



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: PCT/US94/02024 (22) International Filing Date: 16 February 1994 (16.02.94) (30) Priority Data: 08/019,470 18 February 1993 (18.02.93) US (71) Applicant: MASSACHUSETTS INSTITUTE OF TECHNOLOGY [US/US]; 77 Massachusetts Avenue, Cambridge, MA 02139 (US). (72) Inventors: SACHS, Emmanuel, M.; 14 Liberty Avenue, Somerville, MA 02144 (US). CURODEAU, Alain; 305 Memorial Drive #512A, Cambridge, MA 02139 (US). FAN, Tailin; 784 Main Street #5, Cambridge, MA 02139 (US). BREDT, James, F.; 73 Templeton Parkway, Watertown, MA 02172 (US). CIMA, Michael; 28 Burlington Street, Lexington, MA 02173 (US). BRANCAZIO, David; 159 Sherman Street #2, Cambridge, MA 02140 (US). (74) Agents: O'CONNELL, Robert, F. et al.; Dike, Bronstein, Roberts & Cushman, 130 Water Street, Boston, MA 02109 (US).</p>	<p>(81) Designated States: CA, JP, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published With international search report. (88) Date of publication of the international search report: 27 October 1994 (27.10.94)</p>	
<p>(54) Title: HIGH SPEED, HIGH QUALITY THREE DIMENSIONAL PRINTING</p>		
<div> </div>		
<p>(57) Abstract</p>		
<p>A system for producing three dimensional components by bonding together successive layers of a porous material with droplets of a binder material. A binder printhead has an array of nozzles which controllably supply jets of binder material droplets to the layers of porous material. The printhead is scanned in a raster scan fashion over each layer of porous material along a first scan axis in one direction to provide first fast scanning paths of droplets. The printhead is then moved laterally of such one direction and is then moved along the fast scan axis in the opposite direction to provide second fast scanning paths of droplets which are interlaced with the first scanning paths. The supply of the droplets to the porous material can be controlled so as to control the overlapping thereof to produce various desired surface and interior characteristics of the components.</p>		

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INTERNATIONAL SEARCH REPORT

In ternational application No.
PCT/US94/02024

A. CLASSIFICATION OF SUBJECT MATTER
IPC(5) :B05C 11/00, 5/00; B32B 31/00; G01D 15/18
US CL :Please See Extra Sheet.
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)
U.S. : Please See Extra Sheet.

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P ----- Y,P	US, A, 5,204,055 (SACHS ET AL) 20 April 1993, see entire document.	1-2 ----- 3-15
Y	US, A, 4,158,204 (KUHN ET AL) 12 June 1979, see entire document.	3-15
A	US, A, 4,575,330 (HULL) 11 March 1986, see entire document.	1-17
A	US, A, 4,665,492 (MASTERS) 12 May 1987, see entire document.	1-17
A	US, A, 3,999,188 (YAMADA) 21 December 1976, see entire document.	1-17
A	US, A, 4,129,875 (ITO ET AL) 12 December 1978, see	1-17

Further documents are listed in the continuation of Box C. See patent family annex.

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"O" document referring to an oral disclosure, use, exhibition or other means	
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PCT/US94/02024

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US, A, 4,791,434 (WILLS) 13 December 1988, see entire document.	1-17
A	US, A, 5,136,515 (HELINSKI) 04 August 1992, see entire document.	1-17
A	US, A, 5,059,266 (YAMANE ET AL) 22 October 1991, see entire document.	1-17
A	NAMRAC Proceedings, Symposium #15, undated, Deckard et al, "Solid Freeform Fabrication and Selective Powder Sintering", pages 636-640.	1-17
A	Cadence, April 1989, T. Wohlers, "Creating Parts by the Layers", pages 73-76.	1-17

INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER:

US CL :

118/688, 712, 697, 620, 315, 323; 156/64, 356; 239/690, 695; 347/1

B. FIELDS SEARCHED

Minimum documentation searched

Classification System: U.S.

118/688, 712, 697, 620, 315, 323, 669, 663, 623, 624, 625, 636, 313; 156/64, 356; 239/690, 695; 347/1, 82, 78, 79, 80; 264/113, 128; 425/472