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(71) Applicant: **HEWLETT-PACKARD DEVELOPMENT COMPANY, L.P.** [US/US]; 11445 Compaq Center Drive West, Houston, Texas 77070 (US).

(72) Inventors: **KELP-STEBBINS, Emma**; Columbia Tech Center, 1115 SE 164th Ave, Columbia Center, Suite 210, Vancouver, Washington 98683 (US). **FREDRICKSON, Daniel**; Columbia Tech Center, 1115 SE 164th Ave, Columbia Center, Suite 210, Vancouver, Washington 98683 (US).

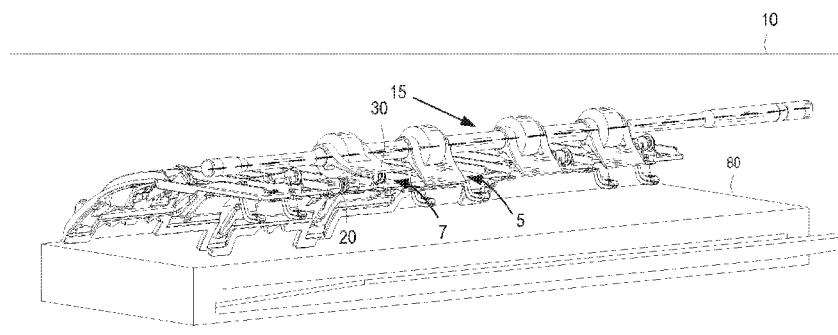
(74) Agent: **HASAN, Nishat**; 3390 E. Harmony Road, Mail Stop 35, Fort Collins, Colorado 80528 (US).

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(54) Title: FLAP TO DIRECT MEDIUM

FIG. 1



(57) Abstract: Examples disclosed herein relate to a device including a flap. In examples, the device includes a star wheel to advance a medium along an output media path; and a flap disposed to cover the star wheel in a first position and to be moved by a force applied by a medium being advanced along the output media path to a second position. In examples, the medium is to be directed toward an output tray when the flap is in the second position.



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- *as to the identity of the inventor (Rule 4.17(i))*
- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

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FLAP TO DIRECT MEDIUM

BACKGROUND

[0001] Sheet outputting devices – including printers, finisher, copiers, scanners, fax machines, multifunction printers, all-in-one devices, or other devices – process and output media such as plain paper, photo paper, transparencies, and other media. In some examples, sheet outputting devices can output media stacks of metals and polymeric media, such as Compact Discs, in addition to or instead of broad and thin media. Sheet outputting devices may output multiple sheets of media into an output tray.

BRIEF DESCRIPTION OF THE DRAWINGS

- [0002] The following detailed description references the drawings, wherein:
- [0003] FIG. 1 is a partial schematic view of a device according to an example.
- [0004] FIG. 2 is a partial schematic view of the device of FIG. 1 according to an example.
- [0005] FIG. 3 is a partial schematic view of the device of FIG. 1 according to an example.
- [0006] FIG. 4 is a partial schematic view of the device of FIG. 1 according to an example.
- [0007] FIG. 5 is a partial schematic view of the device of FIG. 1 according to an example.

DETAILED DESCRIPTION

[0008] In the following discussion and in the claims, the term “couple” or “couples” is intended to include suitable indirect and/or direct connections. Thus, if a first component is described as being coupled to a second component, that coupling may, for example, be: (1) through a direct electrical or mechanical connection, (2) through an indirect electrical or mechanical connection via other devices and connections, (3) through an optical electrical connection, (4) through a wireless electrical connection, and/or (5) another suitable coupling. The term “connect” or “connected” is intended to include suitable direct connections.

[0009] A number of devices output media onto an output bin or tray for retrieval. The size of output media may vary. The speed at which devices process media has been increasing. For example, printing speeds and scanning speeds of devices are increasing. As a result, media is being output onto the output tray at increasing rates. However, as the speed of media ejection increases it becomes more difficult to control the tidiness of media on the output tray. Many media ejection systems include star wheels to contact a medium and drive it through the media ejection system. However, some systems may be designed such that a user could contact a star wheel during media retrieval resulting in an injury.

