

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
11 January 2024 (11.01.2024)



(10) International Publication Number
WO 2024/009137 A1

(51) International Patent Classification:

B01D 39/10 (2006.01) **B01D 35/02** (2006.01)
B01D 17/02 (2006.01)

(21) International Application Number:

PCT/IB2022/059209

(22) International Filing Date:

28 September 2022 (28.09.2022)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

10202250370U 05 July 2022 (05.07.2022) SG

(71) Applicant: **VULCAN PHOTONICS SDN. BHD.**

[MY/MY]; D-11-08, Menara Suezcap 1 KL Gateway, No. 2,
Jalan Kerinchi, Kampung Kerinchi, Kuala Lumpur, 59200
(MY).

(72) Inventors: **KOO, Khong Nee**; No. 32 Lengkok Paya

Terubong, Ayer Itam, Pulau Pinang, 11060 (MY). **SEAH,
Mei Qun**; 66 Jalan USJ 12/2F, Subang Jaya, Selangor,
47630 (MY). **BINTI JAMALUDIN, Farah Hidayah**; No.

70, Jalan Pulau Perdana 2/3, Taman Pulau Perdana, Johor
Bahru, Johor, 81110 (MY).

(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, CV, CZ, DE, DJ, DK, DM,
DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE,
KG, KH, KN, KP, KR, KW, 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, ST, SV, SY, TH,
TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS,
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, SC, 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,

(54) Title: OIL-WATER SEPARATION FILTER AND APPARATUS, AND METHOD OF OPERATING THE SAME

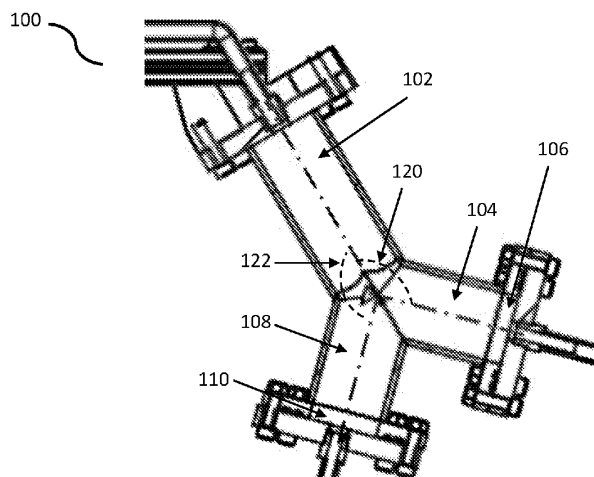


FIG. 3

(57) Abstract: Described herein is a filter comprising a mesh and a coating layer on the mesh, the coating layer having a first silane moiety and a pH-responsive polymer. The first silane moiety includes a hydrophobic alkyl chain. The first silane moiety is attached directly to the mesh and the pH-responsive polymer is attached to the mesh by a linker. The mesh may be switched between being hydrophilic and oleophilic by acid or alkaline treatment, or temperature treatment. Also described is a method to prepare the filter, a connector having the filter, an apparatus having the connector, and a method of separating an oil-water mixture.

[Continued on next page]

WO 2024/009137 A1

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

Declarations under Rule 4.17:

— *of inventorship (Rule 4.17(iv))*

Published:

— *with international search report (Art. 21(3))*
— *in black and white; the international application as filed
contained color or greyscale and is available for download
from PATENTSCOPE*