

## SECTION B — PERFORMING OPERATIONS; TRANSPORTING

### B65 CONVEYING; PACKING; STORING; HANDLING THIN OR FILAMENTARY MATERIAL

**B65G TRANSPORT OR STORAGE DEVICES, e.g. CONVEYERS FOR LOADING OR TIPPING; SHOP CONVEYER SYSTEMS; PNEUMATIC TUBE CONVEYERS** (transport or storage devices used in a particular handling or treatment of articles or materials, see the relevant subclass, e.g. in metal-working B21D 43/00, B23Q 7/00, B23Q 41/02; vehicle, railway, sea or aircraft aspects B60-B64; transportation, conveyor or haulage systems specially adapted for motor vehicle or trailer assembly lines B62D 65/18; in packaging B65B; handling thin or filamentary materials B65H; hoisting, lifting, hauling, e.g. truck loaders B66; handling liquids B67; specially adapted to underground conditions E21F 13/00; storing or distributing gases or liquids F17; in handling radioactive materials G21C 19/00)

#### Subclass index

##### HANDLING AND STORAGE

Loading and unloading.....	65/00, 67/00, 69/00
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Storage.....	1/00, 3/00, 5/00
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of loose material.....	65/28
Assisting manual handling.....	7/00, 9/00

##### CONVEYERS, CHUTES

Mechanical	
with endless element.....	15/00-23/00
with particular movement.....	25/00, 27/00, 29/00, 33/00
other kinds.....	35/00
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chutes; roller-ways; projectors.....	11/00, 13/00, 31/00
Parts or auxiliary devices applicable to different kinds	
rollers; frames; auxiliary handling.....	39/00, 41/00, 47/00
control, safety; maintenance.....	43/00, 45/00
Non-mechanical.....	51/00, 53/00, 54/00

#### Storing; Storage devices

	1/10	• • •	with relatively-movable racks to facilitate insertion or removal of articles
<b>1/00 Storing articles, individually or in orderly arrangement, in warehouses or magazines</b> (conveyer combinations in warehouses, magazines, or workshops B65G 37/00; stacking of articles B65G 57/00; removing articles from stacks B65G 59/00; loading machines B65G 65/02; arrangements of articles for drying or baking in kilns or ovens F26, F27)	1/12	• • •	with article supports or holders movable in a closed circuit to facilitate insertion or removal of articles
	1/127	• • • •	the circuit being confined in a vertical plane [3]
	1/133	• • • •	the circuit being confined in a horizontal plane [3]
1/02 • Storage devices (furniture, shop fittings, table equipment A47B, A47F, A47G; mechanical garages E04H; for data record cards in association with machines for marking or sensing data G06K; coin changers or sorters G07D; coin-freed apparatus G07F)	1/137	• • •	with arrangements or automatic control means for selecting which articles are to be removed (devices for feeding articles to conveyers from several groups of articles B65G 47/10) [4]
1/04 • • • mechanical	1/14	• •	Stack holders or separators
1/06 • • • with means for presenting articles for removal at predetermined position or level (B65G 1/12 takes precedence) [3]	1/16	•	Special arrangements of articles in storage spaces
	1/18	• •	Articles inclined so as to be mutually self-supporting
1/07 • • • • the upper article of a pile being always presented at the same predetermined level [3]	1/20	• •	Articles arranged in layers with spaces between articles
1/08 • • • • the articles being fed by gravity			

- 3/00 Storing bulk material or loose, i.e. disorderly, articles** (filling or emptying storage spaces or containers, spreading-out or piling-up bulk material or loose articles B65G 65/28, B65G 65/30, B65G 69/04; storing agricultural or horticultural produce A01F 25/00)
- 3/02 • in the open air (B65G 3/04 takes precedence)
- 3/04 • in bunkers, hoppers or like large containers (such containers *per se* B65D 88/00)
- 5/00 Storing fluids in natural or artificial cavities or chambers in the earth** (modification of mine passages or chambers for storage purposes, especially for fluids E21F 17/16)

**Devices assisting manual conveyance of articles over short distances, e.g. in storage depots, warehouses or factories**

- 7/00 Devices for assisting manual moving or tilting heavy loads** (chutes B65G 11/00; roller-ways B65G 13/00; for tilting and emptying barrels or casks B65G 65/24)
- 7/02 • Devices adapted to be interposed between loads and the ground or floor, e.g. crowbars with means for assisting conveyance of loads (crowbars *per se* B66F 15/00)
- 7/04 • • Rollers
- 7/06 • • using fluid at high pressure supplied from an independent source to provide a cushion between load and ground
- 7/08 • • for tilting the loads
- 7/10 • • for rolling cylindrical loads
- 7/12 • Load-carriers, e.g. hooks, slings, harness, gloves, modified for load-carrying
- 9/00 Apparatus for assisting manual handling having suspended load-carriers movable by hand or gravity** (manually-operated endless-rope or chain conveyers B65G 17/00; railway systems B61B)

**Chutes; Kinds or types of conveyers; Constructional features, details, or auxiliary devices peculiar to conveyers of particular types [4]**

- 11/00 Chutes** (used as storage devices B65G 1/02, B65D 88/26; feeding or discharging conveyers by devices incorporated in, or operatively associated with, conveyers B65G 47/00; for sports, games, or amusements A63G 21/00; for refuse disposal in buildings E04F 17/12)
- 11/02 • of straight form
- 11/04 • for mail in buildings
- 11/06 • of helical or spiral form
- 11/08 • with discontinuous guiding surfaces, e.g. arranged in zig-zag or cascade formation
- 11/10 • flexible
- 11/12 • pivotable
- 11/14 • extensible, e.g. telescopic
- 11/16 • Interior surfaces; Linings
- 11/18 • Supports or mountings
- 11/20 • Auxiliary devices, e.g. for deflecting, controlling speed of, or agitating, articles or solids

