SECTION B — PERFORMING OPERATIONS; TRANSPORTING

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

B65H HANDLING THIN OR FILAMENTARY MATERIAL, e.g. SHEETS, WEBS, CABLES

Note(s)

1. This subclass does not cover methods or devices intimately associated with other operations on thin or filamentary material, e.g. sheets, webs, cables or means for performing such operations, which are classified in the relevant subclasses for these operations, e.g.:
   - B07C.....Postal sorting, similar sorting of documents, e.g. cheques
   - B08B 1/02.....Cleaning travelling work, e.g. webs, by methods involving the use of tools, brushes or like members
   - B21B 41/00.....Metal rolling involving guiding, conveying or accumulating easily-flexible work, e.g. wire, sheet metal bands, in loops or curves
   - B21C 47/00, B21C 49/00.....Winding-up, coiling, winding-off or temporarily accumulating metal wire, metal band or other flexible metal material, characterised by features relevant to metal processing only, other than by rolling
   - B21D 43/00.....Feeding, positioning or storing devices, combined with, or arranged in, or specially adapted for use in connection with, apparatus for working or processing sheet metal without essentially removing material
   - B23K 9/12.....Means for automatic feeding of electrodes for spot or seam welding or cutting
   - B29C 31/00.....Handling for shaping or joining of plastics, for shaping of substances in a plastic state in general or for after-treatment of shaped products, e.g. feeding the material to be shaped
   - B41B 15/32, B41B 21/32.....Film-handling mechanisms in photographic composing machines
   - B41F 13/02.....Conveying or guiding webs through rotary-printing presses or machines
   - B41J 11/00-B41J 17/00.....Handling of copy- or impression-transfer material in typewriters or selective printing mechanisms
   - B41K 3/44.....Means for handling copy matter in stamping or numbering apparatus or devices
   - B41L.....Handling sheets or webs in apparatus or devices for manifolding, duplicating or printing for office or other commercial purposes, or on addressing machines or like series-printing machines
   - B42B.....Handling relating to permanently attaching together sheets, quires, or signatures
   - B42C.....Handling sheets in book-binding
   - B65B.....Handling of sheets or webs in apparatus for, or methods of, packaging articles, not of interest apart from their application in packaging machines
   - B65C.....Handling of labels in labelling or tagging apparatus
   - C14B 1/62.....Winding or stacking hides or leather in machines or devices for manufacturing leather
   - D01-D07.....Spinning, weaving, braiding, lace-making, knitting, sewing, making ropes or cables
   - D21F 2/00.....Transferring webs from wet ends to press sections in paper-making
   - F26B 13/00.....Handling fabrics, fibres, yarns or other material in long lengths in drying apparatus
   - G03B.....Film-strip handling or handling of pictures in apparatus for taking photographs or for projecting or viewing them
   - G06K 13/00.....Conveying record carriers from one station to another
   - G06M 7/00.....Counting of flat articles, e.g. sheets, carried by a conveyor
   - G11B 15/00-G11B 19/00, G11B 23/00, G11B 25/00 Information storage based on relative movement between record carrier and transducer, involving handling record carriers for recording or reproducing
   - H01F 41/06.....Manufacturing coils for magnets, inductances, transformers, by winding
   - H01G 13/02.....Machines for winding capacitors
   - H04N 1/00.....Sheet handling not of interest apart from its use in systems for transmission or reproduction of pictures or patterns not varying in time, e.g. facsimile transmission.
2. In this subclass:
   - the groups relating to thin material, as defined under (i) of Note (3) below, are primarily intended to cover the handling of articles made of paper or cardboard, but also include the handling of articles made of other materials which have similar characteristics or present similar handling problems, e.g. articles made of sheet-plastics or leather;
   - the groups relating to filamentary material (groups B65H 49/00onwards), as defined in Note (3) below, cover only methods or devices of general application or interest.
3. In this subclass, the following terms or expressions are used with the meanings indicated:
   - "handling" includes feeding, folding (other than in the manufacture of products), guiding, orientating, storing, unwinding, and winding;
   - "thin material" includes:
     i. sheets, signatures, envelopes, blanks, and thin piles thereof (hereinafter referred to as "articles"), and
     ii. webs, tapes, and films, e.g. of paper, fabric, metal foil, or plastics;
   - "filamentary material" includes thread, wires, ropes, cables, and hoses;

- "package" means a mass of filamentary material, formed by coiling, depositing, or winding, with or without a supporting core or former or an enclosing container or receptacle.

Subclass index

ARTICLES
Feeding; piles
pile supports; lifting ends of piles for overlapping; overturning articles.....1/00, 13/00, 15/00
separating from piles; feeding from piles or to machines; feed control; positioning; feeding to piles; feed tables.....3/00, 5/00, 7/00, 9/00, 11/00
Delivering
from machines to piles.....29/00, 35/00, 37/00
gathering.....39/00
folding; unfolding.....45/00, 47/00
piling.....13/00, 15/00, 31/00, 33/00
Combinations of piling and depiling operations.....83/00
Recirculating articles.....85/00
Control, checking, safety.....43/00
WEBS
Feeding
unwinding, paying-out webs; winding webs; advancing webs.....16/00, 18/00, 20/00
changing the web roll; special constructions of feed or guide rollers; covering cores, not otherwise provided for.....19/00, 27/00, 81/00
webs: splicing; registering, tensioning or guiding; con- trolling tension.....21/00, 23/00, 77/00
Delivery from machines
with or after auxiliary operations; gathering; separating.....35/00, 37/00, 39/00, 41/00
folding; unfolding.....45/00, 47/00
Machines: control, checking, safety or warning; driving gear not otherwise provided for.....26/00, 43/00, 63/00, 79/00
Storing.....75/00
FILAMENTARY MATERIAL
Unwinding, paying out; forwarding.....49/00, 51/00
Winding, coiling, depositing; wound packages; guides; covering cores not otherwise provided for.....54/00, 55/00, 57/00, 81/00
Tension control; Measuring pre-determined lengths; joining.....59/00, 77/00, 61/00, 69/00
Cores, formers: securing material, replacing, removing, stripping-off waste material.....65/00, 67/00, 73/00
Treatment during formation of package.....71/00
Machines: control, checking, safety or warning; driving gear not otherwise provided for.....26/00, 43/00, 63/00, 79/00
Storing.....75/00
SUBJECT MATTER NOT PROVIDED FOR IN OTHER GROUPS OF THIS SUBCLASS.....99/00

