

CPC COOPERATIVE PATENT CLASSIFICATION

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

Ventilation of mines or tunnels

- 1/00 Ventilation of mines or tunnels; Distribution of ventilating currents** (ventilating rooms or spaces in general [F24F](#))
- 1/003 . { [Ventilation of traffic tunnels](#) (during construction [E21F 1/04](#) - [E21F 3/00](#)) }
- 1/006 . { [Ventilation at the working face of galleries or tunnels](#) }
- 1/02 . Test models (analogue computers therefor [G06G 7/50](#))
- 1/04 . Air ducts (suspension devices [E21F 17/02](#))
- 1/06 . . Duct connections (tube connections in general [F16L](#))
- 1/08 . Ventilation arrangements in connection with air ducts, e.g. arrangements for mounting ventilators ({[E21F 1/003](#) takes precedence}; ventilators in general [F04D](#))
- 1/085 . . { [using compressed gas injectors](#) }
- 1/10 . Air doors ({[E21F 1/003](#) takes precedence; air locks [E21F 1/145](#); dam doors [E21F 17/12](#)}; doors in general [E06B](#))
- 1/12 . . Devices for automatically opening air doors
- 1/14 . Air partitions; Air locks ({[E21F 1/003](#) takes precedence}; dams [E21F 17/103](#); air locks for foundations [E02D](#))
- 1/145 . . { [Air locks](#) (air doors [E21F 1/10](#); dam doors [E21F 17/12](#)) }
- 1/16 . Shaft covers
- 1/18 . Gravity flow ventilation ([E21F 1/02](#) - [E21F 1/16](#) take precedence)
- 3/00 Cooling or drying of air** (air-conditioning rooms or spaces in general [F24F](#))

- 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](#))
- 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](#)})
- 5/20 . Drawing-off or depositing dust ([dust-removing while drilling E21C 7/00](#); while slitting [E21C 35/22](#))
- 7/00 Methods or devices for drawing- off gases with or without subsequent use of the gas for any purpose**
- 9/00 Devices preventing sparking of machines or apparatus** (preventing sparking of electric machines or apparatus [H01K](#), [H02K](#))
- 11/00 Rescue devices or other safety devices, e.g. safety chambers, escape ways** (respiratory apparatus [A62B 7/00](#); revival apparatus [A62B 33/00](#); breathing aids for curative purposes [A61H 31/00](#))
- 13/00 Transport specially adapted to underground conditions** (mine cars [B61D](#); transport in general, loading {unless specially adapted to underground conditions} [B65G](#))
- 13/002 . { [Crushing devices specifically for conveying in mines](#) }
- 13/004 . { [Staff transport system](#) }
- 13/006 . { [Equipment transport systems](#) }
- 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](#) }

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

- 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](#))
- 5/02 . by wetting or spraying
- 5/04 . . Spraying barriers ([spray nipples](#), spraying in general [B05B](#), [B05D](#); picks with arrangements of fluid-spraying nozzles [E21C 35/187](#))
- 5/06 . . Fluids used for spraying
- 5/08 . Rock dusting of mines; Depositing other protective substances
- 5/10 . . Devices for rock dusting
- 5/12 . . Composition of rock dust
- 5/14 . Fluid barriers or rock dusters made to work by, or at the same time as, shots or explosions
- 5/143 . . { [Fluid barriers](#) }
- 5/146 . . { [Rock dusters](#) }

- 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](#))}