

CPC COOPERATIVE PATENT CLASSIFICATION

E FIXED CONSTRUCTIONS

EARTH DRILLING; MINING

E21 EARTH DRILLING; MINING

E21F SAFETY DEVICES, TRANSPORT, FILLING-UP, RESCUE, VENTILATION, OR DRAINING IN OR OF MINES OR TUNNELS

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.

Ventilation of mines or tunnels

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| 1/00 | Ventilation of mines or tunnels; Distribution of ventilating currents (ventilating rooms or spaces in general F24F) | 5/06 | . . Fluids used for spraying |
| 1/003 | . {Ventilation of traffic tunnels (during construction E21F 1/04 - E21F 3/00)} | 5/08 | . Rock dusting of mines; Depositing other protective substances |
| 1/006 | . {Ventilation at the working face of galleries or tunnels} | 5/10 | . . Devices for rock dusting |
| 1/02 | . Test models (analogue computers therefor G06G 7/50) | 5/12 | . . Composition of rock dust |
| 1/04 | . Air ducts (suspension devices E21F 17/02) | 5/14 | . Fluid barriers or rock dusters made to work by, or at the same time as, shots or explosions |
| 1/06 | . . Duct connections (tube connections in general F16L) | 5/143 | . . {Fluid barriers} |
| 1/08 | . Ventilation arrangements in connection with air ducts, e.g. arrangements for mounting ventilators ({ E21F 1/003 takes precedence}; ventilators in general F04D) | 5/146 | . . {Rock dusters} |
| 1/085 | . . {using compressed gas injectors} | 5/16 | . Layers of hygroscopic or other salts deposited on floors, walls, or the like, for binding dust; Deposition of such layers (dust-absorbing materials in general C09K 3/22) |
| 1/10 | . Air doors ({ E21F 1/003 takes precedence; air locks E21F 1/145 ; dam doors E21F 17/12 }; doors in general E06B) | 5/18 | . Impregnating walls, or the like, with liquids for binding dust ({injections for improving soil or rock E21D 9/001 ; borehole closures, i.e. packers, for use during the injection process E21B 33/12 }) |
| 1/12 | . . Devices for automatically opening air doors | 5/20 | . Drawing-off or depositing dust (dust-removing while drilling E21C 7/00 ; while slitting E21C 35/22) |
| 1/14 | . Air partitions; Air locks ({ E21F 1/003 takes precedence}; dams E21F 17/103 ; air locks for foundations E02D) | 7/00 | Methods or devices for drawing- off gases with or without subsequent use of the gas for any purpose |
| 1/145 | . . {Air locks (air doors E21F 1/10 ; dam doors E21F 17/12)} | 9/00 | Devices preventing sparking of machines or apparatus (preventing sparking of electric machines or apparatus H01K , H02K) |
| 1/16 | . Shaft covers | 11/00 | Rescue devices or other safety devices, e.g. safety chambers or escape ways (breathing aids for curative purposes A61H 31/00 ; respiratory apparatus A62B 7/00 ; breathing apparatus for accidentally buried persons A62B 33/00) |
| 1/18 | . Gravity flow ventilation (E21F 1/02 - E21F 1/16 take precedence) | 13/00 | Transport specially adapted to underground conditions (mine cars B61D ; transport in general, loading {unless specially adapted to underground conditions} B65G) |
| 3/00 | Cooling or drying of air (air-conditioning rooms or spaces in general F24F) | 13/002 | . {Crushing devices specifically for conveying in mines} |

Safety devices (flue-gas indicators [G01N](#)); Rescue devices

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| 5/00 | Means or methods for preventing, binding, depositing, or removing dust {(in combination with mining machines E21C 35/22)}; Preventing explosions or fires (dams E21F 17/103 ; applying liquids or other fluent materials to surfaces in general B05) | 13/004 | . {Staff transport system} |
| 5/02 | . by wetting or spraying | 13/006 | . {Equipment transport systems} |
| 5/04 | . . Spraying barriers (spray nipples, spraying in general B05B , B05D ; picks with arrangements of fluid-spraying nozzles E21C 35/187) | 13/008 | . . {for mine roof support units for step-by-step movement} |
| | | 13/02 | . {Transport of mined mineral} in galleries |
| | | 13/025 | . . {Shuttle cars} |