Feeding articles to machines; Separating articles from piles; Pile supports

1/00 **Supports or magazines for piles from which articles are to be separated** (carriers used for associating, collating, or gathering articles B65H 39/00; combinations of piling and depiling operations, of interest apart from the single operation of piling or depiling B65H 83/00)

1/02 • adapted to support articles on edge
1/04 • adapted to support articles substantially horizontally, e.g. for separation from top of pile
1/06 • • for separation from bottom of pile
1/08 • with means for advancing the pile to present the articles to a separating device (pressing on piles from which articles are separated from the bottom B65H 1/06)
1/10 • • comprising weights
1/12 • • comprising springs
1/14 • • comprising positively-acting mechanical devices
1/16 • • comprising pneumatic or hydraulic means
1/18 • • controlled by height of pile
1/20 • • controlled by weight of pile; Floating arrangements
1/22 • • moving in direction of plane of articles, e.g. for bodily advancement of fanned-out piles
1/24 • • with means for relieving or controlling pressure of the pile
1/26 • with auxiliary supports to facilitate introduction or renewal of the pile
1/28 • compartmented to receive piles side by side
1/30 • with means for replenishing the pile during continuous separation of articles therefrom

3/00 **Separating articles from piles** (associating, collating, or gathering articles B65H 39/00; machines for separating superposed webs B65H 41/00; unpiling thin material combined with folding B65H 45/26; combinations of piling and depiling operations, of interest apart from the single operation of piling or depiling B65H 83/00)

3/02 • using friction forces between articles and separator
3/04 • • Endless-belt separators
3/06 • • Rollers or like rotary separators
3/08 • using pneumatic force
3/10 • • Suction rollers
3/12 • • Suction bands, belts, or tables moving relatively to the pile
3/14 • • Air blasts producing partial vacuum
3/16 • using magnetic force
3/18 • using electrostatic force

3/20 • using adhesives
3/22 • by needles or the like engaging the articles
3/24 • by pushers engaging the edges of the articles
3/26 • by separators engaging folds, flaps, or projections of articles
3/28 • by screw or like separators
3/30 • by escapement devices (screw or like separators B65H 3/28); from staggered piles; from piles of articles having staggered formations, e.g. cuts or perforations
3/32 • by elements, e.g. fingers, plates, rollers, inserted or traversed between articles to be separated and remainder of the pile (such elements acting only as supplementary devices to assist separation or prevent double feed B65H 3/50)
3/34 • Article-retaining devices controlling the release of the articles to the separators
3/36 • by separators moved in special paths, e.g. enclosing an area
3/38 • • the paths not enclosing an area
3/40 • by two or more separators acting alternately on the same pile (rotary or oscillating bodies carrying two or more separators B65H 3/42)
3/42 • by two or more separators mounted for movement with, or relative to, rotary or oscillating bodies
3/44 • Simultaneously, alternately, or selectively separating articles from two or more piles
3/46 • Supplementary devices or measures to assist separation or prevent double feed (control means comprising detectors responsive to double feed B65H 7/12)
3/48 • • Air blast acting on edges of, or under, articles
3/50 • • Elements, e.g. fingers, plates, rollers, inserted or traversed between articles to be separated and remainder of the pile
3/52 • • Friction retainers acting on under or rear side of article being separated
3/54 • • Pressing or holding devices
3/56 • • Elements, e.g. scrapers, fingers, needles, brushes, acting on separated article or on edge of the pile
3/58 • • Articles spiked, threaded, cemented, or gummed together, to prevent double feed, e.g. piles with gummed edges
3/60 • • Loosening articles in piles
3/62 • • • by swinging, agitating, or knocking the pile
3/64 • • • by vacuum apparatus
3/66 • Article guides or smoothers, e.g. movable in operation
3/68 • • immovable in operation

5/00 Feeding articles separated from piles; Feeding articles to machines (identical mechanisms or parts for delivering or advancing articles from machines B65H 29/00; recirculating articles B65H 85/00)
5/02 • by belts or chains
5/04 • by movable tables or carriages (rotary tables B65H 5/18)
5/06 • by rollers
5/08 • by grippers, e.g. suction grippers
5/10 • • Reciprocating or oscillating grippers
5/12 • • Revolving grippers, e.g. mounted on arms, frames, or cylinders
5/14 • • Details of grippers; Actuating mechanisms therefor
5/16 • by pusher, needles, friction, or like devices adapted to feed single articles along a surface or table
5/18 • by rotary dials or tables
5/20 • by dropping-roller or like device
5/22 • by air-blast or suction device (suction grippers B65H 5/08)
5/24 • Feeding streams of overlapping articles
5/26 • Duplicate, alternate, selective, or coacting feeds
5/28 • Feeding articles stored in rolled or folded bands
5/30 • Opening devices for folded sheets or signatures
5/32 • Saddle-like members over which partially-unfolded sheets or signatures are fed to signature-gathering, stitching, or like machines
5/34 • Varying the phase of feed relative to the receiving machine
5/36 • Article guides or smoothers, e.g. movable in operation
5/38 • • immovable in operation

