

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
26 February 2004 (26.02.2004)

PCT

(10) International Publication Number
WO 2004/017095 A3

(51) International Patent Classification⁷: **C09K 11/06**,
G03F 7/00, G01T 1/24, G03F 7/025, C09K 9/02

(21) International Application Number:
PCT/US2003/025234

(22) International Filing Date: 13 August 2003 (13.08.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/403,599 14 August 2002 (14.08.2002) US

CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC,
SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA,
UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:
— of inventorship (Rule 4.17(iv)) for US only

Published:
— with international search report
— before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments

(71) Applicant (*for all designated States except US*): **JP LAB-
ORATORIES, INC.** [US/US]; 120 Wood Avenue, Middle-
sex, NJ 08846 (US).

(72) Inventor; and

(75) Inventor/Applicant (*for US only*): **PATEL, Gord-
hanbhai, N.** [US/US]; 133 Walnut Avenue, Somerset, NJ
08873 (US).

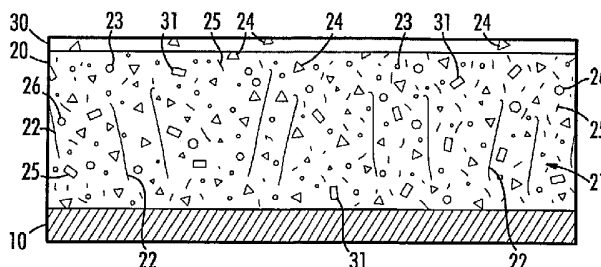
(74) Agents: **HARDAWAY, John, B., III** et al.; NEXSEN
PRUET JACOBS & POLLARD, LLC, P.O. Box 10107,
Greenville, SC 29603 (US).

(88) Date of publication of the international search report:
24 June 2004

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,

*For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.*

(54) Title: THICK RADIATION SENSITIVE DEVICES



(57) Abstract: Described is radiation sensitive imaging and dosimeter composition (20) containing a radiation sensitive material (21), e.g., a diacetylene (R-C≡C-C≡C-R', where R and R' are substituent groups) or a radiochromic dye, a polymeric binder (22) and optionally a solvent (23) and/or an activator (24). Radiation sensitive materials are incorporated into a moldable or castable material and are molded or casted into shaped-articles (100), such as coatings, films, fiber, plaques, rods and blocks. Upon exposure to high-energy radiations, radiation sensitive material develops color thereby producing a visible image. Because of the higher thickness, a significantly lower dose of radiation can be monitored and an image is produced in three dimensions. Materials, processes and usages for thick radiation sensitive devices are described. A thick block can be used for monitoring radiation dosages in the three dimensions.

WO 2004/017095 A3

INTERNATIONAL SEARCH REPORT

Application No
PCT/US 03/25234

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C09K11/06 G03F7/00 G01T1/24 G03F7/025 C09K9/02

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 C09K G01T G03F

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, WPI Data, PAJ, INSPEC, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 96/21885 A (PATEL GORDHANBHAI N ;CHENG YAO MING (US); JP LAB INC (US); PATEL S) 18 July 1996 (1996-07-18) the whole document	1-6, 12-19, 21-27, 31, 33-41, 43
X	US 4 918 317 A (HESS TODD M ET AL) 17 April 1990 (1990-04-17) the whole document	1-5, 7, 8, 12, 17-27, 33, 34, 37-39, 41, 43
	----- -/--	

Further documents are listed in the continuation of box C. Patent family members are listed in 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 document 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.
- *Z* document member of the same patent family

Date of the actual completion of the international search 5 April 2004	Date of mailing of the international search report 16. 04. 2004
---	--

Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Lehnert, A
--	--------------------------------------