- 13/00 Roller-ways** (storage devices comprising roller-ways B65G 1/02; endless-chain conveyers comprising load-supporting rollers B65G 17/00; rollers, or arrangements thereof B65G 39/00; feeding or discharging conveyers by devices incorporated in, or operatively associated with, conveyers B65G 47/00; in metal-rolling equipment B21B 39/00, B21B 41/00)
- 13/02 • having driven rollers
- 13/04 • • all rollers driven
- 13/06 • • Roller driving means [3]
- 13/07 • • • having endless driving elements
- 13/071 • • • with frictional engagement
- 13/073 • • • comprising free-wheel gearing
- 13/075 • Braking means [3]
- 13/08 • of curved form; with branch-offs
- 13/10 • • Switching arrangements
- 13/11 • Roller frames
- 13/12 • • adjustable
- 15/00 Conveyers having endless load-conveying surfaces, i.e. belts and like continuous members, to which tractive effort is transmitted by means other than endless driving elements of similar configuration** (having load-conveying surfaces formed by interconnected longitudinal links B65G 17/06; feeding or discharging conveyers by devices incorporated in, or operatively associated with, conveyers B65G 47/00)
- 15/02 • for conveying in a circular arc
- 15/04 • the load being carried on the lower run of the endless surface
- 15/06 • with oppositely-moving parts of the endless surface located in the same plane and parallel to one another
- 15/08 • the load-carrying surface being formed by a concave or tubular belt, e.g. a belt forming a trough
- 15/10 • comprising two or more co-operating endless surfaces with parallel longitudinal axes, or a multiplicity of parallel elements, e.g. ropes defining an endless surface
- 15/12 • • with two or more endless belts
- 15/14 • • • the load being conveyed between the belts
- 15/16 • • • • between an auxiliary belt and a main belt
- 15/18 • • • the belts being sealed at their edges (endless-surface conveyers having a single belt with sealed edges B65G 15/08)
- 15/20 • • • arranged side by side, e.g. for conveyance of flat articles in vertical position (for conveying sheets or like thin flat articles B65H)
- 15/22 • comprising a series of co-operating units
- 15/24 • • in tandem
- 15/26 • • extensible, e.g. telescopic
- 15/28 • Conveyers with a load-conveying surface formed by a single flat belt, not otherwise provided for
- 15/30 • Belts or like endless load-carriers (co-operating with rails or the like B65G 21/22; with rollers B65G 39/20; belts in general F16G)
- 15/32 • • made of rubber or plastics
- 15/34 • • • with reinforcing layers, e.g. of fabric
- 15/36 • • • • the layers incorporating ropes, chains, or rolled steel sections
- 15/38 • • • with flame-resistant layers, e.g. of asbestos, glass
- 15/40 • • • troughed or tubular; formed with joints facilitating troughing
- 15/42 • • • having ribs, ridges, or other surface projections
- 15/44 • • • • for impelling the loads
- 15/46 • • • formed with guides

- 15/48 • • metallic
- 15/50 • • Endless load-carriers consisting of a series of parallel ropes or belt strips
- 15/52 • • • interconnected by transverse slats
- 15/54 • • Endless load-carriers made of interwoven ropes or wires
- 15/56 • • • with edge-protecting or reinforcing means
- 15/58 • • with means for holding or retaining the loads in fixed position, e.g. magnetic
- 15/60 • Arrangements for supporting or guiding belts, e.g. by fluid jets (construction of rollers or supports therefor B65G 39/00, F16G)
- 15/62 • • Guides for sliding belts
- 15/64 • • for automatically maintaining the position of the belts
  
- 17/00 Conveyers having an endless traction element, e.g. a chain, transmitting movement to a continuous or substantially-continuous load-carrying surface or to a series of individual load-carriers; Endless-chain conveyers in which the chains form the load-carrying surface** (feeding or discharging conveyers by devices incorporated in, or operatively associated with, conveyers B65G 47/00; railway systems, detachable load-carriers on rails B61B; escalators or paternosters neither combined nor associated with loading or unloading apparatus B66B 9/00)
- 17/02 • comprising a load-carrying belt attached to, or resting on, the traction element
- 17/04 • • the belt having loops forming load-receiving pockets
- 17/06 • having a load-carrying surface formed by a series of interconnected, e.g. longitudinal, links, plates, or platforms
- 17/08 • • the surface being formed by the traction element
- 17/10 • • the surface forming a longitudinal trough
- 17/12 • comprising a series of individual load-carriers fixed, or normally fixed, relative to traction element
- 17/14 • • with two spaced connections to traction element
- 17/16 • comprising individual load-carriers which are pivotally mounted, e.g. for free-swinging movement (guides inverting or tilting load-carriers for emptying B65G 47/34)
- 17/18 • • and move in contact with a guiding surface
- 17/20 • comprising load-carriers suspended from overhead traction chains
- 17/22 • with oppositely-moving parts of the conveyer located in a common plane
- 17/24 • comprising a series of rollers which are moved over a supporting surface by the traction element to effect conveyance of loads or load-carriers
- 17/26 • comprising a series of co-operating units, e.g. interconnected by pivots
- 17/28 • • extensible, e.g. telescopic
- 17/30 • Details; Auxiliary devices (belts B65G 15/30; framework B65G 21/00)
- 17/32 • • Individual load-carriers (control B65G 17/48)
- 17/34 • • • having flat surfaces, e.g. platforms, grids, forks
- 17/36 • • • having concave surfaces, e.g. buckets
- 17/38 • • Chains or like traction elements (chains in general F16G); Connections between traction elements and load-carriers
- 17/40 • • • Chains acting as load-carriers
- 17/42 • • • Attaching load-carriers to traction elements
- 17/44 • • • • by means excluding relative movements
- 17/46 • • Means for holding or retaining the loads in fixed position on the load-carriers, e.g. magnetic
  
