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(54) Title: IMAGED MEDIA PRODUCTION

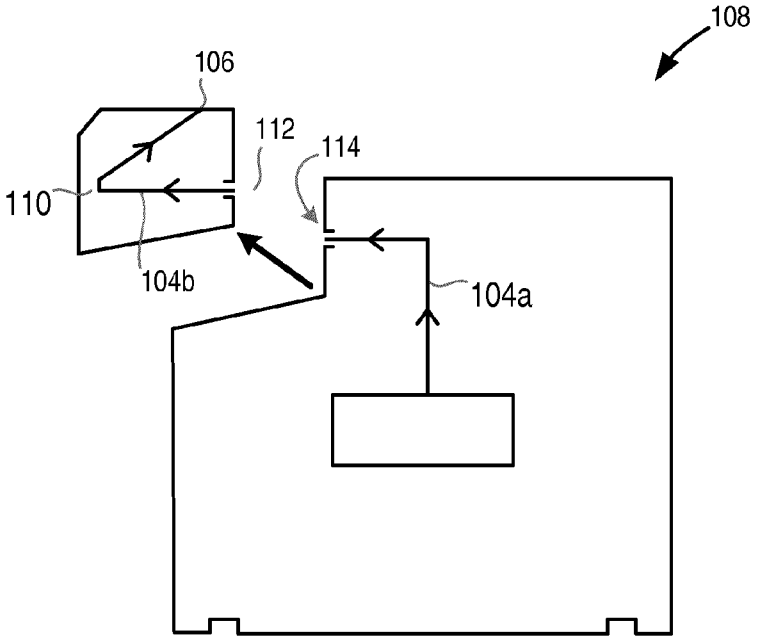


Figure 1B

[Continued on next page]

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(57) Abstract: An imaged media production apparatus such as a printer is disclosed having a detachable media handler. When assembled, the media handler is provided at least partially within the footprint of the main body of the printer giving rise to improved space efficiency. The printer body is provided with at least one reference datum which aligns with a corresponding reference datum on compatible media handler modules.

IMAGED MEDIA PRODUCTION

BACKGROUND

[0001] Media handlers to deliver media in an arranged fashion are known. For example, stackers facilitate delivery of imaged media arranged into sets. Media handlers cooperate with printers, copiers, printer-copiers, scanners and other imaged media production apparatus to handle imaged media output from the image former of an imaged media production apparatus.

BRIEF DESCRIPTION OF THE DRAWINGS

[0002] Figures 1A and 1B illustrates an example imaged media production apparatus in accordance with the teachings disclosed herein;

[0003] Figures 2A to 2D illustrate an example of the engagement mechanism between an example imaged media production apparatus and an example media handler;

[0004] Figure 3A is a schematic illustration of media transmission paths in an example imaged media production apparatus according to the teachings disclosed herein;

[0005] Figure 3B is schematic illustration of media transmission paths in another example apparatus according to the teachings disclosed herein;

[0006] Figure 4 illustrates an example of an imaged media production apparatus according to the teachings disclosed herein;

[0007] Figure 5 further illustrates the apparatus as illustrated in Figure 4;

[0008] Figure 6 illustrates an example imaged media production apparatus having an example of a media handler according to the teachings disclosed herein;

[0009] Figure 7 illustrates an example apparatus having another example of a media handler according to the teachings disclosed herein; and

[00010] Figure 8 shows a cross section to reveal the internal components of an example printing apparatus having a stacker.

[00011] Wherever possible the same reference numbers will be used throughout the drawings and accompanying written description to refer to the same or like parts.

DETAILED DESCRPTION

[00012] It is known to provide a printing apparatus or other imaged media production apparatus, such as a copier, printer-copier or scanner, with a media handler in the form of an external accessory which may be added to the machine after purchasing it. Such a media handler is typically provided adjacent to an imaged media production apparatus, to receive imaged media at the output of the imaged media production apparatus. This arrangement allows a media handler to be provided as an accessory to an existing printer without adding to the cost of manufacturing the printer. Accessory configurations provide greater freedom to an end user in selecting the most appropriate media handler for their needs, for example in terms of the capacity of media handler.

[00013] It is also known for a media handler to be integrated into the imaged media production apparatus during manufacture. This arrangement does not increase the footprint size of the imaged media production apparatus and, furthermore, the apparatus is conveniently assembled during manufacture and does not require assembly by an end user or supplier.

[00014] A media handler provides a facility to arrange imaged media. The imaged media are output from the image forming section of a reproduction apparatus. One type of media handler is a so-called “stacker” which provides a facility to arrange imaged sheet media in stacks of sheet media, typically on a job-by job basis. Another type of media handler is a so-called “folder” which provides a facility to fold imaged sheet media.

[00015] Example printers and apparatus disclosed herein comprise an image former to form images on a media surface. They also include a media handler to arranged image media. A conveyance path is provided to convey imaged media from the image former to an output of the imaged media production apparatus via the media handler. The media handler is detachably engaged with the imaged media production apparatus.

[00016] Example apparatus disclosed herein comprise an imaged media production apparatus having a media handler which forms an integral part of the imaged media production apparatus when assembled. The conveyance path of an example apparatus from an image former of the apparatus to an output of the apparatus is through the media handler. This configuration gives rise to a

number of advantages over known accessory configurations in terms of providing the facility to arrange imaged media without significantly increasing the floor space occupied by the apparatus. At the same time, example apparatus benefit from the media handler being detachable from the main body of the imaged media production apparatus, which gives rise to greater flexibility in the choice of media handler that the apparatus includes.

[00017] Figure 1A shows a cross section through an example imaged media production apparatus. The imaged media production apparatus 100 includes an image former 102, a media handler 110 and a conveyance path 104 between the image former 102 and an output 106, via the media handler 110. Figure 1B illustrates the detachment of the media handler 110 from the main body.

