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.
17/031,212	09/24/2020	Scott Twiddy	30232-022001	5866

69713 7590 04/16/2021

OCCHIUTI & ROHLICEK LLP
50 Congress Street
Suite 1000
Boston, MA 02109

EXAMINER	
DARNELL, BAILEIGH K	

ART UNIT	PAPER NUMBER
1743	

NOTIFICATION DATE	DELIVERY MODE
04/16/2021	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):

INFO@ORPATENT.COM

Office Action Summary	Application No. 17/031,212	Applicant(s) Twiddy et al.	
	Examiner BAILEIGH K DARNELL	Art Unit 1743	AIA (FITF) 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 03/04/2021.

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

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

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

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

Disposition of Claims*

5) ☑ Claim(s) 1 and 6-31 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1 and 6-31 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 03/04/2021 is/are: a)☑ accepted or b)☐ objected to by the Examiner.

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

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

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

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

Attachment(s)

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

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

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

4) ☐ Other: _____.

DETAILED ACTION

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 Amendment

The amendment filed 03/04/2021 has been entered. Claims 2-5 have been canceled and claim 31 is a newly submitted claim. Claims 1 and 6-31 remain pending and are the claims addressed below. The objections to the drawings, specification, and claims made in the 12/04/2020 Office action have been overcome and are therefore withdrawn.

Claim Interpretation

Claim 28 recites "substantially stable" in regards to the cured mold material under a build curing condition. This recitation will be interpreted in the rejections below consistent with paragraph [0168] of the originally filed specification, which states, "the cured mold material is substantially stable (*e.g., chemically and/or physically*) under a build curing condition."

Claim 29 recites "substantially stable" in regards to the cured build material under a mold removal condition. This recitation will be interpreted in the rejections below consistent with paragraph [0168] of the originally filed specification, which states, "the cured build material is substantially stable (*e.g., chemically and/or physically*) under the mold removal condition."

Claim 30 recites "sufficiently solidified" in regards to the non-liquid for subsequent incremental deposit of material onto it during the additive fabrication stage. This recitation will be interpreted in the rejections below consistent with paragraph [0007] of the originally filed specification, which states, "in

this non-liquid form the build material is sufficiently solidified for subsequent incremental deposit of material on to it (*e.g., the non-liquid build material can support the weight of incrementally added material and/or the force of the material as it is jetted to, for example, prevent mixing between the build material and the support material*)."

Claim Rejections - 35 USC § 112

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action. Applicant's amendments to the claims overcome the rejections previously made; therefore, the rejections made under this section in the 12/04/2020 Office action are withdrawn.

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 6, 10-11, 13-14 and 16-31 are rejected under 35 U.S.C. 102(a)(2) as being anticipated by SCHMIDT (US 2003/0083771; of record).

As to claim 1: SCHMIDT discloses a method for dispensing a curable phase change material to form a three-dimensional object ([0002]) reading on the claimed method for fabricating a part. The method disclosed in SCHMIDT is performed by using a selective deposition modeling (SDM) apparatus 10 (i.e., additive fabrication stage), such that a three-dimensional object 44 is built on a support structure 46; where the object 44 (i.e., build material) and support structure 46 (i.e., solid mold) are built in a layer by layer manner on a build platform 14 ([0051]; FIG. 1). SCHMIDT discloses the build material and support material being dispensed as discrete droplets 30 in the flowable state, which solidify upon contact with the layer 28 as a result of a phase change (i.e., uncured or incompletely cured form) ([0054]; [0062]). Also, SCHMIDT depicts through illustration, the build material 44 being printed

into a cavity of the solid support material 46 (see annotated FIG. 1 below). Consequently, SCHMIDT reads on the claimed fabricating, in an additive fabrication stage, an object including build material for the part in an uncured or incompletely cured form and a solid mold forming a cavity with a shape of the part and containing the build material.