[0010] To address these issues, in the examples described herein, a device is described which includes a flap to cover a star wheel and direct a medium onto an output tray. The device includes a media path to transport the medium to the output tray. In such an example, a star wheel is disposed to contact a medium being transported through the media path and drive the medium to the output tray. In operation, as the medium exits the media path, the medium may move the flap. The flap may be moved to a position to direct the medium towards the output tray as the medium exits the media path. In examples, the flap may contact a trailing portion of the medium and direct the medium towards a receiving surface of the output tray. In such examples, the flap may be positioned to cover a star wheel to reduce the risk of injury to a user retrieving media from the device.

[0011] Accordingly, the present specification describes, in one example, a device that includes a star wheel to advance a medium along an output media path; and a flap disposed to cover the star wheel in a first position and to be moved by a force applied by a medium being advanced along the output media path to a second position, the medium to be directed toward an output tray when the flap is in the second position.

[0012] In another example, the present specification describes an imaging device that includes a star wheel to advance a medium; a pinch roller disposed above the star wheel; an

output tray to receive the medium; and a flap disposed to cover the star wheel and to rotate in response to a force applied by the medium to a position in which the flap directs the medium towards the output tray when the medium is unconstrained by the pinch roller and the star wheel.

[0013] In yet another example, the present specification describes an imaging device that includes an axle coupled to the imaging device; a pinch roller coupled to the axle; a star wheel disposed below the pinch roller to form an end of a media path to advance a medium; an output tray to receive the medium; and a flap coupled to the axle and disposed to cover the star wheel in a first position and to rotate in response to a force applied by the medium to a second position in which a flap directs the medium towards the output tray.

[0014] Referring now to the drawings, FIG. 1 is a partial schematic view of a device 10 according to an example. FIG. 2 is a partial schematic view of device 10 of FIG. 1 according to an example. FIG. 3 is a partial schematic view of device 10 of FIG. 1 according to an example. FIG. 4 is a partial schematic view of device 10 of FIG. 1 according to an example. FIG. 5 is a partial schematic view of device 10 of FIG. 1 according to an example. The example device 10 includes a star wheel 20 and a flap 30. In examples, device 10 further includes an axle 40, a pinch roller 50, and an output tray 80. In examples, a medium traveling through device 10 may travel along a media path 15 towards output tray 80. In examples, star wheel 20, pinch roller 50, and flap 30 may be disposed to form an end of media path 15.

[0015] In examples, device 10 may be any device to output media which may be stacked on an output tray, such as an imaging device, a finisher, etc. An “imaging device” may be a hardware device, such as a printer, scanner, copier, multifunction printer (MFP), or any other device with functionalities to physically produce graphical representation(s) (e.g., text, images, models etc.) on paper, photopolymers, thermopolymers, plastics, fabric, composite, metal, wood, or the like. In some examples, an MFP may be capable of performing a combination of multiple different functionalities such as, for example, printing, photocopying, scanning, faxing, etc. In examples,

media may be any type of paper, photopolymers, thermopolymers, plastics, fabric, composite, metal, wood, etc., which may be stacked on a receiving surface 85 of output tray 80 of device 10. In examples, device 10 may output media along media path 15. In examples, media path 15 may be an output media path or a media ejection path for media ejected by device 10. In examples, more than one star wheel 20, pinch roller 50, and flap 30 may be disposed along the end of media path 15. In such examples, the number and location of star wheel 20, pinch roller 50 and flap 30 may be selected for the particular use and design of device 10. For example, the dimensions of various media traveling through device 10 may determine the location of star wheel 20, pinch roller 50, and flap 30 at the end of media path 15. In an example, device 10 may be an inkjet printer to eject paper along media path 15 onto output tray 80. In other examples, device 10 may be a laser printer to output media onto output tray 80.

[0016] In examples, output tray 80 may be any structure to receive media output from device 10. In some examples, output tray 80 may be integrated into device 10. In other examples, output tray 80 may be a separate device coupled to device 10. In examples, output tray 80 may include a surface 85 to receive multiple sheets or a stack of output media from device 10. Various parameters related to output tray 80 may be selected for the particular use and design of device 10. For example, the dimensions and orientation of output tray 80 may be determined by the size of the device 10 and the particular use of the system.

