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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/422,303	02/01/2017	Riley Reese	50823-712.301

153281

Arevo / WILSON, SONSINI, GOODRICH & ROSATI
650 PAGE MILL ROAD
PALO ALTO, CA 94304-1050

CONFIRMATION NO. 1368
POWER OF ATTORNEY NOTICE



OC000000115860072

Date Mailed: 04/02/2020

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/28/2020.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71.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.

/trwoodson/



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/422,303	02/01/2017	Riley Reese	3019-023us2

CONFIRMATION NO. 1368

POA ACCEPTANCE LETTER

148464
Arevo
c/o McGeary Cukor LLC
7 Dumont Place
Morristown, NJ 07960



Date Mailed: 04/02/2020

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/28/2020.

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.

/trwoodson/

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) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA/82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

Application Number	15/422,303
Filing Date	02-01-2017
First Named Inventor	Riley Reese
Title	HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS
Art Unit	1744
Examiner Name	MORENO HERNANDEZ, JERZI H
Attorney Docket Number	3019-023us2

SIGNATURE of Applicant or Patent Practitioner

Signature	/Jason Paul DeMont/	Date (Optional)	
Name	Jason Paul DeMont	Registration Number	35,793
Title (if Applicant is a juristic entity)			
Applicant Name (if Applicant is a juristic entity)	Arevo, Inc.		

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) 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.**

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

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:

148464

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):

Arevo, Inc.



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

Date (Optional)

March 26, 2020

Name

Sonny Vu

Title

Chief Executive Officer

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.

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

STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: Arevo, Inc.

Application No./Patent No.: 15/422,303 Filed/Issue Date: 02-01-2017

Titled: HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL

Arevo, 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 042135, Frame 0723, 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: _____ To: _____

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

2. 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.

[Page 1 of 2]

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.

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.

/Jason Paul DeMont/

March 28, 2020

Signature

Date

Jason Paul DeMont

35,793

Printed or Typed Name

Title or Registration Number

Electronic Acknowledgement Receipt	
EFS ID:	38998319
Application Number:	15422303
International Application Number:	
Confirmation Number:	1368
Title of Invention:	HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS
First Named Inventor/Applicant Name:	Riley Reese
Customer Number:	153281
Filer:	Jason P. DeMont
Filer Authorized By:	
Attorney Docket Number:	50823-712.301
Receipt Date:	28-MAR-2020
Filing Date:	01-FEB-2017
Time Stamp:	02:15:55
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	aia0082a_3019-0023us2.pdf	184296	no	1
			e06ace0a7eda7dd85f021b979d375f63607efd4		

Warnings:

Information:					
2	Power of Attorney	aia0082b_3019-023us2.pdf	647773	no	1
			8caef6abee9c13094b006ddf45253e273a667d97		
Warnings:					
Information:					
3	Assignee showing of ownership per 37 CFR 3.73	aia0096_3019-023us2.pdf	105826	no	2
			59e4b19ab177fecac89bcc298474baeccc52b5c1		
Warnings:					
Information:					
Total Files Size (in bytes):			937895		
<p>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.</p> <p><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.</p> <p><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.</p> <p><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.</p>					



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/422,303	02/01/2017	Riley Reese	50823-712.301	1368
153281 7590 09/19/2019 Arevo / WILSON, SONSINI, GOODRICH & ROSATI 650 PAGE MILL ROAD PALO ALTO, CA 94304-1050			EXAMINER MORENO HERNANDEZ, JERZI H	
			ART UNIT 1744	PAPER NUMBER
			NOTIFICATION DATE 09/19/2019	DELIVERY MODE 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):

patentdocket@wsgr.com

Notice of Abandonment	Application No.	Applicant(s)
	15/422,303	Reese et al.
	Examiner	Art Unit
	JERZI H MORENO HERNANDEZ	1744

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

This application is abandoned in view of:

1. ☒ Applicant's failure to timely file a proper reply to the Office letter mailed on 05 February 2019.
 - (a) ☐ A reply was received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the period for reply (including a total extension of time of _____ month(s)) which expired on _____.
 - (b) ☐ A proposed reply was received on _____, but it does not constitute a proper reply under 37 CFR 1.113 to the final rejection. (A proper reply under 37 CFR 1.113 to a final rejection consists only of: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) if this is utility or plant application, a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. Note that RCEs are not permitted in design applications.)
 - (c) ☐ A reply was received on _____ but it does not constitute a proper reply, or a bona fide attempt at a proper reply, to the non-final rejection. See 37 CFR 1.85(a) and 1.111. (See explanation in box 7 below).
 - (d) ☒ No reply has been received.
2. ☐ Applicant's failure to timely pay the required issue fee and publication fee, if applicable, within the statutory period of three months from the mailing date of the Notice of Allowance (PTOL-85).
 - (a) ☐ The issue fee and publication fee, if applicable, was received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the statutory period for payment of the issue fee (and publication fee) set in the Notice of Allowance (PTOL-85).
 - (b) ☐ The submitted fee of \$ _____ is insufficient. A balance of \$ _____ is due.
The issue fee required by 37CFR 1.18 is \$ _____. The publication fee, if required by 37 CFR 1.18(d), is \$ _____.
 - (c) ☐ The issue fee and publication fee, if applicable, has not been received.
3. ☐ Applicant's failure to timely file corrected drawings as required by, and within the three-month period set in, the Notice of Allowability (PTO-37).
 - (a) ☐ Proposed corrected drawings were received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the period for reply.
 - (b) ☐ No corrected drawings have been received.
4. ☐ The letter of express abandonment which is signed by the attorney or agent of record or other party authorized under 37 CFR 1.33 (b). See 37 CFR 1.138(b).
5. ☐ The letter of express abandonment which is signed by an attorney or agent (acting in a representative capacity under 37 CFR 1.34) upon the filing of a continuing application.
6. ☐ The decision by the Board of Patent Appeals and Interference rendered on _____ and because the period for seeking court review of the decision has expired and there are no allowed claims.
7. ☐ The reason(s) below:

/JERZI H MORENO HERNANDEZ/ Examiner, Art Unit 1744	/Anthony Calandra/ Primary Examiner, Art Unit 1748
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Petitions to revive under 37 CFR 1.137, or requests to withdraw the holding of abandonment under 37 CFR 1.181, should be promptly filed to minimize any negative effects on patent term.



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/422,303	02/01/2017	Riley Reese	50823-712.301	1368
153281 7590 02/05/2019 Arevo / WILSON, SONSINI, GOODRICH & ROSATI 650 PAGE MILL ROAD PALO ALTO, CA 94304-1050			EXAMINER MORENO HERNANDEZ, JERZI H	
			ART UNIT 1744	PAPER NUMBER
			NOTIFICATION DATE 02/05/2019	DELIVERY MODE 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):

patentdocket@wsgr.com

DETAILED CORRESPONDENCE

Notice of Pre-AIA or AIA Status

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

Response to Arguments

Applicant's arguments/remarks filed on 09/28/2018 and 11/07/2018 have been fully considered.

With respect to the claim rejection(s) under 35 U.S.C. § 112(a), Applicant's amendment(s) to the claim(s) has/have overcome the claim rejection(s).

With respect to the claim rejection(s) under 35 U.S.C. § 112(b), Applicant's amendment(s) to the claim(s) has/have overcome the claim rejection(s).

With respect to the claim rejection(s) under 35 U.S.C. § 103, applicant argues that Comb does not teach/disclose the claimed controller.

This argument is moot because Comb was/is not used to teach the controller in the previous/current rejection.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In response to applicant's argument that there is no motivation to combine the references (i.e. Comb, Ruff and Liu), the examiner recognizes that obviousness may be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988), *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992), and *KSR International Co. v. Teleflex, Inc.*, 550 U.S. 398, 82

USPQ2d 1385 (2007). In this case, the references themselves provide suggestions/motivations for the modification. Additionally, Applicant did not explain why the motivations/suggestions provided in the previous rejection (i.e. NF dated 06/28/2018) are not valid.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "to permit removal of said 3D object from said thermally conductive plate when said thermally conductive plate has cooled to said lower temperature and while said thermally conductive plate is secured to said build platform") are not recited in the rejected claim(s). 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).

Applicant further argues that the prior art does not teach all the limitations of amended claim 19 (new limitations were added to claim 19 in CLM submitted on 09/28/18).

This argument is moot because the arguments do not apply to the combination of references being used in the current rejection.

Note

Examiner wishes to point out to applicant that claim(s) 19, 22, 24-26, 34-36 and 46-51 is/are directed towards an apparatus and as such will be examined under the following conditions. The process/manner of using the apparatus and/or the material worked upon by the apparatus is/are viewed as recitation(s) of intended use and is/are given patentable weight only to the extent that structure is added to the claimed apparatus (See MPEP 2114 II and 2115 for further details). For apparatuses, the claim limitations will define structural limitations (See MPEP 2114-2115) or functional limitations properly recited (See MPEP 2173.05 (g)).

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.

Claim(s) 19, 22, 24-26, 34-35 and 46-51 is/are rejected under 35 U.S.C. 103 as being unpatentable over Comb (US 2015/0145174 – of record) as evidenced by Hypherphysics (Thermal expansion coefficients, 2013 – attached) in view of Comb (US 2013/0186549) and Din (2015/0056319 – of record) alone or further in view of Ruff (US 2017/0036403 with priority date of 05/15/14 – of record).

Regarding claims 19, 25, 34 and 46, Comb '174 teaches a build apparatus ((26), F2-8) for use in printing a 3D object (P0001), comprising:

a build platform (52) comprising one or more heating units ((56); P0044, P0056, F6);

a thermally conductive plate (36b having a plate-like shape and comprising steel, P0053, F5-6; thus, 36b is considered to be a thermally conductive plate) disposed adjacent to and in thermal communication with said build platform (bottom surface of 36b is placed on top of 52; thus, 36b is adjacent to 52 and in thermal communication with 52 when 52 is heated via heat transfer by conduction, P0047, F5-6);

a polymer coating (36a) adjacent to said thermally conductive plate (polymeric layer/coating 36a adjacent to 36b to make a coated plate 36; wherein 36a can be a polyimide coating/layer, P0054-0055, F5-6), wherein said polymer coating adjacent to said thermally conductive plate is configured to secure at least a portion of said 3D object during printing (P0056 & P0025; Additionally, since the taught coating and the claimed coating are not

patentably distinct in terms of structure, the taught coating is expected to be capable of securing at least a portion of said 3D object during printing, See MPEP 2112.01 I),

wherein said build platform (52) comprises aluminum and has a first coefficient of thermal expansion (CTE) (P0047; wherein aluminum intrinsically has a coefficient of thermal expansion of about $0.000024/^{\circ}\text{C}$, as evidenced by Hyperphysics) and said thermally conductive plate (36b) comprises steel and has a second CTE (P0053; wherein steel intrinsically has a coefficient of thermal expansion of about $0.000013/^{\circ}\text{C}$, as evidenced by Hyperphysics), and wherein said first CTE is greater than said second CTE ($0.000024/^{\circ}\text{C} > 0.000013/^{\circ}\text{C}$; thus, Comb implicitly teaches the claimed CTEs; Additionally, since the taught and claimed materials are identical, the properties/CTEs are expected to be the same, See MPEP 2112.01 I-II).

Comb '174 further teaches to direct said one or more heating units (56) to supply heat to said build platform to control the temperature of said build platform while printing said 3D object (P0052, P0066, P0074) but does not teach a controller coupled to the heating units and/or temperature detectors.

In the same in the field of endeavor, build platforms, Comb '549 teaches/suggests to use a controller (24) operatively coupled to one or more heating units (38), wherein said controller uses feedback to control a temperature of a build platform (18) while printing said 3D object, which feedback comprises (i) receiving, from one or more temperature detectors ("temperature sensors"), one or more temperatures of said build platform and ii) directing said one or more heating units to supply heat to said build platform to control said temperature of said build platform (P0059, P0068-0069, P0112, P0173, P0177-0179, P0194, F2A and F11A-C). Comb '549 does not explicitly teach that the controller is configured to terminate supply heat to said build platform.

In the same in the field of endeavor, build platforms, Din teaches to use a controller (110) operatively coupled to one or more heating units (124) (P0025, F5), wherein said controller uses feedback to control a temperature of a build platform (120) while printing said 3D

object, which feedback comprises (i) receiving, from one or more temperature detectors (170), one or more temperatures of said build platform and ii) directing said one or more heating units to supply heat to said build platform to control said temperature of said build platform (P0023, P0026, F4-5) and terminate supply heat to said build platform after the 3D the object is formed to enable/start cooling (P0028, P0032).

Since Comb '174 further teaches to include a controller (22) to control the components of the 3D printing system automatically (P0037), to enable adjustments in the power supplied to the heating units (P0066 and P0073-0074) and to look into Comb '549 or other art for details about the heating units/control (P0052), it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Comb '174 in view of Comb '549 and/or Din by incorporating temperature detectors, coupling the controller to the detectors and the heating units and creating a temperature feedback-control loop as instantly claimed for the benefit(s) of enhancing/automating the temperature control of the build platform. Additionally, since the usage of a controller configured to control heating of build platform via heating unit(s) based on feedback from temperature sensor(s) is well known and desirable in the art, as evidenced by LIU (US 2016/0167309 – previously applied; P0115) or Low (US 2003/0222066 – of record; Abstract, P0014, F1), the proposed modification is obvious, desirable, and within one of ordinary skill in the art. Since Comb '174 further teaches to separate the thermally conductive plate from the build platform to facilitate the removal of the 3D object (P0008, P0089) and/or to flex the thermally conductive plate to facilitate the removal of the 3D object (P0008, P0027) and Din teaches to terminate supply heat to said build platform after the 3D the object is formed to enable/start cooling (P0028, P0032), it would also have been obvious to one of ordinary skill in the art to further configure the controller to terminate supply of heat to said build platform to cool said build platform and said thermally conductive plate while the thermally conductive plate is secured to said build platform to allow sufficient cooling before the operator separates the thermally conductive plate from the build platform, flexes the thermally conductive plate, or

removes the formed 3D object for the benefit(s) of avoiding burns/hazards and/or preventing overheating.

Alternatively, in the same field of endeavor, build platforms, Ruff teaches a build apparatus (20; P0069, F2-4) comprising a polymer coating (24; wherein 24 is a polymer coating, P0019, claim 4), a thermally conductive plate (22; wherein 22 can be made of steel or other thermally conductive materials, P0027), and a platform (30; wherein 30 can be made of aluminum, P0065), to heat the build apparatus during printing to increase adhesion of the coating to 3D object and to allow sufficient cooling of the build apparatus after printing ends to decrease adhesion of the coating to 3D object for the benefit(s) of allowing 3D object removal with little or no external force and/or preventing damage to the coating/object (P0059, P0021, P0076).

It would have been obvious/desirable to one with ordinary skill in the art to further modify the apparatus of the combination in view of Ruff by enabling temperature/heating control of the build apparatus during/after printing for the benefit(s) of adjusting adhesion of the printed 3D object to the coating during/after printing and by terminating supply of heat to said build platform to cool said build platform and said thermally conductive plate while the thermally conductive plate is secured to said build platform for the benefit(s) reducing the adhesion of the printed object to the coating, allowing/facilitating removal of printed object from the coating with little or no external force and/or preventing damage to the coating/object during removal.

Regarding claim 22, Comb '174 further teaches wherein said heating units (56) are spaced along a surface of said build platform (F6 & F8). Din further suggests/obviates claim 22 (P0025, F5).

Regarding claim 24, Comb '549 further teaches wherein said build platform comprises said one or more temperature detectors situated at one or several locations to provide said feedback to said controller for controlling said temperature of said build platform (P0194). Din also further teaches claim 24 (P0023, F4).

Regarding claim 26, since Ruff further teaches that glass is suitable material for build platforms, is a lower cost alternative to aluminum, and remains flat (P0065-0066) and glass is a well-known ceramic, it would have been obvious/desirable to one with ordinary skill in the art to further modify the apparatus of the combination in view of Ruff by using glass/ceramic material instead of aluminum for the build platform for the benefit(s) of reducing cost and/or reducing thermal expansion/non-planarity when heating the build platform. In addition, it has been held that the selection of a known material based on its suitability for its intended use supports a prima facie obviousness determination (See MEPE 2144.07).

Regarding claim 35, Comb further teaches wherein said thermally conductive plate has a thickness ranging between 0.025 inches and 0.5 inches ("thicknesses for 36b may range from about 5 mils to about 100 mils" (i.e. 0.005-0.1 inches) which is within the claimed range; Comb further teaches that the thickness is selected depending on the desired amount of flexibility, P0057, P0068, P0087).

Regarding claim 47, Comb further teaches wherein said polymer coating has a thickness ranging between 0.001 inches and 0.1 inches ("suitable thicknesses for 36a may range from about 1 mil to about 30 mils (i.e. 0.001-0.03 inches) which is within the claimed range, P0057).

Regarding claim 48, Comb further teaches wherein said thermally conductive plate is flexible to facilitate dissociation between said 3D object and said thermally conductive plate upon cooling of said thermally conductive plate (36b is flexible/thin which facilitates the removal/peeling of 3D object and reduces damages, P0057, P0026-0027, P0082). Ruff further suggests/obviates claim 48 (P0059, P0021, P0076).

Regarding claim 49, while Comb fails to explicitly teach that the build platform, the removable plate, and the polymer coating are able to withstand high temperature ranging between 150 degree Celsius and 300 degree Celsius, Comb implicitly teaches that build platform, the removable plate, and the polymer coating are capable of withstand temperatures

ranging from 150-300 degree Celsius because the apparatus of Comb is capable of manufacturing polyetherimide 3-D parts (P0055; polyetherimides have high glass transition and/or melting temperatures (i.e. at least 200 degree Celsius which is within the claimed range)). In addition, since the taught and claimed/disclosed materials for the build platform, the removable plate, and the polymer coating are identical, they are expected to have the same properties and/or functionalities (See MPEP 2112.01 I-II). Additionally, Ruff further suggests/obviates claim 49 (P0038).

Regarding claim 50, Comb further teaches wherein said build platform comprises holes for heater cartridges of said temperature control unit (52 has holes 84 for 56, P00072-0073, F6).

Regarding claim 51, the combination further implicitly teaches wherein said one or more heating units are positioned at different locations of said build platform than said one or more temperature detectors because the heating units and the temperature detectors are not capable of occupying the same space/location within the build platform. Din appears to further teach/suggests this claim (P0023, F4-5). In addition, since it has been held that a mere rearrangement of element without modification of the operation of the device involves only routine skill in the art (See MPEP 2144.04 VI C), it would have been obvious have been obvious to one having ordinary skill in the art to further modify the apparatus of the combination by arranging the heating units and temperature detectors at different/spaced locations within said build platform for the benefit(s) of preventing overheating/damage of the temperature detectors and/or increasing accuracy of temperature detection of the build platform.

Claim(s) 36 is/are rejected under 35 U.S.C. 103 as being unpatentable over Comb (US 2015/0145174 – of record) as evidenced by Hypherphysics (Thermal expansion coefficients, 2013 - attached) in view of Comb (US 2013/0186549), Din (2015/0056319 – of record) and Ruff (US 2017/0036403 with priority date of 05/15/14 – of record) as applied to claim 19 above, and further in view of Koyagi (US 2006/0198918 – of record).

Regarding claim 36, Comb further teaches wherein said thermally conductive plate is ... secured to and removable from said build platform (P0008, P0023). Comb further teaches that magnetically or non-magnetically means such as a snapping means or a vacuum means are suitable and known means used to removably connect/secure a plate to the platform but prefers to use a magnetic means because a vacuum means is more complex and/or expensive (P0028-0030).

In the same field of endeavor, build platforms, Koyagi teaches that mechanical, vacuum and magnetic means are interchangeable means to removably secure a plate to the build platform and that the mechanical and magnetic means have some disadvantages (P0053, P0055).

Since Comb does not explicitly teach that non-magnetic means cannot/shouldn't be used in his apparatus, Koyagi teaches that magnetic means also has disadvantages, and Comb/ Koyagi teach that both magnetic and nonmagnetic means are interchangeable as they yield the same result (removably connect/secure a plate to platform), it would have been obvious to one with ordinary skill in art at the time the invention was filed to further modify the apparatus of the combination in view of Koyagi by using a non-magnetic means to removably connect/secure the plate to the platform as this proposed modification is considered to be a simple substitution that does not modify the operation of the taught apparatus.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). 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 date of this final action.

For additional prior art of record and not relied upon that is considered to be pertinent to Applicant's disclosure see Notice of References Cited PTOL 892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JERZI H MORENO HERNANDEZ whose telephone number is (571)272-0625. The examiner can normally be reached on 1:00-10:00 PM.

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, YOGENDRA N GUPTA can be reached on 571-272-1316. 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.

/JERZI H MORENO HERNANDEZ/
Examiner, Art Unit 1744

/Anthony Calandra/
Primary Examiner, Art Unit 1748

<i>Notice of References Cited</i>	Application/Control No. 15/422,303		Applicant(s)/Patent Under Reexamination Reese et al.	
	Examiner JERZI H MORENO HERNANDEZ		Art Unit 1744	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-9833944-B1	12-2017	Huthmaker; Robert Wayne	B29C59/02	1/1
*	B	US-20130186549-A1	07-2013	Comb; James W.	B29C65/02	156/62.8
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

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	HyperPhysics,Thermal Expansion Coefficients, 2013, http://hyperphysics.phy-astr.gsu.edu/hbase/Tables/thexp.html (Year: 2013)
	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.

<i>Search Notes</i> 	Application/Control No. 15/422,303	Applicant(s)/Patent Under Reexamination Reese et al.
	Examiner JERZI H MORENO HERNANDEZ	Art Unit 1744

CPC - Searched*		
Symbol	Date	Examiner
B29C67/0051;B29C67/0055;B29C67/0085	5/15/2017	JHMH
B33Y30/00 or B33Y50/02	5/15/2017	JHMH
B29C67/0088	5/15/2017	JHMH
B29C67/0092	5/15/2017	JHMH
B29C33/68	5/15/2017	JHMH
B29K2879/085	5/15/2017	JHMH
Updated search	01/27/2018	JHMH
Updated search	06/20/2018	JHMH
Updated search	01/30/2019	JHMH

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

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

Search Notes		
Search Notes	Date	Examiner
inventor name searched	5/15/2017	JHMH
see EAST search history attached	5/15/2017	JHMH
See updated EAST search history attached	01/27/2018	JHMH
See updated EAST search history attached	06/20/2018	JHMH
See updated EAST search history attached	01/30/2019	JHMH

/JERZI H MORENO HERNANDEZ/ Examiner, Art Unit 1744	
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<i>Search Notes</i> 	Application/Control No. 15/422,303	Applicant(s)/Patent Under Reexamination Reese et al.
	Examiner JERZI H MORENO HERNANDEZ	Art Unit 1744

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/JERZI H MORENO HERNANDEZ/ Examiner, Art Unit 1744	
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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S145	1	15/422303.app. and CTE	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/28 17:56
S146	3	"56128452".FMID.	US-PGPUB; USPAT; FPRS	OR	OFF	2019/01/28 18:05
S147	266	B29C64\$.cpc. and (resin polymer\$3 resilient polyimide) with (coat\$3 layer) same (plate substrate) same (platform stage)	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/28 18:07
S148	0	B29C64\$.cpc. and (plate platform stage) same (first) same (second) same (coefficient near2 thermal near32 expansion)	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/28 18:18
S149	8	B29C64\$.cpc. and (plate platform stage) same (first) same (second) same (coefficient near2 thermal near32 expansion)	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/28 18:19
S150	1	"4052217".pn.	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/28 18:29
S151	3	("20140220168" "4052217" "20160176118" "20150343688" "5094095" "5141680" "6269938" "6571702" "8911199" "9592660" "20140265032" "20160204078" "9248600" "20130310192").PN. and (expansion)	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/28 18:37
S152	2	("20140220168" "4052217" "20160176118" "20150343688" "5094095" "5141680" "6269938" "6571702" "8911199" "9592660" "20140265032" "20160204078" "9248600" "20130310192").PN. and (CTE)	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/28 18:37
S153	30	B29C64/245.cpc. and (expansion) near5 (coefficient thermal) with (different mismatch)	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/28 18:59
S154	30	(B29C64\$.cpc. B33Y\$.cpc.) and (plate platform stage) same (first) same (second) same (coefficient near2 thermal near32 expansion)	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/28 19:03
S155	39	(B29C64\$.cpc. B33Y\$.cpc.) and (plate platform stage platen base stand) same (first) same (second) same (coefficient	US-PGPUB; USPAT;	OR	ON	2019/01/28 19:04

		thermal\$2) near5 (expansion)	USOCR			
S156	39	(B29C64\$.cpc. B33Y\$.cpc.) and (plate platform stage platen base stand) with (mismatch different multiple plural\$4) with (coefficient thermal\$2) near5 (expansion)	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/28 19:10
S157	29	(B29C64\$.cpc. B33Y\$.cpc.) and (plate platform stage platen base stand) with (mismatch different multiple plural\$4) with (coefficient thermal\$2) near5 (expansion) not (S149 S154 S153)	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/28 19:10
S158	4	("20020130112" "20090202378" "5216616" "6520996").PN. OR ("9604409").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/28 19:18
S159	14	("20130310192" "20140220168" "20140265032" "20150343688" "20160176118" "20160204078" "4052217" "5094095" "5141680" "6269938" "6571702" "8911199" "9248600" "9592660").PN. OR ("9937669").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/28 19:25
S160	8	("20160332387" "20030222066" "20150375458" "20170036403" "20150056319" "20160167309" "20160075091" "20120133083").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/28 19:26
S161	0	("20160332387" "20030222066" "20150375458" "20170036403" "20150056319" "20160167309" "20160075091" "20120133083").PN. and (coefficient thermal\$2) near5 (expansion)	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/28 19:26
S162	0	((("20160332387" "20030222066" "20150375458" "20170036403" "20150056319" "20160167309" "20160075091" "20120133083").PN.) and (coefficient thermal\$2) near5 (expansion)	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/28 19:27
S163	0	((("20160332387" "20030222066" "20150375458" "20170036403" "20150056319" "20160167309" "20160075091" "20120133083").PN.) and (expansion)	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/28 19:27
S164	0	((("20160332387" "20030222066" "20150375458" "20170036403" "20150056319" "20160167309" "20160075091" "20120133083").PN.) and ("CTE")	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/28 19:27
S165	6	(B29C64\$.cpc. B33Y\$.cpc.) and (plate platform stage platen base stand) same (first) same (second) same (CTE)	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/28 19:27
S166	6	(B29C64\$.cpc. B33Y\$.cpc.) and (plate platform stage platen base stand) with (second different mismatch) same (CTE)	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/28 19:30
S167	2	(B29C64\$.cpc. B33Y\$.cpc.) and ((plate platform stage platen base stand) with (second different mismatch) same (CTE)).clm.	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/28 19:30
S168	16	(B29C64\$.cpc. B33Y\$.cpc.) and ((plate	US-	OR	ON	2019/01/28

		platform stage platen base stand) same (second different mismatch) with (coefficient thermal\$2) near3 (expansion)).clm.	PGPUB; USPAT; USOCR			19:35
S169	44	(B29C64\$.cpc. B33Y\$.cpc.) and ((plate platform stage platen base stand) with (second different mismatch) with (coefficient thermal\$2) near3 (expansion))	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/28 19:42
S170	4	(B29C64\$.cpc. B33Y\$.cpc.) and ((plate platform stage platen base stand) with (second different mismatch) with (coefficient thermal\$2) near3 (expansion))	FPRS; EPO; JPO; DERWENT	OR	ON	2019/01/28 19:44
S171	19	(B29C64\$.cpc. B33Y\$.cpc.) and ((plate platform stage platen base stand) with (coefficient thermal\$2) near3 (expansion))	FPRS; EPO; JPO; DERWENT	OR	ON	2019/01/28 19:45
S172	2	"52779823".FMID.	US-PGPUB; USPAT; FPRS	OR	OFF	2019/01/28 19:47
S173	0	"2012237745" and (coefficient thermal\$2) near3 (expansion)	US-PGPUB	OR	ON	2019/01/28 19:49
S174	1	"20120237745" and (coefficient thermal\$2) near3 (expansion)	US-PGPUB	OR	ON	2019/01/28 19:49
S175	0	"2010018953" and (coefficient thermal\$2) near3 (expansion)	US-PGPUB	OR	ON	2019/01/28 19:50
S176	0	"20100018953" and (coefficient thermal\$2) near3 (expansion)	US-PGPUB	OR	ON	2019/01/28 19:50
S177	1	"20100018953"	US-PGPUB	OR	ON	2019/01/28 19:51
S178	0	"19705208".pn.	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/28 19:53
S179	13	"42041799".FMID.	US-PGPUB; USPAT; FPRS	OR	OFF	2019/01/28 19:54
S180	1	(US-20100101490-\$).did.	US-PGPUB	OR	OFF	2019/01/28 19:54
S181	0	"19705208".pn. and (expansion coefficient)	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/28 19:54
S182	1	(US-20100101490-\$).did. and expansion	US-PGPUB	OR	OFF	2019/01/28 19:57
S183	1	(B29C64\$.cpc. B33Y\$.cpc.) and ((plate platform stage platen base stand) with (CTE))	FPRS; EPO; JPO; DERWENT	OR	ON	2019/01/28 20:00
S184	0	("20160332387" "20030222066" "20150375458" "20170036403" "20150056319" "20160167309" "20160075091" "20120133083").PN. and CTE	FPRS; EPO; JPO; DERWENT	OR	ON	2019/01/28 20:01
S185	0	("20160332387" "20030222066" "20150375458" "20170036403"	US-PGPUB;	OR	ON	2019/01/28 20:01

		"20150056319" "20160167309" "20160075091" "20120133083").PN. and CTE	USPAT; USOCR			
S186	0	((("20160332387" "20030222066" "20150375458" "20170036403" "20150056319" "20160167309" "20160075091" "20120133083").PN.) and CTE	US- PGPUB; USPAT; USOCR	OR	ON	2019/01/28 20:01
S187	0	((("20160332387" "20030222066" "20150375458" "20170036403" "20150056319" "20160167309" "20160075091" "20120133083").PN.) and (thermal\$3 heat\$3) with (expansion distortion change)	US- PGPUB; USPAT; USOCR	OR	ON	2019/01/28 20:02
S188	3	((("20160332387" "20030222066" "20150375458" "20170036403" "20150056319" "20160167309" "20160075091" "20120133083").PN.) and (expansion distortion change)	US- PGPUB; USPAT; USOCR	OR	ON	2019/01/28 20:02
S189	8	((("20160332387" "20030222066" "20150375458" "20170036403" "20150056319" "20160167309" "20160075091" "20120133083").PN.)	US- PGPUB; USPAT; USOCR	OR	ON	2019/01/28 22:05
S190	23	(B29C64\$.cpc. B33Y\$.cpc.) and ((plate platform stage platen base stand) same (coefficient thermal\$2) near3 (expansion)).ab.	FPRS; EPO; JPO; DERWENT	OR	ON	2019/01/28 22:43
S191	10	(B29C64\$.cpc. B33Y\$.cpc.) and ((plate platform stage platen base stand) same (coefficient thermal\$2) near3 (expansion)).ab.	US- PGPUB; USPAT; USOCR	OR	ON	2019/01/28 22:44
S192	486	(B29C64\$.cpc. B33Y\$.cpc.) and ((plate platform stage platen base stand) same (coefficient thermal\$2) near3 (expansion))	US- PGPUB; USPAT; USOCR	OR	ON	2019/01/28 22:45
S193	26	(B29C64\$.cpc. B33Y\$.cpc.) and ((platen platform stage platen base stand) same (coefficient thermal\$2) near3 (expansion)) with (plate)	US- PGPUB; USPAT; USOCR	OR	ON	2019/01/28 22:46
S194	1	"60451523".FMID.	US- PGPUB; USPAT; FPRS	OR	OFF	2019/01/28 22:54
S195	1	"60451523".FMID.	US- PGPUB; USPAT; FPRS	OR	OFF	2019/01/28 23:06
S196	1	("20100100222" "20130186558" "5939008" "8188373").PN. and (coefficient thermal\$2) near3 (expansion)	US- PGPUB; USPAT; USOCR	OR	ON	2019/01/28 23:10
S197	4	("20100100222" "20130186558" "5939008" "8188373").PN.	US- PGPUB; USPAT; USOCR	OR	ON	2019/01/28 23:11
S198	1	(US-20160075091-\$).did.	US-PGPUB	OR	OFF	2019/01/28 23:27
S199	1	(US-20160075091-\$).did. and (platform) same (material ceramic)	US-PGPUB	OR	OFF	2019/01/28 23:28

S200	1	(US-20170036403-\$).did.	US-PGPUB	OR	OFF	2019/01/28 23:32
S201	1	(US-20170036403-\$).did. and (material)	US-PGPUB	OR	OFF	2019/01/28 23:32
S202	1	(US-20120237745-\$).did.	US-PGPUB	OR	OFF	2019/01/28 23:50
S203	1	(US-20120237745-\$).did. and (thermal expansion)	US-PGPUB	OR	OFF	2019/01/28 23:50
S204	0	("2016/0144428").URPN.	USPAT	OR	OFF	2019/01/28 23:52
S205	22	("2013/0256953").URPN.	USPAT	OR	OFF	2019/01/28 23:56
S206	1	("2013/0256953").URPN. and (thermal same (expansion coefficient)	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/28 23:57
S207	45	(B29C64\$.cpc. B33Y\$.cpc.) and ((platen platform stage platen base stand) same (coefficient thermal\$2) near3 (expansion)) with (substrate)	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/28 23:58
S208	61	(B29C64\$.cpc. B33Y\$.cpc.) and ((platen platform stage platen base plate substrate) same (coefficient thermal\$2) near3 (expansion) same (bow\$3 deform\$3 deformat\$3 uneven curl\$3))	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/29 00:01
S209	28	(B29C64\$.cpc. B33Y\$.cpc.) and (platen platform stage platen base plate substrate) with (cool\$3 cold) with (object part print product) with (removal)	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/29 00:21
S210	0	("2017/0252980").URPN.	USPAT	OR	OFF	2019/01/29 00:22
S211	12	("20100100222" "20130186558" "20130292862" "20130307193" "20140048969" "20140048970" "20140065194" "20170036403" "5939008" "6986654" "8185229" "8188373").PN. OR ("9833944").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/29 01:02
S212	12	("20100100222" "20130186558" "20130292862" "20130307193" "20140048969" "20140048970" "20140065194" "20170036403" "5939008" "6986654" "8185229" "8188373").PN. OR ("9833944").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/29 01:15
S213	3	("20130310507" "3663651").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/29 01:20
S214	1	ep adj "1637307"	DERWENT	OR	OFF	2019/01/29 01:25
S215	0	Gekotek.as,aanm.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/29 01:33
S216	1	(Aniket near2 Vyas)",aanm.as."	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/29 01:36

S217	3	(B29C64\$.cpc. B33Y\$.cpc.) and (platen platform stage bed) with (permanent) near5 (coating)	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/29 01:44
S218	68	(B29C64\$.cpc. B33Y\$.cpc.) and (heat\$3) near3 (bed platform) and (part object print product) with (removal separation) with (cool\$3)	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/29 01:50
S219	51	(B29C64\$.cpc. B33Y\$.cpc.) and (heat\$3) near3 (bed platform) and (part object print product) with (removal separation) with (cool\$3) and (@pd or @ptad or @prad or @ad or @rlad)<"20141216"	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/29 01:51
S220	63	(B29C64\$.cpc. B33Y\$.cpc.) and (heat\$3) near3 (bed platform plate platen) and (part object print product) with (removal separation pop) with (cool\$3) and (@pd or @ptad or @prad or @ad or @rlad)<"20141216"	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/29 01:59
S221	58	(B29C64\$.cpc. B33Y\$.cpc.) and (bed platform plate platen stage substrate) same (cool\$3 shrink\$4) with (part object print product) with (removal separation pop\$4) and (@pd or @ptad or @prad or @ad or @rlad)<"20141216"	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/29 02:08
S222	17	S221 not S220	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/29 02:09
S223	154	(B29C64\$.cpc. B33Y\$.cpc.) and (cool\$3) with (part object print product item) with (removal separation pop\$4) and (@pd or @ptad or @prad or @ad or @rlad)<"20141216"	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/29 02:11
S224	125	(B29C64\$.cpc.) and (cool\$3) with (part object print product item) with (removal separation pop\$4) and (@pd or @ptad or @prad or @ad or @rlad)<"20141216"	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/29 02:11
S225	845	(B29C64/106;B29C64/118).cpc. and (heat\$3) with (plate\$1 platform bed)	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/29 02:19
S226	77	(B29C64/106;B29C64/118).cpc. and (heat\$3) with (plate\$1 platform bed) same (sensor thermocouples) and (cool\$3) and (@pd or @ptad or @prad or @ad or @rlad)<"20141216"	US-PGPUB; USPAT; USOCR	OR	OFF	2019/01/29 02:20
S227	70	(B29C64/106;B29C64/118).cpc. and (cool\$3) with (part object print product item) with (removal separation pop\$4) and (@pd or @ptad or @prad or @ad or @rlad)<"20141216"	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/29 02:26
S228	68	(B29C64/106;B29C64/118).cpc. and (part object print product item) with (pop\$4) and (@pd or @ptad or @prad or @ad or @rlad)<"20141216"	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/29 02:29
S229	141	(B29C64/106;B29C64/118).cpc. and (platen plate platform substrate) with (coating) and (@pd or @ptad or @prad or @ad or @rlad)<"20141216"	US-PGPUB; USPAT; USOCR	OR	ON	2019/01/29 02:31

