CLASS 271, SHEET FEEDING OR DELIVERING

SECTION I - CLASS DEFINITION

Means for moving an individual sheet from a stack of sheets or positioning the individual sheet with respect to a location where the sheet is operated upon or moving or positioning the individual sheet after having been operated upon.

(1) Note. Where the mechanism for operating on the sheet is particularly set forth and the function is not, therefore, merely that of positioning the sheet, it will be classified in the class provided for the particular operating mechanism.

SECTION II - LINES WITH OTHER CLASSES AND WITHIN THIS CLASS

In Class 271, a separation of an individual sheet from a stack of sheets is considered proper even if no specific feeding of the sheet toward an operation is disclosed. In Class 271, a sheet feeding or delivering means combines or places the sheets (1) adjacent to or on top of each other in a random order or (2) to perform the operation on individually fed sheets.

In Class 270, a sheet material associating apparatus has a mechanism to place the sheets from plural sources into an operational specified association onto or against a surface which then groups the sheets in said specified association or places the sheets in said specified association. The delivery of the sheet to a stack from plural sources requires a specific order of associating the sheets other than mere random stacking. Class 270 accepts putting the sheets in a logical array or placing the sheets in an associated stack in order to perform the operation on the sheets in the stack.

An explanatory note on the scope and limitations of this class is justified by the development of the art.

The line between the art for stacking or unstacking sheets found in this and the indented subclasses of Class 271 and that found in Class 414, Material or Article Handling, was at best nebulous prior to the reclassification of subclasses 788+ in Class 414. During that project the classifier discussed establishing a line with three examiners expert in the material handling arts (i.e., Mr. Valenza representing Class 198, Mr. Stoner representing Class 271, and Mr. Paperner representing Class 414) and the following line was established:

(a) Class 271 provides for the stacking or unstacking of either (1) individual sheets of unfolded paper, (2) packets of similar sheets of paper attached together or individual folded sheets of paper (e.g., signatures) when the thickness of each packet or folded sheet of paper is substantially uniform and any variation thereof is not utilized during the stacking or unstacking operation and (3) thin, substantially flat, nonfood articles when at least one of the articles to be stacked or unstacked is temporarily bent or flexed during the handling thereof;

(b) Class 414 provides for the stacking or unstacking of either (a) sheetlike food articles (b) nonpaper, sheetlike articles (e.g., glass sheets) which are not temporarily bent or flexed during their handling, and (c) packets of similar sheets of paper when thickness of the packet or folded sheet varies (e.g., wedge shaped) and this variation is utilized during the stacking or unstacking operation; and

(c) Class 414 also provides for the stacking of paper sheets or sheetlike articles otherwise proper for Class 271 (i.e., in (a) above) when the stack formed is subsequently handled as a unit and moved away from the location where it was formed by handling means other than an endless conveyor surface on which the stack was formed. All original patents within Class 414, subclasses 788+ have been placed in compliance with this line.

SECTION III - REFERENCES TO OTHER CLASSES

SEE OR SEARCH CLASS:

19,	Textiles: Fiber Preparation.
26,	Textiles: Cloth Finishing.
34,	Drying and Gas or Vapor Contact With Solids, particularly subclasses 110+, 143+, 306, 443+, 444, 466, 556, and 611+.
40,	Card, Picture, or Sign Exhibiting.
53,	Package Making, especially subclasses 389.1+ for a package making apparatus with means to convey cover material.
72,	Metal Deforming.
84,	Music.
101,	Printing.
112,	Sewing.
140,	Wireworking, subclasses 92.3+, web for fabric feeding combined with the intercoiling of helices with each other or with successive loops or apertures.

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, for sheet or web feeding combined with laminating.

194, Check-Actuated Control Mechanisms.

198, Conveyors: Power-Driven, for a conveyor of general utility, and subclass 418.3 and 418.4 for a conveyor on which articles are piled for further conveyance.

221, Article Dispensing, for an article dispenser not otherwise provided for, and see especially subclasses 33+ for a means for dispensing a flexible sheet, which sheet is distorted as it is separated from the source of supply.

226, Advancing Material of Indeterminate Length, for a method of or apparatus for feeding material without utilizing both the leading and trailing ends thereof.

242, Winding, Tensioning, or Guiding, for subject matter falling within the scope of this class (271) in combination with other apparatus, usually winding or unwinding.

250, Radiant Energy, subclasses 559+ for photocell with circuit for evaluating web, strand, strip, or sheet.

270, Sheet-Material Associating, subclasses 52+, especially subclasses 58+ for mechanism wherein individual sheets are removed from plural source stacks and the sheets are assembled into plural finished stacks, each finished stack comprising at least one sheet from each of the source stacks.

279, Chucks or Sockets, subclass 3 for a vacuum operated chuck mechanisms, and see the notes therein for other, similar subject matter.

340, Communications: Electrical, for electrical condition responsive indicating system, subclass 674 for transporting a discrete article and subclass 675+ for web, film or strip.

346, Recorders, subclasses 134+ for sheet feeding and delivering in combination with a record receiver or driving means.

358, Facsimile and Static Presentation Processing, subclasses 400+ for a facsimile apparatus including document handling.

378, X-Ray or Gamma Ray Systems or Devices, subclasses 167+ for the devices or systems using X-ray or Gamma ray in combination with a sheet feeding or delivering.

396, Photography, appropriate subclasses for combinations with a sheet feeding or delivering.

399, Electrophotography, subclasses 16+ and 361+ for document handling (e.g., feeding or delivering sheet medium (i.e., originals or copies) within an electrophotos:graphic device).

400, Typewriting Machines, subclasses 624+, for a machine of that class having a sheet or web feeding means for feeding sheet from a stack or pack holder.

414, Material or Article Handling, subclasses 788+ for apparatus which places or removes articles from an intersupporting group, (e.g., from a stack).

493, Manufacturing Container or Tube From Paper; or Other Manufacturing From a Sheet or Web, for a combination of that class with sheet feeding means.

700, Data Processing: Generic Control Systems or Specific Applications, subclasses 213 through 244 for an article handling or distributing sensor.

SECTION IV - GLOSSARY

CONVEYOR

Refers to “means for moving and placing the individual sheet with respect to a device for operation on the sheet.” Thus, in the subclasses indented under “Feeding”, the “Conveyor” may be modified by means for orienting, retarding or interrupting the feed relative to the operation; and in the subclasses indented under “Delivering”, the “Conveyor” should be limited to a means for transporting the individual sheet from the operation or placing the individual sheet in a receiver for a stack of such sheets. In either case the conveyor of Class 271 is distinct from a conveyor of other classes, wherein material or articles are transported from an input location to an output location. Class 271 has also for many years included a device wherein a stack of sheets is moved as an article to a position at which sheets are removed from the stack by a separator, but has not included a device wherein a stack of sheets is formed by a delivery means, and subsequently the stack of sheets is moved as an article away from the formation position. See References With Other Classes, above, for the location of patents not proper for Class 271.

DELIVERING

Refers to the “means for removing the individual sheet from the operation after having been operated on or placing the individual sheet on a receiver after having been operated on.”

FEEDING

Refers to the "means for moving individual sheet from a stack" and involves use of a "separator or a conveyor."

SEPARATOR

Refers to "means for setting apart or individualizing a sheet relative to a stack of sheets, and moving the individual sheet from the stack, particularly for the purpose of presenting toward a position at which the sheet will be operated on."

SUBCLASSES

1 SPECIAL ARTICLES:
This subclass is indented under the class definition. Means adapted for feeding or delivering sheet-like bodies or sheets of other than rectangular outline.

2 Envelope:
This subclass is indented under subclass 1. Means adapted to handle unsealed envelopes and the like.

3.01 DELIVERING TO STACK AND FEEDING THEREFROM:
This subclass is indented under the class definition. Subject matter including means for moving an individual sheet from a pack of sheets and placing the individual sheet toward an operation and means for removing the individual sheet from the operation and placing the individual sheet in the same pack of sheets.

SEE OR SEARCH THIS CLASS, SUBCLASS:
3.14+, for feeding and delivering the individual sheet to and from separate locations.

3.02 Aligning at stack:
This subclass is indented under subclass 3.01. Subject matter including means for positioning the pack of sheets with respect to a part of a support for the pack or with respect to a part of the sheet moving means.

SEE OR SEARCH THIS CLASS, SUBCLASS:
13, 15, 17, for a side-edge aligner combined with a conveyor.
226+, for aligning a sheet being fed along a conveyor path.

3.03 Intermediate tray:
This subclass is indented under subclass 3.01. Subject matter comprising a receiver and wherein the individual sheet is moved from the pack of sheets and collected temporarily in the receiver before placing the individual sheet toward the operation.

3.04 With job divider (e.g., resettable bail bar or double bar separator):
This subclass is indented under subclass 3.01. Subject matter comprising a means for separating apart a set of sheets from the sheets being delivered to the pack.

(1) Note. A resettable bail bar or double bar separator or similar means are included as job divider for the subclass.

(2) Note. "Job" is an initial number of sheets forming the pack.

3.05 Feeding from bottom of stack:
This subclass is indented under subclass 3.01. Subject matter wherein the individual sheet is moved from the lowermost part of the pack of sheets and placed toward the operation.

SEE OR SEARCH THIS CLASS, SUBCLASS:
3.12, for sheets in a pack deriving substantial support from their edges.
23, 35, 131+, for other types of separators feeding from the bottom of the stack.

3.06 Control for feeding responsive to delivering:
This subclass is indented under subclass 3.05. Subject matter including means for sensing an occurrence of a condition or a change in condition of the device which removes the individual sheet from the operation and in response thereto acts to start, stop or change the mode of moving the individual sheet from the pack of sheets and placing toward the operation.

SEE OR SEARCH THIS CLASS, SUBCLASS:
3.09, for a control for feeding the individual sheet from the top of the stack.

3.07 Pneumatic separating:
This subclass is indented under subclass 3.05. Subject matter wherein the sheet is individualized and moved from the pack of sheets by suction or air blast.

SEE OR SEARCH THIS CLASS, SUBCLASS:
3.11, for a pneumatic separator feeding the individual sheet from the top of the stack.
90+, for a sheet removing means engaging the individual sheet by a pneumatic medium.

3.08 Feeding from top of stack:
This subclass is indented under subclass 3.01. Subject matter wherein the individual sheet is moved from the uppermost part of the pack of sheets and placed toward the operation.

SEE OR SEARCH THIS CLASS, SUBCLASS:
3.12, for sheets in a pack deriving substantial support from their edges.

3.09 Control for feeding responsive to delivering:
This subclass is indented under subclass 3.08. Subject matter including means for detecting an occurrence of a condition or a change in condition of the device which removes the individual sheet from the operation and in response acts to start, stop or change the mode of moving the individual sheet from the pack of sheets and placing it toward the operation.

3.11 Pneumatic separating:
This subclass is indented under subclass 3.08. Subject matter wherein the sheet is individualized and moved from the pack of sheets by suction or air blast.

SEE OR SEARCH THIS CLASS, SUBCLASS:
3.07, for a pneumatic separator feeding the individual sheet from the bottom of the stack.
90+, for a sheet removing means engaging the individual sheet by a pneumatic means.

3.12 Sheets on edges:
This subclass is indented under subclass 3.01. Subject matter wherein the pack of sheets is held so that the sheets derive a substantial amount of support from their outer borders.

SEE OR SEARCH THIS CLASS, SUBCLASS:
149+, for a pack advancer holding sheets on edge.

3.13 With sheet sensor for selective location:
This subclass is indented under subclass 3.01. Subject matter including means for detecting the presence or absence of the sheet at a designated position along a path of sheet movement.

(1) Note. “Path” includes the pack.

SEE OR SEARCH THIS CLASS, SUBCLASS:
9.06, 111, 227+, and 258.01+, for other sheet detecting means.

3.14 FEEDING AND DELIVERING:
This subclass is indented under the class definition. Subject matter including means for moving an individual sheet from a position or from a pack of sheets and placing it toward an operation; and including means for removing the individual sheet from the operation after having been operated on or placing the individual sheet on a receiver after having been operated on.

(1) Note. This subclass may include in the combination a mere means for operating upon the sheet, provided the invention is limited to the handling of the sheet and is not a specific system special to the operations performed on the sheet.

(2) Note. The term “placing ” may include the act of partially turning the sheet about an axis that passes through the surface of the sheet so that an edge thereof is accurately aligned if that edge was previously misaligned. Such turning is sometimes termed “orienting ” in other classes if applied to articles conveyed in the device of that other class. In Class 271 it is clear from the total disclosure that the alignment is applied to

the sheet and that the sheet will be operated upon by some further mechanism (which mechanism, if claimed, is recited only by its name). If partial turning occurs, it is incidental to alignment, but the purpose is to synchronize the feeding of the sheet to the operation to be performed on that sheet by locating the sheet precisely prior to feeding.

SEE OR SEARCH THIS CLASS, SUBCLASS:

3.01+, for delivering the sheet to the same stack from where the sheet is moved toward the operation.

145+, for supporting or holding a stack of sheets in a position for removal of the individual sheets.

207+, for means to hold the delivered sheets in a stacked array.

3.15 Sensor located at the feeder and controls the delivering:

This subclass is indented under subclass 3.14. Subject matter wherein a detecting means is positioned at the sheet moving and placing means for regulating the means for removing the sheet from the operation after having been operated on or placing the sheet on a receiver after having been operated on.

(1) Note. For this subclass the feeding element and the delivering element are placed on separate paths.

3.16 Having timer:

This subclass is indented under subclass 3.15. Subject matter comprising a time recording device wherein the time recording device is responsive to the sensor for controlling the delivering of the sheets.

3.17 Sensor located at the delivering and controls the feeding:

This subclass is indented under subclass 3.14. Subject matter wherein a detecting means is positioned at the sheet removing and placing means for regulating the means for moving the individual sheet from the pack of sheets or placing the sheet toward the operation.

SEE OR SEARCH THIS CLASS, SUBCLASS:

3.06, and 3.09, for a sheet feeding control responsive to a sheet delivering.

3.18 Conveyor releases to subsequent conveyor:

This subclass is indented under subclass 3.14. Subject matter wherein the individual sheet is removed by a sheet carrying means which discharges the individual sheet to another sheet carrying means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

264+, for a means to convey the sheet from the pack to the operation.

3.19 With alternate conveying path:

This subclass is indented under subclass 3.18. Subject matter wherein the subsequent conveyor carries the individual sheet at least to two distinct routes.

3.2 Including conveyor couple:

This subclass is indented under subclass 3.18. Subject matter wherein one of the sheet carrying means consisting of two elements each of which elements has an endless orbitally-moving surface rotating in opposite directions, the surface of one element being opposite to and spaced from the surface of the other element during at least a portion of their movement and the surfaces moving in the same direction and engaging opposite surfaces of the sheet lying therebetween during the portion of their movement.

(1) Note. The element may be an endless belt cooperating with another endless belt, a rotating roller cooperating with another rotating roller or the endless belt cooperating with one or more rotating rollers; the criterion for placement herein being only that the conveyed sheet lies between the elements which thereby cooperates to move the sheet.

3.21 On peripheral face of drum or belt:

This subclass is indented under subclass 3.18. Subject matter wherein one of the sheet conveyors includes a circumferential surface of a rotating or endlessly orbiting member.

(1) Note. The conveyed sheet being entirely in contact with the circumferential surface of the member.

3.22 Pneumatic:

This subclass is indented under subclass 3.21. Subject matter wherein the circumferential surface of the sheet conveyor engages the sheet by suction or air blast.

(1) Note. Although in most devices the gaseous fluid is air, either under suction or under pressure, or both, the use of a special fluid other than air (e.g., steam) is not barred.

SEE OR SEARCH THIS CLASS, SUBCLASS:

5, 11+, 20, for a device using a pneumatic feeding means.

94+, for a separator having a unidirectionally moving suction member or surface.

112, and 132, for a device wherein a suction assists a feeding means.

SEE OR SEARCH CLASS:

221, Article Dispensing, subclass 211 for an article dispenser using a suction separator.

3.23 Including pneumatic conveyor:

This subclass is indented under subclass 3.18. Subject matter comprising at least one sheet carrying means for engaging the individual sheet by suction or air blast.

SEE OR SEARCH CLASS:

406, Conveyors: Fluid Current, appropriate subclasses for conveying a solid material or an article by means of a fluid current. See the search notes under the class definition for other classes having specialized fluid current conveying.

