

CPC COOPERATIVE PATENT CLASSIFICATION

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

ENGINES OR PUMPS

F01 MACHINES OR ENGINES IN GENERAL; ENGINE PLANTS IN GENERAL; STEAM ENGINES

F01K STEAM ENGINE PLANTS; STEAM ACCUMULATORS; ENGINE PLANTS NOT OTHERWISE PROVIDED FOR; ENGINES USING SPECIAL WORKING FLUIDS OR CYCLES (gas-turbine or jet-propulsion plants F02; nuclear power plants, engine arrangements therein G21D)

NOTE

Attention is drawn to the notes preceding class F01, especially as regards the definitions of "steam" and "special vapour".

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	Steam accumulators (use of accumulators in steam engine plants F01K 3/00)	3/08	. Use of accumulators and the plant being specially adapted for a specific use
1/02	. for storing steam otherwise than in a liquid	3/10	. . for vehicle drive, e.g. for accumulator locomotives
1/04	. for storing steam in a liquid, e.g. Ruth's type (in alkali to increase steam pressure F22B 1/20)	3/12	. having two or more accumulators
1/06	. Internal fittings facilitating steam distribution, steam formation, or circulation (acting during charging or discharging F01K 1/08; fittings facilitating circulation through multiple accumulators F01K 1/14)	3/14	. having both steam accumulator and heater, e.g. superheating accumulator (steam superheaters per se F22G)
1/08	. Charging or discharging of accumulators with steam (peculiar to multiple accumulators F01K 1/12)	3/16	. . Mutual arrangement of accumulator and heater
1/10	. specially adapted for superheated steam	3/18	. having heaters (having both steam accumulator and heater F01K 3/14; steam heaters per se F22)
1/12	. Multiple accumulators; Charging, discharging or control specially adapted therefor	3/181	. . {using nuclear heat (F01K 3/26 takes precedence)}
1/14	. . Circulation	3/183	. . . {one heater being a fired superheater}
1/16	. Other safety or control means	3/185	. . . {using waste heat from outside the plant (F02G 5/00 takes precedence)}
1/18	. . for steam pressure	3/186	. . . {using electric heat}
1/20	. Other steam-accumulator parts, details, or accessories	3/188	. . . {using heat from a specified chemical reaction}
		3/20	. . . with heating by combustion gases of main boiler
		3/205	. . . . {more than one circuit being heated by one boiler}
		3/22	. . . Controlling, e.g. starting, stopping (F01K 7/00, F01K 13/02 take precedence)
		3/24	. . . with heating by separately-fired heaters
		3/242	. . . . {delivering steam to a common mains}
		3/245	. . . . {delivering steam at different pressure levels (F01K 3/247 takes precedence)}
		3/247	. . . . {one heater being an incinerator}
		3/26	. . . with heating by steam
		3/262	. . . . {by means of heat exchangers}
		3/265	. . . . . {using live steam for superheating or reheating}
		3/267	. . . . . {by mixing with steam, e.g. LOFFLER-boiler}
		5/00	Plants characterised by use of means for storing steam in an alkali to increase steam pressure, e.g. of Honigmann or Koenemann type