7/00 Controlling article feeding, separating, pile-advancing, or associated apparatus, to take account of incorrect feeding, absence of articles, or presence of faulty articles
7/02 • by feelers or detectors
7/04 • • responsive to absence of articles, e.g. exhaustion of pile (B65H 7/14 takes precedence)
7/06 • • responsive to presence of faulty articles or incorrect separation or feed (B65H 7/14 takes precedence)
7/08 • • • responsive to incorrect front register
7/10 • • • responsive to incorrect side register (controlling transverse register of webs B65H 23/032)
7/12 • • • responsive to double feed or separation
7/14 • • by photoelectric feelers or detectors
7/16 • Controlling air-supply to pneumatic separators
7/18 • Modifying or stopping actuation of separators
7/20 • Controlling associated apparatus

9/00 Registering, e.g. orientating, articles; Devices therefor
9/02 • Gauge pins
9/04 • Fixed or adjustable stops or gauges (gauge pins B65H 9/02)
9/06 • Movable stops or gauges, e.g. rising and falling front stops
9/08 • Holding devices, e.g. finger, needle, suction, for retaining articles in registered position
9/10 • Pusher or like movable registers; Pusher or gripper devices which move articles into registered position
9/12 • carried by article grippers
9/14 • Retarding or controlling the forward movement of articles as they approach stops
9/16 • Inclined tape, roller, or like article-forwarding side registers
9/18 • Assisting by devices such as reflectors, lenses, transparent sheets, or mechanical indicators
9/20 • Assisting by photoelectric, sonic, or pneumatic indicators

11/00 Feed tables
11/02 • angularly adjustable in plane of articles

13/00 Lifting the ends of piles to facilitate the formation of overlapped piles

15/00 Overturning articles [4]
15/02 • Overturning piles **[4]**

Feeding webs to or from machines; Winding or unwinding webs; Splicing webs

16/00 Unwinding, paying-out webs [4]
16/02 • Supporting web roll **[4]**
16/04 • • cantilever type **[4]**
16/06 • • both-ends type **[4]**
16/08 • • parallel rollers type **[4]**
16/10 • Arrangements for effecting positive rotation of web roll **[4]**

18/00 Winding webs [4]
18/02 • Supporting web roll **[4]**
18/04 • • Interior-supporting **[4]**
18/06 • • Lateral-supporting **[4]**
18/08 • Web-winding mechanisms **[4]**
18/10 • • Mechanisms in which power is applied to web-roll spindle **[4]**
18/12 • • • to effect step-by-step advancement of web **[4]**
18/14 • • Mechanisms in which power is applied to web roll, e.g. to effect continuous advancement of web **[4]**
18/16 • • • by friction roller **[4]**
18/18 • • • • to effect step-by-step advancement of web **[4]**
18/20 • • • the web roll being supported on two parallel rollers at least one of which is driven **[4]**
18/22 • • • by friction band **[4]**
18/24 • • • • to effect step-by-step advancement of web **[4]**
18/26 • • Mechanisms for controlling contact pressure on winding-web package, e.g. for regulating the quantity of air between web layers **[4]**
18/28 • Wound package of webs **[4]**

19/00 Changing the web roll [4]
19/10 • in unwinding mechanisms or in connection with unwinding operations **[4]**
19/12 • • Lifting, transporting, or inserting the web roll; Removing empty core **[4]**
19/14 • • Accumulating surplus web for advancing to machine while changing the web roll **[4]**
19/16 • • Driving, e.g. accelerating, the replacement web roll in association with web-splicing operation **[4]**
19/18 • • Attaching, e.g. pasting, the replacement web to the expiring web **[4]**
19/20 • • Cutting-off the expiring web **[4]**
19/22 • in winding mechanisms or in connection with winding operations **[4]**
19/24 • • Accumulating surplus web delivered while changing the web roll **[4]**
19/26 • • Cutting-off the web running to the wound web roll **[4]**
19/28 • • Attaching the leading end of the web to the replacement web-roll core or spindle (cores, formers, supports or holders, e.g. reels, with arrangements for securing ends of material B65H 75/28) **[4]**
19/29 • • Securing the trailing end of the wound web to the web roll (cores, formers, supports or holders, e.g. reels, with arrangements for securing ends of material B65H 75/28) **[4]**
19/30 • • Lifting, transporting, or removing the web roll; Inserting core **[4]**

20/00 Advancing webs (web-delivering apparatus incorporating devices for performing auxiliary operations B65H 35/00, B65H 37/00) **[4]**
20/02 • by friction roller **[4]**
20/04 • • to effect step-by-step advancement of web **[4]**
20/06 • by friction band **[4]**
20/08 • • to effect step-by-step advancement of web **[4]**
20/10 • by a feed band against which web is held by fluid pressure, e.g. suction or air blast **[4]**
20/12 • by suction roller **[4]**
20/14 • by direct action on web of moving fluid **[4]**
20/16 • by web-gripping means, e.g. grippers, clips **[4]**
20/18 • • to effect step-by-step advancement of web **[4]**
20/20 • by web-penetrating means, e.g. pins **[4]**
20/22 • • to effect step-by-step advancement of web **[4]**
20/24 • by looping or like devices **[4]**
20/26 • Mechanisms for advancing webs to or from the inside of web rolls **[4]**
20/28 • Mechanisms for delivering webs in superposed folds and refeeding them from the lower end of the folded assemblies **[4]**
20/30 • Arrangements for accumulating surplus web (while changing the web roll B65H 19/14, B65H 19/24) **[4]**
20/32 • • by making loops **[4]**
20/34 • • • with rollers **[4]**
20/36 • having means to optionally advance the web either in one longitudinal direction or in the opposite longitudinal direction **[4]**
20/38 • • by changing the direction of mechanism driving the web-roll spindle **[4]**
20/40 • • by changing the direction of mechanism driving the pinch roller **[4]**