[00018] The teachings disclosed herein are applicable to printers, photocopiers, printer-copiers, scanners and other apparatus for producing or reproducing an image on a media surface. The image former may comprise a printing, photocopying or scanning unit of the imaged media production apparatus. The information to form an image on a media surface may be provided from computer readable image files or from an image provided on another media surface. The conveyance path may be provided, for example, by a plurality of cooperating rollers to guide media sheets through the apparatus and/or by guide belts. The media handler may, for example, be a stacker to stack sheet media into job sets.

[00019] Example apparatus disclosed herein can be considered to exhibit a modular configuration. Example imaged media production apparatus disclosed herein and illustrated in Figure 1B comprise a main body 108 and a media handler module 110. The media handler is detachably engaged with the main body as illustrated in Figure 1B. This allows the media handler to be removed and replaced, for example to facilitate repair of the media handler or replacement with a different media handler. The modular configuration offers advantages in manufacturing flexibility and serviceability. Furthermore, the detachment of the media handler module can potentially provide an access area to access the internal mechanisms or components of the main body so that they may be serviced.

[00020] The example media handler 108 has a media input 112 to receive imaged media from the main body via a first portion 104a of the conveyance path 104. The media handler 108 provides a second portion 104b of the conveyance path 104 between the media input 112 and the output 106. The media input 112 of the example media handler is positioned so that, when in an assembled configuration whereby the media handler is positioned within the receptacle, the first portion and the second portion of the conveyance paths coincide.

[00021] The imaged media production apparatus may be conveniently assembled on the manufacturing line for supply as a single unit. Alternatively, the main body of the imaged media production apparatus may be manufactured and/or sold separately to the media handler. Thus, customers and end-users are able to select a compatible media handler module to be connected to the main body and/or change the selected media handler according to their needs. Thus, an end-user may select a low cost handler which supports just a limited media set or, alternatively, a higher cost handler which is more robust and/or supports a wider media set. These choices regarding the media handler can advantageously be made irrespective of the properties and cost of the main imaged media production apparatus. Moreover, an end-user is able to adapt the functionality of example apparatus on an on-going basis over time as their needs change.

[00022] An example media handler disclosed herein is configured to engage with the main body of an imaged media production apparatus. The example media handler includes a media input to receive imaged media from an image former of the imaged media production apparatus via a first conveyance path. The example media handler also includes a second conveyance path from the media input to an output which forms an output of the imaged media production apparatus when the media handler is engaged with the imaged media production apparatus.

[00023] Example imaged media production apparatus comprise an image former to form images on a media surface. Example imaged media production apparatus also comprise an engagement portion to allow an image handler to be engaged with the imaged media production apparatus in an assembled

configuration. They also comprise a conveyance path to convey imaged media from the image former to an input of one said image handler when in said assembled configuration.

[00024] Another example imaged media production apparatus comprises a main body and a media handler, the main body and the media handler being provided with inter-engagement portions to allow the media handler to be engaged with the main body in an assembled configuration wherein a conveyance path is provided from an image formed house in the main body to an output of the media handler.

[00025] Example methods of assembling an image reproduction apparatus include providing a main body housing an image reproduction unit and a conveyance path to convey imaged media from the image reproduction unit to an engagement region of the main body. Example methods of assembling an image reproduction apparatus also include engaging a media handler with the main body to align the terminating portion of the conveyance path of the main body with a media input of the media handler.

[00026] A further example apparatus includes inter-engagement portion(s) provided on the media handler and/or the main body of the imaged media production apparatus to allow the media handler to be detachably engaged with the main body of the imaged media production apparatus. Thus, compatible media handlers are configured to be detachably engaged with the main unit of example imaged media production apparatus disclosed herein.

[00027] A further example printers disclosed herein comprises a main body and a detachable media handler coupled thereto, wherein the media handler is provided within the footprint of the printer.

[00028] Another example imaged media production apparatus disclosed herein comprises a main body and a media handler, the main body and the media handler being provided with inter-engagement portions to allow the media handler to be engaged with the main body in an assembled configuration wherein a conveyance path is provided from an image formed house in the main body to an output of the media handler.

[00029] Figures 2A to 2D illustrate an example of the features which facilitate engagement between an example imaged media production apparatus and an

example media handler. Figures 2A and 2B illustrate the main body of an example imaged media production apparatus and the provision of a plurality of reference points or datums which allow the media handler module to be located relative to the main body during assembly. The reference points, which are located at an engagement area of the main body, are defined in three mutually orthogonal planes. Figure 2A shows four "z-datum" reference points, or primary datums, which are defined parallel to the XY plane. Also shown in Figure 2A are two y-datum reference points, or secondary datums, which are located parallel to the XZ plane. A tertiary datum, or x-datum, is shown in Figure 2B and is on a plane perpendicular to both the primary and secondary datums, namely on the YZ plane.

[00030] Figure 2C shows corresponding x, y and z-datums on an example media handler to be engaged with the example main body shown in Figures 2A and 2B. During an example method of assembly, the media handler is correctly located relative to the main body by substantially aligning the x, y and z reference points on the media handler with the x, y and z reference points on the main body respectively. The media handler is then engaged with the main body by means of a plurality of screws shown in Figure 2C which are used to secure the media handler in the primary plane such that the corresponding z-datums. A plurality of screws are also used to engage the media handler in the secondary plane such that the y-datums are aligned. These screws (not shown for reasons of clarity) are located in pairs above and below the y-datum reference points.

[00031] Figure 2D illustrates a cross-section through an example imaged media production apparatus with the media handler shown in Figure 2C engaged with the main body shown in Figures 2A and 2B. An engagement portion secures the media handler in the tertiary plane with respect to the x-datum.

[00032] An example imaged media production apparatus, such as a printer, comprises a detachable media handler. When assembled, the media handler is provided at least partially within the footprint of the main body of the printer giving rise to improved space efficiency. The printer body is provided with at

least one reference datum which aligns with corresponding reference datum on compatible media handler modules when assembled.

