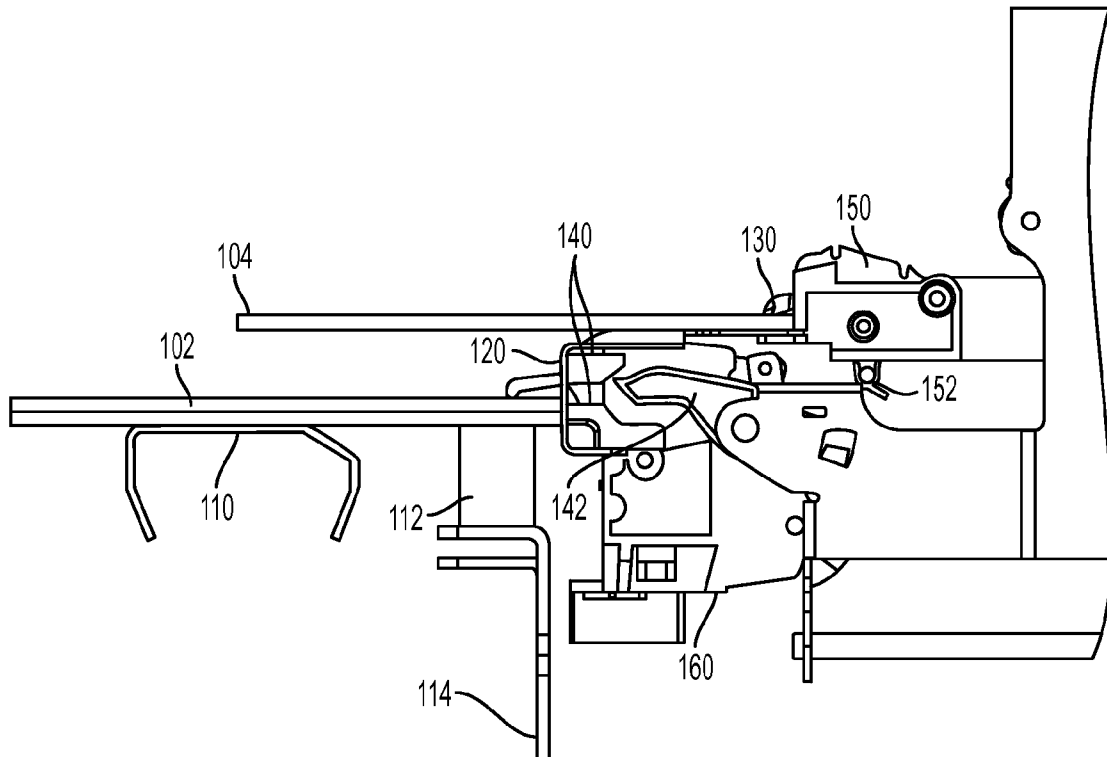




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(19) **United States**(12) **Patent Application Publication**
Shelhart et al.(10) **Pub. No.: US 2015/0166277 A1**(43) **Pub. Date: Jun. 18, 2015**(54) **EJECTOR FOR IMPROVED STACK
REGISTRATION**(52) **U.S. Cl.**CPC .. **B65H 3/24** (2013.01); **B65H 1/04** (2013.01);
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(US)(21) Appl. No.: **14/106,974**(22) Filed: **Dec. 16, 2013****Publication Classification**(51) **Int. Cl.**
B65H 3/24 (2006.01)
B65H 1/08 (2006.01)
B65H 1/04 (2006.01)(57) **ABSTRACT**

Sheet stacking apparatus examples herein include a clamp receiving at least two sheets (e.g., a set of sheets). The clamp aligns and holds the set of sheets. The sheet stacking apparatus also includes an ejector device, an elevator platform, and a registration wall. The ejector device moves the set of sheets held by the clamp in a first direction to move the set of sheets to the elevator platform. The ejector device moves the set of sheets held by the clamp in a second direction to move the set of sheets to contact either the elevator platform or a previously stacked set of sheets. The ejector device moves the set of sheets held by the clamp in a third direction, opposite the first direction, to position the set of sheets against the registration wall. The clamp then releases the set of sheets so that they remain against the registration wall.