21/00 Apparatus for splicing webs (during web-roll changing B65H 19/00; associating two or more webs B65H 39/16)
21/02 • for premarked, e.g. preprinted, webs

23/00 Registering, tensioning, smoothing, or guiding webs (registering articles B65H 9/00; in connection with splicing B65H 21/00; tensioning devices of general interest in connection with the handling of webs, tapes, or filamentary materials B65H 77/00)
23/02 • transversely (by tentering, gripper, or like apparatus operating on fabric webs D06C)
23/022 • • by tentering devices **[4]**
23/025 • • • by rollers **[4]**
23/028 • • • by clips **[4]**
23/032 • • Controlling transverse register of web **[4]**
23/035 • • • by guide bars **[4]**
23/038 • • • by rollers **[4]**
23/04 • longitudinally
23/06 • • by retarding devices, e.g. acting on web-roll spindle
23/08 • • • acting on web roll being unwound
23/10 • • • acting on running web (by fluid action B65H 23/24)
23/12 • • • • and causing parts thereof to move in opposite directions and in frictional engagement
23/14 • • • • Tensioning rollers applying braking forces
23/16 • • by weighted or spring-pressed movable bars or rollers
23/18 • • by controlling or regulating the web-advancing mechanism, e.g. mechanism acting on the running web

23/182 • • • in unwinding mechanisms or in connection with unwinding operations **[4]**
23/185 • • • • motor-controlled **[4]**
23/188 • • • in connection with running-web **[4]**
23/192 • • • • motor-controlled **[4]**
23/195 • • • in winding mechanisms or in connection with winding operations **[4]**
23/198 • • • • motor-controlled **[4]**
23/24 • • by fluid action, e.g. to retard the running web **[4]**
23/26 • • by transverse stationary or adjustable bars or rollers
23/28 • • by longitudinally-extending strips, tubes, plates, or wires (flexible tapes or bands B65H 23/30)
23/30 • • by longitudinally-extending flexible tapes or bands
23/32 • • Arrangements for turning or reversing webs
23/34 • • Apparatus for taking-out curl from webs

26/00 Warning or safety devices, e.g. automatic fault detectors, stop-motions, for web-advancing mechanisms (safety devices in general F16P; investigating chemical or physical properties of materials in general G01N; indicating devices in general G08B) **[4]**
26/02 • responsive to presence of irregularities in running webs **[4]**
26/04 • • for variation in tension **[4]**
26/06 • responsive to predetermined lengths of webs **[4]**
26/08 • responsive to a predetermined diameter **[4]**

27/00 Special constructions, e.g. surface features, of feed or guide rollers for webs (rollers in general F16C 13/00)

Delivering articles from machines; Piling articles; Article or web delivery apparatus incorporating devices for performing specified auxiliary operations; Associating or gathering articles or webs; Machines for separating superposed webs

29/00 Delivering or advancing articles from machines; Advancing articles to or into piles (associating, collating or gathering articles B65H 39/00; combinations of piling and depiling operations, of interest apart from the single operation of piling or depiling B65H 83/00; recirculating articles B65H 85/00; for articles other than those defined by Note (3) (i) of this subclass, see B65G)
29/02 • by mechanical grippers engaging the leading edge only of the articles
29/04 • • the grippers being carried by endless chains or bands
29/06 • • the grippers being carried by rotating members
29/08 • • the grippers being oscillated in arcuate paths
29/10 • • the grippers being reciprocated in rectilinear paths
29/12 • by means of the nip between two, or between two sets of, moving tapes or bands
29/14 • • and introducing into a pile
29/16 • by contact of one face only with moving tapes, bands, or chains
29/18 • • and introducing into a pile
29/20 • by contact with rotating friction members, e.g. rollers, brushes, or cylinders
29/22 • • and introducing into a pile
29/24 • by air-blast or suction apparatus (dropping articles from suction carriers B65H 29/32)
29/26 • by dropping
29/28 • • from mechanical grippers (grippers engaging the leading edge only B65H 29/02)
29/30 • • from magnetic holders
29/32 • • from pneumatic, e.g. suction, carriers
29/34 • • from supports slid from under the articles
29/36 • • from tapes, bands, or rollers rolled from under the articles
29/38 • by movable piling or advancing arms, frames, plates, or like members with which the articles are maintained in face contact
29/40 • • Members rotated about an axis perpendicular to direction of article movement, e.g. star-wheels formed by S-shaped members
29/42 • • Members rotated about an axis parallel to direction of article movement, e.g. helices
29/44 • • Members oscillated in arcuate paths
29/46 • • Members reciprocated in rectilinear path
29/48 • by tables arranged to be tilted to cause sliding of articles
29/50 • Piling apparatus of which the discharge point moves in accordance with the height of the pile
29/51 • • piling by collecting on the periphery of cylinders **[3]**
29/52 • Stationary guides or smoothers
29/54 • Article strippers, e.g. for stripping from advancing elements
29/56 • • for stripping from elements of machines
29/58 • Article switches or diverters
29/60 • • diverting the stream into alternative paths (B65H 29/62 takes precedence)
29/62 • • diverting faulty articles from the main stream (control devices detecting faulty articles B65H 43/04)
29/64 • • directing the components of composite articles into separate paths
29/66 • Advancing in streams of overlapping articles
29/68 • Reducing the speed of articles as they advance (web retarding devices B65H 23/06)
29/70 • Article-bending or stiffening arrangements

