



(51) International Patent Classification:

B29D 11/00 (2006.01) **B05B 12/14** (2006.01)
B05C 11/08 (2006.01)

(21) International Application Number:

PCT/US2014/058943

(22) International Filing Date:

3 October 2014 (03.10.2014)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/890,045	11 October 2013 (11.10.2013)	US
61/890,055	11 October 2013 (11.10.2013)	US
61/890,059	11 October 2013 (11.10.2013)	US

(71) Applicant: **TRANSITIONS OPTICAL, INC.** [US/US];
9251 Belcher Road, Pinellas Park, Florida 33782 (US).

(72) Inventors: **KOENIG, Jerry, L., II**; 8382 Wrens Way,
Largo, Florida 33773 (US). **BEAMER, Willard**; 5018
72nd Street East, Palmetto, Florida 34221 (US). **PACE,
Lex, Eric**; 10559 104th Avenue North, Largo, Florida
33773 (US).

(74) Agents: **FORTNEY, Lester, N.** et al.; The Webb Law
Firm, One Gateway Center, 420 Ft. Duquesne Blvd., Suite
1200, Pittsburgh, Pennsylvania 15222 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

(88) Date of publication of the international search report:

2 June 2016

(54) Title: SPIN COATER FOR APPLYING MULTIPLE COATINGS TO AN OPTICAL SUBSTRATE

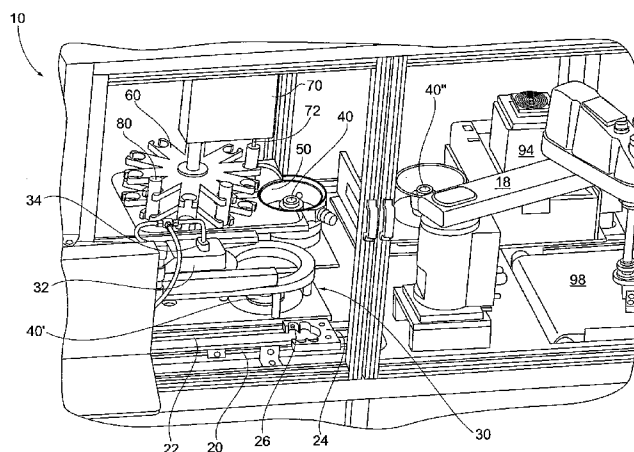


FIG. 1

(57) Abstract: A spin coater (10) that can be used to apply multiple coating compositions over an optical substrate, is described. The spin coater includes, a coater bowl (50) configured to collect excess coating material expelled from an optical substrate being coated, a rotatable chuck (40) configured to receive and rotate the optical substrate in the bowl during coating, a plurality of coating reservoirs, (80) each containing a coating material, and an indexable coating reservoir platform (60) containing the plurality of reservoirs and configured to index a selected reservoir into a dispensing position above the coater bowl. The spin coater can include or have associated therewith at least one curing station (92, 94, 96), in which each curing station is independently configured to cure at least partially at least one applied coating material. Each curing station can include at least one of, a thermal curing station, a UV curing station, and/or an IR curing station.



INTERNATIONAL SEARCH REPORT

International application No
PCT/US2014/058943

A. CLASSIFICATION OF SUBJECT MATTER
 INV. B29D11/00 B05C11/08
 ADD. B05B12/14

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)
 B29D B05B B05C

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)
 EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 002 008 A (USHIJIMA MITSURU [JP] ET AL) 26 March 1991 (1991-03-26)	1,2
Y	column 4, lines 17, 18, 24, 41-65; figures 4, 5	3,4,7,8, 16-19
Y	----- JP 2001 240469 A (MATSUSHITA ELECTRIC IND CO LTD) 4 September 2001 (2001-09-04) paragraph [0038]; figure 5	3,4,7,8, 16-19
A	----- US 2005/058775 A1 (OKU AKIO [JP] ET AL) 17 March 2005 (2005-03-17) columns 36,38	1-4,7,8, 16,19
A	----- US 5 772 764 A (AKIMOTO MASAMI [JP]) 30 June 1998 (1998-06-30) column 3, line 47 - column 4, line 10; figure 2	1

Further documents are listed in the continuation of Box C.

See patent family 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 application or patent 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
- "&" document member of the same patent family

Date of the actual completion of the international search 19 December 2014	Date of mailing of the international search report 18/04/2016
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Pipping, Lars

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/US2014/058943

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5002008	A	26-03-1991	US 5002008 A
			US 5089305 A
			26-03-1991
			18-02-1992

JP 2001240469	A	04-09-2001	NONE

US 2005058775	A1	17-03-2005	JP 2005046694 A
			US 2005058775 A1
			24-02-2005
			17-03-2005

US 5772764	A	30-06-1998	JP 3227642 B2
			JP H09115821 A
			KR 100357312 B1
			US 5772764 A
			12-11-2001
			02-05-1997
			24-01-2003
			30-06-1998

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2014/058943

Box No. 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 No. 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 fees, this Authority did not invite payment of additional fees.
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.:

1-4, 7, 8, 16-19

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- 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: 1-4, 7, 8, 16-19

A spin coater with at least one coating reservoir having an indexable coating reservoir platform, further comprising a dispensing unit and a movable piston for dispensing of coating material

2. claims: 5, 20

A spin coater with at least one coating reservoir having an indexable coating reservoir platform, further comprising a rotatable carousel

3. claims: 6, 21

A spin coater with at least one coating reservoir having an indexable coating reservoir platform which is movable as a unit

4. claims: 9, 22

A spin coater with at least one coating reservoir having an indexable coating reservoir platform, wherein each coating reservoir is a disposable plastic syringe

5. claims: 10-15, 23-35

A spin coater with at least one coating reservoir having an indexable coating reservoir platform, further comprising at least one curing station
