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[Continued on next page]

(54) Title: APPARATUS FOR PRODUCING AN OBJECT BY MEANS OF ADDITIVE MANUFACTURING AND METHOD FOR CALIBRATING AN APPARATUS

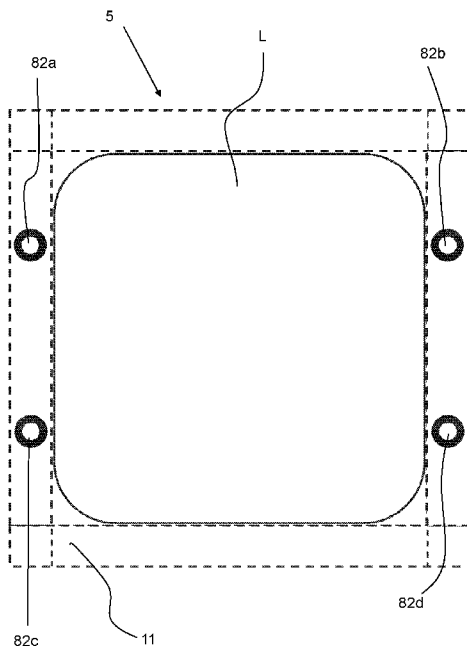


Fig. 3

(57) Abstract: The invention relates to an apparatus and method for producing an object by means of additive manufacturing. The apparatus comprises a process chamber for receiving a bath of material which can be solidified by exposure to electromagnetic radiation; a support for positioning the object in relation to the surface level of the bath of material; and a solidifying device for solidifying a layer of the material on the surface level by means of electromagnetic radiation. According to the invention, a registering device is provided for registering a characteristic of a calibration area related to the surface level of the bath of material. Furthermore, a control unit connected to the registering device is provided. The control unit is arranged for using the characteristic of the calibration area obtained by the registering device for controlling the position of the electromagnetic radiation emitted by the solidifying device.



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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
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ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B29C G01S

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 832 415 A (WILKENING CHRISTIAN [DE] ET AL) 3 November 1998 (1998-11-03) cited in the application	1-3,5-11
A	claim 15 column 3, line 46 - line 63 column 5, line 8 - line 17 -----	4
A	US 5 133 987 A (SPENCE STUART T [US] ET AL) 28 July 1992 (1992-07-28) claims column 6, line 19 - line 23 column 7, line 50 - column 9, line 49 column 10, line 38 - line 65 ----- -/--	1-11

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

21 July 2016

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INTERNATIONAL SEARCH REPORT

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PCT/NL2015/050819

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4 818 562 A (ARCELLA FRANK G [US] ET AL) 4 April 1989 (1989-04-04)	20
A	figure 1	1-11
	column 2, line 41 - column 4, line 54	
	column 5, line 16 - line 37	

A	DE 10 2005 025348 A1 (TRUMPF WERKZEUGMASCHINEN GMBH [DE])	1-11
	14 December 2006 (2006-12-14)	
	paragraph [0004] - paragraph [0012]	
	paragraph [0015]	
	paragraph [0019]	
	paragraph [0035]	
	figures 1,2	

X	WO 94/16875 A1 (EOS ELECTRO OPTICAL SYST [DE]; REICHLER JOHANNES [DE]; LANGER HANS J [D]) 4 August 1994 (1994-08-04)	12-19
Y	figures	20
	claims	
	page 5	

X	WO 2013/036942 A1 (PELL BARNEY D [US])	21-30
	14 March 2013 (2013-03-14)	
	page 3, line 8 - line 9	
	page 14, line 3 - page 16, line 9	

X	US 2012/092724 A1 (PETTIS NATHANIEL B [US]) 19 April 2012 (2012-04-19)	31-46
	paragraph [0042] - paragraph [0072]	
	figure 3	

X	KR 101 400 875 B1 (KIM HYUN JAE [KR])	31-45
	2 June 2014 (2014-06-02)	
	abstract	

X	CN 103 414 792 A (CHINESE ACAD INST AUTOMATION; DONGGUAN CAS CLOUD COMPUTING INDUSTRY TE) 27 November 2013 (2013-11-27)	31-45
	abstract	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/NL2015/050819

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-11

Apparatus and method for calibrating a laser sintering process

2. claims: 12-20

Apparatus and method for producing an object by means of additive manufacturing using a plurality of solidifying devices

3. claims: 21-30

Modular apparatus for producing an object by means of additive manufacturing and interconnecting module therefore

4. claims: 31-46

System for producing an object by means of additive manufacturing via a public network

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/NL2015/050819

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