3.24 Including gripper couple:

This subclass is indented under subclass 3.18. Subject matter including at least two elements having surfaces located adjacent to and opposite to one another, the element surfaces engaging opposed surfaces of the sheet located between the element surfaces with sufficient frictional force to move the sheet**.**

4.01 Separator and conveyor:

This subclass is indented under subclass 3.14. Subject matter including means for individualizing a sheet relative to a pack of sheets and moving the individual sheet from its position in the pack, and a means for carrying the individual sheet away from the pack toward the operation.

SEE OR SEARCH THIS CLASS, SUBCLASS:

10.01+, for a separator and a conveyor in which the feeding of the sheet being claimed.

4.02 Sensor located at the separator and controls the conveyor:

This subclass is indented under subclass 4.01. Subject matter comprising a detecting means positioned at the sheet individualizing and moving means for regulating the sheet carrying means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

10.02, for a sensor at a separator controlling a conveyor having only the feeding of the sheet being claimed.

4.03 Sensor located at the conveyor and controls the separator:

This subclass is indented under subclass 4.01. Subject matter comprising a detecting means at the sheet carrying means for regulating the sheet individualizing and moving means.

(1) Note. The sheets must be disengaged from the pack to be considered for sensing at a conveyor.

SEE OR SEARCH THIS CLASS, SUBCLASS:

10.03, for a sensor at a separator controls a conveyor having only the feeding of the sheet being claimed.

4.04 Mechanically linked for simultaneous operation:

This subclass is indented under subclass 4.01. Subject matter wherein (1) a gear and clutch, or (2) a shaft, roller and cam mechanism or the

equivalent; drives the separator and conveyor at the same time.

SEE OR SEARCH THIS CLASS, SUBCLASS:

10.04, for a mechanical sensor at a separator controls a conveyor having the feeding of the sheet bei**ng** claimed.

4.05 Endless belt separator:

This subclass is indented under subclass 4.01. Subject matter wherein the separator is a continuous band of flexible material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

10.06+, for a sensor at a separator controls a conveyor in which only the sheet feeding being claimed.

4.06 To endless belt conveyor:

This subclass is indented under subclass 4.05. Subject matter wherein the conveyor is a continuous band of flexible material and the sheet is moved by the separator to the conveyor.

SEE OR SEARCH THIS CLASS, SUBCLASS:

10.07, for a sensor at a separator controlling a conveyor in which only the feeding of the sheet being claimed.

4.07 To rotary conveyor:

This subclass is indented under subclass 4.05. Subject matter wherein a conveyor turns about an axis in an arc of a circle and the individualized sheet from the endless separator is carried to the conveyor.

SEE OR SEARCH THIS CLASS, SUBCLASS:

10.08, for a sensor at a separator controls a conveyor having only the feeding of the sheet being claimed.

21+, for a sheet-buckling rotary separator.

94+, for a suction separator having a rotational movement.

SEE OR SEARCH CLASS:

221, Article Dispensing, subclasses 42+, for a rotary ejecting means for the concurrent separation and distortion of flexible articles, subclass 259 for a surface contact type discharge assistant to remove articles from a source of supply, and subclass 277 for an article dispenser having rotary discharge assistants.

4.08 Rotary separator:

This subclass is indented under subclass 4.01. Subject matter wherein the separator turns about an axis in an arc of a circle.

SEE OR SEARCH THIS CLASS, SUBCLASS:

4.07, for a rotary conveyor.

10.09+, for a sensor at a separator controls a conveyor wherein only the feeding being claimed.

4.09 To endless belt conveyor:

This subclass is indented under subclass 4.08. Subject matter wherein the conveyor is a continuous band of flexible material and the sheet is moved by the separator to the conveyor.

SEE OR SEARCH THIS CLASS, SUBCLASS:

10.1, for a rotary separator with endless belt conveyor.

4.1 To rotary conveyor:

This subclass is indented under subclass 4.08. Subject matter wherein the conveyor turns about an axis in an arc of a circle and the individualized sheet from the rotary separator is carried to the conveyor.

SEE OR SEARCH THIS CLASS, SUBCLASS:

4.07, for moving the sheet by an endless separator and carrying it by a rotary conveyor.

10.11+, for a sensor at a separator controlling a conveyor wherein only the feeding being claimed.

4.11 Reciprocating separator:

This subclass is indented under subclass 4.01. Subject matter wherein the separator undergoes a to and fro movement during its operation.

SEE OR SEARCH THIS CLASS, SUBCLASS:

10.14+, for a reciprocating separator where feeding being claimed.

SEE OR SEARCH CLASS:

221, Article Dispensing, subclasses 36+ for a dispenser for a flexible article including ejecting means which concurrently separates and distorts the article, many of such ejecting means having a reciprocating motion, and see also subclasses 232 and 268+ for an article dispenser of general type including a reciprocating discharge assistant means.

4.12 To rotary conveyor:

This subclass is indented under subclass 4.11. Subject matter wherein the conveyor turns about an axis in an arc of a circle and the individualized sheet from the endless separator is carried to the conveyor.

SEE OR SEARCH THIS CLASS, SUBCLASS:

10.16, for a reciprocating separator having a rotary conveyor.

5 Pneumatic separator:

This subclass is indented under subclass 4.01. The separator having means for engaging the sheet by suction or air blast.

(1) Note. Compare this class, subclass 90, and indented subclasses.

6 Continuous endless conveyor:

This subclass is indented under subclass 4.01. The same endless band or bands carrying the sheet to and taking it from operative position.

7 Continuous endless conveyors:

This subclass is indented under subclass 3.14. The same endless band or bands carrying the sheet to and carrying it from operative position.

8.1 FEEDING:

This subclass is indented under the class definition. Subject matter for moving an individual sheet from a pack of sheets, or moving the individual sheet toward an operation, or positioning the individual sheet with respect to a location where the individual sheet is operated upon.

SEE OR SEARCH CLASS:

221, Article Dispensing, appropriate subclasses for article dispensers not otherwise provided for, and see especially subclasses 33+ for dispensers for flexible sheets in which the sheets are distorted as they are separated from the source of supply.

9.01 Multiple supplies:

This subclass is indented under subclass 8.1. Subject matter including two or more feeding sources.

9.02 Sheet feeding from one supply controls feeding from another supply:

This subclass is indented under subclass 9.01. Subject matter wherein a means for (a) moving an individual sheet from a position or from a pack of sheets and (b) placing the individual sheet toward an operation from one source regulates the moving and placing of the individual sheets of the other source.

9.03 Responsive to empty supply:

This subclass is indented under subclass 9.02. Subject matter wherein the feeding means includes a device for sensing depletion or near depletion of one feeding source and in response thereto controls the feeding from the other source.

SEE OR SEARCH CLASS:

221, Article Dispensing, subclass 6 for an article dispenser using an empty source indicating means, and subclasses 103+ for an article dispenser in which each of the supply source is depleted in turn.

9.04 Alternate feeding:

This subclass is indented under subclass 9.02. Subject matter wherein at least two distinct means are operating one after the other each on its own source of supply for moving the individual sheet from the position or from the pack of sheets and placing it toward the operation.

SEE OR SEARCH CLASS:

221, Article Dispensers, subclasses 112+ for an article dispenser having an arrangement which assures that the

articles are dispensed from several sources in a mixed order.

9.05 Supply selection (e.g., sheet color):
This subclass is indented under subclass 9.01. Subject matter wherein the supply includes sheets having a plurality of unique characteristics and at least one of the feeding means controls the feeding of the sheet having one specific characteristic such as a particular color.

9.06 Size selection:
This subclass is indented under subclass 9.05. Subject matter wherein one of the characteristics is a particular dimension of the sheet.

9.07 Single separator acts on multiple supplies:
This subclass is indented under subclass 9.01. Subject matter wherein only one device is provided for individualizing and moving sheets from the multiple supplies.

9.08 Movably mounted supply:
This subclass is indented under subclass 9.07. Subject matter wherein a support for at least one of the sources moves relative to the separator.

9.09 Including manual supply:
This subclass is indented under subclass 9.01. Subject matter wherein at least one of the feeding sources comprises a human operated sheet feeding mechanism.

9.1 Including continuous web supply:
This subclass is indented under subclass 9.01. Subject matter wherein at least one of the feeding sources provides a sheet having an indefinable length.

9.11 Superposed supplies:
This subclass is indented under subclass 9.01. Subject matter wherein the two or more sources, each complete with its own feeding means, are placed one above the other.

SEE OR SEARCH CLASS:
221, Article Dispensing, subclass 130 for a superposed article dispenser.

9.12 Juxtaposed supplies:
This subclass is indented under subclass 9.01. Subject matter wherein the two or more sources each complete with its own feeding means are arranged side by side in linear relationship.

SEE OR SEARCH CLASS:
221, Article Dispensing, subclass 131 for an article dispenser in a juxtaposed alignment.

9.13 With convergence to single path:
This subclass is indented under subclass 9.01. Subject matter wherein an individual flow of sheets from the two or more feeding sources merge together into a common flow route.

10.01 Separator and conveyor:
This subclass is indented under subclass 8.1. Subject matter including means for individualizing a sheet relative to a pack of sheets and moving the individual sheet from its position in the pack and a means for carrying the individual sheet away from the pack toward the operation.

SEE OR SEARCH THIS CLASS, SUBCLASS:
4.01+, for a separator and a conveyor in combination with sheet delivering.

SEE OR SEARCH CLASS:
221, Article Dispensing, subclasses 224+ for an article dispenser not otherwise provided for, having means to segregate article from the stack or other source of supply combined with means to subsequently manipulate such separated article.

10.02 Sensor located at the separator and controls the conveyor:
This subclass is indented under subclass 10.01. Subject matter comprising a detecting means at the sheet individualizing and moving means for regulating the sheet carrying means.

SEE OR SEARCH THIS CLASS, SUBCLASS:
4.02, for a sensor at a separator controlling a conveyor having the delivery of the sheet being claimed.

10.03 Sensor located at the conveyor and controls the separator:

This subclass is indented under subclass 10.01. Subject matter comprising a detecting means at the sheet carrying means for regulating the sheet individualizing and moving means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

4.03, for a sensor at a separator controlling a conveyor having the delivery of the sheets being claimed.

10.04 Mechanically linked for simultaneous operation:

This subclass is indented under subclass 10.01. Subject matter wherein (1) a gear and clutch, or (2) a shaft, roller and cam mechanism or the equivalent; drives the separator and conveyor at the same time.

SEE OR SEARCH THIS CLASS, SUBCLASS:

4.04, for a mechanical sensor at a separator controlling a conveyor having the delivery of the sheet being claimed.

10.05 Selective drive (e.g., number of degree of rotation):

This subclass is indented under subclass 10.01. Subject matter includes a device for permitting a certain amount of movement of the separator or the conveyor such as a number of degree of rotation of the separator.

10.06 Endless belt separator:

This subclass is indented under subclass 10.01. Subject matter wherein the separator is a continuous band of flexible material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

4.05+, for a sensor at a separator controlling a conveyor having the delivery of the sheet being claimed.

10.07 To endless belt conveyor:

This subclass is indented under subclass 10.06. Subject matter wherein the conveyor is a continuous band of flexible material and the individualized sheet is moved by the separator to the conveyor.

SEE OR SEARCH THIS CLASS, SUBCLASS:

4.06, for a sensor at a separator controlling a conveyor in which the delivery of the sheet being claimed.

10.08 To rotary conveyor:

This subclass is indented under subclass 10.06. Subject matter wherein the conveyor turns about an axis in an arc of a circle and the individualized sheet from the endless separator is carried to the conveyor.

SEE OR SEARCH THIS CLASS, SUBCLASS:

4.07, for a sensor at a separator controlling a conveyor in which the delivery of the sheet being claimed.

10.09 Rotary separator:

This subclass is indented under subclass 10.01. Subject matter wherein the sheet individualizing and moving means includes a surface or an element that turns about an axis in an arc of a circle.

SEE OR SEARCH THIS CLASS, SUBCLASS:

4.08+, for a sensor at a separator controlling a conveyor having the delivery of the sheet being claimed and subclasses 109+, for a rotary separator not claimed in combination with the conveyor.

10.1 To endless belt conveyor:

This subclass is indented under subclass 10.09. Subject matter wherein the individualized sheet is carried from the rotary separator by a continuous band of flexible material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

4.09, for a sensor at a separator controls a conveyor in which the delivery of the sheet being claimed.

10.11 To rotary conveyor:

This subclass is indented under subclass 10.09. Subject matter wherein the conveyor turns about an axis in an arc of a circle and the individualized sheet from the endless separator is carried to the conveyor.

SEE OR SEARCH THIS CLASS, SUBCLASS:

4.1, for a sensor at a separator controls a conveyor in which the delivery of the sheet being claimed.

10.12 With aligning:

This subclass is indented under subclass 10.11. Subject matter including means for positioning or locating the sheet with respect to the location of the rotary conveyor.

10.13 With clutch:

This subclass is indented under subclass 10.11. Subject matter wherein the rotary separator and conveyor arrangement combined with a mechanism which selectively engages and disengages an arrangement of the driving parts of the separator and the conveyor.

10.14 Reciprocating separator:

This subclass is indented under subclass 10.01. Subject matter wherein the separator undergoes a to and fro movement during its operation.

SEE OR SEARCH THIS CLASS, SUBCLASS:

4.11+, for a sensor at separator controls a conveyor in which the delivery of the sheet being claimed.

10.15 To endless belt conveyor:

This subclass is indented under subclass 10.14. Subject matter wherein the individualized sheet is carried from the reciprocating separator by a continuous band of flexible material.

10.16 To rotary conveyor:

This subclass is indented under subclass 10.14. Subject matter wherein the conveyor turns about an axis in an arc of a circle and the individualized sheet from the reciprocating separator is carried to the conveyor.

SEE OR SEARCH THIS CLASS, SUBCLASS:

4.12, for a sensor at a separator controls a conveyor in which the delivery of the sheet being claimed.

11 Pneumatic separator:

This subclass is indented under subclass 10.01. The separator having means for engaging the sheet by suction or air-blast.

(1) Note. Compare this class, subclass 90, and indented subclasses.

12 Endless conveyor:

This subclass is indented under subclass 11. The sheet being carried from the separator by one or more endless bands.

13 Side aligner:

This subclass is indented under subclass 12. With means for positioning the lateral edge of the sheet parallel to the line of travel.

14 Reciprocating conveyor:

This subclass is indented under subclass 11. The sheet being carried away from the separator by a member moving to-and-fro in a straight path.

15 Side aligner:

This subclass is indented under subclass 11. With means for positioning the lateral edge of the sheet parallel to the line of travel.

16 Buckling separator and endless conveyor:

This subclass is indented under subclass 10.01. With means for forcing an intermediate portion of the sheet away from the pack, while the ends remain in contact therewith, and one or more endless bands for then carrying the sheet therefrom.

17 Side aligner:

This subclass is indented under subclass 16. With means for positioning the lateral edge of the sheet parallel to the line of travel.

SEE OR SEARCH CLASS:

38, Textiles: Ironing or Smoothing, subclass 143 for spreading out and piling on one another laundry sheets preparatory to ironing the same or to smooth the same.

18 Separators:

This subclass is indented under subclass 8.1. Means for removing an individual sheet from its position in a pack.

SEE OR SEARCH CLASS:
221, Article Dispensing, subclasses 208+ for article dispensers not otherwise provided for having means to assist the discharge of articles from a source of supply which may be a stack or pack of aligned articles.

18.1 Magnetic or electrostatic:
This subclass is indented under subclass 18. Device wherein the removal of the sheet is effected or facilitated by an element or mechanism that generates lines of magnetic flux or static electricity.

(1) Note. This subclass is for a device wherein a stack of ferrous sheets moves through a magnetic field, which causes partial separation of the sheets to facilitate individual feeding of the sheets from the stack. Movement of the magnet is for adjustment purposes only. An electrostatic zone can act in a similar way to cause partial separation of paper sheets.

SEE OR SEARCH THIS CLASS, SUBCLASS:
193, for a magnetic or electrostatic sheet delivery conveyor.

18.2 Cyclicly moving:
This subclass is indented under subclass 18.1. Device wherein the element or mechanism is periodically moved relative to the pack to effect the removal of individual sheets from the pack.

(1) Note. This subclass is for a device wherein one magnet causes removal of the sheet from the pack and another magnet causes partial separation of the sheets while still in the pack.

18.3 Surface-piercing element(s):
This subclass is indented under subclass 18. Device wherein the sheet-removal means includes one or more sharp pointed members, the point of which penetrates the face of the sheet that is to be removed.

SEE OR SEARCH THIS CLASS, SUBCLASS:
141, for a reciprocating separator using pin means.

19 Buckling:
This subclass is indented under subclass 18. Adapted to force an intermediate portion of the sheet away from the pack while the ends remain in contact therewith.

