

CPC COOPERATIVE PATENT CLASSIFICATION

F MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING (NOTE omitted)

ENGINES OR PUMPS

F04 POSITIVE DISPLACEMENT MACHINES FOR LIQUIDS; PUMPS FOR LIQUIDS OR ELASTIC FLUIDS (portable fire-extinguishers with manually-operated pumps [A62C 11/00](#), with power-driven pumps [A62C 25/00](#); charging or scavenging combustion engines by pumps [F02B](#); engines fuel-injection pumps [F02M](#); ion pumps [H01J 41/00](#); electro-dynamic pumps [H02K 44/02](#))
(NOTE omitted)

F04F PUMPING OF FLUID BY DIRECT CONTACT OF ANOTHER FLUID OR BY USING INERTIA OF FLUID TO BE PUMPED {(evacuating by sorption [F04B](#))}; **SIPHONS** {(conveying materials in bulk by flows of gas, liquid of foam [B65G 53/00](#))}

NOTES

1. Attention is drawn to the notes preceding class [F01](#).
2. Combinations of pumps belonging to this subclass with other pumps are only classified in this subclass if such other pumps are fore pumps of diffusion pumps.

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| 1/00 | Pumps using positively or negatively pressurised fluid medium acting directly on the liquid to be pumped (using only negative pressure F04F 3/00 ; jet pumps F04F 5/00 ; siphons F04F 10/00) | 5/10 | . . displacing liquids, e.g. containing solids, or liquids and elastic fluids |
| | | 5/12 | . . . of multi-stage type |
| 1/02 | . using both positively and negatively pressurised fluid medium, e.g. alternating | 5/14 | . the inducing fluid being elastic fluid |
| 1/04 | . . generated by vaporising and condensing | 5/16 | . . displacing elastic fluids |
| 1/06 | . the fluid medium acting on the surface of the liquid to be pumped (F04F 1/02 takes precedence) | 5/18 | . . . for compressing |
| 1/08 | . . specially adapted for raising liquids from great depths, e.g. in wells | 5/20 | . . . for evacuating |
| 1/10 | . . of multiple type, e.g. with two or more units in parallel (F04F 1/08 takes precedence) | 5/22 | of multi-stage type |
| 1/12 | . . . in series | 5/24 | . . displacing liquids, e.g. containing solids, or liquids and elastic fluids |
| 1/14 | . . adapted to pump specific liquids, e.g. corrosive or hot liquids | 5/26 | . . . of multi-stage type (F04F 5/28 takes precedence) |
| 1/16 | . . characterised by the fluid medium being suddenly pressurised, e.g. by explosion | 5/28 | . . . Restarting of inducing action |
| 1/18 | . the fluid medium being mixed with, or generated from the liquid to be pumped | 5/30 | with axially-slidable combining nozzle |
| 1/20 | . . specially adapted for raising liquids from great depths, e.g. in wells | 5/32 | with hinged flap in combining nozzle |
| | | 5/34 | . . characterised by means for changing inducing fluid source |
| | | 5/36 | . . characterised by using specific inducing fluid |
| | | 5/38 | . . . the inducing fluid being mercury vapour |
| | | 5/40 | . . . the inducing fluid being oil vapour |
| | | 5/42 | . characterised by the input flow of inducing fluid medium being radial or tangential to output flow (cyclones B04C) |
| 3/00 | Pumps using negative pressure acting directly on the liquid to be pumped (siphons F04F 10/00) | 5/44 | . Component parts, details, or accessories not provided for in, or of interest apart from, groups F04F 5/02 - F04F 5/42 |
| 5/00 | Jet pumps, i.e. devices in which flow is induced by pressure drop caused by velocity of another fluid flow (diffusion pumps F04F 9/00 ; combination of jet pumps with pumps of other than jet type F04B ; use of jet pumps for priming or boosting non-positive-displacement pumps F04D) | 5/46 | . . Arrangements of nozzles |
| | | 5/461 | . . . {Adjustable nozzles} |
| | | 5/462 | . . . {with provisions for cooling the fluid} |
| | | 5/463 | . . . {with provisions for mixing} |
| 5/02 | . the inducing fluid being liquid | 5/464 | . . . {with inversion of the direction of flow} |
| 5/04 | . . displacing elastic fluids | 5/465 | . . . {with supersonic flow (mixing of supersonic fluids B01F 5/04)} |
| 5/06 | . . . of rotary type | 5/466 | . . . {with a plurality of nozzles arranged in parallel} |
| 5/08 | . . . the elastic fluid being entrained in a free falling column of liquid | | |

F04F

- 5/467 . . . {with a plurality of nozzles arranged in series}
- 5/468 . . . {with provisions for priming}
- 5/469 . . . {for steam engines}
- 5/48 . . Control
- 5/50 . . . of compressing pumps
- 5/52 . . . of evacuating pumps
- 5/54 . Installations characterised by use of jet pumps, e.g. combinations of two or more jet pumps of different type

7/00 Pumps displacing fluids by using inertia thereof, e.g. by generating vibrations therein

- 7/02 . Hydraulic rams

9/00 Diffusion pumps

- 9/02 . of multi-stage type
- 9/04 . in combination with fore pumps, e.g. use of isolating valves
- 9/06 . Arrangement of vapour traps
- 9/08 . Control

10/00 Siphons

- 10/02 . Gravity-actuated siphons

13/00 Pressure exchangers

99/00 Subject matter not provided for in other groups of this subclass