

# 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.

<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> )	5/10	. . displacing liquids, e.g. containing solids, or liquids and elastic fluids
1/02	. using both positively and negatively pressurised fluid medium, e.g. alternating	5/12	. . . of multi-stage type
1/04	. . generated by vaporising and condensing	5/14	. the inducing fluid being elastic fluid
1/06	. the fluid medium acting on the surface of the liquid to be pumped ( <a href="#">F04F 1/02</a> takes precedence)	5/16	. . displacing elastic fluids
1/08	. . specially adapted for raising liquids from great depths, e.g. in wells	5/18	. . . for compressing
1/10	. . of multiple type, e.g. with two or more units in parallel ( <a href="#">F04F 1/08</a> takes precedence)	5/20	. . . for evacuating
1/12	. . . in series	5/22	. . . . of multi-stage type
1/14	. . adapted to pump specific liquids, e.g. corrosive or hot liquids	5/24	. . displacing liquids, e.g. containing solids, or liquids and elastic fluids
1/16	. . characterised by the fluid medium being suddenly pressurised, e.g. by explosion	5/26	. . . of multi-stage type ( <a href="#">F04F 5/28</a> takes precedence)
1/18	. the fluid medium being mixed with, or generated from the liquid to be pumped	5/28	. . . Restarting of inducing action
1/20	. . specially adapted for raising liquids from great depths, e.g. in wells	5/30	. . . . with axially-slidable combining nozzle
<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> )	5/32	. . . . with hinged flap in combining nozzle
<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> )	5/34	. . characterised by means for changing inducing fluid source
5/02	. the inducing fluid being liquid	5/36	. . characterised by using specific inducing fluid
5/04	. . displacing elastic fluids	5/38	. . . the inducing fluid being mercury vapour
5/06	. . . of rotary type	5/40	. . . the inducing fluid being oil vapour
5/08	. . . the elastic fluid being entrained in a free falling column of liquid	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>
		5/46	. . 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 ( <a href="#">mixing of supersonic fluids B01F 5/04</a> )}
		5/466	. . . {with a plurality of nozzles arranged in parallel}

## 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**