SEE OR SEARCH THIS CLASS, SUBCLASS:
16, and indented subclass.

SEE OR SEARCH CLASS:
221, Article Dispensing, subclasses 33+ for article dispensers not otherwise provided for in which flexible articles are distorted as they are separated from the source of supply.

20 Pneumatic:
This subclass is indented under subclass 19. Wherein the sheet is engaged by suction or airblast.

21 Rotary:
This subclass is indented under subclass 19. Wherein the sheet is engaged by a member moving in the arc of a circle.

22 Pack advancer:
This subclass is indented under subclass 21. Having means for keeping top or side feed packs forced into position for separating.

23 Bottom feed:
This subclass is indented under subclass 21. The pack being so held as to permit it to fall into position for separating a sheet.

24 Pack advancer:
This subclass is indented under subclass 19. Having means for keeping top or side feed packs forced into position for separating.

25 Feeler control:
This subclass is indented under subclass 24. Having means contacting with a portion of the pack to control the action of the advancer.

30.1 Pack advancer:
This subclass is indented under subclass 90. Device provided with means to urge a stack of sheets in a direction such that the foremost sheet of the stack is in a position appropriate for removal of a single sheet.

(1) Note. The device of this and indented subclasses is usually for feed from the top of a stack, or for feed from a stack of on edge or imbricated sheets. A device of this and indented subclasses is usually for feed from the bottom of the stack and would not be found herein (since a bottom-feet mechanism does not have a stack urging means) unless the patent thereto also claimed a weight for urging the stack toward the bottom of the hopper.

SEE OR SEARCH THIS CLASS, SUBCLASS:
22, 24+, 37+, 126+, and 128+, for a device including a pack advancer in combination with a separator of a type appropriate to the subclass under which the pack advancer is indented.
147+, for a pack advancer of general utility.

31 Feeler control:
This subclass is indented under subclass 30.1. Having means contacting with a portion of the pack to control the action of the advancer.

31.1 Stack on Edge:
This subclass is indented under subclass 30.1. Devices wherein a stack holder is provided and arranged to support the stack so that the individual sheets derive a substantial amount of their support from their edges.

(1) Note. Many of the devices herein includes a spring or weight to move a backstop that advances the stack.

SEE OR SEARCH THIS CLASS, SUBCLASS:
129, for a pack advancer which supports sheets on edge in combination with a reciprocating feeder.
149+, for a pack advancer of general utility which supports sheets on edge.

33 Adhesive:
This subclass is indented under subclass 18. The sheet-engaging means supplied with a substance to which the sheet will adhere.

SEE OR SEARCH CLASS:
221, Article Dispensing, subclasses 210+ for article dispensers not otherwise provided for including article adhering discharge assistant means.

34 Endless belt:
This subclass is indented under subclass 18. The sheet engaged by one or more endless bands.

SEE OR SEARCH CLASS:
221, Article Dispensing, subclasses 42+ for rotary ejectors including friction roller means for the concurrent separation and distortion of flexible articles, subclass 253 for endless belt carried discharge assistants for general utility article dispensers, and particularly subclass 259 for article dispensers in which the article is engaged by discharge assistant means which contacts the surface of the article only, many of these devices being an endless belt type of friction device.

35 Bottom feed:
This subclass is indented under subclass 34. The pack being so held as to permit it to fall into position for separating.

37 Preliminary protrusion:
This subclass is indented under subclass 109. Each sheet being slightly projected from the pack prior to its engagement by the rotary separator.

38 Feeler control:
This subclass is indented under subclass 37. Having means contacting with a portion of the pack to control the operation.

42 Reciprocating:
This subclass is indented under subclass 18. The sheet being engaged by a member moving to and fro in a straight path.

SEE OR SEARCH CLASS:
221, Article Dispensing, subclasses 36+ for dispensers for flexible articles including ejecting means which concurrently separate and distort the articles, many of such ejecting means having a reciprocating motion, and see also subclasses 232 and 268+ for article dispensers of general types including reciprocating discharge assistant means.

65 Optional face or back:
This subclass is indented under subclass 278. Apparatus wherein means are adapted to deliver the sheet either side up.

66 Endless conveyors to flies:
This subclass is indented under subclass 65. Apparatus wherein the sheet is carried by endless bands to fingers which bear against one side of the sheet and rotate to turn it over.

67 Endless conveyors to curtains:
This subclass is indented under subclass 278. Apparatus wherein the sheet is carried by endless bands and deposited on bands adapted to be rolled up and permit the sheet to fall.

69 Endless conveyors to other conveyors:
This subclass is indented under subclass 278. Apparatus wherein the sheet is carried by endless bands to another type of carried which continues the delivery.

70 To flies:
This subclass is indented under subclass 69. Apparatus wherein the final conveyor is composed of fingers which bear against one side of the sheet and rotate to turn it over.

SEE OR SEARCH THIS CLASS, SUBCLASS:
65,

72 Rotary conveyors to flies:
This subclass is indented under subclass 278. Apparatus wherein means are provided which move in the arc of a circle to deliver the sheets to fingers which bear against one side of the sheet and rotate to turn it over.

73 Curtains:
This subclass is indented under subclass 278. Apparatus wherein bands are provided which receive the sheet and are adapted to be rolled up and permit the sheet to fall.

(1) Note. The bands may or may not serve as conveyors.

81 Traveling:
This subclass is indented under subclass 314. Apparatus wherein the conveyor has a bodily movement in addition to the rotary movement.

82 Suspension gripper:
This subclass is indented under subclass 314. Apparatus wherein the rotary conveyor has means for carrying the sheet suspended from the edge.

83 Flies:
This subclass is indented under subclass 314. Apparatus wherein means are adapted to bear against one side of the sheet and rotate to turn it over.

SEE OR SEARCH THIS CLASS, SUBCLASS:
66, 70 and 72.

84 Reciprocating conveyors:
This subclass is indented under subclass 278. Apparatus wherein the delivering means moves to and fro in a rectilinear path.

85 Suspension gripper:
This subclass is indented under subclass 84. Apparatus wherein the conveyors are provided with means for carrying the sheet suspended from one edge.

90 Pneumatic:
This subclass is indented under subclass 8.1. Device wherein the sheet-removing means engages an individual sheet by a gaseous fluid medium under subatmospheric or above-atmospheric pressure.

(1) Note. Although in most devices the gaseous fluid is air, either under suction or under pressure, or both, the use of a special fluid other than air (e.g., steam) is not barred, if the fluid is for the purpose

of preconditioning a stack of sheets (e.g., fluffing the sheets of the stack with the hot, moist steam) to facilitate subsequent separation of the sheets from the stack.

SEE OR SEARCH THIS CLASS, SUBCLASS:

5, 11+, 20, for a device using pneumatic feed means;

112, 132, for a device wherein suction assists a feed means.

SEE OR SEARCH CLASS:

221, Article Dispensing, subclass 211 for article dispensers not otherwise provided for in which suction carrier means is effective to engage and remove articles from a source of supply, and subclass 278 for fluid pressure discharge assistants for articles.

91 Plural, relatively-moving suction members:

This subclass is indented under subclass 90. Device wherein the sheet-removing means comprises at least two vacuum elements, each of which is movable relative to the stack, and each of which is also movable relative to the other.

(1) Note. This subclass is for a device wherein plural cups bend the margins of corners of a sheet toward each other to facilitate separation of that sheet from the stack.

92 Laterally receding members (e.g., for tautening sheet laterally):

This subclass is indented under subclass 91. Device wherein at least two of the elements that are in engagement with a sheet move away from each other in a direction that is transverse to the direction of feeding of the sheet so engaged, thereby tending to tension an area of the sheet that is between the elements.

93 Including members for separating and members for forwarding sheet:

This subclass is indented under subclass 91. Device wherein at least one of the elements moves to and from the stack of sheets in a direction generally perpendicular to the plane of the foremost sheet to engage and move the foremost sheet away from the stack, and wherein another of the elements moves in a direction generally parallel to said plane, whereby said one element initiates the movement of a foremost sheet and transfers said foremost sheet to the other of the elements to continue the movement of the foremost sheet away from the stack.

SEE OR SEARCH THIS CLASS, SUBCLASS:

11+, for a device using a pneumatic separator and a conveyor forwarding the foremost sheet.

94 Unidirectionally-moving suction member or surface:

This subclass is indented under subclass 90. Device wherein the sheet-removing means comprises an element that turns continually in the same direction, through the surface of which element vacuum is applied to engage and remove a sheet from a stack.

(1) Note. The shape of the suction member of this subclass may vary. Included herein is a drum or a belt having apertures therein or a wheel or chain having orbiting cups mounted thereon. What is common to all the devices is the presence of suction through the suction member and the movement in one direction of the suction member.

SEE OR SEARCH THIS CLASS, SUBCLASS:

196, for a delivery conveyor having similar structure.

95 Having additional movement:

This subclass is indented under subclass 94. Device wherein motion is imparted to said element, which motion is supplemental to the turning of the element.

(1) Note. Included in this subclass is a device wherein a continuously turning suction member has additional movement to and from the stack, and a device wherein a one or more suction cups rotate or oscillate on their own axis and simultaneously revolve within a carrier about a second axis. The latter arrangement permits the suction cup to be retarded in its motion so that it is momentarily stationary with respect to

the sheet which it will engage, even though the carrier in which it is mounted continues to rotate.

SEE OR SEARCH THIS CLASS, SUBCLASS:
120, for a friction separator having similar compound rotary movement.

96 With means to adjust suction:
This subclass is indented under subclass 94. Device provided with means to vary the zone or area on the foremost sheet where vacuum is applied, or to vary the degree of vacuum applied, or vary the effect of the vacuum applied.

(1) Note. The adjustments noted in the definition above may be performed, for example, by adjusting the position of a nozzle that applies suction through the periphery of an apertured drum or belt, or by use of a valve that regulates the amount of suction applied, or by adjusting the speed of rotation of the drum or belt.

SEE OR SEARCH THIS CLASS, SUBCLASS:
108, for a pneumatic separator including a valve means.

97 Sheet removal by pressurized gas:
This subclass is indented under subclass 90. Device wherein the sheet-removing means includes a source of air or other gaseous medium subjected to above-atmospheric pressure.

(1) Note. A distinction should be made between a device using pressurized gas for the purpose of causing or aiding removal of a sheet from a stack (found in this and indented subclasses), a device using pressurized gas for the purpose of restraining feeding of sheets other than the foremost sheet (found in subclass 104), and a device using pressurized gas for the purpose of fluffing or riffling the sheets of a stack while the sheets remain in the stack (found in subclass 105).

(2) Note. Some patents in this subclass disclose the use of Bernoulli's Principle for the movement of sheets. That principle includes the use of air under relatively high pressure and velocity to generate an area of low pressure adjacent a surface.

SEE OR SEARCH THIS CLASS, SUBCLASS:
104, and 105, and see (1) note above.
195, for a sheet conveyor using pressurized gas.

98 And suction means:
This subclass is indented under subclass 97. Device wherein the sheet-removing means also includes a vacuum element operating in conjunction with the pressurized air.

99 Suction member acting on bottom of pack:
This subclass is indented under subclass 90. Device wherein a stack of sheets is held so as to permit the sheets thereof to fall into position at which the sheet-removing means engages the lowermost sheet of the stack, and wherein the sheet-removing means comprises a vacuum element.

(1) Note. Included in this and indented subclasses is a device wherein the stack of sheets is supported partly on the edges of the sheets and partly by means extending in the plane of the lowermost sheet and below said lowermost sheet.

SEE OR SEARCH THIS CLASS, SUBCLASS:
165+, for a pack holder for use with a bottom-feed device, and see the search notes of subclass 165 for reference to other subclasses involving bottom-feed.

100 Oscillating member bending margin of bottom sheet:
This subclass is indented under subclass 99. Device wherein the vacuum element moves to and from the stack, and during its movement away from the stack engages a portion of the lowermost sheet adjacent one of the edges or corners thereof to move that portion away from the undisturbed residue of the stack.

(1) Note. Although most devices of this and the indented subclasses include a suction member that oscillates by pivoting in the

arc of a circle, a few such devices include a suction member that oscillates by reciprocating in a straight line to perform the same type of bending of the sheet margin.

SEE OR SEARCH THIS CLASS, SUBCLASS:

106, for a device wherein a suction member bends a portion of the foremost (usually the topmost) sheet of a stack prior to removal.

101 With moving segments supporting remainder of pack:

This subclass is indented under subclass 100. Device provided with at least one component that is moved from a position outside the stack to a position between the bent portion of the lowermost sheet of the stack and the undisturbed portion of the next-to-lowermost sheet of the stack, thereby to hold the undisturbed residue of the stack against feeding movement during separation of the lowermost sheet from the stack.

(1) Note. Included in this subclass are some devices wherein the stack is moved in a direction parallel to the plane of the sheets thereof as the lowermost sheet is separated therefrom. The relative movement between support segment and remainder of stack has been considered sufficient for placement herein.

102 Suction member reciprocating perpendicularly to sheet:

This subclass is indented under subclass 99. Device wherein the vacuum element moves to and from the stack in a direction generally normal to the plane of the lowermost sheet of the stack.

(1) Note. Although in most devices of this subclass the motion is straight line reciprocation, and in a few such devices the motion is a pivotal oscillation, with either motion, the suction member pulls the foremost sheet away from the stack in a direction perpendicular to the plane of the sheet.

SEE OR SEARCH THIS CLASS, SUBCLASS:

132, for a device wherein a member reciprocating in a direction generally parallel to the plane of the sheet, and a suction means that does not move but is located adjacent the lowermost sheet is activated to ensure that the reciprocating member will engage the lowermost sheet.

103 Sheet-moving action of suction member results from engagement with sheet:

This subclass is indented under subclass 90. Device wherein the sheet-removing means includes a vacuum cup mounted on an array of telescopically projectable and retractable elements, through which array a source of vacuum is applied, and wherein the projection of the vacuum cup toward the foremost sheet of a stack causes a sheet-engaging orifice of the vacuum cup to be sealed by the foremost sheet, whereupon the increase in vacuum (i.e., decrease in pressure) within the array following the sealing causes the array and the cup mounted thereon to be retracted from the stack with the foremost sheet attracted to the cup.

104 With means to restrain feed of next sheet:

This subclass is indented under subclass 90. Device provided with means to retard the removal of the sheet adjacent to and succeeding the foremost sheet of the stack.

SEE OR SEARCH THIS CLASS, SUBCLASS:

121, 137 and 167, for a similar sheet-retarding device associated with a different sheet-separating means or a pack holder.

105 Means effecting preliminary operation on sheets in pack:

This subclass is indented under subclass 90. Device including a means using a gaseous fluid medium under subatmospheric or above-atmospheric pressure, which means acts on any of the sheets of a stack to separate at least a portion of a sheet from a corresponding portion of an adjacent sheet, but without removing any of the sheets from the stack.

(1) Note. This subclass provides for a device which is a subcombination of a sheet-feeding machine, the device performing an operation that prepares the stack for feeding or removal of sheets therefrom. Examples of such device include, a nozzle issuing a blast of steam or heated air or ionized air, a suction device for removing dust from the sheets of a stack, and means to bend, flex or riffle the margins of the sheets prior to removal.

106 Suction member flexing sheet or portion:
This subclass is indented under subclass 105. Device wherein the means is a vacuum element that bends all or a part of the foremost sheet prior to removal of said sheet from a stack.

SEE OR SEARCH THIS CLASS, SUBCLASS:
100, for a device wherein an oscillating suction member operates on the bottom of a stack to flex the lowermost sheet prior to removal.

107 Oscillating suction member:
This subclass is indented under subclass 90. Device wherein the sheet-removing means is a vacuum element that moves to and from the stack in the arc of a circle.

108 Controlled by valve means:
This subclass is indented under subclass 90. Device wherein the flow of gaseous medium to or from the sheet-removal means is regulated by mechanism to vary or stop such flow.

SEE OR SEARCH THIS CLASS, SUBCLASS:
96, for a device wherein a rotating suction element includes means for varying the suction therein.

109 Rotary:
This subclass is indented under subclass 8.1. Device wherein the sheet-removing means engages an individual sheet by a surface or element that turns about an axis in an arc of a circle.

SEE OR SEARCH THIS CLASS, SUBCLASS:
21+, for a sheet-buckling rotary separator 94+, for a suction separator having rotational movement.

SEE OR SEARCH CLASS:
221, Article Dispensing, subclasses 42+ for rotary ejecting means for the concurrent separation and distortion of flexible articles, subclass 259 for surface contact type discharge assistants to remove articles from a source of supply, and subclass 277 for article dispensers having rotary discharge assistants.