S230	1	(US-20160039194-\$).did.	US-PGPUB	OR	OFF	2019/01/29 02:35
S231	1	(US-20160039194-\$).did. and (cool\$3 expansion)	US-PGPUB	OR	OFF	2019/01/29 02:36
S232	4	(B29C64\$.cpc. B33Y\$.cpc.) and (platen platform stage bed) with (passive) near3 (cool\$3)	US- PGPUB; USPAT; USOCR	OR	ON	2019/01/29 02:44
S233	141	(B29C64\$.cpc. B33Y\$.cpc.) and (multi\$1layer bi\$1layer) with (plate platen platform)	US- PGPUB; USPAT; USOCR	OR	ON	2019/01/29 02:46
S234	98	(B29C64\$.cpc. B33Y\$.cpc.) and (multi\$1layer bi\$1layer) with (plate platen platform) and (@pd or @ptad or @prad or @ad or @rlad)<"20141216" not (S218 S187 S223 S226 S229)	US- PGPUB; USPAT; USOCR	OR	ON	2019/01/29 02:47
S235	204	(B29C64\$.cpc. B33Y\$.cpc.) and (temperature) with (sensor thermocouple detector control\$3) same (dissociation remov\$3 peel\$3 separat\$4 split\$4 pop\$4 releas\$3) with (platform stage plate platen bed) with (part model piece object product)	US- PGPUB; USPAT; USOCR	OR	ON	2019/01/29 02:54
S236	66	(B29C64\$.cpc. B33Y\$.cpc.) and (temperature) with (sensor thermocouple detector control\$3) same (dissociation remov\$3 peel\$3 separat\$4 split\$4 pop\$4 releas\$3) with (platform stage plate platen bed) with (part model piece object product) and (@pd or @ptad or @prad or @ad or @rlad)<"20141216" not (S218 S187 S223 S226 S229)	US- PGPUB; USPAT; USOCR	OR	ON	2019/01/29 02:55
S239	7	B29C64\$.cpc. and (coefficient adj thermal adj expansion) near3 (aluminum)	US- PGPUB; USPAT; USOCR	OR	OFF	2019/01/29 20:27
S240	23	B33Y\$.cpc. and (coefficient adj thermal adj expansion) near3 (aluminum)	US- PGPUB; USPAT; USOCR	OR	OFF	2019/01/29 20:30
S241	1	(US-20150145174-\$).did.	US-PGPUB	OR	OFF	2019/01/29 21:06
S242	1	(US-20150145174-\$).did. and (control\$3)	US-PGPUB	OR	OFF	2019/01/29 21:07
S243	1	(US-20150145174-\$).did. and (temperature)	US-PGPUB	OR	OFF	2019/01/29 21:10
S244	1	"20130186549" and (heat\$3 temperature) same (sensor detector thermocouple control\$3)	US-PGPUB	OR	OFF	2019/01/29 21:12
S247	0	(US-20150145174-\$).did. and (control\$3) same (cool\$3)	US-PGPUB	OR	OFF	2019/01/29 22:30
S248	1	(US-20150145174-\$).did. and (cool\$3)	US-PGPUB	OR	OFF	2019/01/29 22:30
S249	1	(US-20150145174-\$).did. and (power)	US-PGPUB	OR	OFF	2019/01/30 00:01
S250	0	"20130186549" and (power)	US-PGPUB	OR	OFF	2019/01/30 00:04

S251	0	"20130186549" and power	US-PGPUB	OR	OFF	2019/01/30 00:04
S252	1	"20130186549" and resistance	US-PGPUB	OR	OFF	2019/01/30 00:04
S253	1	"20130186549" and (temperature heat "38" heating)	US-PGPUB	OR	OFF	2019/01/30 00:06
S254	1	"20130186549" and (temperature heat heating cool\$3) with (platform)	US-PGPUB	OR	OFF	2019/01/30 00:27
S257	1	"20130186549" and (temperature heat heating cool\$3) with (platform)	US-PGPUB	OR	OFF	2019/01/30 01:35
S258	21	B29C64\$.cpc. and "pop" with (object part print item product)	US-PGPUB	OR	OFF	2019/01/30 01:38
S259	1077	B29C64\$.cpc. and (control\$3) same (cool\$3 cold temperature) same (remov\$3 releas\$3 pop\$3 separat\$3)	US-PGPUB	OR	OFF	2019/01/30 01:49
S260	1	15/422303.app.	US- PGPUB; USPAT; USOCR	OR	ON	2019/01/30 03:34
S261	0	(B33Y\$.cpc. and B2964C\$.cpc.) and (((("REESE") near3 ("Riley")).INV,AANM. ((("BHEDA") near3 ("Hemant")).INV,AANM. ((("AREVO") near3 ("INC")).AS,AANM.) and (cool\$3) with (pop\$3 releas\$3 adhesion remov\$3)	US- PGPUB; USPAT; USOCR	OR	ON	2019/01/30 03:37
S262	43	((("AREVO") near3 ("INC")).AS,AANM.	US- PGPUB; USPAT; USOCR	OR	ON	2019/01/30 03:37
S263	0	((("AREVO") near3 ("INC")).AS,AANM. and (@pd)<"20131216"	US- PGPUB; USPAT; USOCR	OR	ON	2019/01/30 03:39
S264	1	"53399080".FMID.	US- PGPUB; USPAT; FPRS	OR	OFF	2019/01/30 03:39
S265	8	(B29C64\$.cpc. B33Y\$.cpc.) and (cool\$3 cold temperature) with (dissociation remov\$3 peel\$3 separat\$4 split\$4 pop\$4 releas\$3) with (part model piece object product item print) with (adhesion) and (@pd or @ptad or @prad or @ad or @rlad)<"20141215"	US-PGPUB	OR	OFF	2019/01/30 03:47
S266	11	(B29C64\$.cpc. B33Y\$.cpc.) and (cool\$3 cold temperature) with (dissociation remov\$3 peel\$3 separat\$4 split\$4 pop\$4 releas\$3) with (part model piece object product item print) with (adhesion) and (@pd or @ptad or @prad or @ad or @rlad)<"20141215"	US- PGPUB; USPAT; USOCR	OR	OFF	2019/01/30 03:48
S268	8	(B29C64\$.cpc. B33Y\$.cpc.) and (cool\$3) with (dissociation remov\$3 peel\$3 separat\$4 split\$4 pop\$4 releas\$3) with (part model piece object product item print) same (adhesion) and (@pd or @ptad or @prad or @ad or @rlad) <"20141215"	US- PGPUB; USPAT; USOCR	OR	OFF	2019/01/30 03:52

EAST Search History

S269	1	(US-20150145174-\$).did.	US-PGPUB	OR	OFF	2019/01/30 15:19
S270	1	(US-20150145174-\$).did. and (adhesion)	US-PGPUB	OR	OFF	2019/01/30 15:19

EAST Search History (Interference)

< This search history is empty >

1/ 30/ 2019 9:40:24 PM

C:\ Users\ jhernandez\ Documents\ EAST\ Workspaces\ 15422303.wsp

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 15/422,303		Filing Date 02/01/2017		☐ 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), (l), 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(j))		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	11/07/2018	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)			
	Total (37 CFR 1.16(i))	* 14	Minus	** 21	= 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			
AMENDMENT		(Column 1)	(Column 2)	(Column 3)						
		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".					Crystal R Queen					
*** 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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Riley Reese, et al.

Application No.: 15/422,303

Filed: February 1, 2017

Title: HEATED BUILD PLATFORM AND
SYSTEM FOR THREE DIMENSIONAL
PRINTING METHODS

Confirmation No.: 1368

Group No.: 1744

Examiner: Jerzi H. Moreno Hernandez

Customer No. 153281

ELECTRONICALLY FILED ON: November 7, 2018

SUPPLEMENTAL AMENDMENT AND RESPONSE

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

Dear Commissioner:

This communication supplements the Amendment and Response to Non-Final Office Action filed on September 28, 2018, which was filed in response to the Non-Final Office Action mailed on June 28, 2018.

Applicant respectfully requests reconsideration of this application in view of the following amendments and remarks:

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

Summary of the Interview begin on page **5** of this paper.

Remarks begin on page **6** of this paper.

AMENDMENTS TO THE CLAIMS

1. -18. (Canceled)

19. (Currently Amended) A build apparatus for use in printing a three-dimensional (3D) object, comprising:

a build platform comprising one or more heating units, a thermally conductive plate disposed adjacent to and in thermal communication with said build platform, and a polymer coating adjacent to said thermally conductive plate, wherein said polymer coating adjacent to said thermally conductive plate is configured to [(i)] secure at least a portion of said 3D object during printing, ~~and (ii) permit removal of said 3D object subsequent to printing and when said build platform has cooled to a lower temperature and while said thermally conductive plate is secured to said build platform, which removal is without chemically or mechanically removing material from said 3D object and without damaging said thermally conductive plate or said 3D object~~ wherein said build platform has a first coefficient of thermal expansion (CTE) and said thermally conductive plate has a second CTE, and wherein said first CTE is greater than said second CTE; and

a controller operatively coupled to said one or more heating units, wherein said controller uses feedback to control a temperature of said build platform while printing said 3D object, which feedback comprises (i) receiving, from one or more temperature detectors, one or more temperatures of said build platform, and (ii) directing said one or more heating units to supply heat to said build platform to control said temperature of said build platform while printing said 3D object and terminate [[said]] supply of heat to said build platform to cool said build platform and said thermally conductive plate secured to said build platform, ~~to permit removal of said 3D~~

~~object from said thermally conductive plate when said thermally conductive plate has cooled to said lower temperature and while said thermally conductive plate is secured to said build platform.~~

20. – 21. (Canceled)

22. (Previously Presented) The build apparatus of claim 19, wherein said heating units are spaced along a surface of said build platform.

23. (Canceled)

24. (Currently Amended) The build apparatus of claim 19, wherein said build platform comprises said one or more temperature detectors situated at one or several locations to provide said feedback to said controller for controlling said temperature of said build platform.

25. (Previously Presented) The build apparatus of claim 19, wherein said build platform comprises a material selected from the group consisting of aluminum, steel, brass, ceramic, glass, and an alloy with a low coefficient of thermal expansion (CTE).

26. (Previously Presented) The build apparatus of claim 19, wherein said build platform comprises a ceramic material.

27. (Canceled)

28.-33. (Canceled)

34. (Previously Presented) The build apparatus of claim 19, wherein said thermally conductive plate comprises a material selected from the group consisting of aluminum, steel, brass, ceramic, glass, and an alloy with a low coefficient of thermal expansion (CTE).

35. (Previously Presented) The build apparatus of claim 19, wherein said thermally conductive plate has a thickness ranging between 0.025 inches and 0.5 inches.

36. (Previously Presented) The build apparatus of claim 19, wherein said thermally

conductive plate is non-magnetically secured to and removable from said build platform.

37. – 44. (Canceled)

45. (Canceled)

46. (Currently Amended) The build apparatus of claim ~~[[45]]~~ 19, wherein said polymer coating is a polyimide.

47. (Currently Amended) The build apparatus of claim ~~[[45]]~~ 19, wherein said polymer coating has a thickness ranging between 0.001 inches and 0.1 inches.

48. (Previously Presented) The build apparatus of claim 19, wherein said thermally conductive plate is flexible to facilitate dissociation between said 3D object and said thermally conductive plate upon cooling of said thermally conductive plate.

49. (Currently Amended) The build apparatus of claim 19, wherein said build platform, said thermally conductive plate, and said polymer coating are configured to withstand high temperature ranging between 150 degree Celsius and 300 degree Celsius.

50. (Previously Presented) The build apparatus of claim 19, wherein said build platform comprises holes for said one or more heating units.

51. (Previously Presented) The build apparatus of claim 19, wherein said one or more heating units are positioned at different locations of said build platform than said one or more temperature detectors.

SUMMARY OF THE INTERVIEW

Applicant is appreciative of Examiner Hernandez for extending the courtesy of an examiner's interview to Applicant's representatives, Ali Alemozafar and Jing Wang, on October 31, 2018. During the interview, amendments consistent with those detailed herein were discussed.

REMARKS

Claims 19, 22, 24-27, 34-36, and 45-51 were pending prior to entry of the abovementioned amendments. Claims 19, 24, 46, 47, and 49 are currently amended. Claims 27 and 45 have been canceled. No new matter is added by any of these amendments. Accordingly, upon entry, claims 19, 22, 24-26, 34-36, and 46-51 will be pending.

Reconsideration and allowance of this application is respectfully requested in light of the abovementioned amendments and the following remarks.

Claims Amendments

Claim 19 has been amended to clarify the claimed subject matter. These amendments are fully supported by the application as originally filed, U.S. Patent Application No. 15/422,303, now U.S. Patent Publication No. 2017/0217106 (“the Application”) at, for example, paragraphs [0019] and [0029].

Claims 24, 46, 47, and 49 have been amended for antecedent basis purposes.

It shall be understood herein that any instance in which Applicant has addressed certain comments set forth by the Office shall not be construed as a concession to other comments or arguments advanced by the Office. Any circumstance in which Applicant has amended or canceled a claim also does not mean that Applicant concedes to the arguments or positions advanced by the Office with respect to that claim or other claims pending herein.

CONCLUSION

Applicant believes that this paper fully addresses the rejections raised in the Non-Final Office Action mailed June 28, 2018. Applicant respectfully solicits the Examiner to expedite the prosecution of this patent application to issuance. Should the Examiner have any question, the Examiner is encouraged to telephone the undersigned at (212) 497-7740.

The Commissioner is authorized to charge any additional fees which may be required, including petition fees and extension of time fees, to Deposit Account No. **23-2415**, Attorney Docket No. 50823-712.301.

Respectfully submitted,

WILSON SONSINI GOODRICH & ROSATI

Date: November 7, 2018

By: /Jing Wang/
Jing Wang, Ph.D.
Reg. No. 76,486

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Customer No. 153281

Electronic Acknowledgement Receipt	
EFS ID:	34243082
Application Number:	15422303
International Application Number:	
Confirmation Number:	1368
Title of Invention:	HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS
First Named Inventor/Applicant Name:	Riley Reese
Customer Number:	153281
Filer:	Jing NM Wang/Joanna Laney
Filer Authorized By:	Jing NM Wang
Attorney Docket Number:	50823-712.301
Receipt Date:	07-NOV-2018
Filing Date:	01-FEB-2017
Time Stamp:	17:46:17
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		50823_712_301_Supp_Response.pdf	115252	yes	7
			b1632aab394970665a1ac2c60ba6fa4f39ca927		

Multipart Description/PDF files in .zip description			
Document Description	Start	End	
Supplemental Response or Supplemental Amendment	1	1	
Claims	2	4	
Applicant summary of interview with examiner	5	5	
Applicant Arguments/Remarks Made in an Amendment	6	7	
Warnings:			
Information:			
Total Files Size (in bytes):		115252	
<p>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.</p> <p><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.</p> <p><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.</p> <p><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.</p>			



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/422,303	02/01/2017	Riley Reese	50823-712.301	1368
153281 7590 11/06/2018 Arevo / WILSON, SONSINI, GOODRICH & ROSATI 650 PAGE MILL ROAD PALO ALTO, CA 94304-1050			EXAMINER MORENO HERNANDEZ, JERZI H	
			ART UNIT 1744	PAPER NUMBER
			NOTIFICATION DATE 11/06/2018	DELIVERY MODE 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):

patentdocket@wsgr.com

<i>Applicant-Initiated Interview Summary</i>	Application No. 15/422,303	Applicant(s) Reese et al.		
	Examiner JERZI H MORENO HERNANDEZ	Art Unit 1744	AIA (First Inventor to File) Status Yes	Page 1 of 1

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

1. JERZI H MORENO HERNANDEZ (Examiner); WebEx/ Video Conference 2. JING WANG (Attorney of Record); WebEx/Video Conference

3. ALI ALEMOZAFAR (Attorney of Record); WebEx/ Video Conference

Date of Interview: 31 October 2018

Issues Discussed:

Other:
Applicant's representatives and examiner discussed the amendments filed on 09/28/2018. Agreement was reached that amendments seem to overcome the current 112 rejections. Examiner noted that the proposed amendments do not seem to overcome the current 103 rejection because the instant independent claim does not currently recite the material differences that differentiate the invention from the prior art in terms of structure and that enable its distinct function/operation. Examiner also noted that further search and consideration would be required.

/JERZI H MORENO HERNANDEZ/ Examiner, Art Unit 1744	/Anthony Calandra/ Primary Examiner, Art Unit 1748
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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: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

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

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Riley Reese, et al.

Application No.: 15/422,303

Filed: February 1, 2017

Title: HEATED BUILD PLATFORM AND
SYSTEM FOR THREE DIMENSIONAL
PRINTING METHODS

Confirmation No.: 1368

Group No.: 1744

Examiner: Jerzi H. Moreno Hernandez

Customer No. 153281

ELECTRONICALLY FILED ON: September 28, 2018

AMENDMENT AND RESPONSE TO NON-FINAL OFFICE ACTION

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

Dear Commissioner:

This communication is in response to the Non-Final Office Action mailed June 28, 2018. The shortened statutory period for reply ends on September 28, 2018. This response has been filed within that period. Therefore, this response is timely filed and no extension fees are due.

Applicant respectfully requests reconsideration of this application in view of the following amendments and remarks:

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

Remarks begin on page **6** of this paper.

Electronic Acknowledgement Receipt	
EFS ID:	33869057
Application Number:	15422303
International Application Number:	
Confirmation Number:	1368
Title of Invention:	HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS
First Named Inventor/Applicant Name:	Riley Reese
Customer Number:	153281
Filer:	Jing NM Wang/Joanna Laney
Filer Authorized By:	Jing NM Wang
Attorney Docket Number:	50823-712.301
Receipt Date:	28-SEP-2018
Filing Date:	01-FEB-2017
Time Stamp:	18:06:48
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		50823_712_301_NFOA_Response_2.pdf	186370 bba04a3fa1e4ec71bc7d70d2e54ca4de94ff17cf	yes	12

Multipart Description/PDF files in .zip description			
Document Description		Start	End
Applicant Arguments/Remarks Made in an Amendment		6	12
Claims		2	5
Amendment/Req. Reconsideration-After Non-Final Reject		1	1

Warnings:

Information:

Total Files Size (in bytes):	186370
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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

Claims 19, 22, 24-27, 34-36, and 45-50 were pending prior to entry of the abovementioned amendments. Claims 19, 22, 24, and 50 are currently amended. Claim 51 has been added. No new matter is added by any of these amendments. Accordingly, upon entry, claims 19, 22, 24-27, 34-36, and 45-51 will be pending.

Reconsideration and allowance of this application is respectfully requested in light of the abovementioned amendments and the following remarks.

Claims Amendments

Claim 19 has been amended to clarify the claimed subject matter. The amendments to claim 19 are fully supported by the application as originally filed at, U.S. Patent Application No. 15/422,303, now U.S. Patent Publication No. 2017/0217106 (“the Application”) at, for example, paragraphs [0019], [0020], and [0026]-[0028].

Claims 22, 24, and 50 have been amended for antecedent basis or clarity purposes.

New claim 51 is fully supported by the Application at, for example, paragraph [0020] and FIG. 2.

35 U.S.C. § 112

Claims 19, 22, 24-27, 34-36 and 45-50 stand rejected under 35 U.S.C. § 112(a) or 35 U.S.C. § 112 (pre-AIA), first paragraph. Claims 19, 22, 24-27, 34-36 and 45-50 stand rejected under 35 U.S.C. § 112(b) or 35 U.S.C. § 112 (pre-AIA), second paragraph.

Without conceding in the basis of rejection, and solely to expedite the prosecution of this application, Applicant has amended claim 19 to clarify the claimed subject matter. For example, claim 19 has been amended to recite “when said build platform has cooled to a

lower temperature ... feedback comprises (i) receiving, from one or more temperature detectors, one or more temperatures of said build platform, and (ii) directing said one or more heating units to supply heat to said build platform to control said temperature of said build platform while printing said 3D object and terminate said supply of heat to said build platform to cool said build platform and said thermally conductive plate secured to said build platform.” Applicant submits that claim 19 is fully supported by the Application at, for example, paragraphs [0019], [0020], and [0026]-[0028]. In addition, claim 19 is not indefinite. Accordingly, Applicant respectfully requests that the 35 U.S.C. § 112(a) and § 112(b) rejections of claim 19, and dependent claims 22, 24-27, 34-36, and 45-50 thereof, be withdrawn.

Furthermore, Applicant has amended claims 22 and 50 to clarify the claimed subject matter. For example, claim 22 has been amended to recite “said heating units.” Claim 50 recites similar language. Accordingly, Applicant respectfully requests that the 35 U.S.C. § 112(b) rejection of claims 22 and 50 be withdrawn.

35 U.S.C. § 103

A. *Claims 19, 22, 25-27, 34-35 and 45-50 are non-obvious over the asserted combination of Comb, Ruff and Liu*

Claims 19, 22, 25-27, 34-35 and 45-50 stand rejected under 35 U.S.C. § 103 over U.S. Publication No. 2015/0145174 (Comb), in view of U.S. Publication No. 2017/0036403 (Ruff) and U.S. Publication No. 2016/0167309 (Liu).

Without conceding in the basis of rejection, and solely to expedite the prosecution of this application, Applicant has amended Claim 19 to clarify certain differences between the claimed subject matter and the asserted combination of Comb, Ruff, and Liu.

Comb discloses a build sheet in which “after removal from platen plate 52, the thin flexible nature of build sheet 36 allows 3D part 38 and support structure 40 to be removed by flexing build sheet 36.” See Comb at paragraph [0082].

However, nothing in Comb teaches or discloses “a controller operatively coupled to said one or more heating units, wherein said controller **uses feedback to control a temperature of said build platform** while printing said 3D object, which feedback comprises (i) receiving, from one or more temperature detectors, one or more temperatures of said build platform, and (ii) directing said one or more heating units to supply heat to said build platform to control said temperature of said build platform while printing said 3D object and terminate said supply of heat to said build platform to cool said build platform and said thermally conductive plate secured to said build platform, to **permit removal of said 3D object** from said thermally conductive plate when said thermally conductive plate has cooled to said lower temperature and **while said thermally conductive plate is secured to said build platform**” as recited in Claim 19.

Neither Ruff nor Liu cures such deficiencies of Comb. For example, Ruff discloses that “the intermediate base structure 30 has a recess 40 in an edge formed to permit the user to place fingers with the recess and to raise the edge of the coated print plate 20 up off the upper surface of the intermediate base structure 30. The removed coated print bed can be manually handled during removal of the printed object. The ***printed object can be removed from the separated coated print bed.***” See Ruff at paragraph [0063] (emphasis added).

Liu discloses a build platform which is “heated by a heating plate mounted under the platform so as to enhance adhesion of the model onto the printing platform. The temperature of the printing platform is also read by a temperature sensor to be obtained by the main controller,

and then the main controller performs temperature control via PID algorithm.” See Liu at paragraph [0115]. Liu however, does not teach or disclose “*feedback* to control a temperature of said build platform while printing said 3D object ... *permit removal of said 3D object* from said thermally conductive plate when said thermally conductive plate has cooled to said lower temperature and while said thermally *conductive plate is secured to said build platform*,” as recited in Claim 19.

Not only does the asserted combination of Comb, Ruff and Liu not meet all of the elements of Claim 19, but there is not even any motivation to combine Comb, Ruff and Liu (Applicant is not conceding that the asserted combination of Comb, Ruff and Liu would even meet all of the elements of Claim 19).

Comb discloses that good adhesion between the build substrate and 3D part “can also **present issue with removal of the 3D part** and support structure from the build substrate ... In particular, the flexing of the build substrate amplifies the stresses induced at the bending line of action, causing delamination of the 3D part from its base layers, or delamination of the base layers from the build substrate ... Earlier systems incorporated thick inflexible build platens, making removal of thick still 3D parts with large base areas very difficult. In fact, the only effective solution of removal in this case involved prying the 3D part off with crow bar-like device or chisel, which could damage the 3D part or platen.” See Comb at paragraphs [0026] and [0027]. Comb solves such problem by using a platen assembly “which incorporates a chuck portion that magnetically couples to *removable and interchangeable build sheets*, [and] provides several unique advantages over build substrates currently used in the industry.” See Comb at paragraph [0030].

Accordingly, Applicant respectfully requests that the § 103 rejection of Claim 19 be withdrawn.

Claims 22, 25-27, 34-35 and 45-50 depend from and include all of the elements of Claim 19, and recite additional elements of particular advantage and utility. The asserted combination of Comb, Ruff and Liu does not meet all of the elements of Claim 19, much less the combination of elements of claims 22, 25-27, 34-35 and 45-50. Accordingly, Applicant respectfully requests that the § 103 rejections of claims 22, 25-27, 34-35 and 45-50 over the asserted combination of Comb, Ruff and Liu also be withdrawn.

B. Claim 24 is non-obvious over the asserted combination of Comb, Ruff, Liu and Low

Claim 24 stands rejected under 35 U.S.C. § 103 over Comb, in view of Ruff and Liu, and further in view of U.S. Publication No. 2003/0222066 (Low).

Claim 24 is not obvious over the asserted combination of Comb, Ruff, Liu and Low for at least the reason that this claim depends from and includes all of the elements of Claim 19, and recites additional elements of particular advantage and utility. The asserted combination of Comb, Ruff, and Liu does not meet all of the elements of Claim 19, much less the combination of elements of claim 24, and Low does not cure the abovementioned deficiencies of Comb, Ruff, and Liu. Accordingly, Applicant respectfully requests that the § 103 rejection of claim 24 be withdrawn.

C. Claim 36 is non-obvious over the asserted combination of Comb, Ruff, Liu and Koyagi

Claim 36 stands rejected under 35 U.S.C. § 103 over Comb, in view of Ruff and Liu, and further in view of U.S. Publication No. 2006/0198918 (Koyagi).

Claim 36 is not obvious over the asserted combination of Comb, Ruff, Liu and Koyagi for at least the reason that this claim depends from and includes all of the elements of Claim 19,

and recites additional elements of particular advantage and utility. The asserted combination of Comb, Ruff, and Liu does not meet all of the elements of Claim 19, much less the combination of elements of claim 36, and Koyagi does not cure the abovementioned deficiencies of Comb, Ruff, and Liu. Accordingly, Applicant respectfully requests that the § 103 rejection of claim 36 be withdrawn.

It shall be understood herein that any instance in which Applicant has addressed certain comments set forth by the Office shall not be construed as a concession to other comments or arguments advanced by the Office. Any circumstance in which Applicant has amended or canceled a claim also does not mean that Applicant concedes to the arguments or positions advanced by the Office with respect to that claim or other claims pending herein.

CONCLUSION

Applicant believes that this paper fully addresses the rejections raised in the Non-Final Office Action mailed June 28, 2018. Applicant respectfully solicits the Examiner to expedite the prosecution of this patent application to issuance. Should the Examiner have any question, the Examiner is encouraged to telephone the undersigned at (212) 497-7740.

The Commissioner is authorized to charge any additional fees which may be required, including petition fees and extension of time fees, to Deposit Account No. **23-2415**, Attorney Docket No. 50823-712.301.

Respectfully submitted,

WILSON SONSINI GOODRICH & ROSATI

Date: September 28, 2018

By: /Jing Wang/
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AMENDMENTS TO THE CLAIMS

1. -18. (Canceled)

19. (Currently Amended) A build apparatus for use in printing a three-dimensional (3D) object, comprising:

a build platform ~~comprising one or more heating units~~, a thermally conductive plate disposed adjacent to and in thermal communication with said build platform, and a coating adjacent to said thermally conductive plate, wherein said coating adjacent to said thermally conductive plate is configured to (i) secure at least a portion of said 3D object during printing ~~and while said thermally conductive plate is at one or more temperature set points~~, and (ii) permit removal of said 3D object subsequent to printing and when said ~~thermally conductive plate~~ build platform has cooled to a lower temperature ~~below said one or more temperature set points and while said thermally conductive plate is secured to said build platform~~, which removal is without chemically or mechanically removing material from said 3D object and without damaging said thermally conductive plate or said 3D object; and

~~a temperature control unit in thermal communication with said build platform, wherein said temperature control unit is configured to supply heat to said build platform; and~~

a controller operatively coupled to said one or more heating units, wherein said controller uses feedback to control a temperature of said build platform while printing said 3D object, which feedback comprises (i) uses feedback to detect~~receiving~~, from one or more temperature detectors, one or more temperatures of said ~~thermally conductive plate~~build platform, and (ii) ~~directs~~directing ~~said temperature control unit~~one or more heating units to supply heat to said build platform to ~~maintain~~ control said temperature of said build platform ~~one or more temperature set points while printing said 3D object and terminate said supply of heat to said~~

build platform to cool said build platform and said thermally conductive plate secured to said build platform, to permit removal of said 3D object from said thermally conductive plate when said thermally conductive plate has cooled to said lower temperature and while said thermally conductive plate is secured to said build platform.

20. – 21. (Canceled)

22. (Currently Amended) The build apparatus of claim 19, wherein said ~~temperature control unit comprises heater cartridges that~~ heating units are spaced along a surface of said build platform.

23. (Canceled)

24. (Currently Amended) The build apparatus of claim 19, wherein said build platform comprises one or more ~~thermocouples~~ temperature detectors situated at one or several locations to provide said feedback to said controller for ~~maintaining~~ controlling said ~~one or more temperature of said build platform set points.~~

25. (Previously Presented) The build apparatus of claim 19, wherein said build platform comprises a material selected from the group consisting of aluminum, steel, brass, ceramic, glass, and an alloy with a low coefficient of thermal expansion (CTE).

26. (Previously Presented) The build apparatus of claim 19, wherein said build platform comprises a ceramic material.

27. (Previously Presented) The build apparatus of claim 19, wherein said build platform has a first coefficient of thermal expansion (CTE) and said thermally conductive plate has a second CTE, wherein said first CTE is greater than said second CTE.

28.-33. (Canceled)

34. (Previously Presented) The build apparatus of claim 19, wherein said thermally

conductive plate comprises a material selected from the group consisting of aluminum, steel, brass, ceramic, glass, and an alloy with a low coefficient of thermal expansion (CTE).

35. (Previously Presented) The build apparatus of claim 19, wherein said thermally conductive plate has a thickness ranging between 0.025 inches and 0.5 inches.

36. (Previously Presented) The build apparatus of claim 19, wherein said thermally conductive plate is non-magnetically secured to and removable from said build platform.

37. – 44. (Canceled)

45. (Previously Presented) The build apparatus of claim 19, wherein said coating is a polymer coating.

46. (Previously Presented) The build apparatus of claim 45, wherein said polymer coating is a polyimide.

47. (Previously Presented) The build apparatus of claim 45, wherein said polymer coating has a thickness ranging between 0.001 inches and 0.1 inches.

48. (Previously Presented) The build apparatus of claim 19, wherein said thermally conductive plate is flexible to facilitate dissociation between said 3D object and said thermally conductive plate upon cooling of said thermally conductive plate.

49. (Previously Presented) The build apparatus of claim 19, wherein said build platform, said thermally conductive plate, and said coating are configured to withstand high temperature ranging between 150 degree Celsius and 300 degree Celsius.

50. (Currently Amended) The build apparatus of claim 19, wherein said build platform comprises holes for said one or more heating units ~~heater cartridges of said temperature control unit.~~

51. (New) The build apparatus of claim 19, wherein said one or more heating units are

positioned at different locations of said build platform than said one or more temperature detectors.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 15/422,303		Filing Date 02/01/2017		☐ 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), (l), 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(j))		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	09/28/2018	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)			
	Total (37 CFR 1.16(i))	* 16	Minus	** 21	= 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			
AMENDMENT		(Column 1)	(Column 2)	(Column 3)						
		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".					susan A hay					
*** 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.
15/422,303	02/01/2017	Riley Reese	50823-712.301	1368
153281 7590 06/28/2018 Arevo / WILSON, SONSINI, GOODRICH & ROSATI 650 PAGE MILL ROAD PALO ALTO, CALIFORNIA 94304-1050 UNITED STATES OF AMERICA			EXAMINER MORENO HERNANDEZ, JERZI H	
			ART UNIT 1744	PAPER NUMBER
			NOTIFICATION DATE 06/28/2018	DELIVERY MODE 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):

patentdocket@wsgr.com

DETAILED CORRESPONDENCE

Notice of Pre-AIA or AIA Status

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

Continued Examination Under 37 CFR 1.114

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 05/01/2018 has been entered.

Status of the Application

This is a non-final office action in response to applicant's amendments and/or remarks filed on 05/01/2018. Claim(s) 19, 22, 24-27, 35, 45, and 48-49 is/are currently amended. Claim(s) 1-18, 20-21, 23, 28-33, 37-44 are/were canceled. Claim(s) 50 is/are added. The remaining of the claims are as previously presented. Accordingly, claims 19, 22, 24-27, 34-36 and 45-50 is/are examined herein.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112(a):

(a) IN GENERAL.—The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.

The following is a quotation of the first paragraph of pre-AIA 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 19, 22, 24-27, 34-36 and 45-50 are rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor or a joint inventor, or for pre-AIA the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 19 recites "said thermally conductive plate is at one or more temperature set, points", "said thermally conductive plate has cooled to a temperature below said one or more temperature set points", and "controller (i) uses feedback to detect one or more temperatures of said thermally conductive plate" which are considered to be new matter because the original disclosure does not have adequate/sufficient support for these limitations. While the original disclosure has support for detecting temperature of the build platform and for controlling the temperature at set points of the build platform (P0020, original claim 24), the scope of the thermally conductive plate is different from the scope of the build platform. Thus, the recitations are considered to be new matter.

Claim(s) 22, 24-27, 34-36 and 45-50 is/are rejected as being dependent from claim 19 and therefor including all the limitation thereof.

The following is a quotation of 35 U.S.C. 112(b):

(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 19, 22, 24-27, 34-36 and 45-50 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

Claim 19 recites “a temperature control unit in thermal communication with said build platform, wherein said temperature control unit is configured to supply heat to said build platform” and “a controller operatively coupled to one or more heating units” which is indefinite. Is the temperature control unit same or different element/unit then the heating unit(s)? Based on P0019 and F2 of instant application, the heating unit(s) is/are the same as the temperature control unit. Claim 19 has been examined below as if they are the same structural element(s).

Claim 19 also recites “controller (i) uses feedback to detect one or more temperatures of said thermally conductive plate” which is indefinite because one of ordinary skill in the art would NOT know from the claim terms what structure or steps are encompassed by the claim (See MPEP 2173.05 (g)). How is the feedback obtained? Which structural element generates/obtains the feedback? How the controller detects the one or more temperatures? It is uncommon for controllers to be capable of detecting temperature(s). Typically temperature detectors detect temperature and controllers use/process the detected temperature to perform calculation in order to perform temperature control based on the detected temperature. Is this applicant intend?

Claim 19 recites “one or more temperature set points” which is indefinite because the scope of the temperature set point(s) is unclear. What the numerical value/range of the temperature set point(s)?

Claims 22 and 50 recite “heater cartridges” which make the claims indefinite. Are the heater cartridge the same or different elements than the heating units introduced in claim 19? Claims have been examined below as if they are the same.

Claim(s) 22, 24-27, 34-36 and 45-50 is/are rejected as being dependent from claim 19 and therefor including all the limitation thereof.

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.

Claim(s) 19, 22, 25-27, 34-35 and 45-50 is/are rejected under 35 U.S.C. 103 as being unpatentable over Comb (US 2015/0145174 – of record) in view of Ruff (US 2017/0036403 – of record with priory date of 05/15/14) and LIU (US 2016/0167309 with priory date of 07/31/13).

Regarding claim 19, Comb teaches a build apparatus ((26), F2-8) for use in printing a 3D object (P0001), comprising:

a build platform (52), a thermally conductive plate (36b having a plate-like shape and comprising steel, P0053, F5-6; thus, 36b is considered to be a thermally conductive plate) adjacent to and in thermal communication with said platform (bottom of 36b is placed on top of plate/platform 52; thus, 36b is adjacent to 52 and in thermal communication with 52 when 52 is heated via heat transfer by conduction, P0047, F5-6), and a coating (36a) adjacent to said thermally conductive plate (polymeric layer/coating 36a adjacent to 36b to make a coated plate 36; wherein 36a can be a polyimide coating/layer, P0054-0055, F6), wherein said coating adjacent to said thermally conductive plate is configured to (i) secure at least a portion of said 3D object during printing and while said thermally conductive plate is at one or more temperature set points (since the taught coating and the claimed coating are not patentably distinct in terms of structure, they are expected to have the same properties/functions (See MPEP 2112.01 (I)); thus, 36a is capable of securing said 3D object during printing; In addition, 36a is configured to adhere/secure the 3D object during printing, P0056, P0025-0026), and (ii)

permit removal of said 3D object subsequent to printing ... which removal is without chemically or mechanically removing material from said 3D object and without damaging said thermally conductive plate or said 3D object (since the taught coating and the claimed coating are not patentably distinct in terms of structure, they are expected to have the same properties/functions (See MPEP 2112.01 (I)); thus, 36a is capable of permitting the removal of said 3D object after printing without damaging the conductive plate or 3D object; In addition, 36/36a is configured to enable efficient peeling/removal of said 3D object from 36/36b once said 3D object (P0057, P0026) without chemically or mechanically removing material from said 3D object and without damaging said thermally conductive plate or said 3D object (P0027,P0082));

a temperature control unit (56) comprising one or more heating units and in thermal communication with said build platform (52), wherein said temperature control unit is configured to supply heat to said build platform to maintain said build platform at a temperature set point (P0052, P0074).