[0017] In examples, star wheel 20 may be disposed at one end of media path 15. In examples, a star wheel may be used in various mechanical devices to convey components traveling through the device. In such examples, a star wheel may be generally disk shaped with a periphery containing a plurality of recess or pockets thereby forming a star-shape. In other examples, a star wheel may have a generally circular shaped periphery with projecting fingers extending from the circular periphery to form a generally star shape. In examples, star wheels may rotate about a central axis. In the example of FIGs. 1-5, star wheel 20 may be disposed to

contact a medium 100 traveling along media path 15. In an example, star wheel 20 may be driven by another component, such as a motor, coupled thereto. In such an example, star wheel 20 may be disposed underneath pinch roller 50 to drive medium 100 through device 10 along with pinch roller 50. In other examples, star wheel 20 may drive medium 100 along media path 15 without the aid of pinch roller 50.

[0018] In examples, axle 40 may be coupled to device 10 above output tray 80. Axle 40 includes a central axis 45. Axle 40 may be any type of shaft about which an object may rotate. In some examples, axle 40 may be composed of any material to allow axle 40 to securely couple to and retain flap 30 and pinch roller 50 on device 10 such as metal, plastic, composite, wood, etc.

[0019] In examples, pinch roller 50 may be coupled to device 10 via axle 40. In examples, a pinch roller may rotate about a central axis and apply a force normal to a surface of the roller in contact with an object. In such examples, a pinch roller may include a portion composed of a compressible material, such as rubber, urethane, foam, cloth, etc. In examples, pinch roller 50 may be any type of pinch roller to couple to axle 40 and to rotate about central axis 45. In an example, medium 100 traveling along media path 15 may contact pinch roller 50 and star wheel 20. In an example, pinch roller 50 may be disposed to apply a force to medium 100 to advance medium 100 through media path 15. For example, pinch roller 50 may apply a force to medium 100 by compressing the compressible material of pinch roller 50. In the examples of FIG. 3 - FIG. 5, medium 100 is depicted as advancing along media path 15 according to an example. In such an example, the force applied by medium 100 as it is advanced along media path 15 may rotate pinch roller 50 about central axis 45. In examples, pinch roller 50 may be disposed on top of star wheel 20 to constrain medium 100 as depicted in FIG. 4. In such examples, pinch roller 50 and star wheel 20 may constrain medium 100 until a trailing edge of medium 100 no longer contacts pinch roller 50 or star wheel 20 as depicted in FIG. 5.

[0020] In examples, flap 30 may be disposed to cover star wheel 20. In examples, flap 30 may be coupled to axle 40. In examples, flap 30 may be disposed to cover star wheel 20 in a first position 5 in which flap 30 may be resting under the force of gravity as depicted in FIG. 1. In such an example, flap 30 may be in contact with star wheel 20. In examples, flap 30 may be disposed to cover star wheel 20 in a second position 7 in which flap 30 is rotate about central axis 45 depicted in FIG. 1 and FIG. 5. In examples, flap 30 may be coupled to axle 40 via arm 35a and arm 35b. In such an example, arms 35a may be coupled to axle 40 on one side of pinch roller 50 and arm 35b may be coupled to axle 40 on an opposite side of pinch roller 50. In examples, flap 30 may be coupled to axle 40 by snapping arm 35a and arm 35b on to axle 40. In examples, flap 30 may rotate freely about central axis 45 in response to a force applied thereon.

[0021] In examples, flap 30 may rotate about central axis 45 in response to medium 100 traveling along media path 15. In such an example, the weight of flap 30 may be selected to allow medium 100 traveling along media path 15 to rotate flap 30 about central axis 45. For example, flap 30 may weigh between 1 grams and 20 grams. In examples, flap 30 may apply a force to medium 100 to direct medium 100 towards output tray 80. In such examples, flap 30 may be rotated to second position 7 to direct medium 100 towards output tray 80 as depicted in FIG. 1 and FIG. 5. In such an example, flap 30 may contact a portion 110 of medium 100 to direct medium 100 towards output tray 80 when pinch roller 50 and star wheel 20 no longer constrain medium 100.