110 Control of separator responsive to sensing of sheet:
This subclass is indented under subclass 109. Device provided with means to detect the absence or presence of a sheet from the pack or stack of sheets, and further provided with means to activate or deactivate the sheet-removing means as a result of such detection.

SEE OR SEARCH THIS CLASS, SUBCLASS:
25, 31, 38, and 152+, for a device wherein a feeler or sensor is associated with a pack advancer, and 258+ for a device wherein a feeler or sensor is associated with a feed interrupter.

111 Including plural separators or plural sensors:
This subclass is indented under subclass 110. Device provided with two or more sheet-removing means or provided with two or more detectors.

112 Suction assisted:
This subclass is indented under subclass 109. Device provided with means in addition to the turning surface or element, which means includes a source of vacuum or subatmospheric pressure that facilitates the operation of the sheet-removing means.

(1) Note. The suction means must be a stationary suction member that does not by itself remove a sheet from the stack. Rather, it is separate from the rotating

separator and pulls the sheet into a position that will ensure the engagement of the sheet by the separator. For a suction member that reciprocates to separate a sheet from a pack, see subclass 102, and for a suction member that assists a reciprocating bottom-feed member, see subclass 132.

SEE OR SEARCH THIS CLASS, SUBCLASS:
102, and 132, and see (1) Note, above.

113 Separator rotating in plane of foremost sheet:
This subclass is indented under subclass 109. Device wherein the axis of turning is perpendicular to the surface of the sheet that is nearest the sheet-removing means, whereby the means turns in a zone that is parallel to said surface.

(1) Note. In exemplary operation, the separator "peels" the foremost sheet from the stack by interposing a rotating finger between the surfaces of the foremost sheet and the next sheet.

114 Variably or intermittently driven:
This subclass is indented under subclass 109. Device wherein the sheet-removing means is impelled to be turned by mechanism that imparts changeable turning speeds to the means, or imparts different turning speeds to different sheet-engaging portions of the means, or imparts a discontinuous turning motion to the means.

115 In oscillatory movement:
This subclass is indented under subclass 114. Device wherein the sheet-removing means turns partially to-and-fro about an axis, whereby the means feeds a sheet during one direction of its turning and retracts to its initial position during its reverse direction of turning.

116 By over-running one-way drive:
This subclass is indented under subclass 114. Device provided with a clutch mechanism that imparts a turning motion to the sheet-removing means during only a portion of the time required for removal of a sheet, and thereafter permits the sheet-removing means to be turned by continued movement of the sheet past said means until the sheet is fully removed.

117 Separator adjustable or retractable relative to pack:
This subclass is indented under subclass 109. Device wherein the sheet-removing means is mounted on structure that permits the position of said means to be varied with respect to the stack of sheets or permits said means to be moved away from the stack, or wherein the stack of sheets is mounted on structure that permits the stack to be moved away from the sheet-removing means.

(1) Note. Subclasses 126+ provide for a device wherein the stack of sheets is urged toward the separator. This subclass (117) provides for a device wherein the stack of sheets may be moved away from the separator, usually for the purpose of replenishing the stack. In this subclass will also be found a device wherein the separation of sheets from a stack is stopped at will by retracting the stack from the separator.

SEE OR SEARCH THIS CLASS, SUBCLASS:
126, and see (1) Note above.
136, for a reciprocating feeder wherein operation may be stopped at will by moving the feeder and the stack apart.

118 Feed by successive approach and retraction:
This subclass is indented under subclass 117. Device wherein the sheets are sequentially removed from the stack by alternately bringing together and moving apart the sheet-removing means and the stack in continuous sequence of operations.

(1) Note. Either the sheet-removing means may be moved to and from the stack, or the stack may be moved to and from the sheet-removing means.

119 Separator having non-uniform periphery:
This subclass is indented under subclass 109. Device wherein the surface or element that turns about an axis is not circular or is not regular in its circumference.

(1) Note. Included herein is a device wherein the rotating separator includes one or more pins or lugs projecting radi-

ally from the axis of rotation, or a device wherein the separator comprises a roughened surface or a helicoidal projection.

120 Including relatively movable elements:
This subclass is indented under subclass 119. Device wherein the surface or element that turns about an axis is mounted so as to have an additional motion with respect to the axis of turning.

(1) Note. Included herein is a device wherein a roller is mounted so as to rotate about its own axis as well as revolve about the axis of rotation of the separator, or a device wherein a separator has a surface portion that is adjustable radially or circumferentially relative to the axis of rotation.

SEE OR SEARCH THIS CLASS, SUBCLASS:
95, for a suction separator wherein a suction element revolves about an external axis and has additional movement (e.g., rotation or oscillation) about its own axis.

121 With means to restrain feed of next sheet:
This subclass is indented under subclass 109. Device provided with means to retard the removal of the sheet adjacent to and succeeding the foremost sheet of the stack.

SEE OR SEARCH THIS CLASS, SUBCLASS:
104, 137 and 167, for a similar sheet-retarding device associated with a different sheet-separating means or a pack holder.

122 By restrainer having rearwardly moving surface:
This subclass is indented under subclass 121. Device wherein a face of said retarding means adjacent to the foremost sheet has motion imparted thereto, which motion is in a direction opposite to the direction of movement of the foremost sheet during separation thereof.

123 By restrainer acting on rear end of sheet:
This subclass is indented under subclass 121. Device wherein said sheet-retarding means engages a margin or edge of the foremost sheet or the sheets adjacent to the foremost sheet, which margin or edge is that which is opposite to the direction of movement of the foremost sheet during separation thereof.

124 By adjustable restrainer:
This subclass is indented under subclass 121. Device wherein the sheet-retarding means is located adjacent the sheet-removing means to form an opening that permits the foremost sheet to be moved out of a stack holder, and the extent of the opening is variable.

SEE OR SEARCH THIS CLASS, SUBCLASS:
138, for a device having a reciprocating bottom-feed separator and an adjustable sheet-restraining throat.

125 Including restraining roller:
This subclass is indented under subclass 124. Device wherein one of the elements comprising the sheet-retarding means is a cylindrical member which may rotate.

(1) Note. Usually the restraining roller is located adjacent to the feeding roller and diametrically opposite thereto so that the sheet being fed passes between the rollers. The rotation of the restraining roller is regulated, or the gap between the rollers is adjusted, thus the movement of the next-to-foremost sheet is restrained.

126 With means to urge pack toward separator:
This subclass is indented under subclass 109. Device provided with means to force a stack of sheets in a direction such that the foremost sheet of the stack is in a position appropriate for removal of single sheets.

SEE OR SEARCH THIS CLASS, SUBCLASS:
147+, for a pack advancer of general utility, and see the search notes of subclass 147 for reference to other pack advancer subclasses.

127 Including pivoted pack holder:
This subclass is indented under subclass 126. Device provided with a structure to hold a stack of sheets, which structure is permitted to turn toward the sheet-removing means to a limited extent about an axis.

128 With pack advancer:
This subclass is indented under subclass 42. Device having means for urging top and side feed packs into position appropriate for removal of single sheets.

SEE OR SEARCH THIS CLASS, SUBCLASS:
147+, for a pack advancer and see the search notes of subclass 147 for reference to other pack advancer subclasses.

129 With sheet on edge:
This subclass is indented under subclass 128. Device wherein the pack is held so that the sheets thereof derive a substantial amount of their support from their edges.

SEE OR SEARCH THIS CLASS, SUBCLASS:
149, for a pack advancer holding sheets on edge.

130 And feeler control for advancer:
This subclass is indented under subclass 128. Device provided with means to detect the absence or presence of a sheet adjacent a sheet-removal zone, and further provided with means to activate or deactivate the stack-urging means as a result of such detection.

SEE OR SEARCH THIS CLASS, SUBCLASS:
152+, for a pack advancer controlled by a feeler, and see the search notes of subclass 152, for reference to other such subclasses.

131 Bottom feed:
This subclass is indented under subclass 42. Device wherein the stack of sheets is held so as to permit the sheets thereof to fall into position at which the reciprocating member engages the lowermost sheet for separation of the lowermost sheet from the stack.

SEE OR SEARCH THIS CLASS, SUBCLASS:
165+, for a pack holder for use with a bottom-feed device, and see the search notes of subclass 165 for reference to other subclasses involving bottom feed.

132 Suction assisted:
This subclass is indented under subclass 131. Device provided with means in addition to the reciprocating member, which means include a source of vacuum or subatmospheric pressure that facilitates the operation of the reciprocating member.

(1) Note. The suction means must be a stationary suction member that does not by itself remove a sheet from the stack. Rather it is separate from the reciprocation separator and pulls the sheet into a position that will ensure the engagement of the sheet by the separator. For a suction member that reciprocates to separate a sheet from a pack, and for a suction member that assists a rotating feed means, see search notes below.

SEE OR SEARCH THIS CLASS, SUBCLASS:
102, for a suction member that reciprocates to separate a sheet from a pack, and see (1) Note, above.
112, for a suction member that assists a rotating feed means, and see (1) Note, above.

133 With means to prepare pack or bottom sheet for feeding:
This subclass is indented under subclass 131. Device provided with means that acts on a stack of sheets or on the lowermost sheet of the stack while the stack is in its holder, which means makes the stack or the lowermost sheet ready for feeding of an individual sheet therefrom.

(1) Note. Included herein are such exemplary devices as one wherein the pack is vibrated to loosen the sheets, or one wherein the edges of the sheets are riffled, or one wherein the sheets pass a diverter which shifts the sheets parallel

to their surfaces to break the surface adhesion of one sheet against another.

134 By relief of pack weight:
This subclass is indented under subclass 133. Device wherein the means acts to support a portion of the stack above the lowermost sheet, thereby to facilitate feeding of the lowermost sheet unburdened by the downward force of sheets thereabove.

(1) Note. In most devices of this subclass it is not the entire weight of the sheets above the lowermost that is supported. Rather, the hopper containing the stack is provided with fixed or moveable projections into the downward travel of the stack such that at least one edge of a sheet (and the stack above the sheet) is partially and temporarily supported.

135 By partial planar movement of bottom sheet:
This subclass is indented under subclass 133. Device wherein the means acts on the lowermost sheet and moves that lowermost sheet in its own plane to pre-feed or to individualize that lowermost sheet prior to the action of the reciprocating feed member in fully separating the sheet from the stack.

(1) Note. Included herein a device wherein a pusher having steps simultaneously engages a plurality of sheets to push those sheets in repeated increments along the feed direction until the lowermost sheet is fully ejected, as well as a device in which the lowermost sheet is partially moved in a direction other than the feed direction so that it will be subsequently engaged by the reciprocating feed member.

136 With means to skip or stop feed:
This subclass is indented under subclass 131. Device provided with means to prevent the feeding of a lowermost sheet temporarily or under control of a user of the device.

(1) Note. Included herein is a device wherein the feed of sheets will be skipped at regular intervals, for example a sheet will be fed on a regular feed stroke, but on the next regular feed stroke a sheet will not be fed, and also included is a device wherein the operator of the device, or a signal from another part of the device, will effect nonfeed of the reciprocating member until feed is again desired.

SEE OR SEARCH THIS CLASS, SUBCLASS:
117, for a rotating feeder wherein operation may be stopped at will.

137 With means to restrain feed of next sheet:
This subclass is indented under subclass 131. Device provided with means to retard the removal of the sheet adjacent to and succeeding the foremost sheet of the stack.

SEE OR SEARCH THIS CLASS, SUBCLASS:
104, 121 and 167, for a similar sheet-retarding device associated with a different sheet separating-means or a pack holder.

138 By adjustable exit or throat:
This subclass is indented under subclass 137. Device wherein the sheet-retarding means is located at an opening of a stack holder that permits the foremost sheet to be moved out of the holder, and the extent of the opening is variable.

SEE OR SEARCH THIS CLASS, SUBCLASS:
124+, for a device having a rotary separator and an adjustable sheet-restraining member.

139 By pusher reciprocating variably or non-rectilinearly:
This subclass is indented under subclass 131. Device provided with means to effect to-and-fro movement of the sheet-engaging member, wherein the member may be adjusted relative to the means, or the means may be adjusted relative to the stack, or wherein the means or the member may be moved to-and-fro in other than a straight line.

140 Orbital (e.g., four-way) motion of pusher:
This subclass is indented under subclass 139. Device wherein the means or the member may be moved in other than a straight line.

(1) Note. In a device of this subclass the pusher movement is usually as follows: an initial movement toward the bottom surface of the bottom sheet, a feeding movement in engagement with the sheet and in the direction of feed parallel to the plane of the sheet, a withdrawal movement away from the surface of the sheet, and a retraction movement parallel to the plane of the sheet and opposite to the feed direction, thus ending in a position ready for the initial movement.

141 By pin (e.g., pointed) pusher:
This subclass is indented under subclass 131. Device wherein the sheet-engaging member includes an element having a pointed end that partially pierces the sheet to be fed.

SEE OR SEARCH THIS CLASS, SUBCLASS:
18.3, for a separator having surface-piercing elements.

142 By adjustable (e.g., for sheet thickness) pusher:
This subclass is indented under subclass 131. Device wherein the sheet-engaging member includes an element projecting toward the stack, and is provided with means to permit or cause change in the extent of projection of the element.

143 By self-aligning (e.g., yieldable) pushers:
This subclass is indented under subclass 131. Device provided with a plurality of sheet-engaging members, each of which members is mounted for movement toward the stack to the extent necessary to properly engage the bottom sheet of the pack for feeding thereof.

(1) Note. Included herein are devices wherein sheets that may be warped are to be fed. The pusher members are mounted to partake of the same reciprocator movement, but are spaced laterally of the direction of feed and are independently urged toward the plane of the sheet so that they accommodate themselves to the warpage to engage the sheet for proper feed.

144 Holder adjustable to size of sheet:
This subclass is indented under subclass 131. Device wherein the stack is held in a hopper which can be varied in dimension to accommodate the length and width dimensions of the sheets of the stack.

SEE OR SEARCH THIS CLASS, SUBCLASS:
171, and 223, for a sheet holder that is adjustable to the size of sheets therein.

145 Pack holders:
This subclass is indented under subclass 8.1. Device for supporting or holding a stack (i.e., a regularly-arranged collection) of sheets in position for removal of individual sheets therefrom.

(1) Note. Included in this subclass are feed tables that are capable of holding a stack of sheets, but which (as disclosed) hold a single sheet for feeding from the table.

146 With means to vibrate pack:
This subclass is indented under subclass 145. Device provided with mechanism for moving the holder to-and-fro with a low amplitude of movement but a high frequency of movement.

SEE OR SEARCH THIS CLASS, SUBCLASS:
210, for a vibrating sheet delivery receiver.

SEE OR SEARCH CLASS:
198, Conveyors: Power-Driven, subclass 521, 594+, 609, and 752+ for a vibratory conveyor.

147 Advancer:
This subclass is indented under subclass 145. Device provided with means to urge a stack of sheets in a direction such that the foremost sheet of the stack is in a position appropriate for removal of single sheets.

(1) Note. The device of this and indented subclasses is usually for feed from the top of a stack, or for feed from a stack of on-edge or imbricated sheets. A device for feed from the bottom of the stack would not be found herein (since a bottom-feed mechanism does not have a stack-urging means) unless the patent

thereto also claimed a weight for urging the stack toward the bottom of the hopper.

SEE OR SEARCH THIS CLASS, SUBCLASS:

22, 24+, 30.1+, 37+, 126+, and 128+, for a device including a pack advancer in combination with a separator of a type appropriate to the subclass under which the pack advancer is indented.

217, for a pile-lowering means for received sheets.

148 With means to move portions of advancer unequally (e.g., for unequal-thickness sheets):

This subclass is indented under subclass 147. Device wherein the urging means is provided with areas thereon capable of moving at a rate of speed greater than or lesser than other areas on the urging means, or said means can be adjusted to lie at different levels, thus permitting the foremost sheet to be equally presented to the sheet-removal means even though the individual sheets are thinner at one portion thereof than at another.

149 For on-edge or imbricated sheets:

This subclass is indented under subclass 147. Device wherein the stack holder is arranged to support the sheets of the stack so that the individual sheets derive a substantial amount of their support from their edges, or wherein the sheets are arranged in overlapped array, the margin of one sheet lying beyond the edge of an adjacent sheet relative to the direction in which the stack is urged.

(1) Note. Many of the devices herein include a spring or weight to move a backstop that advances the stack.

SEE OR SEARCH THIS CLASS, SUBCLASS:

216, for a receiver on which sheets are deposited in imbricated array.

