS | 13-FEB-2014

49. **Mobile device accessory for three-dimensional scanning**

A variety of techniques are disclosed for enabling three-dimensional scanning with mobile devices. In general, an accessory provides additional optics, image sensors, lighting and/or processing to complement preexisting device hardware in support of a variety of three-dimensional imaging techniques.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20140043442 | US APPLICATIONS | 13-FEB-2014

50. **Networked three-dimensional printer with web-based video feed**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

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S36	498	700/98.ccls. and printer and model	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/08/14 18:08
S37	112	700/98.ccls. and printer and model and slice	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/08/14 18:08
S38	5730	B29C67/0088.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/08/14 18:08
S39	1936	B29C67/0088.cpc. and printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/08/14 18:08
S40	1092	B29C67/0088.cpc. and printer and model	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/08/14 18:08
S41	329	B29C67/0088.cpc. and printer and model and slic$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/08/14 18:08
S42	53	B29C67/0088.cpc. and printer and model and slic$3 and @ay<"2014"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/08/14 18:08
S43	30222	G05B15/02.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/08/14 18:08
S44	337	G05B15/02.cpc. and G06F17/50.cpc.	US-PGPUB; USPAT; USOCR; FPRS;	AND	ON	2017/08/14 18:08

			EPO; JPO; DERWENT; IBM_TDB			
S45	161	G05B15/02.cpc. and G06F17/50.cpc. and S38	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/08/14 18:08
S46	6954	B33Y50/02.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/08/14 18:08
S47	161	S46 and S45	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/08/14 18:08
S48	2060	store and sliced and model and printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/08/14 18:08
S49	158	store and sliced with model and printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/08/14 18:08
S50	1782	automatic configuration slicing printer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/08/15 15:43
S51	1607	automatic configuration slicing printer (cloud|network)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/08/15 15:43
S52	9	automatic configuration slicing printer (cloud|network) machine-ready	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/08/15 15:44
S53	3	automatic configuration slicing printer (cloud|network) pre-sliced	US-PGPUB; USPAT;	AND	ON	2017/08/15 15:57

			USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
S54	2997	automatic configuration slicing model (cloud|network)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/08/15 15:58
S55	34016	automatic$4 (configuration|configured|configures) (slicing|slices|sliced) model (cloud|network|stored)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/08/15 15:58
S56	47	automatic$4 with (configuration|configured|configures) with (slicing|slices|sliced) and model with (cloud|network|stored)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/08/15 15:59
S57	92	automatic$4 with (configuration|configured|configures) same (gcode|slice|slicing|slicer|sliced|slices) and model with (cloud|network|stored)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/08/15 16:00
S58	1188	automatic$4 with (configuration|configured|configures) same (gcode|slice|slicing|slicer|sliced|slices|printer|3D|three-dimensional) and model with (cloud|network|stored)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/08/15 16:01
S59	40231	machine ready model library	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/08/15 16:59
S60	35	machine ready model library	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2017/08/15 17:00
S61	2	"20140156053".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2017/08/15 17:08

S62	5	(20020041386|20120224755).pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2017/08/15 17:23

EAST Search History (Interference)

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Patents

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10 results / page Download (CSV)

B29C67/0092?

Support structures for the 3D object during manufacture, e.g. using sacrificial material

Method and apparatus for three-dimensional modeling



Grant US6685866B2 • William J. Swanson • Stratasys, Inc.
Priority 1999-06-23 • Filing 2001-07-09 • Grant 2004-02-03 • Publication 2004-02-03

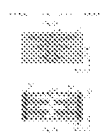
Disclosed are an apparatus and method for three-dimensional **deposition modeling**, which shield a supply of **modeling** filament fed through a **deposition modeling** machine from exposure to environmental moisture. Dry gas under pressure is ...

Search within classification B29C67/0092 (1,271 results)

Y02P90/265?

Product design therefor

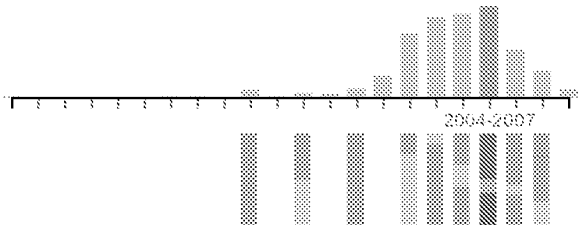
Three dimensional model and mold making method using thick-slice subtractive ...



Grant US6021358A • George A. Sachs • Sachs; George A.
Priority 1996-09-18 • Filing 1996-09-18 • Grant 2000-02-01 • Publication 2000-02-01

A method of rapid prototyping which can utilize existing subtractive fabrication devices for the purpose of forming complex three-dimensional objects from a

Top 1000 results by filing date



Relative count of top 5 values

Assignees	Inventors	CPCs

- Accenture Llp 5.5%
  G06F17/30 G06F9/4428 G06F Y10S707/00
- Microsoft Corporation 3.6%
  H04L29/12235 H04L61/2007 H04L61/2023 H04L29/12216
- International Business Machines Corporation 3.6%
  Y10S707/99933 Y10S707/99943 Y10S707/99953 Y10S707/99934
- Xerox Corporation 3%
  G03G G03G21/14 G03G21/00 G06F3/1278
- Silverbrook Research Pty Ltd 2.8%
  H04M1/274 H04M1/2745 H04M1/2755 H04M1/27

Expand

computer **model**. The method extends the capability of existing milling machines and ...

Real world **modeling** and control process for integrated manufacturing equipment



Grant US5305221A • Robert W. Atherton • Atherton Robert W
Priority 1990-05-04 • Filing 1990-05-04 • Grant 1994-04-19 • Publication 1994-04-19
This process **models** production integrated processing equipment, also known as cluster tools, modular equipment, track systems, etc. Further, the **model** produced by this invention is a real-world **model**, i.e., it is realistic and validatable.

Search within classification Y02P90/265 (2,543 results)

Animal **models** of human amyloidoses



Grant US5958883A • Alan D. Snow • Board Of Regents Of The University Of Washington Office Of Technology
Priority 1992-09-23 • Filing 1996-06-05 • Grant 1999-09-28 • Publication 1999-09-28
In vivo assays for selecting candidate therapeutics for inhibiting amyloidoses, such as congophilic and fibrillar β/A4 amyloid **deposition** in brain. A candidate reagent is administered to a first rat in a first infusate comprising β/A4 ...

Mass production of shells and **models** for dental restorations produced by solid ...



Application US20020064745A1 • Martin Schulman • Schulman Martin L.
Priority 1998-07-10 • Filing 2001-09-05 • Publication 2002-05-30
Solid free form fabrication techniques such as fused

deposition modeling and **three-dimensional printing** are used to create a shell used in the manufacture of a dental restoration. **Three-dimensional printing** comprises ink-jet printing a ...

Local enforcement of accuracy in fabricated models



Grant US7698014B2 · Patrick Colm Dunne · 3M Innovative Properties Company

Priority 2006-01-20 · Filing 2006-08-28 · Grant 2010-04-13 · Publication 2010-04-13

The systems and methods disclosed herein employ a combination of digital three-dimensional **modeling** and rapid fabrication technologies to provide pre-indexed, pre-registered, and/or precut components for articulated dental **models**. Dental ...

Apparatus for forming color images, using a hue-plus-gray color model



Grant US5537228A · Paul H. Dillinger · Hewlett-Packard

Priority 1992-05-04 · Filing 1994-11-14 · Grant 1996-07-16 · Publication 1996-07-16

The invention is for use with a visible medium capable of light reflection etc., and for use with a color-image source that defines a desired color. Here a device for causing the medium to appear colored includes a gray-scale subsystem to ...

Method for forming color images, using a hue-plus-gray color model and error ...



Grant US5333243A · Jeffrey S. Best · Hewlett-Packard Company

Priority 1992-05-04 · Filing 1992-05-04 · Grant 1994-07-26 · Publication 1994-07-26

The invention is for use with a visible medium capable of light

reflection etc., and for use with a color-image source that defines a desired color. Here a device for causing the medium to appear colored includes a gray-scale subsystem to ...

Workcell controller employing entity-server model for physical objects and ...



Grant US5014208A · Charles D. Wolfson · Siemens Corporate Research, Inc.

Priority 1989-01-23 · Filing 1989-01-23 · Grant 1991-05-07 · Publication 1991-05-07

A computer operated controller for controlling and/or monitoring a physical object and a logical abstraction related to the physical object is disclosed. The controller comprises a physical object entity representing the physical object.

Method and system for the generation of a computer model



Application US20030191554A1 · Raymond Russell · Russell Raymond Macdonald

Priority 2002-04-09 · Filing 2002-06-18 · Publication 2003-10-09

(i) providing a data generating means capable of generating and of transmitting data and arranged to generate a control data set representative of a computer **model** of a workpiece, said computer **model** comprising a surface relief, and being ...

Next > >> About 9,638 results

Fabricated: The new world of **3D printing**

H Lipson, M Kurman - 2013 - books.google.com

... 'Revolutionary' **Machine** makes **3-D** objects from drawings By Kathleen ... When most people first hear about **3D printing**, their mind leaps to their old, familiar desktop **printer**. ... **3D printers** make things by following instructions from a computer and stacking raw material into layers. ...

Cited by 588 Related articles All 5 versions Cite Save More

3-D printing: The new industrial revolution

B Berman - Business horizons, 2012 - Elsevier

... It also costs Alessi about 70% less than the traditional method of **making** prototypes ("**3D** Systems," 2011). ... as easily as he/she would download digital music—and then download and **print** the part ... For instance, in terms of cost, materials suitable for **3-D printing** can run 10 to 100 ...

Cited by 584 Related articles All 9 versions Cite Save

Three-dimensional **printing**: rapid tooling and prototypes directly from a CAD **model**

E Sachs, M Cima, J Cornie - CIRP Annals-Manufacturing Technology, 1990 - Elsevier

... Thus a line **printer** with jets spaced one jet diameter apart could **print** a 0.5 meter by 0.5 ... Such a device would take approximately 0.13 seconds to **print** a layer. ... Qeometric Contd There are two distinct issues in the control of geometry in **3D Printing**: the minimum possible feature ...

Cited by 253 Related articles All 4 versions Cite Save

Additive manufacturing technologies: **3D printing**, rapid prototyping, and direct digital manufacturing

I Gibson, D Rosen, B Stucker - 2014 - books.google.com

... 7 1.4.4 Stereolithography or **3D Printing** . . . . 273 11.3.3 Inkjet **Printing** Processes. . . . . 351 15.2 **Preparation** of CAD **Models**: The STL File . . . . . 352 15.2.1 STL File Format, Binary/ASCII . . ...

Cited by 307 Related articles All 7 versions Cite Save More

Implementing a **3D printing** service in an academic library

S Pryor - Journal of Library Administration, 2014 - Taylor & Francis

... one user has ever declined a **print** after a cost estimate (which was for a large, complex **print**), and most ... technologies for map and geography libraries: **3-D printing**, holographic imaging, **3-D** city **models**, and **3-D model**-based animations. ... **3D printing**: **Making** things at the library. ...

Cited by 44 Related articles All 7 versions Cite Save

3D-printing of non-assembly, articulated **models**

J Call, DA Calian, C Amati, R Kleinberger... - ACM Transactions on ..., 2012 - dl.acm.org

... (b) Hand **model** (input, articulated, **3D print**) (c) Elephant **model** (input, articulated, **3D print**) Figure 12: Results of joint fitting on three input **models**. ... LIPSON, H., MOON, F., HAI, J., AND PAVENTI, C. 2005. **3- d printing** the history of mechanisms. ... **3D** polyomino puzzle. ACM Trans. ...

Cited by 126 Related articles All 11 versions Cite Save

Materializing information: **3D printing** and social change

M Ratto, R Ree - First Monday, 2012 - firstmonday.org

... that if you break your cup from Ikea, and you go to your **3D printer** to replace it ... experienced during the tutorial in navigating the tools provided in order to successfully **print** a pendant ... is interesting to note that, at least among participants in the emergence of **3D printing**, this insight ...

Cited by 83 Related articles All 8 versions Cite Save More

Three Dimensional **Printing**: Rapid Tooling and'Prototypes Directly from a CAD **Model**

P Williams, D Brancazio... - Journal of ..., 1992 - ... .asmedigitalcollection.asme.org

... An example of a high speed application is the "Dijit" **printer** from Diconix, Inc. ... Fig. 5 Schematic of **3D Printing machine** tridge (part number 51608A) employs evaporative-bubble tech- nology, and can **print** 0.002 in. diameter droplets up to 3000 times per second. ...

Cited by 535 Related articles All 14 versions Cite Save

Medical applications for **3D printing**: current and projected uses

CL Ventola - Pharmacy and Therapeutics, 2014 - ncbi.nlm.nih.gov

... 13 Doctors at the University of Michigan published a case study in the New England Journal of Medicine reporting that use of a **3D printer** and CT images of a ... 5 A pharmacist could then **print** and dispense the personalized medication via an automated **3D printing** system. ...

Cited by 220 Related articles All 6 versions Cite Save

RP in medicine: a case study in cranial reconstructive surgery

S Gopakumar - Rapid Prototyping Journal, 2004 - emeraldinsight.com

... Prior to the usage of CAD and RP for the design and manufacture of implants, the cranial defect **models** were usually fabricated by **making** impression of the ... It serves as a bridge between the **3D** STL files and the FDM hardware. ... The mold was **prepared** using RTV silicone rubber ...

Cited by 67 Related articles All 5 versions Cite Save

Kindling and Epileptic Activity [in Russian], **Astroprint**, Odessa (1999)
AA Shandra, LS Godlevskii, AI Brusentsov - Google Scholar
Cited by 8 Related articles Cite Save

Chemical Composition of Stars: Method and Results of Analysis (**Astroprint**, Odessa, 1995)
LS Lyubimkov - Google Scholar
Cited by 8 Related articles Cite Save

Differential Equations with a Multivalued Right-Hand Side, Asymptotic Methods "**AstroPrint**", Odessa, 1999
VA Plotnikov, AV Plotnikov, AN Vityuk - MR1738934 (2001k: 34022)
Cited by 7 Related articles Cite Save

Ancient landslide (Olbia) on the right (west) shore of Dnieper-Bugsky liman
E Konikov, G Pedan, A Kravchuk - 2006 - dspace.onu.edu.ua
The ancient city of Olbia is situated on the paleo-slope of a landslide. The Upper City sits on the plateau, with absolute elevations of 38-42 m (Fig. 8). The Lower City is on the upper landslide terrace, which is 40-85 m wide and has an elevation of 6.5-12.5 m. The surface of
All 3 versions Cite Save More

Paleoenvironment and human occupation at the site of Zaliznychne in the light of neolithization in the Lower Danube region of Ukraine
OV Smyntyna - 2011 - dspace.onu.edu.ua
During recent years, the transition from hunting-gathering to a productive economy and the neolithization of the northwestern part of the Black Sea region have appeared to be rather widely discussed in the context of the consequences of a so-called'Great Flood'that some
All 3 versions Cite Save More

Benthic foraminifera as indicators of pollution in the north-western part of the Black Sea
AO Kravchuk - 2006 - liber.onu.edu.ua
Population growth and the resultant acceleration of domestic, municipal, industrial, agricultural and recreational activity are the primary causes of anthropogenic pollution of the marine realm (Yanko et al., 1999). Such pollution produces numerous obvious biological
Cited by 1 Related articles All 3 versions Cite Save More

The issue of the" Steppe Neolithic" in the northwestern Black Sea area
D Kiosak - 2011 - liber.onu.edu.ua
The northwestern Black Sea coastal area is the westernmost territory of the Great Eurasian Steppe. It always served as a contact zone between the latter and the Balkans. It had its own way of neolithization. The appearance of the first agricultural population in the steppes, that
All 3 versions Cite Save More

Ecological aspects of mud volcano activities in the Azov-Black Sea region
M Maslakov, EF Shnyukov, V Yanko-Hombach - 2011 - dspace.onu.edu.ua
Since 1990, the Ukrainian-Russian team of scientists headed by the second author of this presentation has performed multidisciplinary research on mud volcano activity in the Azov-Black Sea region over the course of dozens of onshore and offshore expeditions carried out
Cited by 2 Related articles All 3 versions Cite Save More

The role of geological factors in the formation of H2S contamination in the Black Sea
E Shnyukov, V Yanko-Hombach - 2011 - liber.onu.edu.ua
The Black Sea formed within an east-west trending elliptical depression with a surface area of 436,400 km2, a water volume of 547,000 m3, and a water depth reaching 2212 m at its lowest point. It is the world's largest (423,000 km2) meromictic basin, where the deep waters
Cited by 1 Related articles All 3 versions Cite Save More

Reconstruction of north-western Black Sea coastline positions for the past 25 ky
E Larchenkov, S Kadurin - 2006 - liber.onu.edu.ua
Recent relief and shoreline of NW Black Sea shelf have been formed through interaction of various processes: eustatic sea-level change, sedimentation/erosion, and the subsequent vertical movements during last 25 ky (Fedorov, 1988; Larchenkov, Kadurin, 2005). This work
Cited by 3 Related articles All 3 versions Cite Save More

Automatic engraving method and apparatus
JH Payne - US Patent 5,329,381, 1994 - Google Patents
... The **configuration** of the invention is shown in FIG ... **Automatic** concatenation o ○ SPOT files and ○ PLOT files is now used to create a single output file which contains positioning ... The result is that the tool **automatically** moves out of the way and engraving stops after each tray has ...
Cited by 44 Related articles All 2 versions Cite Save

Combining X-ray micro-CT technology and 3D **printing** for the digital preservation and study of a 19th Century Cantonese chess piece with intricate internal structure
SD Laycock, GD Bell, DB Mortimore, MK Greco... - Journal on Computing ..., 2012 - dl.acm.org
... are becoming increasingly common in universities, research institutes, and to some extent, in industrial **settings**. ... This software features **automatic** mask interpolation, luminance thresholding, gen- eration of mask shapes, and the ... Figure 7 show a **slice** in the **printer's** software. ...
Cited by 17 Related articles All 9 versions Cite Save

System and method for the creation and **automatic** deployment of personalized, dynamic and interactive voice services, with real-time **database** queries
M Zimgibl, A Patnaik, B Maass, CS Leon - US Patent 6,798,867, 2004 - Google Patents
... System and method for the creation and **automatic** deployment of personalized, dynamic and interactive voice services, with real-time **database** queries US 6798867 B1. ... The requested is drawn from the **database automatically**, in real-time by connecting to the **database**. ...
Cited by 117 Related articles All 2 versions Cite Save

Detection and use of **printer configuration** information
AN Leonard, J Sadusk - US Patent App. 14/587,548, 2014 - Google Patents
... also store user preferences or criteria for filtering content, eg, for **automatic printing** or other ... In one aspect, a print server 208 may manage subscriptions and **automatically** direct new ... machine-ready models may take into account a **printer's** properties and **configuration** in order ...
All 2 versions Cite Save

Towards the production of radiotherapy treatment shells on 3D **printers** using data derived from DICOM CT and MRI: preclinical feasibility studies
..., MD Tam, S Isherwood, DB Mortimore... - ... of Radiotherapy in ..., 2015 - cambridge.org
... This step was performed using an **automatic** flood fill operation ... a) Image of a **slice** of the ... For each **setup**, three repeat readings were acquired with a stan- dard deviation of <0·1%. For point (i), the change in dose produced by the material (ΔD5 cm) assesses its effect on the dose ...
Cited by 10 Related articles All 8 versions Cite Save

Automated determination of relevant **slice** in multidimensional data sources
I Tien, C Hulen, CI Lim - US Patent App. 11/412,499, 2006 - Google Patents
... [0031]. Many other **configurations** of computing ... example, defining automated time intelligence on the actual value of a KPI can have it **automatically** set for ... Other applications may be selected based on the report parameter, a subscriber request, or a user interface **configuration**. ...
Cited by 22 Related articles All 2 versions Cite Save

System, method, and program product for digital production management
AP Wegner, ML McCoy, ML Crogan - US Patent App. 14/172,449, 2014 - Google Patents
... can comprise a digital production management platform, which may be **configured** for remote ... applications for production device (eg, **printer**) **settings** may entail **automatic** generation of ... the production management platform in order to receive or **automatically configure** the **printer** ...
Cited by 3 Related articles All 2 versions Cite Save

Automatic hardware and firmware generation for multi-function custom controls
D Johnson, S Boyd - US Patent App. 10/900,070, 2004 - Google Patents
... [0167]. The results of the **automatic** hardware and ... system **configuration settings** based on. SYS_FIG.INC. SCH-FIG.INC, This “include” file **automatically** generates the top. (180), level OrCAD schematic name which includes all the. desired functions based on SYS_FIG.INC. ...
Cited by 11 Related articles All 2 versions Cite Save

Food product scale and related in-store random weight item transaction system with RFID capabilities

RJ Schuller, RJ Weisz, NG Mills... - US Patent ..., 2009 - Google Patents

... RF detection field 34, the scale could be **configured** to only perform the **automatic** operator login ... only RFID tags it is contemplated that each tag would be pre-**configured** to store ... is presented to the customer and it identifies multiple incentives, the scale may **automatically** link the ...

Cited by 10 Related articles All 4 versions Cite Save

Confdiagnoser: An automated **configuration** error diagnosis tool for java software

S Zhang - Proceedings of the 2013 International Conference on ..., 2013 - dl.acm.org

... ConfDiagnoser focuses on identifying and monitoring **config**- uration option-affected control flow rather than the values, for two reasons. ... **Automatic** misconfiguration troubleshooting with PeerPressure. ... **Configuration** debugging as search: finding the needle in the haystack. ...

Cited by 11 Related articles All 4 versions Cite Save

Computer-aided fixture design **verification**
Y Kang, Y Rong, J Yang, W Ma - Assembly Automation, 2002 - emeraldinsight.com
... been advanced so rapidly that computers can now generate fixture **configurations automatically**, for both ... solution, the market is demanding tools/technologies that not only **verify** the product ... can calculate the machining surface deviation using the tolerance **verification** algorithm. ...
Cited by 90 Related articles All 13 versions Cite Save More

A visual simulation technique for **3D printing**
HJ Jee, E Sachs - Advances in Engineering Software, 2000 - Elsevier
... For instances, they can **automatically** generate, simulate, and **verify** numerically controlled machining programs [11] and ... is same as the amount of layer thickness T p , so the **configuration** of M ... subtract one from m nz before being multiplied by T p . These **configurations** will be ...
Cited by 43 Related articles All 6 versions Cite Save

Stress relief: improving structural strength of **3D** printable objects
O Stava, J Vanek, B Benes, N Carr... - ACM Transactions on ..., 2012 - dl.acm.org
... The first **automatic** method devised to detect structural issues of **printed** objects was proposed by ... be inserted to prevent nonrigid deformations of the object, and they are **automatically** placed at ... For each selected grip **configuration** Gs, we multiply the value of Λ for all remaining ...
Cited by 174 Related articles All 10 versions Cite Save

Practical **3D printers**: The science and art of **3D printing**
B Evans - 2012 - books.google.com
... an illustration application and then extruding it into three-dimensions, learning more about x parametric computer-aided design (CAD), or even how to process and prepare **3D models** for **printing**. This book is not an instruction booklet for how to build a **Model** Th X **3D printer**. ...
Cited by 77 Related articles All 4 versions Cite Save More

The creation and **verification** of cranial **models** using three-dimensional rapid prototyping technology in field of transnasal sphenoid endoscopy
V Waran, R Menon, D Pancharatnam... - American journal of ..., 2012 - ingentaconnect.com
... to appreciate that each individual patient will have different anatomic **configurations** based on ... any teaching **model** based on individual patients must have the anatomy **verified** compared with ... fused deposition modeling, and **3D printing**,12 which allow for **automatic** fabrication of ...
Cited by 25 Related articles All 4 versions Cite Save

Perceptual **models** of preference in **3D printing** direction
X Zhang, X Le, A Panotopoulou, E Whiting... - ACM Transactions on ..., 2015 - dl.acm.org
... F(⋯) satisfies the follow- ing constraint over the entire **configuration** space spanned by 4 ... Figure 10: Interactive modification of viewpoint preference – (top- left) **automatic** computation M3(d ... with MeshMixer, we specify only support area weight when **automatically** selecting **printing** ...
Cited by 24 Related articles All 5 versions Cite Save

Reconstruction and **verification** of **3D** object **models** for grasping
ZC Marton, L Goron, RB Rusu, M Beetz - Robotics Research, 2011 - Springer
... Acquiring these **automatically** from the Internet has been explored in [6], but obtaining the ... in training aa classifier that differentiates between plausible and less plausible **configurations**, ie to ... Rabbani, T., Heuvel, F.: Efficient hough transform for **automatic** detection of cylinder in ...
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Automatic registration of 2-D with **3-D** imagery in urban environments
I Stamos, PK Allen - Computer Vision, 2001. ICCV 2001. ..., 2001 - ieeexplore.ieee.org
... X &D1) U . . . U P(R3DM X R2D,)4 describes the space of every possible matching **configuration** between **3** ... The **automatically** com- puted principal point of the cameras is also shown; it is the point of intersection of ... **Automatic** recovery of relative camera rotations for urban scenes ...
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Microcatheter shaping for intracranial aneurysm coiling using the 3-dimensional **printing** rapid prototyping technology: preliminary result in the first 10 consecutive ...
K Namba, A Higaki, N Kaneko, T Mashiko, S Nemoto... - World neurosurgery, 2015 - Elsevier
... with a microcatheter shape determined by the patient's anatomy and **configuration** of the ... We hypothesized that an accurately shaped microcatheter will **automatically** select the targeted aneurysm ... Using a **3D** aneurysm **model**, we designed and **verified** a shaping mandrel (Figure ...
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Improved surface finish in **3D printing** using bimodal powder distribution
M Lanzetta, E Sachs - Rapid Prototyping Journal, 2003 - emeraldinsight.com
... The lines observed have been **printed** (Figure 1) using a semi-**automatic** machine (Lanzetta and Sachs, 2001c), which **...** of droplet spacing were explored and the effect of droplet spacing on line diameter was **verified** to follow a **...** Figure 1 **Configuration** of the line-**printing** machine. **...**
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Spec2Fab: a reducer-tuner **model** for translating specifications to **3D prints**

D Chen, DIW Levin, P Didyk, P Sitthi-Amorn… - ACM Transactions on …, 2013 - dl.acm.org

... In this paper, we propose an abstraction mechanism that simplifies the design, development, implementation, and **reuse** of these ... For instance, tuners can be completely uncon- nected (Figure 5 (left) or be **organized** into groups which ... Tuner nodes **store** a list of their neighbors. ...

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Additive manufacturing technologies: **3D printing**, rapid prototyping, and direct digital manufacturing

I Gibson, D Rosen, B Stucker - 2014 - books.google.com

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Mass Customization: **Reuse** of Digital **Slicing** for Additive Manufacturing

TH Kwok, H Ye, Y Chen, C Zhou… - Journal of …, 2017 - … .asmedigitalcollection.asme.org

2.

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Semantic annotation of **3D** anatomical **models** to support diagnosis and follow-up analysis of musculoskeletal pathologies

I Banerjee, CE Catalano, G Patanè… - International journal of …, 2016 - Springer

... The paper is **organized** as follows ... W3C Open Annotation Community Group, to fulfil the main requirements of SemAnatomy3D annotation framework: **storing** the annotation ... World Health **Organization**, Geneva. 9. Spagnuolo M, Falcidieno B (2009) **3D** media and the semantic web ...

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Investigation of a **3D printer**

H Junji - 2014 - diva-portal.org

... The basic **organization** of a DXF file is as follows: ... endloop endfacet There are two **storage** formats available for STL files: ASCII and BINARY. ... 2009. http://www.redeyeondemand.com/Downloads/ **Saving**%20your%20CAD%20fi le%20in%20STL%20format.pdf 10. ...

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Mass Customization: **Reuse** of Topology Information to Accelerate **Slicing** Process for Additive Manufacturing

H Ye, C Zhou, W Xu - International Solid Freeform …, 2016 - sffsymposium.engr.utexas.edu

... The remainder of the paper is **organized** as follows: In Sec.2, we overviewed the existing **slicing** method, the similarity among customized products ... Comparing to the classic closest point method, time **saving** is significant, though this method consumes more **storage**. ...

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Design for self assembly of building components using rapid prototyping

L Sass - Architecture in the Network Society [22nd …, 2004 - cumincad.architexturez.net

... The resulting representation was created from **stored** in- formation **reused** to generate a new ... and Gero's methods are based on the user,s ability to **reuse** explicit knowledge ... Designing Assemblies Designing each assembly is a complex process of **organizing** constraints to create ...

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Will **Model**-based Definition replace engineering drawings throughout the product lifecycle? A global perspective from aerospace industry

V Quintana, L Rivest, R Pellerin, F Venne… - Computers in …, 2010 - Elsevier

... can choose to display only selected **3D** annotations in order to **organize**, capture and ... drawings follow international standards in terms of how the data is **organized** and structured ... the drawing's content) and a document format (the arrangement and **organization** of information ...

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Method and system for **reuse** of materials in additive manufacturing systems

A Teken, B Belocon - US Patent 9,688,020, 2017 - Google Patents

... The invention, however, both as to **organization** and method of operation, together with objects, features and ... memories (EEPROMs), magnetic or optical cards, or any type of media suitable for **storing** electronic instructions, including programmable **storage** devices. ...

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A Digital Fabrication Assistant for 3D Arts and Crafts

J Lin, H Nishino, T Kagawa - Broadband and Wireless ..., 2014 - ieeexplore.ieee.org

... SYSTEM IMPLEMENTATION A. System **Organization** Figure 2 shows the software components structure of the ... It provides a space-partitioning data structure for **organizing** a point cloud in a k ... The face indices in the VF table, however, are repeatedly **stored**; therefore, we restore ...

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Clever support: Efficient support structure generation for digital fabrication

J Vanek, JAG Galicia, B Benes - Computer graphics forum, 2014 - Wiley Online Library

... In this work we will focus mainly on Fused Deposition **Modeling** (FDM) **printers** since they are ... Most of them addressed the possible printability and structural problems of the **3D models** before they are ... are added at the ends of the support struts for easier removal from the **model**. ...

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3D printed molecules and extended solid models for teaching symmetry and point groups

VF Scalfani, TP Vaid - J. Chem. Educ, 2014 - ACS Publications

... University **Libraries**, Rodgers **Library** for Science and ... in one piece directly from a digital **3D** design file, greatly simplifying the process of fabricating molecular **models**. ... groups in an inorganic chemistry course.(17) More importantly, with **3D printing** technology, any **model** can be ...

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Investigating the implications of 3D printing in special education

E Buehler, N Comrie, M Hofmann, S McDonald... - ACM Transactions on ..., 2016 - dl.acm.org

... Specifically, they were concerned that the planned **3D modeling** curriculum might prove a challenge for the vision ... goals for the **3D printer** are to create tactile graphics and hand-held **models** and provide ... of it is marketed as, 'Oh it will scan and you'll get a **print-ready model**' and I ...

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Beginning design for 3D printing

J Micallef - 2015 - books.google.com

... 93 EnSuring That **3D MOdels** Are **3D Print Ready**..... ... Having the design skills to **model** objects for **3D printing** is no trivial matter, and unfortunately ... lower left, and Meshmixer at the lower right) can help newcomers learn **3D modeling** skills right ...

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Programmatic conversion of crystal structures into 3D printable files using Jmol

VF Scalfani, AJ Williams... - Journal of ..., 2016 - jcheminf.springeropen.com

... allow researchers and educators to quickly locate a large collection (>30,000) of crystal structures that are **3D print ready**; no further ... material in the **3D printing** process is recommended to achieve optimal results and quality of the printed **model**. ... virtual reality **modeling** language. ...

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System for visually managing office document finishing options

Y Hoppenot, J Pouyadou - US Patent App. 12/393,371, 2009 - Google Patents

... additional print drivers, each specific to a particular type of **printer**, for converting the **print-ready** document into ... When the **model** 100 is loaded, the **3D** viewer 108 immediately renders it in real time (S108). ... Systems and methods for generating three dimensional, textured **models**. ...

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An introduction to 3D printing

V Zukas, JA Zukas - 2015 - books.google.com

... He is widely known for his work in numerical **modeling** of the behavior of structures and ... These changes are made by (you guessed it) additional software and the refined **model** again sent ... Just as 2D **printers** come in inkjet and laser **models**, **3D printers** operate under a variety of ...

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e-Reconstruction and e-archiving of iconic architectural heritage: A complete example

H Esmaeili, H Thwaites... - Virtual System & ..., 2016 - ieeexplore.ieee.org

... method for the e-reconstruction in the case of the Pekeliling Flats was the traditional polygon **modeling**. ... The **3D-print ready models** of three type units are available online [26 ... **model** that includes elevator shafts, staircases, corridors, refuse chutes, and generally all concrete parts. ...

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Improved understanding of brain morphology through 3D printing: A brief guide

C Madan - Research Ideas and Outcomes, 2016 - riojournal.com

... https://**library**.ualberta.ca/services/3dprinting/preparing-**3d-model**). ... 4. **3D printing**. The resulting files (.stl) are now **print-ready**. ... 2 shows an example of the resulting printed **models**. The hemisphere surfaces were split by the **printers** (University of Alberta **Libraries**) using Netfabb. ...

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Semantic medical image to **3d** print of anatomic structure
SK Zhou, B Geiger - US Patent App. 14/539,051, 2014 - Google Patents
... The **3D print ready model** of the predetermined representation of the anatomy is converted into a **3D print ready model** specific to **...** [0045]. Other **models** may be **...** Alternatively or additionally, an image of the **model** for three-dimensional **printing**, such as using a computer assisted **...**
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Could print on-demand actually be the “new interlibrary loan”?
S Wilson-Higgins - Interlending & Document Supply, 2011 - emeraldinsight.com
... The business **models** for p... Pricing POD as an alternative to ... print and hand it to a patron there would be no distribution costs incurred but the EBM **model** would require ... of having all the content that a **library** might want to access via ILL available as POD in **print ready** files with ...
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The economic implications of alternative publishing **models**
JW Houghton, C Oppenheim - Prometheus, 2010 - Taylor & Francis
... print and delivery related costs, assuming that the content is produced **print ready** and print ... M. and Benjamin, P. (2007) Integrated Activity Based Costing and Activity **Model**- ling, Knowledge ... Halliday, L. and Oppenheim, C. (1999) Economic **Models** of the Digital **Library**, United ...
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The Espresso Book Machine: a change agent for **libraries**
K Arlitsch - **Library** Hi Tech, 2011 - emeraldinsight.com
... Preparing a “**print ready**” digital file to the EBM requires some formatting to achieve a consistent and ... The opportunity for the **library** to alter its collection development **model**, as mentioned earlier ... They include hybrid **models** where the scanning can be done at Kirtas or at the local ...
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The EDIT Cyberplatform for Taxonomy and the Taxonomic Workflow: Selected Components.
P Ciardelli, P Kelbert, A Kohlbecker, N Hoffmann… - GI …, 2009 - academia.edu
... 5 Print publishing – **print-ready** at the click of a button ... taxonomic community's ability to access existing data by introducing a Common Data **Model** and making ... compatible with existing community standards, offering tools for exchanging data between data **models**, and improving ...
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E-mail transmission of **print-ready** documents
JJ Hull, DE Poppink - US Patent 7,375,835, 2008 - Google Patents
... In one embodiment, initial print request 231 identifies the **model** (AMD 2400 GHz processor, rev. ... most current version of the driver is guaranteed to be available when the **print-ready** document is ... completed, PC 109 may attempt to transmit the print job to the next **printer** 102 on ...
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Economic implications of alternative publishing **models**: Self-archiving and repositories
JW Houghton - Liber Quarterly, 2010 - liberquarterly.eu
... copy print and delivery related costs, assuming that the content is produced **print ready** and print ... access as a result of the unilateral adoption of alternative open access **models** by the UK). In the 'Green OA' **model** self-archiving operates in parallel with subscription publishing, so ...
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Client subsystem for changing document/job attributes in a network **printing** system
RH Sperry, AE Audi, LE Burgess, M Kajitani… - US Patent …, 1999 - Google Patents
... RPC Stubs and Run-Time **Library** Operating System. ... a manner in which the Print Assistant operates in conjunction with various subsystems of the DPA Print **Model** of FIG. 3; ... That is, the job cannot be copied to the target **printer** until it is in an appropriate **print ready** condition. ...
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Asymmetrical collaboration in print shop-customer relationships
J O'Neill, D Martin, T Colombino, J Watts-Perotti… - ECSCW 2007, 2007 - Springer
... is a trade-off between the predictability introduced by customising the spot colour **library** and being ... 1 shows the output of a **print-ready** file where the page layout and creep settings4 ... the work of Armour (1996) and Goodwin (1997) that the **model** on which colour management is ...
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Costs and benefits of alternative publishing **models**: Denmark
J Houghton - 2009 - hal.archives-ouvertes.fr
... Costs and Benefits of Alternative Publishing **Models**: Denmark 11 Figure 3: Estimated average publisher costs per article by format and **model** (DKK, circa 2007) ... publishing exclude copy print and delivery related costs, assuming that the content is produced **print ready** and print ...
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The procurement of an automated **library** system with a **model** RFP
RW Ross - **Library** technology reports, 1994 - go.galegroup.com
... It is essential for the head **librarian** or director to meet with the planning team from time to time to restate the objective(s), and refine **...** REQUEST FOR PROPOSAL FOR AN AUTOMATED INTEGRATED **LIBRARY** SYSTEM FOR THE ABS **LIBRARY**. **... Model** Request for Proposal. **...**
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	3	✓	✓							
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AstroPrint - Wikipedia
https://en.wikipedia.org/wiki/AstroPrint
AstroPrint is a cloud platform and application marketplace designed for consumer 3D printing by 3DaGoGo Inc., a private San Diego based technology company ...

Overview | AstroPrint 3D Printing | Adafruit Learning System
https://learn.adafruit.com/astroprint-3d-printing/overview
Dec 30, 2014 - In this guide we're going to setup the Raspberry Pi with Astro Print. AstroPrint is free, open source software for wirelessly managing 3D printers.