31/00 Pile receivers (carriers used for associating, collating, or gathering articles B65H 39/00; combinations of piling and depiling operations, of interest apart from the single operation of piling or depiling B65H 83/00)
31/02 • with stationary end support against which pile accumulates
31/04 • with movable end support arranged to recede as pile accumulates
31/06 • • the articles being piled on edge
31/08 • • the articles being piled one above another
31/10 • • • and applied at the top of the pile
31/12 • • Devices relieving the weight of the pile or permitting or effecting movement of the pile end support during piling
31/14 • • • Springs (fluid springs B65H 31/16)
31/16 • • • Fluid-pressure devices
31/18 • • • Positively-acting mechanical devices
31/20 • adjustable for different article sizes
31/22 • removable or interchangeable
31/24 • multiple or compartmented, e.g. for alternate, programmed, or selective filling
31/26 • Auxiliary devices for retaining articles in the pile
31/28 • Bands, chains, or like moving receivers (for articles piled on edge B65H 31/06)
31/30 • Arrangements for removing completed piles (bands, chains, or like moving receivers B65H 31/28)
31/32 • Auxiliary devices for receiving articles during removal of a completed pile

31/34 • Apparatus for squaring-up piled articles
31/36 • • Auxiliary devices for contacting each article with a front stop as it is piled
31/38 • • Apparatus for vibrating or knocking the pile during piling
31/40 • • Separate receivers, troughs, and like apparatus for knocking-up completed piles

33/00 Forming counted batches in delivery pile or stream of articles
33/02 • by moving a blade or like member into the pile
33/04 • by inserting marker slips in pile or stream
33/06 • by displacing articles to define batches
33/08 • • Displacing whole batches, e.g. forming stepped piles
33/10 • • Displacing the end articles of a batch
33/12 • by creating gaps in the stream
33/14 • by diverting batches to separate receivers
33/16 • by depositing articles in batches on moving supports
33/18 • • with separators between adjacent batches

35/00 Delivering articles from cutting or line-perforating machines; Article or web delivery apparatus incorporating cutting or line-perforating devices, e.g. adhesive tape dispensers (cutting or perforating machines or devices in general B26D, B26F)
35/02 • from or with longitudinal slitters or perforators
35/04 • from or with transverse cutters or perforators
35/06 • • from or with blade, e.g. shear-blade, cutters or perforators (from or with revolving blade B65H 35/08)
35/07 • • • Adhesive-tape dispensers **[3]**
35/08 • • from or with revolving, e.g. cylinder, cutters or perforators
35/10 • from or with devices for breaking partially-cut or perforated webs, e.g. bursters

37/00 Article or web delivery apparatus incorporating devices for performing specified auxiliary operations (incorporating cutting or line-perforating devices B65H 35/00)
37/02 • for applying adhesive (and securing together B65H 37/04)
37/04 • for securing together articles or webs, e.g. by adhesive, stitching, or stapling (adhering replacement to expiring web during change of web roll B65H 19/18) **[2]**
37/06 • for folding

39/00 Associating, collating, or gathering articles or webs (combinations of piling and depiling operations, of interest apart from the single operation of piling or depiling B65H 83/00; machines for both collating or gathering and permanently attaching together sheets or signatures B42C 1/00)
39/02 • Associating, collating, or gathering articles from several sources
39/04 • • from piles
39/041 • • • the piles being disposed in rotary carriers **[3]**
39/042 • • • the piles being disposed in superposed carriers **[3]**
39/043 • • • the piles being disposed in juxtaposed carriers **[3]**
39/045 • • • by collecting in rotary carriers **[2]**
39/05 • • • by collecting in superposed carriers **[2]**
39/055 • • • by collecting in juxtaposed carriers **[2]**
39/06 • • from delivery streams
39/065 • • • by collecting in rotary carriers **[2]**
39/07 • • • by collecting in superposed carriers **[2]**
39/075 • • • by collecting in juxtaposed carriers **[2]**
39/10 • Associating articles from a single source, e.g. to form a writing pad
39/105 • • in rotary carriers **[3]**
39/11 • • in superposed carriers **[3]**
39/115 • • in juxtaposed carriers **[3]**
39/14 • Associating sheets with webs
39/16 • Associating two or more webs

41/00 Machines for separating superposed webs

43/00 Use of control, checking, or safety devices, e.g. automatic devices comprising an element for sensing a variable
43/02 • detecting, or responding to, absence of articles (B65H 43/08 takes precedence)
43/04 • detecting, or responding to, presence of faulty articles (B65H 43/08 takes precedence; diverting faulty articles from main streams B65H 29/62)
43/06 • detecting, or responding to, completion of pile (B65H 43/08 takes precedence)
43/08 • Photoelectric devices

Folding or unfolding thin material

45/00 Folding thin material (specially adapted for the manufacture or treatment of particular products, see the relevant places, e.g. D06F 89/00) **[4]**
45/02 • Folding limp material without application of pressure to define or form crease lines (winding or unwinding fabrics for feeding to or from machines B65H 16/00-B65H 27/00; folding garments for packaging purposes B65B; folding fabrics in sewing machines D05B)
45/04 • • Folding sheets
45/06 • • Folding webs (B65H 20/28 takes precedence)
45/08 • • • longitudinally
45/09 • • • • Doubling, i.e. folding into half of width
45/10 • • • transversely
45/101 • • • • in combination with laying, i.e. forming a zig-zag pile
45/103 • • • • • by a carriage which reciprocates above the laying station
45/105 • • • • • • coacting with fold holders
45/107 • • • • • by means of swinging or reciprocating guide bars
45/109 • • • • Registering or counting the folds; Detecting irregularities in the zig-zag pile
45/12 • Folding articles or webs with application of pressure to define or form crease lines (B65H 20/28 takes precedence; pleating, kilting, or goffering textile fabrics D06J)
45/14 • • Buckling folders
45/16 • • Rotary folders
45/18 • • Oscillating or reciprocating blade folders (carried on rotary members B65H 45/16)
45/20 • • Zig-zag folders
45/22 • • Longitudinal folders, i.e. for folding moving sheet material parallel to the direction of movement
45/24 • • Interfolding sheets, e.g. cigarette or toilet papers
45/26 • • Folding in combination with unpiling (unpiling B65H 3/00)
45/28 • • Folding in combination with cutting (cutting machines B26D)