- 17/48 • • Controlling attitudes of load-carriers during movement (guides B65G 21/20; inverting or tilting load-carriers to discharge contents B65G 47/38)
  
- 19/00 Conveyers comprising an impeller or a series of impellers carried by an endless traction element and arranged to move articles or materials over a supporting surface or underlying material, e.g. endless scraper conveyers** (feeding or discharging conveyers by devices incorporated in, or operatively associated with, conveyers B65G 47/00)
- 19/02 • for articles, e.g. for containers
- 19/04 • for moving bulk material in open troughs or channels
- 19/06 • • the impellers being scrapers similar in size and shape to the cross-section of the trough or channel
- 19/08 • • • and attached to a single belt, rope, or chain
- 19/10 • • • and attached to a pair of belts, ropes, or chains
- 19/12 • • the impellers being plates having an area substantially smaller than that of the trough or channel cross-section
- 19/14 • for moving bulk material in closed conduits, e.g. tubes
- 19/16 • • the impellers being elements having an area substantially smaller than that of the conduit cross-section
- 19/18 • Details
- 19/20 • • Traction chains, ropes, or cables
- 19/22 • • Impellers, e.g. push-plates, scrapers; Guiding means therefor
- 19/24 • • • Attachment of impellers to traction element
- 19/26 • • • • pivotal
- 19/28 • • Troughs, channels, or conduits
- 19/30 • • • with supporting surface modified to facilitate movement of loads, e.g. friction-reducing devices
  
- 21/00 Supporting or protective framework or housings for endless load-carriers or traction elements of belt or chain conveyers** (supporting framework or bases for conveyers as a whole B65G 41/00)
- 21/02 • consisting essentially of struts, ties, or like structural elements
- 21/04 • • the ties being formed by longitudinal cables or ropes
- 21/06 • • constructed to facilitate rapid assembly or dismantling
- 21/08 • Protective roofs or arch supports therefor
- 21/10 • movable, or having interchangeable or relatively-movable parts; Devices for moving framework or parts thereof
- 21/12 • • to allow adjustment of position of load-carrier or traction element as a whole
- 21/14 • • to allow adjustment of length or configuration of load-carrier or traction element (tensioning arrangements for belt or chain B65G 23/44)
- 21/16 • for conveyers having endless load-carriers movable in curved paths
- 21/18 • • in three-dimensionally curved paths
- 21/20 • Means incorporated in, or attached to, framework or housings for guiding load-carriers, traction elements, or loads supported on moving surfaces (arrangements for supporting belts B65G 15/60; rollers or roller arrangements B65G 39/00, F16G)
- 21/22 • • Rails or the like engaging sliding elements or rollers attached to load-carriers or traction elements

- 23/00 Driving gear for endless conveyers** (control devices for conveyers in general B65G 43/00); **Belt- or chain-tensioning arrangements**
- 23/02 • Belt- or chain-engaging elements
  - 23/04 • • Drums, rollers, or wheels
  - 23/06 • • • with projections engaging abutments on belts or chains, e.g. sprocket wheels
  - 23/08 • • • with self-contained driving mechanisms, e.g. motors and associated gearing
  - 23/10 • • • arranged intermediate the ends of the conveyers
  - 23/12 • • • Arrangements of co-operating drums or rollers to augment tractive effort applied to the belts
  - 23/14 • • Endless driving elements extending parallel to belt or chain
  - 23/16 • • • with dogs engaging abutments on belts or chains
  - 23/18 • • Suction or magnetic elements
  - 23/19 • • • Suction elements [3]
  - 23/20 • • Screws
  - 23/22 • Arrangements or mountings of driving motors
  - 23/23 • • of electric linear motors [3]
  - 23/24 • Gearing between driving motor and belt- or chain-engaging elements (contained in drums, rollers, or wheels B65G 23/08)
  - 23/26 • • Applications of clutches or brakes
  - 23/28 • • Arrangements for equalising the drive to several elements
  - 23/30 • • Variable-speed gearing
  - 23/32 • for effecting drive at two or more points spaced along the length of the conveyers
  - 23/34 • • comprising a single motor coupled to spaced driving elements
  - 23/36 • • comprising two or more driving motors each coupled to a separate driving element, e.g. at either end of the conveyers
  - 23/38 • for effecting intermittent movement of belts or chains
  - 23/40 • • Applications of pawl-and-ratchet mechanisms or Geneva wheels
  - 23/42 • • Reciprocating members engaging successive abutments on belts or chains
  - 23/44 • Belt- or chain-tensioning arrangements
- 25/00 Conveyers comprising a cyclically-moving, e.g. reciprocating, carrier or impeller which is disengaged from the load during the return part of its movement** (jigging B65G 27/00; feeding or discharging conveyers by devices incorporated in, or operatively associated with, conveyers B65G 47/00; pumps F04)
- 25/02 • the carrier or impeller having different forward and return paths of movement, e.g. walking-beam conveyers
  - 25/04 • the carrier or impeller having identical forward and return paths of movement, e.g. reciprocating conveyers
  - 25/06 • • having carriers, e.g. belts
  - 25/08 • • having impellers, e.g. pushers
  - 25/10 • • • with impeller pivotally mounted on a reciprocating bar
  - 25/12 • • • with impeller fixed to a reciprocating bar and the bar being rotated about its longitudinal axis on its return stroke
- 27/00 Jigging conveyers** (feeding or discharging conveyers by devices incorporated in, or operatively associated with, conveyers B65G 47/00; jigs for wet separation B03B; generating or transmitting mechanical vibrations B06; jiggers for screening, sifting, or sorting B07B 1/28)
- 27/02 • comprising helical or spiral channels or conduits for elevation of materials (helical or spiral chutes in general B65G 11/06)
  - 27/04 • Load-carriers other than helical or spiral channels or conduits
  - 27/06 • • Joints connecting load-carrier sections
  - 27/08 • Supports or mountings for load-carriers, e.g. framework, bases, spring arrangements
  - 27/10 • Applications of devices for generating or transmitting jigging movements
  - 27/12 • • of shaking devices, i.e. devices for producing movements of low frequency and large amplitude
  - 27/14 • • • hydraulic
  - 27/16 • • of vibrators, i.e. devices for producing movements of high frequency and small amplitude
  - 27/18 • • • Mechanical devices
  - 27/20 • • • • rotating unbalanced masses
  - 27/22 • • • Hydraulic or pneumatic devices
  - 27/24 • • • Electromagnetic devices
  - 27/26 • • • with elastic coupling between vibrator and load-carrier
  - 27/28 • • with provision for dynamic balancing
  - 27/30 • • • by means of an oppositely-moving mass, e.g. a second conveyer
  - 27/32 • • with means for controlling direction, frequency, or amplitude of vibration or shaking movement
  - 27/34 • comprising a series of co-operating units
- 29/00 Rotary conveyers, e.g. rotating discs, arms, star-wheels or cones** (mechanical projectors B65G 31/00; screw or rotary spiral conveyers B65G 33/00; feeding or discharging conveyers by devices incorporated in, or operatively associated with, conveyers B65G 47/00)
- 29/02 • for inclined or vertical transit (B65G 15/00, B65G 17/00 take precedence)
- 31/00 Mechanical throwing machines for articles or solid materials** (feeding or discharging conveyers by devices incorporated in, or operatively associated with, conveyers B65G 47/00; distributors for fertilisers A01C; moulding machines B22C; sandblasting devices B24C; implements for applying plaster E04F 21/06)
- 31/02 • comprising belts
  - 31/04 • comprising discs, drums, or like rotary impellers
- 33/00 Screw or rotary spiral conveyers** (feeding or discharging conveyers by devices incorporated in, or operatively associated with, conveyers B65G 47/00; screws for extruding, compressing, kneading, mixing, pumping, or other special operations, see the relevant classes)
- 33/02 • for articles
  - 33/04 • • conveyed between a single screw and guiding means
  - 33/06 • • conveyed and guided by parallel screws
  - 33/08 • for fluent solid materials
  - 33/10 • • with non-enclosed screws
  - 33/12 • • with screws formed by straight tubes or drums having internal threads, or by spiral or helical tubes
  - 33/14 • • comprising a screw or screws enclosed in a tubular housing