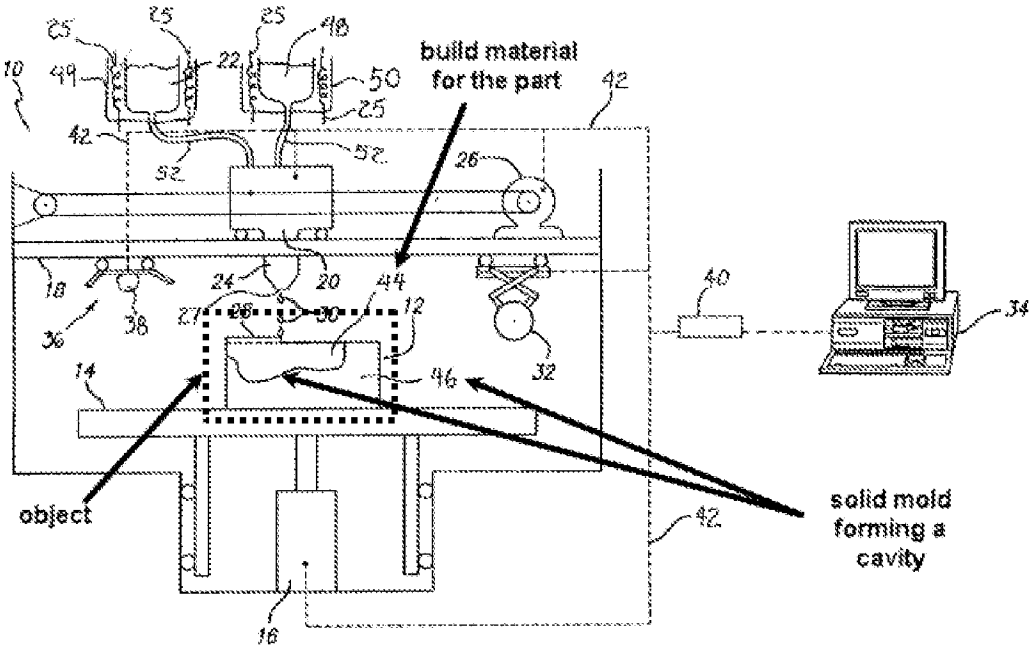

FIG. 1

Furthermore, SCHMIDT discloses using an actinic radiation source 36 in the SDM apparatus 10 ([0060]; FIG. 1); where, after all the material for each layer is dispensed and solidified, a flood exposure is provided by the radiation source 38 (i.e., curing stage) to cure the build material (i.e., curing the part) ([0063]), equivalent to the claimed curing the part, in a curing stage that occurs at least partially after the additive fabrication stage.

As discussed above, SCHMIDT discloses the object 44 (i.e., build material) and support structure 46 (i.e., solid mold) being built in a layer by layer manner (i.e., material that forms the object is deposited incrementally) on a build platform 14 ([0051]; FIG. 1). SCHMIDT further discloses the formulations for the build material and support material being dispensed by the SDM 10 apparatus

while in a flowable state (i.e., liquid phase) and the support material (i.e., solid mold) solidifying substantially upon contact with the build platform 14 for the first layer, and on top of previously formed layers for subsequent layers ([0062]; [0054]). Thus, SCHMIDT reads on the claimed wherein, in the additive fabrication stage, material that forms the object is deposited incrementally including depositing build material for the part in a liquid phase and depositing material for the mold, and during the additive fabrication stage the material for the mold solidified to form the solid mold.

Additionally, SCHMIDT discloses the build material being dispensed as discrete droplets 30 in the flowable state (i.e., liquid) which solidify (i.e., non-liquid) upon contact with layer 28 as a result of a phase change (i.e., phase change mechanism) ([0054]; [0062]; FIG. 1); therefore, SCHMIDT reads on the claimed build material undergoing a phase change mechanism, the phase change mechanism occurring during the additive fabrication stage and causing a phase change of the build material from a liquid to a non-liquid.

Moreover, SCHMIDT discloses using an actinic radiation source 36 in the SDM apparatus 10 ([0060]; FIG. 1); where, after all the material for each layer is dispensed and solidified, a flood exposure is provided by the radiation source 38 to cure the build material ([0063]). SCHMIDT defined "cured" to refer to any polymerization reaction (i.e., distinct polymerization mechanism); preferably a polymerization reaction triggered by exposure to actinic radiation or thermal heat ([0034]). Referring to paragraph [0024] of SCHMIDT's disclosure, it states that radiation is applied to cure every layer or every *few layers* that are deposited. Seeing as the claim does not define "the object", using broadest reasonable interpretation, "the object" as recited in the claim is not confined or limited to a completed object and could therefore be a single layer or a group of at least two layers (i.e., every few layers in SCHMIDT). Hence, in SCHMIDT, if every few layers is being cured and those every few layers constitute the object including build material for the part in an uncured or incompletely cured form and a solid mold forming a cavity with a shape of the part and containing the build material fabricated in an

additive fabrication stage (as established above), then it can be concluded that the radiation being applied to every few layers that are deposited in SCHMIDT's disclosure does in fact read on the claimed distinct polymerization mechanism being initiated *after* the additive fabrication stage. Consequently, SCHMIDT reads on the claimed distinct polymerization mechanism being initiated *after* the additive fabrication stage, occurs during the curing stage, and occurs after the additive fabrication stage of the object, and cures the build material by a polymerization process.