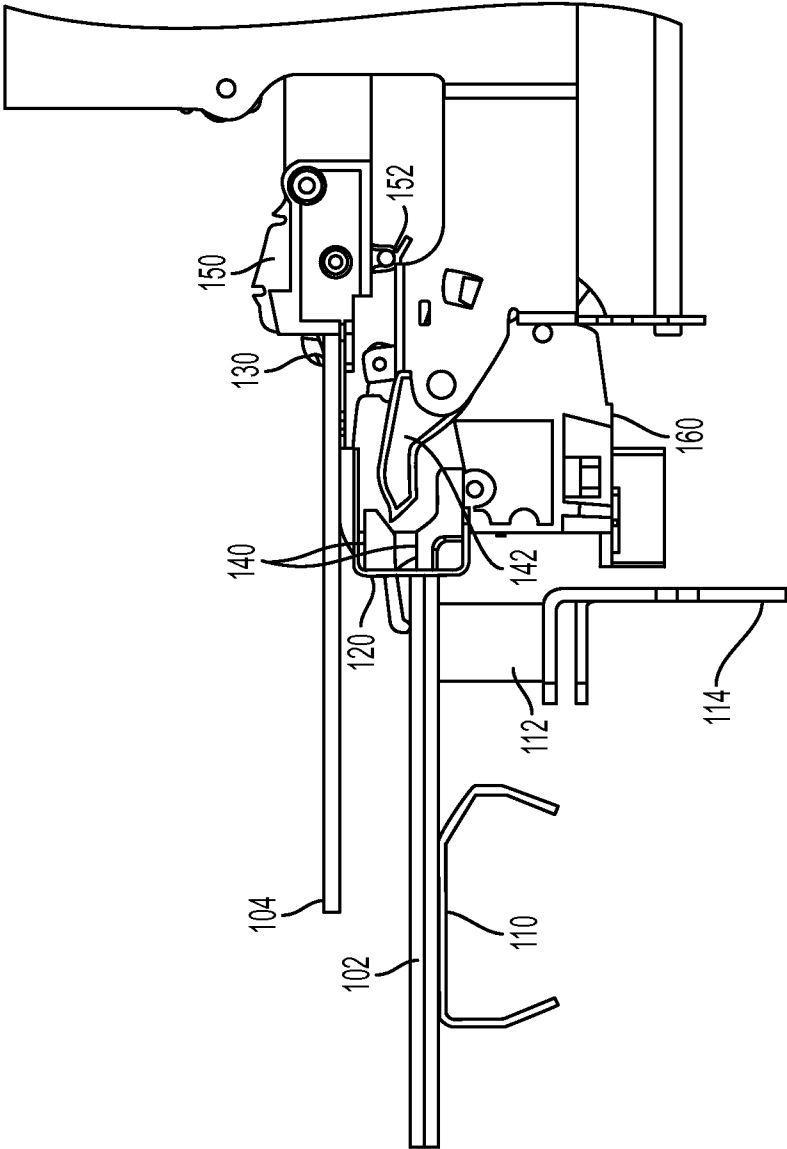


FIG. 1

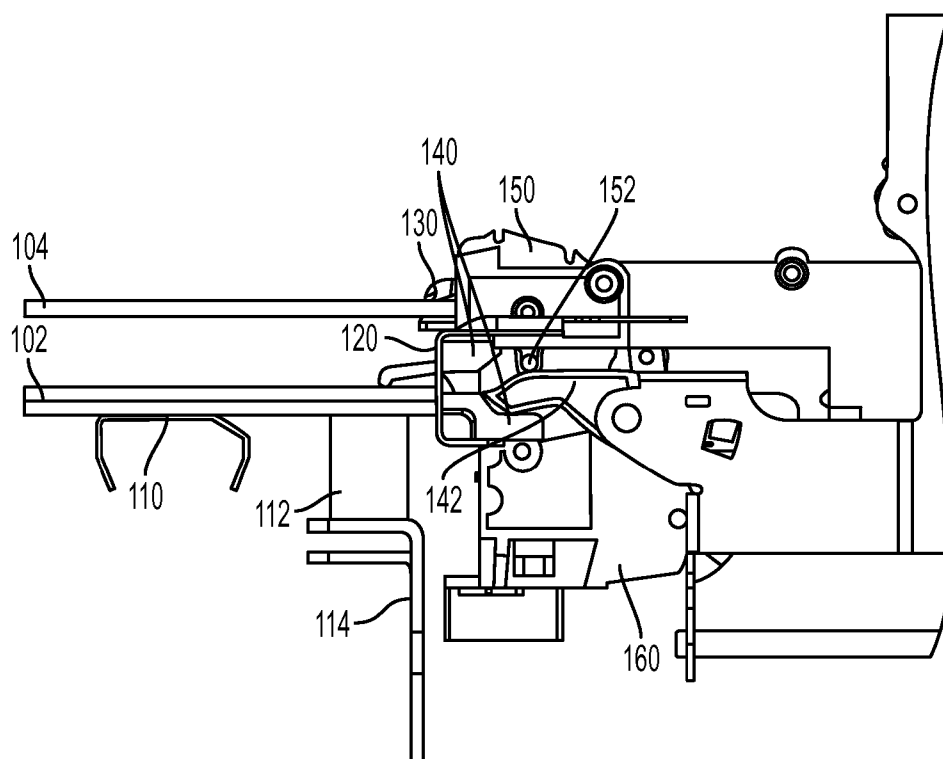


FIG. 2

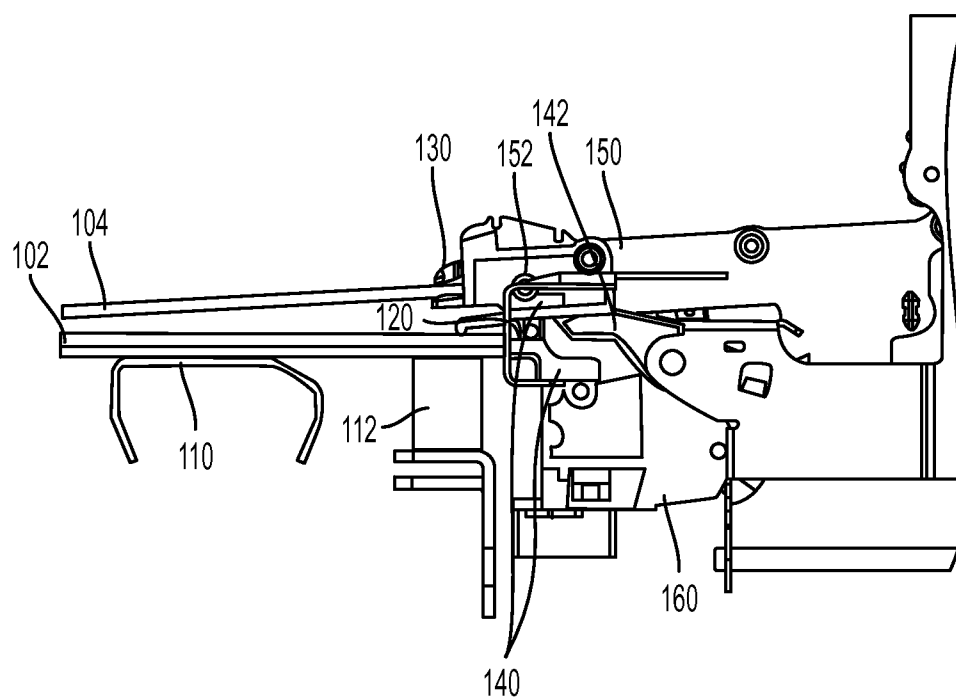


FIG. 3

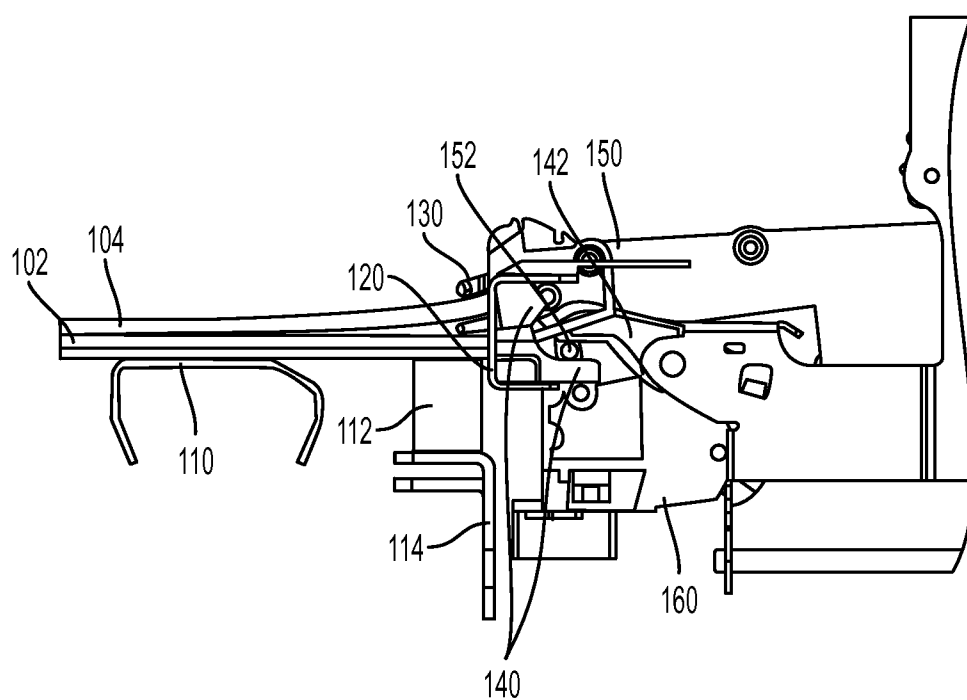


FIG. 4

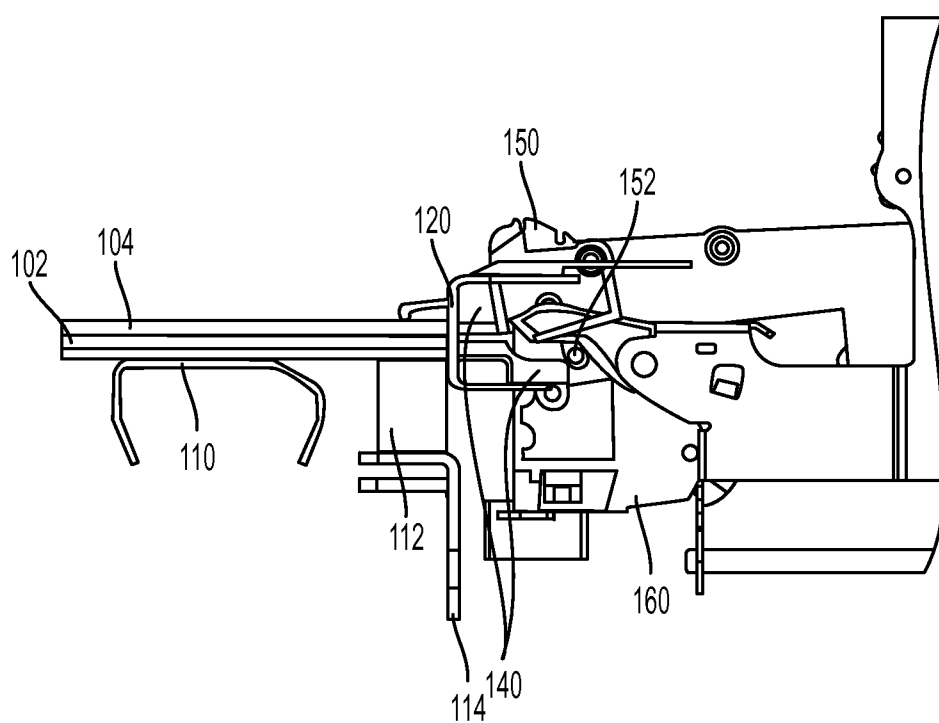


FIG. 5

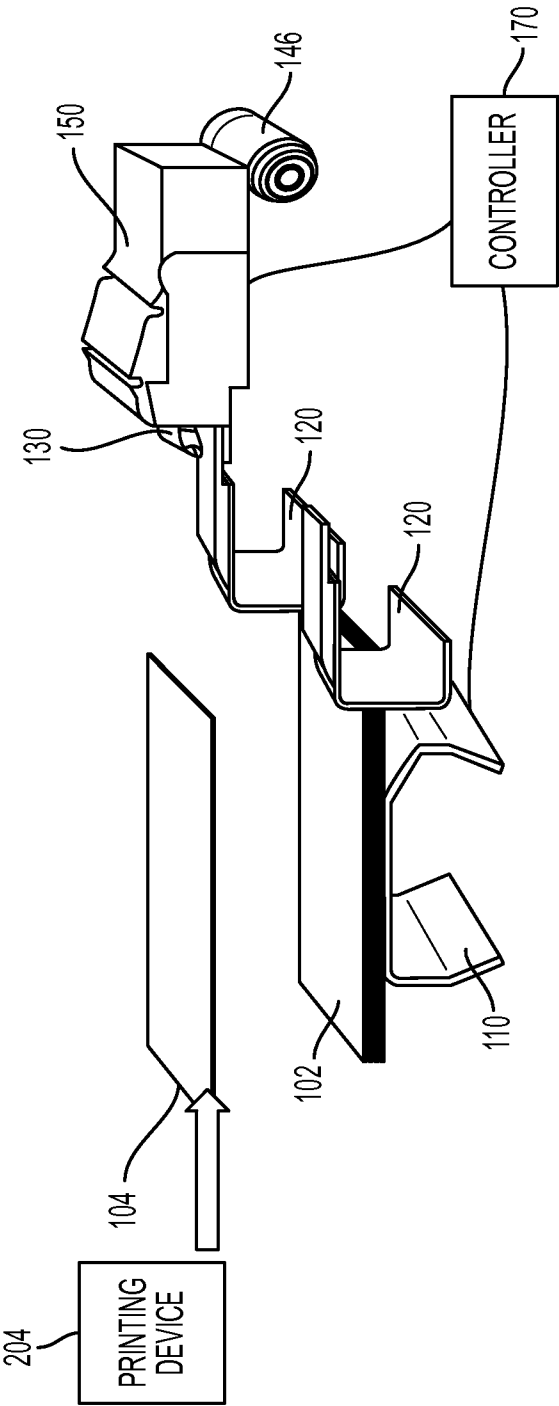


FIG. 6

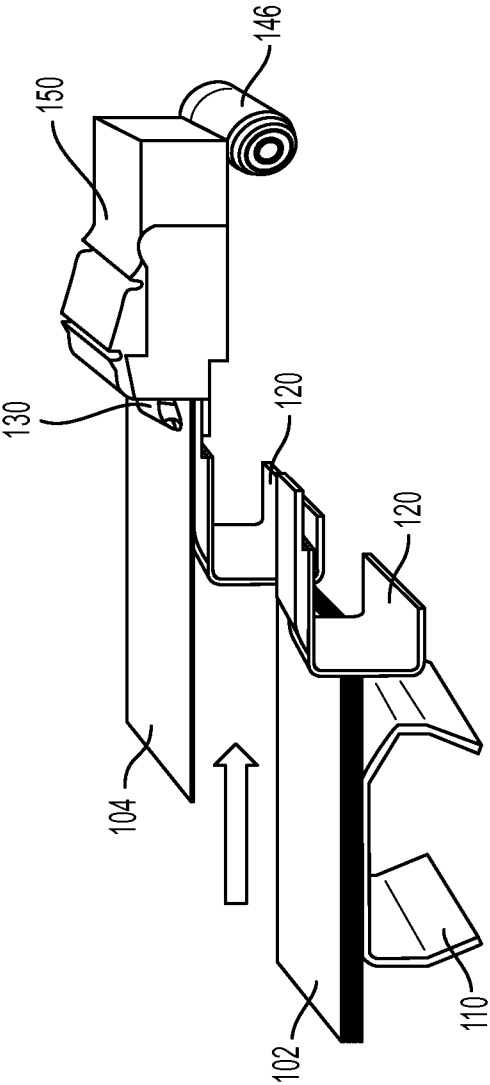


FIG. 7

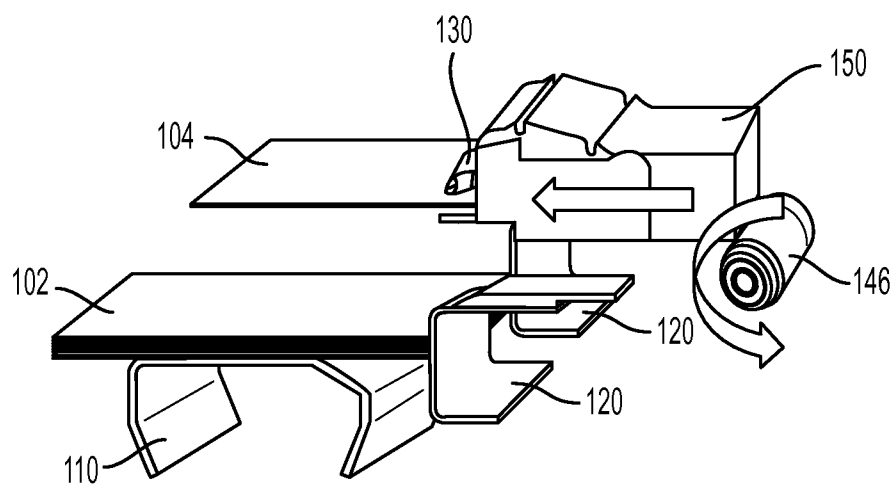


FIG. 8

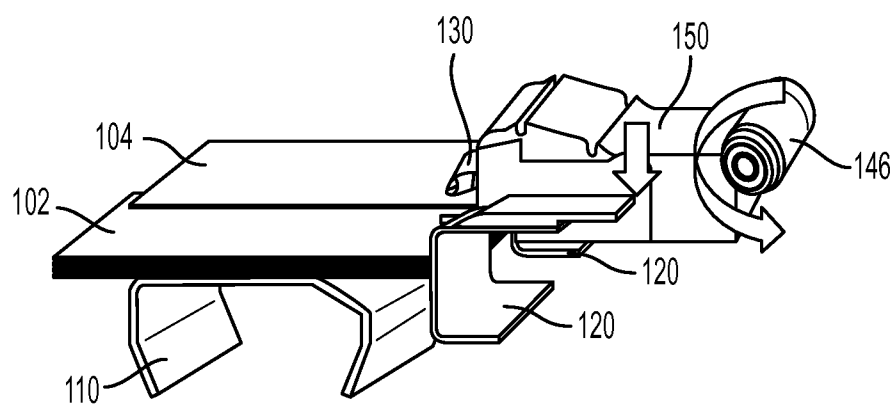


FIG. 9

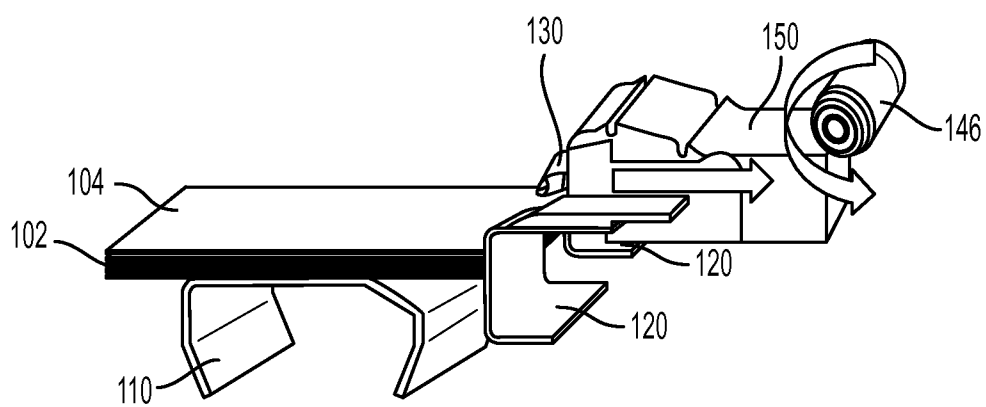


FIG. 10

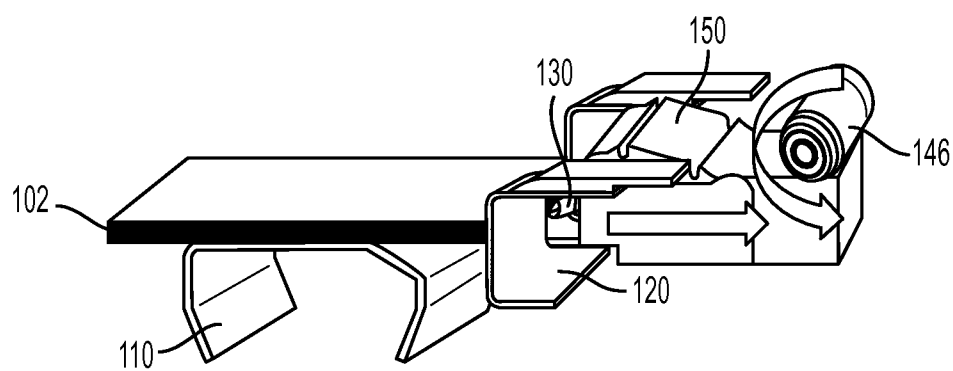


FIG. 11

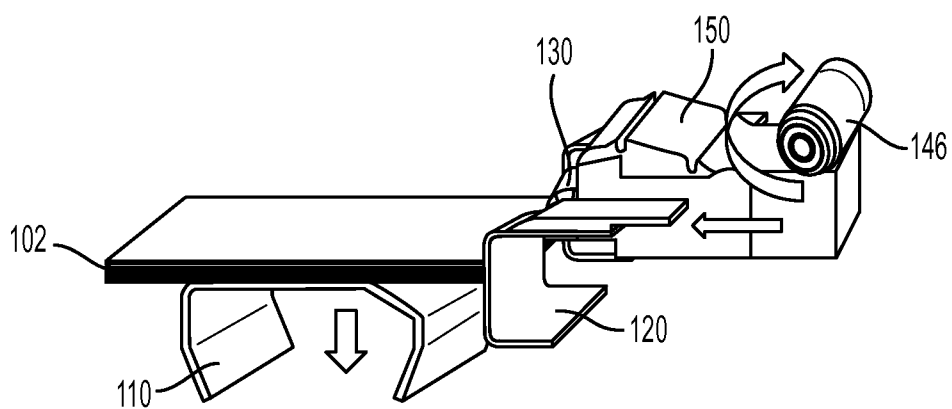


FIG. 12

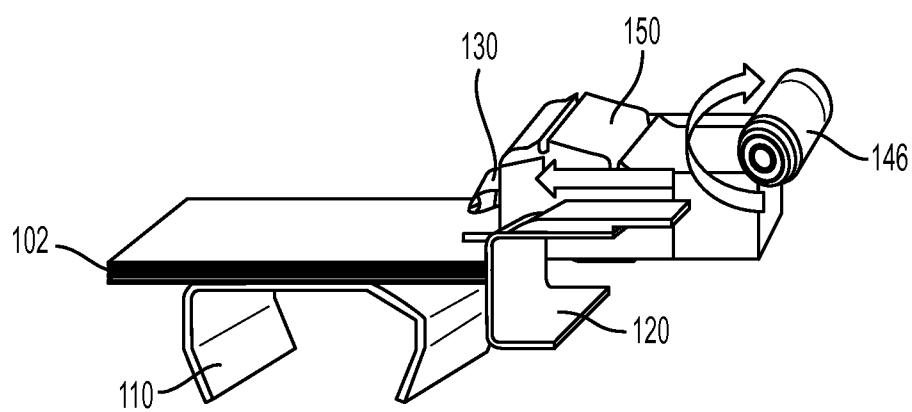


FIG. 13

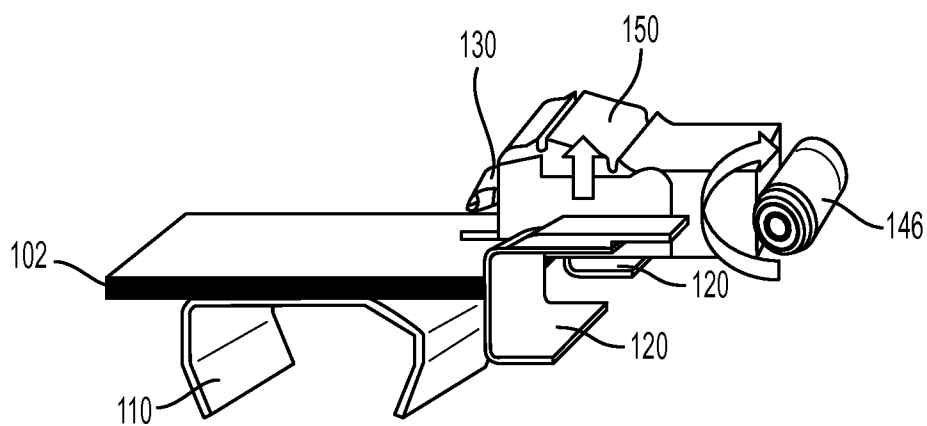


FIG. 14

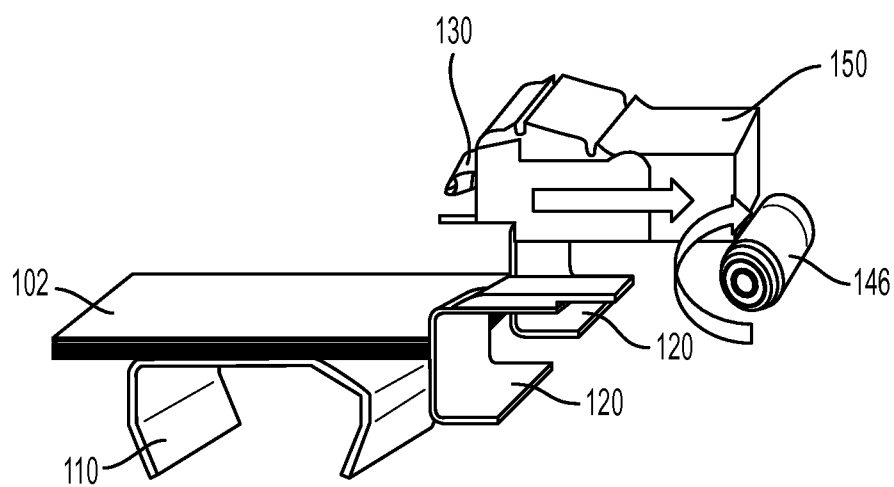


FIG. 15

EJECTOR FOR IMPROVED STACK REGISTRATION

BACKGROUND

[0001] Systems and methods herein generally relate to devices that stack sheets of media and more particularly to structures that stack sets of sheets and provide alignment (registration) of the different sets of sheets.

[0002] Many processing devices, such as printing devices, stack sheets of media before, during, and after various processing steps. The media can be of any form, including paper, card stock, cardboard, transparencies, metals, alloys, woods, plastics, etc. Many times, the stacks are output from the production device onto a flat surface, such as the platform or stacking elevator.

