

CPC COOPERATIVE PATENT CLASSIFICATION

F17D PIPE-LINE SYSTEMS; PIPE-LINES (pumps or compressors [F04](#); fluid dynamics [F15D](#); valves or the like [F16K](#); pipes, laying pipes, supports, joints, branches, repairing, work on the entire line, accessories [F16L](#); steam traps or the like [F16T](#); fluid-pressure electric cables [H01B 9/06](#))

NOTE

In this subclass, pipe-line systems are interpreted as systems described in flow sheets as well as arrangements of co-operating elements, the elements per se being covered in the relevant subclasses.

1/00	Pipe-line systems (conveying articles or materials through a pipe- line by means of a fluid carrier B65G 51/00 , B65G 53/00 ; liquids B67D ; special devices for transferring liquids from bulk storage containers into vehicles or boats or <i>vice versa</i> , e.g. loading or unloading vehicles or portable containers B67D 7/00 ; conveying material which has been excavated by a dredger or soil shifter through a pipe-line E02F 7/10 ; sewer pipe-line systems E03F 3/00 ; thermal insulation of pipe-lines F16L 59/00 ; central heating systems F24D)	3/00	Arrangements for supervising or controlling working operations
1/005	• {for a two-phase gas-liquid flow}	3/01	• for controlling, signalling, or supervising the conveyance of a product
1/02	• for gases or vapours	3/03	• for controlling, signalling, or supervising the conveyance of several different products following one another in the same conduit, e.g. for switching from one receiving tank to another
1/04	• . for distribution of gas	3/05	• . the different products not being separated (separation of contaminants by distillation B01D 3/00)
1/05	• . . Preventing freezing (by heating F16L 53/00)	3/08	• . the different products being separated by "go-devils", e.g. spheres (cleaning devices moved along inside a pipe-line by fluid pressure B08B 9/04 ; {pigs or moles <i>per se</i> , their launching and detection F16L 55/26 })
1/06	• . for steam	3/10	• for taking out the product in the line (sampling in general, examining the physical or chemical properties of materials G01N)
1/065	• . Arrangements for producing propulsion of gases or vapours	3/12	• for injecting a composition into the line
1/07	• . . by compression	3/14	• for eliminating water (separation of liquids B01D , e.g. B01D 17/00 ; separation of gases or vapours B01D 53/00)
1/075	• . . by mere expansion from an initial pressure level, e.g. by arrangement of a flow-control valve	3/145	• . {in gas pipelines}
1/08	• for liquids or viscous products (water-main or service pipe systems E03B 7/04 ; domestic hot-water supply systems F24D 17/00)	3/16	• for eliminating particles in suspension (from liquids by sedimentation B01D 21/00 ; separation by filtration or otherwise B01D 24/00 - B01D 51/00 ; centrifugal apparatus B04)
1/082	• . {for cold fluids, e.g. liquified gas (F17D 1/086 takes precedence)}	3/18	• for measuring the quantity of conveyed product (measuring volume or volume flow, in general G01F)
1/084	• . {for hot fluids (F17D 1/086 takes precedence)}	5/00	Protection or supervision of installations (arrangements for protecting foundations E02D 31/00 ; protecting pipes from damage or internal or external wear F16L 57/00 , against corrosion and scale F16L 58/00 ; investigation of the fluid-tightness of structures G01M 3/00)
1/086	• . {for explosives}	5/005	• {of gas pipelines, e.g. alarm}
1/088	• . {for solids or suspensions of solids in liquids, e.g. slurries (F17D 1/086 takes precedence)}	5/02	• Preventing, monitoring, or locating loss
1/12	• . Conveying liquids or viscous products by pressure of another fluid	5/04	• . by means of a signalling fluid enclosed in a double wall
1/13	• . Conveying liquids or viscous products by gravity	5/06	• . using electric or acoustic means
1/14	• . Conveying liquids or viscous products by pumping	5/08	• Protection of installations or persons from the effects of high voltage induced in the pipe-line (emergency protective circuit arrangements H02H)
1/16	• . Facilitating the conveyance of liquids or effecting the conveyance of viscous products by modification of their viscosity {(changing the flow or the viscosity by adding a chemical agent C09K 3/00 , C10M)}		
1/17	• . . by mixing with another liquid, {i.e. diluting}		
1/18	• . . by heating		
1/20	• Arrangements or systems of devices for influencing or altering dynamic characteristics of the systems, e.g. for damping pulsations caused by opening or closing of valves (fluid dynamics F15D ; damping pulsations in fluids in pipes in general F16L 55/04)		