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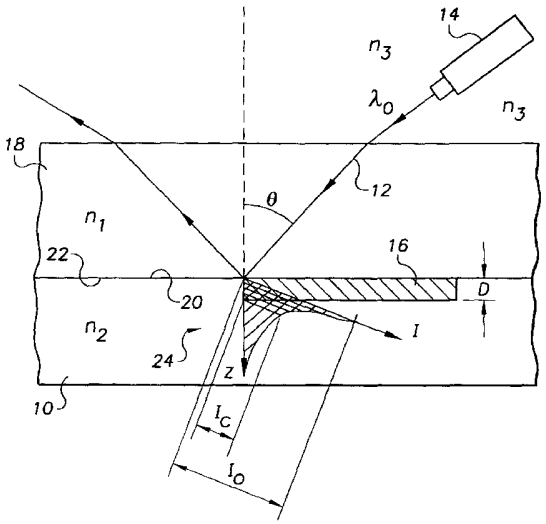
(54) Title: METHOD OF CURING A PHOTOSENSITIVE MATERIAL USING EVANESCENT WAVE ENERGY



(57) Abstract: A method of curing a photosensitive material (10) having a critical electrical field amplitude (Ic) at which photoinitiation occurs. The method includes contacting the photosensitive material, e.g., a photoinitiator/monomer resin system, with a substrate (18) having surface (22), such as an optical element, so as to form an interface (20) between the photosensitive material and the substrate surface. A light beam (12) from source (14) is directed into the substrate, such that the light beam is totally internally reflected from the interface within the substrate, so that an evanescent wave is created in the photosensitive material with amplitude (I). In order for curing to occur in photoinitiation region (16) to depth (I), the electric field amplitude (Io) of the evanescent wave at the interface must be least equal to the critical electric field amplitude of the photosensitive material.

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :C08J 7/18; C08F 2/46, 2/48; B05D 5/06; B05C 3/18
US CL :427/510,512,508,164,165,169; 118/620; 428/156,195,220,411.1,426
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. : 427/508,510,512,508,164,165,169; 428/411.1,426,156,195,220; 118/620; 359/896

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)

EAST (critical adj field adj amplitude)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 4,752,498 A (FUDIM) 21 June 1988 (21/06/88), see the abstract; figures; col. 2, lines 17-68; col. 3, lnes 20-46+ ; col. 4, lines 18-68.	1-5,10-11, 14-19,22, 24,27-28, 33,35,38 --- 7-9,12-13, 21,23,25, 26,30,34, 36-37

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

*	Special categories of cited documents:	"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
"A"	document defining the general state of the art which is not considered to be of particular relevance	"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
"E"	earlier document published on or after the international filing date	"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
"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)	"&"	document member of the same patent family
"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		

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 MARIANNE L. PADGETT DEBORAH THOMAS PAT. LEGAL SPECIALIST Telephone No. (703) 308-2336

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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.
X ----- Y	US 5,169,677A (SANGYOJI et al) 08 December 1992 (08/12/92), see the abstract; figures 4-15; col. 1, lines 9-15; col. 2, line 60-col. 3, line 27.	1-5,7-11, 14-19,21-23,25,26, 28,33-34, 37-38 ---------- 12-13,24, 30,35
Y ---- X	US 6,159,536 A (KIMBALL et al) 12 December 2000 (12/12/00), see abstract; figures, claims.	1,3-5,7-11, 14-15,17-19,21-23 26-28,33-34,37-38 ---------- 2,12-13,16, 24-25,30 35-36
X ----- Y	US 6,042,894 A (GOTO et al) 28 March 2000 (28/03/00), see the abstract; Figures, esp. 1C, 1M, 5D; col. 6, lines 26-31; col. 19, lines 34-68; claims.	1,3-5,7,10, 11,14-15 18-19,21, 22,25,27, 28,33,36, 38 ---------- 12-13,30, 35
A	US 5,076,974 A (MODREK et al) 31 December 1991 (31/12/91), see the abstract; Figure 5; col 10, lines 24-34.	

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BOX I. OBSERVATIONS WHERE CLAIMS WERE FOUND UNSEARCHABLE
2. Where no meaningful search could be carried out, specifically:

there is no meaningful structural limitation in claim 29 and the like limitation in independent claim 31 limitation choice of wavelengths is a method limitation, and what wavelength is used, is not defined, but the thickness is then claimed to be limited by this underifned limitation. As written claims 6 and 20 can not be examined, because it is unknown what index is being match to what, and how they correspond, although it can be assumed that the index being refered to is the index of refraction.