45/30 • • Folding in combination with creasing, smoothing, or application of adhesive (folding or adhesive-application in article or web delivering B65H 37/00)

47/00 **Unfolding thin limp material** (B65H 20/28 takes precedence; opening devices for sheets or signatures B65H 5/30)

Unwinding, paying-out, forwarding, winding, coiling, or depositing filamentary material

49/00 **Unwinding or paying-out filamentary material; Supporting, storing, or transporting packages from which filamentary material is to be withdrawn or paid-out** (winding B65H 54/00; flyers or other guides assisting paying-out B65H 57/00; bobbins, tubes, or other cores for packages B65H 75/00)

49/02 • Methods or apparatus in which packages do not rotate
49/04 • • Package-supporting devices
49/06 • • • for a single operative package
49/08 • • • • enclosing the package
49/10 • • • for one operative package and one or more reserve packages
49/12 • • • • the reserve packages being mounted to permit manual or automatic transfer to operating position
49/14 • • • for several operative packages
49/16 • • • • Stands for frameworks
49/18 • Methods or apparatus in which packages rotate (supports or holders, for storing and repeatedly paying-out and rewinding lengths of material provided for particular purposes B65H 75/34)
49/20 • • Package-supporting devices
49/22 • • • Overhead suspension devices
49/24 • • • Rollers
49/26 • • • Axial shafts or spigots
49/28 • • • Turntables
49/30 • • • Swifts or skein holders
49/32 • • • Stands or frameworks
49/34 • • Arrangements for effecting positive rotation of packages
49/36 • Securing packages to supporting devices (replacing or removing cores, receptacles, or completed packages at paying-out, winding, or depositing stations B65H 67/00)
49/38 • Skips, cages, racks, or containers, adapted solely for the transport or storage of bobbins, cops, or the like

51/00 **Forwarding filamentary material** (stretch-spinning methods D01D 5/12; drawing or drafting rovings or the like D01H 5/00)

51/005 • Separating a bundle of forwarding filamentary materials into a plurality of groups **[4]**
51/01 • • by means of static electricity **[4]**
51/015 • Gathering a plurality of forwarding filamentary materials into a bundle **[4]**
51/02 • Rotary devices, e.g. with helical forwarding surfaces (devices for temporarily storing filamentary material during forwarding B65H 51/20; driven rotary devices for controlling tension B65H 59/18)
51/04 • • Rollers, pulleys, capstans, or intermeshing rotary elements
51/06 • • • arranged to operate singly
51/08 • • • arranged to operate in groups or in co-operation with other elements
51/10 • • • • with opposed coacting surfaces, e.g. providing nips
51/12 • • • • in spaced relation to provide a series of independent forwarding surfaces around which material is passed or wound
51/14 • Aprons, endless belts, lattices, or like driven elements
51/16 • Devices for entraining material by flow of liquids or gases, e.g. air-blast devices (blowing slag wool in molten state C03B 37/06)
51/18 • Gripping devices with linear motion
51/20 • Devices for temporarily storing filamentary material during forwarding, e.g. for buffer storage
51/22 • • Reels or cages, e.g. cylindrical, with storing and forwarding surfaces provided by rollers or bars
51/24 • • • with interdigitating bars
51/26 • • Rollers or bars mounted askew to facilitate movement of filamentary material along them, e.g. pairs of canted rollers
51/28 • Arrangements for initating a forwarding operation
51/30 • Devices controlling the forwarding speed to synchronise with supply, treatment, or take-up apparatus (B65H 59/10, B65H 59/38 take precedence)
51/32 • Supporting or driving arrangements for forwarding devices

54/00 **Winding, coiling, or depositing filamentary material** (cores, formers, holders, cans, or receptacles B65H 75/02; devices specially adapted or mounted for storing and repeatedly paying-out and re-storing lengths of material B65H 75/34)

54/02 • Winding and traversing material on to reels, bobbins, tubes, or like package cores or formers
54/04 • • for making packages with closely-wound convolutions
54/06 • • for making cross-wound packages
54/08 • • • Precision winding arrangements
54/10 • • for making packages of specified shapes or on specified types of bobbins, tubes, cores, or formers
54/12 • • • on flanged bobbins or spools (B65H 54/20 takes precedence)
54/14 • • • on tubes, cores, or formers having generally-parallel sides, e.g. cops or packages to be loaded into loom shuttles
54/16 • • • forming bottle bobbin packages
54/18 • • • forming spools to be loaded into sewing, lace, embroidery, or like machines
54/20 • • • forming multiple packages
54/22 • • Automatic winding machines, i.e. machines with servicing units for automatically performing end-finding, interconnecting of successive lengths of material, controlling or fault-detecting of the running material, and replacing or removing of full or empty cores
54/24 • • • having a plurality of winding units moving along an endless path past one or more fixed servicing units
54/26 • • • having one or more servicing units moving along a plurality of fixed winding units
54/28 • • Traversing devices; Package-shaping arrangements (arrangements for preventing ribbon winding B65H 54/38; grooved, slotted, or split drums for driving of packages B65H 54/46)
54/30 • • • with thread guides reciprocating or oscillating with fixed stroke
54/32 • • • with thread guides reciprocating or oscillating with variable stroke

