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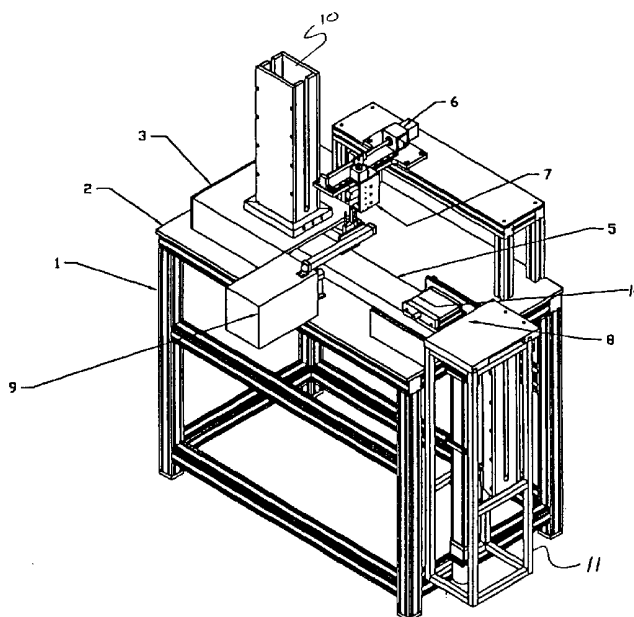
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(54) Title: APPARATUS AND METHOD FOR THE AUTOMATED PREPARATION OF BIOPOLYMER CRYSTALS WITH HIGH OUTPUT



(57) Abstract: A fully automated, high output robotic station for the crystallization of proteins and other biopolymers via the sitting drop vapor diffusion and micro-batch methods. This station performs microplate feeding, liquid aspiration, dilution, and dispensing, as well as microplate sealing and storage into a temperature controlled hotel. All functions are microprocessor controlled. The operator designs the process via graphical user interface, after which the station executes the process automatically to completion.



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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
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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)

IPC 7 C30B

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 practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	US 6 296 673 B1 (JAKLEVIC JOSEPH M ET AL) 2 October 2001 (2001-10-02) column 8, line 66 -column 10, line 44; figure 1 ---	1,3-14
X	WO 93 07311 A (SCHERING CORP) 15 April 1993 (1993-04-15) the whole document ---	1-14
Y	---	15
Y	GB 2 249 492 A (DOUGLAS INSTR LTD ;IMPERIAL COLLEGE (GB)) 13 May 1992 (1992-05-13) the whole document ---	15
A	US 5 013 531 A (SNYDER ROBERT S ET AL) 7 May 1991 (1991-05-07) column 5, line 44 -column 6, line 48; figure 2 ---	1-14
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☒ Patent family members are listed in annex.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CHAYEN N E ET AL: "MICROBATCH CRYSTALLIZATION UNDER OIL - A NEW TECHNIQUE ALLOWING MANY SMALL-VOLUME CRYSTALLIZATION TRIALS" JOURNAL OF CRYSTAL GROWTH, NORTH-HOLLAND PUBLISHING CO. AMSTERDAM, NL, vol. 122, no. 1 / 4, 2 August 1992 (1992-08-02), pages 176-180, XP000306492 ISSN: 0022-0248 figure 3 ---	1-14
A	DE 198 43 655 A (MAX PLANCK GESELLSCHAFT ;BAYER AG (DE)) 30 March 2000 (2000-03-30) ---	
A	US 5 873 394 A (MELTZER WALTER CARL) 23 February 1999 (1999-02-23) ---	
A	EP 0 225 050 A (FUJITSU LTD) 10 June 1987 (1987-06-10) ---	
A	US 5 096 676 A (MCPHERSON ALEXANDER ET AL) 17 March 1992 (1992-03-17) -----	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 01/48151

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6296673	B1	02-10-2001	AU 5599600 A EP 1204467 A1 WO 0078445 A1	09-01-2001 15-05-2002 28-12-2000
WO 9307311	A	15-04-1993	US 5221410 A AU 2764492 A CA 2120744 A1 EP 0553539 A1 EP 0607262 A1 JP 7500806 T MX 9205727 A1 WO 9307311 A1	22-06-1993 03-05-1993 15-04-1993 04-08-1993 27-07-1994 26-01-1995 01-04-1993 15-04-1993
GB 2249492	A	13-05-1992	NONE	
US 5013531	A	07-05-1991	NONE	
DE 19843655	A	30-03-2000	DE 19843655 A1	30-03-2000
US 5873394	A	23-02-1999	AU 8177698 A EP 1017581 A1 JP 2002511795 T WO 9901341 A1	25-01-1999 12-07-2000 16-04-2002 14-01-1999
EP 0225050	A	10-06-1987	JP 1643282 C JP 3003640 B JP 62106000 A DE 3684762 D1 EP 0225050 A2 US 4755363 A	28-02-1992 21-01-1991 16-05-1987 14-05-1992 10-06-1987 05-07-1988
US 5096676	A	17-03-1992	NONE	