GitHub - AstroPrint/AstroBox: AstroBox allows you to control your 3D ...
https://github.com/AstroPrint/AstroBox
README.md. AstroBox Software. The AstroBox software provides a responsive web interface for controlling a 3D printer (RepRap, Ultimaker, ...) and connecting ...

3D Printing with Astroprint on Raspberry Pi - YouTube

https://www.youtube.com/watch?v=A7nDWNr26VM
Jan 1, 2015 - Uploaded by Adafruit Industries
Today we're taking a first look at with Astro Print for Raspberry Pi. AstroPrint is free, open source software ...

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Real Practical use of Octopi? - Topics - Raspberry_Pi - Groups ...
https://www.thingiverse.com/groups/raspberry-pi564/topic:8329
Another thought: if it were hosted by Thingiverse, the huge library of models could be pre-sliced during off-peak time for the most popular printers.

Pre-sliced objects far better than self sliced | Prusa Printers | 3D Hubs ...
https://www.3dhubs.com/talk/thread/pre-sliced-objects-far-better-self-sliced
Pre-sliced objects far better than self sliced. Hello, ... The main reason you are finding that the models on the SD card print better is because the Prusa team has ...

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http://go.imade3d.com/jb-howto - Install Cura slicer, 'Slice' 3D models, GCODEs ... ready to print/; Here's some pre-sliced gcodes ready to print on the JellyBOX.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Serial No.: 14/587,548
Filing Date: December 31, 2014
In re: LEONARD, Alison N., *et al.*
Art Unit: 2127
Examiner: SANDERS, Joshua T.
Conf. No.: 6946

Commissioner for Patents
PO Box 1450
Alexandria, Virginia 22313-1450

AMENDMENT AND REMARKS

Dear Examiner:

Please enter and consider the following Amendment and Remarks, which are responsive to the non-final Office Action mailed December 29, 2016:

A **Request for Extension of Time** appears on page 2 of this paper.

Amendments to the Claims begin on page 3 of this paper.

Remarks begin on page 6 of this paper.

Request for Extension of Time

The applicant requests a one-month extension of time from March 29, 2017 until April 29, 2017 for responding to the outstanding action. The fee of $200 as specified by 37 C.F.R. § 1.17(a)(1) accompanies this request.

Amendments to the Claims

Please amend the claims according to the following claim listing, which replaces all prior versions and listings of the claims in this application:

1. (Currently amended) A method comprising:

receiving a request to fabricate an object from a three-dimensional model;

determining a target printer to fabricate the object;

querying the target printer for one or more properties relevant to fabrication of the object;

receiving a dictionary of the one or more properties from the target printer;

creating a fabrication profile based on the one or more properties; ~~and~~

determining whether a suitable machine-ready model is available for the fabrication profile;

when a suitable machine-ready model is available, selecting the suitable machine-ready model for transmission to the target printer; and

when a suitable machine-ready model is not available, processing the three-dimensional model according to the fabrication profile, and generating a machine-ready representation of the processed three-dimensional model executable by the target printer to fabricate the object.

2. (Currently amended) The method of claim 1 further comprising transmitting one or more of the suitable machine-ready model and the machine-ready representation to the target printer for fabrication.

3. (Original) The method of claim 1 further comprising fabricating the object with the target printer.

4. (Original) The method of claim 1 wherein the one or more properties include a hardware configuration of the target printer.

5. (Original) The method of claim 4 wherein the hardware configuration includes one or more of an extruder type, an extruder nozzle diameter, a build volume, a build platform type, a

hardware version number, a top speed for linear movement of a tool, a step size for movement of the tool, a minimum z-axis step size, a gantry type, and a build material type.

6. (Original) The method of claim 4 wherein the hardware configuration includes an automatically detected hardware reconfiguration.

7. (Original) The method of claim 4 wherein the hardware configuration includes a manually specified hardware reconfiguration.

8. (Original) The method of claim 1 wherein the one or more properties include a firmware configuration of the target printer.

9. (Original) The method of claim 1 wherein the one or more properties include one or more user settings on the target printer.

10. (Original) The method of claim 9 wherein the one or more user settings include user settings from a previous fabrication process.

11. (Original) The method of claim 1 wherein the one or more properties include an application used to operate the target printer.

12. (Original) The method of claim 1 wherein the one or more properties include a build material in the target printer.

13. (Original) The method of claim 1 further comprising receiving an identifier from the target printer and applying the identifier to retrieve the dictionary from a repository of printer information remote from the target printer.

14. (Canceled)

15. (Currently amended) The method of claim 1 wherein ~~generating the machine-ready representation includes selecting one of~~ the suitable machine-ready model is selected from a plurality of stored machine-ready models ~~according to the fabrication profile as the machine-ready representation~~.

16. (Original) The method of claim 15 further comprising:

determining whether one of the plurality of stored machine-ready models can be modified to meet the fabrication profile;

modifying the one of the plurality of stored machine ready models for use as the machine-ready representation if possible; and

generating a new machine-ready representation according to the fabrication profile for use as the machine-ready representation if not possible.

17. (Original) The method of claim 16 wherein modifying includes one or more of translating the machine-ready representation, rotating the machine-ready representation, scaling the machine-ready representation, and changing a top speed in a tool path for the target printer.

18–19. (Canceled)

20. (Currently amended) The method of claim 1 further comprising generating descriptive metadata to accompany one or more of the suitable machine-ready model and the machine-ready representation, the descriptive metadata specifying one or more properties for comparison to properties of printers selected for fabricating the model.

21–31 (Canceled)

Remarks

Status of the Claims

Claims 1, 2, 15 and 20 are amended. Claims 14, 18 and 19 are canceled. Claims 1–13, 15–17 and 20 are presented for examination, where claim 1 is independent.

The claim amendments find support in at least ¶ [0102] of the as-filed Specification. No new matter is added.

Claim Rejections – 35 U.S.C. § 101

Independent claim 1 stands rejected under 35 U.S.C. § 101 "because the claimed invention is directed to a judicial exception (i.e., a law of nature, a natural phenomenon, or an abstract idea) without significantly more."[1] This rejection is traversed for at least the following reasons.

As an initial matter, and without conceding the propriety of this rejection, the applicant has amended the claims to more concretely recite using configuration information for a three-dimensional (3D) printer to select or generate suitable machine-ready models to improve 3D printing generally, and more specifically to improve the compatibility of 3D models and 3D printers. Specifically, the claim now recites:

> determining whether a suitable machine-ready model is available for the fabrication profile;
>
> when a suitable machine-ready model is available, selecting the suitable machine-ready model for transmission to the target printer; and
>
> when a suitable machine-ready model is not available, processing the three-dimensional model according to the fabrication profile, and generating a machine-ready representation of the processed three-dimensional model executable by the target printer to fabricate the object.

Thus, the claim now explicitly and concrete recites the selection or processing of 3D models based on the specific fabrication profile of a target printer. The applicant therefore requests reconsideration of the outstanding subject matter eligibility rejection in view of the foregoing amendment. Nevertheless, the applicant has analyzed the claims under the various tests and

[1] Non-final Office Action mailed December 29, 2016 (hereinafter "Office Action"), p. 3.

guidelines promulgated by the Office following the Supreme Court's *Alice* decision,[2] and sets out some of that analysis here for the examiner's consideration.

1. Step 2A of the subject matter eligibility analysis: independent claim 1 is not directed to an abstract idea or other judicially recognized exception to patent-eligible subject matter.

Under Step 2A of the subject matter eligibility analysis, an examiner should determine whether the claim is directed to an abstract idea (i.e., one of the judicial exceptions),[3] where "'[d]irected to' means the exception is recited in the claim, i.e., the claim sets forth or describes the exception."[4] The Office Action fails to "clearly articulat[e] the reason(s) why the claimed invention is not eligible, for example by providing a reasoned rationale that identifies the judicial exception recited in the claim and why it is considered an exception . . . ."[5]

First, the Office Action mischaracterizes the applicant's claims. The Office Action quotes the applicant's claims, and then states:

> These steps describe the concept of manipulating model data and comparing information to stored reference libraries, which corresponds to concepts identified as abstract ideas by the courts, such as comparing new and stored information using rules to identify options in SmartGene, or using categories to organize, store and transmit information in Cyberfone. All of these concepts relate to an idea standing alone, such as an uninstantiated concept, plan or scheme as well as a mental process (thinking) that "can be performed in the human mind, or by a human using a pen and paper".
>
> The concept described in the claim(s) is not meaningfully different than those concepts found by the courts to be abstract ideas. As such, the description in the claim(s) of manipulating model data and comparing information to stored reference libraries is an abstract idea.[6]

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[2] *Alice Corp. v. CLS Bank Inter'l*, 134 S. Ct. 2347 (2014).
[3] 2014 Interim Guidance on Patent Subject Matter Eligibility, 79 Fed. Reg. 74618, 74622 (Dec. 16, 2014) (Docket No. PTO–P–2014–0058) ("Abstract ideas have been identified by the courts by way of example, including fundamental economic practices, certain methods of organizing human activities, an idea 'of itself,' and mathematical relationships/formulas."). The applicant notes that the Office Action appears to lack a clear articulation of one of the aforementioned abstract ideas, and thus, a *prima facie* case for making an eligibility rejection has not been established.
[4] 2014 Interim Eligibility Guidance Quick Reference Sheet, USPTO Examination Guidance and Training Materials *available at* http://www.uspto.gov/patents/law/exam/2014_eligibility_qrs.pdf (Dec. 2014).
[5] July 2015 Update: Subject Matter Eligibility, USPTO Examination Guidance and Training Materials *available at* http://www.uspto.gov/sites/default/files/documents/ieg-july-2015-update.pdf, Section IV, p. 6 (July 2015).
[6] Office Action, pp. 4–5.

The applicant's claims do not "describe the concept of manipulating model data and comparing information to stored reference libraries." Instead, the applicant's claims recite techniques for implementation by a print server to improve the compatibility of 3D models and 3D printers, solving a technical problem in the art that arises because "machine-ready models are typically dependent on the configuration or properties of the three-dimensional printers, e.g., the hardware configuration, software configuration, user settings, firmware version(s) and so forth."[7] The applicant's claimed invention requests configuration information from a target 3D printer, uses that information to create a fabrication profile based on the printer's particular configuration, and then selects or generates suitable machine-ready models executable by the target printer to fabricate a 3D object based on a model.

The Federal Circuit has warned in *Enfish* that "describing the claims at such a high level of abstraction and untethered from the language of the claims all but ensures that the exceptions to § 101 swallow the rule."[8] Thus, as the Federal Circuit stated in *MCRO v. Bandai*:

> The abstract idea exception prevents patenting a result where "it matters not by what process or machinery the result is accomplished." . . . We do not assume that such claims are directed to patent ineligible subject matter because "all inventions at some level embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas."[9]

The Office Action's position appears to contradict the Federal Circuit's recent caution in *MCRO* to "be careful to avoid oversimplifying the claims by looking at them generally and failing to account for the specific requirements of the claims."[10] "We . . . look to whether the claims in these patents focus on a specific means or method that improves the relevant technology or are instead directed to a result or effect that itself is the abstract idea and merely invoke generic processes and machinery."[11] Here, as in *MCRO*, amended claim 1 includes steps that result in an improvement to 3D printing by providing compatible 3D models to target 3D printers.

Second, the Office Action improperly analogizes the applicant's claimed invention to the

---

[7] Specification, ¶ [0002].
[8] *Enfish, LLC v. Microsoft Corp.*, No. 2015-1244, slip op. at 14 (Fed. Cir. May 12, 2016).
[9] *MCRO, Inc. v. Baindai Namco Games America Inc.*, No. 2015-1080, slip op. at 19 (Fed. Cir. Sep. 13, 2016) (internal citations omitted).
[10] *MCRO,* slip op. at 21 (quoting *In re TLI Commc'ns LLC Patent Litig.*, 823 F.3d 607, 611 (Fed. Cir. 2016) (internal quotation omitted)).
[11] *MCRO,* slip op. at 23 (citing *Enfish*, 822 F.3d at 1336).

SmartGene[12] and *Cyberfone*[13] Federal Circuit cases, by incorrectly asserting that the applicant's claims are similar to cases that "relate to an idea standing alone, such as an uninstantiated concept, plan or scheme as well as a mental process (thinking) that 'can be performed in the human mind, or by a human using a pen and paper.'"[14]

The applicant's claims are non-analogous the claims found ineligible in *SmartGene*, which dealt with computer program products for guiding the selection of therapeutic treatment regimens—i.e., generating ranked lists of therapeutic treatments based on provided patient information. *SmartGene* is typically cited where claims are directed to simply the organization and comparison of data that can be performed mentally. That is clearly not the case here, because the applicant's claims cannot be performed mentally. In fact, the creation of a fabrication profile and the processing/generation of 3D models based on a target 3D printer's configuration are techniques that can improve computer performance by providing compatible 3D models that account for particular 3D printer parameters. Thus, comparing the applicant's claims to *SmartGene* is inconsistent to the Office's examination instructions, which provide guidance for examiners to "ensure that a claimed concept is not identified as an abstract idea *unless it is similar to at least one concept that the courts have identified as an abstract idea*."[15] The Office has also warned against describing a claim at a high level of abstraction untethered from the language of the claim[16] and rejecting a claim simply because it can run on a general purpose computer.[17]

In *Cyberfone*, claims including a telephone/transaction entry device and a system for

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[12] *SmartGene, Inc. v. Advanced Biological Labs*, 555 Fed. Appx. 950 (Fed. Cir. 2014).
[13] *Cyberfone Systems, LLC v. CNN Interactive Group, Inc.*, 558 Fed. Appx. 988 (Fed. Cir. 2014).
[14] Office Action, p. 4.
[15] July 2015 Update: Interim Eligibility Guidance Quick Reference Sheet, USPTO Examination Guidance and Training Materials *available at* http://www.uspto.gov/sites/default/files/documents/ieg-july-2015-qrs.pdf (July 2015) (emphasis added).
[16] USPTO Memorandum, "Recent Subject Matter Eligibility Decisions (*Enfish, LLC v. Microsoft Corp.* and *TLI Communications LLC v. A.V. Automotive, LLC*)," (May 19, 2016) *available at* http://www.uspto.gov/sites/default/files/documents/ieg-may-2016_enfish_memo.pdf ("[T]he Federal Circuit cautioned against describing a claim at a high level of abstraction untethered from the language of the claim when determining the focus of the claimed invention.").
[17] *Id.* ("[T]he the court stated that ***an invention's ability to run on a general purpose computer does not automatically doom the claim***.") (emphasis added). Further, "Examiners should keep in mind that the courts have held computer-implemented processes to be significantly more than an abstract idea (and thus eligible), where generic computer components are able in combination to perform functions that are not merely generic." May 2016 Subject Matter Eligibility Update: Memorandum – "Formulating a Subject Matter Eligibility Rejection and Evaluating the Applicant's Response to a Subject Matter Eligibility Rejection," p. 5 (May 4, 2016) *available at* http://www.uspto.gov/sites/default/files/documents/ieg-may-2016-memo.pdf [hereinafter "May 2016 Subject Matter Eligibility Update"].

entering transaction data into a database were found to be directed to the abstract idea of "categorical data storage, i.e., the idea of collecting information in classified form, then separating and transmitting that information according to its classification."[18] Unlike the claims in *Cyberfone*, the applicant's claims are not directed to categorical data storage, but rather include querying a 3D printer for configuration information, creating a fabrication profile based on the information, and either selecting compatible models based on an analysis of the fabrication profile, or processing and generating 3D models based on the fabrication profile.

Therefore, although the Office Action refers to several Federal Circuit decisions, the claims within these cases are vastly different from the applicant's claimed invention, and thus the examiner has not identified a Supreme Court or Federal Circuit decision in which a similar abstract idea was found. "If the original rejection did not identify a Supreme Court or Federal Circuit decision in which a similar abstract idea was found and applicant challenges identification of the abstract idea, ***the examiner would need to point to a case in which a similar abstract idea was identified and explain why the abstract idea recited in the claim corresponds to the abstract idea identified in the case to maintain the rejection***."[19]

The applicant's claims are directed to a very specific technique for a very particular problem in the art of 3D printing, and not an abstract idea as contemplated by *Alice* or the PTO Guidelines on patentable subject matter. More is needed to support the Office Action's erroneous determination that the applicant's claims are directed to an abstract idea.

2. Step 2B of the subject matter eligibility analysis: independent claim 1 recites significantly more than any alleged abstract idea.

As an initial matter, the Office Action erroneously applies Step 2B of the subject matter eligibility analysis. Specifically, the Office Action recites:

> The claim(s) do not include additional elements that are sufficient to amount to significantly more than the judicial exception because the additional elements when considered both individually and as an ordered combination do not amount to significantly more than the abstract idea. The claim(s) recites the additional limitations of 'a target printer', 'fabricating the object', and 'a build material'. The printer and build material are recited at a high level of generality and are recited as performing generic functions routinely that are well-

[18] 2014 Interim Guidance on Patent Subject Matter Eligibility, 79 Fed. Reg. at 74631.
[19] May 2016 Subject Matter Eligibility Update, p. 6 (emphasis added).

> understood, routine and conventional activities which amount to no more than implementing the abstract idea with a generic printer.
>
> The various parameters described and the computational system that gathers them adds only insignificant extrasolution activity (such as mere data gathering). Thus, taken alone, the additional elements do not amount to significantly more than the above-identified judicial exception (the abstract idea). Looking at the limitations as an ordered combination adds nothing that is not already present when looking at the elements taken individually.[20]

The Office Action thus appears to surmise that the all of the limitations of the claims are "conventional" or "generic," and can be implemented "with a generic printer," without providing any analysis of the limitations themselves, alone or in ordered combination. Thus, the Office Action fails to meet the burden required for establishing a *prima facie* case when making an eligibility rejection. The Office's guidance provides that:

> The initial burden is on the examiner to explain why a claim or claims are unpatentable *clearly and specifically*, so that applicant has sufficient notice and is able to effectively respond. For subject matter eligibility, the examiner's burden is met by *clearly articulating the reason(s) why the claimed invention is not eligible, for example by providing a reasoned rationale that identifies the judicial exception recited in the claim and why it is considered an exception, and that identifies the additional elements in the claim (if any) and explains why they do not amount to significantly more than the exception.*[21]

As explained above, not only does the Office Action not clearly identify the judicial exception recited in the claims, the Office Action's cursory rejection also fails to consider the numerous and detailed additional elements in the claims, and the rejection fails to consider whether and why these numerous additional steps and features (alone and in an ordered combination) do not amount to significantly more than any alleged judicial exception. Instead, the Office Action cherry picks terms from the applicant's claims such as "a target printer," "fabricating the object," and "a build material," and states that they are recited "at a high level of generality and are

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[20] Office Action, p. 5.

[21] July 2015 Update: Subject Matter Eligibility, USPTO Examination Guidance and Training Materials *available at* http://www.uspto.gov/sites/default/files/documents/ieg-july-2015-update.pdf, Section IV, p. 6 (July 2015) (emphasis added) (internal citations omitted). *See also* May 2016 Subject Matter Eligibility Update, p. 2 ("When making the rejection, the Office action must provide an explanation as to why each claim is unpatentable, which must be sufficiently clear and specific to provide applicant sufficient notice of the reasons for ineligibility and enable the applicant to effectively respond.").

recited as performing generic functions"[22] without providing any reasoning whatsoever. The applicant asserts that the claims contain additional, meaningful limitations that detail specifically how the applicant's inventive technique is used to provide specifically tailored (and thus compatible) 3D models to target 3D printers based on a fabrication profile created for that printer.

Further, the applicant's claims recite significantly more than any alleged abstract idea. Specifically, the applicant asserts that, at least the currently recited steps of receiving a request to fabricate an object from a 3D model, determining a target printer to fabricate the object, querying the target printer for one or more properties relevant to fabrication of the object, receiving a dictionary of the one or more properties from the target printer, creating a fabrication profile based on the one or more properties, determining whether a suitable machine-ready model is available for the fabrication profile, selecting the suitable machine-ready model for transmission to the target printer, processing the 3D model according to the fabrication profile, and generating a machine-ready representation of the processed 3D model executable by the target printer to fabricate the object, transform the claim to providing significantly more than any alleged abstract idea.[23]

Lastly, the present claims expressly recite the transformation of (i) properties of the target printer into a fabrication profile, and (ii) a three-dimensional model into a machine-ready representation according to the fabrication profile. Thus, the claims "[e]ffect[] a transformation or reduction of a particular article to a different state or thing," which is explicitly listed in the Office's guidance for post-*Alice* examination as a limitation that can qualify as significantly more.[24] These transformations qualify as significantly more than any alleged abstract idea.

3. The applicant's claims do not preempt a judicial exception.

The applicant's claims do not seek to tie up (preempt) a judicial exception as prohibited by *Alice*. Instead, the present claims are narrowly tailored to a specific technique for querying a 3D printer for configuration information, creating a fabrication profile based on the information,

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[22] Office Action, p. 5.
[23] "Examiners should keep in mind that the courts have held computer-implemented processes to be significantly more than an abstract idea (and thus eligible), where generic computer components are able in combination to perform functions that are not merely generic." May 2016 Subject Matter Eligibility Update, p. 5.
[24] 2014 Interim Guidance on Patent Subject Matter Eligibility, 79 Fed. Reg. at 74624.

and either selecting compatible models based on an analysis of the fabrication profile, or processing and generating 3D models based on the fabrication profile. This will not foreclose the use of "manipulating model data," "comparing new and stored information," or any of the other concepts recited in the Office Action. Rather, the present claims will narrowly protect the techniques for improving the compatibility of 3D models and 3D printers set forth in the present application and claims.

For at least the foregoing reasons, independent claim 1 is believed to be directed to patent-eligible subject matter. The remaining claims further narrow and define the subject matter of claim 1, and are likewise believed to be drawn to patent-eligible subject matter. The applicant respectfully requests reconsideration and withdrawal of the outstanding claim rejection under 35 U.S.C. § 101.

Claim Rejections – 35 U.S.C. § 102

Independent claim 1 stands rejected under 35 U.S.C. § 102 as anticipated by AstroPrint Wireless 3D Printing Software (https://www.kickstarter.com/projects/306530051/astroprinttm-wireless-3dprinting-software), Kickstarter (May 2014) ("*AstroPrint*"). This rejection is traversed for at least the following reasons.

The applicant has devised a technique for providing compatible 3D models to specific, target 3D printers. "While a three-dimensional printer may know its own hardware and software configuration, a service providing machine-ready models may not."[25] To this end, the claims "provide useful techniques for determining printer capabilities and matching these capabilities to pre-existing machine-ready models,"[26] and/or "for the generation of a machine-ready representation of the three-dimensional model that is executable on the target printer."[27] Claim 1 has been amended to clarify these inventive concepts, which are not taught or suggested by *AstroPrint* (or any of the other cited references, alone or in combination).

AstroPrint is a software platform that allows for "Cloud Slicing – updates and optimizations are automatic" and "Slicing Intelligence – recommended settings improve over

[25] Specification, § [0002].
[26] Specification, § [0075].
[27] Specification, § [0099].

time."[28] *AstroPrint* contemplates "automagically set[ting] the most ideal settings for each of your prints, reducing your failed prints. This is based on your printer and filament manufacturer's suggested settings as well as our expert experience."[29] Thus, *AstroPrint* at best includes remote slicing engine for a 3D model using suggested, generic settings derived from a printer manufacturer and a filament manufacturer. Completely missing from *AstroPrint* is any teaching or suggestion of the explicitly claimed steps of "querying the target printer for one or more properties relevant to fabrication of the object; receiving a dictionary of the one or more properties from the target printer; creating a fabrication profile based on the one or more properties; determining whether a suitable machine-ready model is available for the fabrication profile; when a suitable machine-ready model is available, selecting the suitable machine-ready model for transmission to the target printer; and when a suitable machine-ready model is not available, processing the three-dimensional model according to the fabrication profile, and generating a machine-ready representation of the processed three-dimensional model executable by the target printer to fabricate the object."[30]

For the foregoing reasons, independent claim 1 is believed to be patentable over the art of record. The remaining claims depend from an allowable base claim and are likewise in condition for allowance. The applicant respectfully requests reconsideration and withdrawal of the outstanding claim rejections under 35 U.S.C. § 102.

[28] *AstroPrint*, p. 2 (page numbers reflect the PDF of the *AstroPrint* Kickstarter campaign provided in the Office Action).
[29] *AstroPrint*, p. 3.
[30] The applicant notes that the other cited references used in combination with *AstroPrint* to reject dependent claims under 35 U.S.C. § 103 similarly lack these claimed features.

Conclusion

In view of the foregoing, the applicant believes that the currently pending claims are in condition for allowance and respectfully requests a corresponding Notice of Allowance.

The applicant believes that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed.

Nothing in this paper should be construed as intent to concede any issue with regard to any claim, except as specifically stated in this paper. The amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

The Director is hereby authorized to charge any fees or to credit any overpayments associated with this filing to Deposit Account No. 50-4262. If the examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at (617) 916-2658.

Respectfully submitted
STRATEGIC PATENTS, P.C.

/Robert Mazzarese/
Robert A. Mazzarese
Reg. No. 42,852
Tel.: (617)-916-2658

April 26, 2017

Electronic Patent Application Fee Transmittal					
Application Number:	14587548				
Filing Date:	31-Dec-2014				
Title of Invention:	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION				
First Named Inventor/Applicant Name:	Alison N. Leonard				
Filer:	Robert A. Mazzarese/Paula Ng				
Attorney Docket Number:	MBOT-0070-P01				
Filed as Large Entity					
Filing Fees for Utility under 35 USC 111(a)					
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 $0 paid	1251	1	200	200
Miscellaneous:				
			Total in USD ($)	**200**

Electronic Acknowledgement Receipt	
EFS ID:	29034779
Application Number:	14587548
International Application Number:	
Confirmation Number:	6946
Title of Invention:	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION
First Named Inventor/Applicant Name:	Alison N. Leonard
Customer Number:	43520
Filer:	Robert A. Mazzarese/Paula Ng
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The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		MBOT-0070-P01_20170426_OAResponse.pdf	192712 723d0cae1a5328fca21db9c19bfdf7a677b8b7af	yes	15
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
	Extension of Time		2	2	
	Claims		3	5	
	Applicant Arguments/Remarks Made in an Amendment		6	15	
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30757 99fc148e7960855daa920e5e5abb5b4dd2be1c68	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	223469		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

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.

PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/587,548	Filing Date 12/31/2014	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	04/26/2017	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 17	Minus	** 20	= 0	X $80 =	0
	Independent (37 CFR 1.16(h))	* 1	Minus	***3	= 0	X $420 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

HSLIE
TRACIE HARGROVE

This collection of information is required by 37 CFR 1.16. 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, 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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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/587,548	12/31/2014	Alison N. Leonard	MBOT-0070-P01	6946

43520 7590 12/29/2016

STRATEGIC PATENTS P.C.
P.O. BOX 920629
NEEDHAM, MA 02492

EXAMINER	
SANDERS, JOSHUA T	

ART UNIT	PAPER NUMBER
2127	

NOTIFICATION DATE	DELIVERY MODE
12/29/2016	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):

patents@stratpat.com

Office Action Summary	Application No. 14/587,548	Applicant(s) LEONARD ET AL.	
	Examiner JOSHUA SANDERS	Art Unit 2127	AIA (First Inventor to File) Status Yes

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20141231*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ 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.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-20* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-20* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, 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.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *20141231* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ 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)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date *20150710; 20150901; 20160718*.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

DETAILED ACTION

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

2. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

3. The Information Disclosure Statement, filed 10 July 2015 (Paper no. 20150710) has been fully considered by the examiner. A signed copy is attached.

4. The Information Disclosure Statement, filed 01 September, 2015 (Paper no. 20150901) has been fully considered by the examiner. A signed copy is attached.

5. The Information Disclosure Statement, filed 18 July 2016 (Paper no. 20160718) has been fully considered by the examiner. A signed copy is attached.

6. Claims 21-30 are canceled.

7. Claims 1-20 are pending.

8. Claims 1-20 are rejected, grounds follow.

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.

9. **Claim(s) 1-20 are rejected under 35 U.S.C. 101 because the claimed invention is directed to a judicial exception (i.e., a law of nature, a natural phenomenon, or an abstract idea) without significantly more**. The claim(s) are directed to the abstract idea of manipulating model data and comparing information to stored reference libraries, as explained in detail below. The claim(s) do not include additional elements that are sufficient to amount to significantly more than the judicial exception because the additional computer elements/steps, which are recited at a high level of generality, provide conventional computer functions that do not add meaningful limits to practicing the abstract idea.

The claim(s) recites, in part, a method comprising “receiving a request to fabricate an object from a three-dimensional model”, “determining a target printer to fabricate the object,” “querying the target printer for one or more properties relevant to fabrication of the object”, “receiving a dictionary of the one or more properties from the target printer”, “creating a fabrication profile based on the one or more properties”, and “generating a machine-ready representation of the three-dimensional model”.

Dependent Claims add the additional abstract steps of “transmitting the machine- ready representation to the target printer for fabrication”, “receiving an identifier from the target printer and applying the identifier to retrieve the dictionary from a repository of printer information remote from the target printer”, "determining whether one of the plurality of stored machine-ready models can be modified to meet the fabrication profile”, “modifying the one of the plurality of stored machine ready models for use as the machine-ready representation if possible”, “generating a new machine-ready representation according to the fabrication profile for use as the machine-ready representation if not possible”, “determining whether a suitable machine-ready model is available for the fabrication profile”, “selecting the suitable machine-ready model if available and generating the machine-ready representation according to the fabrication profile if not available” and “generating descriptive metadata to accompany the machine-ready representation”.

These steps describe the concept of manipulating model data and comparing information to stored reference libraries, which corresponds to concepts identified as abstract ideas by the courts, such as comparing new and stored information using rules to identify options in SmartGene, or using categories to organize, store and transmit information in Cyberfone. All of these concepts relate to an idea standing alone, such as an uninstantiated concept, plan or scheme as well as a mental process (thinking) that “can be performed in the human mind, or by a human using a pen and paper”.

The concept described in the claim(s) is not meaningfully different than those concepts found by the courts to be abstract ideas. As such, the description in the claim(s) of manipulating model data and comparing information to stored reference libraries is an abstract idea.

The claim(s) do not include additional elements that are sufficient to amount to significantly more than the judicial exception because the additional elements when considered both individually and as an ordered combination do not amount to significantly more than the abstract idea. The claim(s) recites the additional limitations of “a target printer", “fabricating the object”, and "a build material”.
The printer and build material are recited at a high level of generality and are recited as performing generic functions routinely that are well-understood, routine and conventional activities which amount to no more than implementing the abstract idea with a generic printer.

The various parameters described and the computational system that gathers them adds only insignificant extrasolution activity (such as mere data gathering).
Thus, taken alone, the additional elements do not amount to significantly more than the above-identified judicial exception (the abstract idea). Looking at the limitations as an ordered combination adds nothing that is not already present when looking at the elements taken individually.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a)(1) the claimed invention was patented, described in a printed publication, or in public use, on sale or otherwise available to the public before the effective filing date of the claimed invention.
>
> (a)(2) the claimed invention was described in a patent issued under section 151, or in an application for patent published or deemed published under section 122(b), in which the patent or application, as the case may be, names another inventor and was effectively filed before the effective filing date of the claimed invention.

10. **Claim(s) 1-5, 7, 9-12, 14, 15, 18 and 19 are rejected under 35 U.S.C. 102(a)(1) as being anticipated by 3Dagogo – "AstroPrint Wireless 3D printing software – Kickstarter, May 26, 2014, archived by the internet archive project, https://www.kickstarter.com/projects/306530051/astroprinttm-wireless-3d-printing-software, (hereafter ASTROPRINT)**.

Regarding Claim1, ASTROPRINT teaches:

- receiving a request to fabricate an object from a three-dimensional model; (Astroprint; user inputs command via tablet, see top figure, page 4)
- determining a target printer to fabricate the object; (Astroprint.com server identifies printer by account, see page 2, " AstroPrint.com slices, organizes, and stores your designs in the cloud. In addition, through AstroPrint.com, you can connect to your AstroBox to control your printer.")

- querying the target printer for one or more properties relevant to fabrication of the object; (e.g. model; to identify printer manufacturer's settings; see page 3, "Who is it For, a)", astroprint box considered as part of printer)
- receiving a dictionary of the one or more properties from the target printer; (page 3 "manufacturer and filament recommended settings")
- creating a fabrication profile based on the one or more properties; (page 3 "automagically set the most ideal settings for each of your prints") and
- generating a machine-ready representation of the three-dimensional model executable by the target printer to fabricate the object. (page 2, "astroprint.com slices, organizes, and stores your designs in the cloud")

Regarding Claim 2, ASTROPRINT teaches all of the limitations of parent claim 1, ASTROPRINT further teaches:

- further comprising transmitting the machine- ready representation to the target printer for fabrication. (cloud slices are downloaded to the astrobox for printing – see page 3, "When connected to the internet, the AstroBox uses your free AstroPrint.com account to slice, store/retrieve, and organize your files.")

Regarding Claim 3, ASTROPRINT teaches all of the limitations of parent claim 1, ASTROPRINT further teaches:

- further comprising fabricating the object with the target printer. (cloud slices are downloaded to the astrobox for printing – see page 3 “when connected to the internet”)

Regarding Claim 4, ASTROPRINT teaches all of the limitations of parent claim 1, ASTROPRINT further teaches:

- wherein the one or more properties include a hardware configuration of the target printer. (page 3 - hardware configuration such as filament is part of the ideal settings - “This is based on your printer and filament manufacturer's suggested settings as well as our expert experience.”)

Regarding Claim 5, ASTROPRINT teaches all of the limitations of parent claim 4, ASTROPRINT further teaches:

- wherein the hardware configuration includes one or more of an extruder type, an extruder nozzle diameter, a build volume, a build platform type, a hardware version number, a top speed for linear movement of a tool, a step size for movement of the tool, a minimum z-axis step size, a gantry type, and a build material type. (page 3, - build material type at least from “filament manufacturer’s suggested settings”)

Regarding Claim 7, ASTROPRINT teaches all of the limitations of parent Claim 4, ASTROPRINT further teaches:

- wherein the hardware configuration includes a manually specified hardware reconfiguration. (ASTROPRINT page 3, - b) power-users; "…but gives you easy access to every advanced setting you could desire")

Regarding Claim 9, ASTROPRINT teaches all of the limitations of parent claim 1, ASTROPRINT further teaches:

- wherein the one or more properties include one or more user settings on the target printer. (ASTROPRINT – page 3, - b) power-users "…but gives you easy access to every advanced setting you could desire")

Regarding Claim 10, ASTROPRINT teaches all of the limitations of parent claim 9, ASTROPRINT further teaches:

- wherein the one or more user settings include user settings from a previous fabrication process. (ASTROPRINT – b) power-users "we organize gcodes in relation to the STLs they were sliced from. This lets you print hassle free from anywhere, anytime"; anticipates future printing from previous STL slicing user user-customized g-codes)

Regarding Claim 11, ASTROPRINT teaches all of the limitations of parent claim 1, ASTROPRINT further teaches:

- wherein the one or more properties include an application used to operate the target printer. (choose between slic3r, cura, and makerbot per tech specs diagram on page 9)

Regarding Claim 12, ASTROPRINT teaches all of the limitations of parent claim 1, ASTROPRINT further teaches:

- wherein the one or more properties include a build material in the target printer. (page 3, - build material type at least from “filament manufacturer’s suggested settings”)

Regarding Claim 14, ASTROPRINT teaches all of the limitations of parent claim 1, ASTROPRINT further teaches:

- wherein generating the machine-ready representation includes processing the three-dimensional model according to the fabrication profile. (ASTROPRINT - Slicing using a commercial slice utility such as Slic3r; see page 9)

Regarding Claim 15, ASTROPRINT teaches all of the limitations of parent claim 1, ASTROPRINT further teaches:

- wherein generating the machine-ready representation includes selecting one of a plurality of stored machine-ready models according to the fabrication profile as the machine-ready representation. (ASTROPRINT – page3 b) power-users “we organize gcodes in relation to the STLs they were sliced from. This lets you print hassle free from anywhere, anytime”; anticipates future printing from previous

STL slicing; and page 2: "astroprint.com slices, organizes, and stores your designs in the cloud")

Regarding Claim 18, ASTROPRINT teaches all of the limitations of parent claim 1, ASTROPRINT further teaches:

- further comprising determining whether a suitable machine-ready model is available for the fabrication profile. (ASTROPRINT page 3 – b) power-users "we organize gcodes in relation to the STLs they were sliced from. This lets you print hassle free from anywhere, anytime;" anticipates future printing from previous STL slicing; and page 2, "astroprint.com slices, organizes, and stores your designs.)

Regarding Claim 19, ASTROPRINT teaches all of the limitations of parent claim 18, ASTROPRINT further teaches:

- further comprising selecting the suitable machine-ready model if available and generating the machine-ready representation according to the fabrication profile if not available. (astroprint page 3 a) beginners to 3D printing- "AstroPrint makes your 3D printer a 1-click-print device. AstroPrint will automagically set the most ideal settings for each of your prints, reducing your failed prints. This is based on your printer and filament manufacturer's suggested settings as well as our expert experience.")

Claim Rejections - 35 USC § 103

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

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

11. **Claim 6 and 13 are rejected under 35 U.S.C. 103 as being unpatentable over ASTROPRINT and PrintToPeer, PrintToPeer: Your 3D printer on the Web, previously cited, IFW NPL 07/10/2015, 21 pages. (hereafter PRINTTOPEER).**

Regarding Claim 6, ASTROPRINT teaches all of the limitations of parent claim 4, ASTROPRINT does not appear to teach:

- wherein the hardware configuration includes an automatically detected hardware reconfiguration.

However, PRINTTOPEER from the same field of endeavor of 3D printer management, teaches:

- wherein the hardware configuration includes an automatically detected hardware reconfiguration. (PRINTTOPEER - page 6, “your 3D printer is recognized [automatically]")

ASTROPRINT and PRINTTOPEER are analogous because they are from the same field of endeavor and contain overlapping structural and functional similarities, they both

do cloud-hosted slicing, and store printing instructions, they both automatically manage printer settings. Further they both integrate with web-based functions.