- 33/16 • • • with flexible screws operating in flexible tubes
- 33/18 • • • with multiple screws in parallel arrangements
- 33/20 • • • the housing being rotatable relative to the screw
- 33/22 • • • with means for retarding material flow at the delivery end of the housing
- 33/24 • Details
- 33/26 • • Screws (as gearing elements F16H 25/20)
- 33/30 • • • with a discontinuous helical surface
- 33/32 • • Adaptations of bearings or couplings for supporting or connecting screws (B65G 33/16 takes precedence)
- 33/34 • • Applications of driving gear
- 33/36 • • • for rotating housing and screw at different speeds
- 33/38 • • • for effecting simultaneous rotation and reciprocation of screw
  
- 35/00 Mechanical conveyers not otherwise provided for** (feeding or discharging conveyers by devices incorporated in, or operatively associated with, conveyers B65G 47/00)
- 35/02 • comprising an endless traction element, e.g. a belt, arranged to roll cylindrical articles over a supporting surface
- 35/04 • comprising a flexible load-carrier, e.g. a belt, which is wound-up at one end and paid-out at the other (reciprocating belt conveyers B65G 25/06)
- 35/06 • comprising a load-carrier moving along a path, e.g. a closed path, and adapted to be engaged by any one of a series of traction elements spaced along the path (effecting drive at two or more points spaced along the length of an endless conveyer B65G 23/32)
- 35/08 • comprising trains of unconnected load-carriers, e.g. belt sections, movable in a path, e.g. a closed path, adapted to contact each other and to be propelled by means arranged to engage each load-carrier in turn
  
- 37/00 Combinations of mechanical conveyers of the same kind, or of different kinds, of interest apart from their application in particular machines or use in particular manufacturing processes** (mechanical storage devices B65G 1/04; series of co-operating belt conveyer units B65G 15/22; series of co-operating chain conveyer units B65G 17/26; sequence control of combined conveyers B65G 43/10; feeding or discharging conveyers by devices incorporated in, or operatively associated with, conveyers B65G 47/00; specially adapted for handling radioactive materials G21)
- 37/02 • Flow sheets for conveyer combinations in warehouses, magazines, or workshops
  
- Common features or details of, or auxiliary devices applicable to, conveyers of different kinds or types; Feeding or discharging devices incorporated in, or operatively associated with, conveyers**
  
- 39/00 Rollers, e.g. drive rollers, or arrangements thereof incorporated in roller-ways or other types of mechanical conveyers** (driving gear for rollers of roller-ways B65G 13/06; drive rollers of endless conveyers B65G 23/04; arrangement of rollers in metal-rolling equipment B21B 39/10; friction members F16H 55/32)
- 39/02 • Adaptations of individual rollers and supports therefor
- 39/04 • • the rollers comprising a number of roller-forming elements mounted on a single axle
- 39/06 • • the roller sleeves being shock-absorbing, e.g. formed by helically-wound wires
- 39/07 • • Other adaptations of sleeves
- 39/071 • • • for aligning belts or sheets
- 39/073 • • • for cleaning belts
- 39/08 • • the rollers being magnetic (in magnetic belt separators B03C 1/00)
- 39/09 • • Arrangements of bearing or sealing means
- 39/10 • Arrangements of rollers (on a single axle B65G 39/04)
- 39/12 • • mounted on framework
- 39/14 • • • Spring-supported sets, e.g. permitting troughing of a load-carrying belt
- 39/16 • • • for aligning belts or chains (for aligning tapes or webs B65H)
- 39/18 • • • for guiding loads
- 39/20 • • attached to moving belts or chains (belts B65G 15/30; chains B65G 17/44)
  