Comb does not teach to remove the 3D object when the conductive plate has been cooled to a temperature below the desired/printing temperature or the claimed controller.

In the same field of endeavor, build platforms, Ruff teaches a build platform comprising a coating (24), to increase the adhesion between coating and the 3D object by heating the build platform to a desired temperature during printing for the benefits ensuring that the 3D object remains stationary during printing, and to remove the 3D object after the build platform/coating has cooled to a temperature lower than the printing temperature for the benefits facilitating the removal of the 3D object without chemically or mechanically removing material from said 3D object and without damaging said coating or said 3D object (P0021, P0043, P0059, P0076). In fact, Ruff teaches that adhesion between the coating and 3D object decreases as the temperature of the build platform/coating decreases (P0076).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Comb in view of Ruff by removing the 3D object when the build

apparatus (i.e. the build platform, the thermally conductive plate, and the coating) has been cooled to a temperature below the desired/printing temperature for the benefit(s) of further facilitating the removal of the 3D object from the apparatus without damaging the object/apparatus.

The combination does not explicitly teach the claimed controller.

In the same field of endeavor, build platforms, LIU teaches to heat the platform by a heating unit and to use a controller with a PID algorithm to control the heating of the platform based on a feedback temperature of platform which is detected by a temperature sensor for the benefits of enhancing the adhesion of the 3D object and the platform during printing (P0115).

Since Comb teaches to control/maintain the temperature of the build apparatus to a desired temperature (P0074, P0052) while Ruff teaches that the temperature of the build apparatus is an important process parameter affecting adhesion between the 3D object and the apparatus (P0021, P0076), it would have been obvious to one with ordinary skill in the to further modify the apparatus of the combination un view of LIU by incorporating a controller, connecting a controller to the heating unit and a temperature sensor, using a feedback signal from the sensor and the controller to detect/determine the temperature of the apparatus and/or conductive plate and to direct/control the heat supplied to the heating unit to maintain the desired temperature of the apparatus and/or conductive plate during printing of the 3D object for the benefits of maintaining/enhancing the adhesion of the 3D object and the platform during printing. Additionally, since the usage of a controller coupled to heating element(s) and temperature sensor(s) and configured to control/supply heating to the heating element(s) based on a feedback from temperature sensor(s) for the benefits of controlling/maintaining the build apparatus at the desired temperature is well known and desirable in the art (See Low (US 2003/0222066; Abstract, P0014, F1) and/or Zenere (US 2012/0133083; P0039 and claim 4)), the proposed modification is obvious, desirable, and within one of ordinary skill in the art.

Regarding claim 22, while Comb fails to explicitly teach that the heating elements 56

are heater cartridges, Comb is considered to implicitly teach the claimed heater cartridges because the claimed heater cartridges (disclosed in P0019 and F2 of instant specification) appear to have the same shape, structure, arrangement and function as Comb's heating elements 56 which are spaced along the surface of 52 (F3-8, in particular F6-7, P0074). Additionally, examiner notes that heater cartridges are a well know type of heating elements.

Regarding claim 25, Comb further teaches that the build platform can comprise aluminum/alloy ("plate 52 ... preferably fabricated from one or more metallic materials (e.g., aluminum)", P0047).

Regarding claim 26, Ruff further teaches wherein said build platform comprises a ceramic/glass (base 30 "can be made of any rigid and resilient material that will maintain its shape, dimension, and orientation under normal use and handling" such as aluminum or glass, P0065-0066; wherein glass is considered to be a ceramic and it is cheaper than aluminum).

Regarding claim 27, Comb further implicitly teaches wherein said build platform has a first coefficient of thermal expansion (CTE) and said thermally conductive plate has a second CTE, wherein said first CTE is greater than said second CTE (plate 52 is made of aluminum which has a coefficient of thermal expansion of about 0.000024 m/(mK) and the plate 36b is made of steel which has a coefficient of thermal expansion of about 0.000012 m/(mK)).

Regarding claim 34, Comb further teaches wherein said thermally conductive plate comprises a material selected from the group consisting of ... steel ... and an alloy with a low coefficient of thermal expansion (36b is made of steel/alloy, P0053).

Regarding claim 35, Comb further teaches wherein said thermally conductive plate has a thickness ranging between 0.025 inches and 0.5 inches ("thicknesses for 36b may range from about 5 mils to about 100 mils" (i.e. 0.005-0.1 inches) which is within the claimed range and the thickness is selected depending on the desired amount of flexibility, P0057, P0068, P0087).

Regarding claims 45-46, Comb further teaches wherein said coating is a polyimide coating (P0055-0056).

Regarding claim 47, Comb further teaches wherein said polymer coating comprises a thickness ranging between 0.001 inches and 0.1 inches ("suitable thicknesses for 36a may range from about 1 mil to about 30 mils (i.e. 0.001-0.03 inches) which is within the claimed range, P0057).

Regarding claim 48, Comb further teaches wherein said thermally conductive plate is flexible to facilitate dissociation between said 3D object and said thermally conductive plate upon cooling of said thermally conductive plate (36b is flexible/thin which facilitates the removal/peeling of 3D object and reduces damages, P0057, P0026-0027, P0082).

Regarding claim 49, while Comb fails to explicitly teach that the build platform, the removable plate, and the polymer coating are able to withstand high temperature ranging between 150 degree Celsius and 300 degree Celsius, Comb implicitly teaches that build platform, the removable plate, and the polymer coating are capable of withstand temperatures ranging from 150-300 degree Celsius because the apparatus of Comb is capable of manufacturing polyetherimide 3-D parts (P0055; polyetherimides have high glass transition and/or melting temperatures (i.e. at least 200 degree Celsius which is within the claimed range)). In addition, the disclosed/claimed materials making the claimed build platform, the removable plate, and the polymer coating are identical to the materials making the taught build platform, the removable plate, and the polymer coating; thus, they are expected to have the same properties and/or functionalities (See MPEP 2112.01 (I)). Ruff further teaches/suggests claim 49 (P0038).

Regarding claim 50, Comb further teaches wherein said build platform comprises holes for heater cartridges of said temperature control unit (52 has holes 84 for 56, P00072-0073, F6).

Claim(s) 24 is/are rejected under 35 U.S.C. 103 as being unpatentable over Comb (US 2015/0145174 – of record) in view of Ruff (US 2017/0036403 – of record with priority date of 05/15/14) and LIU (US 2016/0167309 with priority date of 07/31/13) as applied to claim 19 above, and further in view of Low (US 2003/0222066).

Regarding claim 24, while LIU teaches to use a temperature sensor to provide said feedback to the controller (P0115), the combination is silent about the arrangement/location of the temperature sensor and the type of the temperature sensor.

In the same field of endeavor, build platforms, Low teaches to use one more thermocouples (12, 12') situated at one or several location within the build platform (22) to provide feedback to a controller (20) to control the temperature of the build platform (Abstract, P0014, F1).

It would have been obvious to one with ordinary skill in the to further modify the apparatus of the combination un view of Low by using thermocouples as the temperature sensor(s) and by arranging/situating the thermocouple(s) within the build platform for the benefits of improving the accuracy of the temperature/heating control of the build platform. Additionally, since thermocouples are a well-known type of temperature sensors and it has been held that a mere rearrangement of an element without modification of the operation of the device involves only routine skill in the art (MPEP § 2144.04 (VI) (C)), the proposed modification is obvious and within one of ordinary skill in the art.

Claim(s) 36 is/are rejected under 35 U.S.C. 103 as being unpatentable over Comb (US 2015/0145174 – of record) in view of Ruff (US 2017/0036403 – of record with priority date of 05/15/14) and LIU (US 2016/0167309 with priority date of 07/31/13) as applied to claim 19 above, and further in view of Koyagi (US 2006/0198918 – of record).

Regarding claim 36, Comb further teaches/suggests that magnetically or non-magnetically means such as a snapping means or a vacuum means are suitable and known

means used to removably connect/secure a plate to platform but prefers to use a magnetic means because a vacuum means is more complex and/or expensive (P0028-0030).

In addition, in the same field of endeavor, build platforms, Koyagi teaches that a mechanical, vacuum, and magnetic means are interchangeable means to removably connect/secure a plate to platform and that the mechanical and magnetic means have some disadvantages (P0053, P0055).

Since Comb does not teach that non-magnetic means cannot/shouldn't be used in his apparatus, Koyagi teaches that magnetic means also has disadvantages, and Comb/Kogabi teach that both magnetic and nonmagnetic means are interchangeable as they yield the same result (removably connect/secure a plate to platform), it would have been obvious to one with ordinary skill in art at the time the invention was filed to further modify the apparatus of the combination in view of Koyagi by using a non-magnetic means to removably connect/secure a plate to platform as this proposed modification is considered to be a simple substitution that does not modify the operation of the taught apparatus.

Response to Arguments

Applicant's arguments/remarks filed on 05/01/2018 have been fully considered.

With respect to the drawing objection(s), applicant's amendment(s) to the claim(s) has/have overcome the objection(s).

With respect to the claim rejection(s) under 35 U.S.C. § 112(a), applicant's amendment(s) to the claim(s) has/have overcome the claim rejection(s). However, the amendment(s) introduced new 112(a) issues as explained above.

With respect to the claim rejection(s) under 35 U.S.C. § 112(b), applicant's amendment(s) to the claim(s) has/have overcome the claim rejection(s). However, the amendment(s) introduced new 112(b) issues as explained above.

With respect to the rejection(s) of amended independent claim(s) 19 under § 102 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Comb, Ruff and LIU as applied above.

With respect to rejection(s) of claim 36, applicant argues that since Comb teaches that a vacuum means (i.e. non-magnetic means) has some disadvantages, one of ordinary skill in the art would not have a motivation to use vacuum means as the non-magnetic means.

This argument is not persuasive. Indeed, Comb prefers to use a magnetic means, but Comb does not teach that a vacuum means or other non-magnetic couldn't/shouldn't be used. In fact, the teachings of Comb and Koyagi teach that both magnetic and nonmagnetic means have advantages and disadvantages but that both are interchangeable as they produce the same result. Therefore, this proposed modification is considered to be a simple substitution that does not modify the operation of the taught apparatus, and therefore, it is still deemed obvious and proper.

Conclusion

For additional prior art of record and not relied upon that is considered to be pertinent to applicant's disclosure see Notice of References Cited PTOL 892.

Cable (US 2016/0075091 – of record; F1-6).

Din (US 2015/0056319 – of record; F3-5, P0023, claims 5 and 10).

Jondal (US 2016/0332387 – of record; Figures).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JERZI H MORENO HERNANDEZ whose telephone number is (571)272-0625. The examiner can normally be reached on 1:00-10:00 PM.

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, YOGENDRA N GUPTA can be reached on 571-272-1316. 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.

/JERZI H MORENO HERNANDEZ/
Examiner, Art Unit 1744

/ROBERT J GRUN/
Primary Examiner, Art Unit 1744

<i>Notice of References Cited</i>	Application/Control No. 15/422,303		Applicant(s)/Patent Under Reexamination Reese et al.	
	Examiner JERZI H MORENO HERNANDEZ		Art Unit 1744	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-20160167309-A1	06-2016	LIU; Haichuan	B29C67/0055	264/40.1
*	B	US-20030222066-A1	12-2003	Low, Steven C.	B22F3/1055	219/121.83
*	C	US-20120133083-A1	05-2012	Zenere; Sergio	B29C67/0066	264/401
	D					
	E					
	F					
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	I					
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	L					
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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	
	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.

<i>Search Notes</i> 	Application/Control No. 15/422,303	Applicant(s)/Patent Under Reexamination Reese et al.
	Examiner JERZI H MORENO HERNANDEZ	Art Unit 1744

CPC - Searched*		
Symbol	Date	Examiner
B29C67/0051;B29C67/0055;B29C67/0085	5/15/2017	JHMH
B33Y30/00 or B33Y50/02	5/15/2017	JHMH
B29C67/0088	5/15/2017	JHMH
B29C67/0092	5/15/2017	JHMH
B29C33/68	5/15/2017	JHMH
B29K2879/085	5/15/2017	JHMH
Updated search	01/27/2018	JHMH
Updated search	06/20/2018	JHMH

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

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

Search Notes		
Search Notes	Date	Examiner
inventor name searched	5/15/2017	JHMH
see EAST search history attached	5/15/2017	JHMH
See updated EAST search history attached	01/27/2018	JHMH
See updated EAST search history attached	06/20/2018	JHMH

	/JERZI H MORENO HERNANDEZ/ Examiner.Art Unit 1744
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<i>Search Notes</i> 	Application/Control No. 15/422,303	Applicant(s)/Patent Under Reexamination Reese et al.
	Examiner JERZI H MORENO HERNANDEZ	Art Unit 1744

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

	/JERZI H MORENO HERNANDEZ/ Examiner.Art Unit 1744
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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S100	1	15/422303.app.	US-PGPUB; USPAT; USOCR	OR	ON	2018/06/19 12:30
S102	29	((("REESE") near3 ("Riley")) OR (("BHEDA") near3 ("Hemant"))).INV,AANM. (((("REESE") near3 ("Riley")) OR (("BHEDA") near3 ("Hemant"))).INV,AANM.)	US-PGPUB; USPAT; USOCR	OR	OFF	2018/06/19 12:35
S103	11	((("REESE") near3 ("Riley")) OR (("BHEDA") near3 ("Hemant"))).INV,AANM. (((("REESE") near3 ("Riley")) OR (("BHEDA") near3 ("Hemant"))).INV,AANM.) and (B33Y30/00).cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/06/19 12:36
S104	18	(US-20170036403-\$ or US-20160075091-\$ or US-20150145174-\$ or US-20110241947-\$ or US-20050275129-\$ or US-20060198918-\$ or US-20080179787-\$ or US-20120328726-\$ or US-20130073073-\$ or US-20130095302-\$ or US-20150056319-\$ or US-20150375458-\$ or US-20160096326-\$ or US-20160332387-\$ or US-20160144428-\$ or US-20150108687-\$ or US-20150076739-\$).did. or (US-5009585-\$).did.	US-PGPUB; USPAT	OR	OFF	2018/06/19 12:58
S105	3	((("REESE") near3 ("Riley")) OR (("BHEDA") near3 ("Hemant"))).INV,AANM. (((("REESE") near3 ("Riley")) OR (("BHEDA") near3 ("Hemant"))).INV,AANM.) and ((coating) same (plate platform)).clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/06/19 13:03
S106	9	((US-20170036403-\$ or US-20160075091-\$ or US-20150145174-\$ or US-20110241947-\$ or US-20050275129-\$ or US-20060198918-\$ or US-20080179787-\$ or US-20120328726-\$ or US-20130073073-\$ or US-20130095302-\$ or US-20150056319-\$ or US-20150375458-\$ or US-20160096326-\$ or US-20160332387-\$ or US-20160144428-\$ or US-20150108687-\$ or US-20150076739-\$).did. or (US-5009585-\$).did.) and (coating)	US-PGPUB; USPAT	OR	OFF	2018/06/19 13:06
S107	13	((US-20170036403-\$ or US-20160075091-\$ or US-20150145174-\$ or US-20110241947-\$ or US-20050275129-\$ or US-20060198918-\$ or US-20080179787-\$ or US-20120328726-\$ or US-20130073073-\$ or US-20130095302-\$ or US-20150056319-\$ or US-20150375458-\$ or US-20160096326-\$ or US-20160332387-\$ or US-20160144428-\$ or US-20150108687-\$ or US-20150076739-\$).did. or (US-5009585-\$).did.) and (cool\$3)	US-PGPUB; USPAT	OR	OFF	2018/06/19 13:10
S108	1	((US-20170036403-\$ or US-20160075091-\$ or US-20150145174-\$ or US-20110241947-\$ or	US-PGPUB;	OR	OFF	2018/06/19 13:10

		US-20050275129-\$ or US-20060198918-\$ or US-20080179787-\$ or US-20120328726-\$ or US-20130073073-\$ or US-20130095302-\$ or US-20150056319-\$ or US-20150375458-\$ or US-20160096326-\$ or US-20160332387-\$ or US-20160144428-\$ or US-20150108687-\$ or US-20150076739-\$).did. or (US-5009585-\$).did.) and (cool\$3) with (print\$3) with (plate platform stage)	USPAT			
S112	47	2013/0186549	US-PGPUB; USPAT	OR	OFF	2018/06/19 18:06
S113	1	"20130186549"	US-PGPUB; USPAT	OR	OFF	2018/06/19 18:06
S115	1	"20130186558"	US-PGPUB; USPAT	OR	OFF	2018/06/19 18:13
S116	25	B29C64/245.cpci. and heat\$3 near4 control	US-PGPUB; USPAT; USOCR	OR	ON	2018/06/19 23:34
S117	3	B29C64/245.cpci. and (platform bed plate\$1) with (heat\$3 temperature) near4 control	US-PGPUB; USPAT; USOCR	OR	ON	2018/06/19 23:38
S118	3	B29C64/245.cpc. and (platform bed plate\$1) with (heat\$3 temperature) near4 control	US-PGPUB; USPAT; USOCR	OR	ON	2018/06/19 23:39
S119	12	B29C64/245.cpc. and (platform plate\$3 bed) with (temperature heat\$3) with (controller control\$3) and (platform plate\$3 bed) with (temperature near3 (sensor detector))	US-PGPUB; USPAT; USOCR	OR	ON	2018/06/19 23:40
S120	191	B29C64\$.cpc. and (platform plate\$3 bed) with (temperature heat\$3) with (controller control\$3) and (platform plate\$3 bed) with (temperature near3 (sensor detector))	US-PGPUB; USPAT; USOCR	OR	ON	2018/06/19 23:41
S121	77	B29C64\$.cpc. and (platform plate\$3 bed) with (temperature heat\$3) with (controller control\$3) same (platform plate\$3 bed) with (temperature near3 (sensor detector))	US-PGPUB; USPAT; USOCR	OR	ON	2018/06/19 23:42
S122	71	(B29C64\$.cpc. B33Y\$.cpc.) and (platform plate\$3 bed) with (temperature heat\$3) with (controller control\$3) same (platform plate\$3 bed) with (temperature near3 (sensor detector)) and (@pd or @ptad or @prad or @ad or @rlad)<"20141215"	US-PGPUB; USPAT; USOCR	OR	ON	2018/06/19 23:44
S123	4	(B29C64\$.cpc. B33Y\$.cpc.) and (platform plate\$3 bed) with (temperature heat\$3) with (controller control\$3) same (platform plate\$3 bed) with (temperature near3 (sensor detector)) same (constant) and (@pd or @ptad or @prad or @ad or @rlad) <"20141215"	US-PGPUB; USPAT; USOCR	OR	ON	2018/06/19 23:57
S124	0	(B29C64\$.cpc. B33Y\$.cpc.) and (platform plate\$3 bed) with (temperature heat\$3) with (controller control\$3) same (platform plate\$3 bed) with (thermocouple thermistor pyrometer) same (constant) and (@pd or	US-PGPUB; USPAT; USOCR	OR	ON	2018/06/19 23:59

		@ptad or @prad or @ad or @rlad) < "20141215"				
S125	64	(B29C64\$.cpc. B33Y\$.cpc.) and (platform plate\$3 bed) with (temperature heat\$3) with (controller control\$3) same (platform plate\$3 bed) with (thermocouple thermistor pyrometer) and (@pd or @ptad or @prad or @ad or @rlad)< "20141215"	US-PGPUB; USPAT; USOCR	OR	ON	2018/06/20 00:00
S126	30	S125 not S122	US-PGPUB; USPAT; USOCR	OR	ON	2018/06/20 00:01
S127	8	B29C64/106.cpc. and (platform plate\$3 bed) with (temperature heat\$3) with (controller control\$3) same (platform plate\$3 bed) with (thermocouple thermistor pyrometer) and (@pd or @ptad or @prad or @ad or @rlad) < "20141215"	US-PGPUB; USPAT; USOCR	OR	ON	2018/06/20 00:06
S128	0	B29C64/118.cpc. and (platform plate\$3 bed) with (temperature heat\$3) with (controller control\$3) same (platform plate\$3 bed) with (thermocouple thermistor pyrometer) and (@pd or @ptad or @prad or @ad or @rlad) < "20141215"	US-PGPUB; USPAT; USOCR	OR	ON	2018/06/20 00:06
S129	0	B29C64/118.cpc. and (platform plate\$3 bed) with (temperature heat\$3) with (controller control\$3) same (platform plate\$3 bed) with (temperature near3 (sensor detector)) same (constant) and (@pd or @ptad or @prad or @ad or @rlad)< "20141215"	US-PGPUB; USPAT; USOCR	OR	ON	2018/06/20 00:08
S130	0	B29C64/118.cpc. and (platform plate\$3 bed) with (temperature heat\$3) with (controller control\$3) same (platform plate\$3 bed) with (temperature near3 (sensor detector)) and (@pd or @ptad or @prad or @ad or @rlad) < "20141215"	US-PGPUB; USPAT; USOCR	OR	ON	2018/06/20 00:08
S131	23	(B29C64\$.cpc. B33Y\$.cpc.) and (platform plate\$3 bed) with (temperature heat\$3) same (heat\$3 near2 cartridges) and (@pd or @ptad or @prad or @ad or @rlad)< "20141215"	US-PGPUB; USPAT; USOCR	OR	ON	2018/06/20 01:14
S132	5	B29C64/106.cpc. and (platform plate\$3 bed) with (coating).clm. and (@pd or @ptad or @prad or @ad or @rlad)< "20141215"	US-PGPUB; USPAT; USOCR	OR	ON	2018/06/20 20:03
S133	5	B29C64/106.cpc. and ((platform plate\$3 bed) with (coating)).clm. and (@pd or @ptad or @prad or @ad or @rlad)< "20141215"	US-PGPUB; USPAT; USOCR	OR	ON	2018/06/20 20:03
S134	29	B29C64\$.cpc. and ((platform plate substrate) near3 (coating)).clm. and (@pd or @ptad or @prad or @ad or @rlad)< "20141215"	US-PGPUB; USPAT; USOCR	OR	ON	2018/06/20 20:13
S135	20	B33Y\$.cpc. and ((platform plate) near3 (coating)).clm. and (@pd or @ptad or @prad or @ad or @rlad)< "20141215" not S134	US-PGPUB; USPAT; USOCR	OR	ON	2018/06/20 20:17
S136	12	B29C64/106.cpc. and ((platform plate\$3 bed) with (sheet film tape)).clm. and (@pd or @ptad or @prad or @ad or @rlad) < "20141215"	US-PGPUB; USPAT; USOCR	OR	ON	2018/06/20 20:18

S137	3	((("REESE") near3 ("Riley")).INV,AANM. (("BHEDA") near3 ("Hemant")).INV,AANM. (("AREVO") near3 ("INC")).AS,AANM.) and ((platform plate\$3 bed) with (sheet film tape coating)).clm.	US- PGPUB; USPAT; USOCR	OR	ON	2018/06/20 20:36
S138	92	(B29C64\$.cpc. or B33Y\$.cpc.) and (@pd or @ptad or @prad or @ad or @rlad) < "20141215" and ((platform plate\$3 bed) near2 (sheet film tape coating)).clm.	US- PGPUB; USPAT; USOCR	OR	ON	2018/06/20 20:39

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S139	12	B29C64/106.cpc. and ((platform plate\$3 bed) with (sheet film tape)).clm. and (@pd or @ptad or @prad or @ad or @rlad) < "20141215"	US- PGPUB; USPAT	OR	ON	2018/06/20 20:19
S140	5	B29C64/106.cpc. and ((platform plate\$3 bed) with (coating)).clm. and (@pd or @ptad or @prad or @ad or @rlad)< "20141215"	US- PGPUB; USPAT	OR	ON	2018/06/20 20:20
S141	3	((("REESE") near3 ("Riley")).INV,AANM. (("BHEDA") near3 ("Hemant")).INV,AANM. (("AREVO") near3 ("INC")).AS,AANM.) and ((platform plate\$3 bed) with (sheet film tape coating)).clm.	US- PGPUB; USPAT	OR	ON	2018/06/20 20:35
S142	92	(B29C64\$.cpc. or B33Y\$.cpc.) and (@pd or @ptad or @prad or @ad or @rlad) < "20141215" and ((platform plate\$3 bed) near2 (sheet film tape coating)).clm.	US- PGPUB; USPAT	OR	ON	2018/06/20 20:41

6/ 20/ 2018 8:47:41 PM**C:\ Users\ jhernandez\ Documents\ EAST\ Workspaces\ 15422303.wsp**

Doc code: RCEX

Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (02-18)

Approved for use through 11/30/2020. OMB 0851-0031

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 contains a valid OMB control number.

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL (Submitted Only via EFS-Web)							
Application Number	15/422,303	Filing Date	2017-02-01	Docket Number (if applicable)	50823-712.301	Art Unit	1744
First Named Inventor	Riley Reese et al.			Examiner Name	MORENO HERNANDEZ, JERZI H		
This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application. Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV							
SUBMISSION REQUIRED UNDER 37 CFR 1.114							
Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).							
☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.							
☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____							
☐ Other _____							
☒ Enclosed							
☒ Amendment/Reply							
☐ Information Disclosure Statement (IDS)							
☐ Affidavit(s)/ Declaration(s)							
☐ Other _____							
MISCELLANEOUS							
☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____. (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)							
☐ Other _____							
FEES							
☒ The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed. The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No <u>232415</u>							
SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED							
☒ Patent Practitioner Signature							
☐ Applicant Signature							

Doc code: RCEX

Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (02-18)

Approved for use through 11/30/2020. OMB 0851-0031

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 contains a valid OMB control number.

Signature of Registered U.S. Patent Practitioner			
Signature	/Jing Wang/	Date (YYYY-MM-DD)	2018-04-30
Name	Jing Wang	Registration Number	76486

This collection of information is required by 37 CFR 1.114. 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.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 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 the Freedom of Information Act requires disclosure of these records.
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 inspections 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.

Electronic Patent Application Fee Transmittal				
Application Number:		15422303		
Filing Date:		01-Feb-2017		
Title of Invention:		HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS		
First Named Inventor/Applicant Name:		Riley Reese		
Filer:		Jing NM Wang/Joanna Laney		
Attorney Docket Number:		50823-712.301		
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- 1ST REQUEST	1801	1	1300	1300
Total in USD (\$)				1300

Electronic Acknowledgement Receipt	
EFS ID:	32497113
Application Number:	15422303
International Application Number:	
Confirmation Number:	1368
Title of Invention:	HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS
First Named Inventor/Applicant Name:	Riley Reese
Customer Number:	153281
Filer:	Jing NM Wang/Joanna Laney
Filer Authorized By:	Jing NM Wang
Attorney Docket Number:	50823-712.301
Receipt Date:	01-MAY-2018
Filing Date:	01-FEB-2017
Time Stamp:	12:05:38
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$1300
RAM confirmation Number	050118INTEFSW00031695232415
Deposit Account	232415
Authorized User	Ali Alemozafar
<p>The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:</p> <p>37 CFR 1.16 (National application filing, search, and examination fees)</p> <p>37 CFR 1.17 (Patent application and reexamination processing fees)</p>	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		50823_712_301_Final_OA_Response.pdf	147835 0b358ade755da62698931882775d404a7a63fcd	yes	13
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Amendment Submitted/Entered with Filing of CPA/RCE		1	1	
	Claims		2	5	
	Applicant summary of interview with examiner		6	6	
	Applicant Arguments/Remarks Made in an Amendment		7	13	
Warnings:					
Information:					
2	Request for Continued Examination (RCE)	50823_712_301_RCE.pdf	91092 3c1d8b58c8f8af59329c77e47a0e092914145a6f	no	3
Warnings:					
This is not a USPTO supplied RCE SB30 form.					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30222 1a74cae9ad1d8b3064c1bcd37d5d3f8adacc68d4	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			269149		

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Confirmation No.: 1368
Riley Reese, et al.	Group No.: 1744
Application No.: 15/422,303	Examiner: Jerzi H. Moreno Hernandez
Filed: February 1, 2017	Customer No. 153281
Title: HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS	

ELECTRONICALLY FILED ON: May 1, 2018

AMENDMENT AND RESPONSE TO FINAL OFFICE ACTION

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

Dear Commissioner:

This communication is in response to the Final Office Action mailed February 6, 2018.
The Response is accompanied by a Request for Continued Examination and the requisite fees.

Applicant respectfully requests reconsideration of this application in view of the
following amendments and remarks:

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

Summary of the Interview begin on page **6** of this paper

Remarks begin on page **7** of this paper.

AMENDMENTS TO THE CLAIMS

1. -18. (Canceled)

19. (Currently Amended) A build apparatus for use in printing a three-dimensional (3D) object, comprising:

a build platform, a thermally conductive plate disposed adjacent to and in thermal communication with [[a]] said build platform, and a coating adjacent to said thermally conductive plate, wherein said coating adjacent to said thermally conductive plate is capable of configured to (i) securing secure at least a portion of said 3D object during printing and while said thermally conductive plate is at one or more temperature set points, and (ii) permitting permit removal of said 3D object subsequent to printing from said thermally conductive plate once said 3D object has been formed and when said thermally conductive plate has cooled to a temperature below said one or more temperature set points, which removal is without chemically or mechanically removing material from said 3D object and without damaging said thermally conductive plate or said 3D object, and wherein said thermally conductive plate is not removable from said build platform during a time period in which said 3D object is printed and removed from said thermally conductive plate;

a temperature control unit in thermal communication with said build platform, wherein said temperature control unit is configured to supply heat to said build platform; and

a controller operatively coupled to one or more heating units, wherein said controller (i) uses feedback to detect one or more temperatures of said thermally conductive plate and (ii) directs said temperature control unit to supply heat to said build platform to maintain said one or more temperature set points while printing said 3D object.

20. (Canceled)
21. (Canceled)
22. (Currently Amended) The build apparatus of claim ~~[[20]]~~ 19, wherein said temperature control unit comprises heater cartridges that are spaced along a surface of said build platform.
23. (Canceled)
24. (Currently Amended) The build apparatus of claim ~~[[20]]~~ 19, wherein said build platform comprises one or more thermocouples situated at one or several locations to provide said feedback to ~~[[a]]~~ said controller for maintaining said one or more temperature set points.
25. (Currently Amended) The build apparatus of claim ~~[[20]]~~ 19, wherein said build platform comprises a material selected from the group consisting of aluminum, steel, brass, ceramic, glass, and an alloy with a low coefficient of thermal expansion (CTE).
26. (Currently Amended) The build apparatus of claim ~~[[20]]~~ 19, wherein said build platform comprises a ceramic material.
27. (Currently Amended) The build apparatus of claim ~~[[20]]~~ 19, wherein said build platform has a first coefficient of thermal expansion (CTE) and said thermally conductive plate has a second CTE, wherein said first CTE is greater than said second CTE.
- 28.-33. (Canceled)
34. (Previously Presented) The build apparatus of claim 19, wherein said thermally conductive plate comprises a material selected from the group consisting of aluminum, steel, brass, ceramic, glass, and an alloy with a low coefficient of thermal expansion (CTE).
35. (Currently amended) The build apparatus of claim 19, wherein said thermally conductive plate has a thickness ranging between 0.025 inches and 0.5 inches, ~~wherein said thickness depends on a flexural character of said material.~~

36. (Previously Presented) The build apparatus of claim 19, wherein said thermally conductive plate is non-magnetically secured to and removable from said build platform.
37. (Canceled)
38. (Canceled)
39. (Canceled)
40. (Canceled)
41. (Canceled)
42. (Canceled)
43. (Canceled).
44. (Canceled)
45. (Currently Amended) The build apparatus of claim ~~[[44]]~~ 19, wherein said coating is a polymer coating.
46. (Previously Presented) The build apparatus of claim 45, wherein said polymer coating is a polyimide.
47. (Previously Presented) The build apparatus of claim 45, wherein said polymer coating has a thickness ranging between 0.001 inches and 0.1 inches.
48. (Currently Amended) The build apparatus of claim ~~[[44]]~~ 19, wherein said thermally conductive plate is flexible to facilitate dissociation between said 3D object and said thermally conductive plate upon cooling of said thermally conductive plate ~~and reduce damage to said coating or said 3D object during removal of said 3D object.~~
49. (Currently Amended) The build apparatus of claim ~~[[44]]~~ 19, wherein said build platform, said thermally conductive plate, and said coating are ~~able~~ configured to withstand high temperature ranging between 150 degree Celsius and 300 degree Celsius.

50. (New) The build apparatus of claim 19, wherein said build platform comprises holes for heater cartridges of said temperature control unit.

SUMMARY OF THE INTERVIEW

Applicant is appreciative of Examiner Hernandez for extending the courtesy of an examiner's interview to Applicant's representatives, Ali Alemozafar and Jing Wang, on April 19, 2018. During the interview, amendments and arguments consistent with those detailed herein were discussed.

REMARKS

Claims 19-20, 22, 24-27, 34-36, 38 and 40-49 were pending prior to entry of the abovementioned amendments. Claims 20, 38, and 40-44 have been canceled. Claim 19, 22, 24-27, 35, 45, 48, and 49 are currently amended. New claim 50 has been added. No new matter is added by any of these amendments. Accordingly, claims 19, 22, 24-27, 34-36, and 45-50 are currently pending.

Reconsideration and allowance of this application is respectfully requested in light of the following remarks.

Claims Amendments

Claim 19 has been amended to clarify the claimed subject matter. These amendments are fully supported by the application as originally filed, U.S. Patent Application No. 15/422,303, now U.S. Patent Publication No. 2017/0217106 (“the Application”) at, for example, paragraphs [0018]-[0027].

Claims 22, 24-27, 35, 45, 48, and 49 have been amended for typographical and antecedent basis purposes.

New claim 50 is fully supported by the Application at, for example, paragraph [0020].

Drawings

The Office has objected to the drawings. Without conceding in the basis of objection, Applicant submits that the objections of the drawings are moot in view of the cancellation of claims 40, 42, and 43.

35 U.S.C. § 112

Claims 19-20, 22, 24-27, 34-36, 38 and 40-49 stand rejected under 35 U.S.C. § 112(a) or 35 U.S.C. § 112 (pre-AIA), first paragraph. Claims 19-20, 22, 24-27, 34-36, 38 and 40-49 stand rejected under 35 U.S.C. § 112(b) or 35 U.S.C. § 112 (pre-AIA), second paragraph.

Without conceding in the basis of rejection, and solely to expedite the prosecution of this application, Applicant has amended claim 19 to clarify the claimed subject matter. Accordingly, Applicant respectfully requests that the 35 U.S.C. § 112 rejections of claim 19, and dependent claims 22, 24-27, 34-36, and 45-49 thereof, be withdrawn.

Without conceding in the basis of rejection, Applicant submits that the 35 U.S.C. § 112 rejections of claims 20, 38, and 40-44 are moot in view of the cancellation of these claims.

35 U.S.C. § 102

A. Claims 19-20, 22, 25, 27, 34, 35, 38, 40-42 and 44-49 are novel over Comb

Claims 19-20, 22, 25, 27, 34-36, 38, 40-42 and 44-49 stand rejected under 35 U.S.C. § 102(a)(2) over U.S. Publication No. 2015/0145174 (Comb).

Without conceding in the basis of rejection, and solely to expedite the prosecution of this application, Applicant has amended Claim 19 to clarify certain differences between the claimed subject matter and Comb. Applicant submits that Claim 19 is novel over Comb because this reference does not teach or disclose all of the elements of this claim.

For example, Comb does not teach or disclose “a controller operatively coupled to one or more heating units, wherein said controller (i) uses feedback to detect one or more temperatures of said thermally conductive plate and (ii) directs said temperature control unit to supply heat to

said build platform to maintain said one or more temperature set points while printing said 3D object,” as recited in Claim 19.

In fact, Comb indicates that “good adhesion is beneficial for anchoring the printed layers, thereby reducing curl and part distortions during the printing process ... curling forces from the printed layers can cause thin plastic sheets to pull upward in a potato chip-like manner.” See paragraphs [0025] and [0042] of Comb. Comb solves such problem by using a “surface treated or otherwise conditioned [top film] to increase its adhesive properties (e.g., texturing) ... for anchoring the printed layers, thereby reducing curl and part distortions during the printing process.” See paragraph [0056] of Comb. Thus, not only does Comb not teach or disclose use of feedback to detect temperature and heating to maintain a temperature of a build platform to maintain a set point temperature while printing, but Comb would have no reason for such features, given that the surface treating of Comb solves the problem identified by Comb.