A person having ordinary skill in the art at the time the invention was filed could have modified the method of ASTROPRINT with the automatic hardware reconfiguration detection of PRINTTOPEER.

A person having ordinary skill in the art at the time the invention was filed could have been motivated to do this in order to implement plug-and-play capability as suggested by PRINTTOPEER. (page 6)

Regarding Claim 13, ASTORPRINT teaches all of the limitations of parent claim 1, ASTROPRINT further teaches:

- applying the identifier to retrieve the dictionary from a repository of printer information remote from the target printer. (ASTROPRINT page 3, - configurations according to Manufacturer)

ASTROPRINT does not appear to explicitly teach:

- further comprising receiving an identifier from the target printer

However, PRINTTOPEER teaches:

- further comprising receiving an identifier from the target printer (PRINTTOPEER Page 6, PrintToPeer automatically recognizes your 3D printer)

ASTROPRINT and PRINTTOPEER are analogous because they are from the same field of endeavor and contain overlapping structural and functional similarities, they both do cloud-hosted slicing, store printing instructions, and they both automatically manage printer settings. Further they both integrate with web-based functions.

A person having ordinary skill in the art at the time the invention was filed could have modified the method of ASTROPRINT with the receiving of printer identifiers of PRINTTOPEER.

A person having ordinary skill in the art at the time the invention was filed could have been motivated to do this in order to implement plug and play functionality as suggested by PRINTTOPEER

12. **Claims 8, 16 and 20 are rejected under 35 U.S.C. 103 as being unpatentable over ASTROPRINT in view of Pettis, et al. US Patent Publication 2013/0329243 (hereafter PETTIS)**.

Regarding Claim 8, ASTROPRINT teaches all of the limitations of parent Claim 1, ASTROPRINT does not appear to teach:

- wherein the one or more properties include a firmware configuration of the target printer.

However, PETTIS from the same field of endeavor of 3D printer management teaches:

- wherein the one or more properties include a firmware configuration of the target printer. ([0073] – "This may also include software-enabled features such as firmware upgrades or the like, and the server 400 may detect such software-enabled features and where appropriate make modifications to the machine-ready code with the modification engine 414." Detecing Firmware configurations of the target printer)

ASTROPRINT and PETTIS are analogous because they contain overlapping structural and functional similarities, both manage 3D models and 3D printers, both use slicing engines to prepare models for printing. Further, both are designed to interact with a variety of printer configurations.

A person having ordinary skill in the art at the time the invention was filed could have modified the method of ASTROPRINT with the firmware configuration detection of PETTIS.

A person having ordinary skill in the art at the time the invention was filed could have been motivated to make this modification in order to optimize the machine-ready code as suggested by PETTIS. ([0073])

Regarding Claim 16, ASTROPRINT teaches all of the limitations of parent claim 15,

ASTROPRINT further teaches

- generating a new machine-ready representation according to the fabrication profile for use as the machine-ready representation if not possible. . (astroprint page 3 - a) beginners to 3D printing- "AstroPrint makes your 3D printer a 1-click-print device. AstroPrint will automagically set the most ideal settings for each of your prints, reducing your failed prints. This is based on your printer and filament manufacturer's suggested settings as well as our expert experience.")

However, ASTROPRINT does not appear to teach:

- determining whether one of the plurality of stored machine-ready models can be modified to meet the fabrication profile;
- modifying the one of the plurality of stored machine ready models for use as the machine-ready representation if possible;

But, PETTIS, from the same field of endeavor of 3D printer management, teaches:

- determining whether one of the plurality of stored machine-ready models can be modified to meet the fabrication profile; (PETTIS – fig. 5, Select machine-ready model 518)
- modifying the one of the plurality of stored machine ready models for use as the machine-ready representation if possible; (fig. 5, modify model 519)

ASTROPRINT and PETTIS are analogous because they contain overlapping structural and functional similarities, both manage 3D models and 3D printers, both use slicing engines to prepare models for printing. Further, both are designed to interact with a variety of printer configurations.

A person having ordinary skill in the art at the time the invention was filed could have modified the method of ASTROPRINT with the firmware configuration detection of PETTIS.

A person having ordinary skill in the art at the time the invention was filed could have been motivated to make this modification in order to pre-populate the database with pre-sliced models as suggested by PETTIS. [0082]

Regarding Claim 20, ASTROPRINT teaches all of the limitations of parent claim 1, ASTROPRINT does not appear to teach:

- further comprising generating descriptive metadata to accompany the machine-ready representation, the descriptive metadata specifying one or more properties for comparison to properties of printers selected for fabricating the model. (but; astroprint teaches “organizing”)

However, PETTIS from the same field of endeavor of 3D printer management teaches:

- further comprising generating descriptive metadata to accompany the machine-ready representation, the descriptive metadata specifying one or more properties

for comparison to properties of printers selected for fabricating the model.

(PETTIS - [0035] – describing generating metadata for a database of models)

ASTROPRINT and PETTIS are analogous because they contain overlapping structural and functional similarities, both manage 3D models and 3D printers, both use slicing engines to prepare models for printing. Further, both are designed to interact with a variety of printer configurations.

A person having ordinary skill in the art at the time the invention was filed could have modified the method of ASTROPRINT with the metadata specification of PETTIS.

A person having ordinary skill in the art at the time the invention was filed could have been motivated to make this modification in order to provide additional information to users as suggested by PETTIS. ([0032] – “any criteria that can be used to identify models of potential interest by explicit type (e.g., labeled in model metadata), implicit type (e.g., determined based on analysis of the model)”)

13. **Claim 17 is rejected under 35 U.S.C. 103 as being unpatentable over ASTROPRINT in view of PETTIS, further in view of AIRWOLF3D, Getting Started with Airwolf 3D Printer SLIC3R Configurations, previously cited, IFW NPL 07/10/2015, 12 pages. (hereafter SLIC3R).**

Regarding Claim 17, the combination of ASTROPRINT and PETTIS teaches all of the limitations of parent claim 16,

However, the combination does not appear to teach:

- wherein modifying includes one or more of translating the machine-ready representation, rotating the machine-ready representation, scaling the machine-ready representation, and changing a top speed in a tool path for the target printer. (103; with slic3r NPL tool speed.)

But, SLIC3R from the same field of endeavor of 3D model Printer management, teaches:

- wherein modifying includes one or more of translating the machine-ready representation, rotating the machine-ready representation, scaling the machine-ready representation, and changing a top speed in a tool path for the target printer. (SLIC3R page 4, describing settings that vary by at least tool speed)

ASTROPRINT, PETTIS and SLIC3R are analogous because they are from the same field of endeavor and contain overlapping functional and structural similarities. Further, ASTROPRINT specifically incorporates SLIC3R in its method. (ASTROPRINT REF page 9).

A person having ordinary skill in the art at the time the invention was filed could have modified the method of the combination of ASTROPRINT and PETTIS with the tool speed adjustment of SLIC3R.

A person having ordinary skill in the art at the time the invention was filed could have been motivated to make this modification as ASTROPRINT specifically teaches incorporating SLIC3R into its method. (page 9).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- **Heide et al.** US Patent Publication 2007/0233298 – including orientation and scaling of a CAD model prior to slicing, similar to applicants disclosure of modification by scaling or orientation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOSHUA SANDERS whose telephone number is (571)272-5591. The examiner can normally be reached on generally: Monday through Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ali can be reached on 571-272-4105. 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.

/J. S./
Examiner, Art Unit 2127

/CARLOS ORTIZ RODRIGUEZ/
Primary Examiner, Art Unit 2127

Notice of References Cited	Application/Control No. 14/587,548	Applicant(s)/Patent Under Reexamination LEONARD ET AL.	
	Examiner JOSHUA SANDERS	Art Unit 2127	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-2007/0233298 A1	10-2007	Heide; Erik K.	G06F17/50	700/98
	B	US-				
	C	US-				
	D	US-				
	E	US-				
	F	US-				
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	3Dagogo ASTROPRINT(TM) WIRELESS 3D PRINTING SOFTWARE, May 26, 2014; Kickstarter; Retrieved from (http://web.archive.org/web/20140526152845/https://www.kickstarter.com/projects/306530051/astroprinttm-wireless-3d-printing-software, 23 December 2016).
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

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

SUBSTITUTE PTO/SB/08 (01-10)
SPPC v1.5 011712

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14/587,548
	Filing Date	Dec 31, 2014
	First Named Inventor	Alison N. Leonard
	Art Unit	2127
	Examiner Name	ALI, MOHAMMAD
Sheet 1 of 2	**Attorney Docket No.**	MBOT-0070-P01

U.S. PATENTS						
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

U.S. PATENT APPLICATION PUBLICATIONS						
Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

FOREIGN PATENT DOCUMENTS								
Examiner Initial*	Cite No	Foreign Document Number[3]	Cnty Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T[5]

NON-PATENT LITERATURE DOCUMENTS			
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, page(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	NPL-152	STRATASYS INC., "Stratasys Production Scheduling Software Ensures Efficiency in Direct Digital Manufacturing", July 30, 2007, 2 pages	

EXAMINER SIGNATURE			
Examiner Signature	/JOSHUA T SANDERS/	Date Considered	12/22/2016

*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.

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.T.S./

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

SUBSTITUTE PTO/SB/08 (01-10)
SPPC v1.5 011712

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	**Application Number**	14/587,548
	Filing Date	Dec 31, 2014
	First Named Inventor	Alison N. Leonard
	Art Unit	2127
	Examiner Name	ALI, MOHAMMAD
Sheet 2 of 2	**Attorney Docket No.**	MBOT-0070-P01

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

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☐ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ Applicant believes that no fees are required with this filing. However, if an Office Action on the merits has been mailed, or a fee is otherwise required, the Commissioner is hereby authorized to charge any fees due under 37 C.F.R. §§1.16 or 1.17, or to credit any overpayments, to Deposit Account No. 50-4262 in order to have this information disclosure statement considered.

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	/Robert Mazzarese/	Date (YYYY-MM-DD)	2015-09-01
Name/Print	Robert A. Mazzarese	Registration Number	42,852

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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SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
14/587,548	12/31/2014	700	2127	MBOT-0070-P01

APPLICANTS
MakerBot Industries, LLC, Brooklyn, NY;

INVENTORS
Alison N. Leonard, Brooklyn, NY;
Joseph Sadusk, New York, NY;

**** CONTINUING DATA ***************************

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****
01/21/2015

Foreign Priority claimed ❑ Yes ☑ No 35 USC 119(a-d) conditions met ❑ Yes ❑ No Verified and Acknowledged /JOSHUA T SANDERS/ Examiner's Signature	❑ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		NY	7	20	1

ADDRESS

STRATEGIC PATENTS P.C.
P.O. BOX 920629
NEEDHAM, MA 02492
UNITED STATES

TITLE

DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION

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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14587548	LEONARD ET AL.
	Examiner	Art Unit
	JOSHUA SANDERS	2127

CPC- SEARCHED		
Symbol	Date	Examiner
B29C67/0088;	12/23/2016	JS
G05B15/02;	12/23/2016	JS
G06F17/50;	12/23/2016	JS
B33Y50/02;	12/23/2016	JS

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US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
700	98	12/23/2016	JS

SEARCH NOTES		
Search Notes	Date	Examiner
EAST keyword, inventor, classification and assignee search performed	12/23/2016	JS
PLUS search performed	12/23/2016	JS
IEEEXplore metadata and author search performed	12/23/2016	JS
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U.S. PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		US-2015033 1402		Nov 19, 2015	Lin, Pierre Pascal A., et al.	

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Sheet 2 of 2	**Attorney Docket No.**	MBOT-0070-P01

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OR

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☐ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ Applicant believes that no fees are required with this filing. However, if an Office Action on the merits has been mailed, or a fee is otherwise required, the Commissioner is hereby authorized to charge any fees due under 37 C.F.R. §§1.16 or 1.17, or to credit any overpayments, to Deposit Account No. 50-4262 in order to have this information disclosure statement considered.

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Signature	/Robert Mazzarese/	Date (YYYY-MM-DD)	2016-07-18
Name/Print	Robert A. Mazzarese	Registration Number	42,852

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.T.S./

1. **Networked three-dimensional printing**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND [+1]
US20120092724 | US APPLICATIONS | 19-APR-2012

2. **Social networking for three-dimensional printers**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20120287472 | US APPLICATIONS | 15-NOV-2012

3. **Networked three-dimensional printing**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
WO2013086309A1 | WIPO APPLICATIONS | 13-JUN-2013

4. **Networked three-dimensional printing**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
EP2788910A1 | EUROPEAN APPLICATIONS | 15-OCT-2014

5. **Networked three-dimensional printing**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND [+1]
US20120113457 | US APPLICATIONS | 10-MAY-2012

6. **Networked three-dimensional printer with three-dimensional scanner**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20120286453 | US APPLICATIONS | 15-NOV-2012

7. **Networked three-dimensional printing**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND [+1]

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US20120113473 | US APPLICATIONS | 10-MAY-2012

8. **Networked three-dimensional printing**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND [+1]
US20120105903 | US APPLICATIONS | 03-MAY-2012

9. **Networked three-dimensional printing**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND [+1]
US8425218 | US PATENTS | 23-APR-2013

10. **Networked three-dimensional printing**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND [+1]
US8414280 | US PATENTS | 09-APR-2013

11. **Location-based print authorization for three-dimensional printers**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20120287459 | US APPLICATIONS | 15-NOV-2012

12. **Web-based design tools for three-dimensional printing**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20120287470 | US APPLICATIONS | 15-NOV-2012

13. **Drag-and-drop interface for three-dimensional printing queue management**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20120287473 | US APPLICATIONS | 15-NOV-2012

14. **Raft techniques in three-dimensional printing**

The strength of a bond between two adjacent layers of a three-dimensional print is weakened by initiating fabrication of a top layer at a height greater than the processing height for the print. This technique may be used in particular at the interface between a raft or other support and an object...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20140371895 | US APPLICATIONS | 18-DEC-2014

15. **Networked three-dimensional printer with web-based video feed**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC

US20120287259 | US APPLICATIONS | 15-NOV-2012

16. **Networked three-dimensional printing**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND [+1]
US8562324 | US PATENTS | 22-OCT-2013

17. **Networked three-dimensional printer with three-dimensional scanner**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US8747097 | US PATENTS | 10-JUN-2014

18. **Networked three-dimensional printing**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
AU2012347683A1 | AUSTRALIAN PATENT DOCUMENTS | 03-JUL-2014

19. **Automated model selection**

A server is configured to store a library of printable content and to select an item from the library in response to a user request. Instead of the user specifying a particular item, the server can automatically select from a number of different items. The server may automatically determine a...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20150038174 | US APPLICATIONS | 05-FEB-2015

20. **Displays for three-dimensional printers**

A variety of techniques are disclosed for incorporating displays into three-dimensional printers.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US9473760 | US PATENTS | 18-OCT-2016

21. **Displays for three-dimensional printers**

A variety of techniques are disclosed for incorporating displays into three-dimensional printers.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20140043630 | US APPLICATIONS | 13-FEB-2014

22. **Automated model customization**

A variety of computer automated tools are disclosed to assist consumers with using three-dimensional printers. Where a user also has access to a three-dimensional scanner, the tools may also support automated modifications to scanned subject matter.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20140046473 | US APPLICATIONS | 13-FEB-2014

23. **Automated model customization**

A variety of computer automated tools are disclosed to assist consumers with using three-dimensional printers. Where a user also has access to a three-dimensional scanner, the tools may also support automated modifications to scanned subject matter.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20140129020 | US APPLICATIONS | 08-MAY-2014

24. **Downloadable three-dimensional models**

A server is configured to store a number of different models of an object in machine-ready form corresponding to a number of different three-dimensional printers having differing capabilities and/or hardware configurations. When a user at a client device or a

printer requests the object, the server...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20130329257 | US APPLICATIONS | 12-DEC-2013

25. **Downloadable three-dimensional models**

A server is configured to store a number of different models of an object in machine-ready form corresponding to a number of different three-dimensional printers having differing capabilities and/or hardware configurations. When a user at a client device or a printer requests the object, the server...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20130329243 | US APPLICATIONS | 12-DEC-2013

26. **Automated model customization**

A variety of computer automated tools are disclosed to assist consumers with using three-dimensional printers. Where a user also has access to a three-dimensional scanner, the tools may also support automated modifications to scanned subject matter.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20140129022 | US APPLICATIONS | 08-MAY-2014

27. **Automated model customization**

A variety of computer automated tools are disclosed to assist consumers with using three-dimensional printers. Where a user also has access to a three-dimensional scanner, the tools may also support automated modifications to scanned subject matter.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20140129021 | US APPLICATIONS | 08-MAY-2014

28. **Downloadable three-dimensional models**

A server is configured to store a number of different models of an object in machine-ready form corresponding to a number of different three-dimensional printers having differing capabilities and/or hardware configurations. When a user at a client device or a printer requests the object, the server...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20130329258 | US APPLICATIONS | 12-DEC-2013

29. **Tagged build material for three-dimensional printing**

A supply of build material such as a spool or cartridge is instrumented with a data tag that includes information about the build material. A three-dimensional printer can read the information from the tag and determine how to use the build material during fabrication of a three-dimensional object.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20140117585 | US APPLICATIONS | 01-MAY-2014

30. **Tagged build material for three-dimensional printing**

A supply of build material such as a spool or cartridge is instrumented with a data tag that includes information about the build material. A three-dimensional printer can read the information from the tag and determine how to use the build material during fabrication of a three-dimensional object.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US9233504 | US PATENTS | 12-JAN-2016

31. **Tagged build material for three-dimensional printing**

A supply of build material such as a spool or cartridge is instrumented with a data tag that includes information about the build material. A three-dimensional printer can read the information from the tag and determine how to use the build material during fabrication of a three-dimensional object.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20160121550 | US APPLICATIONS | 05-MAY-2016

32. **Social networking for three-dimensional printers**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC

US8992202 | US PATENTS | 31-MAR-2015

33. **Web-based design tools for three-dimensional printing**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US9022770 | US PATENTS | 05-MAY-2015

34. **Voice-controlled three-dimensional fabrication system**

An additive three-dimensional fabrication system includes voice control for user interaction. This voice-controlled interface can enable a variety of voice-controlled functions and operations, while supporting interactions specific to consumer-oriented fabrication processes.

CURRENT ASSIGNEES: MAKERBOT IND [+1]
US9108450 | US PATENTS | 18-AUG-2015

35. **Voice-controlled three-dimensional fabrication system**

An additive three-dimensional fabrication system includes voice control for user interaction. This voice-controlled interface can enable a variety of voice-controlled functions and operations, while supporting interactions specific to consumer-oriented fabrication processes.

CURRENT ASSIGNEES: MAKERBOT IND [+1]
US20130297320 | US APPLICATIONS | 07-NOV-2013

36. **Voice-controlled three-dimensional fabrication**

An additive three-dimensional fabrication system includes voice control for user interaction. This voice-controlled interface can enable a variety of voice-controlled functions and operations, while supporting interactions specific to consumer-oriented fabrication processes.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20150348557 | US APPLICATIONS | 03-DEC-2015

37. **Voice-controlled three-dimensional fabrication**

An additive three-dimensional fabrication system includes voice control for user interaction. This voice-controlled interface can enable a variety of voice-controlled functions and operations, while supporting interactions specific to consumer-oriented fabrication processes.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US9349374 | US PATENTS | 24-MAY-2016

38. **Voice-controlled three-dimensional fabrication**

An additive three-dimensional fabrication system includes voice control for user interaction. This voice-controlled interface can enable a variety of voice-controlled functions and operations, while supporting interactions specific to consumer-oriented fabrication processes.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20160260432 | US APPLICATIONS | 08-SEP-2016

39. **Photo booth for three-dimensional images**

A photo booth is configured with a three-dimensional scanner, a display with a user interface coupled to the photo booth, a network interface configured to couple the photo booth in a communicating relationship with a remote processing resource, and processing circuitry. The processing circuitry may...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US9421716 | US PATENTS | 23-AUG-2016

40. **Photo booth for three-dimensional images**

A photo booth is configured with a three-dimensional scanner, a display with a user interface coupled to the photo booth, a network interface configured to couple the photo booth in a communicating relationship with a remote processing resource, and processing circuitry. The processing circuitry may...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US9440399 | US PATENTS | 13-SEP-2016

41. **Mobile device accessory for three-dimensional scanning**

A variety of techniques are disclosed for enabling three-dimensional scanning with mobile devices. In general, an accessory provides additional optics, image sensors, lighting and/or processing to complement preexisting device hardware in support of a variety of three-dimensional imaging techniques.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20140043441 | US APPLICATIONS | 13-FEB-2014

42. **Photo booth for three-dimensional images**

A photo booth is configured with a three-dimensional scanner, a display with a user interface coupled to the photo booth, a network interface configured to couple the photo booth in a communicating relationship with a remote processing resource, and processing circuitry. The processing circuitry may...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20140240794 | US APPLICATIONS | 28-AUG-2014

43. **Photo booth for three-dimensional images**

A photo booth is configured with a three-dimensional scanner, a display with a user interface coupled to the photo booth, a network interface configured to couple the photo booth in a communicating relationship with a remote processing resource, and processing circuitry. The processing circuitry may...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20140249662 | US APPLICATIONS | 04-SEP-2014

44. **Photo booth for three-dimensional images**

A photo booth is configured with a three-dimensional scanner, a display with a user interface coupled to the photo booth, a network interface configured to couple the photo booth in a communicating relationship with a remote processing resource, and processing circuitry. The processing circuitry may...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20140042670 | US APPLICATIONS | 13-FEB-2014

45. **Mobile device accessory for three-dimensional scanning**

A variety of techniques are disclosed for enabling three-dimensional scanning with mobile devices. In general, an accessory provides additional optics, image sensors, lighting and/or processing to complement preexisting device hardware in support of a variety of three-dimensional imaging techniques.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20140043442 | US APPLICATIONS | 13-FEB-2014

46. **Networked three-dimensional printing**

Add a networking capability to a three-dimensional printer offers a wide range of tools for network connected to the use of 3-D printers 3D is improved by making the resource . Web - based server , etc. On the one hand, able to manage access to the content is distributed to the remote user , on the...

CURRENT ASSIGNEES: MAKERBOT IND LLC
KR20140102240A | KOREAN APPLICATIONS | 21-AUG-2014

47. **Networked three-dimensional printer with web-based video feed**

Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US9430169 | US PATENTS | 30-AUG-2016

48. **Three-dimensional printing with multi-material support**

Three-dimensional printer fabrication is improved receiving a digital model of an object, the digital model specifying two or more different build materials; prioritizing the two or more different build materials with a ranking; identifying exclusive locations in the plurality of layers where a...

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20150091208 | US APPLICATIONS | 02-APR-2015

49. **3-dimensional printing that are networked**

Adds a network function to the 3D printer, and, by providing a variety of tools for use with three-dimensional printer in a network connection, three-dimensional production resources is improved. Anything like Web-based server, or on which, on the other hand in order to control access to the...

CURRENT ASSIGNEES: メーカーボット インダストリーズ エルエルシー
JP2015507250A | JAPANESE APPLICATIONS | 05-MAR-2015

50. **Three-dimensional printing of large objects**

A variety of techniques are disclosed for visual and functional augmentation of a three-dimensional printer.

CURRENT ASSIGNEES: MAKERBOT IND LLC
US20140074274 | US APPLICATIONS | 13-MAR-2014

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SPPC v1.5 011712

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14/587,548
	Filing Date	Dec 31, 2014
	First Named Inventor	Alison N. Leonard
	Art Unit	2127
	Examiner Name	ALI, MOHAMMAD
Sheet 1 of 3	**Attorney Docket No.**	MBOT-0070-P01

U.S. PATENTS

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
		US-7639253		Dec 29, 2009	Bae, Seockhoon et al.	
		US-7052103		May 30, 2006	Silverbrook et al.	
		US-6227643		May 8, 2001	Purcell, David A., et al.	

U.S. PATENT APPLICATION PUBLICATIONS

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	NPL-139	GIGASAVVY, "Getting Started with Airwolf 3D Printer SLIC3R Configurations", https://airwolf3d.com/question/3d-printer-slic3r-configurations/ Jan 21, 2013 , 12 Pages	
	NPL-141	ASTROPRINT, "Cloud OS for Desktop 3D Printers", https://www.astroprint.com/ 2015 , 5 Pages	
	NPL-140	INDIEGOGO, INC., "PrintToPeer: Your 3D Printer on the Web", https://www.indiegogo.com/projects/printtopeer-your-3d-printer-on-the-web#/story 2015 , 21 pages	
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Doc code: IDS
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SPPC v1.5 011712

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	First Named Inventor	Alison N. Leonard
	Art Unit	2127
	Examiner Name	ALI, MOHAMMAD
Sheet 2 of 3	**Attorney Docket No.**	MBOT-0070-P01

EXAMINER SIGNATURE			
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☐ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

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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	/Robert Mazzarese/	Date (YYYY-MM-DD)	2015-07-10
Name/Print	Robert A. Mazzarese	Registration Number	42,852

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	**Application Number**	14/587,548
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	First Named Inventor	Alison N. Leonard
	Art Unit	2127
	Examiner Name	ALI, MOHAMMAD
Sheet 3 of 3	**Attorney Docket No.**	MBOT-0070-P01

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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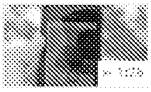
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3D Printing Without Installing Slicers | Make:
makezine.com/2014/06/17/3d-printing-without-installing-slicers/
Jun 17, 2014 - 3D Printing has never been this easy. I lazily sit in my beachfront office, upload my .STL to Astroprint's cloud slicer (cloud slicer! what an ...

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https://3dprint.com/115812/astroprint-custom-slicer/
Jan 19, 2016 - Cloud-based 3D printing management software AstroPrint was designed to offer users a high-quality, quicker and easier alternative to standard ...

3ders.org - 3D Print cloud service AstroPrint releases user statistics ...
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Jul 12, 2016 - 3D Print Cloud service provider AstroPrint is releasing usage stats that ... print time, print quality breakdown and most used slicers on AstroPrint.

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https://all3dp.com/best-3d-slicer-software-3d-printer/
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May 22, 2014 - AstroPrint is wireless 3d printing from your mobile device. They have a rocket for a logo, a Kickstarter video that doesn't totally suck and shot ...

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The systems and methods disclosed herein employ a combination of digital three-dimensional **modeling** and rapid fabrication technologies to provide pre-indexed, pre-registered, and/or precut components for articulated dental **models**. Dental ...

Method and system for automated mass manufacturing of custom tooth die **models** ...



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General purpose image data processing

Methods and system for enabling printing three-dimensional object **models**



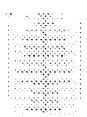
Application US20110087350A1 · Efi FOSEL · 3D M.T.P. Ltd
Priority 2009-10-08 · Filing 2009-10-08 · Publication 2011-04-14
The present invention relates to a system and method of transforming an inconsistent 3D (three-dimensional) **model** of one or more 3D objects into a valid printable 3D **model**, said method comprising: (a) receiving an input **model** file and/or ...

Method and system for the generation of a computer **model**



Application US20030191554A1 · Raymond Russell · Russell Raymond Macdonald
Priority 2002-04-09 · Filing 2002-06-18 · Publication 2003-10-09
(i) providing a data generating means capable of generating and of transmitting data and arranged to generate a control data set representative of a computer **model** of a workpiece, said computer **model** comprising a surface relief, and being ...

System and method for 3d **model** generation



Application US20080112610A1 · Paul Israelsen · S2, Inc.
Priority 2006-11-14 · Filing 2007-11-14 · Publication 2008-05-15
1 . A computer-implemented method for generating a 3D **model**, comprising: a 3D Camera, comprising a Lidar and an optical camera configured to scan asynchronously, generating 3D data representing multiple scans by the 3D Camera; generating an . .

Dynamic, live surface and **model** elements for visualization and **modeling**



Grant US6795089B2 · Vij Rajarajan · Microsoft Corporation
Priority 2000-12-20 · Filing 2000-12-20 · Grant 2004-09-21 · Publication 2004-09-21
Described is a method and system providing a dynamic, live (active) surface and/or **model** elements to complement and enhance what is being modeled or visualized, enabling the addition of new features and functionality to visualization and ...

Search within classification G06T1 (3,335 results)

Computer system with automatic drive **model** ID recognition and drive type ...



Grant US5598577A • Anthony L. Overfield • Dell Usa, L.P.
Priority 1991-12-26 • Filing 1995-12-08 • Grant 1997-01-28 • Publication 1997-01-28
A computer system in which the system software (while running as an overhead process which is not directly under control of the user) queries a disk drive to determine its **model**. The system software checks the corresponding response string ...

Automated multimedia object **models**



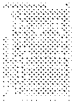
Application US20060282827A1 • Richard Paulsen • Sequoia Media Group, Lc
Priority 2004-02-06 • Filing 2005-02-04 • Publication 2005-12-01
Disclosed herein are systems and methods for creating multimedia presentations from presentation templates and/or multimedia object **models**. Detailed information on various example embodiments of the inventions are provided in the Detailed ...

Three dimensional geological **model** construction



Application US20060197759A1 • Nils Fremming • Technoguide As
Priority 2001-12-12 • Filing 2006-05-02 • Publication 2006-09-07
A method for **modeling** geological structures includes identifying fault planes in a geologic structure, and creating a set of substantially vertically oriented pillars along the fault plane. The pillar grids are then combined into a common . .

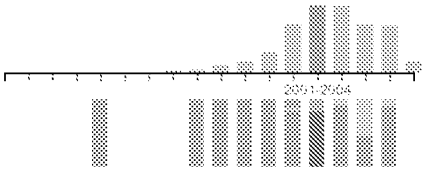
Mental **Model** Elicitation Device (MMED) Methods and Apparatus



Application US20120330869A1 • Jayson Theordore Durham • Jayson Theordore Durham
Priority 2011-06-25 • Filing 2012-06-03 • Publication 2012-12-27
A mental-**model** elicitation process and apparatus, called the Mental-**Model** Elicitation Device (MMED) is described. The MMED is used to give rise to more effective end-user mental-**modeling** activities that require executive function and ...

Next › » About 5,886 results

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Relative count of top 5 values

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Silverbrook Research Pty Ltd H04N1/0035 B41J2/175 B41J2/17 B41J2/00		7.4%
International Business Machines Corporation G06F12/00 G06F12/02 G06F12/0223 G06F12/023		2.4%
Microsoft Corporation H04N19/91 H04N19/44 H04N19/48 H04N19/436		2.2%
3D Systems, Inc B29C67/0088 B29C67/0055 B29C67/0092 B29C67/0092		1.8%
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Patents

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B29C67/0077?

Rapid manufacturing and prototyping of 3D objects by additive depositing, agglomerating or laminating of plastics material, e.g. by stereolithography or selective laser sintering using only solid materials e.g. laminating sheet material precut to local cross sections of the 3D object using layers of powder being selectively joined, e.g. by selective laser sintering or melting

System, method and apparatus for **3d printing**



Application US20150273769A1 · Stanley Korn · Stanley Korn
Priority 2014-03-30 · Filing 2015-03-30 · Publication 2015-10-01
, wherein said processor controls said printer pursuant to a **model** selected from the group consisting of fused deposition **modeling**, material jetting, powder bed fusion, direct metal laser sintering, electron beam melting, selective heat …

Search within classification B29C67/0077 (2 results)

G03F7/70283?

Masks or their effects on the imaging process, e.g. Fourier masks, greyscale masks, holographic masks, phase shift masks, phasemasks, lenticular masks, multiple masks, tilted masks, tandem masks

Systems and methods for fabricating three-dimensional objects



Application US20160221262A1 · Suman Das · Suman Das
Priority 2008-05-05 · Filing 2013-11-08 · Publication 2016-08-04
20 . A method of additive manufacturing, comprising: slicing a digital **model** of a three-dimensional object into a plurality of slices, each slice having a cross-section; generating a build cross section by filling a two-dimensional image …

Search within classification G03F7/70283 (3 results)

G05B2219/35134?

3-D cad-cam

System and method for reproducing molded insole



Application US20160289439A1 · Patrik Louko · Zero Gravity Inside Inc
Priority 2015-03-31 · Filing 2015-03-31 · Publication 2016-10-06
10 . The system of claim 9 , further comprising a computing device configured to process the scanned image and provide the processed image to the **3D printer**. 11 . A three-dimensional scanner for scanning a molded insole that includes rearfoot …

Search within classification G05B2219/35134 (2 results)

Patient-specific temporary implants for accurately guiding local means of tumor …



Application US20160213379A1 · Jean Pouliot · The Regents Of The University Of California
Priority 2013-07-26 · Filing 2014-07-28 · Publication 2016-09-22
The invention is a new approach that builds on recent results in **3D printing** and steerable needle motion planning to create customized implants containing customized curvature-constrained internal channels that fit securely, minimize air …

Fabricating full color three-dimensional objects



Application KR20160132441A • 유태 천 • 마이크로소프트 테크놀로지 라이센싱, 엘엘씨
Priority 2014-03-10 • Filing 2015-02-27 • Publication 2016-11-18
This method is to slicing into the layer a three-dimensional **model** with the color state of preservation, on the basis of color, color, and / or blue and white colors on the texture on the surface that generates the two-dimensional polygons ...

Dynamic real-time slice engine for 3d printing



Application US20150328828A1 • Karl Willis • Autodesk, Inc.
Priority 2014-05-13 • Filing 2015-05-13 • Publication 2015-11-19
Methods, systems, and apparatus include computer programs encoded on a computer-readable storage medium, including a method for **3D printing** without preprocessing a CAD **model** before delivery to a **3D printer**. The CAD **model** for a design to be ...

Systems and methods for fabricating three-dimensional objects

Application WO2014074954A2 • Suman Das • Suman Das
Priority 2012-11-08 • Filing 2013-11-08 • Publication 2014-05-15
Systems and methods for fabricating three-dimensional objects. The system includes an optical imaging system providing a light source; a photosensitive medium adapted to change states upon exposure to a portion of the light source from . .

System and method for reproducing molded insole

Application WO2016161187A2 • Patrick LOUKO • Zerog Oy
Priority 2015-03-31 • Filing 2016-03-31 • Publication 2016-10-06
10. The system of Claim 9, further comprising a computing device configured to process the scanned image and provide the processed image to the **3D printer**. 11. A three-dimensional scanner for scanning a molded insole that includes rearfoot ...

About 8 results

Results by date



Relative count of top 5 values

Assignees	Inventors	CPCs
Suman Das B29C67/0062 B29C67/0055 B33Y30/00 B29C67/0059		25%
Zero Gravity Inside Inc A45D1/00 A43D1 A43D A43D1/00		25%
The Regents Of The University Of California B29C59 B29C67/0059 A61N5/062 A61B2018/0212		12.5%
Paul CILINO B33Y50/00 G03B G03F7/70216 B29C67/0055		12.5%
마이크로소프트 테크놀로지 라이센싱, 엘엘씨 G05B19/4097 B33Y50/02 G06T G05B19/00		12.5%

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Author

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- P. Gil (1)
- Toshio Modegi (1)
- Stefan Junk (1)
- C. M. Mateo (1)

View more...

Affiliation

Publication Title

Conference Location

1. **Workshop Rapid Prototyping - A new approach to introduce digital manufacturing in engineering education**
   Stefan Junk; Rebecca Matt
   2015 International Conference on Information Technology Based Higher Education and Training (ITHET)
   Year: 2015
   Pages: 1 - 6, DOI: 10.1109/ITHET.2015.7217965
   IEEE Conference Publications
   Abstract (444 Kb)

2. **Proposal for 3D-printing regulation technique in fabricating illegal objects using feature-vector based matching algorithm of 3D shapes**
   Toshio Modegi
   2016 55th Annual Conference of the Society of Instrument and Control Engineers of Japan (SICE)
   Year: 2016
   Pages: 877 - 883, DOI: 10.1109/SICE.2016.7749185
   IEEE Conference Publications
   Abstract (383 Kb)

3. **A performance evaluation of surface normals-based descriptors for recognition of objects using CAD-models**
   C. M. Mateo; P. Gil; F. Torres
   2014 11th International Conference on Informatics in Control, Automation and Robotics (ICINCO)
   Year: 2014, Volume: 02
   Pages: 428 - 435, DOI: 10.5220/0005056504280435
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   Abstract (801 Kb)

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Programming moves: Design and evaluation of applying embodied interaction in virtual environments to enhance computational thinking in middle school students

Dhaval Parmar; Joseph Isaac; Sabarish V. Babu; Nikeetha D'Souza; Alison E. Leonard; Sophie Jörg; Kara Gundersen; Shaundra B. Daily

2016 IEEE Virtual Reality (VR)

Year: 2016

Pages: 131 - 140, DOI: 10.1109/VR.2016.7504696

IEEE Conference Publications

Abstract (1503 Kb) Media

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20110022197 59
20120266115 59

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Serial No.: 14/587,548
Filing Date: December 31, 2014
In re: LEONARD, Alison N., *et al.*
Art Unit: 2127
Examiner: SANDERS, Joshua T.
Conf. No.: 6946

Commissioner for Patents
PO Box 1450
Alexandria, Virginia 22313-1450

PRELIMINARY AMENDMENT

Dear Examiner:

Please enter the following amendments prior to examination on the merits:

Amendments to the Drawings begin on page 2 of this paper.

Remarks begin on page 3 of this paper.

Amendments to the Drawings

The attached seven drawing sheets containing Figs. 1–6 replace the drawing sheets filed on December 31, 2014 containing Figs. 1–6.[1]

Attachment: Replacement Sheets (7)

[1] Although only drawing sheet 4 is amended, the applicant has provided a full set of replacement drawings for the Office's convenience.

Remarks

In this Preliminary Amendment, the applicant provides replacement drawings to replace the seven drawing sheets filed on December 31, 2014 containing Figs. 1–6 to fix spelling errors included in Fig. 3B. Specifically, the applicant has revised Fig. 3B on Replacement Sheet 4 to correct the spelling of "machine" in boxes 330, 332 and 334. No new matter is introduced by this amendment.

The applicant hereby authorizes the Patent Office to charge any deficiencies or credit any overpayments associated with this filing to Deposit Account No. 50-4262. If there are any further questions concerning this paper, the Office is encouraged to contact the undersigned directly at (646) 238-1234.