54/34 • • • for laying subsidiary winding, e.g. transfer tails
54/36 • • • Yarn-guide advancing or raising mechanisms, e.g. cop-building arrangements
54/38 • • Arrangements for preventing ribbon winding
54/40 • • Arrangements for rotating packages
54/42 • • • in which the package, core, or former is rotated by frictional contact of its periphery with a driving surface
54/44 • • • in which the package, core, or former is engaged with, or secured to, a driven member rotatable about the axis of the package
54/46 • • • Package drive drums
54/48 • • • • Grooved drums
54/50 • • • • Slotted or split drums
54/52 • • • Drive contact pressure control, e.g. pressing arrangements
54/54 • • • Arrangements for supporting cores or formers at winding stations; Securing cores or formers to driving members
54/547 • • • • Cantilever supporting arrangements **[4]**
54/553 • • • • Both-ends supporting arrangements **[4]**
54/56 • Winding of hanks or skeins
54/58 • • Swifts or reels adapted solely for the formation of hanks or skeins (B65H 49/30 takes precedence)
54/60 • • Devices for domestic use
54/62 • • Binding of skeins
54/64 • Winding of balls; Forming hollow objects by winding on to fusible or soluble cores, e.g. forming pressure vessels
54/66 • • Winding yarns into balls
54/68 • Winding on to cards or other flat cores, e.g. of star form
54/70 • Other constructional features of yarn-winding machines
54/71 • • Arrangements for severing filamentary materials **[4]**
54/72 • • Framework; Casings; Coverings
54/74 • • Driving arrangements (arrangements for preventing ribbon winding B65H 54/38; arrangements for rotating packages B65H 54/40)
54/76 • Depositing materials in cans or receptacles
54/78 • • Apparatus in which the depositing device or the receptacle is reciprocated
54/80 • • Apparatus in which the depositing device or the receptacle is rotated
54/82 • • • and in which coils are formed before deposition
54/84 • • Arrangements for compacting materials in receptacles
54/86 • Arrangements for taking-up waste material before or after winding or depositing
54/88 • • by means of pneumatic arrangements, e.g. suction guns **[4]**

55/00 Wound packages of filamentary material
55/02 • Self-supporting packages
55/04 • characterised by method of winding

57/00 Guides for filamentary materials; Supports therefor
57/02 • Stationary rods or plates
57/04 • Guiding surfaces within slots or grooves
57/06 • Annular guiding surfaces; Eyes, e.g. pigtails
57/08 • • formed of wire or the like
57/10 • • with flared apertures
57/12 • Tubes
57/14 • Pulleys, rollers, or rotary bars
57/16 • formed to maintain a plurality of filaments in spaced relation
57/18 • mounted to facilitate unwinding of material from packages
57/20 • • Flyers (for inserting twist D01H)
57/22 • adapted to prevent excessive ballooning of material
57/24 • with wear-resistant surfaces
57/26 • Supports for guides
57/28 • Reciprocating or oscillating guides (traversing devices for winding, coiling, or depositing filamentary material B65H 54/28)

59/00 Adjusting or controlling tension in filamentary material, e.g. for preventing snarling; Applications of tension indicators (tensioning devices of general interest in connection with the handling of webs, tapes, or filamentary material B65H 77/00)
59/02 • by regulating delivery of material from supply package (by contact of package with support B65H 49/02; by controlling speed of driving mechanism of unwinding or paying-out devices B65H 59/38)
59/04 • • by devices acting on package or support
59/06 • • by devices acting on material leaving the package
59/08 • by contact of running length of material with supply package
59/10 • by devices acting on running material and not associated with supply or take-up devices (by controlling speed of driving mechanism of material-forwarding devices B65H 59/38)
59/12 • • Stationary elements arranged to deflect material from straight path
59/14 • • • and provided with surfaces imposing additional retarding forces on material
59/16 • • Braked elements rotated by material
59/18 • • Driven rotary elements (material-forwarding devices B65H 51/00)
59/20 • • Co-operating surfaces mounted for relative movement
59/22 • • • and arranged to apply pressure to material
59/24 • • • • Surfaces movable automatically to compensate for variation in tension
59/26 • • • and arranged to deflect material from straight path
59/28 • • • • the surfaces being urged towards each other
59/30 • • • • • Surfaces movable automatically to compensate for variation in tension
59/32 • • • • the surfaces being urged away from each other
59/34 • • • • • Surfaces movable automatically to compensate for variation in tension
59/36 • • Floating elements compensating for irregularities in supply or take-up of material (buffer storage devices B65H 51/20)
59/38 • by regulating speed of driving mechanism of unwinding, paying-out, forwarding, winding, or depositing devices, e.g. automatically in response to variations in tension
59/40 • Applications of tension indicators

61/00 Applications of devices for metering predetermined lengths of running material (of general application G01B)

63/00 **Warning or safety devices for use when unwinding, paying-out, forwarding, winding, coiling, or depositing filamentary material, e.g. automatic fault detectors or stop-motions** (safety devices in general F16P; indicating devices in general G08B)

63/02 • responsive to reduction in tension, failure of supply, or breakage, of material

63/024 • • responsive to breakage of materials **[4]**

63/028 • • • characterised by the detecting or sensing element **[4]**

63/032 • • • • electrical or pneumatic **[4]**

63/036 • • • characterised by the combination of the detecting or sensing elements with other devices, e.g. stopping devices for material advancing or winding mechanism **[4]**

63/04 • responsive to excessive tension or irregular operation of apparatus

63/06 • responsive to presence of irregularities in running material, e.g. for severing the material at irregularities