5/02	<ul style="list-style-type: none"> . used in regenerative installation 	
7/00	<p>Steam engine plants characterised by the use of specific types of engine (F01K 3/02 takes precedence); Plants or engines characterised by their use of special steam systems, cycles or processes (reciprocating-piston engines using uniflow principle F01B 17/04); Control means specially adapted for such systems, cycles or processes; Use of withdrawn or exhaust steam for feed-water heating</p>	<p>Plants characterised by condensers arranged or modified to co-operate with the engines (by condensers structurally combined with engines F01K 11/00; steam condensers per se F28B)(F01K 23/04 takes precedence)</p>
7/02	<ul style="list-style-type: none"> . the engines being of multiple-expansion type (the engines being only of turbine type F01K 7/16; the engines using steam of critical or overcritical pressure F01K 7/32; the engines being of extraction or non-condensing type F01K 7/34) 	<ul style="list-style-type: none"> . {condenser cooling circuits} . {Vacuum-breakers} . Arrangements or modifications of condensate or air pumps . . {Control thereof} . . {Returning condensate by capillarity} . with dump valves to by-pass stages
7/025	<ul style="list-style-type: none"> . . {Consecutive expansion in a turbine or a positive displacement engine} 	<p>Plants characterised by the engines being structurally combined with boilers or condensers</p>
7/04	<ul style="list-style-type: none"> . . Control means specially adapted therefor 	<ul style="list-style-type: none"> . the engines being turbines
7/06	<ul style="list-style-type: none"> . the engines being of multiple-inlet-pressure type (F01K 7/02 takes precedence; the engines being only of turbine type F01K 7/16; the engines using steam of critical or over-critical pressure F01K 7/32; the engines being of extraction or non-condensing type F01K 7/34) 	<ul style="list-style-type: none"> . the boilers or condensers being rotated in use
7/08	<ul style="list-style-type: none"> . . Control means specially adapted therefor 	<p>General layout or general methods of operation of complete plants</p>
7/10	<ul style="list-style-type: none"> . characterised by the engine exhaust pressure (the engines being only of turbine type F01K 7/16; the engines using steam of critical or over-critical pressure F01K 7/32; the engines being of extraction or non-condensing type F01K 7/34) 	<ul style="list-style-type: none"> . {Arrangements for measuring or testing (in general G01)} . {Auxiliaries or details not otherwise provided for} . Controlling, e.g. stopping or starting . . {Cooling the interior by injection during idling or stand-by}
7/12	<ul style="list-style-type: none"> . . of condensing type 	<p>Adaptations of plants for special use {(F01K 7/02 takes precedence)}</p>
7/14	<ul style="list-style-type: none"> . . . Control means specially adapted therefor 	<ul style="list-style-type: none"> . for driving vehicles, e.g. locomotives
7/16	<ul style="list-style-type: none"> . the engines being only of turbine type (the engines using steam of critical or overcritical pressure F01K 7/32; the engines being of extraction or non-condensing type F01K 7/34) 	<ul style="list-style-type: none"> . . {the vehicle being a steam locomotive}
7/165	<ul style="list-style-type: none"> . . {Controlling means specially adapted therefor} 	<ul style="list-style-type: none"> . . the vehicles being waterborne vessels
7/18	<ul style="list-style-type: none"> . . the turbine being of multiple-inlet-pressure type 	<ul style="list-style-type: none"> . . . {Control thereof (F01K 3/22, F01K 7/00, F01K 13/02 take precedence)}
7/20	<ul style="list-style-type: none"> . . . Control means specially adapted therefor 	<p>Using steam or condensate extracted or exhausted from steam engine plant (for heating feed-water F01K 7/34; returning condensate to boiler F22D {F01K 7/36 takes precedence})</p>
7/22	<ul style="list-style-type: none"> . . . the turbines having inter-stage steam heating 	<ul style="list-style-type: none"> . {by means of a heat pump (heat pumps systems per se F25B)}
7/223	<ul style="list-style-type: none"> {Inter-stage moisture separation} 	<ul style="list-style-type: none"> . for heating purposes, e.g. industrial, domestic (F01K 17/06 takes precedence; domestic- or space-heating systems, e.g. central-heating systems, in general F24D 1/00, F24D 3/00, F24D 9/00)
7/226	<ul style="list-style-type: none"> {Inter-stage steam injection} 	<ul style="list-style-type: none"> . . . {in combination with at least one gas turbine, e.g. a combustion gas turbine}
7/24	<ul style="list-style-type: none"> Control or safety means specially adapted therefor 	<ul style="list-style-type: none"> . for specific purposes other than heating (F01K 17/06 takes precedence)
7/26	<ul style="list-style-type: none"> . . . the turbines having inter-stage steam accumulation 	<ul style="list-style-type: none"> . Returning energy of steam, in exchanged form, to process, e.g. use of exhaust steam for drying solid fuel or plant
7/28	<ul style="list-style-type: none"> Control means specially adapted therefor 	<p>Regenerating or otherwise treating steam exhausted from steam engine plant ({F01K 3/006 takes precedence} plants characterised by use of means for storing steam in an alkali to increase steam pressure F01K 5/00; returning condensate to boiler F22D)</p>
7/30	<ul style="list-style-type: none"> . . . the turbines using exhaust steam only 	<ul style="list-style-type: none"> . Regenerating by compression
7/32	<ul style="list-style-type: none"> . the engines using steam of critical or overcritical pressure 	<ul style="list-style-type: none"> . . in combination with cooling or heating
7/34	<ul style="list-style-type: none"> . the engines being of extraction or non-condensing type; Use of steam for feed-water heating (feed-water heaters in general F22D) 	<ul style="list-style-type: none"> . . in engine cylinder
7/345	<ul style="list-style-type: none"> . . {Control or safety-means particular thereto} 	<ul style="list-style-type: none"> . . compression done by injection apparatus, jet blower, or the like
7/36	<ul style="list-style-type: none"> . . the engines being of positive-displacement type 	
7/38	<ul style="list-style-type: none"> . . the engines being of turbine type 	
7/40	<ul style="list-style-type: none"> . . Use of two or more feed-water heaters in series 	
7/42	<ul style="list-style-type: none"> . . Use of desuperheaters for feed-water heating 	
7/44	<ul style="list-style-type: none"> . . Use of steam for feed-water heating and another purpose 	

