

Title (en)  
Lubricant-free vacuum pump arrangement

Title (de)  
Schmiermittelfreie Vakuum-Pumpeinrichtung

Title (fr)  
Dispositif de pompe à vide sans lubrifiant

Publication  
**EP 0626516 B1 19970604 (DE)**

Application  
**EP 94103685 A 19940310**

Priority  
• DE 4320963 A 19930624  
• DE 9305554 U 19930415

Abstract (en)  
[origin: US5387090A] A two-stage positive displacement pump (1) is used in particular to operate in conjunction with a turbomolecular pump (2) that can be placed ahead of it in series. The two-stage positive displacement pump (1) is configured as a hybrid pump (3) that has on the medium-entry side a reciprocating pump (5) with a comparatively large displacement area (6), whereby its piston-cylinder space (7) is sealed off with respect to the crank area (8) by means of a sealing membrane (9). Also as a part of this two-stage positive displacement pump (1) which forms the hybrid pump (3), there is placed in series behind the reciprocating pump (5) a diaphragm pump (10), whose displacement area (11) is noticeably smaller compared to that of the reciprocating pump (5).

IPC 1-7  
**F04B 25/00**; **F04B 39/04**; **F04B 23/10**; **F04D 19/04**; **F04D 25/16**; **F04B 23/06**

IPC 8 full level  
**F04B 23/06** (2006.01); **F04B 25/00** (2006.01); **F04B 37/00** (2006.01); **F04B 39/04** (2006.01); **F04B 45/04** (2006.01); **F04D 19/04** (2006.01); **F04D 25/16** (2006.01)

CPC (source: EP US)  
**F04B 23/06** (2013.01 - EP US); **F04B 25/005** (2013.01 - EP US); **F04B 39/048** (2013.01 - EP US); **F04D 19/042** (2013.01 - EP US); **F04D 19/046** (2013.01 - EP US); **F04D 25/16** (2013.01 - EP US)

Cited by  
GB2281358B; CN106678013A

Designated contracting state (EPC)  
DE FR GB

DOCDB simple family (publication)  
**US 5387090 A 19950207**; EP 0626516 A1 19941130; EP 0626516 B1 19970604; JP 2882748 B2 19990412; JP H06299962 A 19941025; US 5584669 A 19961217

DOCDB simple family (application)  
**US 22616594 A 19940411**; EP 94103685 A 19940310; JP 7606094 A 19940414; US 37755195 A 19950124