Accordingly, Applicant respectfully requests that the § 102 rejection of Claim 19 be withdrawn.

Claims 22, 25, 27, 34-36, and 45-49 depend from and include all of the elements of Claim 19, and recite additional elements of particular advantage and utility. Comb does not teach or disclose all of the elements of Claim 19, much less the combination of elements of claims 22, 25, 27, 34-36, and 45-49. Accordingly, Applicant respectfully requests that the § 102 rejections of claims 22, 25, 27, 34-36, and 45-49 also be withdrawn.

Without conceding in the basis of rejection, Applicant submits that the § 102 rejections of claims 20, 38, 40-42, and 44 are moot in view of the cancellation of these claims.

B. Claims 19, 26, 34 and 44-47 are novel over Ruff

Claims 19, 26, 34 and 44-47 stand rejected under 35 U.S.C. § 102(a)(2) over U.S. Publication No. 2017/0036403 (Ruff).

Without conceding in the basis of rejection, and solely to expedite the prosecution of this application, Applicant has amended Claim 19 to clarify certain differences between the claimed subject matter and Ruff. Applicant submits that Claim 19 is novel over Ruff because this reference does not teach or disclose all of the elements of this claim.

For example, Ruff does not teach or disclose “a controller operatively coupled to one or more heating units, wherein said controller (i) uses feedback to detect one or more temperatures of said thermally conductive plate and (ii) directs said temperature control unit to supply heat to said build platform to maintain said one or more temperature set points while printing said 3D object,” as recited in Claim 19.

Accordingly, Applicant respectfully requests that the § 102 rejection of Claim 19 be withdrawn.

Claims 26, 34, and 45-47 depend from and include all of the elements of Claim 19, and recite additional elements of particular advantage and utility. Ruff does not teach or disclose all of the elements of Claim 19, much less the combination of elements of claims 26, 34, and 45-47. Accordingly, Applicant respectfully requests that the § 102 rejections of claims 26, 34, and 45-47 also be withdrawn.

Without conceding in the basis of rejection, Applicant submits that the § 102 rejection of claim 44 is moot in view of the cancellation of this claim.

35 U.S.C. § 103

A. *Claim 24 is not obvious over Comb in view of Naware*

Claim 24 stands rejected under 35 U.S.C. § 103 over Comb as applied to Claim 20 above and further in view of U.S. Publication No. 2016/0096326 (Naware).

Without conceding in the basis of rejection, Applicant submits that the § 103 rejection of Claim 24 is moot in view of the cancellation of this claim.

B. Claims 19 and 26 are not obvious over Comb in view of Koyagi

Claims 19, 26 and 43 stand rejected under 35 U.S.C. § 103 over Comb and Ruff.

Without conceding in the basis of rejection, Applicant submits that Claim 19 is not obvious over the asserted combination of Comb and Ruff for at least the reason that these references, alone or in combination, do not meet all of the elements of this claim. Certain deficiencies of Comb have been discussed above and Ruff does not cure such deficiencies (see above).

Accordingly, Applicant respectfully requests that the § 103 rejections of Claim 19 be withdrawn.

Claim 26 depends from and include all of the elements of Claim 19, and recites additional elements of particular advantage and utility. The asserted combination of Comb and Ruff does not meet all of the elements of Claim 19, much less the combination of elements of Claim 26. Accordingly, Applicant respectfully requests that the § 103 rejection of Claim 26 also be withdrawn.

Without conceding in the basis of rejection, Applicant submits that the § 103 rejection of Claim 43 is moot in view of the cancellation of this claim.

C. Claim 36 is not obvious over Comb in view of Koyagi

Claim 36 stands rejected under 35 U.S.C. § 103 over Comb as applied to Claim 19 above and further in view of U.S. Publication No. 2006/0198918 (Koyagi).

Without conceding in the basis of rejection, Applicant submits that claim 36 is not obvious over the asserted combination of Comb and Koyagi for at least the reason that this claim depends from Claim 19, and recites additional elements of particular advantage and utility. Comb does not teach or disclose all of the elements of Claim 19, much less the combination of elements of Claim 36, and Koyagi does not cure the abovementioned deficiencies of Comb.

Furthermore, Comb indicates that the “chuck portion that magnetically couples to removable and interchangeable build sheets, provides several unique advantages over build substrates currently used in the industry ... the magnetic coupling allows low-cost and reliable build sheets to be used without also requiring vacuum systems, which can substantially reduce the complexity of the additive manufacturing system.” See paragraph [0030] of Comb. Thus, the person of ordinary skill in the art would have no motivation to use the vacuum fixing part 90 and vacuum pump 91 of Koyagi for securing the build sheets in the apparatus of Comb.

Accordingly, Applicant respectfully requests that the § 103 rejection of Claim 36 be withdrawn.

It shall be understood herein that any instance in which Applicant has addressed certain comments set forth by the Office shall not be construed as a concession to other comments or arguments advanced by the Office. Any circumstance in which Applicant has amended or canceled a claim also does not mean that Applicant concedes to the arguments or positions advanced by the Office with respect to that claim or other claims pending herein.

CONCLUSION

Applicant believes that this paper fully addresses the rejections raised in the Final Office Action mailed February 6, 2018. Applicant respectfully solicits the Examiner to expedite the prosecution of this patent application to issuance. Should the Examiner have any question, the Examiner is encouraged to telephone the undersigned at (212) 497-7740.

The Commissioner is authorized to charge any additional fees which may be required, including petition fees and extension of time fees, to Deposit Account No. **23-2415**, Attorney Docket No. 50823-712.301.

Respectfully submitted,

WILSON SONSINI GOODRICH & ROSATI

Date: April 30, 2018

By: /Jing Wang/
Jing Wang, Ph.D.
Reg. No. 76,486

650 Page Mill Road
Palo Alto, CA 94304
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Facsimile No.: (650) 493-6811

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 15/422,303		Filing Date 02/01/2017		☐ 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), (l), 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(j))		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	05/01/2018	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)			
	Total (37 CFR 1.16(i))	* 15	Minus	** 21	= 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		
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".						shareill A coles				
*** 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.
15/422,303	02/01/2017	Riley Reese	50823-712.301	1368
153281 7590 04/25/2018 Arevo / WILSON, SONSINI, GOODRICH & ROSATI 650 PAGE MILL ROAD PALO ALTO, CALIFORNIA 94304-1050 UNITED STATES OF AMERICA			EXAMINER MORENO HERNANDEZ, JERZI H	
			ART UNIT 1744	PAPER NUMBER
			NOTIFICATION DATE 04/25/2018	DELIVERY MODE 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):

patentdocket@wsgr.com

<i>Applicant-Initiated Interview Summary</i>	Application No. 15/422,303	Applicant(s) Reese et al.		
	Examiner JERZI H MORENO HERNANDEZ	Art Unit 1744	AIA (First Inventor to File) Status Yes	Page 1 of 2

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

1. JERZI H MORENO HERNANDEZ (Examiner); WebEx/ Video Conference 2. JING WANG (Attorney of Record); WebEx/Video Conference

3. ALI ALEMOZAFAR (Attorney of Record); WebEx/ Video Conference

Date of Interview: 19 April 2018

Claims Discussed: 19

Prior Art Discussed: Prior art of record.

Amendment proposed: Applicant added limitations to claim 19 apparently to overcome the current 102 and 103 rejections.

Issues Discussed:

Proposed Amendments:
Examiner and applicant's representatives discussed the proposed amendments. Agreement was reached that the proposed amendments seem to overcome the current 102 and 103 rejections but further search and consideration would be required.

Attachment(s): Proposed Amendments,

/JERZI H MORENO HERNANDEZ/ Examiner, Art Unit 1744	/ALISON L HINDENLANG/ Primary Examiner, Art Unit 1744
<p>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</p> <p>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</p>	

U.S. Patent and Trademark Office
PTOL-413/413b (Rev. 01/01/2015)

Interview Summary

Paper No. 20180419

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

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

****FOR DISCUSSION PURPOSES ONLY****
****PLEASE DO NOT ENTER****

Application No: 15/422,303
Title: HEATED BUILD PLATFORM AND SYSTEM FOR THREE
DIMENSIONAL PRINTING METHODS
Filing Date: February 1, 2017
Examiner: Jerzi H. Moreno Hernandez
Attorney Docket No: 50823-712.301

Patent Examiner Interview Agenda – (April 19, 3:30 PM EDT, 12:30 PM PDT)

Planned Attendees: Ali Alemozafar and Jing Wang

Final Office Action February 6, 2018

- Discuss 35 U.S.C. §102(a)(2) rejection of claims 19 and 36 over Comb.
- Discuss 35 U.S.C. §102(a)(2) rejection of claim 19 over Ruff.
- Discuss 35 U.S.C. §103 rejection of claim 24 over Comb in view of Naware.
- Discuss potential language for claim 19 (below)

****FOR DISCUSSION PURPOSES ONLY****
****PLEASE DO NOT ENTER****

19. A build ~~apparatus~~ system for use in printing a three-dimensional (3D) object, comprising:
- a build apparatus comprising a build platform, a thermally conductive plate disposed adjacent to [[a]] said build platform, and a coating adjacent to said thermally conductive plate, wherein said coating is capable of facilitating adhesion of said 3D object to said thermally conductive plate during printing, wherein said thermally conductive plate is capable of (i) securing said 3D object during printing and (ii) permitting removal of said 3D object from said thermally conductive plate once said 3D object has been formed, which removal is without chemically or mechanically removing material from said 3D object and without damaging said thermally conductive plate or said 3D object, and wherein said thermally conductive plate is not removable from said build platform during a time period in which said 3D object is printed and removed from said thermally conductive plate;
- one or more thermocouples in thermal communication with said build platform; and
- a controller operatively coupled to said one or more thermocouples, wherein said controller uses feedback from said one or more thermocouples to maintain one or more temperature set points while printing said 3D object.



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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
15/422,303	02/01/2017	1744	1820	50823-712.301	21	1

CONFIRMATION NO. 1368
CORRECTED FILING RECEIPT

153281

Arevo / WILSON, SONSINI, GOODRICH & ROSATI
650 PAGE MILL ROAD
PALO ALTO, CA 94304-1050



000000098899847

Date Mailed: 04/19/2018

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)

Riley Reese, Carpinteria, CA;
Hemant Bheda, Saratoga, CA;

Applicant(s)

Arevo, Inc., Santa Clara, CA;

Power of Attorney: The patent practitioners associated with Customer Number 021971

Domestic Priority data as claimed by applicant

This application is a CON of 14/574,237 12/17/2014 PAT 9592660

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 Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 02/08/2017

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/422,303**

Projected Publication Date: Not Applicable

Non-Publication Request: No

Early Publication Request: No
Title

HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS

Preliminary Class

264

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).

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CORRECTED ADS FORM

Application Number	15422303
Title of Invention	HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS

Inventor Information

****If no data is shown, no data has been corrected****

	Data of Record	Updated Data
Order Number		
Name		

Residence Information

Residency		
City		
State		
Country of Residence		

Mailing Address of Inventor

Address 1		
Address 2		
City,State/Province, Postal Code		
Country		

Application Information

	Data of Record	Updated Data
Title of Invention	HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS	
Attorney Docket Number	50823-712.301	
Entity Type	Regular Undiscounted	

Domestic Benefit/National Stage Information

****If no data is shown, no data has been corrected****

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121,365(c), or 386(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(a).

	Data of Record	Updated Data
Prior Application Status		
Application Number		
Continuity Type		
Prior Application Number		
Filing Date (YYYY-MM-DD)		
Patent Number		
Issue Date (YYYY-MM-DD)		

Foreign Priority Information

****If no data is shown, no data has been corrected****

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. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX) the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(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).

	Data of Record	Updated Data
Application Number		
Country		
Filing Date		
Access Code		

Applicant Information

****If no data is shown, no data has been corrected****

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.

	Data of Record	Updated Data
Applicant Type	ASG	
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		
Applicant is an Organization	Yes	
Name		
Organization Name	Arevo Inc.	<u>Arevo, Inc.</u>
Address 1		<u>2090 Duane Ave.</u>
Address 2		

City,State/Province,Postal Code	Santa Clara CA 95054	
Country	US	
Phone Number		
Fax Number		
Email Address		

Assignee Information including Non-Applicant Assignee Information

****If no data is shown, no data has been corrected****

Providing this information in the application data sheet does not substitute for compliance with any requirement of part 3 of Title 37 of the CFR to have an assignment recorded in the Office

	Data of Record	Updated Data
Order		
Applicant is an Organization		
Name		
Organization Name		

Mailing Address

Address 1		
Address 2		
City,State/Province,Postal Code		
Country		
Phone Number		
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Signature

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b).

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Jing Wang/	Registration Number	76486
First Name	Jing	Last Name	Wang

Electronic Acknowledgement Receipt	
EFS ID:	32359529
Application Number:	15422303
International Application Number:	
Confirmation Number:	1368
Title of Invention:	HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS
First Named Inventor/Applicant Name:	
Customer Number:	153281
Filer:	Jing NM Wang/Joanna Laney
Filer Authorized By:	Jing NM Wang
Attorney Docket Number:	50823-712.301
Receipt Date:	17-APR-2018
Filing Date:	01-FEB-2017
Time Stamp:	13:10:55
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet to update/ correct info	CorrectedADS.pdf	65133	no	5
			5d1827890c7ace7a32e418cbc52d325cc3301a45		

Warnings:

Information:	
Total Files Size (in bytes):	65133
<p>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.</p> <p><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.</p> <p><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.</p> <p><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.</p>	

<i>Search Notes</i> 	Application/Control No. 15/422,303	Applicant(s)/Patent Under Reexamination Reese et al.
	Examiner JERZI H MORENO HERNANDEZ	Art Unit 1744

CPC - Searched*		
Symbol	Date	Examiner
B29C67/0051;B29C67/0055;B29C67/0085	5/15/2017	JHMH
B33Y30/00 or B33Y50/02	5/15/2017	JHMH
B29C67/0088	5/15/2017	JHMH
B29C67/0092	5/15/2017	JHMH
B29C33/68	5/15/2017	JHMH
B29K2879/085	5/15/2017	JHMH
Updated search	01/27/2018	JHMH

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

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

Search Notes		
Search Notes	Date	Examiner
inventor name searched	5/15/2017	JHMH
see EAST search history attached	5/15/2017	JHMH
See updated EAST search history attached	01/27/2018	JHMH

	/JERZI H MORENO HERNANDEZ/ Examiner.Art Unit 1744
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<i>Search Notes</i> 	Application/Control No. 15/422,303	Applicant(s)/Patent Under Reexamination Reese et al.
	Examiner JERZI H MORENO HERNANDEZ	Art Unit 1744

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

	/JERZI H MORENO HERNANDEZ/ Examiner.Art Unit 1744
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/422,303	02/01/2017	Riley Reese	50823-712.301	1368
153281 7590 02/06/2018 Arevo / WILSON, SONSINI, GOODRICH & ROSATI 650 PAGE MILL ROAD PALO ALTO, CALIFORNIA 94304-1050			EXAMINER MORENO HERNANDEZ, JERZI H	
			ART UNIT 1744	PAPER NUMBER
			NOTIFICATION DATE 02/06/2018	DELIVERY MODE 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):

patentdocket@wsgr.com

DETAILED CORRESPONDENCE

Notice of Pre-AIA or AIA Status

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

Note

Examiner wishes to point out to applicant that claim(s) 19-20, 22, 24-27, 34-36, 38, and 40-49 is/are directed towards an apparatus and as such will be examined under the following conditions. The process/manner of using the apparatus or the material worked upon is viewed as recitation of intended use and is given patentable weight only to the extent that structure is added to the claimed apparatus (See MPEP 2114 II and 2115 for further details). For apparatuses, the claim limitations will define structural limitations (See MPEP 2114-2115) or properly recited functional limitations (See MPEP 2173.05 (g)).

Examiner has interpreted “polymer coating” as a polymer layer/sheet as this is the broadest reasonable interpretation.

Status of the Application

This is a final office action in response to applicant's amendments and/or remarks filed on 11/01/2017. Claims 19 and 35 are currently amended. Claims 21, 23, 28-33, 37 and 39 are canceled. Claims 40-49 are added. The remaining of the claims are as previously presented. Accordingly, claims 19-20, 22, 24-27, 34-36, 38, and 40-49 are examined herein.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the claimed “fastener” and “temperature sensing unit” must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112(a):

(a) IN GENERAL.—The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.

The following is a quotation of the first paragraph of pre-AIA 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim(s) 19-20, 22, 24-27, 34-36, 38, and 40-49 are rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor or a joint inventor, or for pre-AIA the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 19 and 40 recite newly added limitation: “wherein said thermally conductive plate is not removable from said build platform during a time period in which said 3D object is ... removed from said thermally conductive plate” which is considered to be new matter as the original disclosure does not have adequate/sufficient support for this limitation. Negative limitations should have sufficient explicit support in the original disclosure (See MEPEP 2173.05(i)).

Claim(s) 20, 22, 24-27, 34-36, 38, and 40-49 is/are rejected as being dependent from claim 19 and therefor including all the limitation thereof.

Claims 41-42 recite “wherein said thermally conductive plate is not removable from said build platform until after removal of said 3D object from said thermally conductive plate” which is considered to be new matter as the original disclosure does not have adequate/sufficient support for this limitation. Negative limitations should have sufficient explicit support in the original disclosure (See MEPEP 2173.05(i)).

Claim 43 recites “a temperature sensing unit that measures a temperature of said 3D object or said thermally conductive plate, wherein said temperature sensing unit permits removal of said 3D object from said thermally conductive plate once said 3D object has been formed and cooled” which is considered to be new matter. While original disclosure has support for thermocouples that measure the temperature of the build platform and “maintain temperature set point throughout a build” (P0019-0020), the original disclosure does not have adequate/sufficient support for a temperature sensing unit or thermocouples that measure the

temperature of said 3D object or said thermally conductive plate and that permit removal of said 3D object from said thermally conductive plate once said 3D object has been formed and cooled.

The following is a quotation of 35 U.S.C. 112(b):

(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 19-20, 22, 24-27, 34-36, 38, and 40-49 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01.

Claim 19 omits the coating and the properties of the coating and the thermally conductive plate (thickness/flexibility & coefficient of thermal expansions) which are essential elements in order for the invention to function as claimed and as intended (See P0024, P0027-0029).

Claim(s) 20, 22, 24-27, 34-36, 38, and 40-49 is/are rejected as being dependent from claim 19 and therefor including all the limitation thereof.

Claim(s) 19-20, 22, 24-27, 34-36, 38, and 40-49 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

Claim 19 recites “wherein said thermally conductive plate is capable of (i) securing said 3D object during printing and (ii) permitting removal of said 3D object from said thermally conductive plate once said 3D object has been formed, which removal is without chemically or mechanically removing material from said 3D object and without damaging said thermally

conductive plate or said 3D object” which is indefinite. These recitations are unclear because they merely recite a function or result achieved by the invention without reciting the particular structure, materials or steps that accomplish the function or achieve the result (See MPEP 2173.05 (g)). Examiner notes that the claimed thermally conductive plate needs to have a specific structure and materials/properties in order to have the claimed functionalities/capabilities (See P0024, P0027-0029).

Claim(s) 20, 22, 24-27, 34-36, 38, and 40-49 is/are rejected as being dependent from claim 19 and therefor including all the limitation thereof.

Claim 43 recites “a temperature sensing unit that measures a temperature of said 3D object or said thermally conductive plate, wherein said temperature sensing unit permits removal of said 3D object from said thermally conductive plate once said 3D object has been formed and cooled” which is indefinite. How can the temperature sensing unit permit removal of said 3D object? Does the temperature sensing unit remove the object? There is a missing connection between the concepts of sensing temperature and permitting removal of said 3D object.

Claim Rejections - 35 USC § 102

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.

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)(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.

Claims 19-20, 22, 25, 27, 34-36, 38, 40-42, 44-49 and are rejected under 35 U.S.C. 102(a)(2) as being anticipated by Comb (US 2015/0145174 – of record, with a priority date of 11/22/2013).

Regarding claims 19 and 44-46, Comb teaches a build apparatus (26, F2-8) for use in printing a 3D object (P0001), comprising:

a thermally conductive plate (36b having a plate-like shape and comprising **steel**, P0053, F5-6; thus, 36b is considered to be a thermally conductive plate) disposed adjacent to a build platform (bottom of 36b is placed on top of plate/platform 52; thus, 36b is adjacent to 52, F5-6), a polyimide coating adjacent to said thermally conductive plate (polymeric coating/layer 36a adjacent to 36b to make a coated plate 36; wherein 36a can be a polyimide coating/layer, P0054-0055, F6), wherein said thermally conductive plate is capable of (i) securing said 3D object during printing (since the taught plate and the claimed plate are not patentably distinct in terms of structure, they are expected to have the same properties/functions (See MPEP 2112.01 (I)); thus, 36 is capable of securing said 3D object during printing; In addition, 36 is configured to secure the 3D object during printing, P0040, P0042 and P0025) and (ii) permitting removal of said 3D object from said thermally conductive plate once said 3D object has been formed, which removal is without chemically or mechanically removing material from said 3D object and without damaging said thermally conductive plate or said 3D object (since the taught plate and the claimed plate are not patentably distinct in terms of structure, they are expected to have the same properties/functions (See MPEP 2112.01 (I)); thus, 36 is capable of permitting removal of said 3D object from said thermally conductive plate once said 3D object has been formed, which removal is without chemically or mechanically removing material from said 3D object and without damaging said thermally conductive plate or said 3D object; In addition, 36 is configured to enable efficient peeling/removal of said 3D object from 36/36b once said 3D object

has been formed (P0057, P0026) without chemically or mechanically removing material from said 3D object and without damaging said thermally conductive plate or said 3D object (P0027, P0082)), wherein said thermally conductive plate is not removable from said build platform during a time period in which said 3D object is printed ... (36 is not removed from 52 during printing, P0023).

Comb does not teach wherein said thermally conductive plate is not removable from said build platform during a time period in which said 3D object is removed from said thermally conductive plate. However, this recitation does not have patentable weight because it merely recites the manner of operating the claimed apparatus, does not add further structure to the claimed apparatus, and does not differentiate the claimed apparatus from the prior art (See MPEP 2114 (II)). Furthermore, since the taught plate and the claimed plate are not patentably distinct in terms of structure, they are expected to function/operate in the same manner under identical operating conditions (See MPEP 2112.01 (I)). In fact, the claimed/disclosed plate and the taught plate are capable of being removed from their platform at any time deemed convenient by the operator.

Therefore, Examiner considers that Comb still anticipates amended claim 1.

Regarding claim 20, Comb further teaches a temperature control unit configured to control heating of said build platform (heating elements 56 configured to heat plate 52 and 36 to a desired temperature, P0052, P0072, P0074, and F3-8).

Regarding claims 22, while Comb fails to explicitly teach that the heating elements 56 are heater cartridges, Comb is considered to implicitly teach the claimed heater cartridges because the claimed heater cartridges (disclosed in P0019 and F2 of instant specification) appear to have the same shape, structure, and function as Comb's heating elements 56 which are spaced along the surface of 52 (F3-8, in particular F6-7, P0074).

Regarding claim 25, Comb further teaches that the build platform can comprise aluminum/alloy (“plate 52 ... preferably fabricated from one or more metallic materials (e.g., aluminum)”, P0047).

Regarding claim 27, Comb further implicitly teaches wherein said build platform said build platform has a first coefficient of thermal expansion (CTE) and said thermally conductive plate has a second CTE, wherein said first CTE is greater than said second CTE (plate 52 is made of aluminum which has a coefficient of thermal expansion of about 0.000024 m/(mK) and the plate 36b is made of steel which has a coefficient of thermal expansion of about 0.000012 m/(mK)).

Regarding claim 34, Comb further teaches wherein rein said thermally conductive plate comprises a material selected from the group consisting of ... steel ... and an alloy with a low coefficient of thermal expansion (36b is made of steel/alloy, P0053).

Regarding claim 35, Comb further teaches wherein said thermally conductive plate has a thickness ranging between 0.025 inches and 0.5 inches, wherein said thickness depends on a flexural character of said material (“thicknesses for 36b may range from about 5 mils to about 100 mils” (i.e. 0.005-0.1 inches) which is within the claimed range and the thickness is selected depending on the desired amount of flexibility, P0057, P0068, P0087).

Regarding claim 36, Comb further teaches/suggests wherein said thermally conductive plate is non-magnetically secured to and removable from said build platform (magnetically or non-magnetically means such a snapping means or a vacuum means are suitable and known means used to removably connect/secure a plate to platform, P0028-0030).

Regarding claim 38, Comb further teaches wherein said build platform comprises holes for heater cartridges and thermocouples (52 has holes/openings 84 for receiving heating elements/cartridges 56, P0072 and other openings (78) capable of housing/receiving thermocouples, F6).

Regarding claims 40-42, Comb further teaches a fastener (64) capable of securing said thermally conductive plate to said build platform and permitting the removal of said thermally conductive plate from said build platform (F5-7, P0047). In fact, the taught plate (64) is capable of being removed from platform (52) at any time deemed convenient by the operator.

Regarding claim 47, Comb further teaches wherein said polymer coating comprises a thickness ranging between 0.001 inches and 0.1 inches ("suitable thicknesses for film 36a may range from about 1 mil to about 30 mils (i.e. 0.001-0.03 inches) which is within the claimed range, P0057).

Regarding claim 48, Comb further teaches wherein said thermally conductive plate is flexible to facilitate dissociation between said 3D object and said thermally conductive plate upon cooling and reduce damage to said coating or said 3D object during removal of said 3D object (36b is flexible which facilitates the removal/peeling of 3D object and reduces damages, P0057, P0026-0027, P0082).

Regarding claim 49, while Comb fails to explicitly teach that the build platform, the removable plate, and the polymer coating are able to withstand high temperature ranging between 150 degree Celsius and 300 degree Celsius, Comb implicitly teaches that build platform, the removable plate, and the polymer coating are capable of withstand temperatures ranging from 150-300 degree Celsius because the apparatus of Comb is capable of manufacturing polyetherimide 3-D parts (P0055; polyetherimides have high glass transition and/or melting temperatures (i.e. at least 200 degree Celsius which is within the claimed range)). In addition, the disclosed/claimed materials making the claimed build platform, the removable plate, and the polymer coating are identical to the materials making the taught build platform, the removable plate, and the polymer coating; thus, they are expected to have the same properties and/or functionalities (See MPEP 2112.01 (I)).

Claims 19, 26, 34, and 44-47 are rejected under 35 U.S.C. 102(a)(2) as being anticipated by Ruff (US 2017/0036403 – of record with a priority date of 05/16/2014).

Regarding claims 19, 34, and 44-46, Ruff teaches a build apparatus (F2-4) for use in printing a 3D object (P0014, F4), comprising:

a thermally conductive plate (substrate plate 22 which can be made of thermally conductive materials such as steel/aluminum/ceramic, P0027) disposed adjacent to a build platform (22 adjacent to a base 30, F2-4, P0069), a polyimide coating adjacent to said thermally conductive plate (polymeric coating 24 adjacent to 22; wherein 24 can be a polyimide coating/layer, P0015, P0019, P0054-0055), wherein said thermally conductive plate is capable of (i) securing said 3D object during printing (since the taught and the claimed plates are not patentably distinct, 22 is capable of securing said 3D object during printing; In addition, 20 which comprises 22 is configured to secure the 3D object during printing, P0015, P0021, P0064) and (ii) permitting removal of said 3D object from said thermally conductive plate once said 3D object has been formed, which removal is without chemically or mechanically removing material from said 3D object and without damaging said thermally conductive plate or said 3D object (since the taught and the claimed plates are not patentably distinct, 22 is capable of permitting removal of said 3D object from said thermally conductive plate once said 3D object has been formed, which removal is without chemically or mechanically removing material from said 3D object and without damaging said thermally conductive plate or said 3D object; In addition, 22 is configured to be sufficiently flexible so as to aid in the removal of said 3D object from 20 once said 3D object has been formed without chemically or mechanically removing material from said 3D object and without damaging said thermally conductive plate or said 3D object, P0021, P0015, and P0064, claim 13), wherein said thermally conductive plate is not removable from said build platform during a time period in which said 3D object is printed ... (22 is not removed from 30 during printing, F4).

Ruff does not explicitly teach wherein said thermally conductive plate is not removable from said build platform during a time period in which said 3D object is removed from said thermally conductive plate. However, this recitation does not have patentable weight because it merely recites the manner of operating the claimed apparatus, does not add further structure to the claimed apparatus, and does not differentiate the claimed apparatus from the prior art (See MPEP 2114 (II)). Furthermore, since the taught plate and the claimed plate are not patentably distinct in terms of structure, they are expected to function/operate in the same manner under identical operating conditions (See MPEP 2112.01 (I)). In fact, the claimed/disclosed plate and the taught plate are capable of being removed from their platform at any time deemed convenient by the operator.

Therefore, Examiner considers that Ruff still anticipates amended claim 1.

Regarding claim 26, Ruff further teaches wherein said build platform comprises a ceramic material (30 can be made glass, P0065-0066; wherein glass is considered to be a ceramic).

Regarding claim 47, Ruff further teaches wherein said polymer coating comprises a thickness ranging between 0.001 inches and 0.1 inches (the thickness of the coating may range from 1-2 mils (i.e. 0.001-0.002 inches) which is within the claimed range, P0053, claims 5-6).

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.

Claim 24 is/are rejected under 35 U.S.C. 103 as being unpatentable over Comb (US 2015/0145174 – of record with a priority date of 11/22/2013) as applied to claim 20 above, and further in view of Naware (US 20160096326 – of record with a priority date of 10/03/2014).

Regarding claim 24, Comb further teaches to use a controller configured to operate the components of his system (P0037, P0041) but fails to teach that the build platform comprises thermocouples to provide feedback to a controller for mainlining temperature set points.

In the same field of endeavor, build platforms, Naware teaches a build platform (10) comprising heating/cooling mechanisms (38) and temperature sensors (40) at several locations in the build platform (10) (P0032; F2-5), wherein the heating/cooling mechanisms (38) and the temperature sensors (40) are in communication with a controller (50/52) which is configured to set and maintain a desired temperature at each location (P0033-0034) for the purpose(s) of controlling the temperature distribution and the thermal gradient over the surface of the build platform (P0012, P0001).

It would have been obvious to one with ordinary skill in art at the time the invention was filed to modify the apparatus of Comb in view of Naware by incorporating thermocouples at different locations to the build platform such that the thermocouples are configured to provide feedback to a controller for the purpose(s) automatically controlling and/or maintaining the temperature of the build platform at desired temperature set points and controlling the temperature distribution and the thermal gradient over the surface of the build platform.

Claims 19, 26, and 43 is/are rejected under 35 U.S.C. 103 as being unpatentable over Comb (US 2015/0145174 – of record with a priority date of 11/22/2013) as applied to claims 19 and 20 above, and further in view of Ruff (US 2017/0036403 – of record with a priority date of 05/16/2014).

Regarding claims 19 and 26, Comb further teaches that the build platform can comprise aluminum/alloy (“plate 52 ... preferably fabricated from one or more metallic materials (e.g., aluminum)”, P0047) but fails to teach ceramic as a suitable material.

In the same field of endeavor, build platforms, Ruff teaches a build apparatus (F2-4) comprising a thermally conductive plate (substrate plate 22 which can be made of thermally conductive materials such as steel/aluminum/ceramic, P0027) disposed adjacent to a build platform (22 adjacent to a base 30, F2-4, P0069), and a polymer coating (coating 24 made of polymers, P0019, claim 4; P0069); wherein said thermally conductive plate is removable from said build platform (22 is removable/detachable from 30, P0021, P0062-0063, P0069, F2-4), and wherein said build platform comprises a material selected from the group consisting of aluminum, steel, brass, ceramic, glass, and an alloy with a low coefficient of thermal expansion (base 30 “can be made of any rigid and resilient material that will maintain its shape, dimension, and orientation under normal use and handling” such as aluminum or glass, P0065-0066; wherein glass is considered to be a ceramic and it is cheaper than aluminum).

It would have been obvious to one with ordinary skill in art at the time the invention was filed to modify the apparatus of Comb in view of Ruff by using ceramic/glass instead of aluminum as the material for the build platform for the purpose(s) of reducing cost without affecting the thermal stability of the build platform during its operation. In addition, it has been held that the selection of a known material based on its suitability for its intended use supports a prima facie obviousness determination. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

Regarding claim 43, Since Ruff further teaches to measure a temperature of said thermally conductive plate and that it is easier to remove the 3D object when the object/plate are colder (P0076, P0059, P0021), it would have been obvious to one with ordinary skill in art at the time the invention was filed to further modify the apparatus of the combination by incorporating a temperature sensing unit that is configured to measure/monitor a temperature of

said 3D object or said thermally conductive plate and that alert the user when the 3D object/plate are cooled to a temperature suitable for removal for the purpose(s) of facilitating the removal of said 3D object from said thermally conductive plate.

Claim(s) 36 is/are rejected under 35 U.S.C. 103 as being unpatentable over Comb (US 2015/0145174 – of record with a priority date of 11/22/2013) as applied to claim 19 above, and further in view of Koyagi (US 2006/0198918 – of record).

Regarding claim 36, Comb further teaches/suggests that magnetically or non-magnetically means such a snapping means or a vacuum means are suitable and known means used to removably connect/secure a plate to platform, P0028-0030).

In addition, in the same field of endeavor, build platforms, Koyagi teaches a build platform comprising a stage (52) and a molding base/plate (51) (F2-3B), and a vacuum/suction system (91) configured to attach/detach 51 to/from 52 (P0053). Koyagi further teaches that a magnets/hooks can also be used as attaching/detaching systems/mechanisms but that the vacuum/suction system/mechanism is more preferable (P0055).

It would have been obvious to one with ordinary skill in art at the time the invention was filed to modify the apparatus of the Comb in view of Koyagi by providing a suction/vacuum system configured to attach and detach the thermally conductive plate to/from the platform via vacuum for the purpose(s) of improving the securing/attaching and/or facilitating detaching/removal.

Response to Arguments

Applicant's arguments/remarks filed on 11/01/2017 have been fully considered.

With respect to claim amendments, applicant argues the original disclosure has support for newly added limitation and newly added claims.

This argument is not persuasive. P0019 has support for a removable thermally conductive plate while P0031 has support for securing the removable plate to the build platform when the 3D object is printed and for facilitating the 3D object removal via specific properties of

the plates (e.g. thin/flexible). However, these paragraphs do not have adequate/sufficient support for “wherein said thermally conductive plate is not removable from said build platform during a time period in which said 3D object is ... removed from said thermally conductive plate”. Applicant is reminded that negative limitations should have explicit support in the original disclosure (See MEPEP 2173.05(i)). Additionally, the original disclosure suggests that the thermally conductive plate is removed from the platform when the 3D object is removed because the plate must flex (i.e. be thin/flexible) to enable easy 3D object removal and continuous operation (Abstract, P0022, P0027-0028). Last but not least, the original disclosure does not have sufficient/adequate support for some of the newly added claims as explained above.

With respect to the specification objection(s), applicant’s amendment(s) to the specification has/have overcome the objection(s).

With respect to the drawing objection(s), applicant’s amendment(s) to the drawings/claim(s) has/have overcome the previous objection(s). However, applicant’s claim amendments introduced new issues as explained above.

With respect to the claim rejection(s) under 35 U.S.C. § 112(b), applicant’s amendment(s) to the claim(s) has/have overcome the previous claim rejection(s). However, applicant’s claim amendments introduced new issues as explained above.

With respect to the claim rejection(s) under 35 U.S.C. § 102 in view of Comb, applicant argues that “Comb does not teach or disclose a thermally conductive plate that is not removable from said build platform during a time period in which said 3D object is printed and removed from said thermally conductive plate”.

This argument is partially persuasive.

Comb does teach wherein said thermally conductive plate is not removed from said build platform during a time period in which said 3D object is printed (36 is not removed from 52 during printing, P0023).

Examiner agrees that Comb does not teach wherein said thermally conductive plate is not removed from said build platform during a time period in which said 3D object is removed from said thermally conductive plate. However, this recitation does not have patentable weight because it merely recites the manner of operating the claimed apparatus, does not add further structure to the claimed apparatus, and does not differentiate the claimed apparatus from the prior art (See MPEP 2114 (II)). Furthermore, since the taught plate and the claimed plate are not patentably distinct in terms of structure, they are expected to function/operate in the same manner under identical operating conditions (See MPEP 2112.01 (I)). In fact, the claimed/disclosed plate and the taught plate are capable of being removed from their platform at any time deemed convenient by the operator. Furthermore, the original disclosure states that “The removable plate 104 must be thin enough to allow for minor flexing for part removal” (P0022 of instant specification), which is similar to Comb’s disclosure (P0026, P0082). Therefore, Examiner considers that Comb still anticipates amended claim 1.