As to claim 6: SCHMIDT remains as applied above. SCHMIDT further discloses the claimed method further including, after the build material is at least partially cured in the curing stage, a part removal stage including removing the mold yielding the fabricated part ([0063]; [0064]).

As to claim 10: SCHMIDT remains as applied above. SCHMIDT discloses SCHMIDT discloses a formulation for a non-curable phase change support material (i.e., the material for the solid mold) ([0047]); where the support material is dispensed in the flowable state, and solidifies upon contact with layer 28 as a result of a phase change ([0054]; [0062]), equivalent to the claimed material for the mold solidifying by undergoing a physical phase change.

As to claim 11: SCHMIDT remains as applied above. SCHMIDT discloses the formulation of the non-curable phase change support material (i.e., the material for the solid mold) being cooled to ambient temperature wherein it transitions from the flowable to the non-flowable state ([0047]) reading on the claimed wherein undergoing the physical phase change includes allowing the material for the mold to cool.

As to claim 13: SCHMIDT remains as applied above. SCHMIDT further discloses the claimed wherein incrementally depositing material for the object includes depositing a plurality of layers of material ([0024]; [0051]).

As to claim 14: SCHMIDT remains as applied above. SCHMIDT further discloses the claimed at least some layers of material of the plurality of layers of material are deposited using a jetting process ([0005]; [0051]).

As to claim 16: SCHMIDT remains as applied above. SCHMIDT discloses multiple print heads being used to dispense the build and support materials ([0059]) reading on the claimed at least some of the layers being added using two or more print heads.

As to claim 17: SCHMIDT remains as applied above. SCHMIDT discloses the curable phase change build material formulation generally comprising between about 20% to about 40% by weight of high molecular monomers and oligomers, between about 10% to about 60% by weight of low molecular weight monomers, between about 1% to about 6% by weight of a photo-initiator (i.e., polymerization initiation catalyst), and between about 5% to about 25% by weight wax ([0043]). Thus, SCHMIDT reads on the claimed wherein depositing the build material includes depositing polymerization initiation catalyst.

As to claim 18: SCHMIDT remains as applied above. SCHMIDT discloses using multiple print heads to dispense the materials, each print head being dedicated to dispensing either or both of the materials ([0059]); meaning a print head is dedicated to dispensing the build material containing the photo-initiator (i.e., polymerization initiation catalyst) and a print head is dedicated to dispensing the support material. The claim does not require that the first print head *only* dispenses the polymerization initiation catalyst; and because SCHMIDT discloses a print head dedicated to dispensing the build material and therefore also the photo-initiator (i.e., polymerization initiation catalyst), it can be concluded that SCHMIDT reads on the claimed wherein depositing the layers includes depositing a plurality of material components from a corresponding plurality of print heads, a first print head of the plurality of print heads depositing the polymerization initiation catalyst.

As to claim 19: SCHMIDT remains as applied above. SCHMIDT further reads on the claimed polymerization initiation catalyst being mixed with the build material ([0043]).

As to claim 20: SCHMIDT remains as applied above. SCHMIDT discloses the claimed wherein incrementally depositing the layers further includes depositing at least some layers including only mold material ([0066]; [0053]).

As to claim 21: SCHMIDT remains as applied above. SCHMIDT discloses removing the support material (i.e., solid mold) ([0064]) and therefore reads on the claimed removing the solid mold.

As to claim 22: SCHMIDT remains as applied above. SCHMIDT further discloses the claimed wherein removing the solid mold includes at least one of dissolving the solid mold, mechanically removing the solid mold, and liquefying the solid mold ([0064]).

As to claim 23: SCHMIDT remains as applied above. SCHMIDT discloses the claimed build material comprising a wax after the phase change mechanism ([0043]).

As to claim 24: SCHMIDT remains as applied above. SCHMIDT further discloses the claimed build material comprising a liquid prior to the phase change mechanism ([0054]; [0062]).

As to claim 25: SCHMIDT remains as applied above. SCHMIDT further discloses the claimed curing the part includes heating the build material ([0034]).

As to claim 26: SCMIDT remains as applied above. SCHMIDT further reads on the claimed build material undergoing a phase change of the build material to a liquid phase during the curing stage ([0034]).

As to claim 27: SCHMIDT remains as applied above. SCHMIDT discloses the curable phase change build material formulation generally comprising between about 20% to about 40% by weight of high molecular monomers (i.e., polymerization precursor) and oligomers, between about 10% to about 60% by weight of low molecular weight monomers, between about 1% to about 6% by weight of a

photo-initiator, and between about 5% to about 25% by weight wax ([0043]). Thus, SCHMIDT reads on the claimed build material comprising a polymerization precursor.