[00033] As shown in the example of Figure 1B, the main body 108 is provided with a space or receptacle 114 at an outer portion thereof to receive the media handler 110. The space is at an engagement region where engagement of the media handler with the main body takes place. In allowing the media handler to be at least partly received within a space as shown in Figure 1B, the example imaged media production apparatus is space efficient, having little or no impact on the footprint size of the apparatus. This is beneficial in many environments where pressure on available floor space is high. In comparing the example apparatus to known accessory configurations in which a media handler is positioned adjacent to the main output of the reproduction apparatus, the example apparatus having a modular configuration in which the media handler is provided substantially within the footprint of the main body represents a space effective solution.

[00034] An example imaged media production apparatus comprises more than one possible conveyance path between the input of the apparatus and an output of the apparatus. An example apparatus may comprise a first conveyance path between the image former and a first output, or media delivery station. The example apparatus may also comprise a second conveyance path between the image former and a second output, which may be implemented jointly with the first output or separately via the media handler. Example apparatus may also provide further conveyance paths. The conveyance path may be provided with a diverter valve, for example, to allow media to be sent in more than one direction.

[00035] Figures 3A and 3B show a schematic illustration of media transmission paths in an example reproduction apparatus according to the teachings herein. In Figure 3A a conveyance path defines a path along which media sheets are conveyed through the example apparatus from a media input 114 by a conveyance mechanism which may comprise rollers and/or guide belts or the like. From the image former 102, imaged media sheets are transported in use, via a diverter 120, along one of three different conveyance paths. A first conveyance path includes sections 1041 and 1042 to convey imaged media

sheets from the image former to a main output 116 which may, for example, be a main collection basket or delivery platform. A second conveyance path includes sections 1041, 1043 and 1044 to transport imaged media sheets from the image former to a media handler 110 and then to the output 116. A third conveyance path includes sections 0141 and 1045 to transport imaged media sheets to an output of the example reproduction apparatus, for collection by an external accessory which may be an external stacker or folder, for example.

[00036] It can be appreciated from Figure 3A that the media handler when engaged with the main body forms an integral part of the apparatus, with a conveyance path to convey sheet media being provided through the detachable media handler from the image former section of the apparatus to a media output of the apparatus. Example apparatus benefit from the adaptable, modular configuration of the apparatus, arising from the detachability of the media handler, whilst also benefiting from the space-efficient integration of the media handler with the imaged media production apparatus when assembled.

[00037] As shown schematically in Figure 3A, the output 116 for media sheets sent from the media handler may be the main delivery platform of the apparatus. Alternatively, as shown schematically in Figure 3B, the media handler may be provided with a dedicated output 118 to receive arranged media. The output 118 may be provided as part of the media handler and, in this case, will therefore be detachable with the media handler. This arrangement allows different types of media handler output platforms to be accommodated depending on media type, size, media volume and cost constraints.

[00038] An example imaged media production apparatus includes an example media handler which comprises a media support to support arranged media. The media support, or delivery platform, may thus form an output of the imaged media production apparatus. Alternatively, an example media handler may be configured to deliver arranged media, for example sheet media stacked in job sets, to a delivery platform which is integral to the main body.

[00039] The media output support according to an example media handler or imaged media production apparatus may be provided above the main body of the imaged media production apparatus. In contrast to a delivery platform which

protrudes from one of the side edges of the main body, this arrangement is space efficient since the media support may be provided within the footprint of the apparatus.

[00040] An example media handler is configured to be provided within a receptacle, or space, provided at an outer portion of the main body of the imaged media production apparatus. In contrast to accessory configurations whereby a media handler is provided adjacent to the main body, this arrangement allows the media handler to be at least partially provided within the footprint of the main body. Such a configuration is beneficial in many deployed scenarios where space is at a premium.

[00041] Figure 4 shows an example printer generally designated 200 including a stacker 210 detachably engaged with the main body of the printer. In this example, the media handler is mounted in an allocated space provided at a corner of the main body between the top of the printer and the rear side of the printer. The conveyance path through the media handler directs imaged media towards the rear side of the printer. The conveyance path comprises a turning portion 215 which turns the media sheets propelled from the rear of the printer to be input into the media handler 210. Arranged media processed by, and conveyed through, the media handler are delivered to a tray 214 which is provided above the printer.

[00042] This example printer benefits from the feature of a detachable stacker, which can be selected from a range of compatible stackers according to requirements. Furthermore, the mounting of the stacker 210 within the footprint of the printer gives rise to advantages in terms of space efficiency of the printer. The space saving benefits of this configuration are further enhanced by the provision of an output tray 214 located above the printer within the footprint of the printer. The location of the output tray 214 above the upper surface of the printer also facilitates frontal access to the delivered imaged media. A further advantage of this example is that the reproduction apparatus can be placed against a wall without obstructing the output of the printer. This is illustrated in Figure 5.

[00043] Figure 6 shows an example reproduction apparatus having an example media handler 210 according to the teachings disclosed herein. The

example media handler comprises a stacker having a delivery tray 214 provided above the top of the printer. In this example, the delivery tray projects at a substantially acute angle with respect to the upper surface of the printer. The example stacker is further provided with a guide 216 comprising an arm which acts as a cover or roof for the tray. In the example shown in Figure 6, the guide 216 includes a belt system to actively facilitate the transmission of media up the tray 214. This example provides a robust delivery system for the stacker which supports a wide range of media.

[00044] Figure 7 shows a simpler and less expensive example stacker comprises a guide 218 which utilises so called “passive arms” comprising a set or wireframes or other static elements to guide media.

[00045] Figure 8 shows a cross section to reveal the internal components of an example printing apparatus having a stacker with an active guide system 216 to guide imaged media along the delivery tray 214. Figure 8 illustrates the accessibility of the internal components through detachment of the stacker. In particular, it can be appreciated that the dryer modules of the printer which are highlighted by the dashed line 220 can be readily accessed and serviced.