150 Supported by moving conveyor belt:

This subclass is indented under subclass 149. Device wherein the stack rests on a surface that moves toward the sheet-removing means.

(1) Note. Some devices herein include a plurality of plates or backstops arranged to support the sheets in their on-edge condition and urge the stack to sheet-removal position.

151 For imbricated sheets:

This subclass is indented under subclass 150. Device wherein the sheets are arranged in overlapped condition.

(1) Note. Although it is not quickly evident from the title thereof, most of the devices found in the search notes below feed sheets from an imbricated array of sheets.

SEE OR SEARCH THIS CLASS, SUBCLASS:

37, and 38, for feeding sheets from an imbricated array of sheets, and see (1) Note above.

152 Control of advancer responsive to sensing of foremost sheet:

This subclass is indented under subclass 147. Device provided with means to detect the absence or presence of a sheet adjacent a sheet-removal zone, and further provided with means to activate or de-activate the stack-urging means as a result of such detection.

SEE OR SEARCH THIS CLASS, SUBCLASS:

25, 31, 38, and 130, for a device wherein a feeler or sensor is associated with a pack advancer.

176, 199, 215, for sheet delivery means including sheet sensing means.

258+, and 110+, for a device wherein a feeler or sensor is associated with a feed interrupter.

153 Sensor included in feed mechanism:

This subclass is indented under subclass 152. Device which is provided with a means to remove the foremost sheet of a stack, and wherein the detecting means is a part of said removing means.

(1) Note. In patents of this subclass, the sheet separator is claimed in general terms not justifying placement in one of

the specific separator subclasses higher in the class schedule. The emphasis in the claimed invention is in the sensor, which is either (a) integral with the separator, or (b) mounted on the same subassemblage that supports the separator so that the sensor partakes of separator movement at least in part, or (c) activated by a moving element that partakes of movement of the separator.

154 Sensor activates electric or fluidic circuit:
This subclass is indented under subclass 152. Device wherein the detecting means is included in a system of wiring or tubing that carries a flow of electricity or fluid respectively, and wherein said detecting means regulates said flow to activate or deactivate the urging means.

(1) Note. Among the sensers found in devices of this subclass are: magnets, photoelectric cells (for which, per se see search notes below), fluidic devices (for which, per se, see search notes below), and valve operators.

SEE OR SEARCH CLASS:
137, Fluid Handling, subclasses 803+ for fluidic devices, per se, and see (1) Note above.
250, Radiant Energy, subclasses 216+ for photoelectric cells, per se, and see (1) Note above.

155 Controlled electric or fluidic motor actuates advancer:
This subclass is indented under subclass 154. Device wherein the flow is applied directly to motive means that energizes the urging means.

(1) Note. In devices of this subclass the motor, whether electric or hydraulic, is connected directly to the advancer rather than through an intermediate clutch or transmission, and the stopping or starting of the motor is directly responsive to the senser.

156 Controlled pawl and ratchet actuates advancer:
This subclass is indented under subclass 152. Device wherein the stack-urging means that is activated and deactivated by the detecting means comprises a mechanical movement that is known in the art as "pawl and ratchet" and is further explained in (1) Note below.

(1) Note. A pawl is a pivoted element having a free end that interengages with teeth on a mating wheel or bar known as a ratchet. As the pivot of the pawl oscillates arcuately or reciprocates rectilinearly its movement in one direction will cause the free end to engage a ratchet tooth to move the ratchet an increment in said direction, but the movement of the pawl in the reverse direction will permit the pawl to slide over the adjacent tooth (or teeth) of the ratchet, since reverse movement of the ratchet is prevented. Thus oscillatory or reciprocatory movement of the pawl is converted into intermittent one-way movement of the ratchet wheel or ratchet bar.

157 With means to replenish pack or retract advancer platform:
This subclass is indented under subclass 147. Device provided with means to cause or to permit a stack of sheets to be placed or replaced in position for feeding, or provided with a support for a stack of sheets, which support normally urges the stack toward a sheet-removal position but is provided with means to withdraw said support away from the sheet-removal position.

(1) Note. The title and definition of this subclass have been written to accommodate the various ways in which the patents of this and indented subclasses have been disclosed and claimed. The intent of these subclasses is to provide a locus for patents disclosing "continuous" feeders, that is, devices wherein sheets may be individually separated from the top of a stack while a new stack of sheets is added to the bottom of the stack. The claims of some of the patents sometimes recite the replenishment in terms of function and sometimes recite the structure inherently capable of performing the function, but the intent is the same.

(2) Note. Due to the nature of the arrangement of sheets on edge, a device feeding sheets from an on-edge advancer is inherently capable of having the stack of

sheets replenished. Search in the referenced subclass below for structure similar to that of this subclass is sometimes advisable.

SEE OR SEARCH THIS CLASS, SUBCLASS:

149, for structure similar to that of this subclass (157), and see (2) Note above.

158 Using plural platforms during continuous operation of feeder:

This subclass is indented under subclass 157. Device provided with at least two supports alternately or alternatively usable for urging a stack toward the sheet-removal position whereby the sheet removing means may function without stopping for replenishment of the stack.

(1) Note. In some devices plural platforms are mounted on continuously-moving chains so that sheets are fed from the topmost stack while a new stack is loaded on the bottom most platform. In other devices, one platform is held temporarily at the sheet-removal zone while another platform is retracted for reloading of a new stack.

SEE OR SEARCH THIS CLASS, SUBCLASS:

149+, for a device wherein a stack of sheets on-edge is advanced by plural plates mounted on continuously-moving chains.

159 And plural drives for plural platforms:

This subclass is indented under subclass 158. Device wherein a mechanism is provided for each of said supports, each said mechanism being capable of moving its support independently of the other(s).

(1) Note. In some devices a single power source is split into two power drive trains, and in some devices two separate power drive trains are provided. In either case, one platform is retracted for reloading of a stack thereon, while another platform continues to advance the old stack to the feed means.

160 Urged by spring or weight:

This subclass is indented under subclass 147. Device wherein the stack-urging means includes a yieldable resilient member, or includes a mass moved under the influence of gravity.

161 With means to bow sheets:

This subclass is indented under subclass 145. Device provided with means to hold the stack such that the sheets therein are in a non-planar condition.

(1) Note. In some devices the sheets are bowed to stiffen them for easier feeding. In others the sheets are bowed to break the adhesion between the adjacent surfaces of adjacent sheets.

SEE OR SEARCH THIS CLASS, SUBCLASS:

209, for receiver having means to bow the delivered sheets.

162 Holder movable relative to feed position:

This subclass is indented under subclass 145. Device provided with means permitting the stack-holding or stack-supporting means to be moved with respect to the sheet-removing position.

(1) Note. Although the definition above is sufficiently comprehensive to include the movement of a pack advancer, it is obvious from the position of this subclass in the schedule that the movement referred to in the definition of this subclass is other than in the pack advancing direction. A device of this subclass will, for example, permit movement of a feed table away from the feeder in order to permit access of an operator to the feeder.

163 Holder convertible from feed to delivery:

This subclass is indented under subclass 162. Device wherein the stack-holding means can be moved from a location at which it permits sheets to be removed from the stack to a location at which it permits sheets to be added to the stack.

164 Holder moved parallel to plane of sheets:
This subclass is indented under subclass 162. Device wherein the movement is along a direction coincident with a lengthwise or widthwise dimension of a sheet of the stack.

(1) Note. The movement referred to permits a platform that is advancing a stack along a direction to be adjusted perpendicularly to that direction, or permits movement of a stack-holding tray that slides out of the machine for replenishment of the stack therein.

165 For feed from bottom of pack:
This subclass is indented under subclass 145. Device wherein the holder supports the stack so as to permit the sheets thereof to fall into position at which a sheet-removing means engages the lowermost sheet for separation of the lowermost sheet from the stack.

SEE OR SEARCH THIS CLASS, SUBCLASS:
23, 35, 99+, and 131+, for a device feeding from the bottom of a pack holder, the feeder being of the type appropriate to the subclass under which the bottom-feed subclass is indented.

166 With means to relieve weight of pack:
This subclass is indented under subclass 165. Device provided with means to support at least a portion of the stack above the lowermost sheet thereof, thereby to facilitate removal of the lowermost sheet.

SEE OR SEARCH THIS CLASS, SUBCLASS:
134, for a bottom-feed separator and means to relieve the weight of the pack.

167 With means to restrain feed of next sheet:
This subclass is indented under subclass 145. Device provided with means to retard movement of the sheet adjacent to and succeeding the foremost sheet of the stack.

SEE OR SEARCH THIS CLASS, SUBCLASS:
104, 121+, 137+, for a sheet-retarding device associated with a sheet-separating means.

168 By sheet-impaling restrainer:
This subclass is indented under subclass 167. Device wherein the retarding means comprises an element that penetrates the surface of at least the foremost sheet.

(1) Note. The sheet-impaler is usually a pointed pin, but can also comprise a rod that passes through aligned holes that are present in all the sheets of the stack.

169 By lateral margin or side-edge restrainer:
This subclass is indented under subclass 167. Device wherein the means comprises elements that contact those edges or margins of the foremost sheet that are parallel to the direction in which the sheet is to be removed, and wherein the elements are spaced apart from each other a distance equal to or slightly less than the width dimension of said sheet.

170 Corner snubber:
This subclass is indented under subclass 169. Device wherein the elements are located at the junctions of the front edges and side edges of the foremost sheet.

171 Holder adjustable to size of sheet:
This subclass is indented under subclass 145. Device wherein the stack-holding means can be varied in its dimensions to accommodate the length and width dimensions of the sheets comprising the stack.

SEE OR SEARCH THIS CLASS, SUBCLASS:
144, and 223, for a sheet holder that is adjustable to the size of sheets therein.

175 Means to drape sheets over horizontal bar:
This subclass is indented under subclass 306. Device provided with a sheet receiver that comprises a narrow support having one dimension that is coextensive with the width dimension of the individual received sheets and another dimension that is very short compared to the length dimension of said sheets whereby one portion of each received sheet will hang generally vertically on one side of the support and another portion of each received sheet will hang generally vertically on the other side of the support, in which device the transfer mechanism comprises means to cause each sheet to

be deposited on said support with the sheet portions hanging as described.

176 Responsive to delivered sheet:
This subclass is indented under subclass 306. Device provided with means to detect the presence of a sheet moving toward the receiving means, and further provided with means to activate the transfer means as a result of such detection.

SEE OR SEARCH THIS CLASS, SUBCLASS:
152, 199 and 215, for a device wherein a feeler or senser is associated with a feeding or a delivering means indicated by the title of the subclass, and see the Search Notes to subclass 152 for feeding subclasses including feeler means.

177 Means to push sheets out of edgewise into broadside movement (e.g., packer):
This subclass is indented under subclass 306. Device wherein the removing means conveys a succession of individual sheets along a direction parallel to their surfaces, and wherein said transfer mechanism urges each of said sheets in succession to be moved in a direction perpendicular to its surface.

(1) Note. In this subclass the packer usually is an air blast directed toward the surface of the sheet being conveyed, thus the air blast changes the direction of movement from edgewise to broadside. For other air blast means, see the search notes below.

SEE OR SEARCH THIS CLASS, SUBCLASS:
195, for a device using an air blast to help convey the sheet edgewise, and see (1) Note above.
211, for an air blast that helps cushion the dropping of the sheet into a receiver (and see (1) Note above).

178 Rotating packer:
This subclass is indented under subclass 177. Device wherein the transfer mechanism includes a member turning about an axis, at least a portion of the turning member contacting at least a portion of the surface of each sheet.

(1) Note. In this subclass the axis of the packer is usually parallel to the surface of the sheet and the packer pushes each sheet away from the packer axis.

179 Screw or helix:
This subclass is indented under subclass 178. Device wherein the member includes a surface that simultaneously winds around said axis and progresses axially along said axis.

(1) Note. In this subclass the axis of the packer is usually perpendicular to the surface of the sheet and the packer pushes each sheet along the packer axis.

180 By reciprocating or oscillating packer:
This subclass is indented under subclass 177. Device wherein the transfer mechanism includes a member moving to-and-fro in a direction perpendicular to the surface of a sheet that is contacted by the member.

(1) Note. In this subclass the to-and-fro motion of the packer can be rectilinearly reciprocating or arcuately oscillating.

181 Packing sheets on-edge into receiver:
This subclass is indented under subclass 180. Device wherein the member pushes the individual sheets into a stackholder that is arranged to support the sheets thereof so that said sheets derive a substantial amount of their support from their edges.

182 Means to retard sheets:
This subclass is indented under subclass 306. Device wherein the transfer mechanism acts to restrain or hold back the forward movement of each of the succession of sheets that are being conveyed, the action of the transfer mechanism being timed to occur on each successive sheet just as that sheet is at the receiver.

(1) Note. The words “restrain” and “hold back” require (but do not limit the concept to) structure for positively gripping a sheet or for enhancing the frictional hold back characteristics of a retarding surface contacting a sheet. Thus a device having a conveyor belt moving at a rela-

tively reversed or reduced surface speed would not be in this subclass. See search notes below for such a device.

SEE OR SEARCH THIS CLASS, SUBCLASS:

191, and 202, for a device having a conveyor belt moving at a relatively reversed or reduced surface speed (see (1) Note above).

183 By suction retarder:

This subclass is indented under subclass 182. Device wherein the restraint or hold back is effected by a surface or member moving at a speed slower than that of each of the sheets and contacting the sheet surface frictionally, the frictional contact being enhanced by subatmospheric pressure urging the sheet toward the surface or member.

184 Means to change orientation or direction of sheets during delivery:

This subclass is indented under subclass 306. Device wherein the transfer mechanism acts to alter either the direction in which the surface of each successive sheet faces or the direction in which each successive sheet moves, the alteration occurring just before or while the sheet is moved into the receiver.

185 Orientation-changing means:

This subclass is indented under subclass 184. Device wherein the transfer mechanism acts to alter the direction in which the surface of each successive sheet faces.

186 Sheet inverting means:

This subclass is indented under subclass 185. Device wherein the transfer means alters the orientation of each successive sheet from an orientation in which a particular surface is facing in a particular direction to an orientation in which said surface is facing in a direction opposite to said direction.

SEE OR SEARCH THIS CLASS, SUBCLASS:

65+, for a device wherein successive sheets are deposited face up or face down optionally.

187 By rotating circumferential-pocket members:

This subclass is indented under subclass 185. Device wherein the transfer mechanism includes a turning means provided with one or more receptacles for the temporary holding of successive sheets, each receptacle lying in or adjacent a peripheral portion of the turning means.

(1) Note. In use, successive sheets are inserted tangentially into successive pockets of the turning means while the pocket is aligned with the direction of movement of the successive sheets. As the turning means rotates, the pockets hold and carry the sheets circumferentially, and the sheets are released to the receiver at a location different from the insertion location, thereby changing the orientation of the sheets.

188 Means to bow sheets during delivery:

This subclass is indented under subclass 306. Device wherein the transfer mechanism causes the successive sheets to be curved or corrugated temporarily, thereby imparting a temporary stiffness to the sheets that facilitates forward propulsion of the sheets into the receiver.

SEE OR SEARCH THIS CLASS, SUBCLASS:

209, for a device wherein sheets within the receiver are bowed or curved.

189 Means temporarily interposed between conveyor and receiver:

This subclass is indented under subclass 306. Device wherein the transfer mechanism includes means that may be placed in the path of movement of the successive sheets for a short time, or may be removed from such path, said means being located at the discharge end of the conveying means and just before the receiving means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

218, for a temporary sheet support associated with lowering sheet receiver, which support is used to accumulate sheets thereon while a previously-

formed stack is removed from the receiver.

190 Transversely-disposed, gapped sheet-supports on endless carrier:
This subclass is indented under subclass 189. Device wherein the transfer mechanism includes one or more platforms extending across and moving along with the direction of movement of the succession of sheets, while supporting said sheets the plat-form(s) being mounted for such movement in a closed-loop orbit and being spaced one trailing end from a succeeding leading end to permit successive sheets to pass through the space between said ends.

(1) Note. In using this device, each successive sheet is placed by its conveyor on one of successively-appearing platforms, each platform carrying its sheet to a position over the receiver. The sheet is then stopped by means auxiliary to or integral with the platform while the platform continues to move from under the sheet, thus permitting the sheet to pass into the gap between platforms and be deposited onto the receiver.

191 Endless belt on reciprocating carrier:
This subclass is indented under subclass 189. Device wherein the transfer mechanism includes a closed-loop band encircling two or more pulleys mounted on a support that moves to-and-fro between a first position where the bend extends under the discharge end of the conveyor of successive sheets and a second position where the band extends over the receiver.