As to claim 28: SCHMIDT remains as applied above. Given the interpretation of "the cured mold material" being interpreted as "the solidified mold material", as discussed above under 35 USC 112(b), it can be concluded that SCHMIDT also reads on the claimed cured (i.e., solidified) mold material is substantially stable a build curing condition as SCHMIDT discloses the support material remaining until the three-dimensional object has been formed, and once the three-dimensional object is formed the support material (i.e., solidified mold material) is removed ([0063]); thus, the support material in SCHMIDT would have to be substantially stable (e.g., chemically and/or physically; see claim interpretation section above) under a build curing condition.

As to claim 29: SCHMIDT remains as applied above. SCHMIDT also reads on the claimed cured build material being substantially stable under a mold removal condition ([0034]; [0064]).

As to claim 30: SCHMIDT remains as applied above. SCHMIDT further reads on the claimed non-liquid being sufficiently solidified for subsequent incremental deposit of material onto it during the additive fabrication stage ([0054]; [0062]).

As to claim 31: SCHMIDT remains as applied above. Given the interpretation of SCHMIDT discussed in the rejection of claim 1, it can be concluded SCHMIDT also reads on the claimed during the curing stage and after the fabrication stage, the solid mold forms a solid cavity holding the build material for the part in a liquid phase (see the rejection of claim 1; see also SCHMIDT: [0024]; [0034]; [0054]; [0060]; [0062]; [0063]).

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 7-9 and 12 are rejected under 35 U.S.C. 103 as being unpatentable over SCHMIDT (US 2003/0083771; of record) in view of WU et al. (US 2019/0389139; of record). SCHMIDT teaches the subject matter of claim 1 and claim 10 above under 35 USC 102(a)(2).

As to claim 7: SCHMIDT remains as applied above. SCHMIDT discloses the support material (i.e., solid mold material) formulation comprising octadecanol and a tackifier ([0047]); however, SCHMIDT discloses the UV radiation curing the build material but not curing the support material ([0063]). Thus, SCHMIDT fails to disclose the claimed material for the mold solidifying by a curing process.

However, WU teaches a method of selectively depositing layers of a fluid build material to form a 3D article, and supporting at least one of the layers of the build material with a support material ([0013]). WU further teaches support materials for use with a 3D printing system which comprise one or more components that provide mechanical structure to removable supporting portion of a printed 3D article formed from the support material ([0096]). Additionally, WU teaches these components being "phase change" components that undergo a rapid phase change (e.g., fluid to solid) upon deposition and in certain instances components of a support material are curable ([0096]). The support material in WU includes a phase change wax component, tackifier component and a phosphor component ([0098]); where the support material can also include a curable morpholine component which is a chemical species including one or more curable or polymerizable moieties ([0111]). Moreover, WU teaches when used in a material deposition method of printing a 3D article, the support material is also subjected to curing ([0136]); where curing in WU is accomplished using an electromagnetic radiation source that emits UV, visible, or infrared light ([0047]).

It would have been prima facie obvious to one of ordinary skill in the art before the effective filing date of the invention to incorporate the support material (i.e., mold material) including a component which is curable taught by WU into SCHMIDT. Doing so is combining prior art elements according to known methods to yield predictable results; with the added benefit of the curable

components used, generating a support material which is deposited in a shape-unstable or quasi-unstable state and then cured (e.g., polymerized) to form a shape-stable voxel of material, which in turn provides a more stable mechanical structure to portions of a 3D article being formed ([0096]), as recognized by WU.

As to claim 8: SCHMIDT and WU remain as applied above and therefore read on the claimed wherein curing the deposited mold material includes causing the deposited mold material to polymerize, for similar motivation discussed in the rejection of claim 7.

As to claim 9: SCHMIDT and WU remain as applied above and therefore read on the claimed wherein the mold material includes a photo-curable material and the curing process includes applying light to the deposited mold material, for similar motivation discussed in the rejection of claim 7.

As to claim 12: SCHMIDT and WU remain as applied above and therefore read on the claimed material for the mold comprising a wax, for similar motivation discussed in the rejection of claim 7.

Claim 15 is rejected under 35 U.S.C. 103 as being unpatentable over SCHMIDT (US 2003/0083771; of record) in view of NIELSEN et al. (US 2005/0023719; of record). SCHMIDT teaches the subject matter of claim 13 above under 35 USC 102(a)(2).