With respect to the claim rejection(s) under 35 U.S.C. § 102 in view of Ruff, applicant’s arguments are not persuasive. Indeed, P0063 of Ruff teaches that the printed bed can be removed from the base structure prior to the removal of the printed object from the printed bed to facilitate/improve removal, but this does not mean that the printed bed must/should be removed as Ruff does not explicitly state/teach that. In fact, Ruff explicitly teaches that object can be “removed with very little or no external force” (P0059, P0021). Furthermore, the argued recitation does not have patentable weight because it merely recites the manner of operating the claimed apparatus, does not add further structure to the claimed apparatus, and does not differentiate the claimed apparatus from the prior art (See MPEP 2114 (II)). Additionally, since the taught plate and the claimed plate are not patentably distinct in terms of structure, they are expected to function/operate in the same manner under identical operating conditions (See MPEP 2112.01 (I)). In fact, the claimed/disclosed plate and the taught plate are capable of

being removed from their platform at any time deemed convenient by the operator. Therefore, Examiner considers that Ruff still anticipates amended claim 1.

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.

For additional prior art of record and not relied upon that is considered to be pertinent to applicant's disclosure see previous Notice of References Cited PTOL 892.

Cable (US 2016/0075091 – of record; F1-6).

Din (US 2015/0056319 – of record; F3-5, P0023, claims 5 and 10).

Jondal (US 2016/0332387 – of record; Figures).

Pettis (US 2013/0073073 – of record; claims 1-3, claim 9, and claim 13-14, F1).

Pax (US 8282380 – of record; C5, L4-5; C5, L19-20; C5, L28-34; C8, L3-5; C8, L9-13, Claim 15, F1).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JERZI H MORENO HERNANDEZ whose telephone number is (571)272-0625. The examiner can normally be reached on 1:00-10:00 PM.

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, YOGENDRA N GUPTA can be reached on 571-272-1316. 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.

/JERZI H MORENO HERNANDEZ/
Examiner, Art Unit 1744

/ALISON L HINDENLANG/
Primary Examiner, Art Unit 1744

EAST Search History**EAST Search History (Prior Art)**

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S57	1	15/422303.app.	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 17:01
S58	11	((("REESE") near3 ("Riley"))).INV,AANM.	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 18:36
S59	1	15/422303.app.	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 18:37
S60	11	((("REESE") near3 ("Riley"))).INV,AANM.	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 18:37
S61	20	((("BHEDA") near3 ("Hemant"))).INV,AANM.	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 18:37
S63	14	((("AREVO") near3 ("INC"))).AS,AANM.	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 18:37
S64	3	(S60 S61 S63) and ((plate platform base plate platen stage bed tray) with (coat\$3))	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 18:39
S65	3	(S60 S61 S63) and ((plate platform base plate platen stage bed tray) with (coat\$3)).clm.	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 18:39
S66	731	(B33Y30/00 or B29C67/0085 or B29C64/20 or B22F2003/1056).cpc. and ((plate platform base plate platen stage bed tray) with (coat\$3))	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 19:03
S67	430	(B33Y30/00 or B29C67/0085 or B29C64/20 or B22F2003/1056).cpc. and ((platform stage bed tray) with (coat\$3))	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 19:04
S68	315	(B33Y30/00 or B29C67/0085 or B29C64/20 or B22F2003/1056).cpc. and ((platform stage bed tray) near7 (coat\$3))	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 19:04
S69	196	(B33Y30/00 or B29C67/0085 or B29C64/20 or B22F2003/1056).cpc. and ((platform stage bed tray) near7 (coating))	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 19:04

S70	166	S69 and (@pd @ptad @prad @ad @rlad) <"20141215"	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 19:08
S71	0	(B33Y30/00 or B29C67/0085 or B29C64/20).cpc. and ((platform stage bed tray) with (polyimid\$3 adj2 coating))	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 19:19
S72	4	(B33Y30/00 or B29C67/0085 or B29C64/20).cpc. and ((plate platform base plate platen stage bed tray) with (polyimid\$3 near3 coating))	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 19:20
S73	1674	(B29C67/0051;B29C67/0055;B29C67/0085).cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 19:22
S74	4817	(B33Y30/00).cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 19:22
S75	5536	S73 S74	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 19:22
S76	559	(B29C67/0092).cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 19:22
S77	343	S75 and S76	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 19:22
S78	57324	(build\$3 form\$3 work\$3 construct\$3 mold\$4 mould\$3 printing) near3 (platform base plate platen stage bed tray) with (resin \$4polymer \$4monomer \$5plastic thermoplastic flexible resilient polyimide soft) near3 (layer cover sheet tape film coat\$3 foil)	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 19:22
S79	40	S77 and S78	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 19:22
S80	304	S75 and S78	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 19:22
S81	264	S80 not S79	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 19:22
S82	223	S81 and (@pd or @ptad or @prad or @ad or @rlad)<"20141216"	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 19:22
S83	373	S75 and (eas\$3 facilitat\$3 damag\$3 quick) near5 (dissociation remov\$3 peel\$3 separat\$4 split\$4 pop\$4 releas\$3) with (platform stage plate platen bed) with (part model piece object product)	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 19:22

S84	42	S83 and S82	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 19:22
S85	11	S75 and (build\$3 form\$3 work\$3 construct\$3 mold\$4 mould\$3 printing) near3 (platform base plate platen stage bed tray) with (resin \$4polymer \$4monomer \$5plastic thermoplastic flexible resilient polyimide soft) near3 (layer cover sheet tape film coat\$3 foil) with (eas\$3 facilitat\$3 damag\$3 quick) with (dissociation remov\$3 peel\$3 separat\$4 split\$4 pop\$4 releas\$3) with (part model piece object product)	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 19:23
S86	42	S84 and (@pd or @ptad or @prad or @ad or @riad)<"20141216"	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 19:24
S90	2	"20110027594"	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 20:30
S91	2	"20080150186"	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 20:31
S92	1	wo adj "2004050323"	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 20:32
S93	1	wo adj "2004050323"	DERWENT	OR	ON	2018/01/26 20:33
S95	1	"5862244".pn.	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 21:41
S96	1	"5862241".pn.	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 21:42
S97	1	"5865241".pn.	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 21:42
S98	1	"20010038163"	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/26 21:43
S99	1674	(B29C67/0051;B29C67/0055;B29C67/0085).cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/27 22:39
S100	4817	(B33Y30/00).cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/27 22:39
S101	81	(S99 S100) and (sens\$4 determin\$3) with (cool\$3) with (object part)	US-PGPUB; USPAT;	OR	ON	2018/01/27 22:39

EAST Search History

			USOCR			
S102	59	S101 and (@pd or @ptad or @prad or @ad or @rlad)<"20141216"	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/27 22:40
S103	4	(S99 S100) and (sens\$4 determin\$3) with (cool\$3) with (object part) with (remov\$3 peel\$3 separat\$4)	US-PGPUB; USPAT; USOCR	OR	ON	2018/01/27 22:40

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S87	11	((("REESE") near3 ("Riley")).INV,AANM.	US-PGPUB; USPAT	OR	ON	2018/01/26 18:37
S88	20	((("BHEDA") near3 ("Hemant")).INV,AANM.	US-PGPUB; USPAT	OR	ON	2018/01/26 18:38
S89	14	((("AREVO") near3 ("INC")).AS,AANM.	US-PGPUB; USPAT	OR	ON	2018/01/26 18:38

1/28/2018 12:02:41 AM**C:\Users\jhernandez\Documents\EAST\Workspaces\15422303.wsp**



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APPLICATION NUMBER	PATENT NUMBER	GROUP ART UNIT	FILE WRAPPER LOCATION
15/422,303		1744	



Correspondence Address/Fee Address Change

The following fields have been set to Customer Number 153281 on 01/29/2018

- Correspondence Address
- Maintenance Fee Address

The address of record for Customer Number 153281 is:

153281

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650 PAGE MILL ROAD
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PART 1 - ATTORNEY/APPLICANT COPY

page 1 of 1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Confirmation No.: 1368
Riley Reese, et al.	Group No.: 1744
Application No.: 15/422,303	Examiner: Jerzi H. Moreno Hernandez
Filed: February 1, 2017	Customer No. 21971
Title: HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS	

ELECTRONICALLY FILED ON: November 1, 2017

AMENDMENT AND RESPONSE TO NON-FINAL OFFICE ACTION

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

Dear Commissioner:

This communication is in response to the Non-Final Office Action mailed June 2, 2017. The Response is accompanied by a request for a two-month extension of time, and the requisite fee.

Applicant respectfully requests reconsideration of this application in view of the following amendments and remarks:

Amendments to the Specification begin on page **2** of this paper.

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

Summary of the Interview begin on page **7** of this paper.

Remarks begin on page **8** of this paper.

AMENDMENTS TO THE SPECIFICATION

The following amended paragraph should replace the corresponding paragraph in the above referenced pending application. Deletions are denoted by ~~striketrough~~ or [[double brackets]] and additions are denoted by underline. No new matter is added through these amendments.

Please replace paragraph [0020] of the specification as filed with the text as indicated below.

[0020] FIG. 2 shows a build platform with holes for heater cartridges and thermocouples, in accordance with an embodiment of the present invention. As shown in FIG. 2 the heater cartridges are spaced evenly along the surface of the build platform **102**, comprising, for example, an aluminum block. In another embodiment for controlling temperature of the build platform **(102)**, one or more thermocouples can be situated at one or several locations **(204)** on the ~~block~~ build platform 102 to provide feedback to a controller, such as a PID controller, and hence maintain temperature set points throughout a build. Also, a ceramic, or other high temperature dielectric, can be used to insulate the build platform **102** and protect build platform ~~support~~ **102** from emitted heat. The number of holes depends on the number of heating cartridges and/or thermocouples.

AMENDMENTS TO THE CLAIMS

1. -18. (Canceled)

19. (Currently Amended) A build apparatus for use in printing a three-dimensional (3D) object, comprising:

a thermally conductive plate disposed adjacent to a build platform, wherein ~~said thermally conductive plate is removable from said build platform, and wherein said thermally~~ conductive plate is capable of (i) securing said 3D object during printing and (ii) permitting removal of said 3D object from said thermally conductive plate once said 3D object has been formed, which removal is without chemically or mechanically removing material from said 3D object and without damaging said thermally conductive plate or said 3D object, and wherein said thermally conductive plate is not removable from said build platform during a time period in which said 3D object is printed and removed from said thermally conductive plate.

20. (Previously Presented) The build apparatus of claim 19, further comprising a temperature control unit configured to control heating of said build platform.

21. (Canceled)

22. (Previously Presented) The build apparatus of claim 20, wherein said temperature control unit comprises heater cartridges that are spaced along a surface of said build platform.

23. (Canceled)

24. (Previously Presented) The build apparatus of claim 20, wherein said build platform comprises thermocouples situated at one or several locations to provide feedback to a controller for maintaining temperature set points.

25. (Previously Presented) The build apparatus of claim 20, wherein said build platform

comprises a material selected from the group consisting of aluminum, steel, brass, ceramic, glass, and an alloy with a low coefficient of thermal expansion (CTE).

26. (Previously Presented) The build apparatus of claim 20, wherein said build platform comprises a ceramic material.

27. (Previously Presented) The build apparatus of claim 20, wherein said build platform has a first coefficient of thermal expansion (CTE) and said thermally conductive plate has a second CTE, wherein said first CTE is greater than said second CTE.

28. (Canceled)

29. (Canceled)

30. (Canceled)

31. (Canceled)

32. (Canceled)

33. (Canceled)

34. (Previously Presented) The build apparatus of claim 19, wherein said thermally conductive plate comprises a material selected from the group consisting of aluminum, steel, brass, ceramic, glass, and an alloy with a low coefficient of thermal expansion (CTE).

35. (Currently amended) The build apparatus of claim 19, wherein said thermally conductive plate ~~comprises~~ has a thickness ranging between 0.025 inches and 0.5 inches, wherein said thickness depends on a flexural character of said material.

36. (Previously Presented) The build apparatus of claim 19, wherein said thermally conductive plate is non-magnetically secured to and removable from said build platform.

37. (Canceled)

38. (Previously Presented) The build apparatus of claim 19, wherein said build platform

comprises holes for heater cartridges and thermocouples.

39. (Canceled)

40. (New) The build apparatus of claim 19, further comprising a fastener that secures said thermally conductive plate to said build platform during said time period in which said 3D object is printed and removed from said thermally conductive plate.

41. (New) The build apparatus of claim 19, wherein said thermally conductive plate is not removable from said build platform until after removal of said 3D object from said thermally conductive plate.

42. (New) The build apparatus of claim 41, further comprising a fastener that (i) secures said thermally conductive plate to said build platform during printing of said 3D object and (ii) permits removal of said thermally conductive plate from said build platform after removal of said 3D object from said thermally conductive plate.

43. (New) The build apparatus of claim 19, further comprising a temperature sensing unit that measures a temperature of said 3D object or said thermally conductive plate, wherein said temperature sensing unit permits removal of said 3D object from said thermally conductive plate once said 3D object has been formed and cooled.

44. (New) The build apparatus of claim 19, further comprising a coating adjacent to said thermally conductive plate, wherein said coating is capable of facilitating adhesion of said 3D object to said thermally conductive plate during printing.

45. (New) The build apparatus of claim 44, wherein said coating is a polymer coating.

46. (New) The build apparatus of claim 45, wherein said polymer coating is a polyimide.

47. (New) The build apparatus of claim 45, wherein said polymer coating has a thickness ranging between 0.001 inches and 0.1 inches.

48. (New) The build apparatus of claim 44, wherein said thermally conductive plate is flexible to facilitate dissociation between said 3D object and said thermally conductive plate upon cooling and reduce damage to said coating or said 3D object during removal of said 3D object.

49. (New) The build apparatus of claim 44, wherein said build platform, said thermally conductive plate, and said coating are able to withstand high temperature ranging between 150 degree Celsius and 300 degree Celsius.

SUMMARY OF THE INTERVIEW

Applicant is appreciative of Primary Examiner Hindenlang and Examiner Hernandez for extending the courtesy of an examiner's interview to Applicant's representatives, Ali Alemozafar and Jing Wang, on October 26, 2017. During the interview, amendments and arguments consistent with those detailed herein were discussed.

REMARKS

Claims 19-39 were pending prior to entry of the abovementioned amendments. Claim 19 and 35 are currently amended. Claims 21, 23, 28-33, 37, and 39 have been canceled. New claims 40-49 have been added. No new matter is added by any of these amendments. Accordingly, claims 19, 20, 22, 24-27, 34-36, 38, and 40-49 are currently pending.

Reconsideration and allowance of this application is respectfully requested in light of the following remarks.

Claims Amendments

Claim 19 has been amended to clarify the claimed subject matter. These amendments are fully supported by the application as originally filed, U.S. Patent Application No. 15/422,303, now U.S. Patent Publication No. 2017/0217106 (“the Application”) at, for example, paragraphs [0019] and [0031].

New claims 40-49 are fully supported by the Application at, for example, paragraphs [0021], [0023]- [0028], and [0031] and pending claim 23.

Specification

The Office has objected to the Specification for use of inconsistent language with regard to reference character 102. In response, the Specification has been amended to recite “build platform” prior to reference character 102.

Drawings

The Office has objected to the Drawings on the grounds that not every feature of the claims 31 and 37 are shown. Without conceding in the basis of objection, and solely to expedite the prosecution of this application, claims 31 and 37 have been canceled.

35 U.S.C. § 112

Claims 19-39 stand rejected under 35 U.S.C. §112(b) or 35 U.S.C. §112 (pre-AIA), second paragraph.

Without conceding in the basis of rejection, and solely to expedite the prosecution of this application, Applicant has amended Claim 19 to clarify the claimed subject matter. Accordingly, Applicant respectfully requests that the § 112(b) / § 112 (pre-AIA), second paragraph rejection of claims 19-39 be withdrawn.

35 U.S.C. § 102

A. Claims 19, 20, 22, 25, 27, 34, 35, and 38 are novel over Comb

Claims 19-23, 25, 27-35 and 37-38 stand rejected under 35 U.S.C. § 102(a)(2) over U.S. Publication No. 2015/0145174 (Comb).

Without conceding in the basis of rejection, and solely to expedite the prosecution of this application, Applicant has amended Claim 19 to clarify certain differences between the claimed subject matter and Comb. Applicant submits that Claim 19 is novel over Comb because this reference does not teach or disclose all of the elements of this claim.

For example, Comb does not teach or disclose a thermally conductive plate that “is **not removable** from said build platform **during a time period** in which said 3D object is printed and removed from said thermally conductive plate” as recited in Claim 1.

On the contrary, Comb discloses, “the build substrate is preferably flexible enough to allow a user to peel the build substrate from the base of the printed 3D part/support structure ... **after removal from platen plate** 52, the thin, flexible nature of build sheet 36 allows 3D part 38 and support structure 40 to be removed by flexing build sheet 36”. See paragraphs [0026] and [0082] of Comb. In Comb, the build sheet is removed from the platen plate prior to removal of the 3D part from build sheet.

Accordingly, Applicant respectfully requests that the § 102 rejection of Claim 19 be withdrawn.

Claims 20, 22, 25, 27, 34, 35, and 38 depend from and include all of the elements of Claim 19, and recite additional elements of particular advantage and utility. Comb does not teach or disclose all of the elements of Claim 19, much less the combination of elements of claims 20, 22, 25, 27, 34, 35, and 38. Accordingly, Applicant respectfully requests that the § 102 rejections of claims 20, 22, 25, 27, 34, 35, and 38 also be withdrawn.

Without conceding in the basis of rejection, Applicant submits that the § 102 rejections of claims 21, 23, 28-30, 32, 31, and 37 are moot in view of the cancellation of these claims.

B. Claims 19 and 34 are novel over Ruff

Claims 19, 28, 30 and 34 stand rejected under 35 U.S.C. § 102(a)(2) over U.S. Publication No. 2017/0036403 (Ruff).

Without conceding in the basis of rejection, and solely to expedite the prosecution of this application, Applicant has amended Claim 19 to clarify certain differences between the claimed

subject matter and Ruff. Applicant submits that Claim 19 is novel over Ruff because this reference does not teach or disclose all of the elements of this claim.

For example, Ruff does not teach or disclose “wherein said thermally conductive plate is **not removable** from said build platform **during a time period** in which said 3D object is printed and removed from said thermally conductive plate” as recited in Claim 1.

On the contrary, Ruff discloses, “The **removed coated print bed can then be manually handled during removal of the printed object**. The printed object can be removed from the separated coated print bed. The allows the user to work more carefully to remove the printed object from the print bed”. *See* paragraph [0063] of Ruff. In Ruff, the print bed is removed from the intermediate base structure prior to removal of the printed object from print bed.

Accordingly, Applicant respectfully requests that the § 102 rejection of Claim 19 be withdrawn.

Claim 34 depend from and include all of the elements of Claim 19, and recite additional elements of particular advantage and utility. Ruff does not teach or disclose all of the elements of Claim 19, much less the combination of elements of claim 34. Accordingly, Applicant respectfully requests that the § 102 rejections of claims 28, 30, and 34 also be withdrawn.

Without conceding in the basis of rejection, Applicant submits that the § 102 rejections of claims 28 and 30 are moot in view of the cancellation of these claims.

35 U.S.C. § 103

A. Claim 24 is not obvious over Comb in view of Naware

Claim 24 stands rejected under 35 U.S.C. § 103 over Comb as applied to Claim 20 above and further in view of U.S. Publication No. 2016/0096326 (Naware).

Without conceding in the basis of rejection, Applicant submits that Claim 24 is not obvious over the asserted combination of Comb and Naware for at least the reason that this claim depends from Claim 20, which depends from Claim 19, and recites additional elements of particular advantage and utility. Comb does not teach or disclose all of the elements of Claim 19, much less the combination of elements of Claim 24, and Naware does not cure the abovementioned deficiencies of Comb. Accordingly, Applicant respectfully requests that the § 103 rejection of Claim 24 be withdrawn.

B. Claim 26 is not obvious over Comb in view of Ruff

Claim 26 stands rejected under 35 U.S.C. § 103 over Comb as applied to Claim 20 above and further in view of Ruff.

Without conceding in the basis of rejection, Applicant submits that Claim 26 is not obvious over the asserted combination of Comb and Ruff for at least the reason that this claim depends from claim 20, which depends from Claim 19, and recites additional elements of particular advantage and utility. Comb does not teach or disclose all of the elements of Claim 19, much less the combination of elements of Claim 26, and Ruff does not cure the abovementioned deficiencies of Comb. Accordingly, Applicant respectfully requests that the § 103 rejection of Claim 26 be withdrawn.

C. Claim 36 is not obvious over Comb in view of Koyagi

Claims 36 and 39 stand rejected under 35 U.S.C. § 103 over Comb as applied to claim 19 above and further in view of US Publication No. 2006/0198918 (Koyagi).

Without conceding in the basis of rejection, Applicant submits that claims 36 and 39 are not obvious over the asserted combination of Comb and Koyagi for at least the reason that these claims depend from Claim 19, and recite additional elements of particular advantage and utility.

Comb does not teach or disclose all of the elements of Claim 19, much less the combination of elements of Claim 36, and Koyagi does not cure the abovementioned deficiencies of Comb.

Accordingly, Applicant respectfully requests that the § 103 rejections of Claim 36 be withdrawn.

Without conceding in the basis of rejection, Applicant submits that the § 103 rejection of Claim 39 is moot in view of the cancellation of this claim.

It shall be understood herein that any instance in which Applicant has addressed certain comments set forth by the Office shall not be construed as a concession to other comments or arguments advanced by the Office. Any circumstance in which Applicant has amended or canceled a claim also does not mean that Applicant concedes to the arguments or positions advanced by the Office with respect to that claim or other claims pending herein.

CONCLUSION

Applicant believes that this paper fully addresses the rejections raised in the Non-Final Office Action mailed June 2, 2017. Applicant respectfully solicits the Examiner to expedite the prosecution of this patent application to issuance. Should the Examiner have any question, the Examiner is encouraged to telephone the undersigned at (212) 497-7740.

The Commissioner is authorized to charge any additional fees which may be required, including petition fees and extension of time fees, to Deposit Account No. **23-2415**, Attorney Docket No. 50823-712.301.

Respectfully submitted,

WILSON SONSINI GOODRICH & ROSATI

Date: November 1, 2017

By: /Jing Wang/
Jing Wang, Ph.D.
Reg. No. 76,486

650 Page Mill Road
Palo Alto, CA 94304
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Facsimile No.: (650) 493-6811

Electronic Patent Application Fee Transmittal				
Application Number:		15422303		
Filing Date:		01-Feb-2017		
Title of Invention:		HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS		
First Named Inventor/Applicant Name:		Riley Reese		
Filer:		Ali Reza Alemozafar/Joanna Laney		
Attorney Docket Number:		50823-712.301		
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 - 2 months with \$0 paid	1252	1	600	600
Miscellaneous:				
Total in USD (\$)				600

Electronic Acknowledgement Receipt	
EFS ID:	30824004
Application Number:	15422303
International Application Number:	
Confirmation Number:	1368
Title of Invention:	HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS
First Named Inventor/Applicant Name:	Riley Reese
Customer Number:	21971
Filer:	Ali Reza Alemozafar/Joanna Laney
Filer Authorized By:	Ali Reza Alemozafar
Attorney Docket Number:	50823-712.301
Receipt Date:	01-NOV-2017
Filing Date:	01-FEB-2017
Time Stamp:	12:54:43
Application Type:	Utility under 35 USC 111(a)

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Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$ 600
RAM confirmation Number	110117INTEFSW00009978232415
Deposit Account	232415
Authorized User	Ali Alemozafar
<p>The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:</p> <p>37 CFR 1.16 (National application filing, search, and examination fees)</p> <p>37 CFR 1.17 (Patent application and reexamination processing fees)</p>	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		50823_712_301_NFOA_Response.pdf	150540	yes	14
			f80666e4a88d7b15ff610e2f17766f8d55d916b9		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
	Specification		2	2	
	Claims		3	6	
	Applicant summary of interview with examiner		7	7	
	Applicant Arguments/Remarks Made in an Amendment		8	14	
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30938	no	2
			43d4e4593e371b87e83279e58bf682419cdf0c248		
Warnings:					
Information:					
Total Files Size (in bytes):			181478		

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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.

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 15/422,303		Filing Date 02/01/2017		☒ 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									
(Column 1)		(Column 2)		(Column 3)					
AMENDMENT	11/01/2017	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	* 21	Minus	** 21	= 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	
(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 \$ =			
	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			
<p>* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.</p> <p>** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".</p> <p>*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".</p> <p>The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.</p>									

LIE
ANGELA JOHNSON

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.



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.
15/422,303	02/01/2017	Riley Reese	50823-712.301	1368
21971 7590 10/31/2017 WILSON, SONSINI, GOODRICH & ROSATI 650 PAGE MILL ROAD PALO ALTO, CA 94304-1050			EXAMINER MORENO HERNANDEZ, JERZI H	
			ART UNIT 1744	PAPER NUMBER
			NOTIFICATION DATE 10/31/2017	DELIVERY MODE 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):

patentdocket@wsgr.com

<i>Applicant-Initiated Interview Summary</i>	Application No. 15/422,303	Applicant(s) Reese et al.		
	Examiner JERZI H MORENO HERNANDEZ	Art Unit 1744	AIA (First Inventor to File) Status Yes	Page 1 of 2

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

1. JERZI H MORENO HERNANDEZ(Examiner); WebEx/ Video Conference 2. ALISON HINDENLANG(Primary Examiner); WebEx/ Video Conference

3. JING WANG(Agent); WebEx/Video Conference 4. ALI ALEMOZAFAR(Attorney of Record); WebEx/Video Conference

Date of Interview: 26 October 2017

Claims Discussed: Claim 19

Prior Art Discussed: Prior art of record

Issues Discussed:

Proposed Amendments:
Discussed proposed amendments. Agreement was reached that the proposed amendments seem to overcome the current 35 U.S.C. 102 rejections; however, further search and consideration will be necessary.

Attachment(s): Proposed Amendments,

/JERZI H MORENO HERNANDEZ/ Examiner, Art Unit 1744	/ALISON L HINDENLANG/ Primary Examiner, Art Unit 1744
<p>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</p> <p>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</p>	

U.S. Patent and Trademark Office
PTOL-413/413b (Rev. 01/01/2015)

Interview Summary

Paper No. 20171026

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

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

****FOR DISCUSSION PURPOSES ONLY****
****PLEASE DO NOT ENTER****

Application No: 15/422,303
Title: HEATED BUILD PLATFORM AND SYSTEM FOR THREE
DIMENSIONAL PRINTING METHODS
Filing Date: February 1, 2017
Examiner: Jerzi H. Moreno Hernandez
Attorney Docket No: 50823-712.301

Patent Examiner Interview Agenda – (October 26, 2:30 PM EDT, 11:30 AM PDT)

Planned Attendees: Ali Alemozafar and Jing Wang

Non-Final Office Action June 2, 2017

- Discuss 35 U.S.C. §102(a)(2) rejection of claims 19 over Comb.
- Discuss 35 U.S.C. §102(a)(2) rejection of claims 19 over Ruff.
- Discuss potential language for claim 19 (below)

19. A build apparatus for printing a three-dimensional (3D) object, comprising:

a thermally conductive plate disposed adjacent to a build platform, wherein ~~said thermally conductive plate is removable from said build platform, and wherein~~ said thermally conductive plate is capable of (i) securing said 3D object during printing and (ii) permitting removal of said 3D object from said thermally conductive plate once said 3D object has been formed, which removal is without chemically or mechanically removing material from said 3D object and without damaging said thermally conductive plate or said 3D object, and wherein said thermally conductive plate is not removable from said build platform during a time period in which said 3D object is printed and removed from said thermally conductive plate.



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
15/422,303	02/01/2017	Riley Reese	50823-712.301

CONFIRMATION NO. 1368

POA ACCEPTANCE LETTER

21971
WILSON, SONSINI, GOODRICH & ROSATI
650 PAGE MILL ROAD
PALO ALTO, CA 94304-1050



Date Mailed: 10/30/2017

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 10/25/2017.

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.

/qtran/

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 TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:



Practitioners associated with Customer Number:

021971

OR

Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number

Name	Registration Number

As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:



The address associated with Customer Number:

021971

OR

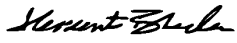
Firm or Individual Name		
Address		
City		
Country		
Telephone		Email

Assignee
Arevo, Inc.
2960 Scott Blvd
Santa Clara, Ca 95054

A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/SB/96 or equivalent) is required to be Filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of The practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature		Date	August 15, 2016
Name	Hemant Bheda	Telephone	408 205 1051
Title	CEO		

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.

Electronic Acknowledgement Receipt	
EFS ID:	30763385
Application Number:	15422303
International Application Number:	
Confirmation Number:	1368
Title of Invention:	HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS
First Named Inventor/Applicant Name:	Riley Reese
Customer Number:	21971
Filer:	Ali Reza Alemozafar/Joanna Laney
Filer Authorized By:	Ali Reza Alemozafar
Attorney Docket Number:	50823-712.301
Receipt Date:	25-OCT-2017
Filing Date:	01-FEB-2017
Time Stamp:	19:51:54
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Assignee showing of ownership per 37 CFR 3.73	50823_712_301_373c_Statement.pdf	111132 c5ab95f57b035f2a2686602a1b0e4a619863da18	no	2

Warnings:

Information:					
2	Power of Attorney	50823_POA_Post_AIA_80_general.pdf	71737	no	1
			77c5515136bd9f8a0a326d6685229b27b60e2701		
Warnings:					
Information:					
Total Files Size (in bytes):			182869		
<p>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.</p> <p><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.</p> <p><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.</p> <p><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.</p>					

STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: Arevo, Inc.

Application No./Patent No.: 15/422,303 Filed/Issue Date: February 1, 2017

Titled: HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS

Arevo, 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 042135, Frame 0723, 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: _____ To: _____

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

2. 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.

[Page 1 of 2]

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.

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.

/Jing Wang/

Signature

10/24/2017

Date

Jing Wang

Printed or Typed Name

76,486

Title or Registration Number

Doc Code: ECOMM.AUTH/ECOMM.WTDW

Doc Description: Internet Communications Authorized/Internet Communications Authorization Withdrawn

PTO/SB/439 (11-15)

**AUTHORIZATION FOR INTERNET
COMMUNICATIONS IN A PATENT
APPLICATION OR REQUEST TO
WITHDRAW AUTHORIZATION FOR
INTERNET COMMUNICATIONS**

Application No.	15/422,303
Filing Date	February 1, 2017
First Named Inventor	Riley Reese et al.
Art Unit	1744
Examiner Name	Jerzi H. Moreno Hernandez
Practitioner Docket No.	50823-712.301

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

I. To authorize permission for Internet Communications.

☒ Recognizing that Internet communications are not secure, I hereby authorize the USPTO to communicate with the undersigned and practitioners in accordance with 37 CFR 1.33 and 37 CFR 1.34 concerning any subject matter of this application via video conferencing, instant messaging, or electronic mail. I understand that a copy of these communications will be made of record in the application file. (MPEP 502.03)

II. To withdraw authorization for Internet Communications.

☐ The authorization given on _____, to the USPTO to communicate with the undersigned and any practitioner in accordance with 37 CFR 1.33 and 37 CFR 1.34 concerning any subject matter of this application via Internet communications such as video conferencing, instant messaging, or electronic mail is hereby withdrawn. I understand that the withdrawal is effective when approved rather than when received.

I am the

☐ applicant.

☐ attorney or agent of record. Registration number _____.

☒ attorney or agent acting under 37 CFR 1.34. Registration number 76,486.

/Jing Wang/
Signature

October 23, 2017
Date

Jing Wang
Typed or printed name

212-497-7740
Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Juristic entities must be represented by a patent practitioner (see 37 CFR 1.31, which is applicable to any paper filed on or after September 16, 2012, that is presented on behalf of a juristic entity, regardless of application filing date). Submit multiple forms if more than one signature is required, see below*.

☐ * Total of 1 forms are submitted.

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.

Electronic Acknowledgement Receipt	
EFS ID:	30735386
Application Number:	15422303
International Application Number:	
Confirmation Number:	1368
Title of Invention:	HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS
First Named Inventor/Applicant Name:	Riley Reese
Customer Number:	21971
Filer:	Ali Reza Alemozafar/Joanna Laney
Filer Authorized By:	Ali Reza Alemozafar
Attorney Docket Number:	50823-712.301
Receipt Date:	23-OCT-2017
Filing Date:	01-FEB-2017
Time Stamp:	18:37:18
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Internet Communications Authorized	50823_712_301_Auth_Internet_Communications.pdf	76035 6fed08167d6bdc11351dd93fbaeb11b62684f3e2	no	2

Warnings:

Information:	
Total Files Size (in bytes):	76035
<p>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.</p> <p><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.</p> <p><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.</p> <p><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.</p>	



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/422,303	02/01/2017	Riley Reese	50823-712.301

CONFIRMATION NO. 1368

21971

WILSON, SONSINI, GOODRICH & ROSATI
650 PAGE MILL ROAD
PALO ALTO, CA 94304-1050

PUBLICATION NOTICE



OC000000093212265

Date Mailed: 08/03/2017

Title: HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS

Publication No. US-2017-0217106-A1

Publication Date: 08/03/2017

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 Public Records Division. The Public Records Division can be reached by telephone at (571) 272-3150 or (800) 972-6382, by facsimile at (571) 273-3250, by mail addressed to the United States Patent and Trademark Office, Public Records Division, Alexandria, VA 22313-1450 or via the Internet.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/422,303	02/01/2017	Riley Reese	50823-712.301	1368
21971 7590 06/02/2017 WILSON, SONSINI, GOODRICH & ROSATI 650 PAGE MILL ROAD PALO ALTO, CA 94304-1050			EXAMINER MORENO HERNANDEZ, JERZI H	
			ART UNIT 1744	PAPER NUMBER
			NOTIFICATION DATE 06/02/2017	DELIVERY MODE 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):

patentdocket@wsgr.com

Office Action Summary	Application No. 15/422,303	Applicant(s) REESE ET AL.	
	Examiner JERZI H. MORENO HERNANDEZ	Art Unit 1744	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 04/14/2017.
☐ 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) 19-39 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) 19-39 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 02/01/2017 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 04/25/2017.

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

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

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

Note

Examiner wishes to point out to applicant that claim(s) 19-39 is/are directed towards an apparatus and as such will be examined under the following conditions. The process/manner of using the apparatus or the material worked upon is viewed as recitation of intended use and is given patentable weight only to the extent that structure is added to the claimed apparatus (See MPEP 2114 II and 2115 for further details). For apparatuses, the claim limitations will define structural limitations (See MPEP 2114-2115) or properly recited functional limitations (See MPEP 2173.05 (g)).

Specification

The disclosure is objected because of the following informalities:

Reference character **“102”** has been used in the instant specification to designate both a build platform (P0020 of instant specification), a build platform support (P0020 of instant specification), and a block (P0020 of instant specification). Consistent language/terminology throughout specification should be used.

Appropriate correction is required.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the claimed **“ceramic or high temperature dielectric that insulates said build platform”, “nano-, micro-, or milli- meter scale features”, and the “guiding legs, guiding rails, spring, latch, a means for providing vacuum suction, magnets, and electromagnets (means) to secure and remove said thermally conductive plate”** must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include

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all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Interpretation

Examiner has interpreted "polymer coating" as a polymer layer or sheet as this is the broadest reasonable interpretation.

Claim Rejections - 35 USC § 112

The following is a quotation of 35 U.S.C. 112(b):

(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 19-39 is rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

Claim 19 recites "a build apparatus for printing a 3D object" which is indefinite because the claimed apparatus is not capable of printing a 3D object. The claimed apparatus is capable of receiving

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printed material and supporting the 3D object, but it is not capable of printing as it does not have a printing/extruding head/nozzle.

Claim(s) 20-39 is/are rejected as being dependent from claim 19 and therefor including all the limitation thereof.

Claim 21 recites "high temperature dielectric that insulates said build platform" which is indefinite because applicant does not provide a clear definition of a "high temperature dielectric" in the instant specification and "high temperature" is a relative term. Thus, the scope of this limitation is unclear.

Claim Rejections - 35 USC § 102

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.

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)(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.

Claims 19-23, 25, 27-35, and 37-38 are rejected under 35 U.S.C. 102(a)(2) as being anticipated by Comb (US 2015/0145174 – of record with a priority date of 11/22/2013).

