

# 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 or 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.

#### WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

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

- 5/461 . . . {Adjustable nozzles}
- 5/462 . . . {with provisions for cooling the fluid}
- 5/463 . . . {with provisions for mixing}
- 5/464 . . . {with inversion of the direction of flow}
- 5/465 . . . {with supersonic flow (mixing of supersonic fluids [B01F 5/04](#))}
- 5/466 . . . {with a plurality of nozzles arranged in parallel}
- 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**