

CPC COOPERATIVE PATENT CLASSIFICATION

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

ENGINEERING IN GENERAL

F15 FLUID-PRESSURE ACTUATORS; HYDRAULICS OR PNEUMATICS IN GENERAL

F15D FLUID DYNAMICS, i.e. METHODS OR MEANS FOR INFLUENCING THE FLOW OF GASES OR LIQUIDS ([{nozzles, spray heads B05B}](#); [devices to decrease friction or resistance or to increase speed of ships B63B](#); [ship rudders B63H 25/38](#); [influencing the flow or the viscosity of fluids with chemical additives C09K 3/00, C10M](#); [hydraulic engineering E02B](#)}; [fluid circuit elements F15C](#); [{one-way check valves F16K 15/00}](#))

NOTE

This subclass comprises boundary-layer control and other arrangements and methods, not provided for in other classes, for influencing the flow of fluids relative to constraining surfaces and after leaving these surfaces, e.g. producing or removing turbulence, deflecting jets, guiding flow through bends in conduits, affecting distribution of fluid in a conduit, reducing fluid friction.

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	Influencing flow of fluids	1/0085	. . {Methods of making characteristic surfaces for influencing the boundary layer}
1/0005	. {Baffle plates}	1/009	. {by means of vortex rings}
1/001	. {Flow of fluid from conduits such as pipes, sleeves, tubes, with equal distribution of fluid flow over the evacuation surface}	1/0095	. {by means of injecting jet pulses of fluid wherein the injected fluid is taken from the fluid and re-injected again, e.g. synthetic jet actuators (F15D 1/008 takes precedence)}
1/0015	. {Whirl chambers}	1/02	. in pipes or conduits
1/002	. {by influencing the boundary layer (F15D 1/06 and F15D 1/12 take precedence)}	1/025	. . {by means of orifice or throttle elements}
1/0025	. . {using passive means, i.e. without external energy supply}	1/04	. . Arrangements of guide vanes in pipe elbows or duct bends; Construction of pipe conduit elements or elbows with respect to flow, specially for reducing losses in flow
1/003	. . . {comprising surface features, e.g. indentations or protrusions (F15D 1/0055 , F15D 1/006 take precedence)}	1/06	. . by influencing the boundary layer {(use of materials, e.g. to reduce surface friction C09K 3/00)}
1/0035	. . . . {in the form of riblets}	1/065	. . . {Whereby an element is dispersed in a pipe over the whole length or whereby several elements are regularly distributed in a pipe}
1/004	. . . . {oriented essentially parallel to the direction of flow}	1/08	. of jets leaving an orifice (nozzles or outlets with means for mechanically breaking up or deflecting the jet B05B , e.g. B05B 1/26)
1/0045	. . . . {oriented essentially perpendicular to the direction of flow}	1/10	. around bodies of solid material
1/005	. . . . {in the form of dimples}	1/12	. . by influencing the boundary layer {(use of materials, e.g. to reduce surface friction C09K 3/00)}
1/0055	. . . {comprising apertures in the surface, through which fluid is withdrawn from or injected into the flow}	1/14	. Diverting flow into alternative channels (in hydraulic engineering E02B)
1/006	. . . {comprising moving surfaces, wherein the surface, or at least a portion thereof is moved or deformed by the fluid flow}		
1/0065	. . {using active means, e.g. supplying external energy or injecting fluid}		
1/007	. . . {comprising surfaces being moved by external supplied energy}		
1/0075	. . . {comprising electromagnetic or electrostatic means for influencing the state of the fluid, e.g. for ionising the fluid or for generating a plasma}		
1/008	. . . {comprising fluid injection or suction means}		