Respectfully submitted,
STRATEGIC PATENTS, P.C.

/Thomas Bassolino/
Thomas J. Bassolino
Reg. No. 65,946
Tel.: (646) 238-1234
Customer Number 43520

December 21, 2016

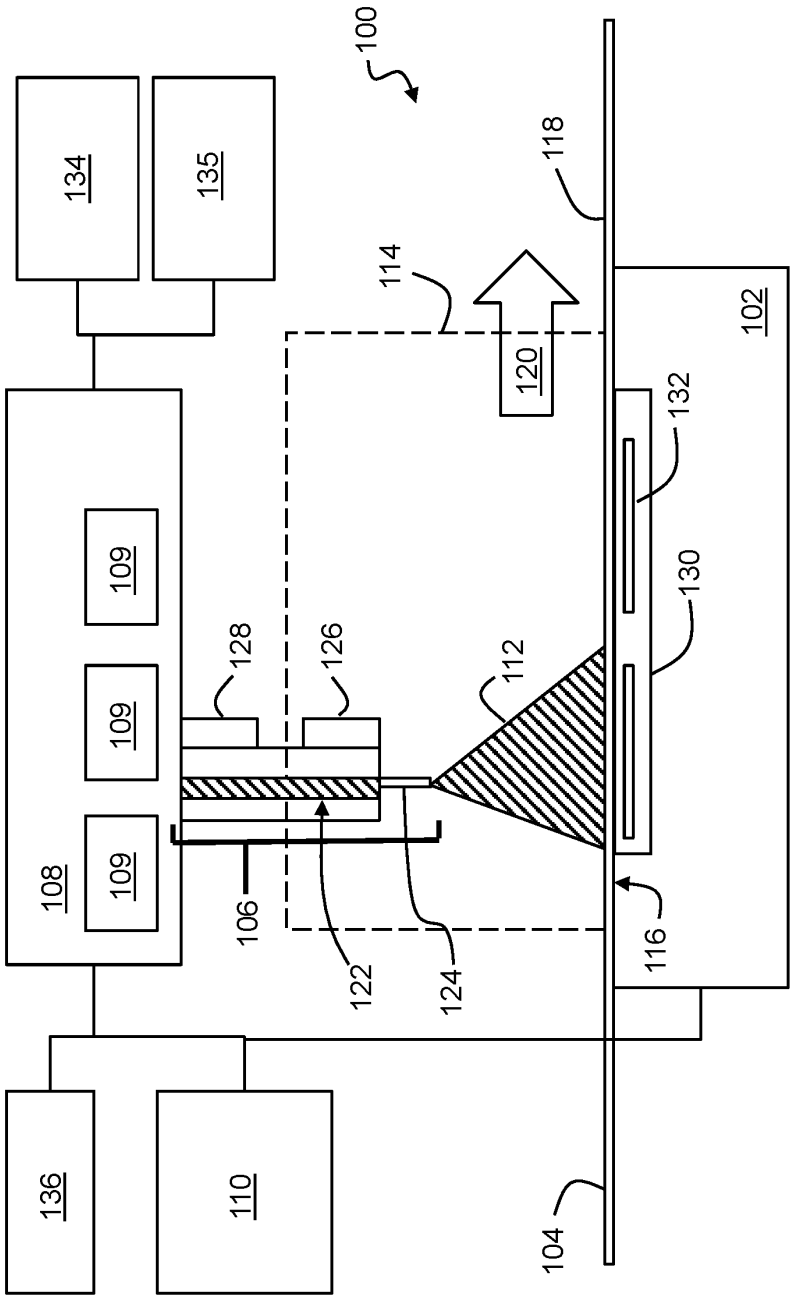

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FIG. 1

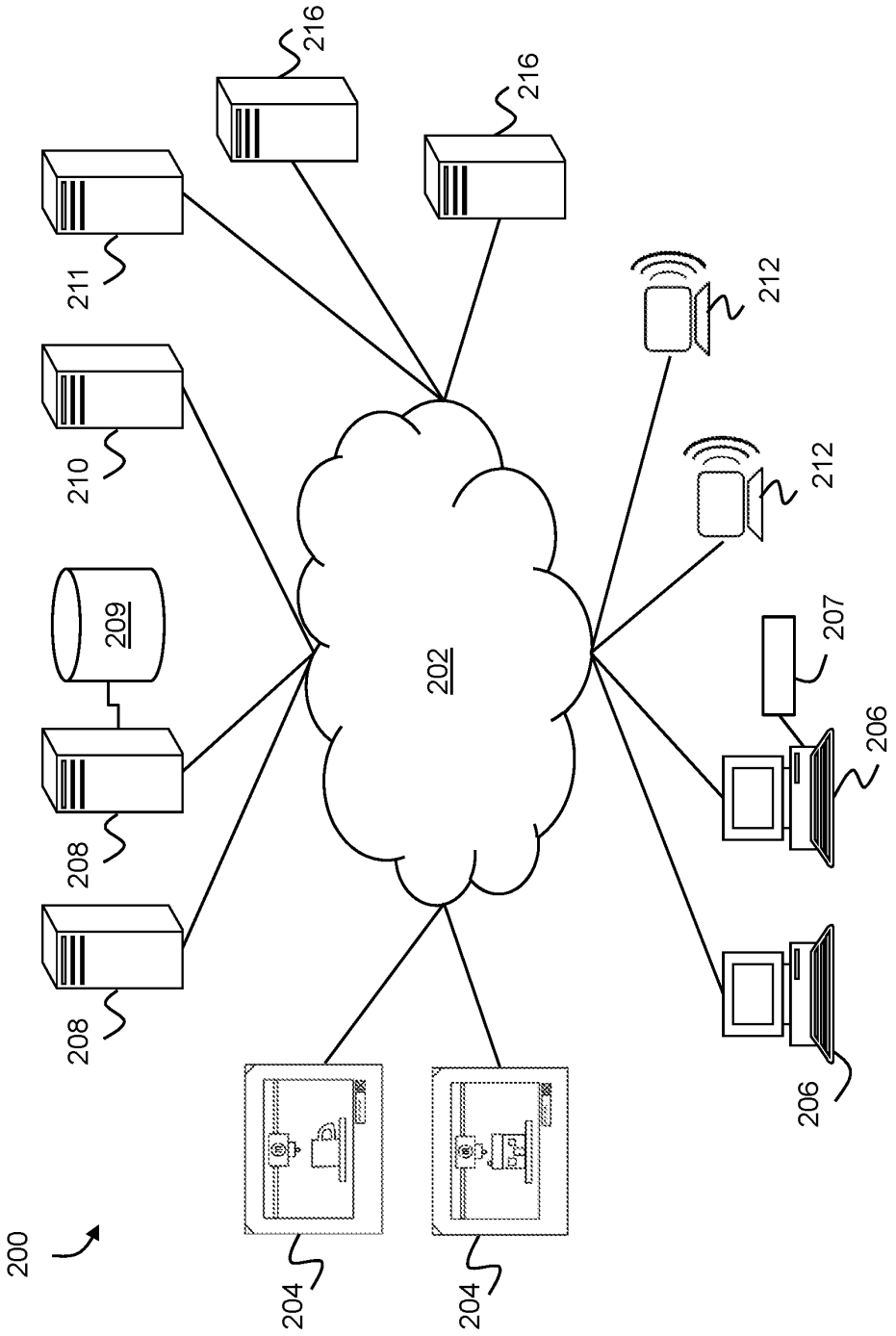


FIG. 2

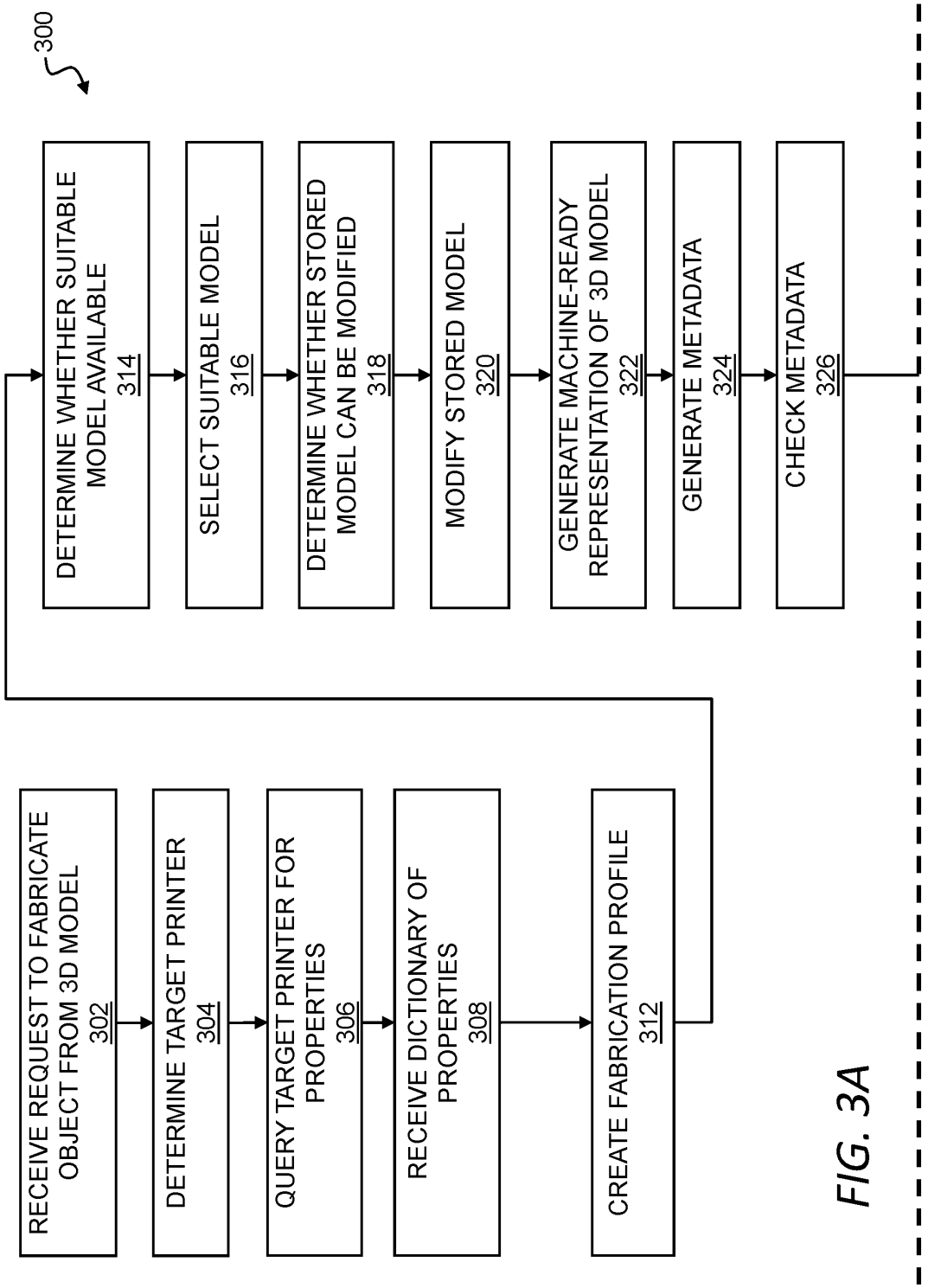

300
RECEIVE REQUEST TO FABRICATE OBJECT FROM 3D MODEL
302
DETERMINE TARGET PRINTER
304
QUERY TARGET PRINTER FOR PROPERTIES
306
RECEIVE DICTIONARY OF PROPERTIES
308
CREATE FABRICATION PROFILE
312
DETERMINE WHETHER SUITABLE MODEL AVAILABLE
314
SELECT SUITABLE MODEL
316
DETERMINE WHETHER STORED MODEL CAN BE MODIFIED
318
MODIFY STORED MODEL
320
GENERATE MACHINE-READY REPRESENTATION OF 3D MODEL
322
GENERATE METADATA
324
CHECK METADATA
326

FIG. 3A

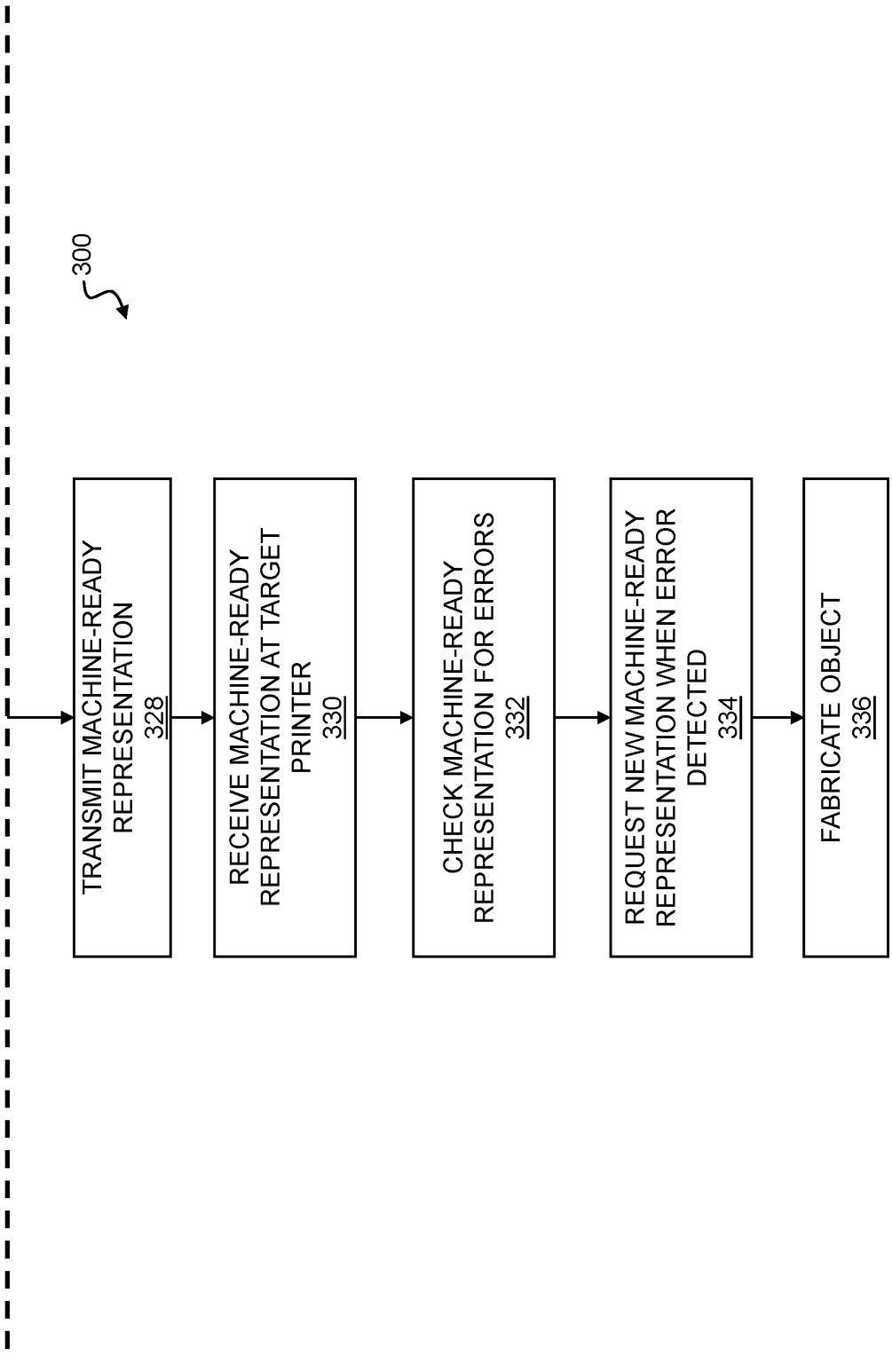

300
TRANSMIT MACHINE-READY REPRESENTATION 328
RECEIVE MACHINE-READY REPRESENTATION AT TARGET PRINTER 330
CHECK MACHINE-READY REPRESENTATION FOR ERRORS 332
REQUEST NEW MACHINE-READY REPRESENTATION WHEN ERROR DETECTED 334
FABRICATE OBJECT 336

FIG. 3B

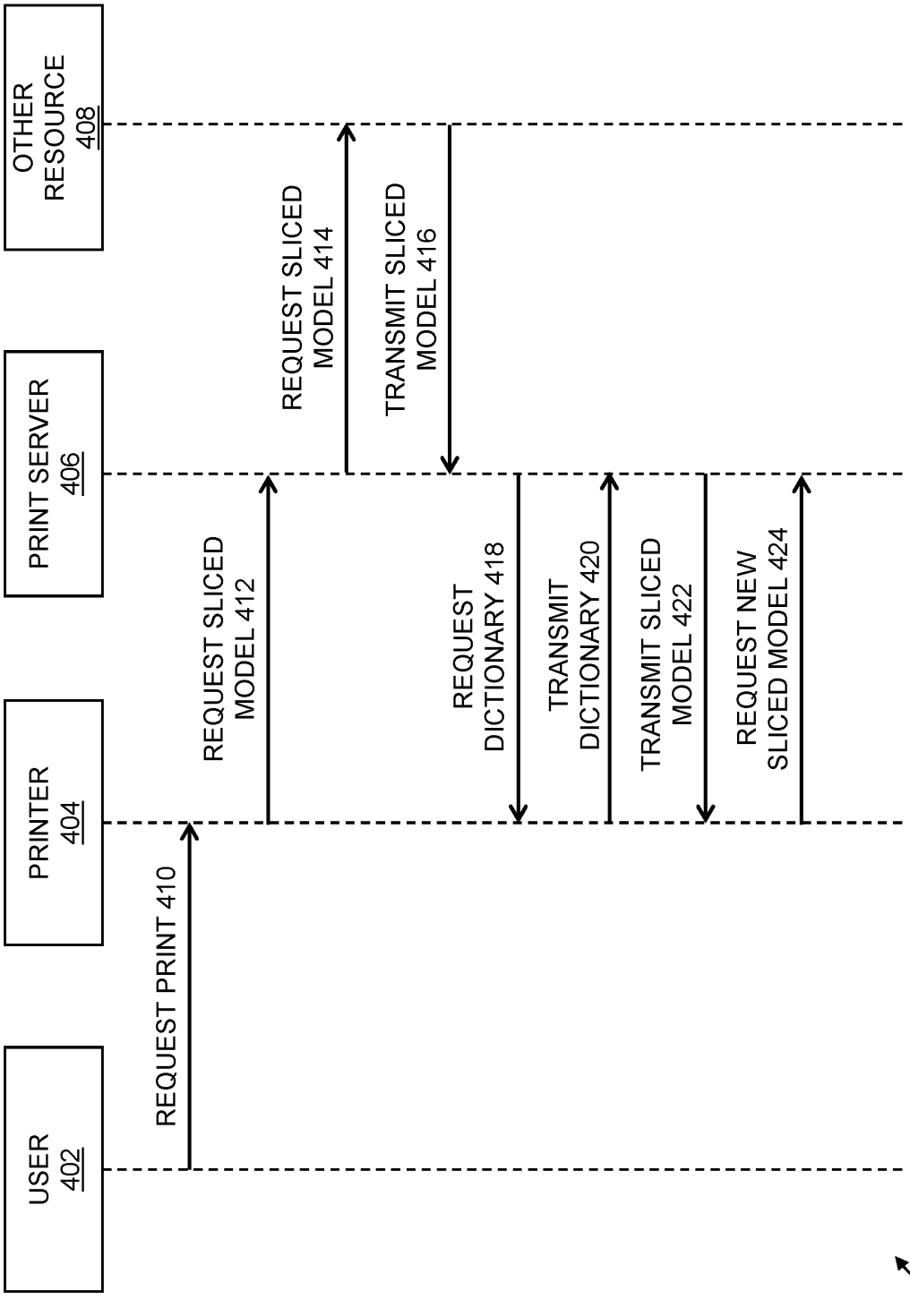

USER 402
PRINTER 404
PRINT SERVER 406
OTHER RESOURCE 408
REQUEST PRINT 410
REQUEST SLICED MODEL 412
REQUEST SLICED MODEL 414
TRANSMIT SLICED MODEL 416
REQUEST DICTIONARY 418
TRANSMIT DICTIONARY 420
TRANSMIT SLICED MODEL 422
REQUEST NEW SLICED MODEL 424
400

FIG. 4

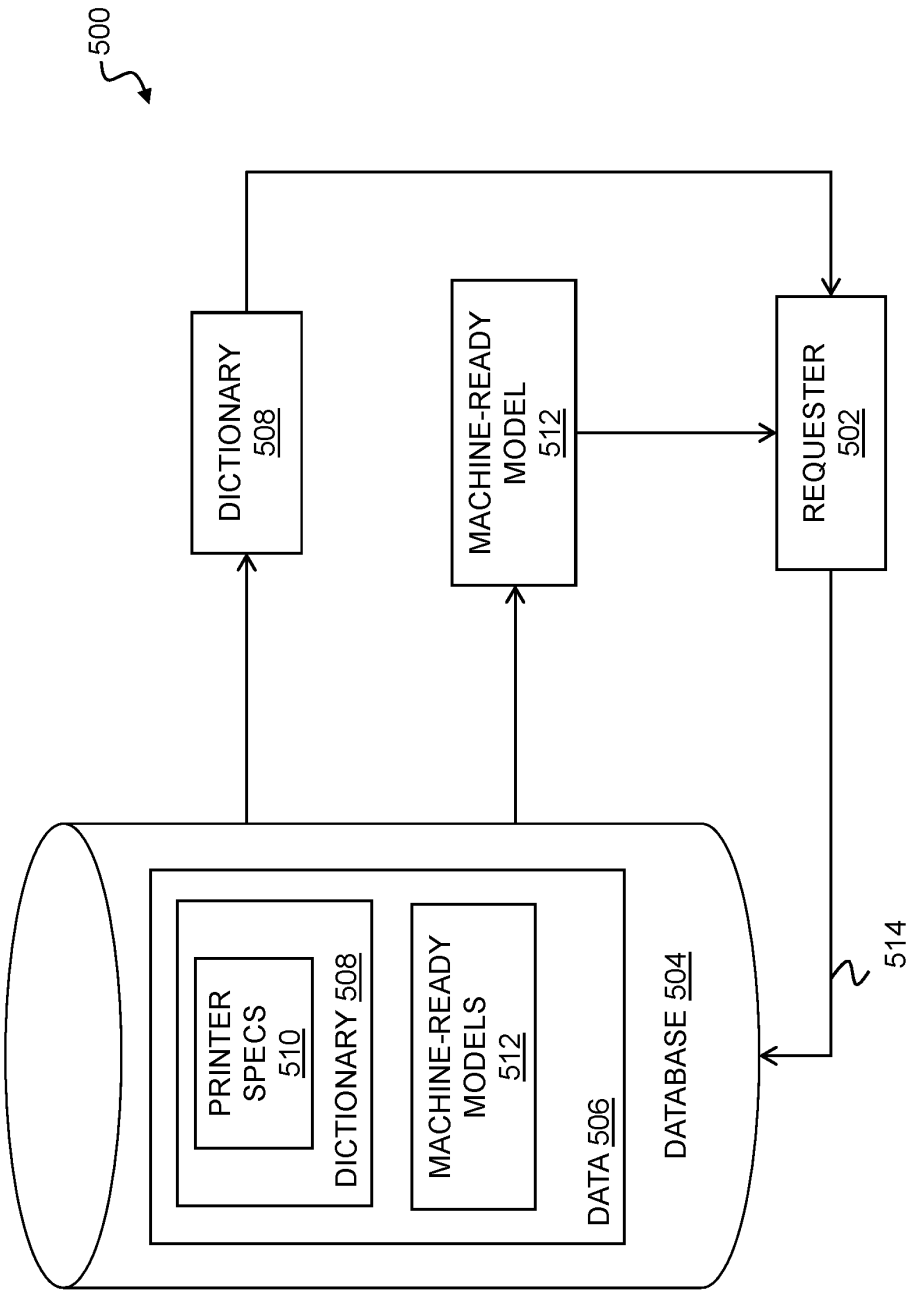

500
DICTIONARY 508
MACHINE-READY MODEL 512
REQUESTER 502
514
DATABASE 504
DATA 506
PRINTER SPECS 510
DICTIONARY 508
MACHINE-READY MODELS 512

FIG. 5

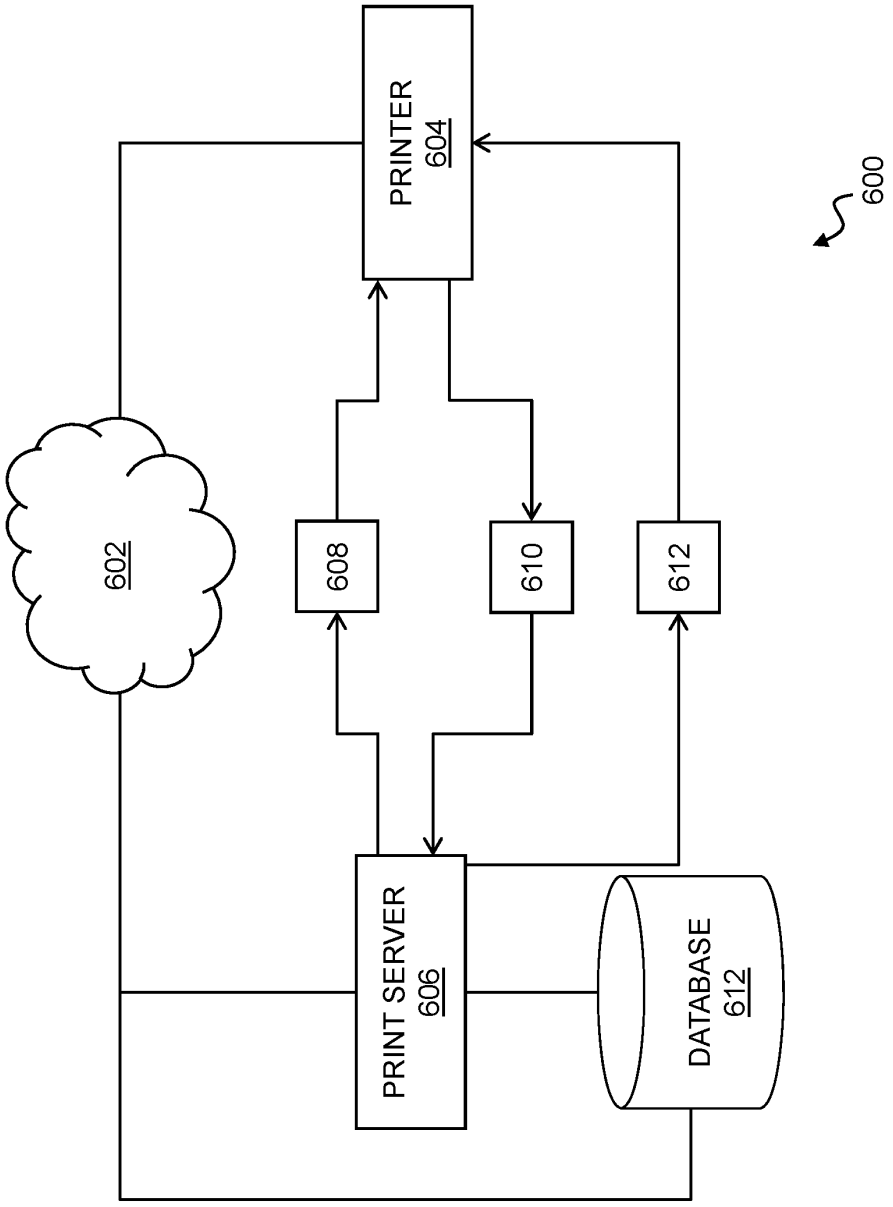

PRINTER
604
600
602
608
610
612
PRINT SERVER
606
DATABASE
612

FIG. 6

Electronic Acknowledgement Receipt	
EFS ID:	27865451
Application Number:	14587548
International Application Number:	
Confirmation Number:	6946
Title of Invention:	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION
First Named Inventor/Applicant Name:	Alison N. Leonard
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Attorney Docket Number:	MBOT-0070-P01
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Application Type:	Utility under 35 USC 111(a)

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14/587,548
	Filing Date	Dec 31, 2014
	First Named Inventor	Alison N. Leonard
	Art Unit	2127
	Examiner Name	ALI, MOHAMMAD
Sheet 1 of 2	**Attorney Docket No.**	MBOT-0070-P01

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		US-2015033 1402		Nov 19, 2015	Lin, Pierre Pascal A., et al.	

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	Application Number	14/587,548
	Filing Date	Dec 31, 2014
	First Named Inventor	Alison N. Leonard
	Art Unit	2127
	Examiner Name	ALI, MOHAMMAD
Sheet 2 of 2	**Attorney Docket No.**	MBOT-0070-P01

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.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ Applicant believes that no fees are required with this filing. However, if an Office Action on the merits has been mailed, or a fee is otherwise required, the Commissioner is hereby authorized to charge any fees due under 37 C.F.R. §§1.16 or 1.17, or to credit any overpayments, to Deposit Account No. 50-4262 in order to have this information disclosure statement considered.

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	/Robert Mazzarese/	Date (YYYY-MM-DD)	2016-07-18
Name/Print	Robert A. Mazzarese	Registration Number	42,852

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.**

Electronic Acknowledgement Receipt	
EFS ID:	26378604
Application Number:	14587548
International Application Number:	
Confirmation Number:	6946
Title of Invention:	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION
First Named Inventor/Applicant Name:	Alison N. Leonard
Customer Number:	43520
Filer:	Robert A. Mazzarese/Paula Ng
Filer Authorized By:	Robert A. Mazzarese
Attorney Docket Number:	MBOT-0070-P01
Receipt Date:	18-JUL-2016
Filing Date:	31-DEC-2014
Time Stamp:	15:56:35
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	MBOT-0070-P01_071816_Form1449.pdf	98760 2aeee8d686c47b5859f4053b9cc41bd66a7d69db	no	2

Warnings:

Information:	
This is not an USPTO supplied IDS fillable form	
Total Files Size (in bytes):	98760

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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.

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/587,548	12/31/2014	Alison N. Leonard	MBOT-0070-P01

CONFIRMATION NO. 6946

43520
STRATEGIC PATENTS P.C.
P.O. BOX 920629
NEEDHAM, MA 02492

PUBLICATION NOTICE

OC000000084066189

Title:DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION

Publication No.US-2016-0185044-A1
Publication Date:06/30/2016

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently http://pair.uspto.gov/. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14/587,548
	Filing Date	Dec 31, 2014
	First Named Inventor	Alison N. Leonard
	Art Unit	2127
	Examiner Name	ALI, MOHAMMAD
Sheet 1 of 2	**Attorney Docket No.**	MBOT-0070-P01

U.S. PATENTS						
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

U.S. PATENT APPLICATION PUBLICATIONS						
Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

FOREIGN PATENT DOCUMENTS								
Examiner Initial*	Cite No	Foreign Document Number[3]	Cnty Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T[5]

NON-PATENT LITERATURE DOCUMENTS			
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, page(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	NPL-152	STRATASYS INC., "Stratasys Production Scheduling Software Ensures Efficiency in Direct Digital Manufacturing", July 30, 2007, 2 pages	

EXAMINER SIGNATURE			
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	14/587,548
	Filing Date	Dec 31, 2014
	First Named Inventor	Alison N. Leonard
	Art Unit	2127
	Examiner Name	ALI, MOHAMMAD
Sheet 2 of 2	**Attorney Docket No.**	MBOT-0070-P01

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.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ Applicant believes that no fees are required with this filing. However, if an Office Action on the merits has been mailed, or a fee is otherwise required, the Commissioner is hereby authorized to charge any fees due under 37 C.F.R. §§1.16 or 1.17, or to credit any overpayments, to Deposit Account No. 50-4262 in order to have this information disclosure statement considered.

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	/Robert Mazzarese/	Date (YYYY-MM-DD)	2015-09-01
Name/Print	Robert A. Mazzarese	Registration Number	42,852

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.**

Electronic Acknowledgement Receipt

EFS ID:	23370631
Application Number:	14587548
International Application Number:	
Confirmation Number:	6946
Title of Invention:	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION
First Named Inventor/Applicant Name:	Alison N. Leonard
Customer Number:	43520
Filer:	Robert A. Mazzarese/Paula Ng
Filer Authorized By:	Robert A. Mazzarese
Attorney Docket Number:	MBOT-0070-P01
Receipt Date:	01-SEP-2015
Filing Date:	31-DEC-2014
Time Stamp:	14:47:37
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	MBOT-0070-P01_090115_Form1449.pdf	73845 a80797e92bd050e10b0eb521dc1f1a8280028715	no	2

Warnings:	
Information:	

This is not an USPTO supplied IDS fillable form					
2	Non Patent Literature	NPL-152_StratasysProductionSchedulingSoftware.pdf	26931 dabafb8cce642e72d7f6c69a4dd22956563198bc	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	100776	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

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
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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.

EFS Web

PATENTS
MBOT-0070-P01

In re application of Alison N. Leonard, *et al.* : Group Art Unit: 2127

Serial No. 14/587,548 : Confirmation No. 6946

Filed: December 31, 2014 : Examiner: ALI, MOHAMMAD

FILING OF DECLARATIONS UNDER 37 CFR § 1.63

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

For the above identified application, in response to the Informational Notice To Applicant mailed March 27, 2015, the applicant submits herewith executed declarations for each of the inventors. More specifically, inventor executed declarations are submitted under 37 C.F.R § 1.63 for inventors Leonard and Sadusk. The applicant previously paid the surcharge for a late filed declaration on March 23, 2015.

The applicant believes that there is no fee for this filing. However, the applicant hereby authorizes the Patent Office to charge any deficiencies or credit any overpayments associated with this filing to Deposit Account No. 50-4262.

Please direct any inquiry regarding this matter to the below signed.

Respectfully Submitted,

STRATEGIC PATENTS, P.C.

/Robert Mazzarese/

Robert Mazzarese
Reg. No. 42,852
(617) 916-2658
Customer Number 43520

July 15, 2015

United States Patent Application
COMBINED DECLARATION AND ASSIGNMENT

Title of Invention:
DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION

DECLARATION

As a below named and undersigned inventor, I hereby declare that:

(a) This declaration is directed to United States application or PCT international application number 14/587,548 filed on December 31, 2014.

(b) The above-identified application was made or authorized to be made by me.

(c) I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I have reviewed and understand the contents of the application, including the claims, and I acknowledge the duty to disclose all information which is material to the patentability of this application as defined in 37 C.F.R. § 1.56 (attached hereto).

ASSIGNMENT

WHEREAS, the undersigned inventor ("Inventor") has developed certain inventions ("Inventions") described in the above U.S. patent application, and has full right to convey his or her entire interest, both legal and equitable, in and to said Inventions free from all prior assignments, agreements, licenses, mortgages, security interests, or other encumbrances whatsoever; and

WHEREAS, MakerBot Industries, LLC ("ASSIGNEE"), an entity organized and existing under the laws of the state of New York, and having a place of business at 1 Metrotech Center, 21st Floor, Brooklyn, NY, 11201, is desirous of acquiring the entire right, title, and interest in and to the Inventions and any and all patents to be obtained therefore;

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged by the Inventor, the Inventor hereby sells, assigns and transfers unto the ASSIGNEE, its successors and assigns, his or her entire right, title and interest in and to the Inventions as described in the above application and all applications resulting therefrom, including any and all conversions, divisions, continuations, continuations-in-part, substitute applications, and reissues or extensions thereof; and all resulting patents in any jurisdiction worldwide; along with all rights of priority and rights to sue for past infringement;

AND the Inventor hereby authorizes and requests the issuing authority to issue any and all patents issuing from any of the forgoing to the ASSIGNEE or its successors and assigns;

AND the Inventor agrees that ASSIGNEE's counsel, Strategic Patents, P.C. having Patent Office Customer Number 43520, shall hereinafter act on behalf of the ASSIGNEE with respect to the Inventions;

AND the Inventor further agrees, without any further payment or compensation by the ASSIGNEE or its successors and assigns, to communicate to the ASSIGNEE, its representatives or agents or its successors and assigns, any facts relating to the Inventions including evidence for interference purposes or for other legal proceedings whenever requested; to testify in any interference or other legal proceedings, whenever requested; to execute and deliver, on request, all lawful papers required to make any of the foregoing provisions effective; and to generally do everything possible to aid the ASSIGNEE, its successors or assigns and nominees to secure, obtain and enforce proper patent protection for the Inventions in this or any foreign country.

The Inventor hereby authorizes the attorneys and agents associated with Patent Office Customer Number 43520 to insert hereon any further information necessary or desirable for recordation of this document.

I accept and agree to the terms of the ASSIGNMENT above.

I hereby acknowledge that any willful false statement made in the DECLARATION above is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

Full Legal Name of inventor: Joseph Sadusk
Residence: New York, NY

Signature: _____ Date: 7/10/2015
Joseph Sadusk

§ 1.56 Duty to disclose information material to patentability.

(a) A patent by its very nature is affected with a public interest. The public interest is best served, and the most effective patent examination occurs when, at the time an application is being examined, the Office is aware of and evaluates the teachings of all information material to patentability. Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section. The duty to disclose information exists with respect to each pending claim until the claim is cancelled or withdrawn from consideration, or the application becomes abandoned. Information material to the patentability of a claim that is cancelled or withdrawn from consideration need not be submitted if the information is not material to the patentability of any claim remaining under consideration in the application. There is no duty to submit information which is not material to the patentability of any existing claim. The duty to disclose all information known to be material to patentability is deemed to be satisfied if all information known to be material to patentability of any claim issued in a patent was cited by the Office or submitted to the Office in the manner prescribed by §§ 1.97(b)-(d) and 1.98. However, no patent will be granted on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct. The Office encourages applicants to carefully examine:

(1) Prior art cited in search reports of a foreign patent office in a counterpart application, and
(2) The closest information over which individuals associated with the filing or prosecution of a patent application believe any pending claim patentably defines, to make sure that any material information contained therein is disclosed to the Office.

(b) Under this section, information is material to patentability when it is not cumulative to information already of record or being made of record in the application, and

(1) It establishes, by itself or in combination with other information, a *prima facie* case of unpatentability of a claim; or
(2) It refutes, or is inconsistent with, a position the applicant takes in:
(i) Opposing an argument of unpatentability relied on by the Office, or
(ii) Asserting an argument of patentability.