Regarding claims 19, Comb teaches a build apparatus (26, F2-8) for printing a 3D object (P0001), comprising:

a thermally conductive plate (metallic base sheet 36b is made of thermally conductive materials (e.g. **steel**) and having a plate-like shape, P0053, F5-6) disposed adjacent to a build platform (bottom of 36b is placed on top of plate/platform 52; thus, 36b is adjacent to 52, F5-6), wherein said thermally conductive plate is removable from said build platform (36b is removable from 52 because 36 which

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comprises 36b is removable, P0053, F3-6), wherein said thermally conductive plate is capable of (i) securing said 3D object during printing (since the taught and the claimed plates are not patentably distinct, 36b is capable of securing said 3D object during printing; In addition, 36 which comprises 36b is configured to secure the 3D object during printing, P0040, P0042 and P0025) and (ii) permitting removal of said 3D object from said thermally conductive plate once said 3D object has been formed, which removal is without chemically or mechanically removing material from said 3D object and without damaging said thermally conductive plate or said 3D object (since the taught and the claimed plates are not patentably distinct, 36b is capable of permitting removal of said 3D object from said thermally conductive plate once said 3D object has been formed, which removal is without chemically or mechanically removing material from said 3D object and without damaging said thermally conductive plate or said 3D object; In addition, 36 which comprises 36b is configured to enable efficient peeling/removal of said 3D object from 36/36b once said 3D object has been formed (P0057, P0026) without chemically or mechanically removing material from said 3D object and without damaging said thermally conductive plate or said 3D object (P0027, P0082)).

Regarding claim 20, Comb further teaches a temperature control unit configured to control heating of said build platform (heating elements 56 configured to heat plate 52 and 36 to a desired temperature, P0052, P0072, P0074, and F3-8).

Regarding claim 21, Comb further teaches a ceramic or high temperature dielectric that insulates said build platform (Insulator 50 made from one or more “thermally-insulating materials e.g. mica” (mica is high-temperature dielectric material) insulating 52, P0046, F7; heat shield 54 configured to prevent heat generated by heating elements 56 from radiating and made of any suitable material e.g. high-temperature polymeric materials (which can be high-temperature dielectric materials), P0051, F7).

Regarding claims 22-23, while Comb fails to explicitly teach that the heating elements 56 are heater cartridges, Comb is considered to implicitly teach the claimed heater cartridges because the claimed heater cartridges (disclosed in P0019 and F2 of instant specification) appear to have the same shape, structure, and function as Comb's heating elements 56 which are spaced along the surface of 52 (F3-8, in particular F6-7, P0074).

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Regarding claim 25, Comb further teaches that the build platform can comprise aluminum/alloy (“plate 52 ... preferably fabricated from one or more metallic materials (e.g., aluminum)”, P0047).

Regarding claim 27, Comb further implicitly teaches wherein said build platform said build platform has a first coefficient of thermal expansion (CTE) and said thermally conductive plate has a second CTE, wherein said first CTE is greater than said second CTE (plate 52 is made of aluminum which has a coefficient of thermal expansion of about 0.000024 m/(mK) and the plate 36b is made of steel which has a coefficient of thermal expansion of about 0.000012 m/(mK)).

Regarding claim 28-29, Comb further teaches a polymer/polyimide coating that is capable of facilitating adhesion to said 3D object during printing (film/layer 36a coating/covering 36b, P0053, F5-6; 36a can be a “polymeric coatings”, can be made of polyimide, and is capable of facilitating adhesion to said 3D object during printing, P0054-0056).

Regarding claim 30, Comb further teaches wherein said polymer coating comprises a thickness ranging between 0.001 inches and 0.1 inches (“suitable thicknesses for film 36a may range from about 1 mil to about 30 mils (i.e. 0.001-0.03 inches) which is within the claimed range, P0057).

Regarding claim 31, while Comb fails to explicitly teach that a surface of the polymer coating comprises nano-, micro-, or milli- meter scale features, Comb does teach that film 36a can be “surface treated or otherwise conditioned to increase its adhesive properties (e.g., texturing)” (P0056; “surface roughness tailored to achieve good adhesion”, P0025). As evidenced by Buser (US 2013/0297320 – of record; P0022) or Pax (US 8282380 – of record; C3, L6-39), it is well known in the art that texturing implies to provide to the surface nano-, micro-, or milli- meter scale features/grooves/protrusions/textures/patterns for the purpose(s) of improving adhesion and/or peeling. Thus, Comb implicitly teaches that the upper surface of the polymer coating comprises nano-, micro-, or milli- meter scale features/patterns.

Regarding claim 32, Comb further teaches wherein said thermally conductive plate is flexible so as to allow for easier dissociation between said 3D object and said thermally conductive plate upon cooling and reduce damage to said polymer coating or said 3D object during removal of said

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3D object (36b is flexible which facilitates the removal/peeling of 3D object and reduces damages, P0057, P0026-0027, P0082).

Regarding claim 33, while Comb fails to explicitly teach that the build platform, the removable plate, and the polymer coating are able to withstand high temperature ranging between 150 degree Celsius and 300 degree Celsius, Comb implicitly teaches that build platform, the removable plate, and the polymer coating are capable of withstand temperatures ranging from 150-300 degree Celsius because the apparatus of Comb is capable of manufacturing polyetherimide 3-D parts (P0055; polyetherimides have high glass transition and/or melting temperatures (i.e. at least 200 degree Celsius which is within the claimed range)). In addition, the disclosed/claimed materials making the claimed build platform, the removable plate, and the polymer coating are identical to the materials making the taught build platform, the removable plate, and the polymer coating; thus, they are expected to have the same properties and/or functionalities.

Regarding claim 34, Comb further teaches wherein rein said thermally conductive plate comprises a material selected from the group consisting of ... steel ... and an alloy with a low coefficient of thermal expansion (36b is made of steel/alloy, P0053).

Regarding claim 35, Comb further teaches wherein said thermally conductive plate comprises a thickness ranging between 0.025 inches and 0.5 inches, wherein said thickness depends on a flexural character of said material ("thicknesses for 36b may range from about 5 mils to about 100 mils" (i.e. 0.005-0.1 inches) which is within the claimed range and the thickness is selected depending on the desired amount of flexibility, P0057, P0068, P0087).

Regarding claim 37, Comb further teaches magnets to secure and remove said thermally conductive plate (magnets 80 configured to attaches/detaches 36b to/from 52, P0060, P0064, P0040, F6).

Regarding claim 38, Comb further teaches wherein said build platform comprises holes for heater cartridges and thermocouples (52 has holes/openings 84 for receiving heating elements/cartridges 56, P0072 and other openings (78) capable of housing/receiving thermocouples, F6).

Claims 19, 28, 30, and 34 are rejected under 35 U.S.C. 102(a)(2) as being anticipated by Ruff (US 2017/0036403 with a priority date of 05/16/2014).

Regarding claims 19 and 34, Ruff teaches a build apparatus (F2-4) for printing a 3D object (P0014, F4), comprising:

a thermally conductive plate (substrate plate 22 which can be made of thermally conductive materials such as steel/aluminum/ceramic, P0027) disposed adjacent to a build platform (22 adjacent to a base 30, F2-4, P0069), wherein said thermally conductive plate is removable from said build platform (22 is removable/detachable from 30, P0021, P0062-0063, P0069, F2-4), wherein said thermally conductive plate is capable of (i) securing said 3D object during printing (since the taught and the claimed plates are not patentably distinct, 22 is capable of securing said 3D object during printing; In addition, 20 which comprises 22 is configured to secure the 3D object during printing, P0015, P0021, P0064) and (ii) permitting removal of said 3D object from said thermally conductive plate once said 3D object has been formed, which removal is without chemically or mechanically removing material from said 3D object and without damaging said thermally conductive plate or said 3D object (since the taught and the claimed plates are not patentably distinct, 22 is capable of permitting removal of said 3D object from said thermally conductive plate once said 3D object has been formed, which removal is without chemically or mechanically removing material from said 3D object and without damaging said thermally conductive plate or said 3D object; In addition, 22 is configured to be sufficiently flexible so as to aid in the removal of said 3D object from 20 once said 3D object has been formed without chemically or mechanically removing material from said 3D object and without damaging said thermally conductive plate or said 3D object, P0021, P0015, and P0064, claim 13).

Regarding claims 28, Ruff further teaches a polymer coating (coating 24) is capable of facilitating adhesion to said 3D object during printing (P0015, claim 1) and is made of polymers (P0019, claim 4; coating can comprise polyimide, P0035-0036).

Regarding claim 30, Ruff further teaches wherein said polymer coating comprises a thickness ranging between 0.001 inches and 0.1 inches (the thickness of the coating may range from 1-2 mils (i.e. 0.001-0.002 inches) which is within the claimed range, P0053, claims 5-6).

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.

Claim 24 is/are rejected under 35 U.S.C. 103 as being unpatentable over Comb (US 2015/0145174 – of record with a priority date of 11/22/2013) as applied to claim 20 above, and further in view of Naware (US 20160096326 – of record with a priority date of 10/03/2014).

Regarding claim 24, Comb further teaches to use a controller configured to operate the components of his system (P0037, P0041) but fails to teach that the build platform comprises thermocouples to provide feedback to a controller for mainlining temperature set points.

In the same field of endeavor, build platforms, Naware teaches a build platform (10) comprising heating/cooling mechanisms (38) and temperature sensors (40) at several locations in the build platform (10) (P0032; F2-5), wherein the heating/cooling mechanisms (38) and the temperature sensors (40) are in communication with a controller (50/52) which is configured to set and maintain a desired temperature at each location (P0033-0034) for the purpose(s) of controlling the temperature distribution and the thermal gradient over the surface of the build platform (P0012, P0001).

It would have been obvious to one with ordinary skill in art at the time the invention was filed to modify the apparatus of Comb in view of Naware by incorporating thermocouples at different locations to the build platform such that the thermocouples are configured to provide feedback to a controller for the purpose(s) automatically controlling and/or maintaining the temperature of the build platform at desired temperature set points and controlling the temperature distribution and the thermal gradient over the surface of the build platform.

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Claim 26 is/are rejected under 35 U.S.C. 103 as being unpatentable over Comb (US 2015/0145174 – of record with a priority date of 11/22/2013) as applied to claim 20 above, and further in view of Ruff (US 2017/0036403 with a priority date of 05/16/2014).

Regarding claim 26, Comb further teaches that the build platform can comprise aluminum/alloy (“plate 52 ... preferably fabricated from one or more metallic materials (e.g., aluminum)”, P0047) but fails to teach ceramic as a suitable material.

In the same field of endeavor, build platforms, Ruff teaches a build apparatus (F2-4) comprising a thermally conductive plate (substrate plate 22 which can be made of thermally conductive materials such as steel/aluminum/ceramic, P0027) disposed adjacent to a build platform (22 adjacent to a base 30, F2-4, P0069), and a polymer coating (coating 24 made of polymers, P0019, claim 4; P0069); wherein said thermally conductive plate is removable from said build platform (22 is removable/detachable from 30, P0021, P0062-0063, P0069, F2-4), and wherein said build platform comprises a material selected from the group consisting of aluminum, steel, brass, ceramic, glass, and an alloy with a low coefficient of thermal expansion (base 30 “can be made of any rigid and resilient material that will maintain its shape, dimension, and orientation under normal use and handling” such as aluminum or glass, P0065-0066; wherein glass is considered to be a ceramic and it is cheaper than aluminum).

It would have been obvious to one with ordinary skill in art at the time the invention was filed to modify the apparatus of Comb in view of Ruff by using ceramic/glass instead of aluminum as the material for the build platform for the purpose(s) of reducing cost without affecting the thermal stability of the build platform during its operation. In addition, it has been held that the selection of a known material based on its suitability for its intended use supports a prima facie obviousness determination. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

Claims 36 and 39 is/are rejected under 35 U.S.C. 103 as being unpatentable over Comb (US 2015/0145174 – of record with a priority date of 11/22/2013) as applied to claim 19 above, and further in view of Koyagi (US 2006/0198918 – of record).

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Regarding claims 36 and 39, Comb further teaches that the usage of suction/vacuum systems to attach/detach thin building films/plates to/from stiff metal plates is known (P0029-0030, P0078), but the usage of suction/vacuum systems can increase the cost/complexity of the apparatus.

In the same field of endeavor, build platforms, Koyagi teaches a build platform comprising a stage (52) and a molding base/plate (51) (F2-3B), and a vacuum/suction system (91) configured to attach/detach 51 to/from 52 (P0053). Koyagi further teaches that a magnets/hooks can also be used as attaching/detaching systems/mechanisms but that the vacuum/suction system/mechanism is more preferable (P0055).

It would have been obvious to one with ordinary skill in art at the time the invention was filed to modify the apparatus of the Comb in view of Koyagi by providing a suction/vacuum system configured to attach and detach the thermally conductive plate to/from the platform via vacuum for the purpose(s) of improving the securing/attaching and/or facilitating detaching/removal.

Conclusion

For additional prior art of record and not relied upon that is considered to be pertinent to applicant's disclosure see Notice of References Cited PTOL 892.

Cable (US 2016/0075091; F1-6).

Din (US 2015/0056319; F3-5, P0023, claims 5 and 10).

Jondal (US 2016/0332387; Figures).

Pettis (US 2013/0073073 –; claims 1-3, claim 9, and claim 13-14, F1).

Scott (US 2011/0241947 – of record; P0065, F2-6).

Pax (US 8282380 – of record; C5, L4-5; C5, L19-20; C5, L28-34; C8, L3-5; C8, L9-13, Claim 15, F1).

Jacobs (US 2015/0037527 – of record; P0005, F1-3).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JERZI H. MORENO HERNANDEZ whose telephone number is (571)272-0625. The examiner can normally be reached on Monday-Friday: 10AM - 7PM EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, YOGENDRA GUPTA can be reached on (571)272-1316. 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.

/JERZI H MORENO HERNANDEZ/
Examiner, Art Unit 1744

/ALISON L HINDENLANG/
Primary Examiner, Art Unit 1744

Notice of References Cited	Application/Control No. 15/422,303	Applicant(s)/Patent Under Reexamination REESE ET AL.	
	Examiner JERZI H. MORENO	Art Unit 1744	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-2015/0056319 A1	02-2015	Din; Shih-Jer	B29C67/0055	425/162
*	B	US-2015/0375458 A1	12-2015	Chen; Peng-Yang	B33Y30/00	425/325
*	C	US-2016/0075091 A1	03-2016	Cable; Kevin Michael	B29C67/0085	528/272
*	D	US-2016/0332387 A1	11-2016	JONDAL; Viktor	B29C67/0085	1/1
*	E	US-2017/0036403 A1	02-2017	RUFF; Bradley	B29C67/0055	1/1
	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	
	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.

Search Notes 	Application/Control No. 15422303	Applicant(s)/Patent Under Reexamination REESE ET AL.
	Examiner JERZI H MORENO HERNANDEZ	Art Unit 1744

CPC- SEARCHED		
Symbol	Date	Examiner
B29C67/0051;B29C67/0055;B29C67/0085	5/15/2017	JHMH
B33Y30/00 or B33Y50/02	5/15/2017	JHMH
B29C67/0088	5/15/2017	JHMH
B29C67/0092	5/15/2017	JHMH
B29C33/68	5/15/2017	JHMH
B29K2879/085	5/15/2017	JHMH

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
inventor name searched	5/15/2017	JHMH
see EAST search history attached	5/15/2017	JHMH

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

/JERZI H MORENO HERNANDEZ/ Examiner.Art Unit 1744	
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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	0	15/422303.app.	US-PGPUB; USPAT; USOCR	OR	ON	2017/05/19 22:42
S2	2	14/574237.app.	US-PGPUB; USPAT; USOCR	OR	ON	2017/05/19 22:43
S3	1	((("AREVO") near3 ("INC"))).AANM.	USPAT	OR	ON	2017/05/19 22:44
S4	10	((("AREVO") near3 ("INC"))).AS,AANM.	US-PGPUB; USPAT; USOCR	OR	ON	2017/05/19 22:44
S5	10	((("AREVO"))).AS,AANM.	US-PGPUB; USPAT; USOCR	OR	ON	2017/05/19 22:45
S6	9	((("REESE") near3 ("Riley"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/05/19 22:46
S7	0	S6 not S4	US-PGPUB; USPAT; USOCR	OR	ON	2017/05/19 22:46
S8	16	((("BHEDA") near3 ("Hemant"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/05/19 22:47
S9	1	"20170036403"	US-PGPUB; USPAT; USOCR	OR	ON	2017/05/19 22:52
S10	1	"20160075091"	US-PGPUB; USPAT; USOCR	OR	ON	2017/05/19 23:08
S11	18	(US-20130327917-\$ or US-20100316877-\$ or US-20110241947-\$ or US-20100193998-\$ or US-20050275129-\$ or US-20060198918-\$ or US-20150145174-\$ or US-20130073073-\$ or US-20130297320-\$ or US-20120328726-\$ or US-20020195744-\$ or US-20150056319-\$ or US-20130095302-\$ or US-20080179787-\$ or US-20070085237-\$ or US-20150375458-\$).did. or (US-8119053-\$ or US-5009585-\$).did.	US-PGPUB; USPAT; USOCR	OR	ON	2017/05/19 23:23
S12	1	14/639046.app.	US-PGPUB;	OR	ON	2017/05/19 23:27

			USPAT; USOCR			
S13	1	14/550419.app.	US- PGPUB; USPAT; USOCR	OR	ON	2017/05/19 23:27
S14	21	(US-6722872-\$ US-7127309-\$ US-7261542-\$ US-8119053-\$ US-8282380-\$ US-8827684-\$ US-9592660-\$ US-20010038168-\$ US- 20050058837-\$ US-20050275129-\$ US- 20060198918-\$ US-20070037509-\$ US- 20100012630-\$ US-20100174392-\$ US- 20100193998-\$ US-20100316877-\$ US- 20110241947-\$ US-20120133083-\$ US- 20120231225-\$ US-20120328726-\$ US- 20130098068-\$).DID.	US- PGPUB; USPAT; USOCR	OR	ON	2017/05/22 09:04
S15	8	(US-20130186558-\$ US-20130256953-\$ US- 20130287934-\$ US-20130297320-\$ US- 20150037527-\$ US-20150145174-\$ US- 20150165687-\$ US-20160096326-\$).DID.	US- PGPUB; USPAT; USOCR	OR	ON	2017/05/22 09:06
S16	5	(B29K2879/085).cpc.	US- PGPUB; USPAT; USOCR	OR	ON	2017/05/22 09:24
S17	1786	B29C67/0088.cpc.	US- PGPUB; USPAT; USOCR	OR	ON	2017/05/22 09:25
S18	2944	(B29C67/0051;B29C67/0055;B29C67/0085).cpc.	US- PGPUB; USPAT; USOCR	OR	ON	2017/05/22 09:26
S19	3163	(B33Y30/00).cpc.	US- PGPUB; USPAT; USOCR	OR	ON	2017/05/22 09:30
S20	4728	S18 S19	US- PGPUB; USPAT; USOCR	OR	ON	2017/05/22 09:30
S21	2293	(B33Y50/02 or B29C67/0088).cpc.	US- PGPUB; USPAT; USOCR	OR	ON	2017/05/22 09:32
S22	1112	(B29C67/0092).cpc.	US- PGPUB; USPAT; USOCR	OR	ON	2017/05/22 09:32
S23	410	S18 and S22	US- PGPUB; USPAT; USOCR	OR	ON	2017/05/22 09:33
S24	867	S18 and S21	US- PGPUB; USPAT; USOCR	OR	ON	2017/05/22 09:33
S25	2	S18 and S16	US- PGPUB; USPAT;	OR	ON	2017/05/22 09:33

			USOCR			
S26	641	B29C33/68.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2017/05/22 09:33
S27	2	S20 and S26	US-PGPUB; USPAT; USOCR	OR	ON	2017/05/22 09:34
S28	599	S20 and S22	US-PGPUB; USPAT; USOCR	OR	ON	2017/05/22 09:35
S29	55327	(build\$3 form\$3 work\$3 construct\$3 mold\$4 mould\$3 printing) near3 (platform base plate platen stage bed tray) with (resin \$4polymer \$4monomer \$5plastic thermoplastic flexible resilient polyimide soft) near3 (layer cover sheet tape film coat\$3 foil)	US-PGPUB; USPAT; USOCR	OR	ON	2017/05/22 09:37
S30	62	S28 and S29	US-PGPUB; USPAT; USOCR	OR	ON	2017/05/22 09:38
S31	71	S22 and S29	US-PGPUB; USPAT; USOCR	OR	ON	2017/05/22 09:41
S32	9	S31 not S30	US-PGPUB; USPAT; USOCR	OR	ON	2017/05/22 09:41
S33	262	S20 and S29	US-PGPUB; USPAT; USOCR	OR	ON	2017/05/22 09:43
S34	200	S33 not S30	US-PGPUB; USPAT; USOCR	OR	ON	2017/05/22 09:43
S35	172	S34 and (@pd or @ptad or @prad or @ad or @rlad)< "20141216"	US-PGPUB; USPAT; USOCR	OR	ON	2017/05/22 09:44
S36	284	S20 and (eas\$3 facilitat\$3 damag\$3 quick) near5 (dissociation remov\$3 peel\$3 separat\$4 split\$4 pop\$4 releas\$3) with (platform stage plate platen bed) with (part model piece object product)	US-PGPUB; USPAT; USOCR	OR	ON	2017/05/22 09:50
S37	33	S36 and S35	US-PGPUB; USPAT; USOCR	OR	ON	2017/05/22 09:50
S38	9	S20 and (build\$3 form\$3 work\$3 construct\$3 mold\$4 mould\$3 printing) near3 (platform base plate platen stage bed tray) with (resin \$4polymer \$4monomer \$5plastic thermoplastic flexible resilient polyimide soft) near3 (layer cover sheet tape film coat\$3 foil) with (eas\$3 facilitat\$3 damag\$3 quick) with (dissociation	US-PGPUB; USPAT; USOCR	OR	ON	2017/05/22 09:55

		remov\$3 peel\$3 separat\$4 split\$4 pop\$4 releas\$3) with (platform stage plate platen bed) with (part model piece object product)				
S39	9	S20 and (build\$3 form\$3 work\$3 construct\$3 mold\$4 mould\$3 printing) near3 (platform base plate platen stage bed tray) with (resin \$4polymer \$4monomer \$5plastic thermoplastic flexible resilient polyimide soft) near3 (layer cover sheet tape film coat\$3 foil) with (eas\$3 facilitat\$3 damag\$3 quick) with (dissociation remov\$3 peel\$3 separat\$4 split\$4 pop\$4 releas\$3) with (part model piece object product)	US- PGPUB; USPAT; USOCR	OR	ON	2017/05/22 09:55
S40	2	S22 and (build\$3 form\$3 work\$3 construct\$3 mold\$4 mould\$3 printing) near3 (platform base plate platen stage bed tray) with (resin \$4polymer \$4monomer \$5plastic thermoplastic flexible resilient polyimide soft) near3 (layer cover sheet tape film coat\$3 foil) with (eas\$3 facilitat\$3 damag\$3 quick) with (dissociation remov\$3 peel\$3 separat\$4 split\$4 pop\$4 releas\$3) with (platform stage plate platen bed) with (part model piece object product)	US- PGPUB; USPAT; USOCR	OR	ON	2017/05/22 09:58
S41	25	"8282380"	US- PGPUB; USPAT; USOCR	OR	ON	2017/05/22 13:49
S42	1	"8282380".pn.	US- PGPUB; USPAT; USOCR	OR	ON	2017/05/22 13:49
S43	1	"20100174392"	US- PGPUB; USPAT; USOCR	OR	ON	2017/05/22 13:52
S44	32	S22 and (build\$3 form\$3 work\$3 construct\$3 mold\$4 mould\$3 printing) near3 (platform base plate platen stage bed tray) with (ceramic)	US- PGPUB; USPAT; USOCR	OR	ON	2017/05/22 14:54
S45	31	S44 and (@pd or @ptad or @prad or @ad or @rlad)< "20141216"	US- PGPUB; USPAT; USOCR	OR	ON	2017/05/22 14:54
S46	2	"20060198918"	US- PGPUB; USPAT; USOCR	OR	ON	2017/05/22 15:20
S47	0	"2015023255"	US- PGPUB; USPAT; USOCR	OR	ON	2017/05/22 16:21
S48	2	"20150023255"	US- PGPUB; USPAT; USOCR	OR	ON	2017/05/22 16:21
S49	3	"54196491".FMID.	US- PGPUB; USPAT; FPRS	OR	ON	2017/05/22 16:21
S50	2	"20110027594"	US-	OR	ON	2017/05/22

EAST Search History

			PGPUB; USPAT; USOCR			16:25
S51	2	"20080150186"	US- PGPUB; USPAT; USOCR	OR	ON	2017/05/22 16:26
S52	1	wo adj "2004050323"	US- PGPUB; USPAT; USOCR	OR	ON	2017/05/22 16:26
S53	1	wo adj "2004050323"	DERWENT	OR	ON	2017/05/22 16:26
S54	2	"20130073073"	US- PGPUB; USPAT; USOCR	OR	ON	2017/05/22 18:26

EAST Search History (Interference)

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5/ 22/ 2017 6:48:33 PM

C:\ Users\ jhernandez\ Documents\ EAST\ Workspaces\ 15422303.wsp

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Substitute for form 1449/PTO		Complete if Known			
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)		Application Number	15422303		
		Filing Date	02-01-2017		
		First Named Inventor	REESE; Riley		
		Art Unit	1744		
		Examiner Name	Not assigned yet		
Sheet	1	of	5	Attorney Docket Number	50823-712.301

U. S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
	001	US-6722872	04-20-2004	SWANSON; William J. et al.	
	002	US-7127309	10-24-2006	DUNN; Benjamin N. et al.	
	003	US-7261542	08-28-2007	HICKERSON; Kevin P. et al.	
	004	US-8119053	02-21-2012	BEDAL; Bryan et al.	
	005	US-8282380	10-09-2012	PAX; Charles et al.	
	006	US-8827684	09-09-2014	SCHUMACHER; Nathan D. et al.	
	007	US-9592660	03-14-2017	REESE; Riley et al.	
	008	US-20010038168	11-08-2001	POPA; Minea A. et al.	
	009	US-20050058837	03-17-2005	FARNWORTH; Warren M. et al.	
	010	US-20050275129	12-15-2005	SAMBU; Shiva P. et al.	
	011	US-20060198918	09-07-2006	KOYAGI; Yasuyuki et al.	
	012	US-20070037509	02-15-2007	RENZ; Bernd et al.	
	013	US-20100012630	01-21-2010	LEUTERER; Martin	
	014	US-20100174392	07-08-2010	FINK; Jeffrey E. et al.	
	015	US-20100193998	08-05-2010	CRUMP; S. Scott et al.	
	016	US-20100316877	12-16-2010	SONG; Heon-Sik et al.	
	017	US-20110241947	10-06-2011	SCOTT; Simon Peter et al.	
	018	US-20120133083	05-31-2012	ZENERE; Sergio	
	019	US-20120231225	09-13-2012	MIKULAK; James K. et al.	
	020	US-20120328726	12-27-2012	ZENERE; Sergio	
	021	US-20130098068	04-25-2013	TAKAHASHI; Norio et al.	

Examiner Signature	/JERZI H MORENO HERNANDEZ/	Date Considered	05/22/2017
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Substitute for form 1449/PTO				Complete if Known	
				Application Number	15422303
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)				Filing Date	02-01-2017
				First Named Inventor	REESE; Riley
				Art Unit	1744
				Examiner Name	Not assigned yet
Sheet	2	of	5	Attorney Docket Number	50823-712.301

U. S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
	022	US-20130186558	07-25-2013	COMB; James W. et al.	
	023	US-20130256953	10-03-2013	TEULET; Patrick	
	024	US-20130287934	10-31-2013	RAMSUNDAR; Pallant Satnarine	
	025	US-20130297320	11-07-2013	BUSER; Anthony James et al.	
	026	US-20150037527	02-05-2015	JACOBS; Andrew C. et al.	
	027	US-20150145174	05-28-2015	COMB; James W.	
	028	US-20150165687	06-18-2015	HO; Kwan et al.	
	029	US-20160096326	04-07-2016	NAWARE; Gaurang N.	

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Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T ⁶
		Country Code ³ Number ⁴ Kind Code ⁵ (if known)				
		None				

Examiner Signature	/JERZI H MORENO HERNANDEZ/	Date Considered	05/22/2017
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Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)				Application Number	15422303
				Filing Date	02-01-2017
				First Named Inventor	REESE; Riley
				Art Unit	1744
				Examiner Name	Not assigned yet
Sheet	3	of	5	Attorney Docket Number	50823-712.301

NON-PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	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 ²
	001	Final Office action dated 7/14/2016 for US Application No. 14/574,237.	☐
	002	Notice of allowance dated 11/03/2016 for US Application No. 14/574,237.	☐
	003	Office action dated 11/30/2015 for US Application No. 14/574,237.	☐

Examiner Signature	/JERZI H MORENO HERNANDEZ/	Date Considered	05/22/2017
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 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 2 hours 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, 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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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)		Application Number	15422303		
		Filing Date	02-01-2017		
		First Named Inventor	REESE; Riley		
		Art Unit	1744		
		Examiner Name	Not assigned yet		
Sheet	4	of	5	Attorney Docket Number	50823-712.301

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.
- ☒ A certification statement is not submitted herewith.

SIGNATURE

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

Signature	/Ali Alemozafar/	Date (YYYY-MM-DD)	2017-04-25
Name/Print	Ali R. Alemozafar, Ph.D., Esq.	Registration Number	68,180

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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.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

Complete if Known

Application Number	15422303
Filing Date	02-01-2017
First Named Inventor	REESE; Riley
Art Unit	1744
Examiner Name	Not assigned yet
Attorney Docket Number	50823-712.301

Sheet 1 of 5

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
	001	US-6722872	04-20-2004	SWANSON; William J. et al.	
	002	US-7127309	10-24-2006	DUNN; Benjamin N. et al.	
	003	US-7261542	08-28-2007	HICKERSON; Kevin P. et al.	
	004	US-8119053	02-21-2012	BEDAL; Bryan et al.	
	005	US-8282380	10-09-2012	PAX; Charles et al.	
	006	US-8827684	09-09-2014	SCHUMACHER; Nathan D. et al.	
	007	US-9592660	03-14-2017	REESE; Riley et al.	
	008	US-20010038168	11-08-2001	POPA; Minea A. et al.	
	009	US-20050058837	03-17-2005	FARNWORTH; Warren M. et al.	
	010	US-20050275129	12-15-2005	SAMBU; Shiva P. et al.	
	011	US-20060198918	09-07-2006	KOYAGI; Yasuyuki et al.	
	012	US-20070037509	02-15-2007	RENN; Bernd et al.	
	013	US-20100012630	01-21-2010	LEUTERER; Martin	
	014	US-20100174392	07-08-2010	FINK; Jeffrey E. et al.	
	015	US-20100193998	08-05-2010	CRUMP; S. Scott et al.	
	016	US-20100316877	12-16-2010	SONG; Heon-Sik et al.	
	017	US-20110241947	10-06-2011	SCOTT; Simon Peter et al.	
	018	US-20120133083	05-31-2012	ZENERE; Sergio	
	019	US-20120231225	09-13-2012	MIKULAK; James K. et al.	
	020	US-20120328726	12-27-2012	ZENERE; Sergio	
	021	US-20130098068	04-25-2013	TAKAHASHI; Norio et al.	

Examiner
SignatureDate
Considered

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached. 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 2 hours 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, 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 (1-800-786-9199) and select option 2.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)				Complete if Known	
				Application Number	15422303
				Filing Date	02-01-2017
				First Named Inventor	REESE; Riley
				Art Unit	1744
				Examiner Name	Not assigned yet
				Attorney Docket Number	50823-712.301
Sheet	2	of	5		

U. S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
	022	US-20130186558	07-25-2013	COMB; James W. et al.	
	023	US-20130256953	10-03-2013	TEULET; Patrick	
	024	US-20130287934	10-31-2013	RAMSUNDAR; Pallant Satnarine	
	025	US-20130297320	11-07-2013	BUSER; Anthony James et al.	
	026	US-20150037527	02-05-2015	JACOBS; Andrew C. et al.	
	027	US-20150145174	05-28-2015	COMB; James W.	
	028	US-20150165687	06-18-2015	HO; Kwan et al.	
	029	US-20160096326	04-07-2016	NAWARE; Gaurang N.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T ⁶
		Country Code ³ Number ⁴ Kind Code ⁵ (if known)				
		None				

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached. 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 2 hours 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, 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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Substitute for form 1449/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)				Complete if Known	
				Application Number	15422303
				Filing Date	02-01-2017
				First Named Inventor	REESE; Riley
				Art Unit	1744
				Examiner Name	Not assigned yet
				Attorney Docket Number	50823-712.301
Sheet	3	of	5		

NON-PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	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 ²
	001	Final Office action dated 7/14/2016 for US Application No. 14/574,237.	☐
	002	Notice of allowance dated 11/03/2016 for US Application No. 14/574,237.	☐
	003	Office action dated 11/30/2015 for US Application No. 14/574,237.	☐

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 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 2 hours 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, 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 Number	15422303
		Filing Date	02-01-2017
		First Named Inventor	REESE; Riley
		Art Unit	1744
		Examiner Name	Not assigned yet
		Attorney Docket Number	50823-712.301
Sheet	4	of	5

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.

- ☒ A certification statement is not submitted herewith.

SIGNATURE

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

Signature	/Ali Alemozafar/	Date (YYYY-MM-DD)	2017-04-25
Name/Print	Ali R. Alemozafar, Ph.D., Esq.	Registration Number	68,180

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.**

Privacy Act Statement

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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.
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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 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.

Electronic Acknowledgement Receipt	
EFS ID:	29027916
Application Number:	15422303
International Application Number:	
Confirmation Number:	1368
Title of Invention:	HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS
First Named Inventor/Applicant Name:	Riley Reese
Customer Number:	21971
Filer:	Ali Reza Alemozafar/Frank Chen (ARAL)
Filer Authorized By:	Ali Reza Alemozafar
Attorney Docket Number:	50823-712.301
Receipt Date:	25-APR-2017
Filing Date:	01-FEB-2017
Time Stamp:	21:46:56
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		IDS50823-712-301-4-25-2017.pdf	295288	yes	9
			7e107bec3ec730a1fc1a7498130343d15a1ec561		

Multipart Description/PDF files in .zip description					
Document Description			Start	End	
Transmittal Letter			1	4	
Information Disclosure Statement (IDS) Form (SB08)			5	9	
Warnings:					
Information:					
2	Other Reference-Patent/App/Search documents	Z-FOA-7-14-2016-US14574237.pdf	529473 7adaaa3ce0ce5f63396a54258861eab27fdd7ad	no	13
Warnings:					
Information:					
3	Other Reference-Patent/App/Search documents	Z-NOA-11-3-2016-US14574237.pdf	536935 dfe8c383a44a4dd55ea2cd8f175c51c89a7511	no	11
Warnings:					
Information:					
4	Other Reference-Patent/App/Search documents	Z-OA-11-30-2015-US14574237.pdf	587333 fa19e565815fe2e86daacfa2df94297dadbf56e	no	15
Warnings:					
Information:					
Total Files Size (in bytes):			1949029		
<p>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.</p> <p><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.</p> <p><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.</p> <p><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.</p>					

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor:	REESE; Riley et al.	Group Art Unit:	1744
Serial Number:	15/422,303	Examiner:	Not assigned yet
Filing or 371 (c) Date:	2017-02-01	CONFIRMATION NO:	1368
Title:	HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS		

FILED ELECTRONICALLY ON: April 25, 2017

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

INFORMATION DISCLOSURE STATEMENT
UNDER 37 CFR § 1.97

Commissioner for Patents:

An Information Disclosure Statement along with attached PTO/SB/08 is hereby submitted. A copy of each listed publication is submitted, if required, pursuant to 37 CFR §§1.97-1.98, as indicated below.

The Examiner is requested to review the information provided and to make the information of record in the above-identified application. The Examiner is further requested to initial and return the attached PTO/SB/08 in accordance with MPEP § 609.

The right to establish the patentability of the claimed invention over any of the information provided herewith, and/or to prove that this information may not be prior art, and/or to prove that this information may not be enabling for the teachings purportedly offered, is hereby reserved.

This statement is not intended to represent that a search has been made or that the information cited in the statement is, or is considered to be, prior art or material to patentability as defined in § 1.56.

A. ☒ 37 CFR § 1.97 (b). This Information Disclosure Statement should be considered by the Office because:

☐ (1) It is being filed within 3 months of the filing date of a national application and is other than a continued prosecution application under § 1.53 (d);

-- OR --

☐ (2) It is being filed within 3 months of entry of the national stage as set forth in § 1.491 in an international application;

-- OR --

☒ (3) It is being filed before the mailing of a first Office action on the merits;

-- OR --

☐ (4) It is being filed before the mailing of a first Office action after the filing of a request for continued examination under § 1.114.

B. ☐ 37 CFR § 1.97(c). Although this Information Disclosure Statement is being filed after the period specified in 37 CFR § 1.97(b), above, it is filed before the mailing date of the earlier of (1) a final office action under § 1.113, (2) a notice of allowance under § 1.311, or (3) an action that otherwise closes prosecution in the application, this Information Disclosure Statement should be considered because it is accompanied by one of:

☐ a statement as specified in § 1.97 (e) provided concurrently herewith;

-- OR --

☐ a fee of \$180.00 as set forth in § 1.17 (p) authorized below, enclosed, or included with the payment of other papers filed together with this statement.

