COOPERATIVE PATENT CLASSIFICATION

B PERFORMING OPERATIONS; TRANSPORTING

TRANSPORTING

B66 HOISTING; LIFTING; HAULING

B66B ELEVATORS; ESCALATORS OR MOVING WALKWAYS (apparatus for raising or lowering persons on theatrical stages or the like A63J 5/12; funicular railbound systems with rigid ground-supported tracks and cable traction, e.g. cliff railways, B61B 9/00; arrangements of ammunition handlers in vessels B63G 3/00; hoists, lifts, or conveyors for loading or unloading in general B65G; braking or detent devices controlling normal movements of winding drums or barrels B66D; ship-lifting devices E02C; garages for many vehicles with mechanical means for lifting vehicles E04H 6/12; hoists for feeding ammunition or projectiles to launching apparatus or to loading mechanisms F41A 9/00)

NOTE
In this subclass, the following term is used with the meaning indicated:
• “elevator” covers the term “lift”, and the two terms are interchangeable

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.

Common features of elevators

1/00 Control systems of elevators in general (safety devices B66B 5/00; controlling door or gate operation B66B 13/00; systems of general application G05)

1/02 . Control systems without regulation, i.e. without retroactive action

1/04 . . hydraulic

1/06 . . electric

1/08 . . with devices, e.g. handles or levers, in the cars or cages for direct control of movements

1/10 . . . specially adapted for mining hoists

1/12 . . with devices, e.g. handles or levers, located at a control station for direct control movements, e.g. electric mining-hoist control systems

1/14 . . . with devices, e.g. push-buttons, for indirect control of movements

1/16 . . . with means for storing pulses controlling the movements of a single car or cage (B66B 1/2433 takes precedence)

1/18 . . . with means for storing pulses controlling the movements of several cars or cages (B66B 1/2458 takes precedence)

1/20 . . . . and for varying the manner of operation to suit particular traffic conditions, e.g. “one-way rush-hour traffic” (B66B 1/2466 takes precedence)

1/22 . . . with means for taking account of delayed calls

1/24 . Control systems with regulation, i.e. with retroactive action, for influencing travelling speed, acceleration, or deceleration

1/2408 . . (where the allocation of a call to an elevator car is of importance, i.e. by means of a supervisory or group controller)

1/2416 . . . (For single car elevator systems)

1/2433 . . . (For elevator systems with a single shaft and multiple cars)

1/2458 . . . (For elevator systems with multiple shafts and a single car per shaft)

1/2466 . . . (For elevator systems with multiple shafts and multiple cars per shaft)

1/2491 . . . (For elevator systems with lateral transfers of cars or cabins between hoistways)

1/26 . . . mechanical

1/28 . . . electrical (detecting excessive speed B66B 5/04; control of electrical motor H02P))

1/285 . . . (with the use of a speed pattern generator)

1/30 . . . effective on driving gear, e.g. acting on power electronics, on inverter or rectifier controlled motor

1/302 . . . (for energy saving)

1/304 . . . (with starting torque control)

1/306 . . . (with DC powered elevator drive)

1/308 . . . (with AC powered elevator drive)

1/32 . . . effective on braking devices, e.g. acting on electrically controlled brakes (brake control H02P, lift brakes per se B66B 5/02)

1/34 . . . Details, e.g. call counting devices, data transmission from car to control system, devices giving information to the control system

1/3407 . . . (Setting or modification of parameters of the control system)
Common features of elevators

1/3415 . . . [Control system configuration and the data transmission or communication within the control system]
1/3423 . . . [Control system configuration, i.e. lay-out]
1/343  . . . . [Fault-tolerant or redundant control system configuration]
1/3438 . . . . [Master-slave control system configuration]
1/3446 . . . . [Data transmission or communication within the control system]
1/3453 . . . . [Procedure or protocol for the data transmission or communication]
1/3461 . . . [between the elevator control system and remote or mobile stations]
1/3469 . . . [mechanical]
1/3476 . . . . [Load weighing or car passenger counting devices (B66B 5/14 takes precedence)]
1/3484 . . . . [using load cells]
1/3492 . . . . [Position or motion detectors or driving means for the detector (B66B 1/40, B66B 1/50 take precedence; length measuring G01B; speed measuring G01P)]