A *prima facie* case of unpatentability is established when the information compels a conclusion that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

(c) Individuals associated with the filing or prosecution of a patent application within the meaning of this section are:

(1) Each inventor named in the application;
(2) Each attorney or agent who prepares or prosecutes the application; and
(3) Every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, the applicant, an assignee, or anyone to whom there is an obligation to assign the application.

(d) Individuals other than the attorney, agent or inventor may comply with this section by disclosing information to the attorney, agent, or inventor.

(e) In any continuation-in-part application, the duty under this section includes the duty to disclose to the Office all information known to the person to be material to patentability, as defined in paragraph (b) of this section, which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

United States Patent Application
COMBINED DECLARATION AND ASSIGNMENT

Title of Invention:
DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION

DECLARATION

As a below named and undersigned inventor, I hereby declare that:

(a) This declaration is directed to United States application or PCT international application number 14/587,548 filed on December 31, 2014.

(b) The above-identified application was made or authorized to be made by me.

(c) I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I have reviewed and understand the contents of the application, including the claims, and I acknowledge the duty to disclose all information which is material to the patentability of this application as defined in 37 C.F.R. § 1.56 (attached hereto).

ASSIGNMENT

WHEREAS, the undersigned inventor ("Inventor") has developed certain inventions ("Inventions") described in the above U.S. patent application, and has full right to convey his or her entire interest, both legal and equitable, in and to said Inventions free from all prior assignments, agreements, licenses, mortgages, security interests, or other encumbrances whatsoever; and

WHEREAS, MakerBot Industries, LLC ("ASSIGNEE"), an entity organized and existing under the laws of the state of New York, and having a place of business at 1 Metrotech Center, 21st Floor, Brooklyn, NY, 11201, is desirous of acquiring the entire right, title, and interest in and to the Inventions and any and all patents to be obtained therefore;

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged by the Inventor, the Inventor hereby sells, assigns and transfers unto the ASSIGNEE, its successors and assigns, his or her entire right, title and interest in and to the Inventions as described in the above application and all applications resulting therefrom, including any and all conversions, divisions, continuations, continuations-in-part, substitute applications, and reissues or extensions thereof; and all resulting patents in any jurisdiction worldwide; along with all rights of priority and rights to sue for past infringement;

AND the Inventor hereby authorizes and requests the issuing authority to issue any and all patents issuing from any of the forgoing to the ASSIGNEE or its successors and assigns;

AND the Inventor agrees that ASSIGNEE's counsel, Strategic Patents, P.C. having Patent Office Customer Number 43520, shall hereinafter act on behalf of the ASSIGNEE with respect to the Inventions;

AND the Inventor further agrees, without any further payment or compensation by the ASSIGNEE or its successors and assigns, to communicate to the ASSIGNEE, its representatives or agents or its successors and assigns, any facts relating to the Inventions including evidence for interference purposes or for other legal proceedings whenever requested; to testify in any interference or other legal proceedings, whenever requested; to execute and deliver, on request, all lawful papers required to make any of the foregoing provisions effective; and to generally do everything possible to aid the ASSIGNEE, its successors or assigns and nominees to secure, obtain and enforce proper patent protection for the Inventions in this or any foreign country.

The Inventor hereby authorizes the attorneys and agents associated with Patent Office Customer Number 43520 to insert hereon any further information necessary or desirable for recordation of this document.

I accept and agree to the terms of the ASSIGNMENT above.

I hereby acknowledge that any willful false statement made in the DECLARATION above is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

Full Legal Name of inventor: Alison N. Leonard
Residence: Brooklyn, NY

Signature: _____ Date: 1-18-2015
Alison N. Leonard

§ 1.56 Duty to disclose information material to patentability.

(a) A patent by its very nature is affected with a public interest. The public interest is best served, and the most effective patent examination occurs when, at the time an application is being examined, the Office is aware of and evaluates the teachings of all information material to patentability. Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section. The duty to disclose information exists with respect to each pending claim until the claim is cancelled or withdrawn from consideration, or the application becomes abandoned. Information material to the patentability of a claim that is cancelled or withdrawn from consideration need not be submitted if the information is not material to the patentability of any claim remaining under consideration in the application. There is no duty to submit information which is not material to the patentability of any existing claim. The duty to disclose all information known to be material to patentability is deemed to be satisfied if all information known to be material to patentability of any claim issued in a patent was cited by the Office or submitted to the Office in the manner prescribed by §§ 1.97(b)-(d) and 1.98. However, no patent will be granted on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct. The Office encourages applicants to carefully examine:

(1) Prior art cited in search reports of a foreign patent office in a counterpart application, and
(2) The closest information over which individuals associated with the filing or prosecution of a patent application believe any pending claim patentably defines, to make sure that any material information contained therein is disclosed to the Office.

(b) Under this section, information is material to patentability when it is not cumulative to information already of record or being made of record in the application, and

(1) It establishes, by itself or in combination with other information, a *prima facie* case of unpatentability of a claim; or
(2) It refutes, or is inconsistent with, a position the applicant takes in:
(i) Opposing an argument of unpatentability relied on by the Office, or
(ii) Asserting an argument of patentability.

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(c) Individuals associated with the filing or prosecution of a patent application within the meaning of this section are:

(1) Each inventor named in the application;
(2) Each attorney or agent who prepares or prosecutes the application; and
(3) Every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, the applicant, an assignee, or anyone to whom there is an obligation to assign the application.

(d) Individuals other than the attorney, agent or inventor may comply with this section by disclosing information to the attorney, agent, or inventor.

(e) In any continuation-in-part application, the duty under this section includes the duty to disclose to the Office all information known to the person to be material to patentability, as defined in paragraph (b) of this section, which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

Electronic Acknowledgement Receipt

EFS ID:	22924567
Application Number:	14587548
International Application Number:	
Confirmation Number:	6946
Title of Invention:	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION
First Named Inventor/Applicant Name:	Alison N. Leonard
Customer Number:	43520
Filer:	Robert A. Mazzarese/Yeanie Huggins
Filer Authorized By:	Robert A. Mazzarese
Attorney Docket Number:	MBOT-0070-P01
Receipt Date:	15-JUL-2015
Filing Date:	31-DEC-2014
Time Stamp:	14:21:04
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	MBOT-0070-P01_071515_DecCommunication_PTO.pdf	76499 b0743239611d329a7a08f16e6b39aff9127e9802	no	1
Warnings:					
Information:					

2	Oath or Declaration filed	MBOT-0070-P01_071015_ExecutedDeclAssg_Sadusk_PTO.pdf	338758 ed9db29ce625a7503822492f1922f5f7e3570798	no	4
Warnings:					
Information:					
3	Oath or Declaration filed	MBOT-0070-P01_011815_Executed_DeclAssg_Leonard_PTO.pdf	62921 2a9c018c454a56ae09b0effe92c4b82e4c3b8219	no	4
Warnings:					
Information:					
		Total Files Size (in bytes):	478178		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

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.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14/587,548
	Filing Date	Dec 31, 2014
	First Named Inventor	Alison N. Leonard
	Art Unit	2127
	Examiner Name	ALI, MOHAMMAD
Sheet 1 of 3	**Attorney Docket No.**	MBOT-0070-P01

U.S. PATENTS

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
		US-7639253		Dec 29, 2009	Bae, Seockhoon et al.	
		US-7052103		May 30, 2006	Silverbrook et al.	
		US-6227643		May 8, 2001	Purcell, David A., et al.	

U.S. PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Cnty Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T[5]

NON-PATENT LITERATURE DOCUMENTS

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, page(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	NPL-139	GIGASAVVY, "Getting Started with Airwolf 3D Printer SLIC3R Configurations", https://airwolf3d.com/question/3d-printer-slic3r-configurations/ Jan 21, 2013 , 12 Pages	
	NPL-141	ASTROPRINT, "Cloud OS for Desktop 3D Printers", https://www.astroprint.com/ 2015 , 5 Pages	
	NPL-140	INDIEGOGO, INC., "PrintToPeer: Your 3D Printer on the Web", https://www.indiegogo.com/projects/printtopeer-your-3d-printer-on-the-web#/story 2015 , 21 pages	
	NPL-138	SOLIDSCAPE, INC., , "Solidscape Element DLL Developer's Manual", Copyright 2014 by Solidscape Inc. a Stratasys Company, 316 DW Highway, Merrimack NH 03054, USA 2014 , 71 pages	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14/587,548
	Filing Date	Dec 31, 2014
	First Named Inventor	Alison N. Leonard
	Art Unit	2127
	Examiner Name	ALI, MOHAMMAD
Sheet 2 of 3	**Attorney Docket No.**	MBOT-0070-P01

EXAMINER SIGNATURE			
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.

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.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ Applicant believes that no fees are required with this filing. However, if an Office Action on the merits has been mailed, or a fee is otherwise required, the Commissioner is hereby authorized to charge any fees due under 37 C.F.R. §§1.16 or 1.17, or to credit any overpayments, to Deposit Account No. 50-4262 in order to have this information disclosure statement considered.

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	/Robert Mazzarese/	Date (YYYY-MM-DD)	2015-07-10
Name/Print	Robert A. Mazzarese	Registration Number	42,852

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14/587,548
	Filing Date	Dec 31, 2014
	First Named Inventor	Alison N. Leonard
	Art Unit	2127
	Examiner Name	ALI, MOHAMMAD
Sheet 3 of 3	**Attorney Docket No.**	MBOT-0070-P01

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.**

Electronic Acknowledgement Receipt	
EFS ID:	22882984
Application Number:	14587548
International Application Number:	
Confirmation Number:	6946
Title of Invention:	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION
First Named Inventor/Applicant Name:	Alison N. Leonard
Customer Number:	43520
Filer:	Robert A. Mazzarese/Paula Ng
Filer Authorized By:	Robert A. Mazzarese
Attorney Docket Number:	MBOT-0070-P01
Receipt Date:	10-JUL-2015
Filing Date:	31-DEC-2014
Time Stamp:	13:55:10
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	MBOT-0070-P01_071015_Form1449.pdf	77766 d9bac3286ea48e968e222b84e774932f7573e993	no	3

Warnings:
Information:

This is not an USPTO supplied IDS fillable form					
2	Non Patent Literature	NPL-139_GettingStartedWithAir.pdf	1053445 96f3ab489c2a08e077256ed604068d5d04b6c4ab	no	12
Warnings:					
Information:					
3	Non Patent Literature	NPL-141_Wireless3DPrintingAstroPrint.pdf	406815 9f8cd4e2dc26264a8cde5df8df89b5c89ce87027	no	5
Warnings:					
Information:					
4	Non Patent Literature	NPL-140_PrintToPeer.pdf	2944088 6902ba2cdad0e7f3559e4186a0804e721c9f7ed1	no	21
Warnings:					
Information:					
5	Non Patent Literature	NPL-138_ElementDLL_Developers_Guide.pdf	450311 5306873fc9e4165cff86f2989a753a054bc3ab0c	no	71
Warnings:					
Information:					
		Total Files Size (in bytes):	4932425		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
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National Stage of an International Application under 35 U.S.C. 371
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New International Application Filed with the USPTO as a Receiving Office
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UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/587,548	12/31/2014	Alison N. Leonard	MBOT-0070-P01

CONFIRMATION NO. 6946

43520
STRATEGIC PATENTS P.C.
P.O. BOX 920629
NEEDHAM, MA 02492

NOTICE

OC000000074248225

Date Mailed: 03/27/2015

INFORMATIONAL NOTICE TO APPLICANT

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

The item(s) indicated below are also required and should be submitted with any reply to this notice to avoid further processing delays.

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):
  Alison N. Leonard
  Joseph Sadusk

UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
14/587,548	12/31/2014	2673	1740	MBOT-0070-P01	20	1

CONFIRMATION NO. 6946

43520
STRATEGIC PATENTS P.C.
P.O. BOX 920629
NEEDHAM, MA 02492

UPDATED FILING RECEIPT



Date Mailed: 03/27/2015

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Alison N. Leonard, Brooklyn, NY;
Joseph Sadusk, New York, NY;

Applicant(s)

MakerBot Industries, LLC, Brooklyn, NY

Power of Attorney: The patent practitioners associated with Customer Number 43520

Domestic Applications for which benefit is claimed - None.
A proper domestic benefit claim must be provided in an Application Data Sheet in order to constitute a claim for domestic benefit. See 37 CFR 1.76 and 1.78.

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access - A proper **Authorization to Permit Access to Application by Participating Offices** (PTO/SB/39 or its equivalent) has been received by the USPTO.

If Required, Foreign Filing License Granted: 01/21/2015
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/587,548**
Projected Publication Date: 06/30/2016
Non-Publication Request: No
Early Publication Request: No

Title

DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION

Preliminary Class

358

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

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Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

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Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 14/587,548

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	280
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	600
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	720
TOTAL CLAIMS (37 CFR 1.16(i))	20 minus 20 =	*			OR	x 80 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1 minus 3 =	*				x 420 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1600

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)	OR	RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Serial No.: 14/587,548
Filing Date: December 31, 2014
In re: Alison N. Leonard, *et al.*
Art Unit: 2673
Examiner: Not Yet Known
Conf. No.: 6946

Commissioner for Patents
PO Box 1450
Alexandria, Virginia 22313-1450

PRELIMINARY AMENDMENT

Sir/Madam:

Please enter the following amendments prior to examination on the merits:

Amendments to the Claims begin on page 2 of this paper.

Remarks begin on page 5 of this paper.

Amendments to the Claims

Please amend the claims according to the following claim listing, which replaces all prior versions and listings of the claims in this application:

1. (Original) A method comprising:

receiving a request to fabricate an object from a three-dimensional model;

determining a target printer to fabricate the object;

querying the target printer for one or more properties relevant to fabrication of the object;

receiving a dictionary of the one or more properties from the target printer;

creating a fabrication profile based on the one or more properties; and

generating a machine-ready representation of the three-dimensional model executable by the target printer to fabricate the object.

2. (Original) The method of claim 1 further comprising transmitting the machine-ready representation to the target printer for fabrication.

3. (Original) The method of claim 1 further comprising fabricating the object with the target printer.

4. (Original) The method of claim 1 wherein the one or more properties include a hardware configuration of the target printer.

5. (Original) The method of claim 4 wherein the hardware configuration includes one or more of an extruder type, an extruder nozzle diameter, a build volume, a build platform type, a hardware version number, a top speed for linear movement of a tool, a step size for movement of the tool, a minimum z-axis step size, a gantry type, and a build material type.

6. (Original) The method of claim 4 wherein the hardware configuration includes an automatically detected hardware reconfiguration.

7. (Original) The method of claim 4 wherein the hardware configuration includes a manually specified hardware reconfiguration.

8. (Original) The method of claim 1 wherein the one or more properties include a firmware configuration of the target printer.

9. (Original) The method of claim 1 wherein the one or more properties include one or more user settings on the target printer.

10. (Original) The method of claim 9 wherein the one or more user settings include user settings from a previous fabrication process.

11. (Original) The method of claim 1 wherein the one or more properties include an application used to operate the target printer.

12. (Original) The method of claim 1 wherein the one or more properties include a build material in the target printer.

13. (Original) The method of claim 1 further comprising receiving an identifier from the target printer and applying the identifier to retrieve the dictionary from a repository of printer information remote from the target printer.

14. (Original) The method of claim 1 wherein generating the machine-ready representation includes processing the three-dimensional model according to the fabrication profile.

15. (Original) The method of claim 1 wherein generating the machine-ready representation includes selecting one of a plurality of stored machine-ready models according to the fabrication profile as the machine-ready representation.

16. (Original) The method of claim 15 further comprising:

determining whether one of the plurality of stored machine-ready models can be modified to meet the fabrication profile;

modifying the one of the plurality of stored machine ready models for use as the machine-ready representation if possible; and

generating a new machine-ready representation according to the fabrication profile for use as the machine-ready representation if not possible.

17. (Original) The method of claim 16 wherein modifying includes one or more of translating the machine-ready representation, rotating the machine-ready representation, scaling the machine-ready representation, and changing a top speed in a tool path for the target printer.

18. (Original) The method of claim 1 further comprising determining whether a suitable machine-ready model is available for the fabrication profile.

19. (Original) The method of claim 18 further comprising selecting the suitable machine-ready model if available and generating the machine-ready representation according to the fabrication profile if not available.

20. (Original) The method of claim 1 further comprising generating descriptive metadata to accompany the machine-ready representation, the descriptive metadata specifying one or more properties for comparison to properties of printers selected for fabricating the model.

21-31 (Cancelled).

Remarks

In this Preliminary Amendment, claims 21-31 are canceled. Claims 1-20 are presented for examination, where claim 1 is independent. No new matter is added.

The Director is hereby authorized to charge any fees or to credit any overpayments associated with this filing to Deposit Account No. 50-4262.

Respectfully submitted
STRATEGIC PATENTS, P.C.

/John H. Nortrup/
John H. Nortrup
Reg. No. 59,063
Tel.: (207)-590-0723

March 23, 2015

Electronic Patent Application Fee Transmittal

Application Number:	14587548
Filing Date:	31-Dec-2014
Title of Invention:	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION
First Named Inventor/Applicant Name:	Alison N. Leonard
Filer:	John H. Nortrop
Attorney Docket Number:	MBOT-0070-P01

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility application filing	1011	1	280	280
Utility Search Fee	1111	1	600	600
Utility Examination Fee	1311	1	720	720
Pages:				
Claims:				
Miscellaneous-Filing:				
Late Filing Fee for Oath or Declaration	1051	1	140	140
Petition:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**1740**

Electronic Acknowledgement Receipt	
EFS ID:	21852341
Application Number:	14587548
International Application Number:	
Confirmation Number:	6946
Title of Invention:	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION
First Named Inventor/Applicant Name:	Alison N. Leonard
Customer Number:	43520
Filer:	John H. Nortrop
Filer Authorized By:	
Attorney Docket Number:	MBOT-0070-P01
Receipt Date:	23-MAR-2015
Filing Date:	31-DEC-2014
Time Stamp:	17:03:21
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1740
RAM confirmation Number	4319
Deposit Account	504262
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Applicant Response to Pre-Exam Formalities Notice	MBOT-0070-P01_032315_MissingParts.pdf	91278 03059c19eed9462a862d11465f3c0f8f78b84b8e	no	2
Warnings:					
Information:					
2	Transmittal Letter	MBOT-0070-P01_032315_MPCommunication.pdf	69558 67d74c8782b5e9e3f250d741a78d5d1f02503e1d	no	1
Warnings:					
Information:					
3		MBOT-0070-P01_032315_PreliminaryAmendment.pdf	95495 f0e21578ad4a4894d941dd61c66b168b89c8a1e0	yes	5

Multipart Description/PDF files in .zip description

Document Description	Start	End
Preliminary Amendment	1	1
Claims	2	4
Applicant Arguments/Remarks Made in an Amendment	5	5

Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	36950 d1fe13d5c0e40ff51478e53261e71420ccb2a5bf	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	293281		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

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.

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/587,548	12/31/2014	Alison N. Leonard	MBOT-0070-P01

CONFIRMATION NO. 6946

43520
STRATEGIC PATENTS P.C.
P.O. BOX 920629
NEEDHAM, MA 02492

FORMALITIES LETTER

OC000000072958016

Date Mailed: 01/22/2015

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.
- The application search fee must be submitted.
- The application examination fee must be submitted.
- Additional claim fees of $ **880** as an undiscounted entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.
- Surcharge as set forth in 37 CFR 1.16(f) must be submitted.
  The surcharge is due for any one of:
  - late submission of the basic filing fee, search fee, or examination fee,
  - late submission of inventor's oath or declaration,
  - filing an application that does not contain at least one claim on filing, or
  - submission of an application filed by reference to a previously filed application.

SUMMARY OF FEES DUE:

The fee(s) required within **TWO MONTHS** from the date of this Notice to avoid abandonment is/are itemized below. No entity status discount is in effect. If applicant is qualified for small entity status, a written assertion of small entity status must be submitted to establish small entity status. (See 37 CFR 1.27). If applicant is qualified for micro entity status, an acceptable Certification of Micro Entity Status must be submitted to establish micro entity status. (See 37 CFR 1.29 and forms PTO/SB/15A and 15B.)

- $ **280** basic filing fee.
- $ **140** surcharge.
- $ **600** search fee.
- $ **720** examination fee.
- $ **880** for **11** total claims over 20.

- $(**0**) previous unapplied payment amount.
- $ **2620** TOTAL FEE BALANCE DUE.

Items Required To Avoid Processing Delays:

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):
  Alison N. Leonard
  Joseph Sadusk

Replies must be received in the USPTO within the set time period or must include a proper Certificate of Mailing or Transmission under 37 CFR 1.8 with a mailing or transmission date within the set time period. For more information and a suggested format, see Form PTO/SB/92 and MPEP 512.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web, including a copy of this Notice and selecting the document description "Applicant response to Pre-Exam Formalities Notice". https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html

For more information about EFS-Web please call the USPTO Electronic Business Center at **1-866-217-9197** or visit our website at http://www.uspto.gov/ebc.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

/makanno/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

EFS Web

PATENTS
MBOT-0070-P01

In re application of Alison N. Leonard, *et al.* : Group Art Unit: 2673

Serial No. 14/587,548 : Confirmation No. 6946

Filed: December 31, 2014 : Examiner: Not yet known

NOTICE TO FILE MISSING PARTS RESPONSE

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

For the above identified application, in response to a Notice To File Missing Parts mailed January 22, 2015, the applicant submits herewith the total application filing fees, and a preliminary amendment. The application fees are provided by EFS Web.

The applicant hereby authorizes the Patent Office to charge any deficiencies or credit any overpayments associated with this filing to Deposit Account No. 50-4262.

Please direct any inquiry regarding this matter to the below signed agent.

Respectfully Submitted,

STRATEGIC PATENTS, P.C.

/John Nortrup/

John H. Nortrup
Reg. No. 59,063
(207) 590-0723
Customer Number 43520

March 23, 2015

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/587,548	12/31/2014	Alison N. Leonard	MBOT-0070-P01

CONFIRMATION NO. 6946

43520
STRATEGIC PATENTS P.C.
P.O. BOX 920629
NEEDHAM, MA 02492

FORMALITIES LETTER

OC000000072958016

Date Mailed: 01/22/2015

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.
- The application search fee must be submitted.
- The application examination fee must be submitted.
- Additional claim fees of $ **880** as an undiscounted entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.
- Surcharge as set forth in 37 CFR 1.16(f) must be submitted.
  The surcharge is due for any one of:
  - late submission of the basic filing fee, search fee, or examination fee,
  - late submission of inventor's oath or declaration,
  - filing an application that does not contain at least one claim on filing, or
  - submission of an application filed by reference to a previously filed application.

SUMMARY OF FEES DUE:

The fee(s) required within **TWO MONTHS** from the date of this Notice to avoid abandonment is/are itemized below. No entity status discount is in effect. If applicant is qualified for small entity status, a written assertion of small entity status must be submitted to establish small entity status. (See 37 CFR 1.27). If applicant is qualified for micro entity status, an acceptable Certification of Micro Entity Status must be submitted to establish micro entity status. (See 37 CFR 1.29 and forms PTO/SB/15A and 15B.)

- $ **280** basic filing fee.
- $ **140** surcharge.
- $ **600** search fee.
- $ **720** examination fee.
- $ **880** for **11** total claims over 20.

- $(**0**) previous unapplied payment amount.
- $ **2620** TOTAL FEE BALANCE DUE.

Items Required To Avoid Processing Delays:

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):
  Alison N. Leonard
  Joseph Sadusk

Replies must be received in the USPTO within the set time period or must include a proper Certificate of Mailing or Transmission under 37 CFR 1.8 with a mailing or transmission date within the set time period. For more information and a suggested format, see Form PTO/SB/92 and MPEP 512.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web, including a copy of this Notice and selecting the document description "Applicant response to Pre-Exam Formalities Notice". https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html

For more information about EFS-Web please call the USPTO Electronic Business Center at **1-866-217-9197** or visit our website at http://www.uspto.gov/ebc.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

/makanno/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 14/587,548

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	280
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	600
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	720
TOTAL CLAIMS (37 CFR 1.16(i))	31 minus 20 =	* 11			OR	x 80 =	880
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*				x 420 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	2480

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)	OR	RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
14/587,548	12/31/2014	2673	0.00	MBOT-0070-P01	31	3

CONFIRMATION NO. 6946

43520
STRATEGIC PATENTS P.C.
P.O. BOX 920629
NEEDHAM, MA 02492

FILING RECEIPT

OC000000072958015

Date Mailed: 01/22/2015

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Alison N. Leonard, Brooklyn, NY;
Joseph Sadusk, New York, NY;

Applicant(s)

MakerBot Industries, LLC, Brooklyn, NY

Power of Attorney: The patent practitioners associated with Customer Number 43520

Domestic Applications for which benefit is claimed - None.
A proper domestic benefit claim must be provided in an Application Data Sheet in order to constitute a claim for domestic benefit. See 37 CFR 1.76 and 1.78.

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access - A proper **Authorization to Permit Access to Application by Participating Offices** (PTO/SB/39 or its equivalent) has been received by the USPTO.

If Required, Foreign Filing License Granted: 01/21/2015
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/587,548**
Projected Publication Date: To Be Determined - pending completion of Missing Parts
Non-Publication Request: No
Early Publication Request: No

Title

DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION

Preliminary Class

358

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

Doc Code: PA..

Document Description: Power of Attorney

PTO/AIA/82A (07-12)

Approved for use through 11/30/2014. OMB 0651-0035

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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.

TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B or equivalent) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5. If the Power of Attorney by Applicant form is not accompanied by this transmittal form or an equivalent, the Power of Attorney will not be recognized in the application.

Application Number	Not yet known
Filing Date	December 31, 2014
First Named Inventor	Alison N. Leonard
Title	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION
Art Unit	N/A
Examiner Name	N/A
Attorney Docket Number	MBOT-0070-P01

SIGNATURE of Applicant or Patent Practitioner

Signature	/Robert Mazzarese/	Date	December 31, 2014
Name	Robert A. Mazzarese	Telephone	617-916-2658
Registration Number	42,852		

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

☐ *Total of 1 (one) forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. 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 1.11 and 1.14. This collection is estimated to take 3 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, 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.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Doc Code: PA..
Document Description: Power of Attorney

PTO/AIA/82B (07-13)
Approved for use through 11/30/2014. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
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.

POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

☑ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above: 43520

OR

☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:

☑ The address associated with the above-mentioned Customer Number

OR

☐ The address associated with Customer Number:

OR

Firm or Individual Name					
Address					
City		State		Zip	
Country					
Telephone		Email			

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

MakerBot Industries, LLC

☐ Inventor or Joint Inventor (title not required below)

☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)

☑ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)

☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature	/RMC/	Date (Optional)	
Name	R McCarthy		
Title	VP - Legal		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ Total of forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. 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 1.11 and 1.14. This collection is estimated to take 3 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, 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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Electronic Acknowledgement Receipt	
EFS ID:	21099886
Application Number:	14587548
International Application Number:	
Confirmation Number:	6946
Title of Invention:	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION
First Named Inventor/Applicant Name:	Alison N. Leonard
Customer Number:	43520
Filer:	John H. Nortrop
Filer Authorized By:	
Attorney Docket Number:	MBOT-0070-P01
Receipt Date:	31-DEC-2014
Filing Date:	
Time Stamp:	14:07:00
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	MBOT-0070-P01_123114_ADS.pdf	1503507 2bdfe459403e04cc9ef56dac79764bc441f6ae6b	no	6
Warnings:					
Information:					

2	Drawings-only black and white line drawings	MBOT-0070-P01_123114_Drawings.pdf	124443 805979613159ee21e59a8c7e200fcd8a61ec86a0	no	7
Warnings:					
Information:					
3		MBOT-0070-P01_123114_Specification.pdf	211004 959d77dcd1254f05f9886b15ba16d9331234857c	yes	58

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Specification	1	52
	Claims	53	57
	Abstract	58	58

Warnings:					
Information:					
4	Power of Attorney	MBOT-0070-P01_123114_POA.pdf	590755 7ac5a4c8e056efbd67a5dbe73e9ed22dc103947d	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	2429709		

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<u>New Applications Under 35 U.S.C. 111</u>
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.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
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.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
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.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	MBOT-0070-P01
	Application Number	
Title of Invention	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Alison	N.	Leonard	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Brooklyn	State/Province	NY	Country of Residence i	US

Mailing Address of Inventor:

Address 1	MakerBot Industries, LLC		
Address 2	1 Metrotech Center, 21st Floor		
City	Brooklyn	State/Province	NY
Postal Code	11201	Country i	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Joseph		Sadusk	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	New York	State/Province	NY	Country of Residence i	US

Mailing Address of Inventor:

Address 1	690 10th Ave.		
Address 2	Apt# 3R		
City	New York	State/Province	NY
Postal Code	10019	Country i	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	MBOT-0070-P01
	Application Number	
Title of Invention	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION	

☐ **An Address is being provided for the correspondence Information of this application.**			
Customer Number	43520		
Email Address	patents@stratpat.com	Add Email	Remove Email

Application Information:

Title of the Invention	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION		
Attorney Docket Number	MBOT-0070-P01	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	7	**Suggested Figure for Publication (if any)**	

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)
☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	43520		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	MBOT-0070-P01
	Application Number	
Title of Invention	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION	

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX) [i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(h)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country [i]	Filing Date (YYYY-MM-DD)	Access Code [i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

Authorization to Permit Access:

☒ Authorization to Permit Access to the Instant Application by the Participating Offices

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In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	MBOT-0070-P01
	Application Number	
Title of Invention	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1 Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

(•) Assignee	( ) Legal Representative under 35 U.S.C. 117	( ) Joint Inventor
( ) Person to whom the inventor is obligated to assign.	( ) Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Applicant is an Organization check here. [X]

Organization Name	MakerBot Industries, LLC		
Mailing Address Information:			
Address 1	1 Metrotech Center		
Address 2	21st Floor		
City	Brooklyn	**State/Province**	NY
Country [i]	US	Postal Code	11201
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Non-Applicant Assignee Information:

Providing assignment information in this section does not subsitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	MBOT-0070-P01
	Application Number	
Title of Invention	DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION	

Assignee 1

Complete this section only if non-applicant assignee information is desired to be included on the patent application publication in accordance with 37 CFR 1.215(b). Do not include in this section an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest), as the patent application publication will include the name of the applicant(s).

Remove

If the Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information:

Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

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

Signature	/John H. Nortrup/			Date (YYYY-MM-DD)	2014-12-31
First Name	John	Last Name	Nortrup	Registration Number	59063

Additional Signature may be generated within this form by selecting the Add button. Add

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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.

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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 inspections or an issued patent.

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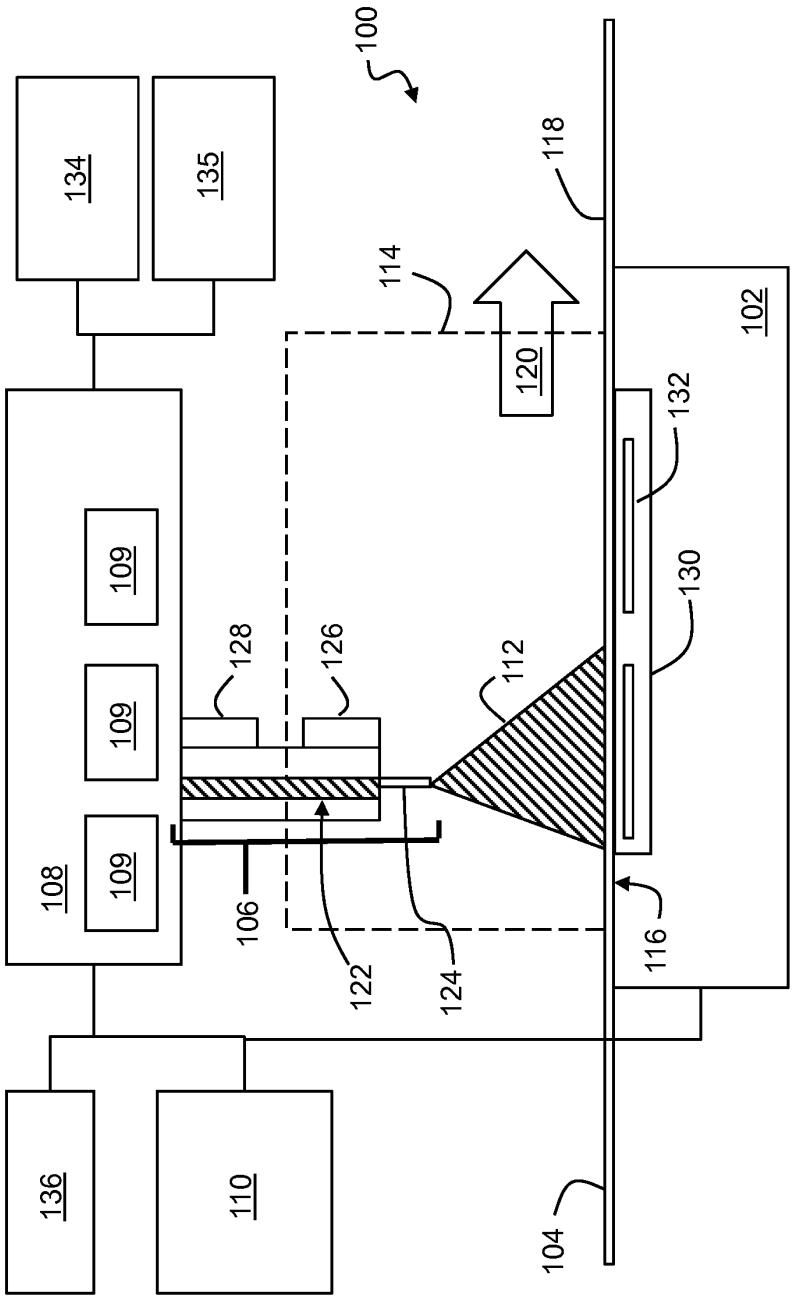

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FIG. 1

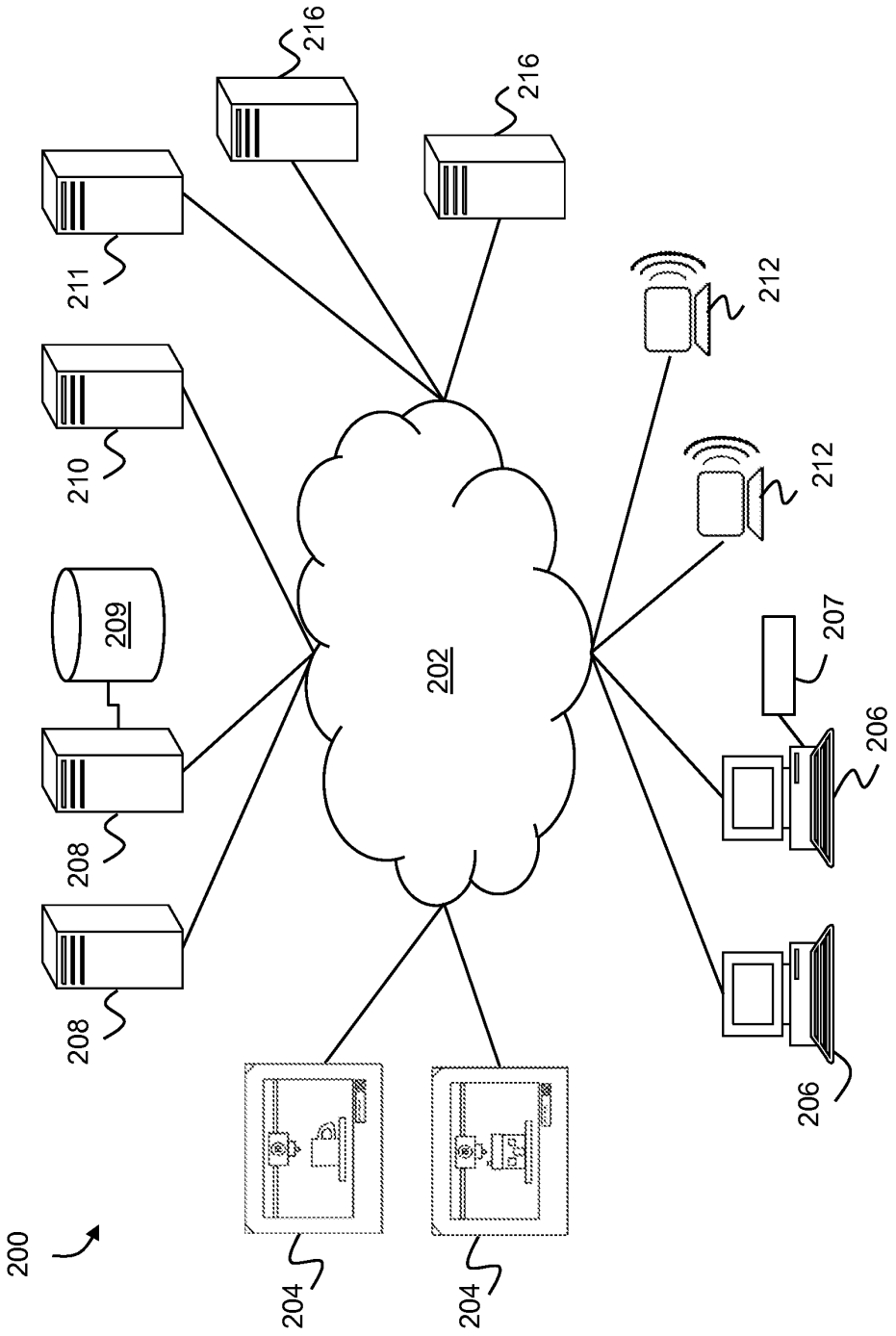


FIG. 2

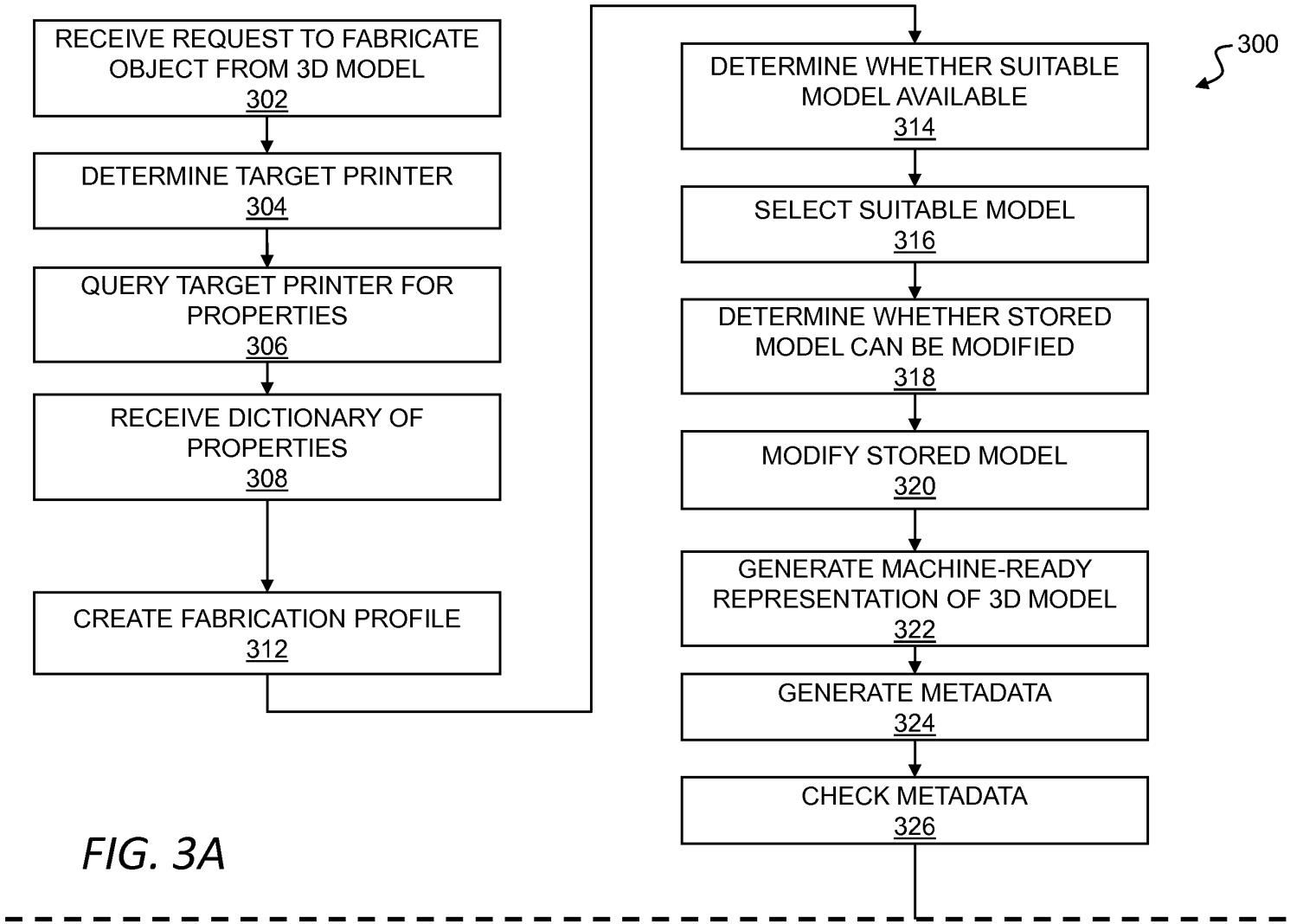

RECEIVE REQUEST TO FABRICATE OBJECT FROM 3D MODEL
302
DETERMINE TARGET PRINTER
304
QUERY TARGET PRINTER FOR PROPERTIES
306
RECEIVE DICTIONARY OF PROPERTIES
308
CREATE FABRICATION PROFILE
312
DETERMINE WHETHER SUITABLE MODEL AVAILABLE
314
SELECT SUITABLE MODEL
316
DETERMINE WHETHER STORED MODEL CAN BE MODIFIED
318
MODIFY STORED MODEL
320
GENERATE MACHINE-READY REPRESENTATION OF 3D MODEL
322
GENERATE METADATA
324
CHECK METADATA
326
300

