MISCELLANEOUS
SPECIAL APPLICATIONS
PRECEDENT PREPARATION OF ITEMS OR MATERIALS TO FACILITATE SEPARATION
3.1 Sorting special items or sorting by methods and apparatus includible in subclasses 509 through 707
3.2 Condition responsive sensor controlling preparation
3.3 Marking or tagging item
3.4 Deflocculation and flocculation
3.5 Magnetizing and demagnetizing
3.6 Surface
TREATMENT SUBSEQUENT WITH HEAT TREATMENT
12.1 PLURAL, DIVERSE SEPARATING OPERATIONS
12.2 Including electrostatic
13 Aqueous suspension, sifting, and stratifying
14 Mercurial adhesion, sifting, and stratifying
15 Gaseous suspension, sifting, and stratifying
16 Aqueous suspension and fluid suspension
17 Aqueous suspension and sifting
18 Aqueous suspension and stratifying
19 Gaseous suspension and stratifying
20 Gaseous suspension and sifting
21 Gaseous suspension and sifting
22 Coincident
23 With deposition
24 Horizontal current
25 With deposition
26 Inclined current
27 With deposition
28 Vertical current
29 With deposition
30 Successive
31 With deposition
32 Horizontal current
33 With deposition
34 Inclined current
35 With deposition
36 Vertical current
37 With deposition
38 Magnetic and sifting
39 Magnetic and fluid suspension
40 Magnetic and stratifying
41 Mercurial suspension and mercurial adhesion
42 Mercurial adhesion or suspension and sifting
43 Mercurial adhesion or suspension and stratifying
44 Sifting and stratifying
44.1 Including sorting of special items or sorting by methods or apparatus includible in subclasses 509 through 707
44.2 Fluid jet
44.3 Drum-type sifter
44.4 Manual sorting
ADHESION
45 With selective differentiation
46 Coating
47 Mercurial (i.e., amalgamators)
48 Coated surface or mass
49 Mercurial
50 Applying or removing coat
51 Contact elements
52 Agitators
53 Baffles
54 Disks and spheres
55 Liners
56 Percolators
57 Receivers
58 Rotating
59 Centrifugal
60 Cylinders, external
61 Cylinders, internal
62 Endless belt
63 Shaking
64 With agitating or conveying
65 Fluid
66 With rubbing
67 Impact
68 Reciprocating
69 Rotating
ELECTROSTATIC
127.1 With heating of particles
127.2 With vibrating trough charging of particles
127.3 Free fall type particle charging
127.4 Attracting and repelling
128 Attracting
129 Repelling
130 Stratifying
509  **SORTING SPECIAL ITEMS, AND CERTAIN METHODS AND APPARATUS (E.G., POCKET TYPE AND LIGHT RESPONSIVE SORTING, ETC.) FOR SORTING ANY ITEMS**

510  .Sorting eggs or components thereof

511  ..Radiant energy sensing means
   controls separating means
   by weight

512  ...Sensing egg weight and controlling separating means in accordance therewith

514  ...Orbiting or rotating carrier responsive to egg weight

515  ....Carrier tilted by means (e.g., trip, cam, etc.) adjacent travel path when depressed to particular elevation

516  ...Same eggs successively placed on means (e.g., balance beams, etc.) responsive to different weights

517  .Sorting lumber, logs, pipes, rails, or like items

518  ..Condition responsive means
   controls separating means

519  ...Relatively movable calipers closed against item

520  ...Sensor responsive to item contact

521  ..With endless conveyor belt

522  .Sorting bottles, ampoules, jars, drinking vessels, or like ceramic or glass containers

523  ..Condition responsive means
   controls separating means

524  ...Sensing radiant energy reflected, absorbed, emitted, or obstructed by item or adjunct (e.g., label, cap, etc.) thereof