[0022] Referring now to FIG. 3 – FIG. 5, in examples, in operation, media 100 traveling along media path 15 may be driven toward pinch roller 50 and star wheel 20 as depicted in FIG. 3. In examples, as depicted in FIG. 4, media 100 may contact flap 30 and apply a force to rotate flap 30 around central axis 45 from first position 5, depicted in FIG. 3, to an elevated position depicted in FIG. 4. In examples, as depicted in FIG. 5, medium 100 is directed towards output tray 80 by flap 30 when medium 100 is unconstrained by pinch roller 50 and star wheel 20. In

such an example, flap 30 may be disposed in second position 7 to direct medium 100 towards receiving surface 85 of output tray 80. It will be understood that second position 7 may be lower than the elevated position of flap 30 depicted in FIG. 4 because when medium 100 is unconstrained by pinch roller 50 and star wheel 20 flap 30 may rotate downward due to the force of gravity.

[0023] In examples, flap 30 may be composed of any material with sufficient structural integrity to apply the downward force on medium 100. For example, flap 30 may be composed of a metal, such as aluminum, a metal composite, such as steel, a plastic, a wood, a composite, such as carbon fiber, carbon reinforced plastics, glass-filled plastic, glass-filled nylon, glass-filled polycarbonate, glass filled acrylonitrile butadiene styrene (ABS), etc. Various parameters related to flap 30 may be selected for the particular use and design of device 10. For example, the dimensions and location of flap 30 may be determined by the size of the device 10, the size and orientation of media to be stacked on output tray 80, the ejection rate of media onto output tray 80, and the particular use of the system. In an example, the number and locations of flap 30 in device 10 may be chosen to allow variability in the dimensions of output media. For example, flap 30 may be dimensioned to contact different sized media, such as, A3 media or A4 media.

[0024] While certain implementations have been shown and described above, various changes in form and details may be made. For example, some features that have been described in relation to one implementation and/or process can be related to other implementations. In other words, processes, features, components, and/or properties described in relation to one implementation can be useful in other implementations. Furthermore, it should be understood that the systems, apparatuses, and methods described herein can include various combinations and/or sub-combinations of the components and/or features of the different implementations described. Thus, features described with reference to one or more implementations can be combined with other implementations described herein.

[0025] The above discussion is meant to be illustrative of the principles and various embodiments of the present disclosure. Numerous variations and modifications will become apparent to those skilled in the art once the above disclosure is fully appreciated. It is intended that the following claims be interpreted to embrace all such variations and modifications.

What is claimed is:

1. A device comprising:

a star wheel to advance a medium along an output media path; and

a flap disposed to cover the star wheel in a first position and to be moved by a force applied by the medium being advanced along the output media path to a second position, the medium to be directed toward an output tray when the flap is in the second position.
2. The device of claim 1, wherein the flap is disposed in the second position to contact a portion of the medium and direct the medium toward a receiving surface of the output tray.
3. The device of claim 1, wherein the flap is coupled to an axle disposed above the star wheel.
4. The device of claim 1, further comprising:

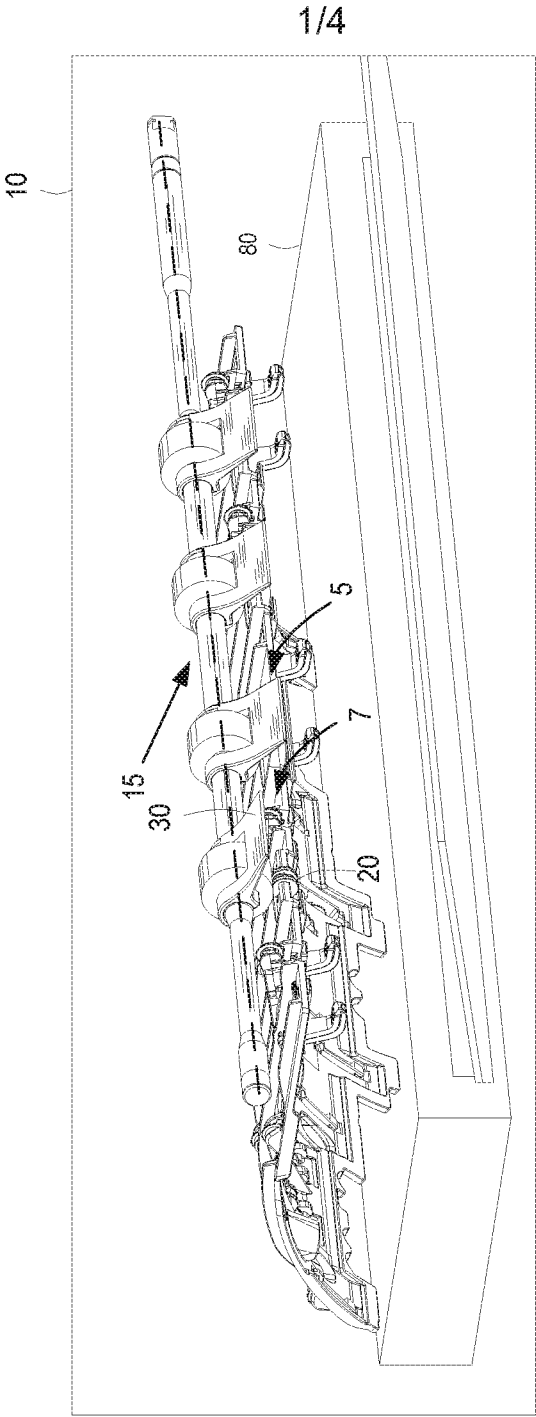
a pinch roller disposed above the star wheel to advance media along the output media path,

wherein the flap is to direct the medium toward the output tray when the medium is unconstrained by the pinch roller and star wheel.
5. The device of claim 4, wherein the flap and pinch roller are disposed on an axle.

6. The device of claim 1, wherein the flap is composed of at least one of a metal, a metal composite, a plastic, a wood, and a composite.
7. The device of claim 1, wherein the flap weighs between 1 grams and 20 grams.
8. An imaging device comprising:
 - a star wheel to advance a medium;
 - a pinch roller disposed above the star wheel;
 - an output tray to receive the medium; and
 - a flap disposed to cover the star wheel and to rotate in response to a force applied by the medium to a position in which the flap directs the medium towards the output tray when the medium is unconstrained by the pinch roller and the star wheel.
9. The imaging device of claim 8, wherein the flap is to apply a force to a portion of the medium when the medium is unconstrained by the pinch roller and the star wheel.
10. The imaging device of claim 8, wherein the flap and pinch roller are disposed on an axle.
11. The imaging device of claim 8, wherein the flap is disposed to surround the pinch roller.

12. The imaging device of claim 8, wherein the flap weighs between 1 and 20 grams.
13. An imaging device, comprising:
 - an axle coupled to the imaging device;
 - a pinch roller coupled to the axle;
 - a star wheel disposed below the pinch roller to form an end of a media path to advance a medium;
 - an output tray to receive the medium; and
 - a flap coupled to the axle and disposed to cover the star wheel in a first position and to rotate in response to a force applied by the medium to a second position in which a flap directs the medium towards the output tray.
14. The imaging device of claim 14, wherein the flap weighs between 1 grams and 20 grams.