FIG. 3A

464

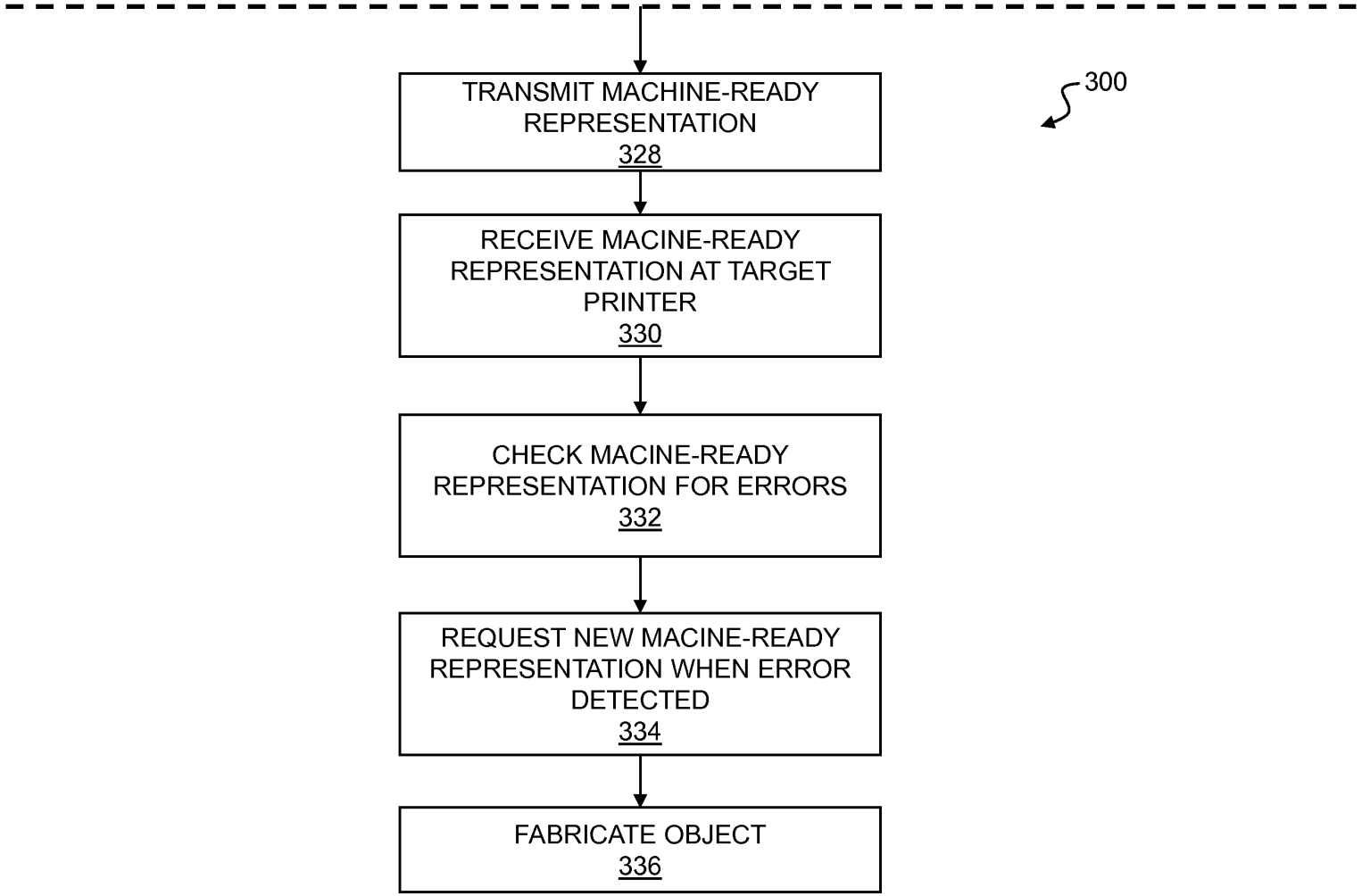

TRANSMIT MACHINE-READY REPRESENTATION
328
RECEIVE MACINE-READY REPRESENTATION AT TARGET PRINTER
330
CHECK MACINE-READY REPRESENTATION FOR ERRORS
332
REQUEST NEW MACINE-READY REPRESENTATION WHEN ERROR DETECTED
334
FABRICATE OBJECT
336
300

FIG. 3B

465

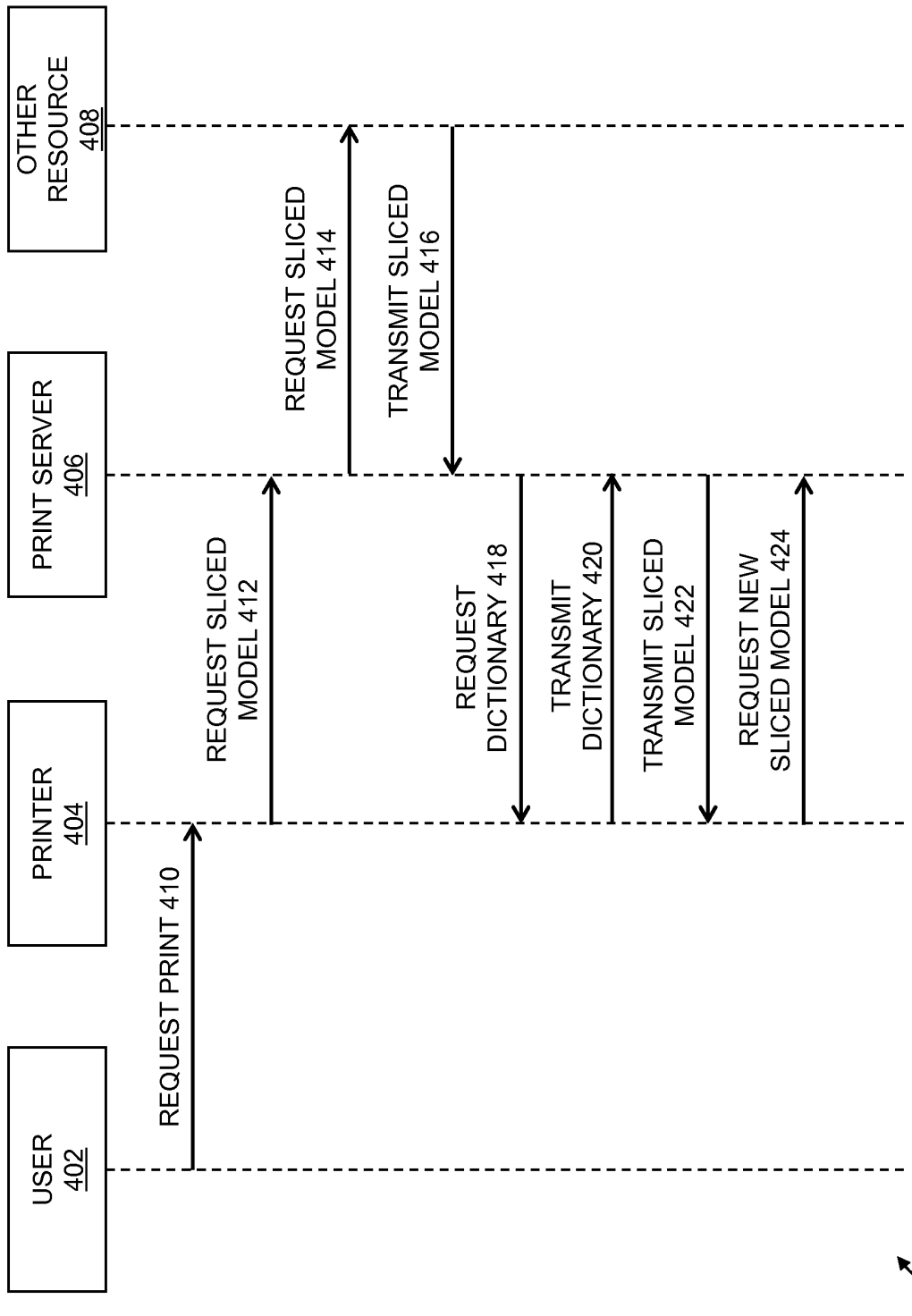

USER 402
PRINTER 404
PRINT SERVER 406
OTHER RESOURCE 408
REQUEST PRINT 410
REQUEST SLICED MODEL 412
REQUEST SLICED MODEL 414
TRANSMIT SLICED MODEL 416
REQUEST DICTIONARY 418
TRANSMIT DICTIONARY 420
TRANSMIT SLICED MODEL 422
REQUEST NEW SLICED MODEL 424
400

FIG. 4

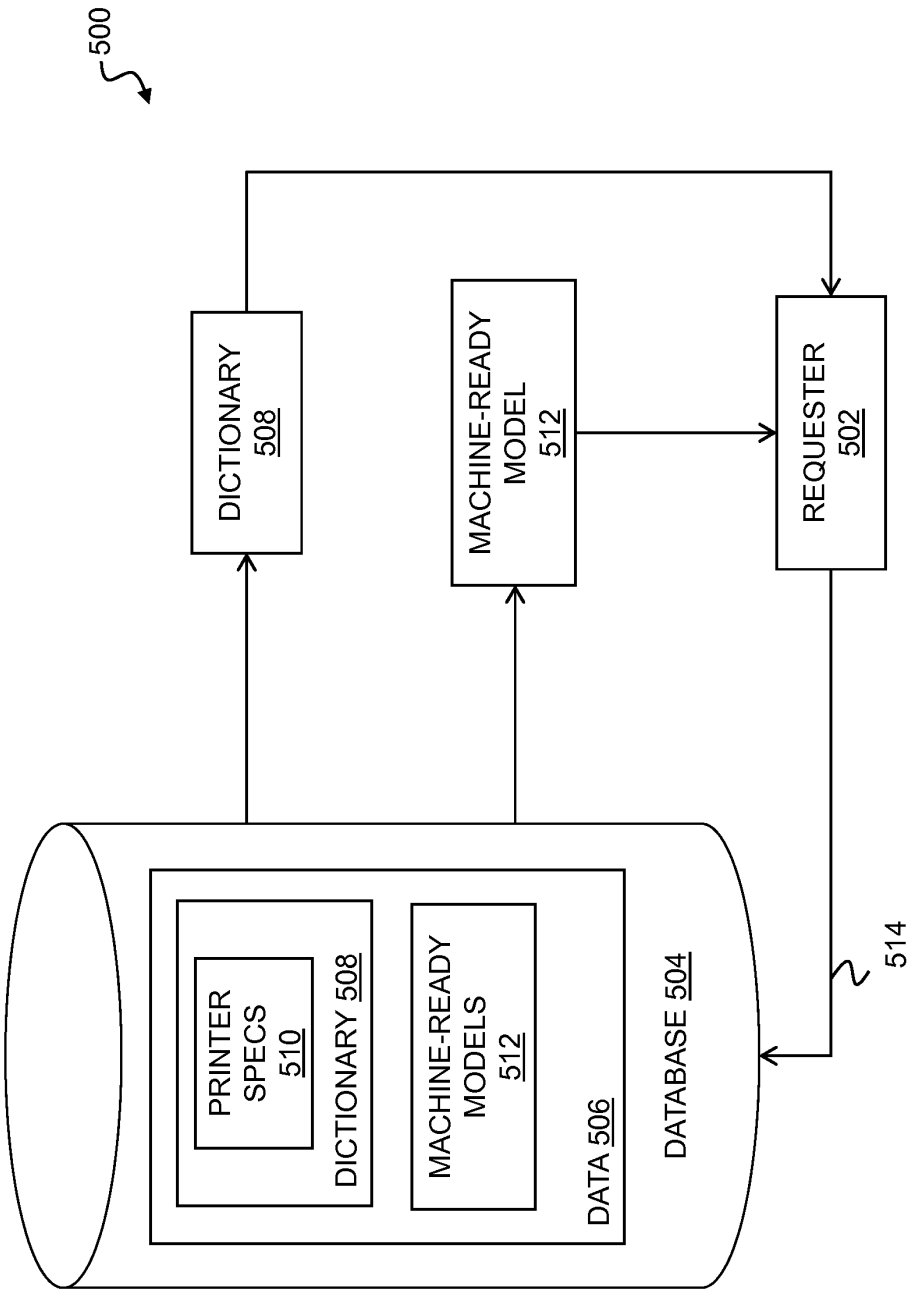

500
DICTIONARY 508
MACHINE-READY MODEL 512
REQUESTER 502
PRINTER SPECS 510
DICTIONARY 508
MACHINE-READY MODELS 512
DATA 506
DATABASE 504
514

FIG. 5

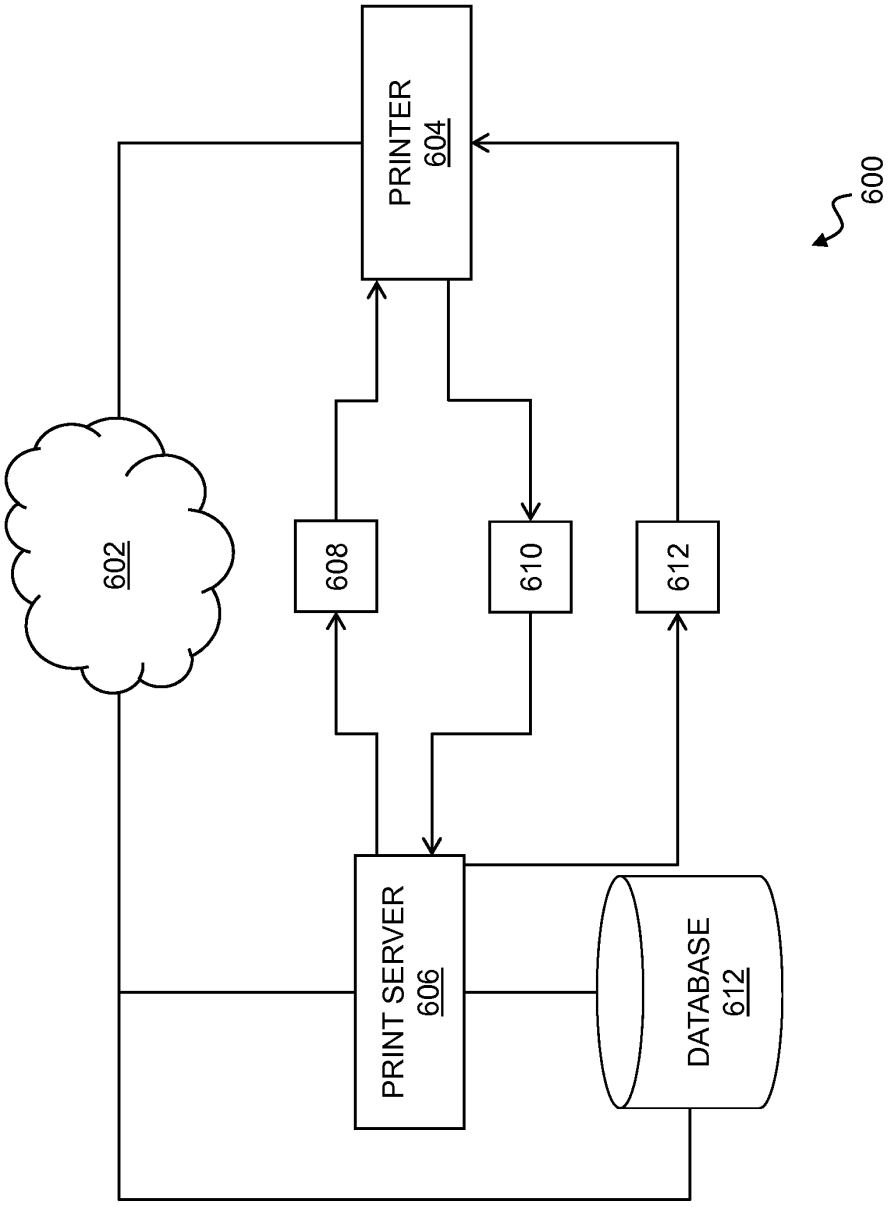

PRINTER
604
600
602
608
610
612
PRINT SERVER
606
DATABASE
612

FIG. 6

DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION

TECHNICAL FIELD

[0001] The present disclosure generally relates to the use of configuration information for a three-dimensional printer to select suitable machine-ready models.

BACKGROUND

[0002] Generally, three-dimensional printers execute machine-ready representations of three-dimensional models for fabricating objects. These machine-ready models are typically dependent on the configuration or properties of the three-dimensional printers, e.g., the hardware configuration, software configuration, user settings, firmware version(s) and so forth. While a three-dimensional printer may know its own hardware and software configuration, a service providing machine-ready models may not. There remains a need for providing machine-ready models based on a three-dimensional printer's configuration, and for improved matching of models to printers.

SUMMARY

[0003] The hardware and software properties of a three-dimensional printer can be queried and applied to select suitable directly printable models for the printer, or to identify situations where a new machine-ready model must be generated. The properties may be any properties relevant to fabrication including, e.g., physical properties of the printer, printer firmware, user settings, hardware configurations, and so forth. A printer may respond to configuration queries with a dictionary of capabilities or properties, and this dictionary may be used to select suitable models, or determine when a new model must be created. Similarly, when a printable model is sent to the printer, metadata for the printable model may be compared to printer properties in the dictionary to ensure that the model can be fabricated by the printer.

BRIEF DESCRIPTION OF THE DRAWINGS

[0004] The foregoing and other objects, features and advantages of the devices, systems, and methods described herein will be apparent from the following description of particular embodiments thereof, as illustrated in the accompanying drawings. The drawings are not necessarily to scale, emphasis instead being placed upon illustrating the principles of the devices, systems, and methods described herein.

[0005] Fig. 1 is a block diagram of a three-dimensional printer.

[0006] Fig. 2 depicts a networked three-dimensional printing environment.

[0007] Figs. 3A–3B show a flowchart of a method for providing machine-ready models based on printer configuration.

[0008] Fig. 4 is a sequence diagram of a system for providing machine-ready models based on printer configuration.

[0009] Fig. 5 illustrates a system for providing dictionaries and machine-ready models.

[0010] Fig. 6 illustrates a system for providing machine-ready models based on printer configuration.

DETAILED DESCRIPTION

[0011] The embodiments will now be described more fully hereinafter with reference to the accompanying figures, in which preferred embodiments are shown. The foregoing may, however, be embodied in many different forms and should not be construed as limited to the illustrated embodiments set forth herein.

[0012] All documents mentioned herein are hereby incorporated by reference in their entirety. References to items in the singular should be understood to include items in the plural, and vice versa, unless explicitly stated otherwise or clear from the text. Grammatical conjunctions are intended to express any and all disjunctive and conjunctive combinations of conjoined clauses, sentences, words, and the like, unless otherwise stated or clear from the context. Thus, the term “or” should generally be understood to mean “and/or” and so forth.

[0013] Recitation of ranges of values herein are not intended to be limiting, referring instead individually to any and all values falling within the range, unless

otherwise indicated herein, and each separate value within such a range is incorporated into the specification as if it were individually recited herein. The words "about," "approximately," or the like, when accompanying a numerical value, are to be construed as indicating a deviation as would be appreciated by one of ordinary skill in the art to operate satisfactorily for an intended purpose. Ranges of values and/or numeric values are provided herein as examples only, and do not constitute a limitation on the scope of the described embodiments. The use of any and all examples, or exemplary language ("e.g.," "such as," or the like) provided herein, is intended merely to better illuminate the embodiments and does not pose a limitation on the scope of the embodiments. No language in the specification should be construed as indicating any unclaimed element as essential to the practice of the embodiments.

[0014] In the following description, it is understood that terms such as "first," "second," "top," "bottom," "above," "below," and the like, are words of convenience and are not to be construed as limiting terms.

[0015] Described herein are devices, systems, and methods for providing machine-ready models based on a printer's configuration in three-dimensional fabrication systems. It will be understood that while the exemplary embodiments below may emphasize three-dimensional fabrication systems using extrusion, the principles of the invention may be adapted to a wide variety of three-dimensional fabrication processes or other processes where instructions for physical steps are created based on assumptions about a machine that is being controlled. This may include a variety of three-dimensional fabrication systems such as selective laser sintering systems, fused deposition modeling systems, stereolithography systems, and other three-dimensional printing systems, as well as automated fabrication lines, robotics systems, and so forth. Other systems that can be adapted for use with the techniques as described herein are also intended to fall within the scope of this disclosure. It should also be understood that any reference herein to a fabrication process such as printing or three-dimensional printing is intended to refer to any and all such additive fabrication processes unless a different meaning is explicitly stated or otherwise clear from the context. Thus, by way of example and not of limitation, a three-dimensional printer (or simply "printer") that may be adapted for use in a system

providing machine-ready models based on the printer's configuration is described with reference to Fig. 1.

[0016] Fig. 1 is a block diagram of a three-dimensional printer. In general, the printer 100 may include a build platform 102, a conveyor 104, an extruder 106, an x-y-z positioning assembly 108, and a controller 110 that cooperate to fabricate an object 112 within a working volume 114 of the printer 100.

[0017] The build platform 102 may include a surface 116 that is rigid and substantially planar. The surface 116 may support the conveyer 104 in order to provide a fixed, dimensionally and positionally stable platform on which to build the object 112.

[0018] The build platform 102 may include a thermal element 130 that controls the temperature of the build platform 102 through one or more active devices 132 such as resistive elements that convert electrical current into heat, Peltier effect devices that can create a heating or cooling effect, or any other thermoelectric heating and/or cooling devices. Thus the thermal element 130 may be a heating element that provides active heating to the build platform 102, a cooling element that provides active cooling to the build platform 102, or a combination of these. The heating element 130 may be coupled in a communicating relationship with the controller 110 in order for the controller 110 to controllably impart heat to or remove heat from the surface 116 of the build platform 102. Thus the thermal element 130 may include an active cooling element positioned within or adjacent to the build platform 102 to controllably cool the build platform 102.

[0019] It will be understood that a variety of other techniques may be employed to control a temperature of the build platform 102. For example, the build platform 102 may use a gas cooling or gas heating device such as a vacuum chamber or the like in an interior thereof, which may be quickly pressurized to heat the build platform 102 or vacated to cool the build platform 102 as desired. As another example, a stream of heated or cooled gas may be applied directly to the build platform 102 before, during, and/or after a build process. Any device or combination of devices suitable for controlling a temperature of the build platform 102 may be adapted to use as the thermal element 130 described herein.

[0020] The conveyer 104 may be formed of a sheet 118 of material that moves in a path 120 through the working volume 114. Within the working volume 114, the path

120 may pass proximal to the surface 116 of the build platform 102 – that is, resting directly on or otherwise supported by the surface 116 -- in order to provide a rigid, positionally stable working surface for a build. It will be understood that while the path 120 is depicted as a unidirectional arrow, the path 120 may be bidirectional, such that the conveyer 104 can move in either of two opposing directions through the working volume 114. It will also be understood that the path 120 may curve in any of a variety of ways, such as by looping underneath and around the build platform 102, over and/or under rollers, or around delivery and take up spools for the sheet 118 of material. Thus, while the path 120 may be generally (but not necessarily) uniform through the working volume 114, the conveyer 104 may move in any direction suitable for moving completed items from the working volume 114. The conveyor may include a motor or other similar drive mechanism (not shown) coupled to the controller 110 to control movement of the sheet 118 of material along the path 120. Various drive mechanisms are shown and described in further detail below.

[0021] In general, the sheet 118 may be formed of a flexible material such as a mesh material, a polyamide, a polyethylene terephthalate (commercially available in bi-axial form as MYLAR), a polyimide film (commercially available as KAPTON), or any other suitably strong polymer or other material. The sheet 118 may have a thickness of about three to seven thousandths of an inch, or any other thickness that permits the sheet 118 to follow the path 120 of the conveyer 104. For example, with sufficiently strong material, the sheet 118 may have a thickness of one to three thousandths of an inch. The sheet 118 may instead be formed of sections of rigid material joined by flexible links.

[0022] A working surface of the sheet 118 (e.g., an area on the top surface of the sheet 118 within the working volume 114) may be treated in a variety of manners to assist with adhesion of build material to the surface 118 and/or removal of completed objects from the surface 118. For example, the working surface may be abraded or otherwise textured (e.g., with grooves, protrusions, and the like) to improve adhesion between the working surface and the build material.

[0023] A variety of chemical treatments may be used on the working surface of the sheet 118 of material to further facilitate build processes as described herein. For example, the chemical treatment may include a deposition of material that can be

chemically removed from the conveyer 104 by use of water, solvents, or the like. This may facilitate separation of a completed object from the conveyer by dissolving the layer of chemical treatment between the object 112 and the conveyor 104. The chemical treatments may include deposition of a material that easily separates from the conveyer such as a wax, mild adhesive, or the like. The chemical treatment may include a detachable surface such as an adhesive that is sprayed on to the conveyer 104 prior to fabrication of the object 112.

[0024] In one aspect, the conveyer 104 may be formed of a sheet of disposable, one-use material that is fed from a dispenser and consumed with each successive build.

[0025] In one aspect, the conveyer 104 may include a number of different working areas with different surface treatments adapted for different build materials or processes. For example, different areas may have different textures (smooth, abraded, grooved, etc.). Different areas may be formed of different materials. Different areas may also have or receive different chemical treatments. Thus a single conveyer 104 may be used in a variety of different build processes by selecting the various working areas as needed or desired.

[0026] The extruder 106 may include a chamber 122 in an interior thereof to receive a build material. The build material may, for example, include acrylonitrile butadiene styrene ("ABS"), high-density polyethylene ("HDPL"), polylactic acid, or any other suitable plastic, thermoplastic, or other material that can usefully be extruded to form a three-dimensional object. The extruder 106 may include an extrusion tip 124 or other opening that includes an exit port with a circular, oval, slotted or other cross-sectional profile that extrudes build material in a desired cross-sectional shape.

[0027] The extruder 106 may include a heater 126 to melt thermoplastic or other meltable build materials within the chamber 122 for extrusion through an extrusion tip 124 in liquid form. While illustrated in block form, it will be understood that the heater 126 may include, e.g., coils of resistive wire wrapped about the extruder 106, one or more heating blocks with resistive elements to heat the extruder 106 with applied current, an inductive heater, or any other arrangement of heating elements suitable for creating heat within the chamber 122 to melt the build material for extrusion. The extruder 106 may

also or instead include a motor 128 or the like to push the build material into the chamber 122 and/or through the extrusion tip 124.

[0028] In general operation (and by way of example rather than limitation), a build material such as ABS plastic in filament form may be fed into the chamber 122 from a spool or the like by the motor 128, melted by the heater 126, and extruded from the extrusion tip 124. By controlling a rate of the motor 128, the temperature of the heater 126, and/or other process parameters, the build material may be extruded at a controlled volumetric rate. It will be understood that a variety of techniques may also or instead be employed to deliver build material at a controlled volumetric rate, which may depend upon the type of build material, the volumetric rate desired, and any other factors. All such techniques that might be suitably adapted to delivery of build material for fabrication of a three-dimensional object are intended to fall within the scope of this disclosure. As noted above, other techniques may be employed for three-dimensional printing, including extrusion-based techniques using a build material that is curable and/or a build material of sufficient viscosity to retain shape after extrusion.

[0029] The x-y-z positioning assembly 108 may generally be adapted to three-dimensionally position the extruder 106 and the extrusion tip 124 within the working volume 114. Thus by controlling the volumetric rate of delivery for the build material and the x, y, z position of the extrusion tip 124, the object 112 may be fabricated in three dimensions by depositing successive layers of material in two-dimensional patterns derived, for example, from cross-sections of a computer model or other computerized representation of the object 112. A variety of arrangements and techniques are known in the art to achieve controlled linear movement along one or more axes. The x-y-z positioning assembly 108 may, for example, include a number of stepper motors 109 to independently control a position of the extruder within the working volume along each of an x-axis, a y-axis, and a z-axis. More generally, the x-y-z positioning assembly 108 may include without limitation various combinations of stepper motors, encoded DC motors, gears, belts, pulleys, worm gears, threads, and so forth. Any such arrangement suitable for controllably positioning the extruder 106 within the working volume 114 may be adapted to use with the printer 100 described herein.

[0030] By way of example and not limitation, the conveyor 104 may be affixed to a bed that provides x-y positioning within the plane of the conveyor 104, while the extruder 106 can be independently moved along a z-axis. As another example, the extruder 106 may be stationary while the conveyor 104 is x, y, and z positionable. As another example, the extruder 106 may be x, y, and z positionable while the conveyer 104 remains fixed (relative to the working volume 114). In yet another example, the conveyer 104 may, by movement of the sheet 118 of material, control movement in one axis (e.g., the y-axis), while the extruder 106 moves in the z-axis as well as one axis in the plane of the sheet 118. Thus in one aspect, the conveyor 104 may be attached to and move with at least one of an x-axis stage (that controls movement along the x-axis), a y-axis stage (that controls movement along a y-axis), and a z-axis stage (that controls movement along a z-axis) of the x-y-z positioning assembly 108. More generally, any arrangement of motors and other hardware controllable by the controller 110 may serve as the x-y-z positioning assembly 108 in the printer 100 described herein. Still more generally, while an x, y, z coordinate system serves as a convenient basis for positioning within three dimensions, any other coordinate system or combination of coordinate systems may also or instead be employed, such as a positional controller and assembly that operates according to cylindrical or spherical coordinates.

[0031] The controller 110 may be electrically coupled in a communicating relationship with the build platform 102, the conveyer 104, the x-y-z positioning assembly 108, and the other various components of the printer 100. In general, the controller 110 is operable to control the components of the printer 100, such as the build platform 102, the conveyer 104, the x-y-z positioning assembly 108, and any other components of the printer 100 described herein to fabricate the object 112 from the build material. The controller 110 may include any combination of software and/or processing circuitry suitable for controlling the various components of the printer 100 described herein including without limitation microprocessors, microcontrollers, application-specific integrated circuits, programmable gate arrays, and any other digital and/or analog components, as well as combinations of the foregoing, along with inputs and outputs for transceiving control signals, drive signals, power signals, sensor signals, and so forth. In one aspect, the controller 110 may include a microprocessor or other processing circuitry

with sufficient computational power to provide related functions such as executing an operating system, providing a graphical user interface (e.g., to a display coupled to the controller 110 or printer 100), convert three-dimensional models into tool instructions, and operate a web server or otherwise host remote users and/or activity through the network interface 136 described below.

[0032] A variety of additional sensors may be usefully incorporated into the printer 100 described above. These are generically depicted as sensor 134 in Fig. 1, for which the positioning and mechanical/electrical interconnections with other elements of the printer 100 will depend upon the type and purpose of the sensor 134 and will be readily understood and appreciated by one of ordinary skill in the art. The sensor 134 may include a temperature sensor positioned to sense a temperature of the surface of the build platform 102. This may, for example, include a thermistor or the like embedded within or attached below the surface of the build platform 102. This may also or instead include an infrared detector or the like directed at the surface 116 of the build platform 102 or the sheet 118 of material of the conveyer 104. Other sensors that may be usefully incorporated into the printer 100 as the sensor 134 include a heat sensor, a volume flow rate sensor, a weight sensor, a sound sensor, and a light sensor. Certain more specific examples are provided below by way of example and not of limitation.

[0033] The sensor 134 may include a sensor to detect a presence (or absence) of the object 112 at a predetermined location on the conveyer 104. This may include an optical detector arranged in a beam-breaking configuration to sense the presence of the object 112 at a location such as an end of the conveyer 104. This may also or instead include an imaging device and image processing circuitry to capture an image of the working volume 114 and analyze the image to evaluate a position of the object 112. This sensor 134 may be used for example to ensure that the object 112 is removed from the conveyor 104 prior to beginning a new build at that location on the working surface such as the surface 116 of the build platform 102. Thus the sensor 134 may be used to determine whether an object is present that should not be, or to detect when an object is absent. The feedback from this sensor 134 may be used by the controller 110 to issue processing interrupts or otherwise control operation of the printer 100.

[0034] The sensor 134 may include a sensor that detects a position of the conveyer 104 along the path. This information may be obtained from an encoder in a motor that drives the conveyer 104, or using any other suitable technique such as a visual sensor and corresponding fiducials (e.g., visible patterns, holes, or areas with opaque, specular, transparent, or otherwise detectable marking) on the sheet 118.

[0035] The sensor 134 may include a heater (instead of or in addition to the thermal element 130) to heat the working volume 114 such as a radiant heater or forced hot air to maintain the object 112 at a fixed, elevated temperature throughout a build. The sensor 134 may also or instead include a cooling element to maintain the object 112 at a predetermined sub-ambient temperature throughout a build.

[0036] The sensor 134 may also or instead include at least one video camera. The video camera may generally capture images of the working volume 114, the object 112, or any other hardware associated with the printer 100. The video camera may provide a remote video feed through the network interface 136, which feed may be available to remote users through a user interface maintained by, e.g., remote hardware such as a three-dimensional print server, or within a web page provided by a web server hosted by the three-dimensional printer 100. Thus in one aspect there is disclosed herein a user interface adapted to present a video feed from at least one video camera of a three-dimensional printer to a remote user through a user interface.

[0037] The sensor 134 may also include more complex sensing and processing systems or subsystems, such as a three-dimensional scanner using optical techniques (e.g., stereoscopic imaging, or shape from motion imaging), structured light techniques, or any other suitable sensing and processing hardware that might extract three-dimensional information from the working volume 114. In another aspect, the sensor 134 may include a machine vision system that captures images and analyzes image content to obtain information about the status of a job, working volume 114, or an object 112 therein. The machine vision system may support a variety of imaging-based automatic inspection, process control, and/or robotic guidance functions for the three-dimensional printer 100 including without limitation pass/fail decisions, error detection (and corresponding audible or visual alerts), shape detection, position detection, orientation detection, collision avoidance, and so forth.

[0038] Other components, generically depicted as other hardware 135, may also be included, such as input devices including a keyboard, touchpad, mouse, switches, dials, buttons, motion sensors, and the like, as well as output devices such as a display, a speaker or other audio transducer, light emitting diodes, and so forth. Other hardware 135 may also or instead include a variety of cable connections and/or hardware adapters for connecting to, e.g., external computers, external hardware, external instrumentation or data acquisition systems, and so forth.