525  ....Sizing with visible light beam

526  ....Detecting internal flaw (e.g., air bubble, crack, etc.) in wall of item

527  .....By means of radio frequency radiation

528  .....Detecting flaw in, or absence or misplacement of, label on item

529  ...Sensing position, shape, or presence of closure

530  ...Sensor contacts item

531  ....Gauge

532  .....Plug

533  .....Relatively movable calipers closed against item

534  .Sorting paper money

535  .Sorting cigarettes, cigars, or packages thereof

536  ...Sensing radiant energy reflected, absorbed, emitted, or obstructed by item or adjunct thereof

537  ..Fluid or vacuum sensing means
   controls separating means

538  .Nonconveying driven means for turning item at separating or inspecting station to facilitate sorting

539  .Traveling items shifted to form line, or into end or edge alignment, to facilitate inspection or separation

540  .Traveling item turned to predetermined position

541  ..Plural orienting means

542  ..Reciprocable or pivotable orienting means

543  ..Fluid orienting means

544  ..Means orienting item moved by gravity

545  ..Driven orienting means

546  ..Signalling, indicating, or display means

547  ..Indicia associated with cards, file folders, or like coded items, or with sorting means thereof (including cards, per se, with edge coding)

548  ..Operation of apparatus stopped

549  ..Signal lamp or audible alarm

550  ..Indicating scale

551  ..Item counter

552  .Condition responsive means
   controls separating means

553  ..Cards or sheets separated by rotatable suction drum

554  ..Sorting cards or sheets coded by perforation

555  ..Diverse

556  ..Diverse electrical tests

557  ..Including noncondition-responsive separating means
558 ...At single station
559 ...Means (e.g., information storing device, timer, delaying relay, etc.) delaying actuation of separating means
560 ...Mechanical
561 ....Rotatable pin carrier
562 ...Magnetic
563 ....Electrical
564 .....Electronic
565 ......Shift register
566 ........Controlled by article
567 ..Magnetic test sensing property of item
568 ...Magnetic core tested
569 ...Reading indicia
570 ...Permeability
571 ..Electrical test sensing property of item
572 ...Detecting flaw in dielectric
573 ...Electrical component tested
574 ....Resistor or capacitor
575 ....Lamp or battery
576 ...Sensing radiant energy reflected, absorbed, emitted, or obstructed by item or adjunct thereof
577 ...Infrared, visible light, or ultraviolet
578 ....Ultraviolet
579 ....Laser
580 ....Color detection
581 .....Intensity
582 ......Measuring ratio of sensed intensities
583 ....Reading indicia
584 .....On mail
585 ....Mirror or prism in optical path
586 ....Sizing
587 ....Reflected from item
588 ....Transmitted through item
589 ...X-ray or gamma ray
590 ...Sonic or supersonic energy
591 ...Sensing by applying fluid or vacuum to item
592 ...Responsive to weight of item
593 ...Detecting movement of item support with electrical sensor
594 ....Photodetector
595 ....Switch
596 ...Pusher or deflector controls movement of item on separate support
597 ...Sensing position, shape, or presence of closure or end wall on container
598 ...Sensing contour of item having no missing parts
599 ...Sorting items according to susceptibility to deform (e.g., malleability, hardness, compressibility, etc.), rupture, or vibrate
600 ...Sensor contacts item
601 ...Gauge
602 ....Relatively movable calipers closed against item
603 ...Sheet gauging
604 ....Sensor generates electrical signal
605 .....Items separated into at least three classes
606 ...Separating means
607 ...Corn silk separator
608 ...Sorting items according to edge coding
609 ...Magnet attracts or repels item
610 ...Keyboard control
611 ...Cards, file folders, or like items sorted by means of necked-down notch thereon
612 ...Cards, file folders, or like items alternatively having notch or hole at particular location thereon
613 ...Sorting cards, file folders, or like items having coded sorting holes
614 ...Hand supported implements
615 ...Brush, flail, or rake used other than as one of opposed pair of gauge elements to separate, or to facilitate separation of, items
616 ...Rotatable
617 ...Item gripped between opposed elements
618 ...Rollers
619 ...Gauge enters hole in item
620 ...Gauging passage between orbiting belts
621 ...Rotating or orbiting carrier having expandable gauging passage passing items of different size at different points along carrier travel path
622 ...Belt
..With gauging pocket for individual item