(1) Note. In using this device, each successive sheet is placed by its conveyor onto the endless belt, the top run of which moves toward the receiver. The movement of the belt carrier toward the receiver thus moves the sheet at a speed equivalent to belt speed plus carrier speed. When the sheet is entirely over the receiver the carrier retracts at a rearward speed effectively equal to the forward speed of the belt, thus the net speed of the sheet is zero, and the sheet falls into the receiver as its belt support retracts.

192 Counter-rotating supports for lateral margins:
This subclass is indented under subclass 189. Device wherein the transfer mechanism includes two means disposed to receive one or more successive sheets and temporarily hold such sheet (s) by contacting the two side borders of the sheet (s) that extend in a direction parallel to the direction of travel thereof, which means releases the sheet (s) so held by turning one of the means in one rotational direction and simultaneously turning the other of the means in the opposite rotational direction.

(1) Note. For the purposes of this subclass oscillation (i.e., to-and-fro partial rotation) of two opposite members is equivalent to unidirectional rotation, provided that the members oscillate in opposite directions simultaneously.

193 By electrostatic or magnetic conveyor:
This subclass is indented under subclass 278. Device wherein the removing means includes mechanism to generate static electricity or lines of magnetic flux, which mechanism cooperates with the removing means to facilitate delivery of a succession of individual sheets to a receiver.

(1) Note. This subclass is for a device wherein an endlessly orbiting belt conveys a succession of individual sheets by frictional contact of the surface of the belt with the surface of the sheets and magnetic or electrostatic forces attract the sheets to the belt to increase the frictional contact.

194 By pneumatic conveyor:
This subclass is indented under subclass 278. Device wherein the removing means includes a gaseous fluid medium under subatmospheric or above-atmospheric pressure.

SEE OR SEARCH CLASS:
406, Conveyors: Fluid Current, appropriate subclasses for conveying solid material or articles by means of a fluid current. See the search notes under the class definition for other classes having specialized fluid current conveying.

195 Using pressurized gas:
This subclass is indented under subclass 194. Device wherein the removing means includes a gaseous fluid medium under above-atmospheric pressure.

(1) Note. This subclass is for a device wherein pressurized gas urges the sheet into close frictional contact with an endlessly orbiting belt, or for a device wherein pressurized gas strips the sheet from a suction-belt conveyor, or for a device wherein pressurized gas is blown in a direction having a component in the direction of movement of the sheet.

SEE OR SEARCH THIS CLASS, SUBCLASS:
97, for a sheet-feeding means using pressurized gas.
177, for a sheet-delivery means using an air blast to push sheets broadside into a receiver.
211, for a sheet-delivery means wherein an air blast cushions the dropping of a sheet into a receiver.

196 Unidirectionally-moving suction member or surface:
This subclass is indented under subclass 194. Device wherein the removing means includes an element that turns continually in the same direction, through the surface of which element vacuum is applied to engage and deliver a sheet to a receiver.

(1) Note. The shape of the suction member of this subclass may vary. Included herein is a drum having apertures therein or a wheel or chain having orbiting cups mounted thereon. Common to all the devices is the presence of suction and the movement in one direction of the suction member. See subclass 197 below for a device having an apertured surface comprising an endless belt.

SEE OR SEARCH THIS CLASS, SUBCLASS:
94+, for similar structure used for feeding individual sheets from a stack.

197 Including endless-belt conveyor and suction chamber:
This subclass is indented under subclass 196. Device wherein the surface is that of a closed-loop band which encircles two or more pulleys and moves adjacent a vacuum box that connects with a source of the vacuum that is applied to the surface of the band.

198 By endless conveyor:
This subclass is indented under subclass 278. Device wherein the removing means includes a closed-loop belt or chain unidirectionally orbiting about two or more pulleys or sprockets.

199 Operation controlled by delivered sheet:
This subclass is indented under subclass 198. Device provided with means to detect the presence of a sheet moving toward the receiving means, and further provided with means to activate or deactivate the orbiting closed-loop belt or chain.

SEE OR SEARCH THIS CLASS, SUBCLASS:
152, 176 and 215, for a device wherein a feeler or senser is associated with a feeding or delivering means indicated by the title of the subclass, and see the Search Notes to subclass 152 for feeding subclasses including feeler means.

200 With delivery end movably relative to pack receiver:
This subclass is indented under subclass 198. Device wherein that portion of the endless conveyor closest to the receiving means may be displaced with relation to the receiving means.

(1) Note. This subclass is for a machine wherein the operator thereof wishes to move a portion of the conveyor aside for inspection or repair of the machine, or for removal of the stack of delivered sheets. For a machine wherein the delivery end of a conveyor moves, thus serving as a mechanism to transfer the successive sheets to a receiver as well as means to convey the sheets, see search notes below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

175, 190 and 191, for a machine wherein the delivery end of a conveyor moves, thus serving as a mechanism to transfer the successive sheets to a receiver as well as means to convey the sheets, and see (1) Note above.

201 Moving away from increasing delivered pack:

This subclass is indented under subclass 200. Device wherein the endless conveyor delivers successive sheets into a stack of sheets that grows in size of stack as a result of such delivery, and provided with means to move the delivery end of said conveyor in a direction that will permit and not interfere with such growth.

202 With means to vary speed of sheets on conveyor(s):

This subclass is indented under subclass 198. Device provided with one conveyor or a succession of conveyors for removing a succession of sheets to a receiver, and further provided with means to change the rate of movement of the succession of sheets moving thereon.

(1) Note. This subclass is for a device wherein a succession of conveyors is provided, a downstream conveyor moving sheets at a speed different (usually slower) than an upstream conveyor.

203 By cyclicly varying conveyor speed:

This subclass is indented under subclass 202. Device provided with means whereby said conveyor or at least one of the conveyors is caused to increase its speed and decrease its speed in regular sequence.

(1) Note. This subclass is for a machine wherein the cyclically vary-speed conveyor takes each of the succession of sheets at a high speed corresponding to its speed through the machine and slows each sheet as that sheet is adjacent the receiver therefor.

204 Suspension gripper:

This subclass is indented under subclass 198. Device provided with means for frictionally engaging opposite surfaces of each successive sheet adjacent at least one of the margins thereof, said means being mounted on a closed-loop belt or chain.

SEE OR SEARCH THIS CLASS, SUBCLASS:

82, for a similar suspension gripper mounted on a rotating drum.

SEE OR SEARCH CLASS:

198, Conveyors: Power-Driven, subclass 803.3 for a sheet gripper, per se, or a sheet gripper mounted on a conveyor, per se.

205 For lateral margins of conveyed sheet:

This subclass is indented under subclass 204. Device wherein said means engage two of said margins of each successive sheet, the engaged margins being those which extend in the direction of movement of the sheets.

206 With means to adjust gripper:

This subclass is indented under subclass 204. Device wherein said means may be varied in operation, position or condition.

207 To receiver for pack of sheets:

This subclass is indented under subclass 278. Device provided with means to hold the delivered sheets in a stacked, (that is, regularly aligned) array.

208 With means to discharge static electricity:

This subclass is indented under subclass 207. Device provided with means to remove, or permit the removal of, any electrical charge that may have accumulated on the delivered sheets prior to the stacking thereof.

209 With means to bow sheets:

This subclass is indented under subclass 207. Device provided with means to cause the sheets to be curved into a nonplanar condition.

(1) Note. The nonplanar condition may be imparted to the entire pack within the receiver for the purpose of facilitating

alignment of the sheets or handling of the pack.

SEE OR SEARCH THIS CLASS, SUBCLASS:

161, for a feeding pack holder provided with bowing means.

188, for means to bow sheets during delivery.

210 With means to vibrate receiver:

This subclass is indented under subclass 207. Device provided with means to move the holder to-and-fro with a low amplitude of movement but a high frequency of movement.

(1) Note. The vibrating receiver is used to jog or align the sheets stacked in the receiver. For other means to jog sheets within a receiver, see search notes below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

146, for means to vibrate a holder from which sheets will be fed.

221+, for other means to jog sheets within a receiver, and see (1) Note above.

SEE OR SEARCH CLASS:

198, Conveyors: Power-Driven, subclass 521, 594+, 609, and 752 for a vibratory conveyor.

211 With air cushion between sheet and pack:

This subclass is indented under subclass 207. Device wherein sheets are successively delivered onto the top of a stack of delivered sheets, and wherein a layer of ambient atmosphere is caused to form below the sheet last delivered and above the top of the stack, which layer of air permits the last delivered sheet to float down onto the top of the stack.

(1) Note. Exemplary of the manner in which the layer of air is formed are: (1) air blast nozzles located above the stack and directed upwardly, and (2) a wall confining the edges of sheets at the top of the stack and extending to also confine the edges of the sheet last delivered and the wall having perforations that permit the controlled escape of air trapped between the sheet last delivered and the top of the stack.

212 For receiving sheets from below the pack:

This subclass is indented under subclass 207. Device wherein the sheets are delivered to the holder from a location underneath the holder and the stack is formed by moving the sheets upwardly into the holder.

(1) Note. The use of a packer to push the delivered sheet up into the receiver is common. A patent that claims a conveyor for moving successive sheets edgewise as well as a packer to push the sheets broadside is properly placed into the subclasses referenced in the search note below as an original and properly cross-referenced into this subclass. This subclass is for a patent wherein the claim is directed to the means (whether by a packer or otherwise) for stacking from below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

177+, for patents that claim a conveyor for moving successive sheets edgewise as well as a packer to push the sheets broadside, and see (1) Note above.

213 With movable sheet-surface support:

This subclass is indented under subclass 207. Device provided with a platform or backing for holding a stack of sheets, which backing extends in the length and width dimension of a sheet and is contiguous with the sheet adjacent thereto, and which backing is capable of being moved, thereby moving or permitting movement of, the stack held thereby.

(1) Note. This subclass provides for a movable support including, for example, an endless conveyor, on which conveyor a plurality of sheets is delivered to form a stack, which conveyor is subsequently actuated to move the formed stack. Temporary removal of one or more walls that serve to confine the sheets during formation of the stack will not bar a patent from original placement in this subclass. However, further provision of structure other than the above-mentioned conveyor, which other structure moves, or helps to move, the stack as a stack will

justify placement of a patent reciting such other structure in class (198).

214 Receding from delivery zone (e.g., retractor):
This subclass is indented under subclass 213. Device wherein the movement of the backing is in a direction away from the source of the delivered sheets.

215 Responsive to increase:
This subclass is indented under subclass 214. Device provided with means to detect growth in the accumulation of the stack of sheets on or held by the platform or backing, and further provided with means for causing movement of the platform or backing away from the source of delivered sheets as a result of such detection.

SEE OR SEARCH THIS CLASS, SUBCLASS:
152, 176, and 199, for a device wherein a feeler or senser is associated with a feeding or delivering device indicated by the title of the subclass, and see the Search Notes to subclass 152 for feeding subclasses including feeler means.

216 Conveyor-receiver for imbricated sheets:
This subclass is indented under subclass 214. Device wherein the direction of movement of the backing is simultaneously parallel to the surface of the sheet adjacent thereto and away from the delivered sheets, whereby the sheets are arranged in overlapped array, the edge of a previously delivered sheet lying beyond the edge of a next delivered sheet.

(1) Note. Included in this subclass is a device wherein a circular table rotates circumferentially as sheets are deposited thereon as well as a device wherein an endless belt conveyor moves about its carrying pulleys as sheets are deposited thereon. In both instances the sheets are imbricated on the conveyor, their margins exposed by an amount equivalent to the amount of movement of the conveyor surface during successive depositings of successive sheets.

SEE OR SEARCH THIS CLASS, SUBCLASS:
149, for a stack holder wherein sheets are arranged in imbricated array for feeding therefrom.

217 Lowering as pack-height increases:
This subclass is indented under subclass 213. Device wherein the direction of movement of the backing or platform is vertical and downward and such movement occurs in synchronism with the delivery of sheets thereto, whereby the platform recedes in relation to the growth of the stack of sheets accumulating thereon.

SEE OR SEARCH THIS CLASS, SUBCLASS:
147+, for a device having similar structure used for advancing a pile to a sheet feeder, and see the Search Notes therein for other pile advancer subclasses.

218 With auxiliary support for part of pile:
This subclass is indented under subclass 217. Device further provided with at least one additional platform that is usable for temporary accumulation of delivered sheets thereto.

(1) Note. In this subclass the stack lowering device includes a temporary support to which the sheets are delivered during the time necessary to remove a stack from the main lowering platform and to replace the main lowering platform into sheet receiving position. See search notes below for a temporary support not related to a stack lowering means.

SEE OR SEARCH THIS CLASS, SUBCLASS:
189+, for a temporary support not related to a stack lowering means, and see (1) Note above.

219 Spring-loaded support:
This subclass is indented under subclass 217. Device wherein the platform is urged upwardly under the influence of a yieldable member, whereby the weight of the growing stack of sheets is resisted by the yieldable member.

220 With movable pack-limiting member(s) (e.g., hold-down):
This subclass is indented under subclass 207. Device provided with means that confine the individual sheets to cause them to be formed into a stack, or align the sheets within a stack receiver, or direct the sheets into the receiver, or ensure that the sheets will remain within the receiver after being directed thereto, said means being capable of movement.

(1) Note. In this subclass the device includes a movable guide means or a movable sheet hold-down means.

221 And means to move members cyclicly against sheet edges (e.g., jogger):
This subclass is indented under subclass 220. Device further provided with linkage powered from a source other than the kinetic energy of the moving sheet itself, which linkage effects periodic movement of the confining or aligning means against peripheral portions of the delivered sheets.

SEE OR SEARCH THIS CLASS, SUBCLASS:
224, for a device wherein the kinetic energy of a moving sheet displaces a movable energy-absorber, and the replacement of the energy-absorber into its original position tends to jog or align the sheet.

222 And yieldable connection in moving means:
This subclass is indented under subclass 221. Device wherein the linkage includes a resilient element, whereby one portion of the linkage may move whereas another portion of the linkage does not move.

223 Members adjustable to sheet size:
This subclass is indented under subclass 220. Device wherein the confining means may be moved to vary the dimensions thereof to accommodate the length and width dimensions of the sheets comprising the stack.

SEE OR SEARCH THIS CLASS, SUBCLASS:
144, and 171, for a sheet-feeding holder that is adjustable to the size of the sheets therein.

224 Sheet-impact bumper member:
This subclass is indented under subclass 223. Device wherein the confining means is further movable under the influence of the kinetic energy of the moving sheet delivered thereto, thereby to absorb the energy of the sheet.

SEE OR SEARCH THIS CLASS, SUBCLASS:
221+, for a sheet jogger powered from a source other than the kinetic energy of the sheet itself.

225 By means to change direction of sheet travel:
This subclass is indented under subclass 8.1. Device wherein the individual sheets move along a particular path or line of movement and provided with means to cause the individual sheets to move along a different path or line of movement.

226 With means to align sheet:
This subclass is indented under subclass 8.1. Device provided with means for positioning or locating a sheet with respect to some part of the device or with respect to some part of a mechanism that will operate on the sheet.

(1) Note. The term “positioning” may include the act of partially turning the sheet about an axis that passes through the surface of the sheet so that an edge thereof is accurately aligned if that edge was previously misaligned. Such turning is sometimes termed “orienting” in other classes if applied to articles conveyed in the device of that other class. In class (271) it is clear from the total disclosure that the alignment is applied to a sheet and that the sheet will be operated upon by some further mechanism (which mechanism, if claimed, is recited only by its name). If partial turning occurs, it is incidental to alignment, but the purpose is to synchronize the feeding of the sheet to the operation to be performed on that sheet by locating the sheet precisely prior to feeding.

(2) Note. Implicit in a device for the subclasses indented herebelow is the concept of sheet movement along a direction

of sheet travel. The movement is caused by one or more conveyors which move the successive sheets to an aligner and move the sheets away from an aligner. The conveyor structure is different from the aligner structure, except in the following subclasses: 233, where a rear-edge aligner may also serve to push a sheet by its rear-edge; and 242, where a conveyor includes an aligner (usually for the front edge) therewith.

(3) Note. For purpose of facilitating the definition of the subclasses indented hereunder, the following discussion and definition of terms used is herein presented. A "sheet" is a thin, usually flexible object having length and width dimensions. The boundary of these dimensions is the "edge" of the sheet. The sheet is moved along a direction of travel, and the term "side-edge" is applied to that edge which is generally parallel to the direction of travel, while the terms "front edge" and "rear edge" are applied to those edges which are generally perpendicular to the direction of travel, at the leading and trailing ends respectively. The term "gripper-couple" is applied to a mechanism comprising two elements having opposed surfaces, between which surfaces a sheet is placed; whereby as the elements are urged toward one another the sheet is firmly contacted by the surfaces so that as the surfaces move together in any direction the sheet will be moved correspondingly, until the elements are urged apart to release sheet. The surface may be on the peripheries of roller which rotate in opposite directions.