1/36 . . . . Means for stopping the cars, cages, or skips at predetermined levels
1/365 . . . . [mechanical]
1/38 . . . . and for returning the controlling handle or lever to its neutral position
1/40 . . . . and for correct levelling at landings
1/405 . . . . [for hydraulically actuated elevators]
1/42 . . . . separate from the main drive
1/425 . . . . [adapted for multi-deck cars in a single car frame]
1/44 . . . . and for taking account of disturbance factors, e.g. variation of load weight
1/46 . . . . Adaptations of switches or switchgear (switches or switchgear in general, applications of switches or switchgear for floor-levelling purpose H01H; panels for boards or switching arrangements H02B 1/015]
1/461 . . . . [characterised by their shape or profile]
1/462 . . . . [Mechanical or piezoelectric input devices]
1/463 . . . . [Touch sensitive input devices]
1/465 . . . . [being resistant to damage]
1/466 . . . . [facilitating maintenance, installation, removal, replacement or repair]
1/467 . . . . [characterised by their mounting position]
1/468 . . . . [Call registering systems]
1/48 . . . . Adaptations of mechanically-operated limit switches (for cranes B66C 13/50; for winding mechanisms B66D 1/56)
1/50 . . . . with operating or control mechanisms mounted in the car or cage or in the lift well or hoistway
1/52 . . . . Floor selectors

3/00 Applications of devices for indicating or signalling operating conditions of elevators
3/002 . . . [Indicators]
3/004 . . . [Mechanical devices that can be illuminated]
3/006 . . . [for guiding passengers to their assigned elevator car]
3/008 . . . [Displaying information not related to the elevator, e.g. weather, publicity, internet or TV]
3/02 . . . . Position or depth indicators
3/023 . . . [characterised by their mounting position]
3/026 . . . [Mechanical devices that can be illuminated]

5/00 Applications of checking, fault-correcting, or safety devices in elevators
5/006 . . . [Monitoring devices or performance analysers (B66B 5/07 takes precedence)]
5/012 . . . [Devices monitoring the users of the elevator system]
5/018 . . . [Devices monitoring the operating condition of the elevator system]
5/025 . . . [for maintenance or repair]
5/031 . . . [for safety reasons]
5/037 . . . . [Performance analysers]
5/043 . . . [Devices enhancing safety during maintenance]
5/05 . . . . [Safety of maintenance personnel]
5/056 . . . . [by preventing crushing]
5/062 . . . . [by devices, being operable or not, mounted on the elevator car]
5/068 . . . . [by activating the safety brakes when the elevator car exceeds a certain upper or lower position in the elevator shaft]
5/075 . . . . [by anchoring the elevator car or counterweight]
5/081 . . . . [by preventing falling by means of safety fences or handrails, being operable or not, mounted on top of the elevator car]
5/087 . . . [Devices facilitating maintenance, repair or inspection tasks (devices incorporated in the buffer B66B 5/288; railings on top of the car B66B 11/0226)]
5/093 . . . [Testing of safety devices]
5/02 . . . responsive to abnormal operating conditions
5/021 . . . [the abnormal operating conditions being independent of the system (alarm systems in general G08B)]
5/022 . . . . [where the abnormal operating condition is caused by a natural event, e.g. earthquake]
5/024 . . . . [where the abnormal operating condition is caused by an accident, e.g. fire]
5/025 . . . [where the abnormal operating condition is caused by human behaviour or misbehaviour, e.g. forcing the doors]
5/027 . . . . [to permit passengers to leave an elevator car in case of failure, e.g. moving the car to a reference floor or unlocking the door]
5/028 . . . [Safety devices separate from control system in case of power failure, for hydraulic lifts, e.g. braking the hydraulic jack (B66B 5/16 takes precedence)]
5/04 . . . for detecting excessive speed
5/042 . . . . [characterised by specific locations of the governor cable]
5/044 . . . [Mechanical overspeed governors]
5/046 . . . . [of the pendulum or rocker arm type]
5/048 . . . . [Testing of overspeed governor]
5/06 . . . electrical
5/08 . . . for preventing overwinding
5/10 . . . electrical
5/12 . . . . . in case of rope or cable slack
5/125 . . . . . [electrical]
5/14 . . . . . in case of excessive loads
5/145 . . . . [electrical]
Common features of elevators

