

Title (en)
Multi-stage centrifugal pumps.

Title (de)
Mehrstufige Kreiselpumpe.

Title (fr)
Pompe centrifuge à plusieurs étages.

Publication
EP 0466350 A2 19920115 (EN)

Application
EP 91305692 A 19910624

Priority
GB 9015047 A 19900707

Abstract (en)
A multi-stage centrifugal pump with an axially split casing (10) and a number of impellers (14) carried by a drive shaft (12) has inter-stage bushings (24) and rings (22) for sealing each side of each impeller. Each bushing (24) or ring (22) is conventionally prevented from rotating by a radial pin protruding from the lower half of the casing (10) into an axial slot in the periphery of the bushing or ring. The pin is necessarily small and is liable to shear, difficult to engage in the slot and, in cases where the bushing (24) or ring (22) is diametrically split, does not allow rotation of the lower half for its removal without lifting the shaft (12). To avoid all these disadvantages, the exposed end (37) of a tangential pin (32) fitted in the casing (10) is flush with the join face (28) of the casing and abuts against a shoulder (44) formed by a recess (38) in the periphery of the bushing (24) or ring (22). This pin (32) can be larger than the known radial pin and is subjected to compression, not shear. <IMAGE>

IPC 1-7
F04D 1/06; **F04D 29/16**; **F04D 29/42**

IPC 8 full level
F04D 1/06 (2006.01); **F04D 29/16** (2006.01)

CPC (source: EP)
F04D 1/06 (2013.01); **F04D 29/167** (2013.01)

Cited by
CN103291462A; DE102008033073B3; GB2410297A; GB2410297B

Designated contracting state (EPC)
AT BE CH DE ES FR GB IT LI NL

DOCDB simple family (publication)
EP 0466350 A2 19920115; **EP 0466350 A3 19920226**; **EP 0466350 B1 19940608**; AT E106994 T1 19940615; CA 2046465 A1 19920108; CA 2046465 C 19980922; DE 69102357 D1 19940714; DE 69102357 T2 19950119; ES 2057773 T3 19941016; GB 9015047 D0 19900829

DOCDB simple family (application)
EP 91305692 A 19910624; AT 91305692 T 19910624; CA 2046465 A 19910708; DE 69102357 T 19910624; ES 91305692 T 19910624; GB 9015047 A 19900707