As to claim 15: SCHMIDT remains as applied above. SCHMIDT discloses the SDM apparatus dispensing a UV curable phase change material to form the object, and another non-curable phase change material to form supports for the object, as needed ([0046]). Though, SCHMIDT fails to explicitly disclose the claimed material for the mold deposited in a second layer of the plurality of layers is deposited on the build material deposited in a first layer of the plurality of layers deposited prior to the second layer.

However, NIELSEN teaches solid freeform fabrication system which utilizes the separate solidification of build material and support material (title). NIELSEN further teaches the solid freeform

fabrication system including a dispensing system such as an ink-jet dispensing system, a curing system and a build platform; the ink-jet dispensing system including both build material for forming three dimensional objects, as well as support material for supporting the build material as it hardens ([0004]). Also, FIG. 2 in NIELSEN depicts a plurality of layers where the support material (i.e., mold material) is deposited in a second layer of the plurality of layers is deposited on the build material deposited in a first layer of the plurality of layers deposited prior to the second layer (FIG. 2 – build material 14, support material 16; [0031]; [0032]).

It would have been prima facie obvious to one of ordinary skill in the art before the effective filing date to incorporate the second layer of support material, in a layer deposited prior to a first layer of build material, taught by NIELSEN into SCHMIDT. NIELSEN recognizes doing so to be advantageous as this allows for dispensing a build material and a support material and then separately or sequentially curing the build material and the support material ([0006]; [0031]) which prevents mixing between the build material and the support material at an interface where they contact one another ([0006]) and ultimately reduces rough surfaces formed at interface areas which remain on the build material once the support material is removed ([0004]; [0006]).

Response to Arguments

Applicant's arguments filed 03/04/2021 have been fully considered but they are not persuasive.

Applicant argues that SCHMIDT fails to disclose "*the distinct polymerization mechanism is initiated **after** the additive fabrication stage*" when fabrication of "*the object including build material for the part in an uncured or incompletely cured form and a solid mold forming a cavity with a shape of the part and containing the build material*" is complete, as now required by amended independent claim 1.

Applicant asserts that SCHMIDT doesn't disclose this feature because SCHMIDT describes initiating curing ***during*** (i.e., for every layer or few layers) and not after an additive fabrication stage.

Applicant points to paragraphs [0024] and [0034] cited by the Examiner as disclosing the features of claim 2 (now incorporated into independent claim 1); Applicant acknowledges that SCHMIDT describes the fabrication and curing of multiple layers at a time, but that these paragraphs do not describe or suggest that any curing mechanism "*is initiated **after** the additive fabrication stage*."

The Examiner respectfully disagrees. The claim does not define "the object", using broadest reasonable interpretation, "the object" as recited in the claim is not confined or limited to a completed object and could therefore be a single layer or a group of at least two layers (i.e., every few layers in SCHMIDT). Hence, in SCHMIDT, if "every few layers" are being cured and those "every few layers" constitute the object including build material for the part in an uncured or incompletely cured form and a solid mold forming a cavity with a shape of the part and containing the build material fabricated in an additive fabrication stage (as established above in the rejection of claim 1), then it can be concluded that the radiation being applied to every few layers that are deposited in SCHMIDT's disclosure does in fact read on the claimed distinct polymerization mechanism being initiated *after* the additive fabrication stage. In order for the Applicant to overcome the SCHMIDT reference applied in the rejections above in regards to the distinct polymerization mechanism being initiated after the additive fabrication stage, the Examiner recommends further defining the object recited in the claims such that it is consistent with Applicant's FIG. 5 as filed which illustrates a completed object/part being cured where the polymerization mechanism is initiated to cure the part after the additive fabrication stage.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: GARDINER et al. (US 2016/0001461) and KUESTER et al. (US 2021/0060869) teach a method for manufacturing a hollow article by using an additive manufacturing system to form a precursory structure including injecting uncured liquid flexible polymer material into an outer cavity of the

precursory structure and then curing and solidifying the uncured liquid flexible polymer to provide cured and solidified flexible polymer material pertinent to the newly added subject matter presented in claim 31.

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

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BAILEIGH K. DARNELL whose telephone number is (469)295-9287. The examiner can normally be reached on M-F, 9am-5pm, MST.

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, Joseph S. Del Sole can be reached on (571)272-1130. 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 https://ppair-my.uspto.gov/pair/PrivatePair. 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.

/BAILEIGH KATE DARNELL/
Examiner, Art Unit 1743

/JOSEPH S DEL SOLE/
Supervisory Patent Examiner, Art Unit 1743