..Pocket formed by rollers, disks, or wheels spaced transversely of belt or by contoured transverse roller, bar, or slit

..Gauge with clearer other than continuous feeder

..Spacing between gauge elements increased to free item

..Rotatable or pivotable clearer

..Stationary clearer

..Diverse

..Including means supporting items for manual sorting or allowing operator to control item destination

..Including separation effected by items following different trajectories through space

..Including separation effected by item of particular size passing through gauging passage between separate elements

..Stationary elements

..Including separation effected by item of particular size passing through gauging aperture in wall (e.g., perforated panel, etc.)

..Including separation effected by different items traveling in different directions while contacting a surface

..Magnet attracts or repels item

..Items thrown or falling through space strike surface and only some rebound

..Items separate by following different trajectories through space

..Fluid jet changes trajectory of item

..Items thrown or falling through space strike surface and rebound with different trajectories

..Takeoff ramp adjustable to different angular positions relative to horizontal plane

..Thrower

..Suction

..Fluid jet

..Sorting items by weight

..Orbiting or rotating carrier responsive to item weight

..Counterbalance on balance beam moved until beam tilts to item discharging position

..Carrier tilted by means adjacent travel cam, etc. depressed to particular elevation

..Same items successively placed on means (e.g., balance beams, etc.) responsive to different weights

..Item support swings about fixed horizontal axis to discharge at different vertically spaced points

..Pusher moving item on separate surface

..Pivoting..

..Reciprocable

..Rotatable

..Gravity-type conveyor (e.g., chute, etc.) movable between different discharge positions

..Movement of items along different paths controlled by passive deflector

..Deflector movable into and out of path of item

..Deflector spaced above conveying means to pass item of particular size thereunder

..Sorting items by size

..Item of particular size passed through gauging passage between separate elements

..Gauging passage between stationary element (e.g., bar, slit, etc.) and orbiting belt

..Gauging passage between stationary element (e.g., bar, slit, etc.) and roller

..Gauging passage between orbiting belt and roller or wheel

..Gauging passage between elements of rotating cage

..Gauging passage between elements of orbiting belt

..Item moves along curved gauging passage
667  ....Gauging passage between rotatable elements
668  ....Element adjustable to change width of gauging passage
669  .....Helical roller
670  .....Items move longitudinally of gauging passage varying in width along length thereof
671  .....Spindle or roller having projecting elements spaced circumferentially thereof
672  .....Spindle or roller having axially spaced, flat-sided circumferential elements (e.g., flanges, disks, wheels, etc.) projecting therefrom
673  .....Cylindrical rollers
674  ....Gauging passage between moving elements (e.g., vibrating bars, slats, etc.)
675  ....Gauging passage between stationary elements (e.g., bars, slats, etc.)
676  .....Element adjustable to change width of gauging passage
677  .....Items move longitudinally of elongate elements
678  .....With means moving, or regulating movement of, items along elements
679  .....Width of gauging passage varies
680  ...Item of particular size passed through gauging aperture in wall (e.g., perforated panel, etc.)
681  ....Aperture in orbiting belt
682  ....Aperture in chute or trough
683  ....Aperture in circumferential wall of hollow body (e.g., tube, etc.) rotatable about longitudinal axis thereof
684  ...Item of particular size or shape enters pocket
685  ....On orbiting belt
686  ....On exterior of drumlike body (e.g., roller, etc.) rotatable about longitudinal axis thereof
687  ....On interior of hollow drumlike body (e.g., tube, etc.) rotatable about longitudinal axis thereof
688  ..Means pierces, or enters preformed hole in, item
689  ..Items separate by traveling in different directions by contacting drumlike body (e.g., roller, hollow cylinder, etc.) turning about longitudinal axis thereof
690  ...Items travel circumferentially and longitudinally of turning axis
691  ..Items separate by traveling in different directions while contacting same inclined surface of moving support
692  ...Items contact inclined reach of orbiting belt
693  ....Item separating reach inclined only in direction of belt movement
694  ...Translating support
695  ..Items separate by traveling in different directions while contacting same horizontal surface of moving support
696  ..Items separate by traveling in different directions while contacting same inclined surface of static support
697  ...Helical ramp
698  ..Means movable between horizontal item-supporting position and gravity discharge position
699  ..Sorting items according to susceptibility to deform (e.g., malleability, hardness, compressibility, etc.), rupture, or vibrate
700  ..Sorting items according to roughness or adhesiveness
701  ..Item turned while traveling
702  ..Manual sorting
703  ...Item supported on table or chute
704  ....Rotated about vertical axis
705  ...Item supported on orbiting or rotating carrier
706  ..Specific compartment of receptacle brought into alignment with feed means by operator
707  ..Items separated by tipping, rolling, or sliding off support under force of gravity