[0039] The printer 100 may include, or be connected in a communicating relationship with, a network interface 136. The network interface 136 may include any combination of hardware and software suitable for coupling the controller 110 and other components of the printer 100 to a remote computer in a communicating relationship through a data network. By way of example and not limitation, this may include electronics for a wired or wireless Ethernet connection operating according to the IEEE 802.11 standard (or any variation thereof), or any other short or long range wireless networking components or the like. This may include hardware for short range data communications such as BlueTooth or an infrared transceiver, which may be used to couple into a local area network or the like that is in turn coupled to a data network such as the Internet. This may also or instead include hardware/software for a WiMax connection or a cellular network connection (using, e.g., CDMA, GSM, LTE, or any other suitable protocol or combination of protocols). Consistently, the controller 110 may be configured to control participation by the printer 100 in any network to which the network interface 136 is connected, such as by autonomously connecting to the network to retrieve printable content, or responding to a remote request for status or availability.

[0040] Fig. 2 depicts a networked three-dimensional printing environment. In general, the environment 200 may include a data network 202 interconnecting a plurality of participating devices in a communicating relationship. The participating devices may, for example, include any number of three-dimensional printers 204 (also referred to interchangeably herein as "printers"), client devices 206, print servers 208, content sources 210, mobile devices 212, and other resources 216.

[0041] The data network 202 may be any network(s) or internetwork(s) suitable for communicating data and control information among participants in the environment

200. This may include public networks such as the Internet, private networks, telecommunications networks such as the Public Switched Telephone Network or cellular networks using third generation (e.g., 3G or IMT-2000), fourth generation (e.g., LTE (E-UTRA) or WiMax-Advanced (IEEE 802.16m)) and/or other technologies, as well as any of a variety of corporate area or local area networks and other switches, routers, hubs, gateways, and the like that might be used to carry data among participants in the environment 200.

[0042] The three-dimensional printers 204 may be any computer-controlled devices for three-dimensional fabrication, including without limitation any of the three-dimensional printers or other fabrication or prototyping devices described above. In general, each such device may include a network interface comprising, e.g., a network interface card, which term is used broadly herein to include any hardware (along with software, firmware, or the like to control operation of same) suitable for establishing and maintaining wired and/or wireless communications. The network interface card may include without limitation wired Ethernet network interface cards ("NICs"), wireless 802.11 networking cards, wireless 802.11 USB devices, or other hardware for wireless local area networking. The network interface may also or instead include cellular network hardware, wide area wireless network hardware or any other hardware for centralized, ad hoc, peer-to-peer, or other radio communications that might be used to carry data. In another aspect, the network interface may include a serial or USB port to directly connect to a computing device such as a desktop computer that, in turn, provides more general network connectivity to the data network 202.

[0043] The printers 204 might be made to fabricate any object, practical or otherwise, that is amenable to fabrication according to each printer's capabilities. This may be a model of a house or a tea cup, as depicted, or any other object such as gears or other machine hardware, replications of scanned three-dimensional objects, or fanciful works of art.

[0044] Client devices 206 may be any devices within the environment 200 operated by users to initiate, manage, monitor, or otherwise interact with print jobs at the three-dimensional printers 204. This may include desktop computers, laptop computers, network computers, tablets, or any other computing device that can participate in the

environment 200 as contemplated herein. Each client device 206 generally provides a user interface, which may include a graphical user interface, a text or command line interface, a voice-controlled interface, and/or a gesture-based interface to control operation of remote three-dimensional printers 204. The user interface may be maintained by a locally executing application on one of the client devices 206 that receives data and status information from, e.g., the printers 204 and print servers 208 concerning pending or executing print jobs. The user interface may create a suitable display on the client device 206 for user interaction. In other embodiments, the user interface may be remotely served and presented on one of the client devices 206, such as where a print server 208 or one of the three-dimensional printers 204 includes a web server that provides information through one or more web pages or the like that can be displayed within a web browser or similar client executing on one of the client devices 206. In one aspect, the user interface may include a voice controlled interface that receives spoken commands from a user and/or provides spoken feedback to the user.

[0045] A client device 206 may, for example include a removable memory device 207 such as a USB drive, memory stick, or the like, which may be used for example to transfer digital models of three-dimensional objects to printers 204.

[0046] The print servers 208 may include data storage, a network interface, and a processor and/or other processing circuitry. In the following description, where the functions or configuration of a print server 208 are described, this is intended to include corresponding functions or configuration (e.g., by programming) of a processor of the print server 208. In general, the print servers 208 (or processors thereof) may perform a variety of processing tasks related to management of networked printing. For example, the print servers 208 may manage print jobs received from one or more of the client devices 206, and provide related supporting functions such as content search and management. A print server 208 may also include a web server that provides web-based access by the client devices 206 to the capabilities of the print server 208. A print server 208 may also communicate periodically with three-dimensional printers 204 in order to obtain status information concerning, e.g., availability of printers and/or the status of particular print jobs, any of which may be subsequently presented to a user through the web server or any other suitable interface. A print server 208 may also maintain a list of

available three-dimensional printers 204, and may automatically select one of the three-dimensional printers 204 for a user-submitted print job, or may permit a user to specify a single printer, or a group of preferred printers, for fabricating an object. Where the print server 208 selects the printer automatically, any number of criteria may be used such as geographical proximity, printing capabilities, current print queue, fees (if any) for use of a particular three-dimensional printer 204, and so forth. Where the user specifies criteria, this may similarly include any relevant aspects of three-dimensional printers 204, and may permit use of absolute criteria (e.g., filters) or preferences, which may be weighted preferences or unweighted preferences, any of which may be used by a print server 208 to allocate a print job to a suitable resource.

[0047] In one aspect, the print server 208 may be configured to support interactive voice control of one of the printers 204. For example, the print server 208 may be configured to receive a voice signal (e.g., in digitized audio form) from a microphone or other audio input of the printer 204, and to process the voice signal to extract relevant content such as a command for the printer. Where the command is recognized as a print command, the voice signal may be further processed to extract additional context or relevant details. For example, the voice signal may be processed to extract an object identifier that specifies an object for printing, e.g., by filename, file metadata, or semantic content. The voice signal may also be processed to extract a dimensional specification, such as a scale or absolute dimension for an object. The print server 208 may then generate suitable control signals for return to the printer 204 to cause the printer 204 to fabricate the object. Where an error or omission is detected, the print server 208 may return a request for clarification to the printer 204, which may render the request in spoken form through a speaker, or within a user interface of the printer 204 or an associated device.

[0048] Other user preferences may be usefully stored at the print server 208 to facilitate autonomous, unsupervised fabrication of content from content sources 210. For example, a print server 208 may store a user's preference on handling objects greater than a build volume of a printer. These preferences may control whether to resize the object, whether to break the object into multiple sub-objects for fabrication, and whether to transmit multiple sub-objects to a single printer or multiple printers. In addition, user

preferences or requirements may be stored, such as multi-color printing capability, build material options and capabilities, and so forth. More generally, a print queue (which may be a printer-specific or user-specific queue, and which may be hosted at a printer 204, a server 208, or some combination of these) may be managed by a print server 208 according to one or more criteria from a remote user requesting a print job. The print server 208 may also store user preferences or criteria for filtering content, e.g., for automatic printing or other handling. While this is described below as a feature for autonomous operation of a printer (such as a printer that locally subscribes to a syndicated model source), any criteria that can be used to identify models of potential interest by explicit type (e.g., labeled in model metadata), implicit type (e.g., determined based on analysis of the model), source, and so forth, may be provided to the print server 208 and used to automatically direct new content to one or more user-specified ones of the three-dimensional printers 204.

[0049] In one aspect, the processor of the print server may be configured to store a plurality of print jobs submitted to the web server in a log and to provide an analysis of print activity based on the log. This may include any type of analysis that might be useful to participants in the environment 200. For example, the analysis may include tracking of the popularity of particular objects, or of particular content sources. The analysis may include tracking of which three-dimensional printers 204 are most popular or least popular, or related statistics such as the average backlog of pending print jobs at a number of the three-dimensional printers 204. The analysis may include success of a particular printer in fabricating a particular model or of a particular printer in completing print jobs generally. More generally, any statistics or data may be obtained, and any analysis may be performed, that might be useful to users (e.g., when requesting prints), content sources (e.g., when choosing new printable objects for publication), providers of fabrication resources (e.g., when setting fees), or network facilitators such as the print servers 208.

[0050] A print server 208 may also maintain a database 209 of content, along with an interface for users at client devices 206 to search the database 209 and request fabrication of objects in the database 209 using any of the three-dimensional printers 204. Thus in one aspect, a print server 208 (or any system including the print server 208) may

include a database 209 of three-dimensional models, and the print server 208 may act as a server that provides a search engine for locating a particular three-dimensional model in the database 209. The search engine may be a text-based search engine using keyword text queries, plain language queries, and so forth. The search engine may also or instead include an image-based search engine configured to identify three-dimensional models similar to a two-dimensional or three-dimensional image provide by a user.

[0051] In another aspect, the printer server 208 may periodically search for suitable content at remote locations on the data network, which content may be retrieved to the database 209, or have its remote location (e.g., a URL or other network location identifier) stored in the database 209. In another aspect, the print server 208 may provide an interface for submission of objects from remote users, along with any suitable metadata such as a title, tags, creator information, descriptive narrative, pictures, recommended printer settings, and so forth. In one aspect, the database 209 may be manually curated according to any desired standards. In another aspect, printable objects in the database 209 may be manually or automatically annotated according to content type, popularity, editorial commentary, and so forth.

[0052] The print server 208 may more generally provide a variety of management functions. For example, the print server 204 may store a location of a predetermined alternative three-dimensional printer to execute a print job from a remote user in the event of a failure by the one of the plurality of three-dimensional printers 204. In another aspect, the print server 208 may maintain exclusive control over at least one of the plurality of three-dimensional printers 204, such that other users and/or print servers cannot control the printer. In another aspect, the print server 208 may submit a print job to a first available one of the plurality of three-dimensional printers 204.

[0053] In another aspect, a print server 208 may provide an interface for managing subscriptions to sources of content. This may include tools for searching existing subscriptions, locating or specifying new sources, subscribing to sources of content, and so forth. In one aspect, a print server 208 may manage subscriptions and automatically direct new content from these subscriptions to a three-dimensional printer 204 according to any user-specified criteria. Thus while it is contemplated that a three-dimensional printer 204 may autonomously subscribe to sources of content through a

network interface and receive new content directly from such sources, it is also contemplated that this feature may be maintained through a remote resource such as a print server 208.

[0054] A print server 208 may maintain print queues for participating three-dimensional printers 204. This approach may advantageously alleviate backlogs at individual printers 204, which may have limited memory capacity for pending print jobs. More generally, a print server 208 may, by communicating with multiple three-dimensional printers 204, obtain a view of utilization of multiple networked resources that permits a more efficient allocation of print jobs than would be possible through simple point-to-point communications among users and printers. Print queues may also be published by a print server 208 so that users can view pending queues for a variety of different three-dimensional printers 204 prior to selecting a resource for a print job. In one aspect, the print queue may be published as a number of print jobs and size of print jobs so that a requester can evaluate likely delays. In another aspect, the print queue may be published as an estimated time until a newly submitted print job can be initiated.

[0055] In one aspect, the print queue of one of the print servers 208 may include one or more print jobs for one of the plurality of three-dimensional printers 204. The print queue may be stored locally at the one of the plurality of three-dimensional printers. In another aspect, the print queue may be allocated between the database 209 and a local memory of the three-dimensional printer 204. In another aspect, the print queue may be stored, for example, in the database 209 of the print server 208. As used here, the term 'print queue' is intended to include print data (e.g., the three-dimensional model or tool instructions to fabricate an object) for a number of print job (which may be arranged for presentation in order of expected execution), as well as any metadata concerning print jobs. Thus, a portion of the print queue such as the metadata (e.g., size, status, time to completion) may be usefully communicated to a print server 208 for sharing among users while another portion of the print queue such as the model data may be stored at a printer in preparation for execution of a print job.

[0056] Print queues may implement various user preferences on prioritization. For example, for a commercial enterprise, longer print jobs may be deferred for after normal hours of operation (e.g., after 5:00 p.m.), while shorter print jobs may be executed

first if they can be completed before the end of a business day. In this manner, objects can be identified and fabricated from within the print queue in a manner that permits as many objects as possible to be fabricated before a predetermined closing time. Similarly, commercial providers of fabrication services may charge explicitly for prioritized fabrication, and implement this prioritization by prioritizing print queues in a corresponding fashion.

[0057] In another aspect, a print server 208 may provide a virtual workspace for a user. In this virtual workspace, a user may search local or remote databases of printable objects, save objects of interest (or links thereto), manage pending prints, specify preferences for receiving status updates (e.g., by electronic mail or SMS text), manage subscriptions to content, search for new subscription sources, and so forth. In one aspect, the virtual workspace may be, or may include, web-based design tools or a web-based design interface that permits a user to create and modify models. In one aspect, the virtual workspace may be deployed on the web, while permitting direct fabrication of a model developed within that environment on a user-specified one of the three-dimensional printers 204, thus enabling a web-based design environment that is directly coupled to one or more fabrication resources.

[0058] The content sources 210 may include any sources of content for fabrication with a three-dimensional printer 204. This may, for example, include databases of objects accessible through a web interface or application programming interface. This may also or instead include individual desktop computers or the like configured as a server for hosted access, or configured to operate as a peer in a peer-to-peer network. This may also or instead include content subscription services, which may be made available in an unrestricted fashion, or may be made available on a paid subscription basis, or on an authenticated basis based upon some other relationship (e.g., purchase of a related product or a ticket to an event). It will be readily appreciated that any number of content providers may serve as content sources 210 as contemplated herein. By way of non-limiting example, the content sources 210 may include destinations such as amusement parks, museums, theaters, performance venues, or the like, any of which may provide content related to users who purchase tickets. The content sources 210 may include manufacturers such as automobile, computer, consumer

electronics, or home appliance manufacturers, any of which may provide content related to upgrades, maintenance, repair, or other support of existing products that have been purchased. The content sources 210 may include artists or other creative enterprises that sell various works of interest. The content sources 210 may include engineering or architectural firms that provide marketing or advertising pieces to existing or prospective customers. The content sources 210 may include marketing or advertising firms that provide promotional items for clients. More generally, the content sources 210 may be any individual or enterprise that provides single or serial objects for fabrication by the three-dimensional printers 204 described herein.

[0059] One or more web servers 211 may provide web-based access to and from any of the other participants in the environment 200. While depicted as a separate network entity, it will be readily appreciated that a web server 211 may be logically or physically associated with one of the other devices described herein, and may, for example, provide a user interface for web access to one of the three-dimensional printers 204, one of the print servers 208 (or databases 209 coupled thereto), one of the content sources 210, or any of the other resources 216 described below in a manner that permits user interaction through the data network 202, e.g., from a client device 206 or mobile device 212.

[0060] The mobile devices 212 may be any form of mobile device, such as any wireless, battery-powered device, that might be used to interact with the networked printing environment 200. The mobile devices 212 may, for example, include laptop computers, tablets, thin client network computers, portable digital assistants, messaging devices, cellular phones, smart phones, portable media or entertainment devices, and so forth. In general, mobile devices 212 may be operated by users for a variety of user-oriented functions such as to locate printable objects, to submit objects for printing, to monitor a personally owned printer, and/or to monitor a pending print job. A mobile device 212 may include location awareness technology such as Global Positioning System ("GPS"), which may obtain information that can be usefully integrated into a printing operation in a variety of ways. For example, a user may select an object for printing and submit a model of the object to a print server, such as any of the print servers

described above. The print server may determine a location of the mobile device 212 initiating the print job and locate a closest printer for fabrication of the object.

[0061] In another aspect, a printing function may be location-based, using the GPS input (or cellular network triangulation, proximity detection, or any other suitable location detection techniques). For example, a user may be authorized to print a model only when the user is near a location (e.g., within a geo-fenced area or otherwise proximal to a location), or only after a user has visited a location. Thus a user may be provided with printable content based upon locations that the user has visited, or while within a certain venue such as an amusement park, museum, theater, sports arena, hotel, or the like. Similarly, a matrix barcode such as a QR code may be employed for localization.

[0062] The other resources 216 may include any other software or hardware resources that may be usefully employed in networked printing applications as contemplated herein. For example, the other resources 216 may include payment processing servers or platforms used to authorize payment for content subscriptions, content purchases, or printing resources. As another example, the other resources 216 may include social networking platforms that may be used, e.g., to share three-dimensional models and/or fabrication results according to a user's social graph. In another aspect, the other resources 216 may include certificate servers or other security resources for third party verification of identity, encryption or decryption of three-dimensional models, and so forth. In another aspect, the other resources 216 may include online tools for three-dimensional design or modeling, as well as databases of objects, surface textures, build supplies, and so forth. In another aspect, the other resources 216 may include a desktop computer or the like co-located (e.g., on the same local area network with, or directly coupled to through a serial or USB cable) with one of the three-dimensional printers 204. In this case, the other resource 216 may provide supplemental functions for the three-dimensional printer 204 in a networked printing context such as maintaining a print queue or operating a web server for remote interaction with the three-dimensional printer 204. Other resources 216 also include supplemental resources such as three-dimensional scanners, cameras, and post-processing/finishing machines or

resources. More generally, any resource that might be usefully integrated into a networked printing environment may be one of the resources 216 as contemplated herein.

[0063] It will be readily appreciated that the various components of the networked printing environment 200 described above may be arranged and configured to support networked printing in a variety of ways. For example, in one aspect there is disclosed herein a networked computer with a print server and a web interface to support networked three-dimensional printing. This device may include a print server, a database, and a web server as discussed above. The print server may be coupled through a data network to a plurality of three-dimensional printers and configured to receive status information from one or more sensors for each one of the plurality of three-dimensional printers. The print server may be further configured to manage a print queue for each one of the plurality of three-dimensional printers. The database may be coupled in a communicating relationship with the print server and configured to store print queue data and status information for each one of the plurality of three-dimensional printers. The web server may be configured to provide a user interface over the data network to a remote user, the user interface adapted to present the status information and the print queue data for one or more of the plurality of three-dimensional printers to the user and the user interface adapted to receive a print job from the remote user for one of the plurality of three-dimensional printers.

[0064] The three-dimensional printer 204 described above may be configured to autonomously subscribe to syndicated content sources and periodically receive and print objects from those sources. Thus in one aspect there is disclosed herein a device including any of the three-dimensional printers described above; a network interface; and a processor (which may without limitation include the controller for the printer). The processor may be configured to subscribe to a plurality of sources of content (such as the content sources 210 described above) selected by a user for fabrication by the three-dimensional printer through the network interface. The processor may be further configured to receive one or more three-dimensional models from the plurality of content sources 210 and to select one of the one or more three-dimensional models for fabrication by the three-dimensional printer 204 according to a user preference for prioritization. The user preference may, for example, preferentially prioritize particular content sources 210,

or particular types of content (e.g., tools, games, artwork, upgrade parts, or content related to a particular interest of the user).

[0065] The memory of a three-dimensional printer 204 may be configured to store a queue of one or more additional three-dimensional models not selected for immediate fabrication. The processor may be programmed to periodically re-order or otherwise alter the queue according to pre-determined criteria or manual user input. For example, the processor may be configured to evaluate a new three-dimensional model based upon a user preference for prioritization, and to place the new three-dimensional model at a corresponding position in the queue. The processor may also or instead be configured to retrieve content from one of the content sources 210 by providing authorization credentials for the user, which may be stored at the three-dimensional printer or otherwise accessible for presentation to the content source 210. The processor may be configured to retrieve content from at least one of the plurality of content sources 210 by authorizing a payment from the user to a content provider. The processor may be configured to search a second group of sources of content (such as any of the content sources 210 described above) according to one or more search criteria provide by a user. This may also or instead include demographic information for the user, contextual information for the user, or any other implicit or explicit user information.

[0066] In another aspect, there is disclosed herein a system for managing subscriptions to three-dimensional content sources such as any of the content sources 210 described above. The system may include a web server configured to provide a user interface over a data network, which user interface is adapted to receive user preferences from a user including a subscription to a plurality of sources of a plurality of three-dimensional models, a prioritization of content from the plurality of sources, and an identification of one or more fabrication resources coupled to the data network and suitable for fabricating objects from the plurality of three-dimensional models. The system may also include a database to store the user preferences, and to receive and store the plurality of three-dimensional models as they are issued by the plurality of sources. The system may include a processor (e.g., of a print server 208, or alternatively of a client device 206 interacting with the print server 208) configured to select one of the plurality of three-dimensional models for fabrication based upon the prioritization. The system

may include a print server configured to communicate with the one or more fabrication resources through the data network, to determine an availability of the one or more fabrication resources, and to transmit the selected one of the plurality of three-dimensional models to one of the one or more fabrication resources.

[0067] In another aspect, there is disclosed herein a network of three-dimensional printing resources comprising a plurality of three-dimensional printers, each one of the plurality of three-dimensional printers including a network interface; a server configured to manage execution of a plurality of print jobs by the plurality of three-dimensional printers; and a data network that couples the server and the plurality of three-dimensional printers in a communicating relationship.

[0068] In general as described above, the server may include a web-based user interface configured for a user to submit a new print job to the server and to monitor progress of the new print job. The web-based user interface may permit video monitoring of each one of the plurality of three-dimensional printers, or otherwise provide information useful to a remote user including image-based, simulation-based, textual-based or other information concerning status of a current print. The web-based user interface may include voice input and/or output for network-based voice control of a printer.

[0069] The fabrication resources may, for example, include any of the three-dimensional printers 204 described above. One or more of the fabrication resources may be a private fabrication resource secured with a credential-based access system. The user may provide, as a user preference and prior to use of the private fabrication resource, credentials for accessing the private fabrication resource. In another aspect, the one or more fabrication resources may include a commercial fabrication resource. In this case the user may provide an authorization to pay for use of the commercial fabrication resource in the form of a user preference prior to use of the commercial fabrication resource.

[0070] Many current three-dimensional printers require significant manufacturing time to fabricate an object. At the same time, certain printers may include a tool or system to enable multiple, sequential object prints without human supervision or intervention, such as a conveyor belt. In this context, prioritizing content may be

particularly important to prevent crowding out of limited fabrication resources with low priority content that arrives periodically for autonomous fabrication. As a significant advantage, the systems and methods described herein permit prioritization using a variety of user-specified criteria, and permit use of multiple fabrication resources in appropriate circumstances. Thus prioritizing content as contemplated herein may include any useful form of prioritization. For example, this may include prioritizing the content according to source. The content sources 210 may have an explicit type that specifies the nature of the source (e.g., commercial or paid content, promotional content, product support content, non-commercial) or the type of content provided (e.g., automotive, consumer electronics, radio control hobbyist, contest prizes, and so forth). Prioritizing content may include prioritizing the content according to this type. The three-dimensional models themselves may also or instead include a type (e.g., tool, game, home, art, jewelry, replacement part, upgrade part, etc.) or any other metadata, and prioritizing the content may include prioritizing the content according to this type and/or metadata.

[0071] In one aspect, the processor may be configured to select two or more of the plurality of three-dimensional models for concurrent fabrication by two or more of the plurality of fabrication resources based upon the prioritization when a priority of the two or more of the plurality of three-dimensional models exceeds a predetermined threshold. That is, where particular models individually have a priority above the predetermined threshold, multiple fabrication resources may be located and employed to fabricate these models concurrently. The predetermined threshold may be evaluated for each model individually, or for all of the models collectively such as on an aggregate or average basis.

[0072] In one aspect, the processor may be configured to adjust prioritization based upon a history of fabrication when a number of objects fabricated from one of the plurality of sources exceeds a predetermined threshold. Thus, for example, a user may limit the number of objects fabricated from a particular source, giving subsequent priority to content from other sources regardless of an objectively determined priority for a new object from the particular source. This prevents a single source from overwhelming a single fabrication resource, such as a personal three-dimensional printer operated by the user, in a manner that crowds out other content from other sources of possible interest. At

the same time, this may enable content sources 210 to publish on any convenient schedule, without regard to whether and how subscribers will be able to fabricate objects.

[0073] In another aspect, the processor may be configured to identify one or more additional sources of content based upon a similarity to one of the plurality of sources of content. For example, where a content source 210 is an automotive manufacturer, the processor may perform a search for other automotive manufactures, related parts suppliers, mechanics, and so forth. The processor may also or instead be configured to identify one or more additional sources of content based upon a social graph of the user. This may, for example, include analyzing a social graph of relationships from the user to identify groups with common interests, shared professions, a shared history of schools or places of employment, or a common current or previous residence location, any of which may be used to locate other sources of content that may be of interest to the user.

[0074] Figs. 3A–3B show a flowchart of a method for providing machine-ready models based on printer configuration. Specifically, Fig. 3B is a continuation of the method 300 shown in Fig. 3A. In general, machine-ready models may take into account a printer's properties and configuration in order to plan toolpaths. Whereas slicers that create on-demand models, or services that look up and provide pre-sliced, machine-ready models may not have knowledge of a printer's properties, the method 300 of Figs. 3A–3B includes a technique for providing suitable machine-ready models taking into account a printer's configuration. The method 300 of Figs. 3A–3B may be used for any of the printers as described herein, e.g., three-dimensional printers, or for other devices and systems. For example, an endpoint in the method 300 may be a printer or another endpoint, e.g., an endpoint that utilizes a model in its operation, where the model can be created or chosen based on the endpoint's configuration or properties.

[0075] There are numerous makes and models of printers, each of which may have different physical capabilities such as build volume, extruder types, minimum step sizes, top speeds, operating temperature ranges, and so forth. Similarly, there may be user configurations, user preferences and the like that are defined in software, as well as hardware accessories such as cameras, three-dimensional scanners, heated build platforms, conveyors, and so forth. Additionally, these printer configurations may change over time, either resulting from manufacturer updates to improve printer performance or

user modifications for convenience, specialty applications, and so forth. Against this backdrop, the methods and systems described herein provide useful techniques for determining printer capabilities and matching these capabilities to pre-existing machine-ready models.

[0076] As shown in step 302, the method 300 may include receiving a request to fabricate an object from a three-dimensional model. This request may come from any of a variety of automated or manually controlled sources, and may be directed to any of a variety of resources including a local printer, a remote print server, and so forth. Receiving the request to fabricate the object may for example include receiving the request at a remote print server, receiving the request at the target printer, receiving the request at a computer locally connected to the target printer, receiving the request at another location, or any combination thereof. Receiving the request to fabricate the object from the three-dimensional model may also or instead include receiving the request from the target printer. The request may also or instead be received from a user, e.g., through a remote device or local device that interacts with at least one of the print server, the target printer, or another resource, e.g., through a network. The request may also be received from another requester or from multiple requesters.

[0077] The object may include any object that can be fabricated or manufactured by the printers as described herein, e.g., an object fabricated in three dimensions by depositing successive layers of material in two-dimensional patterns.

[0078] The three-dimensional model may include a computer model or other computerized representation of the object such as an STL file containing a polygonal mesh or the like characterizing an object in three dimensions. The three-dimensional model may also or instead include data derived from a scan of the object such as a point cloud or the like. The three-dimensional model may also or instead include any other three-dimensional surface or volumetric representation of the object, or any combination of the foregoing that is useful for describing a three-dimensional form of an object. The three-dimensional model may include a three-dimensional design created by a user, e.g., using local or online tools for three-dimensional design and modeling. The three-dimensional model may be located on the target printer, at a computer locally connected to the target printer (or remotely connected to the target printer or other component

through a network), at the print server, on a database or other resource connected to any of the foregoing (e.g., a service or webpage that provides three-dimensional models for fabricating objects corresponding to same), and the like. In general, the three-dimensional model may be any suitable digital representation of a three-dimensional shape, such as a computer-automated design (CAD) model, a stereolithography (STL) file, a 3DS file, a DEM file, a COLLADA file, or any other such file. The three-dimensional model may be used as the basis for a machine-ready representation corresponding thereto, where the machine-ready representation contains instructions that can be directly executed on the target printer for fabrication of the object. To this end, the machine-ready representation may be configured for use on the target printer based on the properties of the target printer.

[0079] As shown in step 304, the method 300 may include determining a target printer to fabricate the object. Determining the target printer may include identifying a selected printer in the request. The selected printer may have been manually selected by a user, e.g., the requester. It will be understood that any selection or input provided by a user discussed herein may be done through a graphical user interface (GUI) included as part of the systems described herein, e.g., a GUI on the target printer, a GUI on a computer connected to the target printer, a GUI on a mobile device, and so on. Determining the target printer may also or instead include selecting the target printer at a remote print server based on one or more selection criteria. The selection criteria may include any criteria that provides for selection of the target printer, e.g., a logical, logistically convenient, or practical selection of the target printer. The selection criteria may include information related to the three-dimensional model (or an aspect thereof, e.g., metadata included therein), the object to be fabricated (e.g., the size, shape, color, material, and so forth), a print queue, a prioritization, a location of the printer or requester, a timeline, printer attributes (e.g., capabilities, properties, features, functions, and the like), and so forth. The target printer may be any of the printers as described herein, or another endpoint, component, machine, or resource. In one aspect, the target printer may include more than one printer.

[0080] As shown in step 306, the method 300 may include querying the target printer for one or more properties relevant to fabrication of the object. The query may be

initiated by the requester, the print server, or another resource in a system utilizing the method 300. The query may request specific properties of the target printer, or the query may be a general query for properties or information relevant to fabrication of an object on the target printer. In one aspect, numerous queries are sent to numerous printers, e.g., for use in selecting one or more of the printers as the target printer. In another aspect, the query is sent to a printer that is not necessarily the target printer as described herein, e.g., when the query or information received from a response to the query is used for the selection of the target printer.

[0081] The properties may include one or more of information, capabilities, features, functions, configurations, data, and the like relevant to fabrication of the object. It will be understood that throughout this disclosure the terms 'property' and 'configuration' (and variations thereof) may be used interchangeably, and thus, unless explicitly stated otherwise or clear from the context, a property may include a configuration and vice-versa. The properties may include a hardware configuration of the target printer, a software configuration, a user setting or preference, or a firmware configuration of the target printer.

[0082] The hardware configuration may include, without limitation, one or more of a printer type (e.g., printer brand or general type of fabrication machine), a printer model, a printer version or generation, an extruder type, an extruder nozzle diameter, a build volume (e.g., build volume size, build volume shape, and so forth), a build platform type, a build platform size, a processor type, a memory capacity, an identification number (e.g., a hardware version number or model number), a speed (e.g., top speed) for linear movement of a tool (e.g., a tool for three-dimensional fabrication of an object), a step size for movement of the tool, a z-axis step size (e.g., a minimum z-axis step size), tool path limitations, a gantry type or configuration (e.g., including gantry limitations and capabilities), a build material type or other properties of the build material (e.g., filament properties), operating temperature ranges, and so forth. The hardware configuration may also include minimum and maximum travel speeds, shell speeds, deposition speeds, fill speeds, acceleration settings (e.g., jerk information such as jerk limits, acceleration rates, and the like), and so forth.

[0083] The hardware configuration may include an automatically detected hardware reconfiguration or a manually specified hardware reconfiguration. For example, if a user has provided a new or replacement component on their printer, the user can manually update the hardware configuration associated with the printer to reflect the new component, e.g., through a GUI or the like. Alternatively, the printer (or another component of the system, e.g., the print server) can automatically detect that a new component is being utilized, and update the hardware configuration accordingly. In this manner, the hardware configuration may be continuously monitored and updated. When a hardware reconfiguration occurs to the printer, the printer (or another component of the system, e.g., the print server) can send a notification or the like to users, e.g., users that are connected to the printer through a network. The notification may include a notice of the new component, and may include an action that the user must perform to request or receive the hardware reconfiguration. If users are not connected to other components of the system, they may receive the hardware reconfiguration when they connect to the system components through a network or the like.

[0084] The hardware configuration may be determined or detected automatically by a component or sensor of the printer. The hardware configuration may also or instead be determined through movement or sensing provided by a component of the printer. For example, an extruder or tool head on a printer may sense its configuration or the configuration of another component of the printer such as the build platform or gantry. A component of the printer may also or instead include circuitry that identifies components used in a printer or their configuration thereof. The circuitry may utilize radio frequency identification tags or the like associated with components or configurations of the printer. The printer or a printing system may also or instead include a tool crib or the like, where a sensor system determines which tools are utilized by the printer at a given time. Determination of the hardware configuration may utilize any of the devices, systems, and techniques described in U.S. Pat. App. No. 14/081,922 filed on November 15, 2013, the entire content of which is hereby incorporated by reference.

[0085] The software configuration of the target printer may include programming or applications related to the printer, the print server, the user (e.g., a mobile device of the user, or a computer of the user), another resource, or any combination thereof. The

software configuration of the target printer may include a version of a slicer used by the target printer, or a version of a slicer that typically creates machine-ready representations of three-dimensional models for the target printer. The software configuration may also or instead include slicer settings, e.g., plate variability and the like. The software configuration of the target printer may include the operating system used by the target printer. The software configuration of the target printer may also or instead include the communications software used by the target printer. In a similar manner as discussed above for the hardware configuration, the software configuration may include an automatically detected software reconfiguration or a manually specified software reconfiguration.

[0086] The firmware configuration of the target printer may include the firmware version or other aspects and data related to the firmware utilized by the target printer or an associated computing device. In one aspect, the printer firmware has information related to the hardware and software configuration of the printer. For example, the hardware and software configurations may be stored in firmware (e.g., the printer firmware can know its hardware configuration), or error checking the configuration of the printer may occur in firmware. In a similar manner as discussed above for the hardware configuration, the firmware configuration may include an automatically detected firmware reconfiguration or a manually specified firmware reconfiguration. For example, the firmware configuration of the target printer may be updated when the firmware of the target printer is updated.

[0087] As discussed above, the properties may also or instead include printing capabilities of the target printer. The printing capabilities may include without limitation color capabilities (e.g., one color, multi-color, color mixing, color changing, and the like), size capabilities (e.g., overall size or minimum feature size), speed capabilities, resolution and accuracy capabilities, build material capabilities, and so forth.

[0088] The properties may also or instead include one or more user settings on the target printer. The user settings may include settings that were updated, or settings that were used for a previous fabrication process. The user settings may be inputted directly on the printer, e.g., through manual configuration of the printer or its components, or by using a GUI or the like on the printer or a device in communication

with the printer. The user settings may include settings related to the hardware configuration, or settings that otherwise influence the fabrication of the object. For example, the user settings may include without limitation color settings, resolution settings, speed settings, size settings, location settings, material settings, and so forth. In one aspect, the user settings may automatically be detected by the printer or print server. For example, material settings such as type of material may be detected through the use of a labeled material source (a labeled spool or the like), through a code on the material, via a sensor on the printer, and so forth.

[0089] The properties may also include an application used to operate the target printer. The application may execute on the printer or a device in communication with the printer, e.g., a computer or mobile device of the user. The properties may further include a build material in the target printer.

[0090] As shown in step 308, the method 300 may include receiving a dictionary of the one or more properties from the target printer. The dictionary may thus include properties of a printer, e.g., the target printer. The properties included in the dictionary may include any as described herein or otherwise known in the art. The dictionary may be a list or collection of the properties, or may be otherwise configured to organize the properties of the printer, e.g., for readability and use by a print server, slicing engine, user, other resource, or the like. The information included in the dictionary may be relevant to slicing a three-dimensional model to create a machine-ready representation for the printer. The dictionary may include information or rules related to the properties. The dictionary may define the hardware, software, firmware, printing capabilities, printing rules, and so forth, for the printer. The dictionary may include encrypted, protected, or hashed data. One skilled in the art will recognize that there are numerous ways to create and code such a dictionary as described herein. Some examples of the manner of information and data that may be included in the dictionary are included below.

[0091] The dictionary may include one or more identifiers for the target printer. For example, the target printer may include an identification number or code, where this identification number or code is the dictionary itself, i.e., the identification number or code acts as an implicit dictionary by uniquely specifying a particular printer or printer type. The identification number or code may include a configuration version, e.g., the

identification number or code may be associated with a particular configuration including any information pertinent to generating or choosing a proper machine-ready representation. The dictionary may also or instead include other information in addition to or in lieu of such an identifier. The identifier may include a hash that may be used in conjunction with a hash table. The identifier for the printer may be a unique identifier, i.e., an identifier specific to that particular printer. In this manner, if a printer is manufactured or built to a customer's specifications (i.e., it is customized), information pertaining to the printer may be acquired or known through its unique identifier. Thus, a component configured to interpret the dictionary (e.g., the print server) may retrieve and analyze the properties of the printer simply through its identifier included in the dictionary. The identifiers for the target printer may also or instead include brand information, model information, generation information, version information, and the like. For example, the identifier may include a model number, which can be the same for each printer associated with that particular model number. Properties may be known for the model number (e.g., properties for particular model numbers may be stored in a database), and the component configured to interpret the dictionary (e.g., the print server) may retrieve and analyze the properties of the printer through the model number included in the dictionary. For example, the model number may have associated default configurations that are known, e.g., by a three-dimensional printing application provider or a service for providing of machine-ready models. In this manner, when a particular printer is connected to the print server, the print server may use a default machine-ready model profile (or slicer profile) for that particular model number of printer. This default profile may be used as a starting template for customized printers of a particular model. Also, users may be able to log updates to their particular printer model's configuration.

[0092] The dictionary may also include one or more flags or the like. The flags may include a linear array of binary indicators of whether a printer includes a certain property or not, or whether the printer has a certain printing capability or not. More generally, the flags may include any tags, labels, colors, descriptors, and the like useful for specifying printer properties. Still more generally, the flags may include any suitable means for storing information in a dictionary in a manner that can be decoded and used to determine printer properties.

[0093] The dictionary may include codes for the properties of a printer. The codes may include a numeric form, which may include numeric information pertaining to the properties. For example, the build volume may be provided by the explicit numbers related to the size of the build volume (e.g., the actual length, width, and height, for example in the x, y, and z directions), and the nozzle diameter may be provided by its explicit diameter. The code may also or instead be interpreted or decrypted, where the component configured to interpret the dictionary may utilize a database for looking up the meaning of the code.

[0094] In general, the dictionary may be provided in any suitable format. The dictionary may for example be formed as a vector of binary flags or other attributes that form a description of properties included therein. The dictionary may also, where appropriate, include scalar quantities for certain properties.

