

Title (en)
VACUUM DEVICE AND VACUUM PUMP

Title (de)
VAKUUMVORRICHTUNG UND VAKUUMPUMPE

Title (fr)
DISPOSITIF SOUS VIDE ET POMPE SOUS VIDE

Publication
EP 1609990 A1 20051228 (EN)

Application
EP 04716009 A 20040301

Priority
• JP 2004002484 W 20040301
• JP 2003055749 A 20030303

Abstract (en)
A vacuum apparatus has a vacuum chamber provided with a gas inlet and a gas outlet, and mechanical vacuum pumps in a plurality of stages for reducing a pressure inside the vacuum chamber and maintaining the pressure-reduced state. The vacuum apparatus has an ejector pump (60) connected to a discharge port (57) of a screw pump (A) as the vacuum pump at the last stage among the vacuum pumps. The vacuum apparatus is reduced in power consumption and used in the semiconductor manufacturing field and so on. <IMAGE>

IPC 1-7
F04B 37/16; **F04F 5/20**; **F04D 19/04**; **F04C 25/02**

IPC 8 full level
F04B 37/16 (2006.01); **F04C 18/16** (2006.01); **F04B 37/14** (2006.01); **F04C 18/18** (2006.01); **F04C 23/00** (2006.01); **F04C 25/02** (2006.01); **F04D 19/02** (2006.01); **F04D 19/04** (2006.01); **F04D 25/16** (2006.01); **F04F 5/04** (2006.01); **F04F 5/20** (2006.01); **F04F 5/54** (2006.01)

CPC (source: EP US)
F04B 37/14 (2013.01 - EP US); **F04C 23/005** (2013.01 - EP US); **F04D 19/046** (2013.01 - EP US); **F04F 5/20** (2013.01 - EP US); **F04F 5/54** (2013.01 - EP US); **F04C 18/16** (2013.01 - EP US); **F04C 2220/12** (2013.01 - EP US)

Cited by
FR2952683A1; FR3008145A1; CN102062088A; CN103900376A; CN104822943A; RU2720125C2; EP3517779A1; FR3077343A1; US10544809B2; US9175688B2; US11209024B2; WO2011061429A3; WO2014072276A1; WO2015001059A1; WO2016209725A1

Designated contracting state (EPC)
DE FR GB

DOCDB simple family (publication)
EP 1609990 A1 20051228; **EP 1609990 A4 20070718**; **EP 1609990 B1 20090812**; DE 602004022519 D1 20090924; JP 2004263635 A 20040924; TW 200506205 A 20050216; US 2006182638 A1 20060817; WO 2004079192 A1 20040916

DOCDB simple family (application)
EP 04716009 A 20040301; DE 602004022519 T 20040301; JP 2003055749 A 20030303; JP 2004002484 W 20040301; TW 93105511 A 20040303; US 54822505 A 20051020