- 41/00 Supporting frames or bases for conveyers as a whole, e.g. transportable conveyer frames**
- 41/02 • Frames mounted on wheels for movement on rail tracks
  
- 43/00 Control, e.g. safety, warning, fault-correcting, devices** (for elevators, escalators or moving walkways B66B; in general F16P, G08B)
- 43/02 • detecting dangerous physical condition of load-carriers, e.g. for interrupting the drive in the event of overheating
- 43/04 • detecting slip between driving element and load-carrier, e.g. for interrupting the drive
- 43/06 • interrupting the drive in case of driving-element breakage; Braking or stopping loose load-carriers
- 43/08 • Control devices operated by article or material being fed, conveyed, or discharged
- 43/10 • Sequence control of conveyers operating in combination
  
- 45/00 Lubricating, cleaning, or clearing devices**
- 45/02 • Lubricating devices
- 45/04 • • for rollers [5]
- 45/06 • • • forming belt troughing structure [5]
- 45/08 • • for chains [5]
- 45/10 • Cleaning devices (adaptations of roller sleeves for cleaning belts B65G 39/073) [5]
- 45/12 • • comprising scrapers [5]
- 45/14 • • • Moving scrapers [5]
- 45/16 • • • with scraper biasing means [5]
- 45/18 • • comprising brushes [5]
- 45/20 • • comprising screws [5]
- 45/22 • • comprising fluid applying means [5]
- 45/24 • • comprising plural diverse cleaning devices [5]
- 45/26 • • for gathering residue after cleaning [5]
  
- 47/00 Article or material-handling devices associated with conveyers; Methods employing such devices** (for sorting, e.g. postal, B07C)
- 47/02 • Devices for feeding articles or materials to conveyers
- 47/04 • • for feeding articles
- 47/06 • • • from a single group of articles arranged in orderly pattern, e.g. workpieces in magazines (de-stacking devices B65G 59/00; picking-up flat workpieces B65H)
- 47/08 • • • spacing or grouping the articles during feeding (during transit by conveyer B65G 47/28)

## B65G

- 47/10 • • • from several groups of articles
  - 47/12 • • • from disorderly-arranged article piles or from loose assemblages of articles
  - 47/14 • • • • arranging or orientating the articles by mechanical or pneumatic means during feeding (during transit by conveyer B65G 47/24, B65G 47/26)
  - 47/16 • • for feeding materials in bulk
  - 47/18 • • • Arrangements or applications of hoppers or chutes
  - 47/19 • • • • having means for controlling material flow, e.g. to prevent overloading (controlling feed or discharge by weighing a continuous stream of material G01G 11/08)
  - 47/20 • • • • the hoppers or chutes being movable
  - 47/22 • Devices influencing the relative position or the attitude of articles during transit by conveyers (during feeding B65G 47/14)
  - 47/24 • • orientating the articles
  - 47/244 • • • by turning them about an axis substantially perpendicular to the conveying plane [5]
  - 47/248 • • • by turning over or inverting them (B65G 47/244 takes precedence) [5]
  - 47/252 • • • • about an axis substantially perpendicular to the conveying direction [5]
  - 47/256 • • • removing incorrectly orientated articles [5]
  - 47/26 • • arranging the articles, e.g. varying spacing between individual articles (stacking or de-stacking B65G 57/00, B65G 59/00, B65G 61/00)
  - 47/28 • • • during transit by a single conveyer
  - 47/29 • • • • by temporarily stopping movement
  - 47/30 • • • during transit by a series of conveyers
  - 47/31 • • • • by varying the relative speeds of the conveyers forming the series
  - 47/32 • • • • Applications of transfer devices
  - 47/34 • Devices for discharging articles or materials from conveyers (B65G 47/256 takes precedence; sorting in general B07)
  - 47/36 • • by detaching suspended articles
  - 47/38 • • by dumping, tripping, or releasing load-carriers
  - 47/40 • • • by tilting conveyer buckets
  - 47/42 • • operated by article or material being conveyed and discharged
  - 47/44 • • Arrangements or applications of hoppers or chutes
  - 47/46 • • with distribution, e.g. automatically, to desired points (in tube mail systems B65G 51/36; postal or like sorting B07C)
  - 47/48 • • • according to bodily destination marks on either articles or load-carriers (marking data records G06K)
  - 47/49 • • • • without bodily contact between article or load-carrier and automatic control device
  - 47/50 • • • according to destination signals stored in separate systems (control by programme G05B 19/00)
  - 47/51 • • • according to unprogrammed signals, e.g. influenced by supply situation at destination (volume, flow, or liquid level meters G01F; scales or weighing machines G01G; remote controls G05G)
  - 47/52 • Devices for transferring articles or materials between conveyers, i.e. discharging or feeding devices (loading or unloading by means not incorporated in, or not operatively associated with, conveyers B65G 65/00; transfer of workpieces during metal rolling B21B 41/00)
  - 47/53 • • between conveyers which cross one another [3]
  - 47/54 • • • at least one of which is a roller-way [3]
  - 47/56 • • to or from inclined or vertical conveyer sections
  - 47/57 • • • for articles
  - 47/58 • • • for materials in bulk
  - 47/60 • • to or from conveyers of the suspended, e.g. trolley, type
  - 47/61 • • • for articles
  - 47/62 • • • for materials in bulk
  - 47/64 • • Switching conveyers
  - 47/66 • • Fixed platforms or combs, e.g. bridges between conveyers
  - 47/68 • • adapted to receive articles arriving in one layer from one conveyer and to transfer them in individual layers to more than one conveyer, or vice versa, e.g. combining the flows of articles conveyed by more than one conveyer
  - 47/69 • • • the articles being accumulated temporarily
  - 47/70 • • • with precedence controls among incoming article flows
  - 47/71 • • • the articles being discharged to several conveyers
  - 47/72 • • transferring materials in bulk from one conveyer to several conveyers, or vice versa
  - 47/74 • Feeding, transfer, or discharging devices of particular kinds or types
  - 47/76 • • Fixed or adjustable ploughs or transverse scrapers
  - 47/78 • • Troughs having discharge openings and closures
  - 47/80 • • Turntables carrying articles or materials to be transferred, e.g. combined with ploughs or scrapers
  - 47/82 • • Rotary or reciprocating members for direct action on articles or materials, e.g. pushers, rakes, shovels
  - 47/84 • • Star-shaped wheels or devices having endless travelling belts or chains, the wheels or devices being equipped with article-engaging elements
  - 47/86 • • • the article-engaging elements being grippers
  - 47/88 • • Separating or stopping elements, e.g. fingers (attached to star-shaped wheels B65G 47/84)
  - 47/90 • • Devices for picking-up and depositing articles or materials
  - 47/91 • • • incorporating pneumatic, e.g. suction, grippers
  - 47/92 • • • incorporating electrostatic or magnetic grippers
  - 47/94 • • Devices for flexing or tilting travelling structures; Throw-off carriages
  - 47/95 • • • adapted for longitudinal delivery
  - 47/96 • • • Devices for tilting links or platforms
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- 49/00 Conveying systems characterised by their application for specified purposes not otherwise provided for** (for conveying sheet material B65H)
  - 49/02 • for conveying workpieces through baths of liquid
  - 49/04 • • the workpieces being immersed and withdrawn by movement in a vertical direction
  - 49/05 • for fragile or damageable materials or articles [4]
  - 49/06 • • for fragile sheets, e.g. glass (transporting of glass products during their manufacture C03B 35/00) [4]
  - 49/07 • • for semiconductor wafers (specially adapted for conveying of semiconductor wafers during manufacture or treatment of semiconductor or electric solid state devices or components H01L 21/677) [5, 2006.01]
  - 49/08 • • for ceramic mouldings (charging, discharging, manipulation with charge in kilns F27D 3/00) [4]