63/08 • responsive to delivery of a measured length of material, completion of winding of a package, or filling of a receptacle

65/00 **Securing material to cores or formers** (arrangements for securing ends of material to cores, formers, supports or holders, e.g. reels, B65H 75/28) **[3]**

67/00 **Replacing or removing cores, receptacles, or completed packages at paying-out, winding, or depositing stations**

67/02 • Arrangements for removing spent cores or receptacles and replacing by supply packages at paying-out stations (supports for packages B65H 49/04, B65H 49/20)

67/04 • Arrangements for removing completed take-up packages and replacing by cores, formers, or empty receptacles at winding or depositing stations; Transferring material between adjacent full and empty take-up elements

67/044 • • Continuous winding apparatus for winding on two or more winding heads in succession **[4]**

67/048 • • • having winding heads arranged on rotary capstan head **[4]**

67/052 • • • having two or more winding heads arranged in parallel to each other **[4]**

67/056 • • • having two or more winding heads arranged in series with each other **[4]**

67/06 • Supplying cores, receptacles, or packages to, or transporting from, winding or depositing stations

67/08 • Automatic end-finding and material-interconnecting arrangements (knot-tying devices B65H 69/00)

69/00 **Methods of, or devices for, interconnecting successive lengths of material; Knot-tying devices**

69/02 • by means of adhesives

69/04 • by knotting

69/06 • by splicing

69/08 • by welding

71/00 **Moistening, sizing, oiling, waxing, colouring, or drying filamentary material as additional measures during package formation** (applying liquids or other fluent materials to surfaces in general B05)

73/00 **Stripping waste material from cores or formers, e.g. to permit their re-use**

Methods, apparatus or devices of general interest or not otherwise provided for in connection with the handling of webs, tapes or filamentary materials

75/00 **Storing webs, tapes, or filamentary material, e.g. on reels** (fishing reels A01K 89/00; storing means for record carriers, specially adapted for co-operation with the recording or reproducing apparatus G11B 23/02)

75/02 • Cores, formers, supports, or holders for coiled, wound, or folded material, e.g. reels, spindles, bobbins, cop tubes, cans (packaging aspects B65D 85/67)

75/04 • • Kinds or types (B65H 75/18 takes precedence)

75/06 • • • Flat cores, e.g. cards

75/08 • • • of circular or polygonal cross-section (cans or receptacles B65H 75/16)

75/10 • • • • without flanges, e.g. cop tubes

75/12 • • • • with a single end flange; formed with one end of greater diameter than the barrel

75/14 • • • • with two end flanges

75/16 • • • Cans or receptacles, e.g. sliver cans

75/18 • • Constructional details

75/20 • • • Skeleton construction, e.g. formed of wire

75/22 • • • collapsible; with removable parts

75/24 • • • adjustable in configuration, e.g. expansible

75/26 • • • Arrangements for preventing slipping of winding

75/28 • • • Arrangements for securing ends of material **[3]**

75/30 • • • Arrangements to facilitate driving or braking

75/32 • • • Arrangements to facilitate severing of material

75/34 • • specially adapted or mounted for storing and repeatedly paying-out and re-storing lengths of material provided for particular purposes, e.g. anchored hoses, power cables (retractors for storing flexible hoses as accessories of dental work stands A61G 15/18; vehicle safety belt retractors B60R 22/34; hose-storing devices in apparatus or devices for transferring liquids from bulk storage containers or reservoirs into vehicles or portable containers B67D 7/40; clothes-line supports D06F 53/00; spring drums for liftable blinds with horizontal lamellae E06B 9/322; spring drums or tape drums for roll-type closures or roller blinds E06B 9/56; hauling- or hoisting-chains with arrangements for holding electric cables, hoses or the like F16G 13/16; devices for guiding pipes, cables or protective tubing, between relatively movable points, e.g. movable channels, F16L 3/01; flexible rulers or tapes with scales G01B 3/10; electrical features of stored material, see the relevant subclasses, e.g. H02G) **[2, 5]**

75/36 • • • without essentially involving the use of a core or former internal to a stored package of material, e.g. with stored material housed within casing or container, or intermittently engaging a plurality of supports as in sinuous or serpentine fashion **[2]**

75/38 • • • involving the use of a core or former internal to, and supporting, a stored package of material **[2]**

75/40 • • • • mobile or transportable

75/42 • • • • • attached to, or forming part of, mobile tools or machines

75/44 • • • • Constructional details

75/48 • • • • • Automatic re-storing devices **[2]**

75/50 • Methods of making reels, bobbins, cop tubes, or the like by working an unspecified material, or several materials

77/00 Adjusting or controlling tension in material

79/00 Driving gear for devices for forwarding, winding, unwinding, or depositing material, not otherwise provided for

81/00 Methods, apparatus, or devices for covering or wrapping cores by winding webs, tapes, or filamentary material, not otherwise provided for (forming hollow objects by winding filamentary material on to fusible or soluble cores B65H 54/64; wrapping for the purpose of packaging B65B 11/00; making wound articles of paper B31C)

81/02 • Covering or wrapping annular or like cores forming a closed or substantially-closed figure

81/04 • • by feeding material obliquely to the axis of the core

81/06 • Covering or wrapping elongated cores

81/08 • • by feeding material obliquely to the axis of the core

---

83/00 Combinations of piling and depiling operations, e.g. performed simultaneously, of interest apart from the single operation of piling or depiling (B65H 85/00 takes precedence) **[5]**

83/02 • performed on the same pile **[5]**

85/00 Recirculating articles, i.e. feeding each article to, and delivering it from, the same machine work-station more than once [5]

99/00 Subject matter not provided for in other groups of this subclass [2006.01]