[00046] The above disclosed example apparatus and methods offer a flexible configuration for providing an imaged media production apparatus with a media handler. A range of compatible media handlers to engage with the main body of the imaged media production apparatus may be conceived allowing a user to select the specification of the media handler in accordance with their needs. Example imaged media production apparatus may be provided fully assembled, with the media handler engaged with the main body, or they may be manufactured without the media handler but configured to allow a compatible media handler to be provided subsequently. The modular configuration of example apparatus, whereby the media handler may be detached from the main body of the apparatus, allows the media handler to be removed for repair or replacement. Thus, for example, simpler media handlers can be replaced by more robust of complex ones, or visa versa. Example apparatus benefit from space-efficiency since the media handler, which may also incorporate a media support to deliver arranged media to a user, may be accommodated substantially within the footprint of apparatus.

[00047] Although certain example apparatus and methods have been described herein, the scope of coverage of this patent is not limited thereto. On the contrary, the patent covers all methods, apparatus and articles of manufacture fairly falling within the scope of the claims.

CLAIMS

1. An imaged media production apparatus comprising:

an image former to form images on a media surface to generate imaged media;

a media handler to arrange imaged media;

a conveyance path to convey imaged media from the image former to an output of the imaged media production apparatus via the media handler;

the media handler being detachably engaged with a main body of the imaged media production apparatus.

2. An imaged media production apparatus as claimed in claim 1, wherein the media handler comprises a media support to support arranged media, which support forms the output of the imaged media production apparatus.

3. An imaged media production apparatus as claimed in claim 2, wherein the media support is provided above the imaged media production apparatus.

4. An imaged media production apparatus as claimed in claim 1, wherein the media handler is substantially mounted within a receptacle provided at an outer portion of the main body of the imaged media production apparatus.

5. A media handler to arrange imaged media, the media handler to engage with the main body of an imaged media production apparatus, the media handler having a media input to receive imaged media from an image former of the imaged media production apparatus via a first conveyance path, the media handler comprising a second conveyance path from the media input to an output which forms an output of the imaged media production apparatus when the media handler is engaged with the imaged media production apparatus.

6. A media handler as claimed in claim 5, further comprising a media support to support arranged media.

7. A media handler as claimed in claim 6 further comprising a guide to guide media on the media support.

8. A media handler as claimed in claim 7, wherein the guide comprises an active guide to convey media on the media support and/or wherein the guide comprises at least one wireframe.

9. A media handler as claimed in claim 5, wherein the media handler is a stacker to arrange printed media in stacks.

10. A media handler as claimed in claim 5, further comprising at least one media handler reference datum wherein the media handler reference datum substantially aligns with a corresponding main body reference datum when the media handler is engaged with the main body.

11. An imaged media production apparatus comprising:
an image former to form images on a media surface;
an engagement portion to allow an media handler to be engaged with the imaged media production apparatus in an assembled configuration; and
a conveyance path to convey imaged media from the image former to an input of one said media handler when in said assembled configuration.

12. An imaged media production apparatus as claimed in claim 11, further comprising at least one reference datum wherein the reference datum substantially aligns with a corresponding media handler reference datum when the media handler is engaged with the imaged media production apparatus in an assembled configuration.

13. A printer comprising a main body and a detachable media handler coupled thereto, wherein the media handler is provided substantially within the footprint of the printer.

14. A method of assembling an image reproduction apparatus including:
providing a main body housing an image reproduction unit and a conveyance path to convey imaged media from the image reproduction unit to media output of the main body,
engaging a media handler with the main body, the media handler being arranged to receive imaged media from the media output of the main body.

15. A method of assembly as claimed in claim 14, wherein prior to engaging the media handler with the main body, further comprising the step of:
locating the media handler relative to the main body by substantially aligning at least on media handler reference datum with a corresponding main body reference datum.