FIG. 1



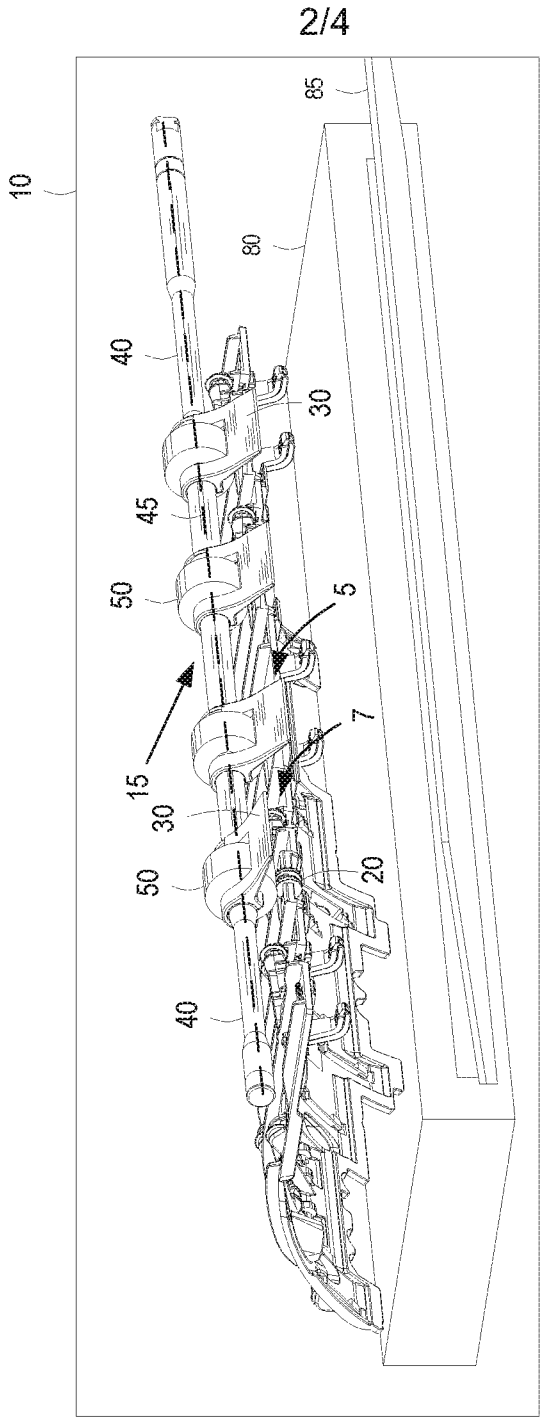


FIG. 2

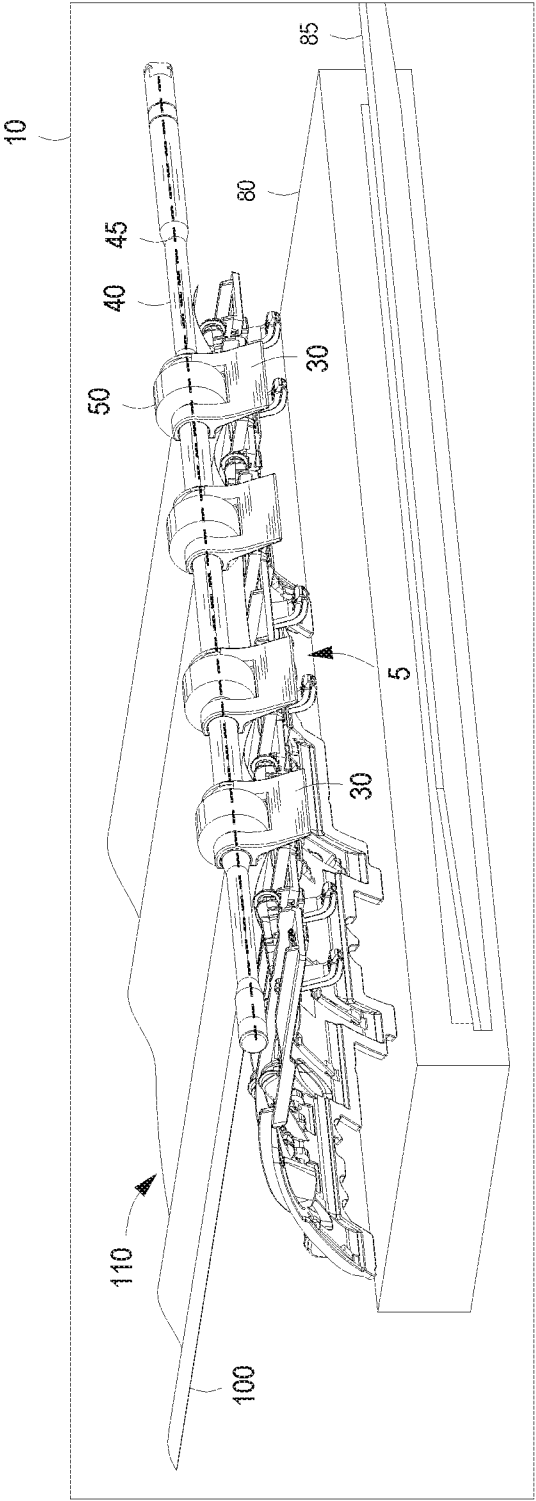


FIG. 3

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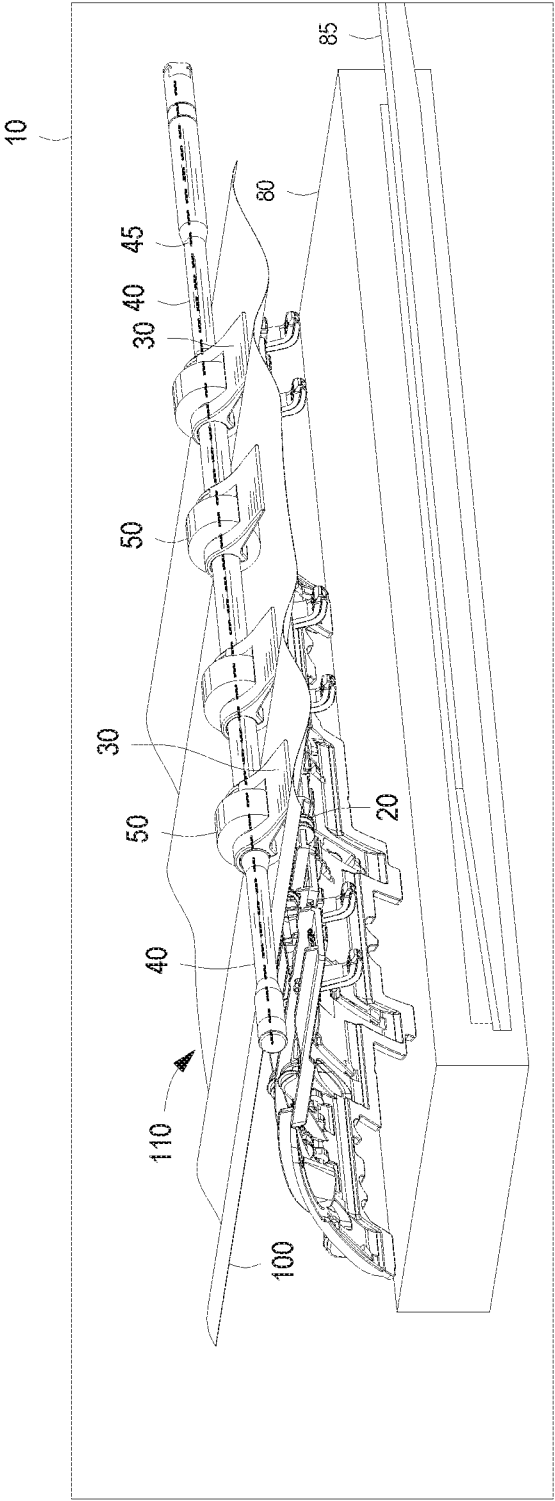
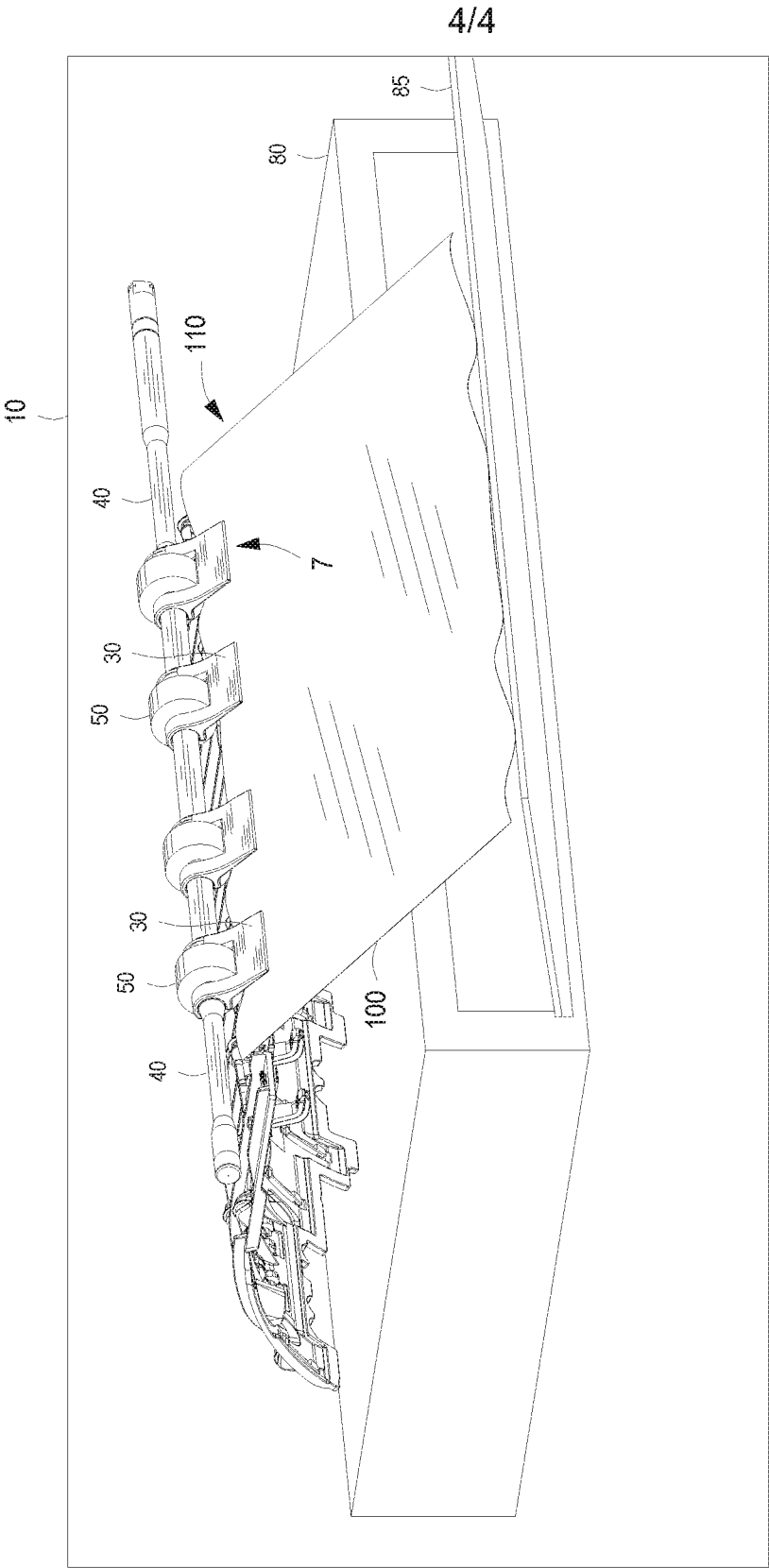


FIG. 4



INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 2016/049145

A. CLASSIFICATION OF SUBJECT MATTER <i>B41J 13/02 (2006.01)</i>		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) B41J 13/00, 13/02		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) Espacenet, USPTO, RUPTO, PatSearch (RUPTO internal)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5033731 A (XEROX CORPORATION) 23.07.1991, col.5 lines 11-48, col.7 lines 28-51, fig.2, ref.22, 22b, 16, 23, 14	1-14
A	US 5775824 A (SAMSUNG ELECTRONICS CO. LTD) 07.07.1998	1-14
A	US 2008/0136097 A1 (SHR-HOW HUANG) 12.06.2008	1-14
☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.		
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Name and mailing address of the ISA/RU: Federal Institute of Industrial Property, Berezhkovskaya nab., 30-1, Moscow, G-59, GSP-3, Russia, 125993 Facsimile No: (8-495) 531-63-18, (8-499) 243-33-37	Authorized officer S. Zhuravlev Telephone No. (495) 531-64-81	