C. ☐ 37 CFR § 1.97 (d). Although this Information Disclosure Statement is being filed after the mailing date of the earlier of (1) a final office action under § 1.113, (2) a notice of allowance under § 1.311, or (3) an action that otherwise closes prosecution in the application, it is being filed before payment of the issue fee and should be considered because it is accompanied by:

i. a statement as specified in § 1.97 (e);

-- AND --

ii. a fee of \$180.00 as set forth in § 1.17(p) is authorized below, enclosed, or included with the payment of other papers filed together with this Statement.

D. ☐ 37 CFR § 1.97 (e). Statement.

☐ A statement is provided herewith to satisfy the requirement under 37 CFR §§ 1.97 (c);

-- AND/OR --

☐ A statement is provided herewith to satisfy the requirement under 37 CFR §§ 1.97 (d);

-- AND/OR --

☐ A copy of a dated communication from a foreign patent office clearly showing that the information disclosure statement is being submitted within 3 months of the filing date on the communication is provided in lieu of a statement under 37 C.F.R. § 1.97(e) (1) as provided for under MPEP 609.04(b) V.

- E. ☐ *Statement Under 37 C.F.R. §1.704(d).* Each item of information contained in the information disclosure statement was first cited in any communication from a patent office in a counterpart foreign or international application or from the Office or is a communication that was issued by a patent office in a counterpart foreign or international application or by the Office that was received by an individual designated in § 1.56(c) not more than thirty (30) days prior to the filing of this information disclosure statement. This statement is made pursuant to the requirements of 37 C.F.R. §1.704(d) to avoid reduction of the period of adjustment of the patent term for Applicant(s) delay.
- F. ☒ *37 CFR §1.98 (a) (2).* The content of the Information Disclosure Statement is as follows:
- ☐ Copies of each of the references listed on the attached Form PTO/SB/08 are enclosed herewith.
- OR --
- ☒ Copies of U.S. Patent Documents (issued patents and patent publications) listed on the attached Form PTO/SB/08 are not enclosed.
- AND/OR --
- ☒ Copies of Foreign Patent Documents and/or Non Patent Literature Documents listed on the attached Form PTO/SB/08 are enclosed in accordance with 37 CFR §1.98 (a)(2).
- AND/OR --
- ☐ Copies of pending unpublished U.S. patent applications are enclosed in accordance with 37 CFR §1.98 (a) (2) (iii).
- G. ☐ *37 CFR §1.98(a)(3).* The Information Disclosure Statement includes non-English patents and/or references.
- ☐ Pursuant to 37 CFR §1.98(a)(3)(i), a concise explanation of the relevance of each patent, publication or other information provided that is not in English is provided herewith.
- ☐ Pursuant to MPEP 609(B), an English language copy of a foreign search report is submitted herewith to satisfy the requirement for a concise explanation where non-English language information is cited in the search report.
- OR --
- ☐ A concise explanation of the relevance of each patent, publication or other information provided that is not in English is as follows: _____
- ☐ Pursuant to 37 CFR §1.98(a) (3) (ii), a copy of a translation, or a portion thereof, of the non-English language reference(s) is provided herewith.
- H. ☐ *37 CFR §1.98(d).* Copies of patents, publications and pending U.S. patent applications, or other information specified in 37 C.F.R. § 1.98(a) are not provided herewith because:
- ☐ Pursuant to 37 CFR §1.98(d)(1) the information was previously submitted in an Information Disclosure Statement, or cited by examiner for another application under which this application claims priority for an earlier effective filing date under 35 U.S.C. 120.
- Application in which the information was submitted: _____
- Information Disclosure Statement(s) filed on: _____
- AND
- ☐ The information disclosure statement submitted in the earlier application complied with paragraphs (a) through (c) of 37 CFR §1.98.

- I. ☒ *Fee Authorization.* The Commissioner is hereby authorized to charge the above-referenced fees of \$0.00 and charge any additional fees or credit any overpayment associated with this communication to Deposit Account No. 23-2415 (Docket No.50823-712.301).

Respectfully submitted,

WILSON SONSINI GOODRICH & ROSATI

Dated: April 25, 2017

By: /Ali Alemozafar/

Ali R. Alemozafar, Ph.D., Esq.
Reg. No. 68,180

650 Page Mill Road
Palo Alto, CA 94304-1050
(650) 493-9300
Customer No. 21971



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
15/422,303	02/01/2017		1820	50823-712.301	21	1

CONFIRMATION NO. 1368

UPDATED FILING RECEIPT



0000000090720203

21971

WILSON, SONSINI, GOODRICH & ROSATI
650 PAGE MILL ROAD
PALO ALTO, CA 94304-1050

Date Mailed: 04/24/2017

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)

Riley Reese, Carpinteria, CA;
Hemant Bheda, Saratoga, CA;

Applicant(s)

Arevo Inc., Santa Clara, CA;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 14/574,237 12/17/2014 PAT 9592660

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 Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 02/08/2017

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/422,303**

Projected Publication Date: 08/03/2017

Non-Publication Request: No

Early Publication Request: No
Title

HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS

Preliminary Class

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 Assets Control, 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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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 15/422,303				
APPLICATION AS FILED - PART I										
(Column 1)		(Column 2)		SMALL ENTITY		OTHER THAN SMALL ENTITY				
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	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), (l), 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))	21	minus 20 = *	1			x 80 =	80			
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	1680			
APPLICATION AS AMENDED - PART II										
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OTHER THAN SMALL ENTITY		
AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=		x	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=		x	=
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
TOTAL ADD'L FEE									TOTAL ADD'L FEE	
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=		x	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=		x	=
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
TOTAL ADD'L FEE									TOTAL ADD'L FEE	
<div style="font-size: x-small;"> * 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. </div>										



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/422,303	02/01/2017	Riley Reese	50823-712.301

CONFIRMATION NO. 1368

21971

WILSON, SONSINI, GOODRICH & ROSATI
650 PAGE MILL ROAD
PALO ALTO, CA 94304-1050

FORMALITIES LETTER



Date Mailed: 04/17/2017

NOTICE OF INCOMPLETE REPLY (NONPROVISIONAL)

Filing Date Granted

The U.S. Patent and Trademark Office has received your reply on 04/13/2017 to the Notice to File Missing Parts (Notice) mailed 02/13/2017 and it has been entered into the nonprovisional application. The reply, however, does not include the following items required in the Notice. A complete reply must be timely filed to prevent ABANDONMENT of the above-identified application. Replies should be mailed to: Mail Stop Missing Parts, Commissioner for Patents, P.O. Box 1450, Alexandria VA 22313-1450.

Applicant is given **TWO MONTHS** from the date of the Notice to File Missing Parts (Notice) mailed 02/13/2017 within which to file all required items and pay any fees required 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).

Items Required to Avoid Abandonment:

The required items noted below SHOULD be filed along with any items required above. The filing date of this nonprovisional application will be the date of receipt of the items required above.

The application is informal since it does not comply with the regulations for the reason(s) indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- Applicant did not provide a statement that the substitute specification contains no new matter.

Applicant is cautioned that correction of the above items may cause the specification and drawings page count to exceed 100 pages. If the specification and drawings exceed 100 pages, applicant will need to submit the required application size fee.

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.

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.

/snguyen/

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 15/422,303	
APPLICATION AS FILED - PART I							
(Column 1)		(Column 2)		SMALL ENTITY		OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	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), (l), 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(j))	13	minus 20 = *			OR	x 80 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1	minus 3 = *			OR	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)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	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	
(Column 1)		(Column 2)		(Column 3)		OTHER THAN SMALL ENTITY	
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	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 found in the appropriate box in column 1.							

Electronically filed on: April 17, 2017

PATENT
Attorney Docket No.: 50823-712.301

Inventor(s): Riley Reese, et al.

Serial Number: 15/422,303

Filing Date: February 1, 2017

Title: HEATED BUILD PLATFORM AND
SYSTEM FOR THREE-DIMENSIONAL
PRINTING METHODS

Group Art Unit: 1368

Examiner: Unassigned

CONFIRMATION NO: 1368

RESPONSE TO NOTICE OF INCOMPLETE REPLY

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313

Dear Commissioner:

This Amendment is in response to the Notice of Incomplete Reply mailed on April 17, 2017. The two month deadline for filing a response to the Notice to File Missing Parts expired on April 13, 2017. Applicants request a one-month Extension of Time under §1.136 extending the time for response to May 13, 2017. Accordingly, this Amendment is timely filed.

Applicant previously submitted a substitute specification on April 14, 2017, in compliance with 37 C.F.R. §1.52, §1.121(b)(3), and §1.125 to correct for formatting errors. The substitute specification contains no new matter.

CONCLUSION

Applicants respectfully request that the Examiner advance the application to issuance. The Commissioner is authorized to charge any additional fees which may be required, including petition fees and extension of time fees, to Deposit Account No. 23-2415 (Docket No. 50823-712.301).

Respectfully submitted,
WILSON SONSINI GOODRICH & ROSATI

Date: April 17, 2017

By: /Ali Alemozafar/
Ali R. Alemozafar, Ph.D., Esq.
Registration No.: 68,180

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Customer No. 021971

Electronic Patent Application Fee Transmittal				
Application Number:		15422303		
Filing Date:		01-Feb-2017		
Title of Invention:		HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS		
First Named Inventor/Applicant Name:		Riley Reese		
Filer:		Ali Reza Alemozafar/Sherry Castro		
Attorney Docket Number:		50823-712.301		
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:	28949271
Application Number:	15422303
International Application Number:	
Confirmation Number:	1368
Title of Invention:	HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS
First Named Inventor/Applicant Name:	Riley Reese
Customer Number:	21971
Filer:	Ali Reza Alemozafar/Sherry Castro
Filer Authorized By:	Ali Reza Alemozafar
Attorney Docket Number:	50823-712.301
Receipt Date:	17-APR-2017
Filing Date:	01-FEB-2017
Time Stamp:	19:59:16
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$200
RAM confirmation Number	041817INTEFSW00006216232415
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

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	50823712301_Response_Notice_Incomplete_Reply.pdf	83306	no	2
			369d621b24958820c61ce9ab2ed5977885511c7d		
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30802	no	2
			3a18e2ee3daaba11d13fe9486e887b9c1ca7c767		
Warnings:					
Information:					
Total Files Size (in bytes):			114108		
<p>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.</p> <p><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.</p> <p><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.</p> <p><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.</p>					

Electronically filed on: April 14, 2017

PATENT
Attorney Docket No.: 50823-712.301

Inventor(s): Riley Reese, et al.

Serial Number: 15/422,303

Filing Date: February 1, 2017

Title: HEATED BUILD PLATFORM AND
SYSTEM FOR THREE-DIMENSIONAL
PRINTING METHODS

Group Art Unit: 1368

Examiner: Unassigned

CONFIRMATION NO: 1368

PRELIMINARY AMENDMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313

Dear Commissioner:

This Preliminary Amendment is in response to the Notification to File Missing Parts of the Non-Provisional Application mailed on January 27, 2017. The two month deadline for filing a response expires on March 27, 2017, therefore this Amendment is timely filed.

Prior to an examination on the merits of the above-identified application, please amend the application as follows:

Amendments to the Specification begin 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.

AMENDMENTS TO THE SPECIFICATION

Please include the following cross-reference section, including the new paragraph, before the FIELD OF THE INVENTION section of the Specification. This new paragraph below will be paragraph [0001] of the Specification.

CROSS-REFERENCE

[0001] This application claims priority to U.S. Application No. 14/574,237, filed December 17, 2014, now U.S. Patent No. 9,592,660, which is entirely incorporated herein by reference.

AMENDMENTS TO THE CLAIMS

1. -18. (Canceled)

19. (New) A build apparatus for printing a three-dimensional (3D) object, comprising:

a thermally conductive plate disposed adjacent to a build platform, wherein said thermally conductive plate is removable from said build platform, and wherein said thermally conductive plate is capable of (i) securing said 3D object during printing and (ii) permitting removal of said 3D object from said thermally conductive plate once said 3D object has been formed, which removal is without chemically or mechanically removing material from said 3D object and without damaging said thermally conductive plate or said 3D object.

20. (New) The build apparatus of claim 19, further comprising a temperature control unit configured to control heating of said build platform.

21. (New) The build apparatus of claim 20, further comprising a ceramic or high temperature dielectric that insulates said build platform.

22. (New) The build apparatus of claim 20, wherein said temperature control unit comprises heater cartridges that are spaced along a surface of said build platform.

23. (New) The build apparatus of claim 20, wherein said temperature control unit comprises a heater and/or temperature sensor.

24. (New) The build apparatus of claim 20, wherein said build platform comprises thermocouples situated at one or several locations to provide feedback to a controller for maintaining temperature set points.

25. (New) The build apparatus of claim 20, wherein said build platform comprises a material selected from the group consisting of aluminum, steel, brass, ceramic, glass, and an alloy with a low coefficient of thermal expansion (CTE).

26. (New) The build apparatus of claim 20, wherein said build platform comprises a ceramic

material.

27. (New) The build apparatus of claim 20, wherein said build platform has a first coefficient of thermal expansion (CTE) and said thermally conductive plate has a second CTE, wherein said first CTE is greater than said second CTE.

28. (New) The build apparatus of claim 19, further comprising a polymer coating that is capable of facilitating adhesion to said 3D object during printing.

29. (New) The build apparatus of claim 28, wherein said polymer coating is a polyimide.

30. (New) The build apparatus of claim 28, wherein said polymer coating comprises a thickness ranging between 0.001 inches and 0.1 inches.

31. (New) The build apparatus of claim 28, wherein a surface of said polymer coating includes nano-, micro-, or milli-meter scale features that increase adhesion to said 3D object.

32. (New) The build apparatus of claim 28, wherein said thermally conductive plate is flexible so as to allow for easier dissociation between said 3D object and said thermally conductive plate upon cooling and reduce damage to said polymer coating or said 3D object during removal of said 3D object.

33. (New) The build apparatus of claim 28, wherein said build platform, said thermally conductive plate, and said polymer coating are able to withstand high temperature ranging between 150 degree Celsius and 300 degree Celsius.

34. (New) The build apparatus of claim 19, wherein said thermally conductive plate comprises a material selected from the group consisting of aluminum, steel, brass, ceramic, glass, and an alloy with a low coefficient of thermal expansion (CTE).

35. (New) The build apparatus of claim 19, wherein said thermally conductive plate comprises a thickness ranging between 0.025 inches and 0.5 inches, wherein said thickness depends on a flexural character of said material.

36. (New) The build apparatus of claim 19, wherein said thermally conductive plate is non-magnetically secured to and removable from said build platform.
37. (New) The build apparatus of claim 19, further comprising a component selected from the group consisting of guiding legs, guiding rails, spring, latch, a means for providing vacuum suction, magnets, and electromagnets to secure and remove said thermally conductive plate.
38. (New) The build apparatus of claim 19, wherein said build platform comprises holes for heater cartridges and thermocouples.
39. (New) The build apparatus of claim 19, wherein said thermally conductive plate is vacuum suctioned onto said build platform.

REMARKS

Claims 1-18 were pending prior to entry of the abovementioned amendments. Claims 1-18 have been canceled. New claims 19-39 have been added. The new claims are fully supported by the application as originally filed at, for example, the claims as originally filed and paragraphs [0011], [0019], [0020], [0022]-[0024], [0026]-[0029], [0031], and [0032]. The amendments do not add any new matter. Accordingly, Claims 19-39 are now pending.

It shall be understood herein that any instance in which Applicant has addressed certain comments set forth by the Office shall not be construed as a concession to other comments or arguments advanced by the Office. Any circumstance in which Applicant has amended or canceled a claim also does not mean that Applicant concedes to the arguments or positions advanced by the Office with respect to that claim or other claims pending herein.

CONCLUSION

Applicants respectfully request that the Examiner advance the application to issuance. The Commissioner is authorized to charge any additional fees which may be required, including petition fees and extension of time fees, to Deposit Account No. 23-2415 (Docket No. 50823-712.301).

Respectfully submitted,
WILSON SONSINI GOODRICH & ROSATI

Date: April 14, 2017

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Electronic Patent Application Fee Transmittal				
Application Number:		15422303		
Filing Date:		01-Feb-2017		
Title of Invention:		HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS		
First Named Inventor/Applicant Name:		Riley Reese		
Filer:		Ali Reza Alemozafar/Sherry Castro		
Attorney Docket Number:		50823-712.301		
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:				
CLAIMS IN EXCESS OF 20	1202	1	80	80
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				80

Electronic Acknowledgement Receipt	
EFS ID:	28930820
Application Number:	15422303
International Application Number:	
Confirmation Number:	1368
Title of Invention:	HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS
First Named Inventor/Applicant Name:	Riley Reese
Customer Number:	21971
Filer:	Ali Reza Alemozafar/Sherry Castro
Filer Authorized By:	Ali Reza Alemozafar
Attorney Docket Number:	50823-712.301
Receipt Date:	14-APR-2017
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Time Stamp:	13:52:19
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$80
RAM confirmation Number	041717INTEFSW00000128232415
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The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		50823712301_Prelim_Amend ment.pdf	106352	yes	7
			7a1b9a9978abd896aa2a907b8b605e4f06ff3513		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Preliminary Amendment		1	1	
	Specification		2	2	
	Claims		3	5	
	Applicant Arguments/Remarks Made in an Amendment		6	7	
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30490	no	2
			2a7e81b8e0187d7ed1f3b4033594259731606564		
Warnings:					
Information:					
Total Files Size (in bytes):			136842		

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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.

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 15/422,303		Filing Date 02/01/2017		☐ 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										
(Column 1)		(Column 2)		(Column 3)						
AMENDMENT	04/14/2017	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)			
	Total (37 CFR 1.16(i))	* 21	Minus	** 21	= 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				
(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 \$ =				
	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									
<p>* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.</p> <p>** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".</p> <p>*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".</p> <p>The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.</p>										

LIE
ANNIE C. SINGLETON

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

In re Application:

Inventors: Riley Reese et al.

Application No.: 15/422,303

Filed: February 1, 2017

Title: HEATED BUILD PLATFORM AND
SYSTEM FOR THREE DIMENSIONAL
PRINTING METHODS

Confirmation No.: **1368**

Customer No. **021971**

FILED ELECTRONICALLY ON: APRIL 13, 2017

RESPONSE TO NOTICE TO FILE MISSING PARTS

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

In response to the Notice to File Missing Parts of Non-Provisional Application mailed February 13, 2017,
Applicants respond as follows:

<p>1. ☐ Copy of Notice to File Missing Parts is provided</p> <p>2. ☐ Filing Fees are authorized herewith</p> <p>3. ☐ Applicant claims small entity status. See 37 CFR 1.27.</p> <p>4. ☒ Replacement Specification is provided [Total Pages 16] Both the claims and abstract must start on a new page. (For information on the preferred arrangement, see MPEP 608.01(a))</p> <p>5. ☐ Replacement Drawing(s) (35 U.S.C. 113) is provided [Total Pages]</p> <p>6. ☒ Oath or Declaration is provided [Total Pages 4] a. ☐ Newly executed (original or copy) b. ☒ Copy from a prior application (37 CFR 1.63(d))</p> <p>7. ☐ Information Disclosure (PTO/SB/08 or PTO-1449) is provided ☐ Copies of citations attached</p> <p>8. ☐ Preliminary Amendment is provided</p> <p>9. ☐ CD-Rom or CD-R in duplicate, large table or Computer Program (<i>Appendix</i>) is provided ☐ Landscape table on CD</p>	<p>10. Nucleotide and/or Amino Acid Sequence Submission is provided (if applicable, items a.-c. are required) a. ☐ Computer Readable Form (CRF) b. ☐ Specification Sequence Listing on: i. ☐ CD-ROM or CD-R (2 copies); or ii. ☐ Paper c. ☐ Statement verifying identity of above copies</p> <p>11. ☐ Assignment Papers (cover sheet & document(s) are provided</p> <p>12. ☐ Power of Attorney is provided ☐ 37 CFR 3.73(c) Statement (when there is an assignee)</p> <p>13. ☐ English Translation Document (if applicable) is provided</p> <p>14. ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed) is provided</p> <p>15. ☐ Applicants request an Extension of Time under 37 C.F.R. §1.136 of: ☐ 1 Month ☐ 2 Months ☐ 3 Months ☐ 4 Months ☐ 5 Months</p> <p>16. ☐ Other: <u>REPLACEMENT SHEET</u></p>
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FEE AUTHORIZATION

The Commissioner is authorized to charge any additional fees which may be required, including petition fees and extension of time fees, to Deposit Account No. **23-2415** (Docket No. 50823-712.301).

Respectfully submitted,

Date: April 13, 2017

By: /Jing Ye/
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HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING

METHODS

FIELD OF THE INVENTION

[0001] The present invention generally relates to the field of 3D printing of objects, and more particularly relates to developing a heated build platform for supporting the three dimensional objects using high temperature polymers.

BACKGROUND

[0002] Additive and subtractive manufacturing technologies enable computer designs, such as CAD files, to be made into three dimensional (3D) objects. 3D printing, also known as additive manufacturing, typically comprises depositing, curing, fusing, or otherwise forming a material into sequential cross-sectional layers of the 3D object. One type of additive manufacturing commonly referred to as fused filament fabrication involves a number of printed layers of a building material, which are extruded from an extruding head of a 3D printer and deposited over a build plate over which the 3D object is formed. The build plate serves as a platform on which a 3D printed object is constructed. Also, the temperature of the build plate must be controlled and varied depending on deposited layers, the building material and other parameters of printing process. The heating of the build plate helps in maintaining the temperature of the first layer and hence fusion of the subsequent layers over the first layer.

[0003] The current 3D printing methods involve heated build plate using silicone pads and have PID control of heated plate. Also, the present methods use polyimide tape as a substrate on the build plate for 3D part adherence. Use of polyimide tape or ultem plates does not meet the

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thermal requirements for high temperature thermoplastics (e.g. Polyether ether ketone (PEEK), Polyetherimide (PEI), Polyphenylsulfone (PPSU), Polyamide-imide (PAI), self-reinforced polyphenylene (SRP), etc. which require the plate to be in the range of 150-300°C). When using high temperature thermoplastics during fused filament fabrication, a heated build plate and a tacky surface are necessary to maintain adhesion between the plate and bottom layer of the printing part. If the build plate is not heated, the initial layer will not adhere to the build plate or the part will pull off the plate as the polymer contracts and cools down. If the build plate does not have a tacky surface then the polymer will slide along the plate or stick to extruding nozzle.

[0004] Polyimide tape has been applied to heated build plates for its tactility and performance under high temperatures. Applying polyimide tape is a difficult process inevitably allowing for tiny debris or air to be trapped between the tape and metal surface. Once the metal surface is heated, the air gaps expand creating an uneven printing surface. Further, the adhesive for the polyimide tape can burn off under high temperatures releasing fumes and damaging the coating.

[0005] Even if a part is built on an area of polyimide tape without debris or air bubbles, the tape can be easily damaged upon removal of the part. At elevated temperatures, the bottom layer of tape can permanently adhere to the 3D part causing the tape to tear or bubbles to form between the tape and build plate. Even when the part has been fully cooled, the polyimide tape can still adhere to the bottom layer resulting in damage or tearing of the tape upon part removal.

[0006] Another problem with the current structures of the build platform is that a user has to wait for the build platform to cool to reduce the risk of damage to the part during removal and even when plate is cooled, the part may be difficult to remove without damaging the part and/or the polyimide tape

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[0007] Therefore, there exists a need in the three dimensional printing methods for developing a heated build platform for supporting 3D objects of high temperature thermoplastics. Further, there also exists a need for facilitating modular and easy removal of built parts from the build surface or platform.

SUMMARY OF THE INVENTION

[0008] An objective of the present invention is to design and develop a temperature controlled build platform for three dimensional printing methods for high temperature thermoplastics.

[0009] Another objective of the present invention is to provide a removable plate that is thermally conductive and is safely secured over the build platform allowing quick installation and release of the plate, and also allowing cooling of a 3D object separately while simultaneously allowing printing of a subsequent object.

[0010] Another objective of the present invention is to apply a high temperature polymer coating on the surface of the removable plate, secured over the heated build, providing tackility for improving adhesion between printable layers and the printing surface and maintain adhesion throughout the build.

[0011] A further objective of the present invention is to provide easy dissociation of the 3D object from the build platform without damaging the 3D object and/or tacky surface provided by the coating.

[0012] A further objective of the present invention is to provide an even surface of build platform by avoiding trapping of debris or air bubbles between the tacky coating or surface and the build platform.

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[0013] Another objective of the present invention is to reduce warping/bowing of the removable plate, where the thermal expansion of the plate can cause bowing and/or rippling, creating an uneven printing surface.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] FIG. 1 shows a build platform with a removable thermally conductive and coated plate for three dimensional printing methods, in accordance with an embodiment of the present invention;

[0015] FIG. 2 shows a build platform with holes for heater cartridges and thermocouples, in accordance with an embodiment of the present invention.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0016] In the following detailed description of embodiments of the invention, numerous specific details are set forth in order to provide a thorough understanding of the embodiment of invention. However, it will be obvious to a person skilled in art that the embodiments of invention may be practiced with or without these specific details. In other instances well known methods, procedures and components have not been described in detail so as to not unnecessarily obscure aspects of the embodiments of the invention.

[0017] Furthermore, it will be clear that the invention is not limited to these embodiments only. Numerous modifications, changes, variations, substitutions and equivalents will be apparent to those skilled in the art, without parting from the spirit and scope of the invention.

[0018] To address major issues in current build platforms or plates employed in three dimensional printing methods, one of them may be poor adhesion between the 3D object and the build platform, embodiments of the present invention provides a system and an apparatus (100)

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performing as a base for depositing extruded layers of polymeric material from a printhead of a 3D printer, and in result a supporting structure for a 3D object. The polymeric materials are high temperature thermoplastics, such as and not limited to PEEK, PEI, PPSU, PAI, SRP and the like. The high temperature thermoplastics demand high thermal requirements for the build platforms in order to withstand the high temperatures and heat involved during the printing process.

[0019] FIG. 1 shows a build platform with a removable thermally conductive and coated plate for three dimensional printing methods, in accordance with an embodiment of the present invention. As shown in FIG. 1, the build apparatus (100) comprises a build platform (102), a thermally conductive removable plate (104) and a high temperature polymer coating (106). The build platform (102) has a temperature control means that controls the temperature of the build platform (102). The surface of the build platform (102) is evenly heated using the temperature control means. In an embodiment, the build platform (102) may be evenly heated using heater cartridges (202) with thermal control from PID controllers connected to thermocouples (204) spaced evenly in the build platform (102), where the heater cartridges are acting as temperature control means for the build platform 102. In an embodiment, the material of build platform 102 may be aluminum, steel, brass, ceramic, glass, or alloys similar with low coefficient of thermal expansion (CTE).

[0020] FIG. 2 shows a build platform with holes for heater cartridges and thermocouples, in accordance with an embodiment of the present invention. As shown in FIG. 2 the heater cartridges are spaced evenly along the surface of the build platform 102, comprising, for example, an aluminum block. In another embodiment for controlling temperature of the build platform (102), one or more thermocouples can be situated at one or several locations (204) on the block 102 to provide feedback to a controller, such as a PID controller, and hence maintain

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temperature set points throughout a build. Also, a ceramic, or other high temperature dielectric, can be used to insulate the build platform 102 and protect build platform support 102 from emitted heat. The number of holes depends on the number of heating cartridges and/or thermocouples.

[0021] In an embodiment of the present invention, the build platform 102 must be able to withstand high temperatures. Since, embodiments of the present invention involve use of high temperature thermoplastics, the build platform 102 must have high thermal tolerances, and able to withstand high temperatures, such as and not limited to temperatures ranging between 150 degrees Celsius to 300 degrees Celsius.

[0022] According to FIG.1, the build apparatus 100 further comprises a removable plate 104 secured over the build platform 102. The removable plate 104 must be thermally conductive in nature, so that it may be heated up due to the heat generated at the build platform 102 because of the temperature control means. Further, the removable plate 104 must be made of a material having a low coefficient of thermal expansion (CTE), to avoid expansion of the plate as it is heated up due to the heated build platform 102. In an embodiment, the material for the removable plate 104 may be aluminum, steel, brass, ceramic, glass, or alloys similar with low coefficient of thermal expansion (CTE). Also, the removable plate 104 must be thin, for example, the thickness of the plate 104 may range from 0.025-0.5". Further, the thickness of the plate 104 also depends on the flexural character of the material. The removable plate 104 must be thin enough to allow for minor flexing for part removal; however, it must not be too thin such that heating of the plate produces rippling, bowing, or warping of the plate, resulting in a print surface that is uneven or not consistently level. Furthermore, the removable plate 104 must be

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able to withstand high temperatures, such as and not limited to temperatures ranging up to 300 degrees Celsius.

[0023] According to embodiments of the present invention, the removable plate 104 is removably secured over the build platform 102. This allows for quick install and release of the plate 104 from the build platform 102. The removable plate 104 is preferably appropriately secured to prevent warping/bowing of the removable plate 104 due to the differences in thermal expansion and contraction compared to the build platform 102. It may be obvious to the person skilled in the art, that there exists a variety of methods to removably secure a plate over a build platform. In an embodiment, guiding legs/rails may be used to slide the removable plate 104 into multiple grooves and multiple set screws and fasteners to secure the plate 104 onto build platform 102. In another embodiment, spring/latch quick-release mechanism may be used to secure in place and remove the plate 104. In another embodiment, the method may be vacuum suction of the plate 104 onto build platform 102. In yet another embodiment, the method may be magnets and/or electromagnets to secure the plate 104 onto build platform 102 .

[0024] As shown in FIG. 1, a high temperature polymer coating 106 is applied directly over the surface of the removable plate 104. In an embodiment, the high temperature polymer used for coating may be polyimide. In an embodiment, a high temperature polymer coating 106 is spray coated over the plate 104. It may be obvious to a person skilled in the art that there exists a variety of coating methods and types of high temperature polymer coatings that can be used to create a coated layer 106 over the plate 104. Further, the thickness of the high temperature polymer coating may range from 0.001" to 0.1". The surface of the removable plate 104 is coated with thin layer of a high temperature polymer in order to impart better adherence properties both to the bottom layer of a 3D object and the plate 104 over the current methods of using polyimide

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plate. The high temperature polymer coating 106 provides a tacky surface preventing the extrudate (material extruded from the nozzle) from sliding along the plate 104 or sticking to extruding nozzle. Further, the high temperature polymer coating 106 is resilient in nature and cannot be easily scratched or punctured. The surface toughness of this coating 106 prevents damage from occurring during 3D object removal.

[0025] Furthermore, the high temperature polymer coating 106 does not wear away and thus does not need to be replaced after every build under high temperature. Also, the coating 106 is applied to a clean plate 104 that further minimizes or eliminates the potential for occurrence of trapped debris or air bubbles between the coating 106 and the plate surface 104. Advantageously, the high temperature polymer coating 106 can operate at temperatures up to 300°C suitable for any high temperature polymer.

[0026] In order to increase polymer adhesion to the plate surface 104 coated with the high temperature polymer 106, the surface of the high temperature polymer coating 106 may be roughened or treated. The surface treatment of the high temperature polymer coating 106 imparts a regular or an irregular patterned feature to the coating 106. In an embodiment, the surface of the high temperature polymer coating 106 may be roughened at the nano-, micro-, or milli- meter scale using methods like and not limited to sand blasting, bead blasting, and/or metal wire brushing to increase polymer adhesion to the coated surface 106.

[0027] The removable plate 104 also possesses flexibility owing to the type of material it is made of. The flexibility of the plate 104 allows for easier dissociation between the 3D object and the removable plate 104 upon cooling. Further, this flexibility also reduces the possibility of damage to the high temperature polymer coating 106 or the 3D object during object removal since a blade or wedge is no longer needed to pry off the object.

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[0028] The advantage of having the removable plate 104 secured over the build platform 102 is easy removal of the built object upon completion. This happens, since the removable plate 104 is thin and also there is a significant difference in thermal contraction between the removable plate and the 3D printed polymer object. Therefore once the building of the object is finished, the object will pop off the plate 104 when the plate and part have cooled. This efficiently avoids the general issue in the current art, where the 3D object sticks to the heated build platform, and the object has to be dug out from the platform in order to remove it or having to remove the object from a support raft requiring an additional step to dissolve or mechanically remove the support from the part. Another efficient advantage of securing a removable thin plate 104 over the heated build platform 102 is that it allows for quick installation and release of the plate 104 from the build platform 102, further allowing for quick transfer of 3D objects during printing. This helps in continuous operation of the 3D printer, increasing the efficiency of the printer.

[0029] The low coefficient of thermal expansion (CTE) of the plate 104 favors an even flat surface for printing. This is because if the material of the plate 104 has a much higher CTE than the build platform 102 below it, then the plate 104 will bow or deform and actually separates from the build platform 102. Resultantly, the surface for printing a 3D object, which is the surface of the removable plate 104, will become uneven and hence, the printing process doesn't have a flat surface to print on. Therefore, the plate 104 should have a low CTE, so that if the build platform 102 below expands, the plate 104 does not bow or deform, and the printing surface will be flat, level, and consistent. Hence, the material of the plate 104 may be thin ceramic, which is thin enough to still conduct heat and have minimal expansion upon heating.

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[0030] The build apparatus 100 described in embodiments of the present invention is suitable for additive manufacturing methods, including and not limited to fused filament fabrication (FFF) and other thermoplastic based reinforced fiber laying processes.

[0031] Advantageously, embodiments of the present invention provides an apparatus comprising a heated build platform 102 over which a removable plate 104 is removably secured, and a layer of a high temperature polymer coating 106 is applied over the surface of the plate 104. The high temperature polymer coating 106 provides adhesion between the 3D object and the surface of the plate 104. Further, embodiments of the present invention disclose surface treatment of the high temperature polymer coating 106 in order to increase polymer adhesion and the plate 106. Therefore, the use of a high temperature polymer coating 106 in an embodiment of the present invention instead of polyimide tape over a removable plate provides a consistent, smooth, tacky, long-lasting surface for the construction of 3D objects via FFF and continuous fiber deposition. Further, a method of securing the coated removable plate 104 to a fixed build platform 102 to allow for easy separation of the object from the removable plate 104 and for quick exchange of objects between builds.

[0032] Furthermore, the polyimide coating 106 has demonstrated better adherence properties both to the bottom layer of a 3D object and the plate 104 over the currently used polyimide tape. This coating 106 is much more resilient compared to polyimide tape, which can be easily scratched or punctured. The surface toughness of this coating 106 prevents damage from occurring during 3D object removal. The polyimide coating 106 does not wear away and thus does not need to be replaced. On the other hand, the current art polyimide tape is preferably replaced after every build under high temperature build platform temperatures. Also, the

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polyimide coating 106 is applied to a clean plate minimizing or eliminating the potential for trapped debris or air bubbles between the coating 106 and removable plate surfaces 104.

[0033] Further advantages include, the polyimide coating 106 can operate at high temperatures up to 300 degrees Celsius suitable for any high temperature thermoplastic. The flexibility of the removable plate 104 also reduces the possibility of damage to the coating 106 or the object during object removal since a blade or wedge is no longer needed to pry off the part. The surface of the polyimide coating 106 can be roughened at the nano-, micro-, or milli- meter scale using sand blasting, bead blasting, and/or metal wire brushing to increase polymer adhesion to the coated surface.

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We Claim:

1. A build apparatus working as a base for printing 3D objects of high temperature thermoplastics employing additive manufacturing methods, the apparatus comprising: a build platform with a temperature control means for heating the build platform; a thin thermally conductive removable plate having a build surface secured on top of the build platform; a high temperature polymer coating evenly applied over the surface of the removable plate for maintaining adhesion between the 3D object and the build surface throughout the printing; and where the surface of the high temperature polymer coating is treated or roughened to improve adhesion between the 3D object and the build surface; and where the removable plate possesses a relatively low coefficient of thermal expansion such that the removable plate does not deform or deform relatively less on heating.
2. The build apparatus claimed in claim 1, wherein the high temperature thermoplastics are used as feed material and are selected from the group consisting of PEEK, PEI, PPSU, PAI, and SRP.
3. The build apparatus claimed in claim 1, wherein the high temperature polymer coating I is a polyimide.
4. The build apparatus claimed in claim 1, wherein the additive manufacturing method is fused filament fabrication (FFF) or a thermoplastic based reinforced fiber laying process.

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5. The build apparatus claimed in claim 1, wherein the temperature control means to heat the build platform comprises heater cartridges that are spaced within the build platform, and heating pads attached to the build platform.

6. The build apparatus claimed in claim 1, wherein the build platform may have thermocouples situated at one or several locations to provide feedback to a controller for maintaining temperature set points throughout a build.

7. The build apparatus claimed in claim 1, wherein ceramic, or other high temperature dielectric is used to insulate the build platform and protect the build platform support from heat.

8. The build apparatus claimed in claim 1, wherein the build platform, the removable plate, and the high temperature polymer coating are able to withstand high temperatures ranging between 150 degrees Celsius to 300 degrees Celsius.

9. The build apparatus claimed in claim 1, wherein the material for the removable plate may be aluminum, steel, brass, ceramic, glass, or alloys with a low coefficient of thermal expansion (CTE).

10. The build apparatus claimed in claim 1, wherein the material for the build platform may be aluminum, steel, brass, ceramic, glass, or alloys with a low coefficient of thermal expansion (CTE).