**Non-mechanical conveying through pipes or tubes; Floating in troughs**

- 51/00 Conveying articles through pipes or tubes by fluid flow or pressure** (water roundabouts A63G 3/00; pneumatic railways B61B); **Conveying articles over a flat surface, e.g. the base of a trough, by jets located in the surface** (pumps F04; fluid dynamics F15D; valves, taps, cocks F16K; pipes, pipe joints, or associated devices F16L)
- 51/01 • Hydraulic transport of articles (B65G 51/04 takes precedence) [6]
- 51/02 • Directly conveying the articles, e.g. slips, sheets, stockings, containers or workpieces, by flowing gases
- 51/03 • • over a flat surface or in troughs [4]
- 51/04 • Conveying the articles in carriers having a cross-section approximating that of the pipe or tube; Tube mail systems
- 51/06 • • Despatch carriers for tube mail
- 51/08 • • Controlling or conditioning the operating medium (in compressors F04; air-conditioning, e.g. de-watering, in pneumatic systems F16L 55/09)
- 51/10 • • • at section junctions of pneumatic systems
- 51/12 • • • • Pneumatic gates
- 51/14 • • • • Pneumatic sluices
- 51/16 • • • varying, e.g. starting or stopping, gas pressure or flow
- 51/18 • • Adaptations of pipes or tubes; Pipe or tube joints
- 51/20 • • Braking arrangements
- 51/22 • • Arrangements for stopping the carriers en route in order to control carrier sequence; Blocking or separating devices
- 51/24 • • Switches
- 51/26 • • Stations
- 51/28 • • • for despatch
- 51/30 • • • for delivery
- 51/32 • • • for despatch, delivery, and transit
- 51/34 • • Two-way operation
- 51/36 • • Other devices for indicating or controlling movements of carriers, e.g. for supervising individual tube sections, for counting carriers, for reporting jams or other operating difficulties
- 51/38 • • • Contact devices on interior of tubes for detecting passage of carriers
- 51/40 • • • Automatically distributing the carriers to desired stations
- 51/42 • • • • according to indications on carriers
- 51/44 • • • • • without mechanical contact between carriers and controllers
- 51/46 • • • • according to separate signal systems
- 53/00 Conveying materials in bulk through troughs, pipes, or tubes by floating the materials, or by flow of gas, liquid, or foam** (fluidising in connection with loading or unloading B65G 69/06; loaders for hay or like field crops A01D 87/00; fluidising devices facilitating filling or emptying of large containers B65D 88/72; dredging E02F; winning materials out of alluvial deposits E21C 45/00; hydraulic or pneumatic mine-filling-up machines E21F 15/00; fluid dynamics F15D; pipe-line systems F17D)
- 53/02 • Floating material troughs (air slides B65G 53/04)
- 53/04 • Conveying materials in bulk pneumatically through pipes or tubes; Air slides
- 53/06 • • Gas pressure systems operating without fluidisation of the materials