[0003] The stacking strategy for conventional devices sends sheets into a compiler throat where they are either stapled together and ejected onto the stack or left unstapled and pushed onto the stack in “chunks” of loose paper. It is difficult to eject one set on top of another to the exact same location (especially if the sets are unstapled) which can result in poor stack alignment (registration).

SUMMARY

[0004] Sheet stacking apparatus examples herein include a clamp receiving at least two sheets (e.g., a set of sheets). The clamp aligns and holds the set of sheets. The sheet stacking apparatus also includes an ejector device connected to the clamp, an elevator platform adjacent the ejector device, and a registration wall connected to the ejector device.

[0005] The ejector device moves the set of sheets held by the clamp in a first direction from a starting position to move the set of sheets to the elevator platform. The ejector device moves the set of sheets held by the clamp in a second direction that is perpendicular to the first direction to move the set of sheets to contact either the elevator platform or a previously stacked set of sheets that were previously moved to the elevator platform. The ejector device moves the set of sheets held by the clamp in a third direction, opposite the first direction, to position the set of sheets against the registration wall while the set of sheets is on the elevator platform or the previously stacked set of sheets. The clamp then releases the set of sheets so that they remain against the registration wall, while the set of sheets is on the elevator platform or the previously stacked set of sheets. After the clamp releases the set of sheets positioned against the registration wall, the ejector device moves to the starting position to receive additional sets of sheets.

[0006] Printing apparatus examples herein include a printer that prints markings on sheets and a clamp receiving at least two of the sheets (e.g., a set of sheets). The clamp aligns and holds the set of sheets. The printing apparatus also includes an ejector device connected to the clamp, an elevator platform adjacent the ejector device, a cam device supporting the ejector device, and a registration wall connected to the cam device.

[0007] The cam device has a shape that allows the cam to control movement of the ejector device. For example, an actuator moves the ejector device over the cam device to control the movement of the clamp and ejector device.

[0008] The ejector device moves the set of sheets held by the clamp forward (in a first direction) from a starting position (as controlled by the cam device) to move the set of sheets to the elevator platform. The ejector device moves the set of

sheets held by the clamp downward (in a second direction that is perpendicular to the first direction) as controlled by the cam device, to move the set of sheets to contact either the elevator platform (or a previously stacked set of sheets that were previously moved to the elevator platform). Thus, the ejector device moves toward the elevator platform when it moves in the second direction.

[0009] The ejector device moves the set of sheets held by the clamp back (in a third direction, opposite the first direction) as controlled by the cam device, to position the set of sheets against the registration wall while the set of sheets is on the elevator platform (or the previously stacked set of sheets). Thus, the ejector device moves in different parallel planes when moving in the first and third directions.

[0010] The clamp then releases the set of sheets so that they remain against the registration wall, while the set of sheets is on the elevator platform or the previously stacked set of sheets. However, the clamp releases the set of sheets only after the ejector device moves in all three movement directions (the first direction, the second direction, and the third direction) to make sure all sets of sheets are all similarly aligned against the registration wall. After the clamp releases the set of sheets positioned against the registration wall, the ejector device moves to the starting position to receive additional sets of sheets. Further, the elevator platform includes an actuator that moves the elevator platform downward in the second direction as the additional sets of sheets are moved to the elevator platform by the ejector device.