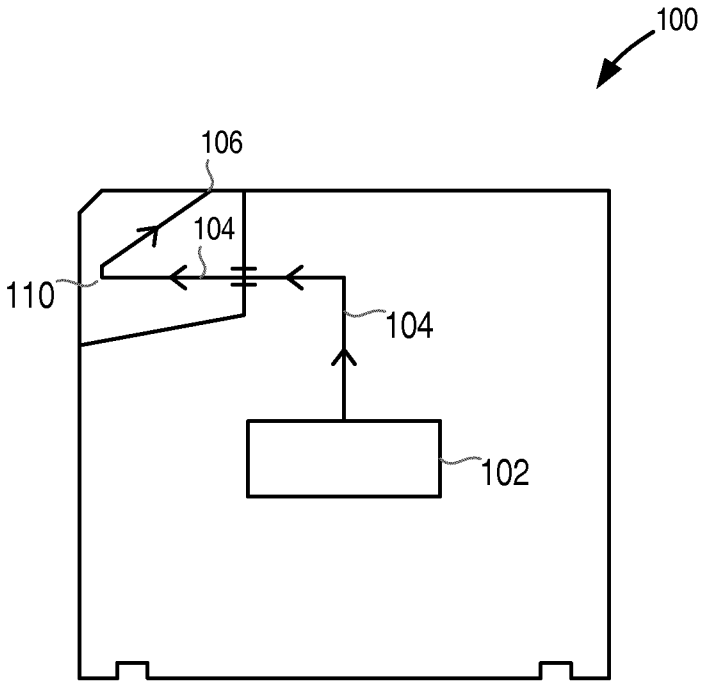


Figure 1A

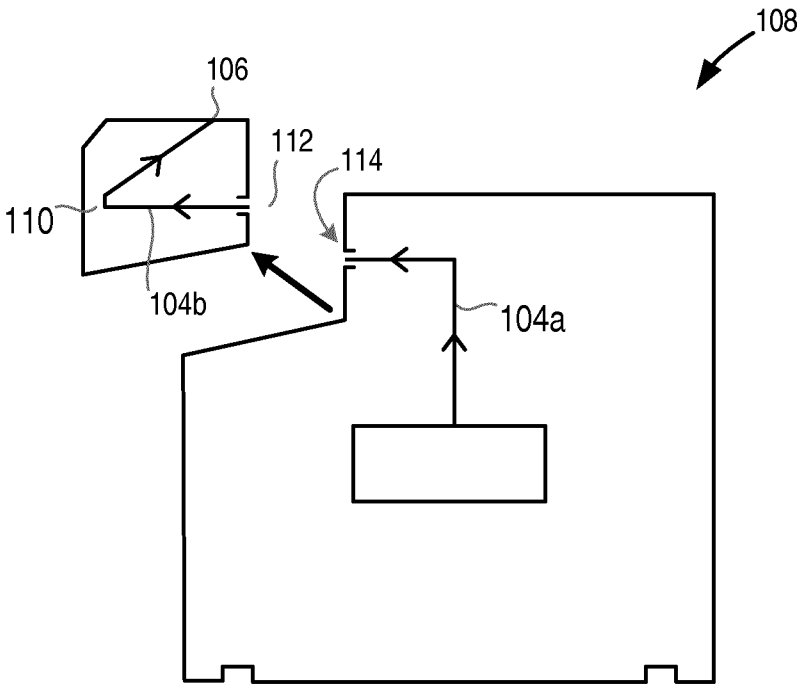


Figure 1B

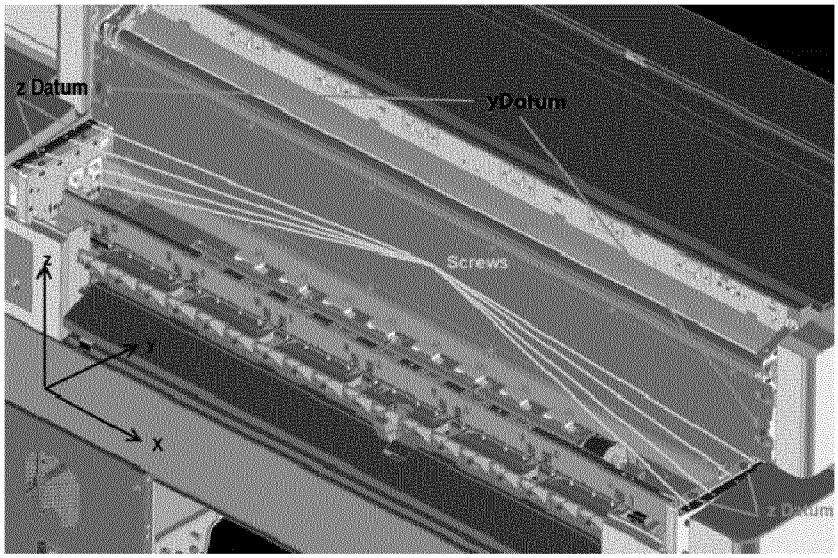


Figure 2A

