

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
11 November 2021 (11.11.2021)



(10) International Publication Number
WO 2021/224294 A1

- (51) **International Patent Classification:**
B01D 53/50 (2006.01) *B01D 53/18* (2006.01)
- (21) **International Application Number:**
PCT/EP2021/061780
- (22) **International Filing Date:**
05 May 2021 (05.05.2021)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
20172997.7 05 May 2020 (05.05.2020) EP
- (71) **Applicant:** YARA INTERNATIONAL ASA [NO/NO];
Drammensveien 131, 0277 Oslo (NO).
- (72) **Inventors:** BAHADUR THAPA, Shyam; Sigurd Hoels
Vei 9, 0655 Oslo (NO). JOURAK, Amir; Dalstunet 6, 2074
Eidsvoll Verk (NO). POIJANEN, Pekka Juhana; Ingar
Nilsens Vei 7, 0268 Oslo (NO).
- (74) **Agent:** DE CLERCQ & PARTNERS; Edgard Gevaert-
dreef 10a, 9830 Sint-Martens-Latem (BE).
- (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, DJ, DK, DM, DO,

DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN,
HR, HU, ID, IL, IN, IR, IS, IT, 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, 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).

Declarations under Rule 4.17:

— of inventorship (Rule 4.17(iv))

Published:

— with international search report (Art. 21(3))

(54) **Title:** WET INLINE SCRUBBER WITH A SIDE INLET FOR REDUCING THE AMOUNT OF SOX IN AN EXHAUST GAS
PRODUCED BY ONE OR MORE ENGINES OF A MARINE VESSEL

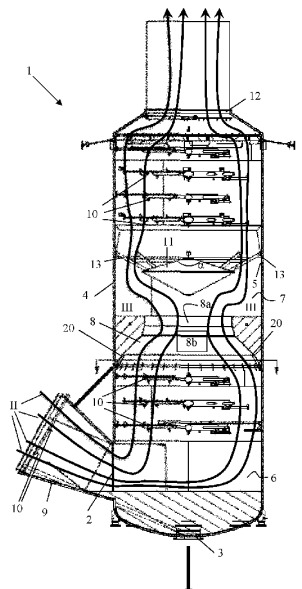


FIG. 1

(57) **Abstract:** The present disclosure relates to a wet inline scrubber with a side inlet using alkali scrubber fluid for reducing the amount of SOx in the exhaust gas of one or more engines of a marine vessel, comprising a vertically extending exhaust gas reaction tube, a lower scrubbing chamber as well as an upper scrubbing chamber comprising a plurality of alkali scrubber fluid injectors to partially scrub this exhaust gas, a used scrubber fluid drain at the bottom thereof. The lower chamber comprises an exhaust gas outlet confining the lower scrubbing chamber at the top thereof, which comprises a central opening arranged to let the partially scrubbed exhaust gas to pass through it, a body extending from the central opening up to an outer wall thereof which is in contact with the inner wall of the exhaust gas reaction tube, wherein between the body of the lower chamber exhaust gas outlet and the inner wall of the exhaust gas reaction tube, one or more slit-shaped openings are provided that allow scrubber scrubber fluid to flow from the upper scrubbing chamber to the lower scrubbing chamber and that allow used scrubber fluid to flow over the inlet side for the exhaust gas present in the lower scrubbing chamber. The present disclosure further relates to a method for reducing the amount of SOx in the exhaust gas of one or more such engines.

WO 2021/224294 A1