

# 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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| <p><b>1/00</b> Ventilation of mines or tunnels; Distribution of ventilating currents (ventilating rooms or spaces in general <a href="#">F24F</a>)</p> <p>1/003 . {Ventilation of traffic tunnels (during construction <a href="#">E21F 1/04</a> - <a href="#">E21F 3/00</a>)}</p> <p>1/006 . {Ventilation at the working face of galleries or tunnels}</p> <p>1/02 . Test models (analogue computers therefor <a href="#">G06G 7/50</a>)</p> <p>1/04 . Air ducts (suspension devices <a href="#">E21F 17/02</a>)</p> <p>1/06 . . Duct connections (tube connections in general <a href="#">F16L</a>)</p> <p>1/08 . Ventilation arrangements in connection with air ducts, e.g. arrangements for mounting ventilators ({<a href="#">E21F 1/003</a> takes precedence}; ventilators in general <a href="#">F04D</a>)</p> <p>1/085 . . {using compressed gas injectors}</p> <p>1/10 . Air doors ({<a href="#">E21F 1/003</a> takes precedence; air locks <a href="#">E21F 1/145</a>; dam doors <a href="#">E21F 17/12</a>}; doors in general <a href="#">E06B</a>)</p> <p>1/12 . . Devices for automatically opening air doors</p> <p>1/14 . Air partitions; Air locks ({<a href="#">E21F 1/003</a> takes precedence}; dams <a href="#">E21F 17/103</a>; air locks for foundations <a href="#">E02D</a>)</p> <p>1/145 . . {Air locks (air doors <a href="#">E21F 1/10</a>; dam doors <a href="#">E21F 17/12</a>)}</p> <p>1/16 . Shaft covers</p> <p>1/18 . Gravity flow ventilation (<a href="#">E21F 1/02</a> - <a href="#">E21F 1/16</a> take precedence)</p> <p><b>3/00</b> Cooling or drying of air (air-conditioning rooms or spaces in general <a href="#">F24F</a>)</p> | <p>5/06 . . Fluids used for spraying</p> <p>5/08 . Rock dusting of mines; Depositing other protective substances</p> <p>5/10 . . Devices for rock dusting</p> <p>5/12 . . Composition of rock dust</p> <p>5/14 . Fluid barriers or rock dusters made to work by, or at the same time as, shots or explosions</p> <p>5/143 . . {Fluid barriers}</p> <p>5/146 . . {Rock dusters}</p> <p>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 <a href="#">C09K 3/22</a>)</p> <p>5/18 . Impregnating walls, or the like, with liquids for binding dust {(injections for improving soil or rock <a href="#">E21D 9/001</a>; borehole closures, i.e. packers, for use during the injection process <a href="#">E21B 33/12</a>)}</p> <p>5/20 . Drawing-off or depositing dust ({dust-removing while drilling <a href="#">E21B 21/011</a>}; while slitting <a href="#">E21C 35/22</a>)</p> <p><b>7/00</b> Methods or devices for drawing- off gases with or without subsequent use of the gas for any purpose</p> <p><b>9/00</b> Devices preventing sparking of machines or apparatus (preventing sparking of electric machines or apparatus <a href="#">H01K</a>, <a href="#">H02K</a>)</p> <p><b>11/00</b> Rescue devices or other safety devices, e.g. safety chambers or escape ways (breathing aids for curative purposes <a href="#">A61H 31/00</a>; respiratory apparatus <a href="#">A62B 7/00</a>; breathing apparatus for accidentally buried persons <a href="#">A62B 33/00</a>)</p> <p><b>13/00</b> Transport specially adapted to underground conditions (mine cars <a href="#">B61D</a>; transport in general, loading {unless specially adapted to underground conditions} <a href="#">B65G</a>)</p> |
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##### Safety devices (flue-gas indicators [G01N](#)); Rescue devices

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| <p><b>5/00</b> Means or methods for preventing, binding, depositing, or removing dust {(in combination with mining machines <a href="#">E21C 35/22</a>)}; Preventing explosions or fires (dams <a href="#">E21F 17/103</a>; applying liquids or other fluent materials to surfaces in general <a href="#">B05</a>)</p> <p>5/02 . by wetting or spraying</p> <p>5/04 . . Spraying barriers (spray nipples, spraying in general <a href="#">B05B</a>, <a href="#">B05D</a>; picks with arrangements of fluid-spraying nozzles <a href="#">E21C 35/187</a>)</p> | <p>13/002 . {Crushing devices specifically for conveying in mines}</p> <p>13/004 . {Staff transport system}</p> <p>13/006 . {Equipment transport systems}</p> <p>13/008 . . {for mine roof support units for step-by-step movement}</p> <p>13/02 . {Transport of mined mineral} in galleries</p> <p>13/025 . . {Shuttle cars}</p> |
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- 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 \[E21D 15/46\]\(#\)](#))}