5/16 . Braking or catch devices operating between cars, cages, or skips and fixed guide elements or surfaces in hoistway or well
5/18 . and applying frictional retarding forces
5/185 . (by acting on main ropes or main cables)
5/20 . by means of rotatable eccentrically-mounted members (B66B 5/24 takes precedence)
5/22 . by means of linearly-movable wedges (B66B 5/24 takes precedence)
5/24 . by acting on guide ropes or cables
5/26 . Positively-acting devices, e.g. latches, knives
5/28 . Buffer-stops for cars, cages, or skips
5/282 . [Structure thereof]
5/284 . [mounted on cars or counterweights]
5/286 . [between two cars or two counterweights]
5/288 . [with maintenance features (if not incorporated in the buffer B66B 5/0087)]

7/00 Other common features of elevators
7/02 Guideways; Guides (arrangements in mine shafts E21D 7/02)
7/021 . [with a particular position in the shaft]
7/022 . [with a special shape]
7/023 . [Mounting means therefor]
7/024 . [Lateral supports]
7/025 . [End supports, i.e. at top or bottom]
7/026 . [Interconnections]
7/027 . [for mounting auxiliary devices]
7/028 . [with earthquake protection devices]
7/04 [Riding means, e.g. Shoes, Rollers, between car and guiding means, e.g. rails, ropes (rollers adapted to match the shape of a special guiding means B66B 7/02; vibration attenuation systems acting between car and its supporting frame B66B 11/026)]
7/041 . [including active attenuation system for shocks, vibrations]
7/042 . [with rollers, shoes]
7/043 . [using learning]
7/044 . [with magnetic or electromagnetic means]
7/045 . [using learning]
7/046 . [Rollers]
7/047 . [Shoes, sliders]
7/048 . [including passive attenuation system for shocks, vibrations]
7/06 Arrangements of ropes or cables
7/062 . [Belts]
7/064 . [Power supply or signal cables]
7/066 . [Chains]
7/068 . [Cable weight compensating devices]
7/08 . for connection to the cars or cages, e.g. couplings
7/085 . [Belt termination devices]
7/10 . for equalising rope or cable tension
7/12 Checking, lubricating, or cleaning means for ropes, cables or guides
7/1207 . [Checking means]
7/1215 . [specially adapted for ropes or cables]
7/1223 . [by analysing electric variables]
7/123 . [by analysing magnetic variables]
7/1238 . [by optical techniques]
7/1246 . [specially adapted for guides]
7/1253 . [Lubricating means]
7/1261 . [specially adapted for ropes or cables]

7/1269 . [specially adapted for guides]
7/1276 . [Cleaning means]
7/1284 . [specially adapted for ropes or cables]
7/1292 . [specially adapted for guides]

Lifts in, or associated with, buildings
9/00 Kinds or types of lifts in, or associated with, buildings or other structures (characterised by control systems B66B 1/00: apparatus for raising or lowering persons on stages of theatres A63J 5/12)
9/003 . [for lateral transfer of car or frame, e.g. between vertical hoistways or to/from a parking position]
2009/006 . [Ganged elevator]
9/02 . actuated mechanically otherwise than by rope or cable
9/022 . [by rack and pinion drives]
9/025 . [by screw-nut drives]
9/027 . [by rope climbing devices]
9/04 . actuated pneumatically or hydraulically (platforms for lifting or lowering through short distances B66F 7/00)
9/06 . inclined, e.g. serving blast furnaces
9/08 . associated with stairways, e.g. for transporting disabled persons [[facilitating access of invalids to vehicles A61G 3/02]]
9/0807 . [Driving mechanisms]
9/0815 . [Rack and pinion, friction rollers]
9/0823 . [Screw and nut]
9/083 . [Pull cable, pull chain]
9/0838 . [Leveling gears]
9/0846 . [Guide rail (B66B 9/0807 takes precedence)]
9/0853 . [Lifting platforms, e.g. constructional features]
9/0861 . [Hanging lifts, e.g. rope suspended seat or platform]
9/0869 . [Collapsible stairways, e.g. operable between a lower level and an upper level]
9/10 . paternoster type (with devices for transferring goods into, or out of, the compartments B65G 17/00)
9/16 . Mobile or transportable lifts specially adapted to be shifted from one part of a building or other structure to another part or to another building or structure
9/187 . with a liftway specially adapted for temporary connection to a building or other structure (B66B 9/193 takes precedence)
9/193 . with inclined liftways