- 13/04 . {Transport of mined material} in gravity inclines; in staple or inclined shafts
- 13/042 . . {Vertical hydraulic conveying of coal (conveying by water flow in general [B65G 53/00](#))}
- 13/045 . . {Bunkers specially adapted for mining purposes (chutes in general [B65G 11/00](#))}
- 13/047 . . {comprising helically running channels (chutes of helical form in general [B65G 11/06](#))}
- 13/06 . {Transport of mined material} at or adjacent to the working face
- 13/061 . . {Chutes and braking conveyors for average and steep slopes, adapted for mining purposes (chutes in general [B65G 11/00](#))}
- 13/063 . . {Loading devices for use in mining}
- 13/065 . . . {Scrapers (digging devices guided by cables [E02F 3/54](#); combined with planing means [E21C 27/42](#))}
- 13/066 . . {Scraper chain conveyors (in general [B65G 19/00](#))}
- 13/068 . . . {Special adaptations for use at the junction of the working face with the gallery, e.g. driving stations coupled to the driving station of the winning machine}
- 13/08 . Shifting conveyors or other transport devices from one location at the working face to another ([guiding mining machines along conveyors for the cut mineral E21C 35/12](#); in combination with mine roof supports for step-by-step movement [E21D 23/00](#))
- 13/083 . . {Conveyor belts removing methods or devices}
- 13/086 . . {Armoured conveyors shifting devices}
- 13/10 . Anchorings for conveyors
- 15/00 Methods or devices for placing filling-up materials in underground workings** ([dams E21F 17/103](#) {; chocks made of flexible containers filled with backfilling material [E21D 15/483](#)})
- 15/005 . {characterised by the kind or composition of the backfilling material}
- 15/02 . Supporting means, e.g. shuttering, for filling-up materials
- 15/04 . . Stowing mats; Goaf wire netting; Partition walls
- 15/06 . Filling-up mechanically
- 15/08 . Filling-up hydraulically or pneumatically ([hydraulic or pneumatic transport devices B65G](#); pipes, pipe couplings [F16L](#))
- 15/10 . . Hydraulic or pneumatic filling-up machines
- 16/00 Drainage** ([keeping dry foundation sites or other areas in the ground E02D 19/00](#))
- 16/02 . of tunnels
- 17/00 Methods or devices for use in mines or tunnels, not covered elsewhere** ([mine lighting F21](#), [H05B](#))
- 17/02 . Suspension devices for tubes or the like, e.g. for ventilating ducts ([supporting pipes, cables or protective tubing in general F16L 3/00 - F16L 7/00](#))
- 17/04 . Distributing means for power supply in mines
- 17/06 . . Distributing electric power; Cable networks; Conduits for cables ([circuit arrangements for supplying or distributing electric power in general H02J](#))
- 17/08 . . Distributing hydraulic power; Pipe networks for hydraulic liquid ([pipe-line systems in general F17D](#))
- 17/10 . . Distributing pneumatic power; Pipe networks for compressed air ([pipe-line systems in general F17D](#))
- 17/103 . Dams, e.g. for ventilation
- 17/107 . . inflatable
- 17/12 . . Dam doors {(air doors [E21F 1/10](#); air locks [E21F 1/145](#))}
- 17/16 . Modification of mine passages or chambers for storage purposes, especially for liquids or gases ([storing fluids in natural or artificial cavities or chambers in the earth B65G 5/00](#))
- 17/18 . Special adaptations of signalling or alarm devices ([for mine lifts B66B](#); gas-sensitive devices [per se G01N](#))
- 17/185 . . {Rock-pressure control devices with or without alarm devices; Alarm devices in case of roof subsidence (props with load-measuring devices [E21D 15/46](#))}