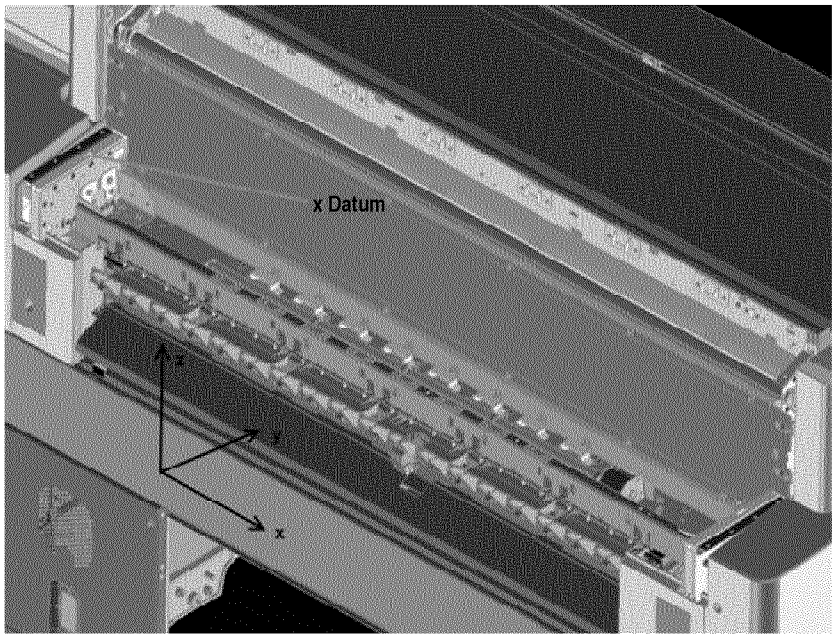


Figure 2B

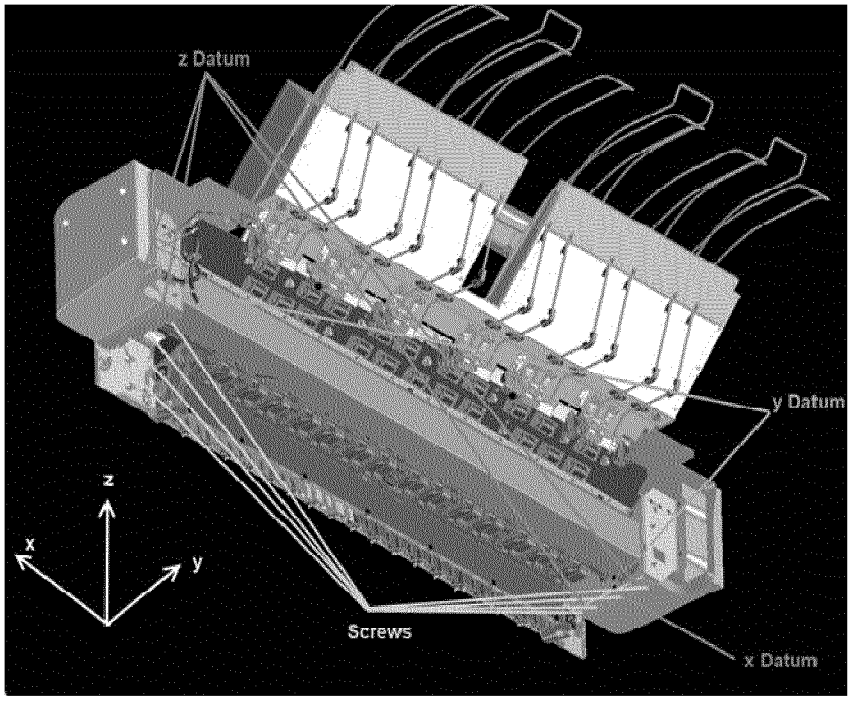


Figure 2C

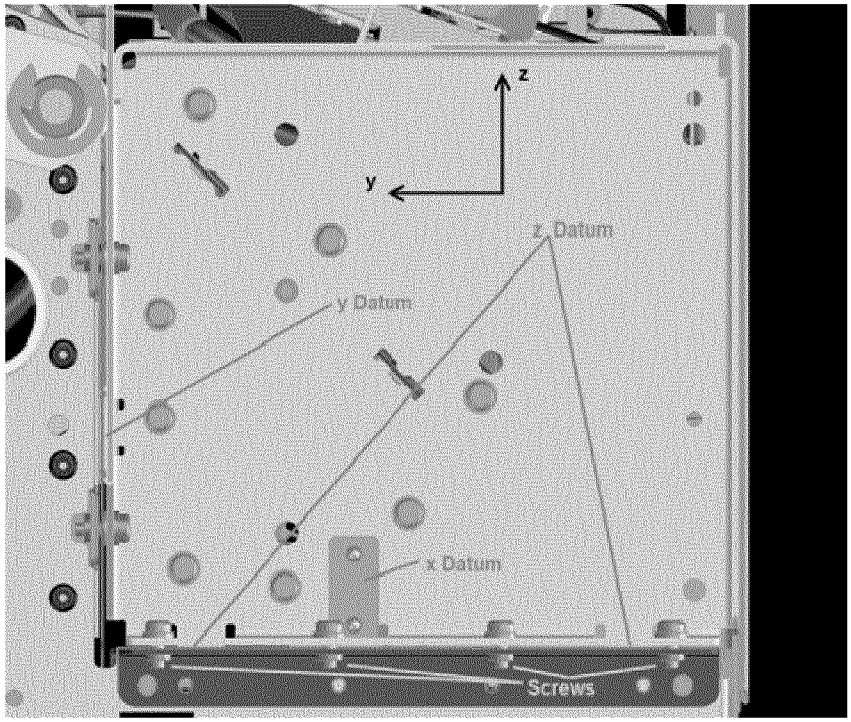


Figure 2D