- 53/08 • • • with mechanical injection of the materials, e.g. by screw
- 53/10 • • • with pneumatic injection of the materials by the propelling gas
- 53/12 • • • • the gas flow acting directly on the materials in a reservoir
- 53/14 • • • • the gas flow inducing feed of the materials by suction effect
- 53/16 • • Gas pressure systems operating with fluidisation of the materials
- 53/18 • • • through a porous wall
- 53/20 • • • • of an air slide, e.g. a trough
- 53/22 • • • • the systems comprising a reservoir, e.g. a bunker
- 53/24 • • Gas suction systems
- 53/26 • • • operating with fluidisation of the materials
- 53/28 • • Systems utilising a combination of gas pressure and suction (inducing feed of the materials by suction in gas pressure systems B65G 53/14)
- 53/30 • Conveying materials in bulk through pipes or tubes by liquid pressure
- 53/32 • Conveying concrete, e.g. for distributing same at building sites (mixing concrete on or by conveyers B28C 5/34)
- 53/34 • Details
- 53/36 • • Arrangements of containers
- 53/38 • • Modification of material containing walls to facilitate fluidisation
- 53/40 • • Feeding or discharging devices
- 53/42 • • • Nozzles (in general B05B)
- 53/44 • • • Endless conveyers
- 53/46 • • • Gates or sluices, e.g. rotary wheels
- 53/48 • • • Screws or like rotary conveyers
- 53/50 • • • Pneumatic devices (incorporated in nozzles B65G 53/42)
- 53/52 • • Adaptations of pipes or tubes
- 53/54 • • • Flexible pipes or tubes
- 53/56 • • • Switches
- 53/58 • • Devices for accelerating or decelerating flow of the materials; Use of pressure generators (controlling pressure of propelling gas B65G 53/66)
- 53/60 • • Devices for separating the materials from propellant gas
- 53/62 • • • using liquid
- 53/64 • • • in discrete amounts
- 53/66 • • Use of indicator or control devices, e.g. for controlling gas pressure, for controlling proportions of material and gas, for indicating or preventing jamming of material

**54/00 Non-mechanical conveyers not otherwise provided for [3]**

- 54/02 • electrostatic, electric, or magnetic [3]

**Stacking or de-stacking; Loading or unloading****Note(s)**

In groups B65G 57/00-B65G 61/00, the following term is used with the meaning indicated:

- "stacking" means disposing articles individually or in layers one above each other.

- 57/00 Stacking of articles** (B65G 60/00 takes precedence; stacking of jumbo rolls B41F; stackable containers B65D; feeding, piling, or stacking sheets B65H; stacked delivery of machined products, see the relevant classes for the machines)
- 57/02 • by adding to the top of the stack
  - 57/03 • • from above
  - 57/04 • • • by suction or magnetic devices
  - 57/06 • • • Gates for releasing articles
  - 57/08 • • articles being tilted or inverted prior to depositing
  - 57/081 • • • alternate articles being inverted
  - 57/09 • • from alongside
  - 57/10 • • • by devices, e.g. reciprocating, acting directly on articles for horizontal transport to the top of stack
  - 57/11 • • the articles being stacked by direct action of the feeding conveyer
  - 57/112 • • • the conveyer being adjustable in height
  - 57/14 • • • the articles being transferred from carriers moving in an endless path adjacent to the stacks (conveyer constructions B65G 15/00-B65G 35/00; combinations of conveyers B65G 37/00)
  - 57/16 • • Stacking of articles of particular shape
  - 57/18 • • • elongated, e.g. sticks, rods, bars
  - 57/20 • • • three-dimensional, e.g. cubiform, cylindrical
  - 57/22 • • • • in layers, each of predetermined arrangement
  - 57/24 • • • • the layers being transferred as a whole, e.g. on pallets
  - 57/26 • • • • the arrangement providing for spaces between the articles
  - 57/28 • by assembling the articles and tilting the assembled articles to a stacked position
  - 57/30 • by adding to the bottom of the stack
  - 57/32 • characterised by stacking during transit
- 59/00 De-stacking of articles** (B65G 60/00 takes precedence)
- 59/02 • De-stacking from the top of the stack
  - 59/04 • • by suction or magnetic devices
  - 59/06 • De-stacking from the bottom of the stack
  - 59/08 • De-stacking after preliminary tilting of the stack
  - 59/10 • De-stacking nested articles
  - 59/12 • characterised by de-stacking during transit
- 60/00 Simultaneously or alternatively stacking and de-stacking of articles**
- 61/00 Use of pick-up or transfer devices or of manipulators for stacking or de-stacking articles not otherwise provided for** (manipulators B25J)
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- 63/00 Transferring or trans-shipping at storage areas, railway yards or harbours; Marshalling yard installations** (transferring of refuse between vehicles or containers B65F 9/00; dredging, soil shifting E02F; conveyers used in co-operation with coal or like winning apparatus E21C 47/00)
- 63/02 • with essentially-horizontal transit otherwise than by bridge
  - 63/04 • with essentially-horizontal transit by bridges equipped with conveyers
  - 63/06 • with essentially-vertical transit (hoppers B65D 88/26)
- 65/00 Loading or unloading** (by means incorporated in, or operatively associated with, conveyers B65G 47/00; of vehicles B65G 67/00)
- 65/02 • Loading or unloading machines comprising essentially a conveyer for moving the loads associated with a device for picking-up the loads
  - 65/04 • • with pick-up shovels (construction of shovels E02F)
  - 65/06 • • with endless scraping or elevating pick-up conveyers
  - 65/08 • • with reciprocating pick-up conveyers
  - 65/10 • • • Raking or scraping devices
  - 65/12 • • • • operations at positions off-set from the conveyer centreline
  - 65/14 • • with jiggging pick-up conveyers, e.g. duck-bills
  - 65/16 • • with rotary pick-up conveyers
  - 65/18 • • • Discs
  - 65/20 • • • Paddle wheels
  - 65/22 • • • Screws
  - 65/23 • Devices for tilting and emptying of containers [3]
  - 65/24 • • for manual tilting of barrels or casks [3]
  - 65/28 • Piling or unpling loose materials in bulk, e.g. coal, manure, timber, not otherwise provided for (by soil-shifting or like equipment E02F)
  - 65/30 • Methods or devices for filling or emptying bunkers, hoppers, tanks, or like containers, of interest apart from their use in particular chemical or physical processes or their application in particular machines, e.g. not covered by a single other subclass (devices for tilting and emptying containers B65G 65/23; such containers having means facilitating filling or emptying B65D 88/54) [3]
- Note(s)**
- Methods or devices for filling bunkers, hoppers, or containers are only classified in group B65G 65/30 if they are of general application apart from their use in particular processes or their application in particular machines or if they are not covered by a single other subclass.
- 65/32 • • Filling devices (pneumatic conveyers B65G 51/00, B65G 53/00)
  - 65/34 • • Emptying devices (conveyer construction B65G 15/00-B65G 35/00; devices similar to vehicle tippers B65G 67/48)
  - 65/36 • • • Devices for emptying from the top
  - 65/38 • • • • Mechanical devices
  - 65/40 • • • Devices for emptying otherwise than from the top
  - 65/42 • • • • using belt or chain conveyers
  - 65/44 • • • • using reciprocating conveyers, e.g. jiggging conveyers
  - 65/46 • • • • using screw conveyers
  - 65/48 • • • • using other rotating means, e.g. rotating pressure sluices in pneumatic systems
- 67/00 Loading or unloading vehicles** (by means incorporated in, or operatively associated with, conveyers B65G 47/00; by means incorporated in the vehicles B60-B64; ground or aircraft-carrier-deck installations B64F; transferring of refuse between vehicles or containers B65F 9/00)
- 67/02 • Loading or unloading land vehicles
  - 67/04 • • Loading land vehicles
  - 67/06 • • • Feeding articles or materials from bunkers or funnels
  - 67/08 • • • using endless conveyers

