

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.

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)	5/04	. . 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 (F04F 1/02 takes precedence)	5/14	. the inducing fluid being elastic fluid
		5/16	. . displacing elastic fluids
1/08	. . specially adapted for raising liquids from great depths, e.g. in wells	5/18	. . . for compressing
		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
		5/32 with hinged flap in combining nozzle
1/20	. . specially adapted for raising liquids from great depths, e.g. in wells	5/34	. . characterised by means for changing inducing fluid source
		5/36	. . characterised by using specific inducing fluid
3/00	Pumps using negative pressure acting directly on the liquid to be pumped (siphons F04F 10/00)	5/38	. . . the inducing fluid being mercury vapour
		5/40	. . . the inducing fluid being oil vapour
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)	5/42	. characterised by the input flow of inducing fluid medium being radial or tangential to output flow (cyclones B04C)
		5/44	. Component parts, details, or accessories not provided for in, or of interest apart from, groups F04F 5/02 - F04F 5/42
5/02	. the inducing fluid being liquid	5/46	. . Arrangements of nozzles

F04F

- 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**