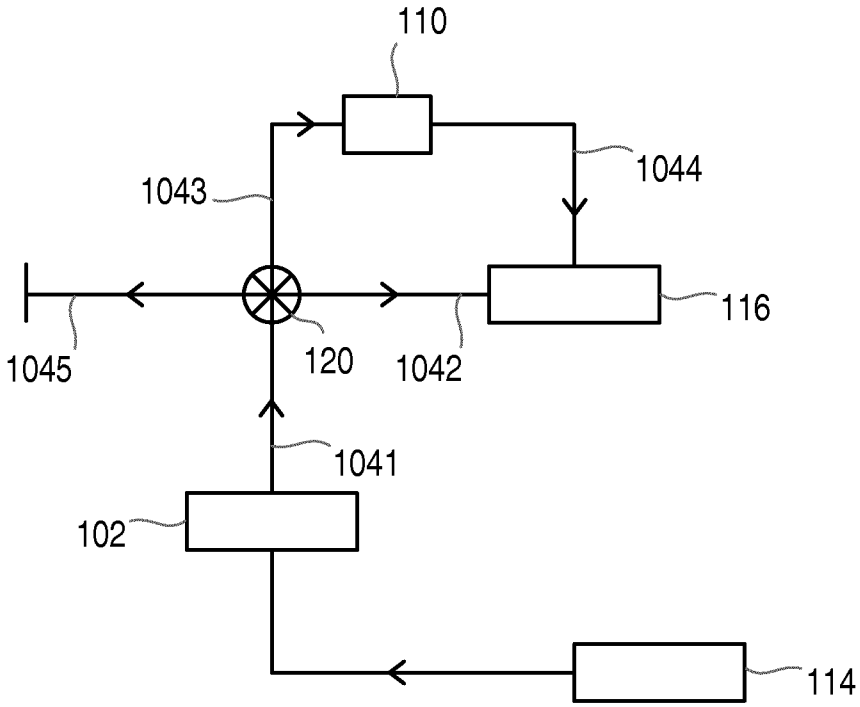


Figure 3A

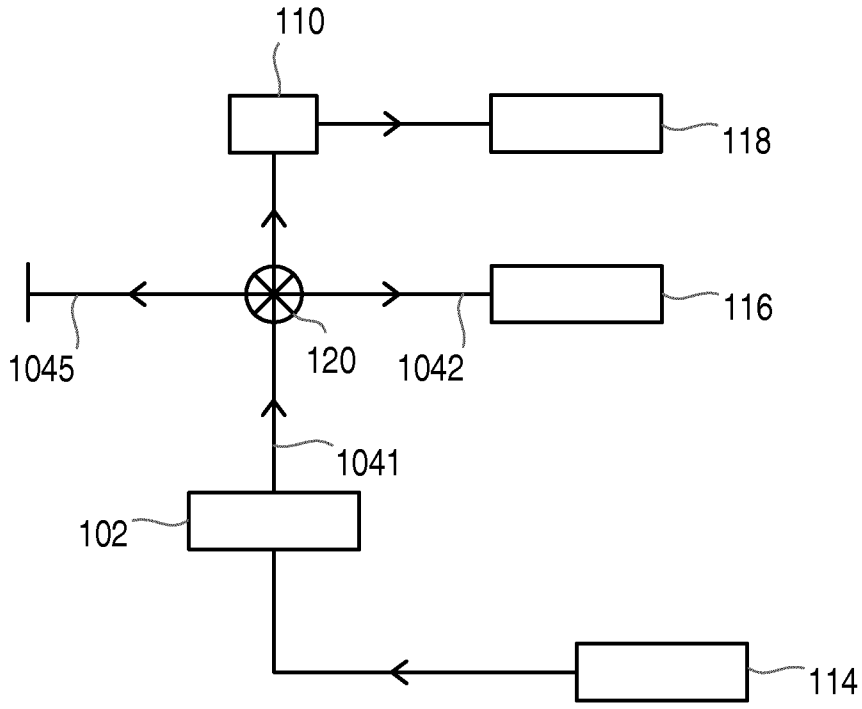


Figure 3B

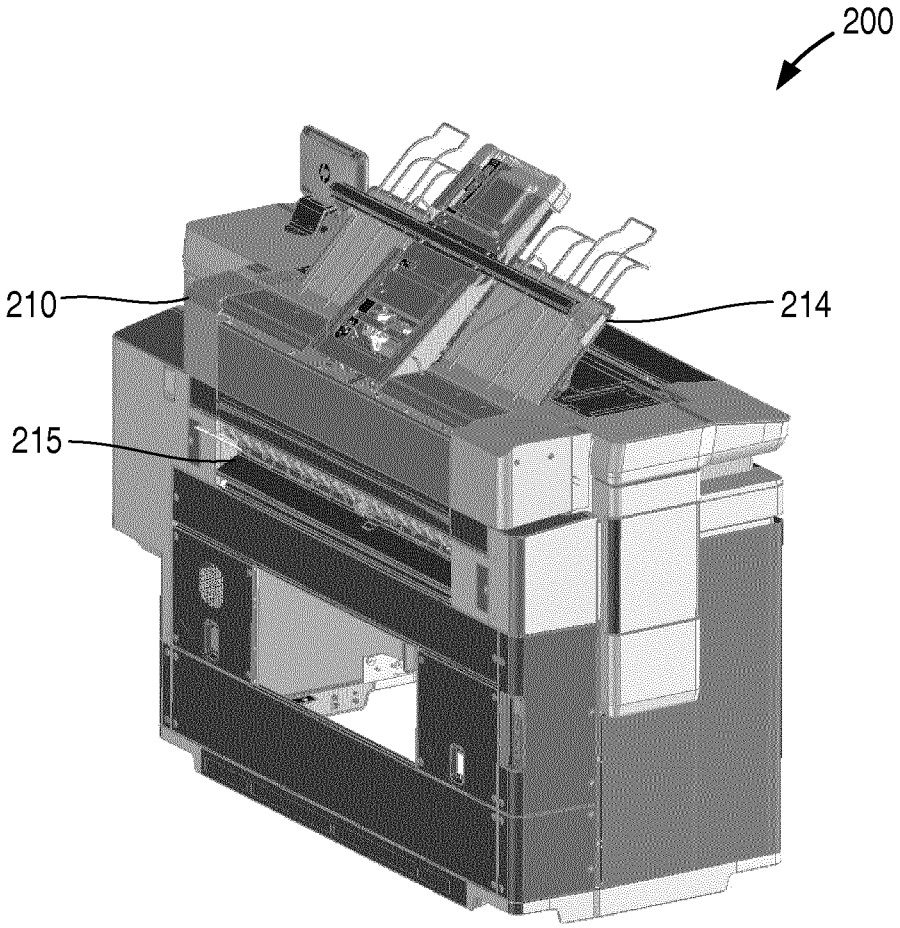


Figure 4

