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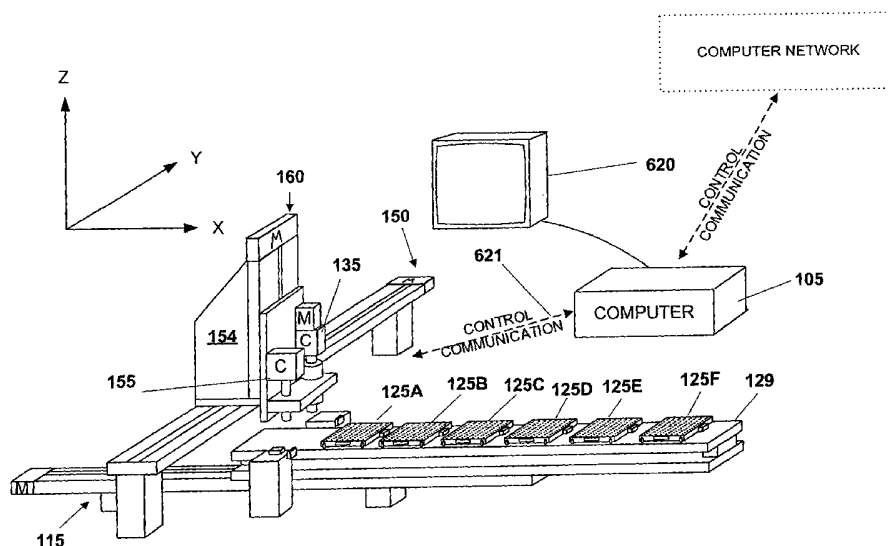
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[Continued on next page]

(54) Title: AUTOMATED VERIFICATION AND INSPECTION DEVICE FOR SEQUENTIALLY INSPECTING MICROSCOPIC CRYSTALS



(57) Abstract: A method and device for inspecting and classifying a plurality of microscopic crystals. An indexing device (105, 115, 150 and 160) sequentially places microscopic crystals in cameraview of a camera (135, 155). The camera (135, 155) takes images of the microscopic crystals and then transfers the images to a computer (105) where they are received. The computer then classifies the images. The computer (105) is also programmed to control the indexing device and the camera. In a preferred embodiment, the microscopic crystals are protein crystals that have been grown in the wells of micro-well plates (125A-125F). Also, preferably, the computer is programmed to automatically classify the images.



WO 03/034030 A3



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# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/33150

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>				
IPC(7) : 382/128 US CL : G06K 9/00				
According to International Patent Classification (IPC) or to both national classification and IPC				
<b>B. FIELDS SEARCHED</b>				
Minimum documentation searched (classification system followed by classification symbols) U.S. : G06K 9/00, 382/128, 141; 117/68;				
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) IEEE Search terms: crystal, microwell				
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>				
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
X,P --- Y,P	US 6,368,402 B2 (DETTITA et al.) 09 April 2002 (09.04.2002) figures 1-4, 8, 9, col. 9, ll. 52-57, col. 10, ll. 38-53, 63-65, col. 11, ll. 7-9, 14-23,	1,2,5,6,10,13,14,17,18 ,22,30,31,34,35,39 ----- 3, 4,7-9, 11, 12, 15, 16, 19-21, , 23-29, 32, 33, 36-38, 40, 41		
Y	US 6,259,960 B1 (INOKUCHI) 10 July 2001(10.07.2001) Col. 7, ll. 36-40, 60-65, col. 17, ll. 18-26 col. 18, ll. 23-41, fig. 1.	9, 11, 12, 21, 23, 24, 38, 40, 41		
Y	Jurisica et al. Intelligent decision support for protein crystal growth, IBM Systems Journal, Vol. 40. no. 2, 2001, pages 394-409	3, 15, 32		
Y, P	US 6,388,788 B1 (HARRIS et al.) 14 May 2002 (14.05.2002) Col. 16, ll. 53-56, col. 14, l. 66, col. 15, ll. 3-10.	7, 19, 36		
Y	Anonymous, Open for Inspection: Parker Daedal's new Positioner designed for Inspection Applcaitons, January 1998, Automation Update Jan. 1998 Newsletter, www.texonics.com/Newsletters/archivedarticles/ 1998/0198newsletter.pdf, entire article	7, 19, 36		
Y	US 6,061,086 (REIMER et al.) 09 May 2000 (09.05.2000) fig. 3, col. 6, ll. 62-63, col. 6, l. 63-col. 7, l. 1, col. 7, ll. 20-29	8, 20, 37		
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.				
<p>* Special categories of cited documents:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </td> <td style="width: 50%; border: none;"> <p>"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</p> <p>"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</p> <p>"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</p> <p>"&amp;" document member of the same patent family</p> </td> </tr> </table>			<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"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</p> <p>"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</p> <p>"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</p> <p>"&amp;" document member of the same patent family</p>
<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"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</p> <p>"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</p> <p>"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</p> <p>"&amp;" document member of the same patent family</p>			
Date of the actual completion of the international search		Date of mailing of the international search report		
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Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703)305-3230		Authorized officer <i>Amelia Au</i> Amelia Au Telephone No. (703) 305-3900		

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PCT/US02/33150

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 6,226,392 B1 (BACUS et al.) 01 May 2001 (01.05.2001) fig. 4B, col. 8, ll. 56-62	25, 26
Y	GB 2310925 A (GLAZER et al.) 10 September 1997 (10.09.1997) fig. 1, p. 2, second paragraph	27