[0011] These and other features are described in, or are apparent from, the following detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Various exemplary systems and methods are described in detail below, with reference to the attached drawing figures, in which:

[0013] FIG. 1 is a schematic diagram illustrating devices herein;

[0014] FIG. 2 is a schematic diagram illustrating devices herein;

[0015] FIG. 3 is a schematic diagram illustrating devices herein;

[0016] FIG. 4 is a schematic diagram illustrating devices herein;

[0017] FIG. 5 is a schematic diagram illustrating devices herein;

[0018] FIG. 6 is a schematic diagram illustrating devices herein;

[0019] FIG. 7 is a schematic diagram illustrating devices herein;

[0020] FIG. 8 is a schematic diagram illustrating devices herein;

[0021] FIG. 9 is a schematic diagram illustrating devices herein;

[0022] FIG. 10 is a schematic diagram illustrating devices herein;

[0023] FIG. 11 is a schematic diagram illustrating devices herein;

[0024] FIG. 12 is a schematic diagram illustrating devices herein;

[0025] FIG. 13 is a schematic diagram illustrating devices herein;

[0026] FIG. 14 is a schematic diagram illustrating devices herein;

[0027] FIG. 15 is a schematic diagram illustrating devices herein; and

[0028] FIG. 16 is a schematic diagram illustrating devices herein.

DETAILED DESCRIPTION

[0029] As mentioned above, it is difficult to eject one set of sheets on top of another set of sheets to the exact same location (especially if the set of sheets is unstapled) which can result in poor stack alignment (registration). Therefore, the devices herein provide an ejector that clamps the set of sheets and pushes the set of sheets off the compiling shelf. However, instead of releasing the set of sheets at this point, the devices described herein pull the set of sheets back towards the registration wall of the compiler shelf, aligning the set of sheets against the registration wall.

[0030] Some components of the compiler area are shown in FIG. 1. More specifically, in FIG. 1, item 102 represents previously stacked and aligned sets of sheets and item 104 represents an additional set of sheets that will be placed on top of the previously stacked set of sheet 102. Such sets of sheets are positioned on and supported by a flat structure. This flat structure includes any form of platform 110, and can include a secondary supporting platform 112 as well as any frame members 114 that are useful in supporting the weight of the stacked set of sheets 102.

[0031] Further, FIG. 1 illustrates a registration wall 120 against which the sets of sheets 102 are aligned. Item 130 represents a clamp that holds the set of sheets 104 that is being placed upon the platform 110 (or on the other sets of sheets 102 that have already been placed on the platform 110). Item 150 represents an ejector mechanism connected to the clamp 130. While the ejector mechanism 150 includes many components, the component highlighted by reference numeral 152 is a cam follower that will follow the shape of various cam structures 140, 142 connected to various frame/drive members 160. More specifically, the cam structures include fixed cam elements 140 and at least one movable, biased cam element 142 (which can be biased by, for example, springs, actuators, etc.).

[0032] As shown in FIGS. 1-5, sheets are fed onto the compiler shelf of the clamp 130 until the set of sheets 104 is complete, at which point the set of sheets 104 is stapled and ejected or, if the set of sheets 104 is an unstapled set, simply ejected loose onto the stack 102. The ejector mechanism 150 clamps the set of sheets 104, pushes the set of sheets 104 out, then releases the clamping pressure applied by the clamp 130 and retracts. With conventional ejectors, the sets of sheets have a tendency to be flung by the ejector, or the set of sheets can bounce back off the rear guide (not shown), or be jostled slightly while the machine is performing other functions (lowering the tray, retracting the ejector, etc). Ultimately, the set of sheets can end up poorly aligned, with a pattern of disturbance based on the different sizes of the sets of sheets being ejected. This mis-registration can be worse for unstapled sets of sheets, which do not have the benefit of being locked together by staple(s).

[0033] The devices disclosed herein include hardware that controls the path of motion for the ejector mechanism. In one style of ejectors (which are not necessarily publically known) the ejector moves in a fairly linear path, where the set of sheets is pushed out, the clamp opens to release the set of sheets, and the ejector pulls straight back. Devices disclosed herein change the geometry of the cam guides 140, 142 (which the

follower pin 152 of the ejector 150 rides along) to allow the ejector 150 to move in or out, and up or down. Thus, the devices herein can easily alter the guides and adjust the clamp time to execute the ejection strategy shown in FIGS. 2-5.

[0034] More specifically, as shown in FIG. 2, as the ejector 150 pushes the set of sheets 104 out toward the elevator platform, the movable gate 142 is forced downward. The ejector 150 continues to follow the top of the movable gate 142 profile, keeping the set of sheets 104 clear of the registration wall 120.

[0035] Next, as shown in FIG. 3, the ejector 150 passes beyond the registration wall 120 along fixed guides 140, lowering the set of sheets 104 below the top of the registration wall 120. FIG. 3 also illustrates that the movable gate 142 returns to its original undeformed position. Again, the movable gate 142 is biased upward and returns to the original position once the cam follower 152 is moved past the movable gate 142 and stops applying downward pressure on the movable gate 142.

[0036] In FIG. 4, the ejector 150 starts to retract. This causes the ejector 150 to follow the surface of the cam 140 to descend further along the fixed portion of the guide and the bottom surface of the movable gate 142 until the stack of sheets is positioned against the registration wall 120. In FIG. 5, the clamp 130 retracts further, and after the set of sheets 104 is completely positioned against the registration wall 120, the clamp 130 releases the set of sheets 104 and returns back through the path defined by the cams 140, 142 to the original position shown in FIG. 1, where the clamp 130 is positioned to again begin receiving sheets that will be accumulated into the next set of sheets.

[0037] This method of ejecting sets onto a stack shown in FIGS. 1-5 offers several benefits with minimal design changes. The set of sheets 104 is pulled tightly against the registration wall 120. Thus, the structures disclosed herein greatly improve the stack registration quality.

[0038] The momentum of the set of sheets as it is released is also an issue with some ejection profiles. For example, if the set of sheets has not come to a complete stop before the clamp 130 releases its grip, the momentum of the set of sheets will cause the sheets to continue to move, resulting in shingling of unstapled sets. There is no opportunity to eject slower or wait longer before releasing the ejector 150 clamp 130 due to the tight timing constraints that exist. The timing of when the ejector 150 releases the clamp 130 is very critical and very sensitive. With the structures herein, all the momentum at the time of clamp 130 releases is directed straight back into the registration wall 120, so sets of sheets coasting or shingling does not occur. Timing is also no longer critical making the system more robust in operation.

[0039] Therefore, these disclosed devices cause sets of sheets being ejected onto a stack to be registered against the registration wall 120 for tight stack registration, allow a more robust operation from a firmware/timing perspective, and these devices have minimal impact to current designs, and can be implemented quickly and at low cost.

[0040] FIGS. 6-15 illustrate more generic devices herein. Such devices can be used with a printing apparatus 204, which outputs processed sheets to the clamp 130. Examples of such generic devices herein can include a printer 204 that prints markings on sheets (or any other processing device that outputs sets of sheets) and a clamp 130 receiving at least two of the sheets (e.g., a set of sheets 104). A controller 170 can be connected to all illustrated and discussed devices (even

though not all connections are shown in the drawings, to avoid clutter). Note that, to further avoid clutter, the printing device 204 and controller 170 are only illustrated in FIG. 6, but those ordinarily skilled in the art would understand that such items, and such connections to and from such items, are present in the structure, even if not specifically illustrated. Further, to avoid clutter, many devices such as actuators, wiring, etc., are intentionally omitted, but such items would be understood to be included within the illustrated structure by those ordinarily skilled in the art.