19/10	. Cooling exhaust steam other than by condenser; Rendering exhaust steam invisible	23/12	. the engines being mechanically coupled (F01K 23/02 takes precedence)
21/00	Steam engine plants not otherwise provided for	23/14	. . including at least one combustion engine
21/005	. {using mixtures of liquid and steam or evaporation of a liquid by expansion}	23/16	. . all the engines being turbines (F01K 23/14 takes precedence)
21/02	. with steam-generation in engine-cylinders	23/18	. characterised by adaptation for specific use
21/04	. using mixtures of steam and gas; Plants generating or heating steam by bringing water or steam into direct contact with hot gas ((F01K 25/005, F02B 47/02 take precedence; injecting water or steam into a as a gas turbine plant F02C 3/305); direct-contact steam generators in general F22B)	25/00	Plants or engines characterised by use of special working fluids, not otherwise provided for; Plants operating in closed cycles and not otherwise provided for
21/042	. . {pure steam being expanded in a motor somewhere in the plant (F01K 21/045 takes precedence)}	25/005	. {the working fluid being steam, created by combustion of hydrogen with oxygen}
21/045	. . {Introducing gas and steam separately into the motor, e.g. admission to a single rotor through separate nozzles}	25/02	. the fluid remaining in the liquid phase
21/047	. . {having at least one combustion gas turbine}	25/04	. the fluid being in different phases, e.g. foamed
21/06	. Treating live steam, other than thermodynamically, e.g. for fighting deposits in engine	25/06	. using mixtures of different fluids (plants using mixtures of steam and gas F01K 21/04)
23/00	Plants characterised by more than one engine delivering power external to the plant, the engines being driven by different fluids	25/065	. . {with an absorption fluid remaining at least partly in the liquid state, e.g. water for ammonia (F01K 5/00 takes precedence)}
23/02	. the engine cycles being thermally coupled	25/08	. using special vapours
23/04	. . condensation heat from one cycle heating the fluid in another cycle	25/085	. . {the vapour being sulfur}
23/06	. . combustion heat from one cycle heating the fluid in another cycle	25/10	. . the vapours being cold, e.g. ammonia, carbon dioxide, ether
23/061	. . . {with combustion in a fluidised bed (plants with a fluidised-bed combustor comprising only gas-turbines F02C 3/205; fluidised-bed apparatus per se B01J 8/18; fluidised-bed combustors F23C 10/00; fluidised-bed steam-boilers F22B 31/0007)}	25/103	. . . {Carbon dioxide (F01K 25/065 takes precedence)}
23/062	. . . . {the combustion bed being pressurised (pressurised fluid bed combustion per se F23C 10/16)}	25/106	. . . . {Ammonia (F01K 25/065 takes precedence)}
23/064	. . . . {in combination with an industrial process, e.g. chemical, metallurgical}	25/12	. . . the vapours being metallic, e.g. mercury
23/065	. . . . {the combustion taking place in an internal combustion piston engine, e.g. a diesel engine}	25/14	. . . using industrial or other waste gases
23/067	. . . . {the combustion heat coming from a gasification or pyrolysis process, e.g. coal gasification (gas turbines with fuel gasifiers F02C 3/28)}	27/00	Plants for converting heat or fluid energy into mechanical energy, not otherwise provided for
23/068	. . . . {in combination with an oxygen producing plant, e.g. an air separation plant}	27/005	. {by means of hydraulic motors}
23/08	. . . with working fluid of one cycle heating the fluid in another cycle	27/02	. Plants modified to use their waste heat, other than that of exhaust, e.g. engine-friction heat
23/10	. . . with exhaust fluid of one cycle heating the fluid in another cycle ((F01K 17/025 takes precedence))		
23/101	. . . . {Regulating means specially adapted therefor (F01K 23/105, F01K 23/108 take precedence)}		
23/103	. . . . {with afterburner in exhaust boiler}		
23/105	. . . . . {Regulating means specially adapted therefor}		
23/106	. . . . . {with water evaporated or preheated at different pressures in exhaust boiler}		
23/108	. . . . . {Regulating means specially adapted therefor}		