11. The build apparatus claimed in claim 1, wherein the removable plate thickness ranges from 0.025-0.5" and wherein the thickness is selected depending on the flexural character of the material.

12. The build apparatus claimed in claim 1, wherein the removable plate is removably secured over the build platform using guiding legs or rails to slide the removable plate

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13. into multiple grooves and multiple set screws and fasteners and securing the plate onto the build platform; or using a spring and latch quick-release mechanism to secure in place and remove the plate; or using vacuum suction of the removable plate onto the build platform; or using magnets or electromagnets to secure the plate over the build platform.

14. The build apparatus claimed in claim 1, wherein the high temperature polymer coating is spray coated over the removable plate and imparts adherence properties both to the bottom thermoplastic layer of a 3D object and the removable plate.

15. The build apparatus claimed in claim 1, wherein the high temperature polymer coating provides a tacky surface preventing the extrudate from sliding along the removable plate or sticking to an extruding nozzle.

16. The build apparatus claimed in claim 1, wherein the thickness of the high temperature polymer coating may range from 0.001" to 0.1".

17. The build apparatus claimed in claim 1, wherein the high temperature polymer coating is applied to a clean removable plate for minimizing or eliminating any potential for occurrence of trapped debris or air bubbles between the high temperature polymer coating and the plate surface.

18. The build apparatus claimed in claim 1, wherein the surface treatment of the high temperature polymer coating imparts a regular or irregular pattern to the coating, where the surface of the high temperature polymer coating is roughened at the nano-, micro-, or millimeter scale to increase polymer adhesion to the high temperature polymer coated surface.

19. The build apparatus claimed in claim 1, wherein the removable plate is flexible in nature, where the flexibility allows for easier dissociation between the 3D object and the

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removable plate upon cooling and reduces the possibility of damage to the high temperature polymer coating or the 3D object during object removal.

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ABSTRACT

An apparatus performing as a base for printing 3D objects using high temperature thermoplastics employing additive manufacturing methods is provided. The apparatus comprises a heated build platform, a thin removable plate secured on top of the build platform, a high temperature polymer coating applied over the removable plate, and surface treatment of high temperature polymer coating to maintain adhesion between 3D object and printing surface, . Also, the removable plate has low coefficient of thermal expansion compared to build platform below it, for avoiding bowing of the plate as it is heated due to heated build platform, hence providing flat printing surface. The thin removable plate allows 3D objects to pop off the plate upon cooling, without damaging the polymer coating, the plate, or the object. It also allows for continuous operation of printing, while the plate is released for cooling, a new plate is installed for printing.

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.

**DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN
APPLICATION DATA SHEET (37 CFR 1.76)**

Title of Invention	HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS
-------------------------------	--

As the below named inventor, I hereby declare that:

This declaration is directed to: ☒ The attached application, or
☐ United States application or PCT international application number _____
filed on _____.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Hemant Bheda Date (Optional): NOV 21, 2014
Signature: *Hemant Bheda*

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. 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 1 minute 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.

Privacy Act Statement

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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.
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APPLICATION DATA SHEET (37 CFR 1.76)**

Title of Invention	HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS
-------------------------------	--

As the below named inventor, I hereby declare that:

This declaration is directed to: ☒ The attached application, or
☐ United States application or PCT international application number _____
filed on _____.

The above-identified application was made or authorized to be made by me.

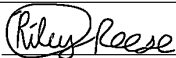
I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

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LEGAL NAME OF INVENTOR

Inventor: Riley Reese Date (Optional): Nov 20 2014
Signature: 

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

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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.
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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.

Electronic Patent Application Fee Transmittal				
Application Number:		15422303		
Filing Date:		01-Feb-2017		
Title of Invention:		HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS		
First Named Inventor/Applicant Name:		Riley Reese		
Filer:		Jing Ye/Sherry Castro		
Attorney Docket Number:		50823-712.301		
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:	28925679
Application Number:	15422303
International Application Number:	
Confirmation Number:	1368
Title of Invention:	HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS
First Named Inventor/Applicant Name:	Riley Reese
Customer Number:	21971
Filer:	Jing Ye/Sherry Castro
Filer Authorized By:	Jing Ye
Attorney Docket Number:	50823-712.301
Receipt Date:	13-APR-2017
Filing Date:	01-FEB-2017
Time Stamp:	20:04:19
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$1740
RAM confirmation Number	041417INTEFSW00006118232415
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

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	50823712301_RNMP_Transmittal.pdf	119256	no	1
			faeae45e0b2f264732e24d411dcc975b451ec8d2		
Warnings:					
Information:					
2		50823712301_Substitute_Specification.pdf	90989	yes	16
			7591803f52d8f6496e17d3839700da40d5a8ddbf		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	11	
	Claims		12	15	
	Abstract		16	16	
Warnings:					
Information:					
3	Oath or Declaration filed	50823712301_Declarations.pdf	261092	no	4
			8b42ec637c3532224c695c136fe99f85ca73b2b7		
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	36828	no	2
			e97035836aa22e74041944caa39816714ecc2956c		
Warnings:					
Information:					
Total Files Size (in bytes):			508165		

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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.



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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO.	TOT CLAIMS	IND CLAIMS
15/422,303	02/01/2017		0.00	50823-712.301	13	1

CONFIRMATION NO. 1368

FILING RECEIPT



CC00000089094148

21971

WILSON, SONSINI, GOODRICH & ROSATI
650 PAGE MILL ROAD
PALO ALTO, CA 94304-1050

Date Mailed: 02/13/2017

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)

Riley Reese, Carpinteria, CA;
Hemant Bheda, Saratoga, CA;

Applicant(s)

Arevo Inc., Santa Clara, CA;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 14/574,237 12/17/2014

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 Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 02/08/2017

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/422,303**

Projected Publication Date: To Be Determined - pending completion of Missing Parts

Non-Publication Request: No

Early Publication Request: No
Title

HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS

Preliminary Class

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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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).

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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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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.

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 15/422,303	
APPLICATION AS FILED - PART I							
(Column 1)		(Column 2)		SMALL ENTITY		OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	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), (l), 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(j))	13	minus 20 = *			OR	x 80 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1	minus 3 = *			OR	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)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)
	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))					OR	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					OR	
TOTAL ADD'L FEE					OR	TOTAL ADD'L FEE	
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)
	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))					OR	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					OR	
TOTAL ADD'L FEE					OR	TOTAL ADD'L FEE	
<p style="font-size: x-small;">* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.</p> <p style="font-size: x-small;">** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".</p> <p style="font-size: x-small;">*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".</p> <p style="font-size: x-small;">The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.</p>							



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/422,303	02/01/2017	Riley Reese	50823-712.301

CONFIRMATION NO. 1368

21971

WILSON, SONSINI, GOODRICH & ROSATI
650 PAGE MILL ROAD
PALO ALTO, CA 94304-1050

FORMALITIES LETTER



Date Mailed: 02/13/2017

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.

The application is informal since it does not comply with the regulations for the reason(s) indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- A substitute specification in compliance with 37 CFR 1.52, 1.121(b)(3), and 1.125, is required. The substitute specification must be submitted with markings and be accompanied by a clean version (without markings) as set forth in 37 CFR 1.125(c) and a statement that the substitute specification contains no new matter (see 37 CFR 1.125(b)). The specification, claims, and/or abstract page(s) submitted is not acceptable and cannot be scanned or properly stored because:
 - The line spacing on the specification, claims, and/or abstract is not 1½ or double spaced (see 37 CFR 1.52(b)).
 - The specification was submitted in multiple column format and is not suitable for electronic reproduction (see 37 CFR 1.52(a)).
- Replacement claim(s) commencing on a separate sheet in compliance with 37 CFR 1.75(h) and 1.121 is required. Claims must be consecutively numbered and the same claim number cannot be used for more than one claim. See 37 CFR 1.126.

Applicant is cautioned that correction of the above items may cause the specification and drawings page count to exceed 100 pages. If the specification and drawings exceed 100 pages, applicant will need to submit the required application size fee.

- 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.
- \$(**0**) previous unapplied payment amount.
- \$ **1740** 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):
Riley Reese
Hemant Bheda

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://portal.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.

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.

/lvongxay/

UTILITY PATENT APPLICATION TRANSMITTAL <small>(Only for new nonprovisional applications under 37 CFR 1.53(b))</small>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;"><i>Attorney Docket No.</i></td> <td>50823-712.201</td> </tr> <tr> <td><i>First Named Inventor</i></td> <td>Riley Reese</td> </tr> <tr> <td><i>Title</i></td> <td>HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING</td> </tr> <tr> <td><i>Express Mail Label No.</i></td> <td></td> </tr> </table>	<i>Attorney Docket No.</i>	50823-712.201	<i>First Named Inventor</i>	Riley Reese	<i>Title</i>	HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING	<i>Express Mail Label No.</i>	
<i>Attorney Docket No.</i>	50823-712.201								
<i>First Named Inventor</i>	Riley Reese								
<i>Title</i>	HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING								
<i>Express Mail Label No.</i>									

APPLICATION ELEMENTS <small>See MPEP chapter 600 concerning utility patent application contents.</small> <ol style="list-style-type: none"> 1. ☐ Fee Transmittal Form (PTO/SB/17 or equivalent) 2. ☐ Applicant asserts small entity status. See 37 CFR 1.27 3. ☐ Applicant certifies micro entity status. See 37 CFR 1.29. Applicant must attach form PTO/SB/15A or B or equivalent. 4. ☒ Specification [Total Pages <u>5</u>] Both the claims and abstract must start on a new page. (See MPEP § 608.01(a) for information on the preferred arrangement) 5. ☒ Drawing(s) (35 U.S.C. 113) [Total Sheets <u>2</u>] 6. ☐ Inventor's Oath or Declaration [Total Pages _____] (including substitute statements under 37 CFR 1.64 and assignments serving as an oath or declaration under 37 CFR 1.63(e)) <ol style="list-style-type: none"> a. ☐ Newly executed (original or copy) b. ☐ A copy from a prior application (37 CFR 1.63(d)) 7. ☒ Application Data Sheet * See note below. See 37 CFR 1.76 (PTO/AIA/14 or equivalent) 8. ☐ CD-ROM or CD-R in duplicate, large table, or Computer Program (Appendix) ☐ Landscape Table on CD 9. Nucleotide and/or Amino Acid Sequence Submission (if applicable, items a. – c. are required) <ol style="list-style-type: none"> a. ☐ Computer Readable Form (CRF) b. ☐ Specification Sequence Listing on: <ol style="list-style-type: none"> i. ☐ CD-ROM or CD-R (2 copies); or ii. ☐ Paper c. ☐ Statements verifying identity of above copies 	ADDRESS TO: Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450
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ACCOMPANYING APPLICATION PAPERS <ol style="list-style-type: none"> 10. ☐ Assignment Papers (cover sheet & document(s)) Name of Assignee _____ 11. ☐ 37 CFR 3.73(c) Statement (when there is an assignee) ☐ Power of Attorney 12. ☐ English Translation Document (if applicable) 13. ☐ Information Disclosure Statement (PTO/SB/08 or PTO-1449) ☐ Copies of citations attached 14. ☐ Preliminary Amendment 15. ☐ Return Receipt Postcard (MPEP § 503) (Should be specifically itemized) 16. ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed) 17. ☐ Nonpublication Request Under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent. 18. ☐ Other: _____ _____ _____ _____ 	
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***Note:** (1) Benefit claims under 37 CFR 1.78 and foreign priority claims under 1.55 **must** be included in an Application Data Sheet (ADS).
 (2) For applications filed under 35 U.S.C. 111, the application must contain an ADS specifying the applicant if the applicant is an assignee, person to whom the inventor is under an obligation to assign, or person who otherwise shows sufficient proprietary interest in the matter. See 37 CFR 1.46(b).

19. CORRESPONDENCE ADDRESS				
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City	State	Zip Code		
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Signature	/Ali Alemozafar/	Date	2017-02-01
Name (Print/Type)	Ali R. Alemozafar	Registration No. (Attorney/Agent)	68180

This collection of information is required by 37 CFR 1.53(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.

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.



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(19) **United States**

(12) **Patent Application Publication**

Reese et al.

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(43) **Pub. Date: Jun. 23, 2016**

(54) **HEATED BUILD PLATFORM AND SYSTEM
FOR THREE DIMENSIONAL PRINTING
METHODS**

(52) **U.S. CL.**
CPC **B29C 67/0092** (2013.01); **B33Y 30/00**
(2014.12)

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Hemant Bheda, Saratoga, CA (US)

(21) Appl. No.: **14/574,237**

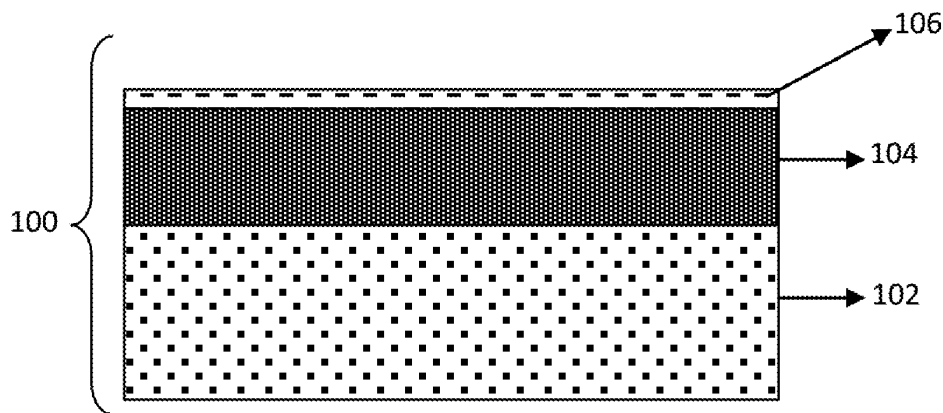
(22) Filed: **Dec. 17, 2014**

Publication Classification

(51) **Int. Cl.**
B29C 67/00 (2006.01)

(57) **ABSTRACT**

An apparatus performing as a base for printing 3D objects using high temperature thermoplastics employing additive manufacturing methods is provided. The apparatus comprises a heated build platform, a thin removable plate secured on top of the build platform, a high temperature polymer coating applied over the removable plate, and surface treatment of high temperature polymer coating to maintain adhesion between 3D object and printing surface. Also, the removable plate has low coefficient of thermal expansion compared to build platform below it, for avoiding bowing of the plate as it is heated due to heated build platform, hence providing flat printing surface. The thin removable plate allows 3D objects to pop off the plate upon cooling, without damaging the polymer coating, the plate, or the object. It also allows for continuous operation of printing, while the plate is released for cooling, a new plate is installed for printing.



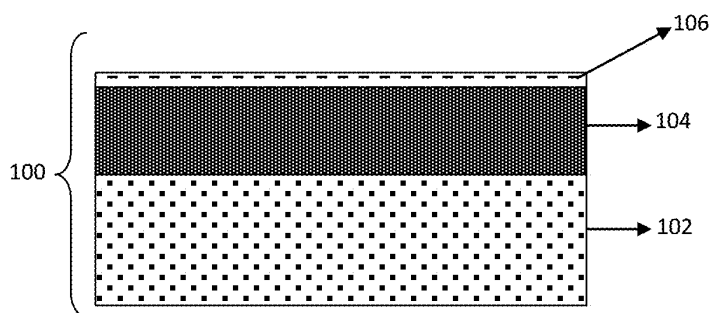


FIG. 1

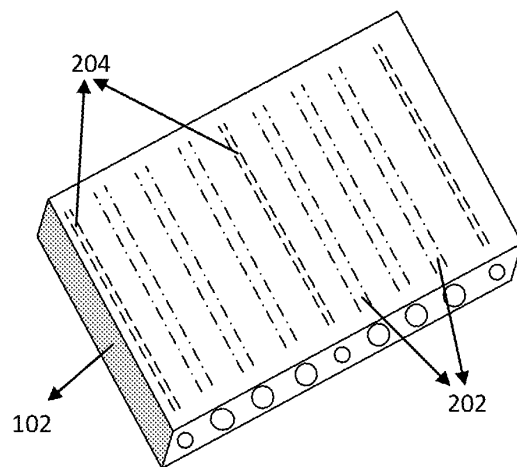


FIG. 2

HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS

FIELD OF THE INVENTION

[0001] The present invention generally relates to the field of 3D printing of objects, and more particularly relates to developing a heated build platform for supporting the three dimensional objects using high temperature polymers.

BACKGROUND

[0002] Additive and subtractive manufacturing technologies enable computer designs, such as CAD files, to be made into three dimensional (3D) objects. 3D printing, also known as additive manufacturing, typically comprises depositing, curing, fusing, or otherwise forming a material into sequential cross-sectional layers of the 3D object. One type of additive manufacturing commonly referred to as fused filament fabrication involves a number of printed layers of a building material, which are extruded from an extruding head of a 3D printer and deposited over a build plate over which the 3D object is formed. The build plate serves as a platform on which a 3D printed object is constructed. Also, the temperature of the build plate must be controlled and varied depending on deposited layers, the building material and other parameters of printing process. The heating of the build plate helps in maintaining the temperature of the first layer and hence fusion of the subsequent layers over the first layer.

[0003] The current 3D printing methods involve heated build plate using silicone pads and have PID control of heated plate. Also, the present methods use polyimide tape as a substrate on the build plate for 3D part adherence. Use of polyimide tape or ultem plates does not meet the thermal requirements for high temperature thermoplastics (e.g. Polyether ether ketone (PEEK), Polyetherimide (PEI), Polyphenylsulfone (PPSU), Polyamide-imide (PAI), self-reinforced polyphenylene (SRP), etc. which require the plate to be in the range of 150-300° C.). When using high temperature thermoplastics during fused filament fabrication, a heated build plate and a tacky surface are necessary to maintain adhesion between the plate and bottom layer of the printing part. If the build plate is not heated, the initial layer will not adhere to the build plate or the part will pull off the plate as the polymer contracts and cools down. If the build plate does not have a tacky surface then the polymer will slide along the plate or stick to extruding nozzle.

[0004] Polyimide tape has been applied to heated build plates for its tactility and performance under high temperatures. Applying polyimide tape is a difficult process inevitably allowing for tiny debris or air to be trapped between the tape and metal surface. Once the metal surface is heated, the air gaps expand creating an uneven printing surface. Further, the adhesive for the polyimide tape can burn off under high temperatures releasing fumes and damaging the coating.

[0005] Even if a part is built on an area of polyimide tape without debris or air bubbles, the tape can be easily damaged upon removal of the part. At elevated temperatures, the bottom layer of tape can permanently adhere to the 3D part causing the tape to tear or bubbles to form between the tape and build plate. Even when the part has been fully cooled, the polyimide tape can still adhere to the bottom layer resulting in damage or tearing of the tape upon part removal.

[0006] Another problem with the current structures of the build platform is that a user has to wait for the build platform to cool to reduce the risk of damage to the part during removal and even when plate is cooled, the part may be difficult to remove without damaging the part and/or the polyimide tape

[0007] Therefore, there exists a need in the three dimensional printing methods for developing a heated build platform for supporting 3D objects of high temperature thermoplastics. Further, there also exists a need for facilitating modular and easy removal of built parts from the build surface or platform.

SUMMARY OF THE INVENTION

[0008] An objective of the present invention is to design and develop a temperature controlled build platform for three dimensional printing methods for high temperature thermoplastics.

[0009] Another objective of the present invention is to provide a removable plate that is thermally conductive and is safely secured over the build platform allowing quick installation and release of the plate, and also allowing cooling of a 3D object separately while simultaneously allowing printing of a subsequent object.

[0010] Another objective of the present invention is to apply a high temperature polymer coating on the surface of the removable plate, secured over the heated build, providing tactility for improving adhesion between printable layers and the printing surface and maintain adhesion throughout the build.

[0011] A further objective of the present invention is to provide easy dissociation of the 3D object from the build platform without damaging the 3D object and/or tacky surface provided by the coating.

[0012] A further objective of the present invention is to provide an even surface of build platform by avoiding trapping of debris or air bubbles between the tacky coating or surface and the build platform.

[0013] Another objective of the present invention is to reduce warping/bowing of the removable plate, where the thermal expansion of the plate can cause bowing and/or rippling, creating an uneven printing surface.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] FIG. 1 shows a build platform with a removable thermally conductive and coated plate for three dimensional printing methods, in accordance with an embodiment of the present invention;

[0015] FIG. 2 shows a build platform with holes for heater cartridges and thermocouples, in accordance with an embodiment of the present invention.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0016] In the following detailed description of embodiments of the invention, numerous specific details are set forth in order to provide a thorough understanding of the embodiment of invention. However, it will be obvious to a person skilled in art that the embodiments of invention may be practiced with or without these specific details. In other instances well known methods, procedures and components have not been described in detail so as to not unnecessarily obscure aspects of the embodiments of the invention.

[0017] Furthermore, it will be clear that the invention is not limited to these embodiments only. Numerous modifications, changes, variations, substitutions and equivalents will be apparent to those skilled in the art, without parting from the spirit and scope of the invention.

[0018] To address major issues in current build platforms or plates employed in three dimensional printing methods, one of them may be poor adhesion between the 3D object and the build platform, embodiments of the present invention provides a system and an apparatus (100) performing as a base for depositing extruded layers of polymeric material from a printhead of a 3D printer, and in result a supporting structure for a 3D object. The polymeric materials are high temperature thermoplastics, such as and not limited to PEEK, PEI, PPSU, PAI, SRP and the like. The high temperature thermoplastics demand high thermal requirements for the build platforms in order to withstand the high temperatures and heat involved during the printing process.

[0019] FIG. 1 shows a build platform with a removable thermally conductive and coated plate for three dimensional printing methods, in accordance with an embodiment of the present invention. As shown in FIG. 1, the build apparatus (100) comprises a build platform (102), a thermally conductive removable plate (104) and a high temperature polymer coating (106). The build platform (102) has a temperature control means that controls the temperature of the build platform (102). The surface of the build platform (102) is evenly heated using the temperature control means. In an embodiment, the build platform (102) may be evenly heated using heater cartridges (202) with thermal control from PID controllers connected to thermocouples (204) spaced evenly in the build platform (102), where the heater cartridges are acting as temperature control means for the build platform 102. In an embodiment, the material of build platform 102 may be aluminum, steel, brass, ceramic, glass, or alloys similar with low coefficient of thermal expansion (CTE).

[0020] FIG. 2 shows a build platform with holes for heater cartridges and thermocouples, in accordance with an embodiment of the present invention. As shown in FIG. 2 the heater cartridges are spaced evenly along the surface of the build platform 102, comprising, for example, an aluminum block. In another embodiment for controlling temperature of the build platform (102), one or more thermocouples can be situated at one or several locations (204) on the block 102 to provide feedback to a controller, such as a PID controller, and hence maintain temperature set points throughout a build. Also, a ceramic, or other high temperature dielectric, can be used to insulate the build platform 102 and protect build platform support 102 from emitted heat. The number of holes depends on the number of heating cartridges and/or thermocouples.

[0021] In an embodiment of the present invention, the build platform 102 must be able to withstand high temperatures. Since, embodiments of the present invention involve use of high temperature thermoplastics, the build platform 102 must have high thermal tolerances, and able to withstand high temperatures, such as and not limited to temperatures ranging between 150 degrees Celsius to 300 degrees Celsius.

[0022] According to FIG. 1, the build apparatus 100 further comprises a removable plate 104 secured over the build platform 102. The removable plate 104 must be thermally conductive in nature, so that it may be heated up due to the heat generated at the build platform 102 because of the temperature control means. Further, the removable plate 104 must be

made of a material having a low coefficient of thermal expansion (CTE), to avoid expansion of the plate as it is heated up due to the heated build platform 102. In an embodiment, the material for the removable plate 104 may be aluminum, steel, brass, ceramic, glass, or alloys similar with low coefficient of thermal expansion (CTE). Also, the removable plate 104 must be thin, for example, the thickness of the plate 104 may range from 0.025-0.5". Further, the thickness of the plate 104 also depends on the flexural character of the material. The removable plate 104 must be thin enough to allow for minor flexing for part removal; however, it must not be too thin such that heating of the plate produces rippling, bowing, or warping of the plate, resulting in a print surface that is uneven or not consistently level. Furthermore, the removable plate 104 must be able to withstand high temperatures, such as and not limited to temperatures ranging up to 300 degrees Celsius.

[0023] According to embodiments of the present invention, the removable plate 104 is removably secured over the build platform 102. This allows for quick install and release of the plate 104 from the build platform 102. The removable plate 104 is preferably appropriately secured to prevent warping/bowing of the removable plate 104 due to the differences in thermal expansion and contraction compared to the build platform 102. It may be obvious to the person skilled in the art, that there exists a variety of methods to removably secure a plate over a build platform. In an embodiment, guiding legs/rails may be used to slide the removable plate 104 into multiple grooves and multiple set screws and fasteners to secure the plate 104 onto build platform 102. In another embodiment, spring/latch quick-release mechanism may be used to secure in place and remove the plate 104. In another embodiment, the method may be vacuum suction of the plate 104 onto build platform 102. In yet another embodiment, the method may be magnets and/or electromagnets to secure the plate 104 onto build platform 102.

[0024] As shown in FIG. 1, a high temperature polymer coating 106 is applied directly over the surface of the removable plate 104. In an embodiment, the high temperature polymer used for coating may be polyimide. In an embodiment, a high temperature polymer coating 106 is spray coated over the plate 104. It may be obvious to a person skilled in the art that there exists a variety of coating methods and types of high temperature polymer coatings that can be used to create a coated layer 106 over the plate 104. Further, the thickness of the high temperature polymer coating may range from 0.001" to 0.1". The surface of the removable plate 104 is coated with thin layer of a high temperature polymer in order to impart better adherence properties both to the bottom layer of a 3D object and the plate 104 over the current methods of using polyimide plate. The high temperature polymer coating 106 provides a tacky surface preventing the extrudate (material extruded from the nozzle) from sliding along the plate 104 or sticking to extruding nozzle. Further, the high temperature polymer coating 106 is resilient in nature and cannot be easily scratched or punctured. The surface toughness of this coating 106 prevents damage from occurring during 3D object removal.

[0025] Furthermore, the high temperature polymer coating 106 does not wear away and thus does not need to be replaced after every build under high temperature. Also, the coating 106 is applied to a clean plate 104 that further minimizes or eliminates the potential for occurrence of trapped debris or air bubbles between the coating 106 and the plate surface 104.

Advantageously, the high temperature polymer coating **106** can operate at temperatures up to 300° C. suitable for any high temperature polymer.

[0026] In order to increase polymer adhesion to the plate surface **104** coated with the high temperature polymer **106**, the surface of the high temperature polymer coating **106** may be roughened or treated. The surface treatment of the high temperature polymer coating **106** imparts a regular or an irregular patterned feature to the coating **106**. In an embodiment, the surface of the high temperature polymer coating **106** may be roughened at the nano-, micro-, or milli-meter scale using methods like and not limited to sand blasting, bead blasting, and/or metal wire brushing to increase polymer adhesion to the coated surface **106**.

[0027] The removable plate **104** also possesses flexibility owing to the type of material it is made of. The flexibility of the plate **104** allows for easier dissociation between the 3D object and the removable plate **104** upon cooling. Further, this flexibility also reduces the possibility of damage to the high temperature polymer coating **106** or the 3D object during object removal since a blade or wedge is no longer needed to pry off the object.

[0028] The advantage of having the removable plate **104** secured over the build platform **102** is easy removal of the built object upon completion. This happens, since the removable plate **104** is thin and also there is a significant difference in thermal contraction between the removable plate and the 3D printed polymer object. Therefore once the building of the object is finished, the object will pop off the plate **104** when the plate and part have cooled. This efficiently avoids the general issue in the current art, where the 3D object sticks to the heated build platform, and the object has to be dug out from the platform in order to remove it or having to remove the object from a support raft requiring an additional step to dissolve or mechanically remove the support from the part. Another efficient advantage of securing a removable thin plate **104** over the heated build platform **102** is that it allows for quick installation and release of the plate **104** from the build platform **102**, further allowing for quick transfer of 3D objects during printing. This helps in continuous operation of the 3D printer, increasing the efficiency of the printer.

[0029] The low coefficient of thermal expansion (CTE) of the plate **104** favors an even flat surface for printing. This is because if the material of the plate **104** has a much higher CTE than the build platform **102** below it, then the plate **104** will bow or deform and actually separates from the build platform **102**. Resultantly, the surface for printing a 3D object, which is the surface of the removable plate **104**, will become uneven and hence, the printing process doesn't have a flat surface to print on. Therefore, the plate **104** should have a low CTE, so that if the build platform **102** below expands, the plate **104** does not bow or deform, and the printing surface will be flat, level, and consistent. Hence, the material of the plate **104** may be thin ceramic, which is thin enough to still conduct heat and have minimal expansion upon heating.

[0030] The build apparatus **100** described in embodiments of the present invention is suitable for additive manufacturing methods, including and not limited to fused filament fabrication (FFF) and other thermoplastic based reinforced fiber laying processes.

[0031] Advantageously, embodiments of the present invention provides an apparatus comprising a heated build platform **102** over which a removable plate **104** is removably secured, and a layer of a high temperature polymer coating **106** is

applied over the surface of the plate **104**. The high temperature polymer coating **106** provides adhesion between the 3D object and the surface of the plate **104**. Further, embodiments of the present invention disclose surface treatment of the high temperature polymer coating **106** in order to increase polymer adhesion and the plate **106**. Therefore, the use of a high temperature polymer coating **106** in an embodiment of the present invention instead of polyimide tape over a removable plate provides a consistent, smooth, tacky, long-lasting surface for the construction of 3D objects via FFF and continuous fiber deposition. Further, a method of securing the coated removable plate **104** to a fixed build platform **102** to allow for easy separation of the object from the removable plate **104** and for quick exchange of objects between builds.

[0032] Furthermore, the polyimide coating **106** has demonstrated better adherence properties both to the bottom layer of a 3D object and the plate **104** over the currently used polyimide tape. This coating **106** is much more resilient compared to polyimide tape, which can be easily scratched or punctured. The surface toughness of this coating **106** prevents damage from occurring during 3D object removal. The polyimide coating **106** does not wear away and thus does not need to be replaced. On the other hand, the current art polyimide tape is preferably replaced after every build under high temperature build platform temperatures. Also, the polyimide coating **106** is applied to a clean plate minimizing or eliminating the potential for trapped debris or air bubbles between the coating **106** and removable plate surfaces **104**.

[0033] Further advantages include, the polyimide coating **106** can operate at high temperatures up to 300 degrees Celsius suitable for any high temperature thermoplastic. The flexibility of the removable plate **104** also reduces the possibility of damage to the coating **106** or the object during object removal since a blade or wedge is no longer needed to pry off the part. The surface of the polyimide coating **106** can be roughened at the nano-, micro-, or milli-meter scale using sand blasting, bead blasting, and/or metal wire brushing to increase polymer adhesion to the coated surface.

1. A build apparatus working as a base for printing 3D objects of thermoplastics employing additive manufacturing methods, the apparatus comprising:

- a build platform with a temperature control means for heating the build platform;
- a thin thermally conductive removable plate having a build surface meant to be removably placed on top of the build platform,
- a polymer coating coated over the surface of the removable plate for maintaining adhesion between the 3D object and the build surface throughout the printing; and
- where the surface of the polymer coating is treated to improve adhesion between the 3D object and the build surface.

2. (canceled)

3. The build apparatus as claimed in claim 1, wherein the polymer coating is a polyimide.

4. (canceled)

5. The build apparatus claimed in claim 1, wherein the temperature control means to heat the build platform comprises heater cartridges that are spaced along the surface of the build platform.

6. The build apparatus claimed in claim 1, wherein the build platform comprises thermocouples situated at one or several locations to provide feedback to a controller for maintaining temperature set points.

7. The build apparatus claimed in claim 1, wherein ceramic or other high temperature dielectric is used to insulate the build platform from external means.

8. The build apparatus as claimed in claim 1, wherein the build platform, the removable plate, and the polymer coating are able to withstand high temperature ranging between 150 degree Celsius and 300 degree Celsius.

9. The build apparatus claimed in claim 1, wherein the material for the removable plate may be aluminum, steel, brass, ceramic, glass, or alloys similar with a low coefficient of thermal expansion (CTE).

10. The build apparatus claimed in claim 1, wherein the material for the build platform may be aluminum, steel, brass, ceramic, glass, or alloys with a low coefficient of thermal expansion (CTE).

11. The build apparatus claimed in claim 1, wherein the removable plate thickness ranges from 0.025-0.5" and wherein the thickness is selected depending on the flexural character of the material.

12. (canceled)

13. The build apparatus claimed in claim 1, wherein the polymer coating is spray coated over the removable plate.

14. (canceled)

15. The build apparatus claimed in claim 1, wherein the thickness of the polymer coating may range from 0.001" to 0.1".

16. (canceled)

17. The build apparatus claimed in claim 1, wherein the surface of the polymer coating is treated at the nano-, micro-, or milli-meter scale to increase polymer adhesion to the polyimide coated surface.

18. The build apparatus claimed in claim 1, wherein the removable plate is flexible in nature, where the flexibility allows for easier dissociation between the 3D object and the removable plate upon cooling and reduces the possibility of damage to the polymer coating or the 3D object during object removal.

* * * * *

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	50823-712.301
		Application Number	
Title of Invention	HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS		
<p>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.</p> <p>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.</p>			

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		
	Riley		Reese			
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service						
City	Carpinteria	State/Province	CA	Country of Residence	US	
Mailing Address of Inventor:						
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Address 2						
City	Carpinteria	State/Province	CA			
Postal Code	93013	Country	US			
Inventor	2				Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Hemant		Bheda			
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service						
City	Saratoga	State/Province	CA	Country of Residence	US	
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Address 1	14812 Gypsy Hill Road					
Address 2						
City	Saratoga	State/Province	CA			
Postal Code	95070	Country	US			
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button.						

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	50823-712.301
		Application Number	
Title of Invention	HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS		

☐ An Address is being provided for the correspondence information of this application.

Customer Number	021971		
Email Address	patentdocket@wsgr.com	Add Email	Remove Email

Application Information:

Title of the Invention	HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS		
Attorney Docket Number	50823-712.301	Small Entity Status Claimed	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	2	Suggested Figure for Publication (if any)	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

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	021971		

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	50823-712.301
		Application Number	
Title of Invention	HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim 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.

When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	14/574237	2014-12-17
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.			Add

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. 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(i)(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).

Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Remove
			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.

NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	50823-712.301
		Application Number	
Title of Invention	HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS		

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	50823-712.301
		Application Number	
Title of Invention	HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS		

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	<input type="button" value="Remove"/>	
<p>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.</p>			
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☒ 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:			
<div> <div></div> <div></div> </div>			
Name of the Deceased or Legally Incapacitated Inventor: <input type="text"/>			
If the Applicant is an Organization check here. ☒			
Organization Name	Arevo Inc.		
Mailing Address Information For Applicant:			
Address 1	2960 Scott Blvd.		
Address 2			
City	Santa Clara	State/Province	CA
Country	US	Postal Code	95054
Phone Number		Fax Number	
Email Address			
Additional Applicant Data may be generated within this form by selecting the Add button. <input type="button" value="Add"/>			

Assignee Information including Non-Applicant Assignee Information:

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	50823-712.301
		Application Number	
Title of Invention	HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS		

Assignee 1				
Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.				
				<input type="button" value="Remove"/>
If the Assignee or Non-Applicant Assignee is an Organization check here.				☐
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Mailing Address Information For Assignee including Non-Applicant Assignee:				
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Address 2		<input type="text"/>		
City	<input type="text"/>	State/Province	<input type="text"/>	
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Signature:

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Ali Alemozafar/		Date (YYYY-MM-DD)	2017-02-01
First Name	Ali	Last Name	Alemozafar	Registration Number
				68180
Additional Signature may be generated within this form by selecting the Add button.				<input type="button" value="Add"/>

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	50823-712.301
		Application Number	
Title of Invention	HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS		

This collection of information is required by 37 CFR 1.76. 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 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet 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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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:

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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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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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Electronic Acknowledgement Receipt	
EFS ID:	28237598
Application Number:	15422303
International Application Number:	
Confirmation Number:	1368
Title of Invention:	HEATED BUILD PLATFORM AND SYSTEM FOR THREE DIMENSIONAL PRINTING METHODS
First Named Inventor/Applicant Name:	Riley Reese
Customer Number:	21971
Filer:	Ali Reza Alemozafar/Sherry Castro
Filer Authorized By:	Ali Reza Alemozafar
Attorney Docket Number:	50823-712.301
Receipt Date:	01-FEB-2017
Filing Date:	
Time Stamp:	19:01:04
Application Type:	Utility under 35 USC 111(a)

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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal of New Application	50823712301_Transmittal.pdf	256498	no	2
			f896bf64d5bb02e1586c16875796ee661b377bae		

Warnings:

Information:					
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	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Abstract		1	1	
	Drawings-only black and white line drawings		2	3	
	Specification		4	6	
	Claims		7	7	
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3	Application Data Sheet	50823712301_ADS.pdf	1829640	no	8
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Total Files Size (in bytes):			2540628		
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