[0041] As shown in FIG. 7, as (or after) the sheets are delivered to the clamp 130, the clamp 130 aligns and holds the set of sheets 104. The apparatus also includes an ejector device 150 connected to the clamp 130, an elevator platform 110 adjacent the ejector device 150, a cam device 146 supporting the ejector device 150, and a registration wall 120 connected to the cam device 146 or to the elevator platform 110. Note that the registration wall 120 is shown as being connected to the ejector 150 in FIGS. 1-5 and, therefore, FIGS. 6-15 illustrate the alternative of the registration wall 120 being part of and connected to the elevator platform 110.

[0042] While one specific cam or slot shape is shown in FIGS. 1-5, those ordinarily skilled in the art would understand that the cam or slot can have any shape that can serve a specific situation of allowing the sets of sheets 102 to all be aligned against the registration wall 120. Thus, the cam device 146 has any shape that allows the cam to control movement of the ejector device 150 (in concert with the controller 170 controlling the timing of the movement of the clamp 130, the ejector 150, the elevator platform 110, etc.). For example, an actuator included as part of the illustrated ejector device 150 (or as a separate element) moves the ejector device 150 over the cam device 146 to control the movement of the clamp 130 and ejector device 150.

[0043] This controlled movement (which is shown generally by the curved arrow in FIGS. 6-15) therefore moves the ejector device 150 in an arc-shaped movement, as shown in FIG. 8. This portion of the controlled movement moves the set of sheets 104 held by the clamp 130 forward (in a first direction, which is to the left in the drawings, and is shown by the left arrow in FIG. 8). Thus, the ejector device 150 moves from a starting position shown in FIGS. 6 and 7 (as controlled by the cam device 146) to move the set of sheets 104 to the elevator platform 110.

[0044] In FIG. 9, the ejector device 150 moves the set of sheets 104 held by the clamp 130 downward (in a second direction that is perpendicular to the first direction, which is shown by the downward arrow in FIG. 9) as controlled by the cam device 146. The portion of the controlled movement shown in FIG. 9 moves the set of sheets 104 to contact either the elevator platform 110 (or a previously stacked set of sheets 102 that were previously moved to the elevator platform 110). Thus, the ejector device 150 moves downward toward the elevator platform 110 when it moves in the second direction.

[0045] Next, as shown in FIG. 10, the ejector device 150 moves the set of sheets 104 held by the clamp 130 back (in a third direction, opposite the first direction, which is to the right in the drawings, and is shown by the right arrow in FIG. 10) as controlled by the cam device 146. This portion of the controlled movement positions the set of sheets 104 against the registration wall 120 as the set of sheets 104 are on the elevator platform 110 (or on the previously stacked set of sheets 102). Thus, as can be observed by comparing FIGS. 8

and 10, the ejector device 150 moves in different parallel planes when moving in the first and third directions.

[0046] As shown in FIG. 11, the clamp 130 then releases the set of sheets 104 so that they remain against the registration wall 120 (while the set of sheets 104 is on the elevator platform 110 or the previously stacked set of sheets 104). Further, the clamp 130 releases the set of sheets 104 only after the ejector device 150 moves in the arc-shaped movement that is the summation of all three movement directions (the first direction, the second direction, and the third direction shown in FIGS. 8-10) to make sure all sets of sheets 102 are all similarly aligned against the registration wall 120.

[0047] As shown in FIGS. 12-14, after the clamp 130 releases the set of sheets 104 positioned against the registration wall 120, the ejector device 150 moves to the starting position (as shown generally by the curved arrow in FIGS. 12-15) to be in position to receive additional sets of sheets 102. More specifically, the elevator platform 110 moves in the third direction (downward, as shown by the arrow in FIG. 12) to prevent the clamp 130 and its associated shelf from disturbing the aligned stacks of sheets 102 as it returns to the starting position.

[0048] Thus, as shown in FIGS. 12-15, the ejector device 150 moves in the first direction (FIGS. 12-13); then upward in a fourth direction (opposite the second direction) as indicated by the upward arrow in FIG. 14, and finally in the third direction (FIG. 15) to return to the starting position shown in FIGS. 6-7 to be in position to receive additional sets of sheets 102.

[0049] As shown in FIG. 16, exemplary system systems and methods herein include various printing devices 204, which can comprise, for example, a printer, copier, multi-function machine, multi-function device (MFD), etc. The printing device 204 can include a controller/processor 224 and a communications port (input/output) 226 operatively connected to the processor 224 and to the computerized network 202 external to the printing device 204. Also, the printing device 204 can include at least one accessory functional component, such as a graphic user interface assembly 236 that also operate on the power supplied from the external power source 228 (through the power supply 222).

[0050] The input/output device 226 is used for communications to and from the computerized device 200. The processor 224 controls the various actions of the computerized device. A non-transitory computer storage medium device 220 (which can be optical, magnetic, capacitor based, etc.) is readable by the processor 224 and stores instructions that the processor 224 executes to allow the computerized device to perform its various functions, such as those described herein. Thus, as shown in FIG. 16, a body housing has one or more functional components that operate on power supplied from an alternating current (AC) source 228 by the power supply 222. The power supply 222 can comprise a power storage element (e.g., a battery, etc.).

[0051] The printing device 204 includes at least one marking device (printing engines) 210 operatively connected to the processor 224, a media path 216 positioned to supply sheets of media from a sheet supply 214 to the marking device(s) 210, etc. After receiving various markings from the printing engine(s), the sheets of media can optionally pass to a finisher 208 which can fold, staple, sort, etc., the various printed sheets and includes the devices illustrated in FIGS. 1-15. Also, the printing device 204 can include at least one accessory functional component (such as a scanner/document han-

pler 212, etc.) that also operate on the power supplied from the external power source 228 (through the power supply 222).

[0052] Many computerized devices are discussed above. Computerized devices that include chip-based central processing units (CPU's), input/output devices (including graphic user interfaces (GUI), memories, comparators, processors, etc. are well-known and readily available devices produced by manufacturers such as Dell Computers, Round Rock Tex., USA and Apple Computer Co., Cupertino Calif., USA. Such computerized devices commonly include input/output devices, power supplies, processors, electronic storage memories, wiring, etc., the details of which are omitted herefrom to allow the reader to focus on the salient aspects of the systems and methods described herein. Similarly, scanners and other similar peripheral equipment are available from Xerox Corporation, Norwalk, Conn., USA and the details of such devices are not discussed herein for purposes of brevity and reader focus.

[0053] The terms printer or printing device as used herein encompasses any apparatus, such as a digital copier, book-making machine, facsimile machine, multi-function machine, etc., which performs a print outputting function for any purpose. The details of printers, printing engines, etc., are well-known and are not described in detail herein to keep this disclosure focused on the salient features presented. The systems and methods herein can encompass systems and methods that print in color, monochrome, or handle color or monochrome image data. All foregoing systems and methods are specifically applicable to electrostatographic and/or xerographic machines and/or processes.

