

CPC COOPERATIVE PATENT CLASSIFICATION

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

ENGINEERING IN GENERAL

F17 STORING OR DISTRIBUTING GASES OR LIQUIDS

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.

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.

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|-------------|---|-------------|--|
| 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) | 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)} |
| 1/005 | • {for a two-phase gas-liquid flow} | 1/17 | • • • by mixing with another liquid {, i.e. diluting} |
| 1/02 | • for gases or vapours | 1/18 | • • • by heating |
| 1/04 | • • for distribution of gas | 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) |
| 1/05 | • • • Preventing freezing (by heating F16L 53/30) | | |
| 1/06 | • • for steam | | |
| 1/065 | • • Arrangements for producing propulsion of gases or vapours | 3/00 | Arrangements for supervising or controlling working operations |
| 1/07 | • • • by compression | 3/01 | • for controlling, signalling, or supervising the conveyance of a product |
| 1/075 | • • • by mere expansion from an initial pressure level, e.g. by arrangement of a flow-control valve | 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 |
| 1/08 | • for liquids or viscous products (water-main or service pipe systems E03B 7/04 ; domestic hot-water supply systems F24D 17/00) | 3/05 | • • the different products not being separated (separation of contaminants by distillation B01D 3/00) |
| 1/082 | • • {for cold fluids, e.g. liquefied gas (F17D 1/086 takes precedence)} | 3/08 | • • the different products being separated by "go-devils", e.g. spheres (cleaning devices moved along inside a pipe-lines by fluid pressure B08B 9/04 ; {pigs or moles <i>per se</i> , their launching and detection F16L 55/26)} |
| 1/084 | • • {for hot fluids (F17D 1/086 takes precedence)} | 3/10 | • for taking out the product in the line (sampling in general, examining the physical or chemical properties of materials G01N) |
| 1/086 | • • {for explosives} | 3/12 | • for injecting a composition into the line |
| 1/088 | • • {for solids or suspensions of solids in liquids, e.g. slurries (F17D 1/086 takes precedence)} | 3/14 | • for eliminating water (separation of liquids B01D , e.g. B01D 17/00 ; separation of gases or vapours B01D 53/00) |
| 1/12 | • • Conveying liquids or viscous products by pressure of another fluid | 3/145 | • • {in gas pipelines} |
| 1/13 | • • Conveying liquids or viscous products by gravity | | |
| 1/14 | • • Conveying liquids or viscous products by pumping | | |

F17D

- 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](#))
- 3/18
 - for measuring the quantity of conveyed product (measuring volume or volume flow, in general [G01F](#))
- 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](#))
- 5/005
 - {of gas pipelines, e.g. alarm}
- 5/02
 - Preventing, monitoring, or locating loss
- 5/04
 - . by means of a signalling fluid enclosed in a double wall
- 5/06
 - . using electric or acoustic means
- 5/08
 - Protection of installations or persons from the effects of high voltage induced in the pipe-line (emergency protective circuit arrangements [H02H](#))