**FLUID SUSPENSION**

708  ...Gaseous

*709*
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<td>710</td>
<td>Plural individual interconnected separation</td>
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<td>Fluidically induced, oppositely directed axial flows only (e.g., multiple cyclone arrangements, etc.)</td>
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<td>Including specific underflow outlet feature (e.g., apex discharge, etc.)</td>
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<td>Including specific overflow outlet feature (e.g., adjustable vortex finder, shape, size, etc.)</td>
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<td>Fluidically induced unidirectional swirling (e.g., axial, radial, tangential separation, free-vortex, etc.)</td>
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<td>Plural extractions at diverse locations along flow path</td>
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<td>Stepped plane</td>
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<td>152</td>
<td>Cylinder internal</td>
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CLASS 209 CLASSIFYING, SEPARATING, AND ASSORTING SOLIDS

724 ...Including circularly flowing liquid separation agent
725 ...Rotational hydrodynamic extraction (e.g., unidirectional hydrocyclone, vortical, whirlpool, etc.)
726 ....Including condition responsive control
727 ....Including oppositely directed axial flows around evacuated core (e.g., hydrocyclone having reverse free-vortices formed, etc.)
728 .....Plural individual interconnected, oppositely directed axial flow producing separation phases (e.g., system arrangements, multiple hydrocyclones, etc.)
729 .....Serially connected
730 .....Including auxiliary fluid (e.g., air or gas core, dilution water, elutriation liquid, etc.)
731 .....Adjacent or subsequent to underflow discharge (e.g., dilution water, elutriation liquid, sedimentation chamber, sump, etc.)
732 .....Including specific overflow discharge feature (e.g., adjustable vortex finder, shape, size, etc.)
733 .....Including specific underflow discharge feature (e.g., apex construction, secondary vortex chamber, etc.)
734 .....Including specific inlet feature (e.g., shape, size, etc.)

MAGNETIC
212 .Diamagnetic
213 .Paramagnetic
214 ..Processes
215 ..Special application
216 ..Multiple type
217 ..Reciprocating magnets
218 ..Belt
219 ..Cylinder external
220 ....Vertical axis
221 ..Cylinder internal
222 ..Disk
223.1 ..Stationary magnets
223.2 ..Cylinder external
224 ..Cylinder internal
225 ..With agitating or conveying
226 ...Magnetic
227 ....Traveling field
228 ..Discharging
229 ...Doffers
230 ....Magnetic
231 ..Feeding
232 ...Fluid suspension

