

Title (en)
Multi-stage centrifugal pump

Title (de)
Mehrstufige Kreiselpumpe

Title (fr)
Pompe centrifuge à plusieurs étages

Publication
EP 3009680 B1 20191113 (DE)

Application
EP 14188999 A 20141015

Priority
EP 14188999 A 20141015

Abstract (en)
[origin: US2016108922A1] A multistage centrifugal pump includes a foot part (1) and a head part (7), between which several pump stages are arranged. Each of the pump stages includes an impeller (4) and a housing (5) surrounding the impeller (4). The housings (5) are arranged over one another. The housings (5) together with an outer casing (9) form an annular channel (8). The housings (5) together with an outer casing (9) are clamped via clamping bolts (11) which are fastened on the head part (7) and the foot part (1). The clamping bolts (11) are arranged within the annular channel (8).

IPC 8 full level
F04D 1/06 (2006.01); **F04D 13/02** (2006.01); **F04D 17/12** (2006.01); **F04D 29/42** (2006.01); **F04D 29/62** (2006.01)

CPC (source: EP US)
F04D 1/063 (2013.01 - EP US); **F04D 13/021** (2013.01 - EP US); **F04D 17/12** (2013.01 - US); **F04D 29/426** (2013.01 - EP US); **F04D 29/628** (2013.01 - EP US)

Citation (examination)
DE 29817337 U1 19981217 - GRUNDFOS AS [DK]

Cited by
EP3670919A1; CN111350669A

Designated contracting state (EPC)
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EP 3009680 A1 20160420; **EP 3009680 B1 20191113**; CN 105526195 A 20160427; US 10094385 B2 20181009; US 2016108922 A1 20160421

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EP 14188999 A 20141015; CN 201510666768 A 20151015; US 201514882750 A 20151014