

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

Ventilation of mines or tunnels

1/00	Ventilation of mines or tunnels; Distribution of ventilating currents (ventilating rooms or spaces in general F24F)	5/10	. . Devices for rock dusting
1/003	. { Ventilation of traffic tunnels (during construction E21F 1/04 - E21F 3/00) }	5/12	. . Composition of rock dust
1/006	. { Ventilation at the working face of galleries or tunnels }	5/14	. Fluid barriers or rock dusters made to work by, or at the same time as, shots or explosions
1/02	. Test models (analogue computers therefor G06G 7/50)	5/143	. . { Fluid barriers }
1/04	. Air ducts (suspension devices E21F 17/02)	5/146	. . { Rock dusters }
1/06	. . Duct connections (tube connections in general F16L)	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)
1/08	. Ventilation arrangements in connection with air ducts, e.g. arrangements for mounting ventilators ({ E21F 1/003 takes precedence}); ventilators in general F04D)	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 })
1/085	. . { using compressed gas injectors }	5/20	. Drawing-off or depositing dust (dust-removing while drilling E21C 7/00 ; while slitting E21C 35/22)
1/10	. Air doors ({ E21F 1/003 takes precedence; air locks E21F 1/145 ; dam doors E21F 17/12 }; doors in general E06B)	7/00	Methods or devices for drawing- off gases with or without subsequent use of the gas for any purpose
1/12	. . Devices for automatically opening air doors	9/00	Devices preventing sparking of machines or apparatus (preventing sparking of electric machines or apparatus H01K , H02K)
1/14	. Air partitions; Air locks ({ E21F 1/003 takes precedence}); dams E21F 17/103 ; air locks for foundations E02D)	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)
1/145	. . { Air locks (air doors E21F 1/10 ; dam doors E21F 17/12) }	13/00	Transport specially adapted to underground conditions (mine cars B61D ; transport in general, loading {unless specially adapted to underground conditions} B65G)
1/16	. Shaft covers	13/002	. { Crushing devices specifically for conveying in mines }
1/18	. Gravity flow ventilation (E21F 1/02 - E21F 1/16 take precedence)	13/004	. { Staff transport system }
3/00	Cooling or drying of air (air-conditioning rooms or spaces in general F24F)	13/006	. { Equipment transport systems }
		13/008	. . { for mine roof support units for step-by-step movement }

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)	13/02	. { Transport of mined mineral } in galleries
5/02	. by wetting or spraying	13/025	. . { Shuttle cars }
5/04	. . Spraying barriers (spray nipples, spraying in general B05B , B05D ; picks with arrangements of fluid-spraying nozzles E21C 35/187)	13/04	. { Transport of mined material } in gravity inclines; in staple or inclined shafts
5/06	. . Fluids used for spraying	13/042	. . { Vertical hydraulic conveying of coal (conveying by water flow in general B65G 53/00) }
5/08	. Rock dusting of mines; Depositing other protective substances	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](#))}