SIFTING
. Combined type
. Special applications
. Distributing
. Material testing
. With heating or cooling
. With weighting
. Feeding and discharging
. Conveyors
. Interconnected
. Feeding
. Hoppers
. With agitators or conveyors
. Cut-offs and valves
. Conveyors
. Receptacles
. Ash pan
. Fluid
. Reversible
. Sifter movement
. Selective
. Distributers or spreaders
. Discharging
. Conveyors and valves
. Conveyors
. Valves
. Receptacles
. Tilting
. Conveying
. Material forcing
. Material positioning
. Guides
. Imperforate sections
. Superposed
. Retarders
. With liquid treatment
. Reciprocating sifters
. Rotating sifters
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July 2011
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<td>Vertical axis</td>
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<td>Drum</td>
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With agitators or conveyors
Reciprocating
Rotating
Horizontal or inclined axis
Vertical axis
With pneumatic treatment
Movable bed
Permeable
Constant current
Divergent or opposite travel
Pulsating current
Divergent or opposite travel
Belts
Chutes, tables, and receptacles
Divergent or opposite travel
Drums
Stationary bed
Permeable
With constant current
With pulsating current
Divergent or opposite travel
Chutes, tables, and receptacles
Magnetic
Movable bed
Chutes, tables, and receptacles
Drums
Opposite travel
Drums
Stationary bed
Elements
Beds
Permeable
Cleaners
Feeding and discharging
Automatic control
Discharging
Automatic control
Conveyers
Dividers and skimmers
Exits
With positively operated dischargers
Automatic control
Feeding
Distributing
Regulating
Fluid supply
Liquid
Circuit
Pneumatic
Operating mechanism
Reciprocating
Rotating
CROSS-REFERENCE ART COLLECTIONS
SORTING FLAT-TYPE MAIL
FROTH FLotation; COPPER
FROTH FLotation; PHOSPHATE
FEEDER CONVEYOR HAVING OPPOSED GRIPPERS
FEEDER CONVEYOR HOLDING ITEM BY MAGNETIC ATTRACTION
FEEDER CONVEYOR HOLDING ITEM BY SUCTION
PNEUMATIC OR LIQUID STREAM FEEDING ITEM
MAGNETIC FEEDER
ITEM FED BY FREE FALL
ITEM HOLDING FEED MAGAZINE INSERTABLE IN SORTING APPARATUS
FEED HOPPER
FEED MEANS SUPPORTING OR GUIDING ITEM MOVING UNDER INFLUENCE OF GRAVITY
ENDLESS FEED CONVEYOR WITH MEANS FOR HOLDING EACH ITEM INDIVIDUALLY
SCREW FEED CONVEYOR
DIVERSE SEQUENTIAL FEEDING STEPS
CENTRIFUGAL FEEDER
RECIPROCATING PUSHER FEEDING ITEM
ENDLESS BELT PUSHER FEEDING ITEM
SWINGING OR ROTATING PUSHER FEEDING ITEM
ROTARY FEED CONVEYOR
VIBRATORY FEED CONVEYOR
RECIPROCATING OR OSCILLATING FEED CONVEYOR
MISCELLANEOUS FEED CONVEYORS
FEED THROUGH INCLUDING AT LEAST ONE ENDLESS CONVEYOR
GRAVITY CONVEYOR MOVING ITEM FROM SEPARATING STATION
DRIVEN OR FLUID CONVEYOR MOVING ITEM FROM SEPARATING STATION
SILVERWARE SORTER
COP SORTER
CONTAINER CLOSURE SORTER
FASTENER SORTER
MUNICIPAL SOLID WASTE SORTING
MATERIALS OF CONSTRUCTION

FLUID APPLIED TO ITEMS

ACCUMULATION RECEIVING SEPARATED ITEMS

MOVING ITEMS TO SORTING MEANS IN SPACED RELATION LENGTHWISE OF FEED PATH

AMBULANT

PLURAL ITEMS TESTED AS GROUP

LAUNDRY SORTING

ILLUMINATING MEANS FACILITATING VISUAL INSPECTION

VIDEO SCANNING

NONCONDITION-RESPONSIVE SORTING BY CONTOUR

ITEM CARRYING BRIDGE RAISABLE TO EXPOSE DISCHARGE OPENING

OPERATOR SELECS DESTINATION OF ITEM

FOREIGN ART COLLECTIONS

FOR 000 CLASS-RELATED FOREIGN DOCUMENTS