11/00 Main component parts of lifts in, or associated with, buildings or other structures
11/005 . [Constructional features of hoistways]
11/001 . [Arrangement of controller, e.g. location]
11/0015 . [in the machine room]
11/002 . [in the hoistway]
11/0025 . [on the car]
11/003 . [on the counterweight]
11/0035 . [Arrangement of driving gear, e.g. location or support]
11/004 . [in the machine room]
11/0045 . [in the hoistway]
11/005 . [on the car]
11/0055 . [on the counterweight]
Lifts in, or associated with, buildings

11/006 . . . [Applications of loading and unloading equipment for lifts associated with buildings (of general application B65G; for paternoster lifts B65G 17/00; for mine lifts B66B 17/14)]

11/0065 . . . [Roping (mining hoist B66B 15/08)]

11/007 . . . [for counterweightless elevators]

11/0075 . . . [with hoisting rope or cable positively attached to a winding drum]

11/008 . . . [with hoisting rope or cable operated by frictional engagement with a winding drum or sheave]

11/0085 . . . [of rucksack elevators]

11/009 . . . [with separate traction and suspension ropes]

11/0095 . . . [where multiple cars drive in the same hoist way]

11/02 . . . Cages, (i.e. cars) (doors, gates or other apparatus controlling access to, or exit from, cages B66B 13/00)

11/0206 . . . [Car frames]

11/0213 . . . [for multi-deck cars]

11/022 . . . [with changeable inter-deck distances]

11/0226 . . . [Constructional features, e.g. walls assembly, decorative panels, comfort equipment, thermal or sound insulation]

11/0233 . . . [Lighting systems]

11/024 . . . [Ventilation systems]

11/0246 . . . [Maintenance features (devices facilitating maintenance in general B66B 5/0087)]

11/0253 . . . [Fixation of wall panels]

11/026 . . . [Attenuation system for shocks, vibrations, imbalance, e.g. passengers on the same side (acting between car or supporting frame and guides B66B 7/04; acting between car and ropes, cables B66B 7/08; correcting levelling between car and floor B66B 1/40)]

11/0266 . . . [Passive systems (aerodynamic structure B66B 11/0226)]

11/0273 . . . [acting between car and supporting frame]

11/028 . . . [Active systems]

11/0286 . . . [acting between car and supporting frame]

11/0293 . . . [Suspension locking or inhibiting means to avoid movement when car is stopped at a floor (locking car to building while loading to avoid movement B66B 17/34)]

11/04 . . . Driving gear [: Details thereof, e.g. seals (braking devices acting on the driving gear B66B 5/02; of mining-hoist winding devices B66B 15/02)]

11/0407 . . . [actuated by an electrical linear motor (in the counterweight B66B 17/12)]

11/0415 . . . [actuated manually, e.g. additional safety system]

11/0423 . . . [actuated pneumatically or hydraulically]

11/043 . . . [actuated by rotating motor; Details, e.g. ventilation (roping on drum, sheave, winch or pulley B66B 11/0065; power supply or control B66B 12/28; H02F; motor construction H02K)]

11/0438 . . . [with a gearless driving, e.g. integrated sheave, drum or winch in the stator or rotor of the cage motor]

11/0446 . . . [with screw-nut or worm-screw gear]

11/0453 . . . [with planetary or epicycloidal gear, e.g. differential gear]

11/0461 . . . [with rack and pinion gear]

11/0469 . . . [with chain, pinion gear]

11/0476 . . . [with friction gear, e.g. belt linking motor to sheave]

11/0484 . . . [with a clutch or a coupling system between several motors, e.g. switching different speeds, progressive starting, torque limitation, flywheel (control B66B 1/28)]

11/0492 . . . [actuated by other systems, e.g. combustion engines]

11/06 . . . [with hoisting rope or cable positively attached to a winding drum (B66B 11/0075 takes precedence)]

11/08 . . . [with hoisting rope or cable operated by frictional engagement with a winding drum or sheave (B66B 11/008 takes precedence)]

13/00 Doors, gates, or other apparatus controlling access to, or exit from, cages or lift well landings (door fittings, locks E05)

13/02 . . . Door or gate operation (of general application E05D)

13/04 . . . of swinging doors

13/06 . . . of sliding doors

13/08 . . . guided for horizontal movement

13/10 . . . by car or cage movement

13/12 . . . Arrangements for effecting simultaneous opening or closing of cage and landing doors

13/125 . . . [electrical]

