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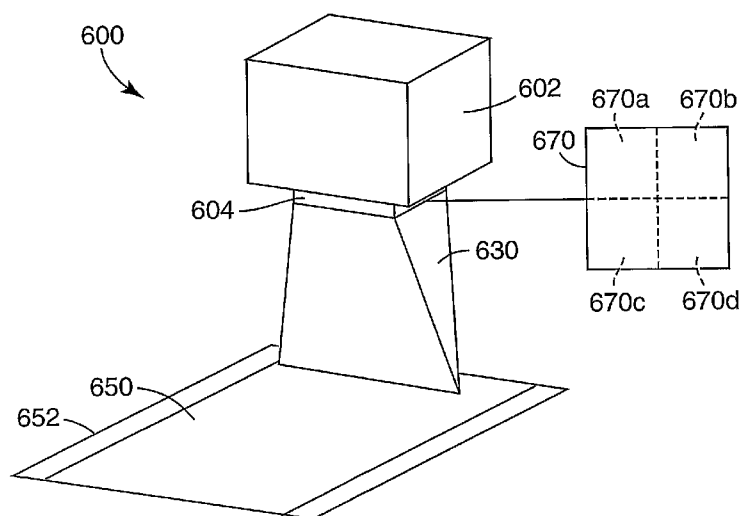
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[Continued on next page]

(54) Title: IRRADIATION APPARATUS



(57) Abstract: An irradiation apparatus (100) comprises a plurality of solid state radiation sources (104) to generate radiation that modifies a first material such as by- curing or creating alignment through polarization. The solid state radiation sources (104) can be disposed in an array pattern. Optical concentrators (120) , arranged in a corresponding array pattern, receive radiation from corresponding solid state radiation sources (104) . The concentrated radiation is received by a plurality of optical waveguides (130) , also arranged in a corresponding array pattern. Each optical waveguide includes a first end (132) to receive the radiation and a second end (133) to output the radiation. The radiation modifying apparatus (100) can be utilized for continuous substrate, sheet, piece part, spot curing, and/or 3D radiation-cure processes.



SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report*

Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

 INV. F21L2/00 F21V8/00 F21V13/00 F21V17/00 G02B6/00
 F21K7/00

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)

G03F G02B

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|------------------------------------------------------------------------------------|-----------------------|
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| A | column 1, line 7 - line 21; figures 1,2 | 11,20, 28,33,40 |
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| A | paragraphs [0002], [0034], [0109], [0110]; figures 30,33 | 11,20, 33,40 |
| X | WO 95/20811 A (SDL, INC) 3 August 1995 (1995-08-03) | 1-19 |
| A | page 6, line 7 - page 7, line 16; figures 1,2 | 20,28, 33,40 |
| | -/-- | |



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

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- *O* document referring to an oral disclosure, use, exhibition or other means
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Date of the actual completion of the international search

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Date of mailing of the international search report

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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. |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
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INTERNATIONAL SEARCH REPORT

International Application No
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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. |
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| A | US 6 002 466 A (BRAUCH ET AL) 14 December 1999 (1999-12-14) the whole document ----- | 1,20,40 |

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2004/039962

Box II Observations where certain claims were found unsearchable (Continuation of item 2 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:
2. ☐ Claims Nos.:
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:
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 III Observations where unity of invention is lacking (Continuation of item 3 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.:
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

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-10,13-17,25,28-29,31,35

Irradiation apparatus with a bundle of waveguides and an optical element placed in the path of the radiation emitted by the waveguides which alters the path of the radiation

2. claims: 11-19, 8-10, 26-27,30,32,33-39,41

Irradiation apparatus with a bundle of waveguides and a with a polariser placed in the path of the radiation emitted by the waveguides

3. claims: 20-27,40-43

Irradiation apparatus with a bundle of waveguides with a refractive optical element formed by the ends of the waveguides which alters the path of the emitted radiation

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US2004/039962

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