

(19) World Intellectual Property
Organization
International Bureau



WIPO | PCT



(10) International Publication Number

WO 2021/211345 A9

(43) International Publication Date
21 October 2021 (21.10.2021)

(51) International Patent Classification:

F04D 17/16 (2006.01) F04D 19/04 (2006.01)

(21) International Application Number:

PCT/US2021/026274

(22) International Filing Date:

07 April 2021 (07.04.2021)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

16/849,467 15 April 2020 (15.04.2020) US

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(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).

Published:

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

(48) Date of publication of this corrected version:

24 November 2022 (24.11.2022)

(15) Information about Correction:

see Notice of 24 November 2022 (24.11.2022)

(54) Title: NON-SEALED VACUUM PUMP WITH SUPERSONICALLY ROTATABLE BLADELESS GAS IMPINGEMENT SURFACE

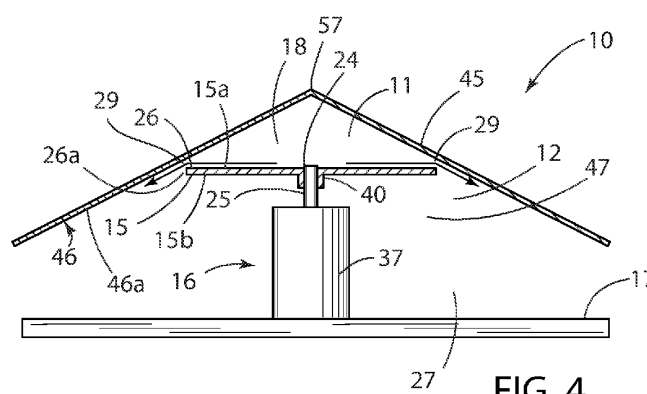


FIG. 4

(57) Abstract: A vacuum pump generally comprises a low pressure portion and a high pressure portion separated by a gas impermeable partition. Gas molecules exit the low pressure portion through an opening in the partition and passively impinge on a featureless rotatable surface in the high pressure portion. A drive rotates the rotatable surface with tangential velocity in the supersonic range at multiple times the most probable velocity of the impinging gas molecules. Impinging gas molecules are ejected outwardly from the periphery of the rotatable surface generating a substantial net outward flow of gas and reducing the pressure in the low pressure portion. The vacuum pump is effective to reduce the pressure in the low pressure portion to a target minimum pressure without using seals to prevent gas molecules from leaking back to the low pressure portion and without using blades or vanes to actively impact the gas molecules.