13/14 . . . Control systems or devices

13/143 . . . [electrical]

13/146 . . . . . [method or algorithm for controlling doors]

13/16 . . . [Door or gate locking devices controlled or primarily controlled by condition of cage, e.g. movement or position]

13/165 . . . [electrical]

13/18 . . . . . without manually-operable devices for completing locking or unlocking of doors

13/185 . . . . . [electrical]

13/20 . . . . . Lock mechanisms actuated mechanically by abutments or projections on the cages

13/22 . . . Operation of door or gate contacts

13/24 . . . Safety devices in passenger lifts, not otherwise provided for, for preventing trapping of passengers

13/245 . . . . . [mechanical]

13/26 . . . between closing doors

13/28 . . . between car or cage and wells

13/285 . . . . . [Toe guards or apron devices]

13/30 . . . Constructional features of doors or gates (of interest apart from this application E06B)

13/301 . . . . . [Details of door sills]

13/303 . . . . . [Details of door panels]

13/305 . . . . . [Slat doors for elevators]

13/306 . . . . . [Details of door jambs]

13/308 . . . . . [Details of seals and joints]

Lifts in hoistways of mines

15/00 Main component parts of mining-hoist winding devices

15/02 . . . Rope or cable carriers

15/04 . . . Friction sheaves; “Koepe” pulleys

15/06 . . . Drums

15/08 . . . Driving gear

17/00 Hoistway equipment

17/02 . . . mounted in head-frames (winding towers for mines E04H 12/26)

17/04 . . . Mining-hoist cars or cages
Lifts in hoistways of mines

Escalators or moving walkways

Kinds or types of escalators or moving walkways

- Escalators
- (of variable speed type)
- linear type
- spiral type
- paternoster type, i.e. the escalator being used simultaneously for climbing and descending

Component parts of escalators or moving walkways

- Driving gear
- [with polygon effect reduction means]
- [Chains therefor]
- [with a drive or carrying sprocket wheel located at end portions]
- [with separate drive chain or belt that engages directly the carrying surface chain]
- for handrails
- with means synchronising the operation of the steps or the carrying belts and the handrails
- Carrying surfaces
- Carrying belts

Aspects of control systems of elevators

- Details with respect to the type of call input
- Single call input
- Up or down call input
- Destination call input before entering the elevator car
- Call input for a preferential elevator car or indicating a special request
- Details of the evaluation method for the allocation of a call to an elevator car
- Primary evaluation criteria
- Waiting time, i.e. response time
- Travel time
- Where the number of stops is limited
- Total time, i.e. arrival time
- Transportation capacity
Energy consumption

Secondary evaluation criteria

Penalisation of transfers

Taking into account the number of passengers present in the elevator car to be allocated

Taking into account the separation of passengers or groups

Avoiding potential interference between elevator cars

Taking into account a certain departure interval of elevator cars from a specific floor, e.g. the ground floor

Taking into account the distribution of elevator cars within the elevator system, e.g. to prevent clustering of elevator cars

Taking into account the number of passengers or groups

Other aspects of the evaluation method

Sequential evaluation of plurality of criteria

where the time needed for a passenger to arrive at the allocated elevator car from where the call is made is taken into account

Periodic re-allocation of call inputs

Taking into account uncertainty terms for predicted values, e.g. the predicted arrival time of an elevator car at the floor where a call is made

Taking into account predicted future events, e.g. predicted future call inputs

Control of empty elevator cars

Standby control

Parking control

Distribution of elevator cars, e.g. based on expected future need

Details of the elevator system configuration

Shafts divided into zones

with variable boundaries

Express or shuttle elevators

Transit control

with sky lobby

Multi-deck elevator cars

Tandem operation of multiple elevator cars in the same shaft

Ganged elevator cars

Details of the change of control mode

by time of the day

by historical, statistical or predicted traffic data, e.g. by learning

by real-time traffic data

by cost function evaluation

by input of special passenger or passenger group

by input of human supervisor

Switches or switchgear

Call registering systems

Wherein the destination is registered before boarding

Wherein the destination is registered after boarding

Wherein the call is registered through physical contact with the elevator system

Wherein the call is registered without making physical contact with the elevator system

using voice recognition

wherein the call is registered using portable devices

for priority users

using passenger condition detectors

for checking authorization of the passengers

for preventing accidental or deliberate misuse

for payment for use