SEE OR SEARCH THIS CLASS, SUBCLASS:

13, 15, and 17, for a side-edge aligner combined with a conveyor as indicated in the title.

227 Responsive to sheet-sensor:

This subclass is indented under subclass 226. Device provided with means to detect the presence of a sheet, or of an index mark on said sheet, at a particular location of the device, and further provided with means to activate the sheet-positioning means as a result of such detection.

(1) Note. Included within the meaning of the term "sheet-positioning means" is (a) an abutment against which a sheet edge is stopped to align that edge, and (b) a conveyor for moving the sheet so that its edge is aligned against the abutment.

SEE OR SEARCH THIS CLASS, SUBCLASS:

258.01+,265.01+, for a device responsive to a sheet senser to perform its function.

228 To control gripper-couple moving sheet to alignment:

This subclass is indented under subclass 227. Device wherein the sheet-detecting means regulates the operation of a gripper-couple to move the sheet into aligned position.

SEE OR SEARCH THIS CLASS, SUBCLASS:

226, see the (3) Note for the definition of the term "gripper-couple".

268, and 277, for a device wherein a gripper-couple causes sheet movement.

229 With means to retard sheet before alignment:

This subclass is indented under subclass 226. Device provided with first means for slowing the speed of movement of each sheet, which first means is in addition to a second means for positioning or locating each sheet, the first means acting before the second means.

230 By member moved with sheet:

This subclass is indented under subclass 229. Device wherein the first means is an element that moves in the same direction as that of the sheet to be retarded, but at a slower speed.

SEE OR SEARCH THIS CLASS, SUBCLASS:

243, for a front-edge aligner that moves with the sheet and may also serve to retard its movement.

231 Including suction retarder:

This subclass is indented under subclass 230. Device wherein the slowing is effected by a surface that contacts the sheet surface friction-

ally, the frictionally contact being enhanced by subatmospheric pressure urging the sheet toward the surface.

SEE OR SEARCH THIS CLASS, SUBCLASS:
183, for a suction retarder in a sheet delivery device.

232 Against aligner entering hole in sheet:
This subclass is indented under subclass 226. Device wherein each sheet to be positioned includes a slit or opening in the surface thereof, and the positioner includes an element that penetrates the slit or opening.

233 Against rear-edge aligner:
This subclass is indented under subclass 226. Device wherein the means for positioning sheets contacts the trailing end of a travelling sheet.

(1) Note. This subclass is for a device having a member that contacts the rear-edge of a sheet for the specifically disclosed purpose of aligning that rear-edge. The structure of the rear-edge contacting means may be similar to the structure of the rear-edge pusher found in subclass 269 or 271 below, but the difference in placement of a patent to the device is in the intent and function of the device. In this subclass (233) the function is to align the sheet in accord with its rear-edge; in the other subclasses (269 and 271) the function is to transport the sheet by pushing its rear-edge.

234 Against plural aligning assemblages:
This subclass is indented under subclass 226. Device provided with more than one sheet-positioning means.

(1) Note. For the purposes of this and indented subclasses, a plurality of elements is considered to be one means if all the elements function in the same way at the same time. Thus, two elements that contact the "front-edge" simultaneously comprise one assemblage, but another two elements that either contact the "side-edge" or contact the "front-edge" at a different time comprise another assemblage.

235 For incremental travel against successive front-edge aligners:
This subclass is indented under subclass 234. Device wherein the sheet moves in a particular path or line of movement, the movement being effected step-by-step due to the action of the plural positioners which act one after another on the sheet.

236 For front and side alignment of sheet:
This subclass is indented under subclass 234. Device wherein at least one of the positioners contacts the "front-edge" of the sheet and at least another of the positioners contacts a "side-edge" of the sheet.

SEE OR SEARCH THIS CLASS, SUBCLASS:
226, see the (3) Note for the definition of the terms "front-edge" and "side-edge".

237 Alignment of imbricated sheets:
This subclass is indented under subclass 236. Device wherein the sheets to be positioned are arranged in overlapped condition.

SEE OR SEARCH THIS CLASS, SUBCLASS:
151, for a device for advancing a pile of imbricated sheets.

238 Including oppositely-disposed side-edge aligners:
This subclass is indented under subclass 236. Device wherein one of the "side-edge" positioners is adjacent one "side-edge" of the sheet and another of the "side-edge" positioners is adjacent an edge on the other side of the sheet, whereby the sheet is caused to travel between the two "side-edge" positioners.

SEE OR SEARCH THIS CLASS, SUBCLASS:
226, see the (3) Note for the definition of the term "side-edge".
240, for a device comprising opposite side-edge aligners.

239 Plural aligners selectively used:
This subclass is indented under subclass 234. Device wherein the operator of the device may use any of the plural positioners at will.

240 Oppositely-disposed side-edge aligners:
This subclass is indented under subclass 234. Device wherein one of the positioners is adjacent one "side-edge" of the sheet and another of the positioners is adjacent and edge on the other side of the sheet, whereby the sheet is caused to travel between the two positioners.

SEE OR SEARCH THIS CLASS, SUBCLASS:
226, see the (3) Note for the definition of the term "side-edge".
238, for device comprising a "front-edge" aligner and opposite "side-edge" aligners.

241 By aligning a sheet-holder and its sheets:
This subclass is indented under subclass 226. Device provided with first means to which the sheet is firmly secured and by which the sheet is carried; and further provided with means for positioning said first means, whereby the sheet carried thereby will also be positioned.

(1) Note. In this subclass the sheet-holder usually comprises a gripper-couple assemblage (for the definition of which, see (3) Note of subclass 226), but the sheet-holder of this subclass may also include a suction plate to which the sheet may be held by vacuum.

(2) Note. See (1) Note of subclass 242 for the difference between the subject matter of this subclass (241) and subclass 242.

242 Against temporarily-stopped conveyer:
This subclass is indented under subclass 226. Device wherein the means for positioning sheets is integral with a means for moving individual sheets, and wherein the sheet-moving means is halted during the time the sheet is positioned relative thereto.

(1) Note. In this subclass the sheet conveyor usually comprises a gripper-couple assemblage (for the definition of which see (3) Note of subclass 226), which is similar to the device of subclass 241. The difference between the two subclasses is that in this subclass the sheet is aligned against a temporarily-stopped conveyor which may comprise a gripper, whereas in subclass 241 the sheet is gripped by a conveyor member, which conveyor member may be stopped so that the member, and the sheet carried thereby, will be aligned.

243 Against front-edge aligner moved in direction of sheet travel:
This subclass is indented under subclass 226. Device wherein the individual sheets are transported along a particular path, and provided with a sheet positioner for the "front-edge" of a sheet, which positioner is shifted along the same path as the sheet.

(1) Note. This subclass is for a device wherein the same instrumentality performs two functions, that is, the "front-edge" aligner travels with the sheet but at a speed slower than that of the conveyor for the sheet; thus the aligner both retards the sheet speed and aligns the "front-edge" of the sheet. For a device wherein one device is used to retard sheet speed and another device is used to align the "front-edge" thereof, see search notes below.

SEE OR SEARCH THIS CLASS, SUBCLASS:
226, see the (3) Note for the definition of the term "front-edge".
230, for a device wherein one device is used to retard sheet speed and another device is used to align the "front-edge" thereof, and see (1) Note above.

244 By retro-moving front-edge aligner:
This subclass is indented under subclass 243. Device wherein at least part of the shifting movement of the positioner is along the same path of movement as the sheet movement but in a direction opposite to the direction of movement of the sheet.

245 Against front-edge aligner interposed into sheet path:
This subclass is indented under subclass 226. Device wherein the individual sheets are transported along a particular direction of travel, and provided with a sheet positioner for the "front-edge" of a sheet, which positioner is moved so as to intersect the direction of sheet

travel and intercept the travel of the sheet momentarily.

246 Synchronized with intermittently-active conveyor-couple:
This subclass is indented under subclass 245. Device wherein the sheet-transporting means includes a gripper-couple that operates at recurrent intervals and in timed relation to the operation of the "front-edge" positioner.

SEE OR SEARCH THIS CLASS, SUBCLASS:
226, see the (3) Note for the definition of the term "gripper-couple".

247 Including sheet-margin gripper:
This subclass is indented under subclass 246. Device wherein the gripper-couple contacts an area of the sheet adjacent an edge thereof.

248 Against aligner adjacent side edge of sheet:
This subclass is indented under subclass 226. Device wherein the positioning means includes a guide surface that is intended to contact one of the "side-edges" of a traveling sheet, which guide surface is generally parallel to the direction of movement of the sheet.

SEE OR SEARCH THIS CLASS, SUBCLASS:
226, see the (3) Note for the definition of the term "side edge".

249 By shifting aligner and gripper-couple laterally of sheet travel:
This subclass is indented under subclass 248. Device provided with both a positioning means and a gripper-couple mechanism that move together with a relatively small degree of movement, the direction of movement being transverse to the direction of sheet movement.

(1) Note. In the device of this subclass, an open sheet-gripper, together with the aligner, move toward a sheet, the side edge of which is contacted by the aligner, after which action the sheet-gripper closes and the mechanism returns to a position at which the sheet is aligned, at which point the sheet- gripper is opened to release the aligned sheet and the sequence is repeated on a next sheet. Compare this with the device of subclass 252.

SEE OR SEARCH THIS CLASS, SUBCLASS:
226, see the (3) Note for the definition of the term "gripper-couple".
252, see (1) Note above.

250 By means to shift sheet laterally against aligner:
This subclass is indented under subclass 248. Device provided with means for imparting to the sheets an additional movement (i.e., additional to the direction of sheet travel), which additional movement is in a direction transverse to the direction of sheet travel and toward the positioning means and is a relatively small degree of sheet movement.

251 By oblique conveyor:
This subclass is indented under subclass 250. Device provided with a sheet moving means that moves successive sheets along a resultant direction that is composed of a large vector direction along the direction of sheet travel and a small vector direction transverse to said direction of sheet travel toward the side-edge positioner.

(1) Note. It is clear that the sheet will at first move in a direction at an acute angle to the side aligner, and after contact of the side edge with the aligner, the sheet will then move parallel to the side aligner.

252 By gripper-couple pulling sheet laterally:
This subclass is indented under subclass 250. Device wherein the means to impart additional movement to the sheets comprises a gripper-couple mechanism that moves transverse to the direction of sheet travel.

SEE OR SEARCH THIS CLASS, SUBCLASS:
226, see the (3) Note for the definition of the term "gripper-couple".

253 With means to adjust position of aligner:
This subclass is indented under subclass 226. Device provided with means to vary the placement of the positioning means with respect to the device.

254 During operation of feeder:
This subclass is indented under subclass 253. Device wherein the placement of the positioning means may be varied while the sheet feeder continues to operate.

(1) Note. For proper original placement of a patent into this subclass, the specification of the patent should clearly disclose continued operation of the sheet feeder or the sheet operating device during the act of adjusting the aligning means.

255 With indicator of aligner position:
This subclass is indented under subclass 253. Device further provided with means to show, by visible index markings, the relationship between the positioning means and the structure of the sheet feeder.

256 With means to interrupt feeding:
This subclass is indented under subclass 8.1. Device provided with means to discontinue, suspend or alter the normal flow or travel of sheets from a stack to an operation station.

(1) Note. A distinction should be made between the temporary stopping of a sheet during the period of time necessary to align that sheet, (which temporary stopping is found in the patents of subclasses 226+, as appropriate) and the stopping of the normal travel of a succession of sheets (which latter stopping is found in the patents of this and indented subclasses).

(2) Note. This subclass is for a device wherein a condition of the device itself, or a machine associated with the device is sensed, and feed is interrupted in response thereto.

257 Manually controlled (e.g., for alternate-cycle feed):
This subclass is indented under subclass 256. Device wherein the interruption of feeding is the direct result of a willful act of an operative.

(1) Note. This subclass is for a device wherein it is desired to change from a condition during which sheet feed occurs during every cycle of operation of the feeder, to a condition during which sheet feed occurs only during every second (or every third or fourth) cycle of operation of the feeder. The feed is interrupted during the "non-feed" cycles at the will of an operative. This subclass is also for a device wherein it is desired to manually override the interrupted feed so as to operate the feeder for the purpose of clearing any jammed or excess sheets.

258.01 Responsive to sheet sensor:
This subclass is indented under subclass 256. Subject matter wherein the feeding interrupting means includes a device for detecting the absence of the sheets or presence of a particular condition of the sheets adjacent to the feeding interrupting means and in response thereto discontinue, suspend or alter the normal flow or travel of the sheet from the stack to the operation station.

SEE OR SEARCH THIS CLASS, SUBCLASS:
3.13, for a sheet feeding and delivering having a sheet sensor.

SEE OR SEARCH CLASS:
192, Clutches and Power-Stop Control, subclasses 126+ for a clutch controlled by a sheet detector.
221, Article Dispensing, subclasses 13+ for an automatic control of a discharge assistant operation in response to the depletion of supply.
235, Registers, subclasses 375+ for various systems controlled by the data bearing records.
902, Electronic Funds Transfer, subclass 16 for a cash dispenser sensitive to an erroneous passage of plural bills.

258.02 Interrupts feeding upstream only:
This subclass is indented under subclass 258.01. Subject matter wherein the detecting device in response to a particular condition detected discontinue, suspend, or alter the normal flow or travel of the sheet from the stack to the operation station only at a location ahead of the location of the detecting device.

258.03 Single sensor with timer:
This subclass is indented under subclass 258.01. Subject matter in combination with a timer wherein the timer is actuated by the detecting device.

258.04 Sensor operates warning indicator:
This subclass is indented under subclass 258.01. Subject matter comprising a means for producing a humanly perceptible signal in response to the sensing of malfunction by the detecting means.

258.05 Mechanical linkage:
This subclass is indented under subclass 258.01. Subject matter wherein the sheet sensor is a mechanically driven device and comprising a means for driving the sheet sensor and the feeding means in a timed relationship with each other.

(1) Note. An electrically powered sensor is excluded from this subclass.

259 Plural sensors:
This subclass is indented under subclass 258. Device provided with two or more of said detecting means.

(1) Note. This subclass is for a device wherein a plurality of sensers are located longitudinally along the direction of travel of successive sheets and detect a condition of jamming or a condition of rate of travel of the successive sheets as the successive sensers are activated.

260 Pneumatic sensors (e.g., to sense superposed sheets):
This subclass is indented under subclass 259. Device wherein the detecting means utilize air pressure or suction in their activating circuitry.

(1) Note. This subclass is for a device wherein two sensers are opposed to each other, and are located so that a succession of sheets pass between the sensers with the surfaces of the sheets adjacent to the sensers. Air, usually suction, applied to the sensers will detect the presence of a single passing sheet by activating one senser, but will detect the presence of superposed (i.e., doubled) sheets by activating both sensers.

261 Laterally spaced sensors (e.g., to sense misalignment):
This subclass is indented under subclass 259. Device wherein the detecting means are located across the direction of travel of the sheets.

(1) Note. This subclass is for a device wherein a succession of rectangular sheets are travelling along a direction perpendicular to their front or leading edges. If the front edge is inclined to that direction rather than perpendicular thereto, one corner of the front edge will pass one of the detectors before the other corner passes a respectively located detector, and this will activate the feed-interrupter so that misalignment can be corrected. This operation is distinguishable from front alignment provided for in another subclass (see search note below).

SEE OR SEARCH THIS CLASS, SUBCLASS:
226+, providing for front alignment of sheets, and see (1) Note above.

262 Excess-thickness sensor:
This subclass is indented under subclass 258. Device wherein the detecting means detects the presence of two or more sheets, or detects a sheet that is thicker than that for which the detector is adjusted.

(1) Note. This subclass is for a device wherein the flow of unwanted (due to double thickness) sheets is diverted to another path, as well as a device wherein the flow is stopped.

263 To activate an electric circuit:
This subclass is indented under subclass 262. Device wherein the detecting means is included in a system of wiring that carries a flow of electricity, and wherein said detecting means regulates said flow to activate the sheet-interrupter.

264 By means to convey sheet (e.g., from pack to operation):
This subclass is indented under subclass 8.1. Device provided with means for moving individual sheets to a particular position.