- 67/10 • • • using conveyers covering the whole length of vehicle trains
- 67/12 • • • Loading elongated articles, e.g. rails, logs
- 67/14 • • • Loading hardened bricks, briquettes, or the like
- 67/16 • • • Loading coke-oven products (discharging coke ovens C10B 33/00)
- 67/18 • • • Refuelling locomotives with solid fuels (servicing locomotives B61K 11/02)
- 67/20 • • • Loading covered vehicles
- 67/22 • • • Loading moving vehicles
- 67/24 • • Unloading land vehicles
- 67/26 • • • using rakes or scrapers
- 67/28 • • • • External transverse blades attached to endless conveyers
- 67/30 • • • using transportable tipping apparatus
- 67/32 • • • using fixed tipping installations
- 67/34 • • • • Apparatus for tipping wagons or mine cars (inverting wagons B65G 67/48; platform-lifts with tiltable platforms B66F 7/22)
- 67/36 • • • • • endwise
- 67/38 • • • • • • comprising a turntable
- 67/40 • • • • • • toward one end only
- 67/42 • • • • • • sideways
- 67/44 • • • • • • by passing the vehicles over a stretch of transversely-inclined rails
- 67/46 • • • • • Apparatus for lifting and tilting
- 67/48 • • • • • Vehicle tippers (devices for washing or cleaning railroad vehicles B60S)
- 67/50 • • • • • Rotary vehicle tippers, i.e. rotating through 360°
- 67/52 • • • • • • having several decks
- 67/54 • • • • • Vehicle-locking means
- 67/56 • • • • • Vehicle and tippler interlocking controls
- 67/60 • Loading or unloading ships (B65G 67/02 takes precedence; arrangement of ship-based loading or unloading equipment for cargo or passengers B63B 27/00) [3]
- 67/62 • • using devices influenced by the tide or by the movements of the ship, e.g. devices on pontoons (horizontal loading or unloading platforms B65G 69/22; loading ramps B65G 69/28) [3]
- 69/00 **Auxiliary measures taken, or devices used, in connection with loading or unloading** (by means incorporated in, or operatively associated with, conveyers B65G 47/00; preventing, minimising, or fighting fire A62C; in vehicles, see the relevant subclasses)
- 69/02 • Filling storage spaces as completely as possible, e.g. application of vibrators
- 69/04 • Spreading-out the materials conveyed over the whole surface to be loaded; Trimming heaps of loose materials
- 69/06 • Fluidising
- 69/08 • Devices for emptying storage spaces as completely as possible (devices preventing the formation of bridges B65D 88/64)
- 69/10 • Obtaining an average product from stored bulk material (for measuring or testing G01)
- 69/12 • Sieving bulk materials during loading or unloading
- 69/14 • Pulverising loaded or unloaded materials
- 69/16 • Preventing pulverisation, deformation, breakage, or other mechanical damage to the goods or materials
- 69/18 • Preventing escape of dust
- 69/20 • Auxiliary treatments, e.g. aerating, heating, humidifying, de-aerating, cooling, de-watering, or drying, during loading or unloading; Loading or unloading in a fluid medium other than air
- 69/22 • Horizontal loading or unloading platforms (pile tables B65H; as road or railway equipment E01F 1/00)
- 69/24 • • having platform-level adjusting means
- 69/26 • • Rotatable platforms
- 69/28 • Loading ramps; Loading docks (as road or railway equipment E01F 1/00) [1, 2006.01]
- 69/30 • • Non-permanently installed loading ramps, e.g. transportable [2006.01]
- 69/32 • • Shelters, surrounds or sealing arrangements for loading docks [2006.01]
- 69/34 • • Accessories, e.g. vehicle restrainers, wheel blockers, positioners or bumpers [2006.01]