[0095] One skilled in the art will recognize that the dictionary may include properties of a printer, and information pertaining to the properties of the printer, at any desired level of granularity according to, e.g., the data storage and processing capabilities of the components being used in a system implementing the method 300. In general, the dictionary may include any information pertinent to generating or choosing a machine-ready representation of a three-dimensional model of an object for a printer in fabricating that object. This information may be provided automatically by a printer or print server, or inputted manually by a user, e.g., using a GUI or the like where a user can enter or select properties pertaining to their printer.

[0096] As described above, the dictionary may include properties of the build material. The properties of the build material may include without limitation build material type (e.g., filament, pellets, or otherwise), build material composition (e.g., PLA, ABS, and so on), build material size (e.g., filament width), deposition and retraction settings for the build material (e.g., deposition or ooze volume, hop distance, retraction distance, and so on), flow rate data (e.g., minimum and maximum flow rate), atomic properties, chemical properties, electrical properties, environmental properties, magnetic properties, manufacturing properties, mechanical properties, optical properties, thermal properties, and so forth. The properties of the build material may also or instead include properties on one or more materials derived from known properties of the materials,

which may be derived from the material composition, a model or manufacturer number, and so forth.

[0097] The dictionary may include user settings as described herein, or the dictionary may be separate from the user settings. In one aspect, the fabrication profile as described herein includes a combination of the dictionary and user settings.

[0098] According to the foregoing, receiving the dictionary of properties may in one aspect include receiving an identifier from the target printer and using the identifier to retrieve the dictionary from a repository of printer information remote from the target printer. The identifier may be any of the types discussed herein, e.g., model number, configuration version, and so forth. The identifier may also or instead identify or be associated with a particular dictionary or set of dictionaries. The repository may include a database, which may be local or remote from the target printer. For example, the repository may include a remote database on a print server, or a database remote to the print server, e.g., a database stored on an external resource in communication with the print server. The repository may include a plurality of dictionaries, where each is associated with an identifier, such as a particular model number of a printer. In this manner, once the identifier is received, the dictionary may be retrieved and the properties or configuration of a printer may become known to the system. In this manner, a target printer may change its status from unknown to known, i.e., in terms of its configuration.

[0099] As shown in step 312, the method 300 may include creating a fabrication profile based on the one or more properties. The fabrication profile may be created by the target printer, a print server, an external resource, or another component of a system implementing the method 300. The fabrication profile may be the basis for the generation of a machine-ready representation of the three-dimensional model that is executable on the target printer, and thus the fabrication profile may include information for generating machine-ready representations for the target printer. The fabrication profile may be generated from information included in the dictionary, e.g., properties of the target printer. For example, in an aspect, the dictionary includes information on a tool head such as an extruder, e.g., the nozzle diameter of the extruder. The nozzle diameter may thus be one aspect that is used to translate the three-dimensional model into the machine-ready representation. In one aspect, the fabrication profile includes the dictionary. The

fabrication profile may also or instead be a profile used to determine which machine-ready representation is available or suitable for a target printer. The fabrication profile may be specific to each printer, or may be used for a plurality of printers, e.g., printers of the same type, model, version, and so forth. The fabrication profile may be saved in the repository such as a database, which may be remote or local to the target printer, e.g., on a remote print server or an external resource. The fabrication profile may include machine readable information for the slicer in creating a machine-ready model. The fabrication profile may be created using a library or the like and a resource or tool that parses the fabrication profile and obtains suitable inputs for a slicing engine or other program used to create machine-ready models. Thus the resource or tool may translate or interpret the dictionary into information for the slicer so that a suitable model can be created (or selected) for the target printer.

[00100] The fabrication profile may be created based on mathematical parameters. In one aspect, information obtained from the dictionary is the same as the information in the fabrication profile (e.g., numerical values associated with physical dimensions such as a nozzle width, build volume, and the like). In another aspect, information obtained from the dictionary may be different from the information in the fabrication profile. For example, a top speed may be included in the dictionary of properties, but tool instructions in the fabrication profile for top speed may be different based on a particular portion of the object to be formed (e.g., whether the particular tool instructions are for the raft, the shell, or the infill of the object to be formed), where the information is populated based on the top speed. In other situations, certain hardware properties or configurations may be combined to create the fabrication profile. For example, slicing parameters may be based on a binary decision (e.g., if the printer includes an automatically leveled build platform, if there is a raft, if another printer is to be used, and so forth). Also, a portion of the object to be formed may have different instructions based on the material used, e.g., the raft properties may be dependent on material.

[00101] As shown in step 314, the method 300 may include determining whether a suitable machine-ready model is available for the fabrication profile. The machine-ready model, which may be otherwise referred to herein as a machine-ready

representation, may be a machine-ready model of the three dimensional model of the object that is executable by a target printer to fabricate the object. The machine-ready model may be specific to certain properties of the printer. For example, the suitability of the machine-ready model may depend on one or more of the hardware configuration of the printer, the software configuration of the printer, and the firmware configuration of the printer. Thus, the determination of whether a suitable machine-ready model is available for the fabrication profile may include an analysis of one or more of the dictionary, the fabrication profile, the hardware configuration of the printer, the compatibility of the machine-ready model with the hardware configuration of the printer, the software configuration of the printer, the compatibility of the machine-ready model with the software configuration of the printer, the firmware configuration of the printer, the compatibility of the machine-ready model with the firmware configuration of the printer, and so forth. The suitable machine-ready model may be stored in a database of potentially suitable machine-ready models, e.g., a remote database on a print server or remote resource. The analysis may include a compatibility analysis, where each machine-ready model is analyzed for its compatibility with the fabrication profile.

[00102] As shown in step 316, the method 300 may include selecting the suitable machine-ready model if available and generating the machine-ready representation according to the fabrication profile if not available. In one aspect, if step 314 determines that a suitable machine-ready model is available for the fabrication profile, that machine-ready model may be selected in step 316. If it is determined in step 314 that a suitable machine-ready model is not available for the fabrication profile, step 316 may include generating the machine-ready representation according to the fabrication profile. The machine-ready representation may be generated using a slicing program or the like (otherwise referred to herein as a slicer) that creates tool instructions for the target printer for fabricating the object from a three-dimensional model. The slicer may be disposed on the printer, a mobile device, a computer connected to the printer or another component, the print server, a cloud, an external resource, or the like. The newly generated machine-ready representation may be stored with other machine-ready models, e.g., cached in a local or remote database. The newly generated machine-ready representation may also or instead be transmitted to a user, the printer, the print server, or elsewhere in a system

implementing the method 300. The machine-ready representation may include machine-ready instructions for fabricating the object on the printer. The machine-ready representation may be generated using various techniques, e.g., any of the techniques described in U.S. Pat. Pub. No. 2014/0371895, the entire content of which is hereby incorporated by reference.

[00103] As shown in step 318, the method 300 may include determining whether one of the plurality of stored machine-ready models can be modified to satisfy the constraints of the fabrication profile. In one aspect, the print server or another component of the system may search for a machine-ready model that most closely meets the fabrication profile. The machine-ready model that most closely meets the fabrication profile will then be selected for modification to meet the fabrication profile or otherwise become suitable for use on the target printer. Before the machine-ready model is modified, a copy may be made, such that the unmodified version will remain in the plurality of stored machine-ready models.

[00104] As shown in step 320, the method 300 may include modifying one of the plurality of stored machine-ready models for use as the machine-ready representation if possible. Modifying one of the plurality of stored machine ready models may include, without limitation, one or more of translating the machine-ready representation, rotating the machine-ready representation, scaling the machine-ready representation, changing a top speed in a tool path for the target printer, and so forth. In a machine-ready representation such as g-code, this may include a simple search and substitution of suitable instruction steps. For example, any speed that exceeds a top speed may be located and replaced with the permitted top speed. For a scaling operation, any physical movement may be located and the numerical value may be adjusted according to a desired scale. In this manner, a machine-ready model may be provided without creating a new model from scratch—a very time and computationally expensive operation. The modification may be performed by a slicer or another tool of a system implementing the method 300. The modified machine-ready model may be stored with the other machine-ready models, e.g., in a local or remote database. The modified machine-ready representation may also or instead be transmitted to a user, the printer, the print server, or elsewhere in a system implementing the method 300.

[00105] As shown in step 322, the method 300 may include generating a new machine-ready representation according to the fabrication profile for use as the machine-ready representation, e.g., if modifying one of the stored machine-ready models is not possible.

[00106] As discussed herein, the method 300 may generally include generating a machine-ready representation of the three-dimensional model executable by the target printer to fabricate the object. Generating the machine-ready representation may include processing the three-dimensional model according to the fabrication profile. Processing the three-dimensional model may include slicing the three-dimensional model. Slicing the three-dimensional model may include decomposing the three-dimensional model into a sequence of two-dimensional slices. The inputs to this process may specify a variety of characteristics such as layer thickness, infilling density, tool temperature, tool speeds, and so forth. Slicing may be provided by a slicing engine or other software module, which may be on a printer, on a computer locally coupled to the printer, on a remote resource, or any combination of these. Processing the three-dimensional model may include generating g-code, which is commonly used for three-dimensional printers, or any other suitable printer-executable description of the object based upon the three-dimensional model. Processing the three-dimensional model may take place on the printer, a remote print server, a computer connected to the target printer, a computer remote to the target printer, in a cloud, by a service for providing machine-ready models, and the like. Generating the machine-ready representation may include creating toolpaths for a tool of the target printer. Generating the machine-ready representation may also or instead include selecting one of a plurality of stored machine-ready models according to the fabrication profile as the machine-ready representation. The machine-ready representations may be selected from, e.g., a database, a store (e.g., a digital or online store), a print service, and so forth. Generating the machine-ready representation may further include generating printer-executable instructions at a computer locally connected to the target printer.

[00107] As shown in step 324, the method 300 may include generating descriptive metadata to accompany the machine-ready representation. The descriptive metadata may specify one or more properties for comparison to properties of printers

selected for fabricating the model or for potential printers to be analyzed for selection. The metadata may thus include information regarding how a machine-ready representation was created, or will be created, where the metadata may be checked against the properties of a printer.

[00108] The metadata may also or instead include printer properties, e.g., recommended printer settings. The metadata may also or instead include any descriptive information for the object, the digital three-dimensional model, the machine-ready representation pertaining to the three-dimensional model, and so forth. For example, the metadata may include information provided by a source of the three-dimensional model such as a title, author, creation date, propriety rights management information, descriptive text, and so forth. Where the three-dimensional model source is an automated model source such as a three-dimensional scanner, the metadata may also or instead identify a scanner time, time and date of a scan, scanning parameters (where applicable), scanner location, and so forth. Metadata may also or instead be provided from other sources. For example, a print server (or some other remote resource) may track downloads and prints of an object, and may log this information in the metadata as usage statistics covering, e.g., number of downloads, popularity, build results, and so forth. The metadata may thus include descriptive data from any of a variety of sources such as a computer rendering of an object, a photograph of an object, an author comment for an object, a number of downloads for an object (or a specific machine-ready model of the object), a category tag for an object, a popularity rating for an object, title, type, prioritization, other tags, creator information, descriptive narrative, pictures, and so forth.

[00109] As shown in step 326, the method 300 may include checking the descriptive metadata against a selected printer prior to fabrication by the selected printer. This may be particularly useful where the metadata includes recommended printer properties, i.e., where the recommended printer properties can be compared to the actual printer properties of the selected printer. The printer may be selected based on certain recommended printer properties in the metadata matching the actual printer properties, a certain percentage of matching properties, or the like. In a similar manner, a printer may not be selected if certain recommended printer properties in the metadata do not match

the actual printer properties. The checking of the metadata may be performed by the printer, print server, an external resource, a user, and so forth.

[00110] As shown in step 328, the method 300 may include transmitting the machine-ready representation to the target printer for fabrication. The machine-ready representation may be transmitted by a print server, a computer connected to the target printer, a computer remote to the target printer, a remote resource, and the like. The transmission may include an e-mail containing the machine ready representation as an attachment, a download link to a location where the file can be retrieved, a direct file transfer (via FTP, SFTP, or the like), and so forth.

[00111] As shown in step 330, the method 300 may include receiving the machine-ready representation at the target printer. Alternatively, the machine-ready representation may be received by a print server, a computer connected to the target printer, a computer remote to the target printer, a remote resource, and the like. Receiving the machine-ready representation may include downloading the machine-ready representation, e.g., through a network, USB flash drive, or the like. It will also be understood that the machine-ready representation may be transmitted to the printer in its entirety or streamed in smaller segments where, e.g., memory capacity of the printer is limited and/or connectivity to the printer is of high quality and bandwidth.

[00112] As shown in step 332, the method 300 may include checking the machine-ready representation for errors. In one aspect, errors refer to mismatches between the instructions contained in the machine-ready representation and capabilities of the target printer such as movements at a speed greater than the top speed of the printer, or movements outside of the build volume of the printer. Thus, while any error checking may be performed according to, e.g, design or fabrication rules, known material properties etc., additional error checking is enabled by the current system where more specific information about printing capabilities can be obtained from the dictionary, fabrication profile, and explicit hardware and software properties. As noted above, this type of error checking can be further facilitated by metadata for the machine-ready representation that explicitly specifies, e.g., hardware requirements, assumptions about machine capabilities, and so forth.

[00113] Errors may include an incorrect configuration of either or both of the printer and the machine-ready representation. The printer, a print server, a computer connected to the target printer, a computer remote to the target printer, a remote resource, or the like, may check the machine-ready representation for errors. Settings, properties, or configurations of the printer may also or instead be checked for errors. In one aspect, an error check includes checking information included in the machine-ready representation, e.g., its metadata, and comparing this information to the printer's configuration. A user may receive a notification (e.g., an error message) when the machine-ready representation or the printer's configuration has errors. In another aspect, a new machine-ready representation may be obtained when the machine-ready representation or the printer's configuration has errors.

[00114] As shown in step 334, the method 300 may include requesting a new machine-ready representation when an error is detected. The new machine-ready representation may be requested by the printer, a print server, a computer connected to the target printer, a computer remote to the target printer, a remote resource, or the like. Alternatively, the machine-ready representation may be modified or there may be a request for modification when an error is detected.

[00115] As shown in step 336, the method 300 may include fabricating the object with the target printer, where the fabrication of the object is based on the machine-ready representation.

[00116] In another aspect, the method 300 outlined above may also or instead include managing a print queue. For example, a print server or client device may select a printer, receive a dictionary associated with that printer, and then create or select a machine-ready representation based on the selected printer's configuration. If the selected printer malfunctions, the print server or another component of the system may receive information regarding the malfunction, query one or more other printers, and select another printer based on its configuration or other relevant parameters. The print server or another component of the system may then receive a dictionary from the subsequently selected printer and then create or select another machine-ready representation or use the same machine-ready representation already created or selected. Alternatively, the system can create or select a plurality of machine-ready representations for one or more printers

initially, or select a similar printer with a similar dictionary, such that the same or similar machine-ready representations can be utilized for one or more printers.

[00117] Fig. 4 is a sequence diagram of a system for providing machine-ready models based on printer configuration. Specifically, Fig. 4 shows a system 400 having a user 402, a printer 404, and a print server 406. The system 400 may also include other resources 408. In general, Fig. 4 shows an example of communications that may be present in the system 400 for yielding a machine-ready model based on the configuration of the printer 404. The parties in the system 400 of Fig. 4 may be connected via a network, locally connected, or otherwise may be in communication with one another. It will be understood that the embodiment of Fig. 4 is provided by way of example only, and that numerous techniques may be used to synchronize operation of a printer and various remote resources such as remote slicing engines or model repositories as contemplated herein.

[00118] The user 400 may be a user of the printer 404, a client or user of the print server 406 or other resource 408, a user of a service that provides machine-ready models, or generally any party that uses the printer 404 or otherwise wants to obtain a machine-ready model.

[00119] The printer 404 and print server 406 may be any of the printers and servers as described herein or otherwise known in the art. The print server 406 may also or instead include client devices, mobile devices, and the like, or the print server 406 may be incorporated into or in communication with such devices. In this manner, sliced models as discussed herein may be created or selected by client devices, mobile devices, and the like.

[00120] The other resource 408 may include a cloud-based service, a webpage, an application, another server, another printer, another user, a database, and so forth. The other resource 408 may be local or remote to one or more of the other components of the system 400. The other resource 408 may include a plurality of other resources. The other resource 408 may also or include any of the other resources described elsewhere herein, e.g., with reference to Fig. 2.

[00121] As shown by arrow 410, the user 402 may send a request to the printer 404 requesting a print of an object. The user 402 may also or instead send such a request

to another component or device that controls the printer 404. This request may be generated from a user interface on a computer locally coupled to the printer 404, or remotely through a remote print management website or the like.

[00122] As shown by arrow 412, upon receiving the request for a print, the printer 404 may request a sliced model from the print server 406. This request may also or instead be sent directly from the user 402. This request may also or instead be sent to another component of the system 400, e.g., the other resource 408. The print server 406 may select or generate a sliced model based on this request, or it may request additional information for selecting or generating a sliced model based on this request. The sliced model may be a machine-ready model, i.e., a model that is suitable for use by the printer 404 in fabricating the object.

[00123] As shown by arrow 414, the print server 406 may request the sliced model from the other resource 408. For example, if the other resource 408 includes a database of sliced models, the print server 406 may request a particular sliced model from this database. In response to this request, the other resource 408 may search for and select a sliced model, or the other resource 408 may generate a sliced model.

[00124] As shown by arrow 416, the other resource may transmit a sliced model to the print server 406 in response to its request. The sliced model may also or instead be sent to another component of the system 400, e.g., the printer 404 or user 402.

[00125] As shown by arrow 418, the print server 406 may request a dictionary from the printer 404. The dictionary may include any as described herein. For example, the dictionary may include one or more properties of the printer 404. This request may also or instead be sent to another component of the system 400, e.g., the user 402. The request for a dictionary may be automatically sent upon receiving a request for a sliced model. Alternatively, the request for a dictionary may be sent only upon determining that there are not any suitable sliced models for the printer 404. This determination may be made at the print server 406, the other resource 408, or any combination thereof.

[00126] As shown by arrow 420, the printer 404 may transmit the dictionary to the print server. Alternatively, another component of the system 400 may transmit the dictionary to the print server, e.g., the user 402 or the other resource 408. The dictionary may also or instead be transmitted to another component of the system 400, e.g., the user

402 or the other resource 408. The dictionary may be transmitted upon the request for the dictionary, or the dictionary may be automatically transmitted when requesting a sliced model. Once the dictionary is received, it may be stored (e.g., on the print server 406 or the other resource 408) and tagged such that it need not be transmitted again. Thus, the print server 406 or other resource 408 may include a plurality of stored dictionaries, where each dictionary may be associated with a particular printer.

[00127] As shown by arrow 422, the print server 406 may transmit the sliced model to the printer 404. The sliced model may also or instead be sent to another component of the system 400, e.g., the user 402. The sliced model may also or instead be sent from another component of the system 400, e.g., the other resource 408. The sliced model may be the machine-ready representation selected or generated by the print server 406 or another component of the system 400 to be used by the printer 404 in fabricating the object.

[00128] As shown by arrow 424, the printer 404 may request a new sliced model from the print server 406, e.g., if there are errors with the received sliced model. Thus, upon receipt of the sliced model, the printer 404 or another component of the system 400 may error check the sliced model, or otherwise test the sliced model for suitability in fabricating the object. If errors are detected or the sliced model is otherwise unsuitable, the request for a new sliced model may be sent. This request may also or instead be sent by another component of the system 400, e.g., the user 402. This request may also or instead be sent to another component of the system 400, e.g., the other resource 408.

[00129] Fig. 5 illustrates a system for providing dictionaries and machine-ready models. One skilled in the art will recognize that Fig. 5 illustrates one possibility out of numerous possibilities for such a system 500. The main components of the system 500 may include a requester 502 and a database 504. The requester 502 and the database 504 may be in communication with one another, e.g., through a network.

[00130] The requester 502 may include without limitation a client or user as described herein or as known in the art. The requester 502 may also or instead include a device operated by a client or user, where the device is in communication with one or more of the database 504, a printer, a print server, another resource, and so on. In one aspect, the requester 502 is the printer. In another aspect, the requester 502 is the print

server. The requester 502 may send a request or query (illustrated by arrow 514) to the database 504. The request may include without limitation a request for a dictionary 508 or a request for a machine-ready model 512. The requester 502 may send the request in response to a print request or as part of a print request.

[00131] The database 504 may include stored data 506. The stored data 506 may include one or more dictionaries 508 and one or more machine ready models 512.

[00132] The dictionaries 508 may include any of the dictionaries described herein. For example, the dictionary 510 may include printer specifications 510, e.g., specifications related to the configuration and capabilities of a printer. The dictionaries 508 may specify printer hardware, software, firmware, accessories, and the like at any useful level of granularity, and may, for example, be indexed according to printer identifiers so that the database 504 can be used to retrieve a dictionary based on a unique printer identifier. In another aspect, the dictionary may be stored on a printer (not shown) coupled to the system, or the dictionary may be dynamically created by a printer in response to a request for the dictionary based on an actual, current configuration detected for the printer. In another aspect, any combination of the foregoing may be use to capture an accurate representation of the target printer.

[00133] The machine-ready models 512 may include models that are suitable for use by a printer in fabricating an object. Any number of machine-ready models 512 may be provided for a particular object. Thus when an object and a target printer are specified in a print request, the database 504 may be queried to retrieve a suitable model to fabricate the object using the target printer. Although the dictionaries 508 and machine-ready models 512 are shown in the same database 504, one skilled in the art will recognize that they may be located in different, separate databases, or that there may be a plurality of databases including different dictionaries 508 and machine-ready models 512. The database 504 may be located on a printer, a print server, another resource, and so forth, as well as combinations of the foregoing. In response to the request from the requester 502, the database 504 (or a component operating the database 504) may send the requester 504 the requested data, e.g., one or both of the dictionary 508 and the machine ready model 512.

[00134] Fig. 6 illustrates a system for providing machine-ready models based on printer configuration. Once again, one skilled in the art will recognize that Fig. 6 illustrates one possibility out of numerous possibilities for such a system 600. As shown in Fig. 6, the system 600 may include a network 602 interconnecting a printer 604 and a print server 606. In general, the network 602, printer 604, and print server 606 may be any as described herein.

[00135] As shown in Fig. 6, in operation, the print server 606 may send a query 608 to the printer 604. The query 608 may include a request for the printing capabilities or printing configuration (e.g., a dictionary) of the printer 604. In response, the printer 604 may respond by sending the print server 606 an answer 610. The answer 610 may include a dictionary as described herein for the printer 604. Based on the information included in the answer 610, the print server 606 may send the printer 604 an asset 612. The asset 612 may include without limitation a machine-ready representation of a three-dimensional model executable by the printer 604, instructions for printing, a fabrication profile, and so forth. Before sending the asset 612, the print server 606 may develop, generate, select, modify, etc., the asset 612, which may be done internally on the print server 606 or with the aid of an external resource such as a database 614. For example, in one aspect, the print server 606 uses a dictionary included in the answer 610 to create a fabrication profile, which the print server 606 or an external resource then uses to generate a machine-ready representation of a three-dimensional model executable by the printer 604. The machine-ready representation is then sent to the printer 604 as the asset 612.

[00136] The database 614 may be located on the print server 606 or be an external resource to the print server 606. The print server 606 may thus be in communication with the database 614 through the network 602. The database 614 may include a plurality of dictionaries, machine-ready models, or the like for use by the print server 606. The print server 606 may also or instead supply the database 614 with dictionaries, machine-ready models, or other information.

[00137] The above systems, devices, and methods described herein may be used to supplement current systems for three-dimensional fabrication. For example, the techniques described herein may be used in systems where users print from libraries (e.g.,

online databases), print purchased files (e.g., from online stores or services providing machine-ready models), print from applications running on their computers or mobile devices, when importing or exporting files, and so forth. The techniques described herein may be used to ensure that clients are using suitable machine-ready models for their particular printer configuration when printing.

[00138] The above systems, devices, and methods described herein may be used in networked printers, where printers will automatically send their configuration information and receive machine-ready models based on the configuration information. In another aspect, non-networked printers may provide configuration information and receive machine-ready models through external devices, e.g., Universal Serial Bus (USB) devices or the like, or by using configuration programming local to their machine. For example, a user interface or application running on the printer or a computer/device connected to the printer may include an option to copy configuration data to a USB flash drive or the like. A user may then use the USB flash drive to load the configuration into a print server, application, webpage, or the like. An alternate embodiment may include a user entering configuration data into a GUI for a print server or the like. The configuration data may be entered using profile codes or the like, where profile codes are associated with a printer configuration. A database may thus maintain the profile codes mapped to particular configuration data.

[00139] In one aspect, a printer captures its properties, e.g., in a dictionary or the like, and provides the dictionary to a three-dimensional printing service. The three-dimensional printing service may include a slicing engine, where the slicing engine may only being to slice a three-dimensional model after receiving the dictionary from the printer. The sliced model (or machine-ready model) may include the configuration information, e.g., the dictionary. The sliced model may also or instead include a link or path (e.g., a URL) to the original three-dimensional model. Firmware included on the printer may issue a warning if the sliced model does not match the configuration of the printer. Firmware included on the printer may attempt to use the three-dimensional printing service (e.g., via a cloud service or the like) to correct the sliced model if the sliced model does not match the configuration of the printer. This correction may include without limitation attempting to use another sliced model, the original three-dimensional

model, re-slicing the original three-dimensional model, or modifying the sliced model. A user of the printer may save their configuration with the three-dimensional printing service so that future sliced models may be provided based on the configuration of the printer. In this manner, a printer may have a saved profile of its configuration. A user of the printer may also be able to reconfigure and reset their printer's profile. A printer's profile may also or instead be automatically created at the time of manufacturing of the printer.

[00140] In one aspect, a printer (or properties thereof, e.g., the dictionary) may require authenticating before the printer can obtain a machine-ready model. In another aspect, a printer's dictionary is stored on a print server or database in communication with the print server, and the stored dictionary may be updated when the printer connects to the print server. The update may be an automatic update, a manual update, a scheduled update, and so forth. In yet another aspect, a user may have an account with a print server or the like, where the user can save printer dictionaries and machine-ready models for a plurality of printers. Printer dictionaries and machine-ready models may also or instead be saved locally by a user or client.

[00141] In an implementation, if a printer is connected to a print server, the configuration of the printer is automatically sent to the print server. In this instance, when a user connects a printer to a print server for the first time, the user may be prompted to name or label the printer or configuration. Based on the print server's experience with the make and model of the printer, certain data may be known simply from the connection without the transfer of a dictionary or the like. In other instances, the dictionary may provide configuration information to the print server. If the print server needs additional information, a user may be prompted to input or select such information. Configurations and printers may also be saved on the print server or a component thereof, such that a user may access this information, e.g., using a GUI or the like. A print server or database connected thereto may provide a user with three-dimensional models for selection, where the models have associated machine-ready representations for different printers. A user of such a system with a saved profile may be able to select a three-dimensional model for printing, and the print server may automatically choose a machine-ready representation based on the user's or printer's profile. Alternatively, a print server may be able to create

machine-ready representations of the three-dimensional models selected by the user based on the user's or printer's profile. If a user has more than one printer associated with their profile, they may select which printer they want the machine-ready representation to be executed on to print a selected three-dimensional model.

[00142] The techniques described herein may assist in providing accurate print time estimation because the configurations of particular printers will be known to a print server. For example, a printer's configuration may provide a printing estimator with relevant acceleration parameters and the estimator can compute accelerated print times accordingly. Acceleration parameters may also be useful for slicer computations for variable layer height.

[00143] As described above, a slicer may utilize the configuration information of the printers in creating machine-ready models. By way of example and not of limitation, the configuration information may be parsed by the slicer in the following ways: the slicer may maintain configurations as a set of layered style sheet type overrides; the slicer may maintain a function, script, or the like that manipulates a base profile based on some simple logic keyed from the configuration; or some combination thereof. The slicer may utilize an algorithm that computes a toolpath for a given dictionary.

[00144] Several use cases of the techniques described herein will now be discussed. After obtaining a machine-ready representation of a three-dimensional model of an object, a user may print the object one or more times. In one aspect, the user may not need to obtain another machine-ready representation for printing the object, but can re-use the one already received. If the user in this scenario switched printers, or switched their printer's configuration, the system may automatically recognize that the user has done so when attempting to use the machine-ready representation on the new printer or configuration. This may be accomplished through an error check or compatibility check performed by a component of the system, e.g., the printer or the print server. If the machine-ready representation is unsuitable for the new printer or configuration, the system may stop the user from using the machine-ready representation (e.g., through a notification or the like), or the machine-ready representation may simply not function with the printer. In one aspect, the new printer or new configuration may also be compatible with the machine-ready representation and a new machine-ready

representation may not be required. In another aspect, the new printer or new configuration may not be compatible with the machine-ready representation and a new machine-ready representation may be required. In such a use case, the system may begin a process to obtain a new suitable machine-ready representation for the new printer or configuration. The process may occur automatically, or the user may initiate the process. In one aspect, the process for obtaining a new suitable machine-ready representation for the new printer or configuration occurs automatically, and no error notification is sent, so the user has no direct knowledge that a new representation was needed and was obtained.

[00145] In another use case, the system may adapt the printer or the machine-ready representation instead of obtaining a new machine-ready representation for a new printer or configuration. For example, the printer can adapt itself (or a user can adapt the printer) to become compatible with a machine-ready representation. Such adaptations may include changes to print speed and the like.

[00146] The above systems, devices, methods, processes, and the like may be realized in hardware, software, or any combination of these suitable for the control, data acquisition, and data processing described herein. This includes realization in one or more microprocessors, microcontrollers, embedded microcontrollers, programmable digital signal processors or other programmable devices or processing circuitry, along with internal and/or external memory. This may also, or instead, include one or more application specific integrated circuits, programmable gate arrays, programmable array logic components, or any other device or devices that may be configured to process electronic signals. It will further be appreciated that a realization of the processes or devices described above may include computer-executable code created using a structured programming language such as C, an object oriented programming language such as C++, or any other high-level or low-level programming language (including assembly languages, hardware description languages, and database programming languages and technologies) that may be stored, compiled or interpreted to run on one of the above devices, as well as heterogeneous combinations of processors, processor architectures, or combinations of different hardware and software. At the same time, processing may be distributed across devices such as the various systems described above, or all of the functionality may be integrated into a dedicated, standalone device.

All such permutations and combinations are intended to fall within the scope of the present disclosure.

[00147] Embodiments disclosed herein may include computer program products comprising non-transitory computer-executable code or computer-usable code that, when executing on one or more computing devices, performs any and/or all of the steps of the control systems described above. The code may be stored in a non-transitory fashion in a computer memory, which may be a memory from which the program executes (such as random access memory associated with a processor), or a storage device such as a disk drive, flash memory or any other optical, electromagnetic, magnetic, infrared or other device or combination of devices. In another aspect, any of the control systems or the like described above may be embodied in any suitable transmission or propagation medium carrying computer-executable code and/or any inputs or outputs from same.

[00148] It will be appreciated that the devices, systems, and methods described above are set forth by way of example and not of limitation. Numerous variations, additions, omissions, and other modifications will be apparent to one of ordinary skill in the art. In addition, the order or presentation of method steps in the description and drawings above is not intended to require this order of performing the recited steps unless a particular order is expressly required or otherwise clear from the context.

[00149] The method steps of the implementations described herein are intended to include any suitable method of causing such method steps to be performed, consistent with the patentability of the following claims, unless a different meaning is expressly provided or otherwise clear from the context. So for example performing the step of X includes any suitable method for causing another party such as a remote user, a remote processing resource (e.g., a server or cloud computer) or a machine to perform the step of X. Similarly, performing steps X, Y and Z may include any method of directing or controlling any combination of such other individuals or resources to perform steps X, Y and Z to obtain the benefit of such steps. Thus method steps of the implementations described herein are intended to include any suitable method of causing one or more other parties or entities to perform the steps, consistent with the patentability of the following claims, unless a different meaning is expressly provided or otherwise clear

from the context. Such parties or entities need not be under the direction or control of any other party or entity, and need not be located within a particular jurisdiction.

[00150] It will be appreciated that the methods and systems described above are set forth by way of example and not of limitation. Numerous variations, additions, omissions, and other modifications will be apparent to one of ordinary skill in the art. In addition, the order or presentation of method steps in the description and drawings above is not intended to require this order of performing the recited steps unless a particular order is expressly required or otherwise clear from the context. Thus, while particular embodiments have been shown and described, it will be apparent to those skilled in the art that various changes and modifications in form and details may be made therein without departing from the spirit and scope of this disclosure and are intended to form a part of the invention as defined by the following claims, which are to be interpreted in the broadest sense allowable by law.

CLAIMS

What is claimed is:

1. A method comprising:

receiving a request to fabricate an object from a three-dimensional model;

determining a target printer to fabricate the object;

querying the target printer for one or more properties relevant to fabrication of the object;

receiving a dictionary of the one or more properties from the target printer;

creating a fabrication profile based on the one or more properties; and

generating a machine-ready representation of the three-dimensional model executable by the target printer to fabricate the object.

2. The method of claim 1 further comprising transmitting the machine-ready representation to the target printer for fabrication.

3. The method of claim 1 further comprising fabricating the object with the target printer.

4. The method of claim 1 wherein the one or more properties include a hardware configuration of the target printer.

5. The method of claim 4 wherein the hardware configuration includes one or more of an extruder type, an extruder nozzle diameter, a build volume, a build platform type, a hardware version number, a top speed for linear movement of a tool, a step size for movement of the tool, a minimum z-axis step size, a gantry type, and a build material type.

6. The method of claim 4 wherein the hardware configuration includes an automatically detected hardware reconfiguration.

7. The method of claim 4 wherein the hardware configuration includes a manually specified hardware reconfiguration.

8. The method of claim 1 wherein the one or more properties include a firmware configuration of the target printer.

9. The method of claim 1 wherein the one or more properties include one or more user settings on the target printer.

10. The method of claim 9 wherein the one or more user settings include user settings from a previous fabrication process.

11. The method of claim 1 wherein the one or more properties include an application used to operate the target printer.

12. The method of claim 1 wherein the one or more properties include a build material in the target printer.

13. The method of claim 1 further comprising receiving an identifier from the target printer and applying the identifier to retrieve the dictionary from a repository of printer information remote from the target printer.

14. The method of claim 1 wherein generating the machine-ready representation includes processing the three-dimensional model according to the fabrication profile.

15. The method of claim 1 wherein generating the machine-ready representation includes selecting one of a plurality of stored machine-ready models according to the fabrication profile as the machine-ready representation.

16. The method of claim 15 further comprising:

determining whether one of the plurality of stored machine-ready models can be modified to meet the fabrication profile;

modifying the one of the plurality of stored machine ready models for use as the machine-ready representation if possible; and

generating a new machine-ready representation according to the fabrication profile for use as the machine-ready representation if not possible.

17. The method of claim 16 wherein modifying includes one or more of translating the machine-ready representation, rotating the machine-ready representation, scaling the machine-ready representation, and changing a top speed in a tool path for the target printer.

18. The method of claim 1 further comprising determining whether a suitable machine-ready model is available for the fabrication profile.

19. The method of claim 18 further comprising selecting the suitable machine-ready model if available and generating the machine-ready representation according to the fabrication profile if not available.

20. The method of claim 1 further comprising generating descriptive metadata to accompany the machine-ready representation, the descriptive metadata specifying one or more properties for comparison to properties of printers selected for fabricating the model.

21. The method of claim 20 further comprising checking the descriptive metadata against a selected printer prior to fabrication by the selected printer.

22. The method of claim 1 wherein receiving the request to fabricate the object includes receiving the request at a remote print server.

23. The method of claim 1 wherein receiving the request to fabricate the object includes receiving the request at the target printer.

24. The method of claim 1 wherein receiving the request to fabricate the object includes receiving the request at a computer locally connected to the target printer.

25. The method of claim 1 wherein determining the target printer includes identifying a selected printer in the request.

26. The method of claim 1 wherein determining the target printer includes selecting the target printer at a remote print server based on one or more selection criteria.

27. The method of claim 1 wherein generating the machine-ready representation includes generating printer-executable instructions at a computer locally connected to the target printer.

28. The method of claim 1 further comprising:

receiving the machine-ready representation at the target printer;

checking the machine-ready representation for errors; and

requesting a new machine-ready representation when an error is detected.

29. The method of claim 1 wherein receiving the request to fabricate the model includes receiving the request from the target printer.

30. A computer program product comprising non-transitory computer executable code embodied in a non-transitory computer readable medium that, when executing on one or more computing devices, performs the steps of:

receiving a request to fabricate an object from a three-dimensional model;

determining a target printer to fabricate the object;

querying the target printer for one or more properties relevant to fabrication of the object;

receiving a dictionary of the one or more properties from the target printer;

creating a fabrication profile based on the one or more properties; and

generating a machine-ready representation of the three-dimensional model executable by the target printer to fabricate the object.

31. A system comprising:

a print server coupled through a data network to a plurality of three-dimensional printers, the print server configured to receive a request to fabricate an object from a three-dimensional model, determine a target printer from the plurality of three-dimensional printers to fabricate the object, query the target printer for one or more properties relevant to fabrication of the object, receive a dictionary of the one or more properties from the target printer, create a fabrication profile based on the one or more properties, and generate a machine-ready representation of the three-dimensional model executable by the target printer to fabricate the object; and

a database coupled in a communicating relationship with the print server and configured to store at least one of the dictionary, the fabrication profile, and the machine-ready representation.

DETECTION AND USE OF PRINTER CONFIGURATION INFORMATION

ABSTRACT

The hardware and software properties of a three-dimensional printer can be queried and applied to select suitable directly printable models for the printer, or to identify situations where a new machine-ready model must be generated. The properties may be any properties relevant to fabrication including, e.g., physical properties of the printer, printer firmware, user settings, hardware configurations, and so forth. A printer may respond to configuration queries with a dictionary of capabilities or properties, and this dictionary may be used to select suitable models, or determine when a new model must be created. Similarly, when a printable model is sent to the printer, metadata for the printable model may be compared to printer properties in the dictionary to ensure that the model can be fabricated by the printer.