(1) Note. See the glossary entry for "conveyor" in the Class Definition wherein the difference between a "conveyor" of this class (271) and a conveyor of other classes is discussed. It should be emphasized that in a typical patent for this class (271) and this group of subclasses (264+) the total disclosure of the patent and the environment in which the device is to be used is of importance in proper placement of the patent. Thus, although a typical claim of a patent in this and indented subclasses may recite only a conveyor structure, it is clear from the patent that the conveyor is feeding a sheet to an operation that will change the characteristics of the sheet, or is feeding a sheet that originated from a stack of sheets, or both. In other words, the device does more than move an article from one location to another.

265.01 Responsive to sheet sensor:
This subclass is indented under subclass 264. Subject matter comprising a device which detects the presence or absence of the sheet at a designated location or a sheet thickness and in response thereto continue moving the individual sheet toward a desired location.

SEE OR SEARCH THIS CLASS, SUBCLASS:
3.13, 110+, 227+, and 258.01+, for other detector means.

265.02 Plural sensors:
This subclass is indented under subclass 265.01. Subject matter including two or more detecting devices.

265.03 Laterally spaced sensors:
This subclass is indented under subclass 265.02. Subject matter wherein the detecting devices are located at different locations at a distance from each other and along the direction of travel of the sheet.

(1) Note. This subclass is for a device wherein a succession of sheets are travelling along a direction perpendicular to their front or leading edges and the detecting means are located across from the line of travel of the sheets.

SEE OR SEARCH THIS CLASS, SUBCLASS:
226+, for a feeding with means to align a sheet.

265.04 Thickness sensor:
This subclass is indented under subclass 265.01. Subject matter wherein the detecting device detects combined thickness of two or more sheet layers or detects depth of the individual sheet.

266 With intermittent movement of the sheet:
This subclass is indented under subclass 264. Device wherein the conveyor causes the sheet to move intermittently or step-by-step.

(1) Note. This subclass is for a feeder wherein a particular sheet is to be moved through an operating station whereat a plurality of operations is to be performed on the same sheet, but each operation will be performed at a different location on that sheet. The feeder moves the sheet through the machine in successive steps.

267 On oscillating or reciprocating conveyor:
This subclass is indented under subclass 264. Device wherein the sheet-moving means comprises mechanism that itself moves to and fro but imparts movement to the sheet in only one direction.

(1) Note. The to-and-fro movement can be arcuate oscillation or rectilinear reciprocation.

268 Including gripper-couple:
This subclass is indented under subclass 267. Device wherein the sheet-moving means comprises a gripper-couple that contacts an area of the sheet adjacent an edge thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:

226, see the (3) Note for the definition of the term "gripper-couple".

269 Including rear-edge pusher:

This subclass is indented under subclass 267. Device wherein the sheet-moving means comprises a member that contacts the trailing end of the travelling sheet.

(1) Note. For the difference between this subclass (269) and subclass 233, see (1) Note of subclass 233.

SEE OR SEARCH THIS CLASS, SUBCLASS:

233, and 271, for a device including a rear-edge pusher, and see (1) Note above.

270 With means to vary speed of conveyor sheet:

This subclass is indented under subclass 264. Device provided with means to adjust parts of the sheet-moving means relative to each other or their supporting mechanism, or provided with means to change the speed of movement of the sheet moved thereby, or provided with means to cyclicly change the speed of movement of the sheet-moving means (i.e., change from fast to slow repetitively).

271 By rear-edge pusher:

This subclass is indented under subclass 264. Device wherein the sheet-moving means comprises a member that contacts the trailing end of the travelling sheet.

(1) Note. For the difference between this subclass (271) and subclass 233, see (1) Note of subclass 233.

SEE OR SEARCH THIS CLASS, SUBCLASS:

233, and 269, for a device including a rear-edge pusher, and see (1) Note above.

272 Between superposed conveyor couple:

This subclass is indented under subclass 264. Device wherein the sheet-moving means comprises two elements, each of which elements has an endless, orbitally-moving surface, the surface of one element being opposite to and spaced from the surface of the other element during at least a portion of their movement and the surfaces moving in the same direction and engaging opposite surfaces of a sheet lying therebetween during said portion of movement.

(1) Note. The element may be an endless belt cooperating with another endless belt, a rotating roller cooperating with another rotating roller or an endless belt cooperating with one or more rotating rollers; the criterion for placement herein being only that the conveyed sheet lies between the elements which thereby cooperate to move the sheet.

273 Having means to permit separation of couple:

This subclass is indented under subclass 272. Device provided with structure whereby the two elements may be moved away from one another.

(1) Note. This subclass provides for a feeder wherein one part of the conveyor couple may be separated from the other part to remove sheets that may have become jammed between the parts.

274 Including couple-elements resiliently urged together:

This subclass is indented under subclass 273. Device wherein the two elements are normally biased toward one another by yieldable means and the movement away from one another is resisted by the yieldable means.

275 On peripheral face of drum or belt:

This subclass is indented under subclass 264. Device wherein the sheet-moving means comprises a circumferential surface of a rotating or endlessly-orbiting member, the conveyed sheet being entirely in contact with said surface.

276 Including pneumatic means:

This subclass is indented under subclass 275. Device wherein the contact between the sheet and the conveyor surface is caused by vacuum means or air pressure means.

277 Including gripper-couple:

This subclass is indented under subclass 275. Device provided with at least two elements having surfaces located adjacent to and opposite to one another, the element surfaces engag-

ing opposed surfaces of the sheet located between the element surfaces with sufficient frictional force to move the sheet as the elements are moved by the drum or endless belt or chain on which the elements are mounted.

278 DELIVERING:
This subclass is indented under the class definition. Apparatus wherein means are provided limited to removing or conveying individual sheets from a work station to a receiver, stack, or some determined position.

279 Multiple discharge:
This subclass is indented under subclass 278. Apparatus having means to deliver the sheets to a plurality of receivers.

280 For separating sheet from moving assemblage of sheets:
This subclass is indented under subclass 279. Apparatus wherein the sheets to be delivered comprise a set of two or more sheets that are being conveyed toward two or more receivers, the apparatus being provided with means for disassociating one of said sheets from one or more other sheets and for concurrently delivering said one sheet to one receiver and the one or more other sheets to one or more other receivers.

(1) Note. This subclass and the indented subclasses are for a device wherein a "master" or "original" sheet has been superimposed onto a "copy" sheet and the so-formed set passed through a photocopying machine. After processing, the moving assemblage or set of superimposed sheets is separated, the "master" being delivered to one location and the "copy" being delivered to another location. The characteristics of this operation that distinguish it from feeding separators of this class, subclass 8 are that in this and the indented subclasses (a) the set is moving in a direction parallel to the surfaces of the sheets and (b) two receivers are provided for the two parts of the set.

SEE OR SEARCH THIS CLASS, SUBCLASS:
8.1+, for a device for feeding sheets from a stack of sheets.

281 By separating member moving in direction opposite of assemblage:
This subclass is indented under subclass 280. Apparatus wherein the means for disassociating includes a member which moves in a direction counter to the direction in which the assemblage is being conveyed to effect relative movement between the sheet and the remainder of the assemblage.

282 By sheet attracting means:
This subclass is indented under subclass 280. Apparatus wherein the means for disassociating includes means capable of drawing toward itself one or more of the sheets, e.g., by magnetism, suction, etc.

283 Pneumatic attracting means:
This subclass is indented under subclass 282. Apparatus wherein the attracting means includes pneumatic means for causing the attraction.

284 Opposed pneumatic attracting means:
This subclass is indented under subclass 283. Apparatus wherein oppositely located pneumatic attracting means are provided to act on opposite sides of the assemblage.

285 With leading edges of sheets offset:
This subclass is indented under subclass 280. Apparatus in which the assemblage is conveyed to disassociating means with the leading edge of one sheet in advance of the leading edge of another sheet.

286 With means to cause offset:
This subclass is indented under subclass 285. Apparatus in which means are provided to create the offset relation of the leading edges.

287 Of successive sheets to plural receivers in succession:
This subclass is indented under subclass 279. Apparatus wherein the sheets to be delivered comprise a sequence of two or more sheets that are being conveyed one after the other toward two or more receivers, the apparatus being provided with means for diverting a first of said sheets into a first receiver, a second of said sheets into a second receiver, the sequence continuing until a sheet is diverted into the last receiver whereupon the next sheet is diverted

into the first receiver and the operation is repeated.

(1) Note. A machine for this subclass and the indented subclasses differs from a machine for Class 270, subclasses 58.01+ in that this and the indented subclasses provide for the stacking into plural receivers of sheets from a single or an undetermined source, whereas Class 270, subclasses 58.01+ provides for the stacking into plural receivers of sheets from a plurality of source stacks, the sheets of which are to be collated into a plurality of finished stacks. See the search class notes in the class definition of Class 271 for further discussion. In this and the indented subclasses will also be found a machine which is programmed so that one or more of the receivers is "skipped" to form special stacks.

SEE OR SEARCH CLASS:

209, Classifying, Separating, and Assorting Solids, the appropriate subclasses for a machine wherein sheets are assorted into plural receivers in accordance with characteristics of the respective sheets.

270, Sheet-Material Associating, subclasses 58.01+, and see (1) Note above.

288 With control means to vary mode of operation:

This subclass is indented under subclass 287. Apparatus having means to alter the normal sequence of delivery.

(1) Note. Programming means to skip one or more receivers or means to deliver all sheets to a single receiver until the receiver is filled, or to deliver all sheets or sheets in excess of capacity of the receivers to an additional receiver are included here.

289 To bypass array of receivers:

This subclass is indented under subclass 288. Apparatus wherein the control means causes the sheets to be delivered to a location other than the receivers involved in the normal sequence of delivery.

290 To route sheets to subsequent array of receivers:

This subclass is indented under subclass 289. Apparatus wherein the other location is an additional group of receivers into which these sheets are successively delivered.

291 With selective actuation of means for inverting duplex sheets:

This subclass is indented under subclass 287. Apparatus including means to selectively deliver sheets having copy on both sides thereof in oppositely faced relation to that of sheets having copy on single sides thereof.

292 With movable receivers or receiver portions:

This subclass is indented under subclass 287. Apparatus in which at least a part of each receiver is movable, e.g., relative to another receiver part, the delivery location, etc.

293 With means to increase spacing between receiver defining portions:

This subclass is indented under subclass 292. Apparatus in which the means defining the boundaries of each receiver are relatively movable to increase the dimension of the entrance thereto.

294 Receivers moving into registry with delivery zone:

This subclass is indented under subclass 292. Apparatus in which the entrance of each receiver is successively moved into alignment with a stationary exit of the means delivering the sheets.

295 Receivers arranged in rotary array:

This subclass is indented under subclass 294. Apparatus in which the receivers are arranged in an array rotatable about an axis to align each receiver entrance with the delivering means exit.

296 By diverter or conveyor moving past receivers:

This subclass is indented under subclass 287. Apparatus in which the means delivering the sheets or a means for deflecting the sheets from the conveyor is successively moved into alignment with the entrance to each receiver.

297 By individual diverter for each receiver:
This subclass is indented under subclass 287. Apparatus in which an individual deflector is located adjacent the entrance to each receiver to direct conveyed sheets into that receiver.

298 With means to program discharge destination:
This subclass is indented under subclass 279. Apparatus wherein a means is provided by which an operator can feed precoded instructions into the machine to select the delivery sequence or discharge destination.

SEE OR SEARCH CLASS:
209, Classifying, Separating, and Assorting Solids, the appropriate subclasses for a machine wherein sheets are assorted into plural receivers in accordance with characteristics of the respective sheets.

299 To laterally spaced receivers:
This subclass is indented under subclass 279. Apparatus in which sheets are delivered to side-by-side receivers.

300 By release from conveyor at plural locations:
This subclass is indented under subclass 279. Apparatus in which a means to convey the sheets has a means to temporarily hold the sheets and then selectively discharges the sheets at one of the plurality of receivers.

301 Selectively to recirculating path or exit:
This subclass is indented under subclass 279. Apparatus in which an endless loop conveying path is provided and in which a selectively operable means is provided which in one condition maintains the sheet in the endless loop and in another condition causes the sheets to exit the loop.

302 By conveyor section movable to direct sheets along alternate paths:
This subclass is indented under subclass 279. Apparatus wherein the sheet delivering means is a conveyor that can be shifted or has a portion that can be shifted to divert the sheet into the receiver.

303 With movable diverter:
This subclass is indented under subclass 279. Apparatus having movable means to deflect a sheet from a conveying path to a receiver or receivers.

304 Bidirectionally rotating diverter roller:
This subclass is indented under subclass 303. Apparatus in which the diverter is a revolving wheellike member which can selectively revolve in opposing directions depending upon the desired destination of the sheet.

305 Individual diverter for each receiver:
This subclass is indented under subclass 303. Apparatus wherein a separate diverter is located adjacent the entrance to each receiver to direct conveyed sheets into that receiver.

306 With transfer means between conveyor and receiver:
This subclass is indented under subclass 278. Apparatus provided with means additional to the removing means and a receiving means, which additional means (i.e., transfer mechanism) is located adjacent a receiving means and which additional means facilitates or effects the passage of individual sheets from said removing means to said receiving means.

(1) Note. In this and the indented subclasses the delivery means includes a conveyor for merely moving a succession of individual sheets (usually in a direction parallel to their surfaces) from an operating station, and a receiver wherein the individual sheets are stacked (usually in surface-to-surface contact). The additional transfer mechanisms of these subclasses do more than merely convey the sheets in one direction. It is a positively acting mechanism that effects a change in position, orientation, speed, or other condition of the sheets just prior to the receipt of such sheets by the receiver.

307 Means to strip sheets from engagement with moving conveyor:
This subclass is indented under subclass 306. Apparatus in which the removing means comprises a moving conveyor and in which the transfer means includes means to separate sheets from engagement with the conveyor.

(1) Note. The strippers herein are to be distinguished from mere release means provided as an adjunct to the conveyor to terminate the conveying effect, e.g., cams for opening grippers of a gripper conveyor, means for terminating operation of a suction box for a suction conveyor, etc., and from the guide means commonly provided to guide an already released sheet from the conveyor to the receiving means.

308 Stripper cyclically movable between stripping and nonstripping position:
This subclass is indented under subclass 307. Apparatus in which the stripping means is cyclically movable, either in response to the need for removing a sheet or as a result of the stripping operation, between a position in which it is operative to separate a sheet from the conveyor and a position at which it would be incapable of initiating separation of a sheet.

309 By air blast:
This subclass is indented under subclass 307. Apparatus in which the means for stripping the sheet from the conveyor includes means for applying a pneumatic discharge to the sheet.

310 By means to attract sheet from conveyor:
This subclass is indented under subclass 307. Apparatus wherein the means for separating the sheet from the conveyor includes means capable of drawing the sheet toward itself, e.g., by suction, electrical attraction, etc.

311 Stripper normally in contact with conveyor surface:
This subclass is indented under subclass 307. Apparatus wherein the means for separating is retained in touching relation with the surface of the conveyor.

312 Stripper normally in spaced relation to conveyor surface:
This subclass is indented under subclass 307. Apparatus wherein the means for separating is normally retained in a position away from the conveyor surface even during the separating operation.

(1) Note. The spacing can be provided at the side of the conveyor or even below the conveyor surface as long as there is no contact between the stripper and the conveyor surface.

313 With means to maintain constant spacing of movable stripper:
This subclass is indented under subclass 312. Apparatus in which the stripper is mounted for movement toward and away from the conveyor surface during normal operation of the conveyor and in which means are provided to maintain a predetermined spacing between the stripper and the conveyor.

(1) Note. This device is to be distinguished from an adjustable separator which is locked in a predetermined position at a nominal spacing from the conveyor.

314 Rotary conveyor:
This subclass is indented under subclass 278. Apparatus in which the removing means includes means traveling in the arc of a circle for delivering the sheets.

315 With circumferential pocket members:
This subclass is indented under subclass 314. Apparatus in which the means moving in the arc of a circle includes one or more receptacles for the temporary holding of successive sheets, each receptacle lying in or adjacent to a peripheral portion of the means moving in the arc of a circle.

CROSS-REFERENCE ART COLLECTIONS

900 STRIPPER:
Device which separate a sheet from a moving conveyor.

901 MAGNETIC OPERATION:
Device which handle sheet material and which use a magnetic force in their operation.

902 REVERSE DIRECTION OF SHEET MOVEMENT:
Device which change the direction of sheet movement so that the leading edge of the sheet becomes the trailing edge of the sheet.

903 TRAVELING WICKET (FOR STACK ON EDGE):
Device which convey sheets by means of rotating or orbiting racks that support the stack on edge.

END