INTERNATIONAL SEARCH REPORT

Application No
PCT/US 03/25234

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>HSU C-K; AL-SHEIKLY M; MCLAUGHLIN W L; CHRISTOU A: "RADIOCHROMIC THIN-FILM SENSOR USING BLUE TETRAZOLIUM IN POLYVINYL ALCOHOL" MATERIALS RESEARCH SOCIETY SYMPOSIUM PROCEEDINGS, THIN FILMS -STRUCTURE AND MORPHOLOGY, vol. 441, 1997, XP008029266 the whole document</p>	<p>1-5,7, 17-21, 26,33, 34,37, 38,41,43</p>
X	<p>AL-SHEIKHLY M; MCLAUCHLIN W L; CHRISTOU A; OVACS A: "RADIOCHROMIC BLUE TETRAZOLIUM FILM DOSIMETER" PROCEEDINGS OF THE SYMPOSIUM ON TECHNIQUES FOR HIGH DOSE DOSIMETRY IN INDUSTRY, AGRICULTURE, AND MEDICINE, INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, November 1998 (1998-11), pages 59-63, XP008029270 the whole document</p>	<p>1-5,7, 17-21, 26,33, 34,37, 38,41,43</p>
X	<p>ABDEL-FATTAH A A ET AL: "Temperature, humidity and time. Combined effects on radiochromic film dosimeters" RADIATION PHYSICS AND CHEMISTRY, ELSEVIER SCIENCE PUBLISHERS BV., AMSTERDAM, NL, vol. 47, no. 4, 1 April 1996 (1996-04-01), pages 611-621, XP004051052 ISSN: 0969-806X the whole document</p>	<p>1-5,7, 17-21, 26,33, 34,37, 38,41,43</p>
X	<p>MCLAUGHLIN W L ET AL: "SENSITOMETRY OF THE RESPONSE OF A NEW RADIOCHROMIC FILM DOSIMETER TO GAMMA RADIATION AND ELECTRON BEAMS" NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH, SECTION - A: ACCELERATORS, SPECTROMETERS, DETECTORS AND ASSOCIATED EQUIPMENT, NORTH-HOLLAND PUBLISHING COMPANY. AMSTERDAM, NL, vol. A302, no. 1, 1 April 1991 (1991-04-01), pages 165-176, XP000227702 ISSN: 0168-9002 the whole document</p>	<p>1-5,7, 17-21, 26,33, 34,37, 38,41,43</p>
X	<p>VATNITSKY S M: "Radiochromic Film Dosimetry for Clinical Proton Beams" APPLIED RADIATION AND ISOTOPES, PERGAMON PRESS LTD., EXETER, GB, vol. 48, no. 5, 1 May 1997 (1997-05-01), pages 643-651, XP004065297 ISSN: 0969-8043 the whole document</p>	<p>1-5,7, 17-21, 26,33, 34,37, 38,41,43</p>

-/--

INTERNATIONAL SEARCH REPORT

Application No
PCT/US 03/25234

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 5 283 157 A (DAVIES PAUL) 1 February 1994 (1994-02-01) claims -----	14, 16
A	RATIVANICH N; RADAK B B; MILLER A; URIBE R M; MCLAUGHLIN W L: "LIQUID RADIOCHROMIC DOSYMETRY" RADIATION PHYSICS AND CHEMISTRY, vol. 18, no. 5-6, 1981, pages 1001-1010, XP008029268 the whole document -----	6-8, 11

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 03/25234

Box I Observations where certain claims were found unsearchable (Continuation of item 1 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:

Claim 53 is not allowable insofar it is related to a radiation therapy; see Rule 39.1(iv) PCT - Method for treatment of the human or animal body by therapy.
2. Claims Nos.: 20, 28-30, 32, 42, 44-46, 55-61, 63-66
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:

see FURTHER INFORMATION sheet PCT/ISA/210
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 II Observations where unity of invention is lacking (Continuation of item 2 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 fee, this Authority did not invite payment of any additional fee.
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.:

1 (part) - 5 (part), 6, 7, 8, 11, 12 (part) - 19 (part)
21 (part) - 27 (part), 31 (part), 33 (part) - 41 (part), 43 (part)
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.
 No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.1

Claim 53 is not allowable insofar it is related to a radiation therapy; see Rule 39.1(iv) PCT - Method for treatment of the human or animal body by therapy.

Continuation of Box I.2

Claims Nos.: 20, 28-30, 32, 42, 44-46, 55-61, 63-66

The following claims are unclear to such an extent contrary to the requirements of Article 6 PCT that a meaningful search for these claims cannot be carried out:

Claim 20 refers back to claim 20, thus making a meaningful search impossible.

Claim 28 refers back to claim 28, thus making a meaningful search impossible. Claims 29 and 30 depend on claim 28. As it is not clear which features claim 28 refers to it is not possible to search these claims.

Claim 32 refers back to claim 32, thus making a meaningful search impossible.

Claim 42 refers back to claim 42, thus making a meaningful search impossible.

Claim 44 refers back to claim 44, thus making a meaningful search impossible. Claims 45-46 depend on claim 44. As it is not clear which features claim 44 refers to it is not possible to search these claims.

Claim 55 refers back to claim 55, thus making a meaningful search impossible. Claims 56-61 depend on claim 55. As it is not clear which features claim 55 refers to it is not possible to search these claims.

Claim 63 refers back to claim 63, thus making a meaningful search impossible. Claims 64-66 depend on claim 63. As it is not clear which features claim 63 refers to it is not possible to search these claims.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

INTERNATIONAL SEARCH REPORT

Information on patent family members

Application No

PCT/US 03/25234

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
WO 9621885	A	18-07-1996	US	5420000 A	30-05-1995
			WO	9621885 A1	18-07-1996
			AU	1676095 A	31-07-1996
			US	5672465 A	30-09-1997
US 4918317	A	17-04-1990	JP	1025086 A	27-01-1989
US 5283157	A	01-02-1994	EP	0617330 A1	28-09-1994
			JP	6317911 A	15-11-1994