[0054] In addition, terms such as "right", "left", "vertical", "horizontal", "top", "bottom", "upper", "lower", "under", "below", "underlying", "over", "overlying", "parallel", "perpendicular", etc., used herein are understood to be relative locations as they are oriented and illustrated in the drawings (unless otherwise indicated). Terms such as "touching", "on", "in direct contact", "abutting", "directly adjacent to", etc., mean that at least one element physically contacts another element (without other elements separating the described elements). Further, the terms automated or automatically mean that once a process is started (by a machine or a user), one or more machines perform the process without further input from any user.

[0055] It will be appreciated that the above-disclosed and other features and functions, or alternatives thereof, may be desirably combined into many other different systems or applications. Various presently unforeseen or unanticipated alternatives, modifications, variations, or improvements therein may be subsequently made by those skilled in the art which are also intended to be encompassed by the following claims. Unless specifically defined in a specific claim itself, steps or components of the systems and methods herein cannot be implied or imported from any above example as limitations to any particular order, number, position, size, shape, angle, color, or material.

1. A sheet stacking apparatus comprising:

- a clamp receiving at least two sheets, said at least two sheets comprising a set of sheets, said clamp aligning and holding said set of sheets;
- an ejector device connected to said clamp;
- an elevator platform adjacent said ejector device;
- a cam device supporting said ejector device; and
- a registration wall connected to said ejector device,

said ejector device contacting and moving over said cam device,

said cam device having a shape to control movement of said ejector device as said ejector device moves over said cam device,

said ejector device moving said set of sheets held by said clamp in a first direction from a starting position to move said set of sheets to said elevator platform,

said ejector device moving said set of sheets held by said clamp in a second direction, perpendicular to said first direction, to move said set of sheets to contact one of: said elevator platform; and a previously stacked set of sheets previously moved to said elevator platform,

said ejector device moving said set of sheets held by said clamp in a third direction, opposite said first direction, to position said set of sheets against said registration wall as said set of sheets are on one of: said elevator platform; and said previously stacked set of sheets,

said clamp releasing said set of sheets to remain against said registration wall as said set of sheets are on one of: said elevator platform; and said previously stacked set of sheets, and

said ejector device moving to said starting position to receive additional sets of sheets after said clamp releases said set of sheets positioned against said registration wall.

2. The sheet stacking apparatus according to claim 1, further comprising an actuator moving said ejector device.

3. The sheet stacking apparatus according to claim 1, said clamp releasing said set of sheets only after said ejector device moves in said first direction, said second direction, and said third direction.

4. The sheet stacking apparatus according to claim 1, said ejector device moving in different parallel planes when moving in said first direction and said third direction.

5. The sheet stacking apparatus according to claim 1, said ejector device moving toward said elevator platform when moving in said second direction.

6. The sheet stacking apparatus according to claim 1, said elevator platform comprising an actuator moving said elevator platform in said second direction as said additional sets of sheets are moved to said elevator platform by said ejector device.

7. The sheet stacking apparatus according to claim 1, said at least two sheets comprising sheets previously processed by a processing apparatus.

8. A sheet stacking apparatus comprising:

a clamp receiving at least two sheets, said at least two sheets comprising a set of sheets, said clamp aligning and holding said set of sheets;

an ejector device connected to said clamp;

an elevator platform adjacent said ejector device;

a cam device supporting said ejector device; and

a registration wall connected to said cam device,

said ejector device contacting and moving over said cam device,

said cam device having a shape to control movement of said ejector device as said ejector device moves over said cam device,

said ejector device moving said set of sheets held by said clamp in a first direction from a starting position as controlled by said cam device to move said set of sheets to said elevator platform,

said ejector device moving said set of sheets held by said clamp in a second direction, perpendicular to said first direction, as controlled by said cam device to move said set of sheets to contact one of: said elevator platform; and a previously stacked set of sheets previously moved to said elevator platform,

said ejector device moving said set of sheets held by said clamp in a third direction, opposite said first direction, as controlled by said cam device to position said set of sheets against said registration wall as said set of sheets are on one of: said elevator platform; and said previously stacked set of sheets,

said clamp releasing said set of sheets to remain against said registration wall as said set of sheets are on one of: said elevator platform; and said previously stacked set of sheets, and

said ejector device moving to said starting position to receive additional sets of sheets after said clamp releases said set of sheets positioned against said registration wall.

9. The sheet stacking apparatus according to claim 8, further comprising an actuator moving said ejector device over said cam device.

10. The sheet stacking apparatus according to claim 8, said clamp releasing said set of sheets only after said ejector device moves in said first direction, said second direction, and said third direction.

11. The sheet stacking apparatus according to claim 8, said ejector device moving in different parallel planes when moving in said first direction and said third direction.

12. The sheet stacking apparatus according to claim 8, said ejector device moving toward said elevator platform when moving in said second direction.

13. The sheet stacking apparatus according to claim 8, said elevator platform comprising an actuator moving said elevator platform in said second direction as said additional sets of sheets are moved to said elevator platform by said ejector device.

14. The sheet stacking apparatus according to claim 8, said at least two sheets comprising sheets previously processed by a processing apparatus.

15. A printing apparatus comprising:
 a printer printing markings on sheets;
 a clamp receiving at least two of said sheets, said at least two of said sheets comprising a set of sheets, said clamp aligning and holding said set of sheets;
 an ejector device connected to said clamp;
 an elevator platform adjacent said ejector device;
 a cam device supporting said ejector device; and

a registration wall connected to said cam device,
 said ejector device contacting and moving over said cam device,
 said cam device having a shape to control movement of said ejector device as said ejector device moves over said cam device,
 said ejector device moving said set of sheets held by said clamp in a first direction from a starting position as controlled by said cam device to move said set of sheets to said elevator platform,
 said ejector device moving said set of sheets held by said clamp in a second direction, perpendicular to said first direction, as controlled by said cam device to move said set of sheets to contact one of: said elevator platform; and a previously stacked set of sheets previously moved to said elevator platform,
 said ejector device moving said set of sheets held by said clamp in a third direction, opposite said first direction, as controlled by said cam device to position said set of sheets against said registration wall as said set of sheets are on one of: said elevator platform; and said previously stacked set of sheets,
 said clamp releasing said set of sheets to remain against said registration wall as said set of sheets are on one of: said elevator platform; and said previously stacked set of sheets, and
 said ejector device moving to said starting position to receive additional sets of sheets after said clamp releases said set of sheets positioned against said registration wall.

16. The printing apparatus according to claim 15, further comprising an actuator moving said ejector device over said cam device.

17. The printing apparatus according to claim 15, said clamp releasing said set of sheets only after said ejector device moves in said first direction, said second direction, and said third direction.

18. The printing apparatus according to claim 15, said ejector device moving in different parallel planes when moving in said first direction and said third direction.

19. The printing apparatus according to claim 15, said ejector device moving toward said elevator platform when moving in said second direction.

20. The printing apparatus according to claim 15, said elevator platform comprising an actuator moving said elevator platform in said second direction as said additional sets of sheets are moved to said elevator platform by said ejector device.

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