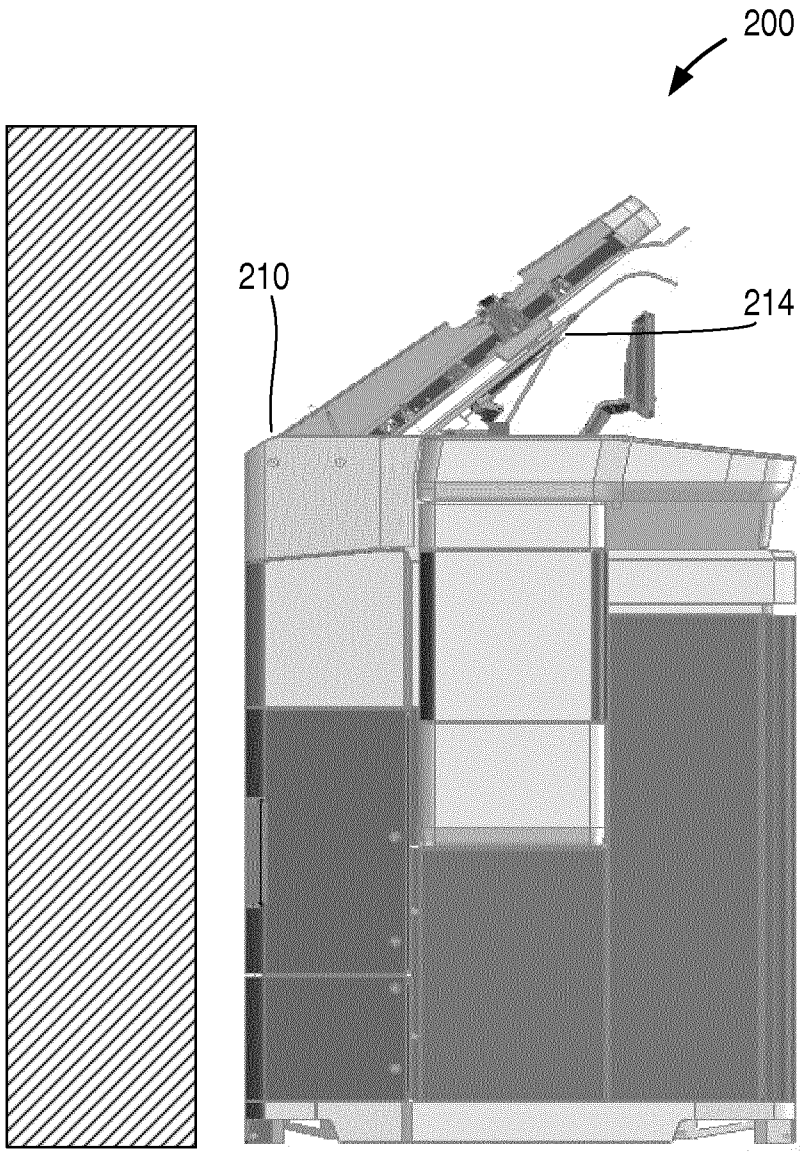


Figure 5

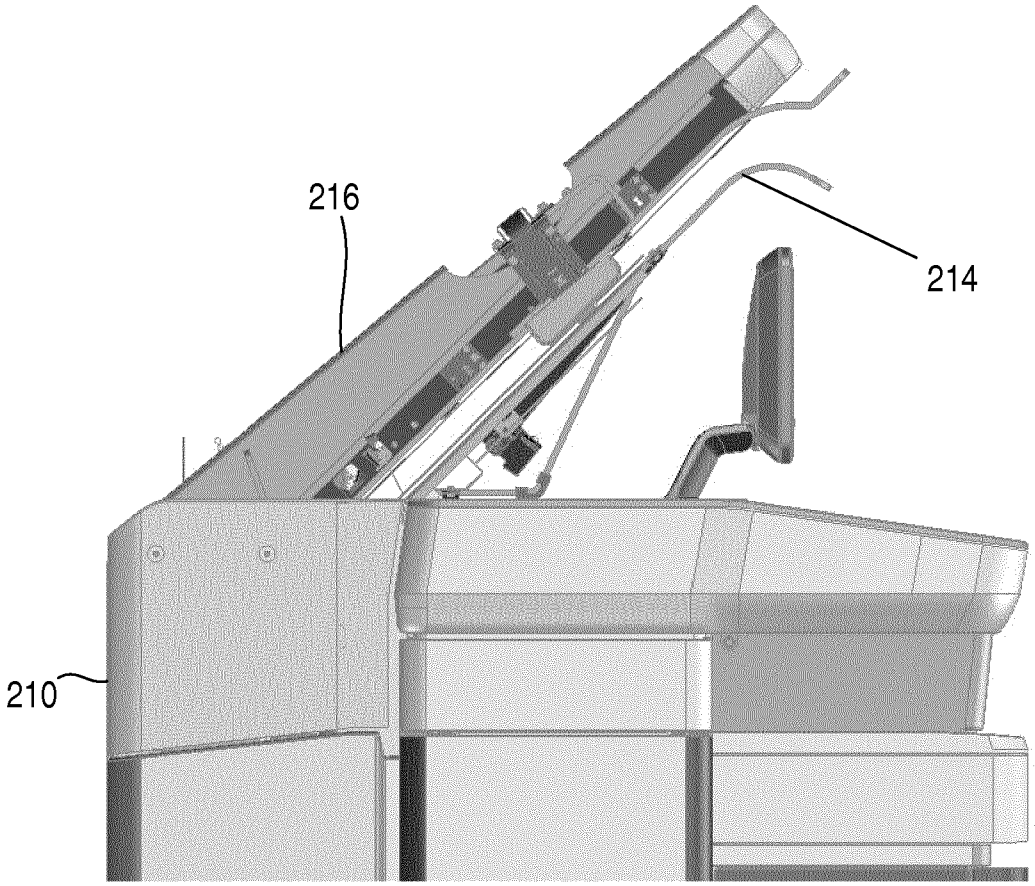


Figure 6

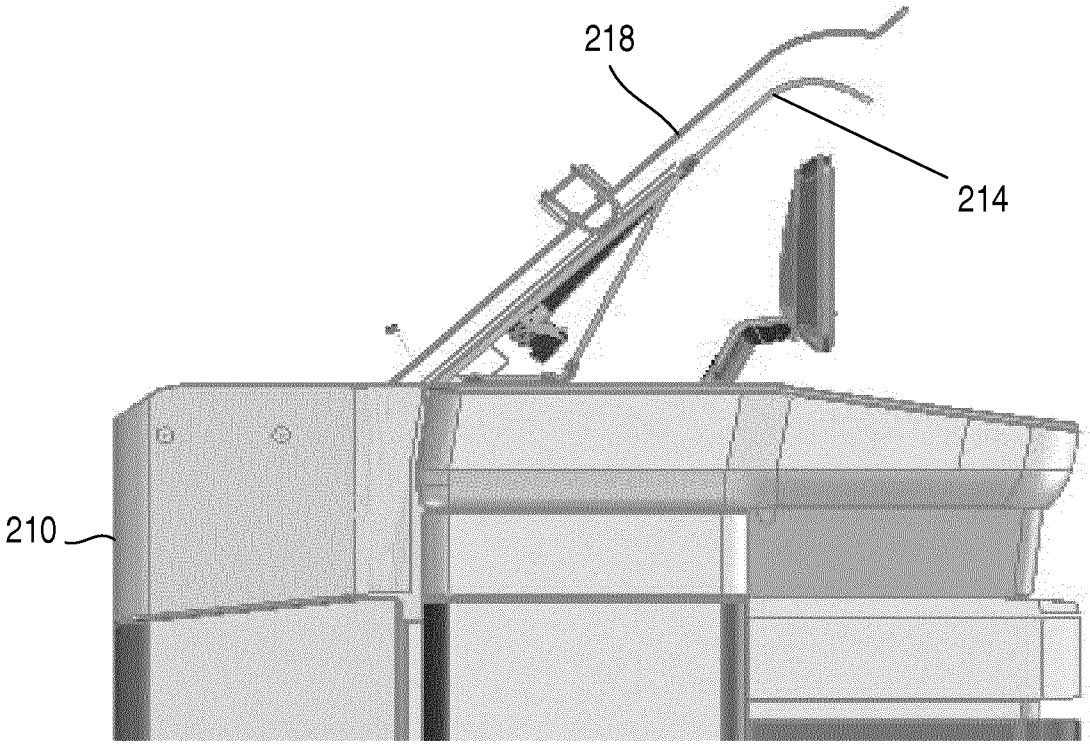


Figure 7

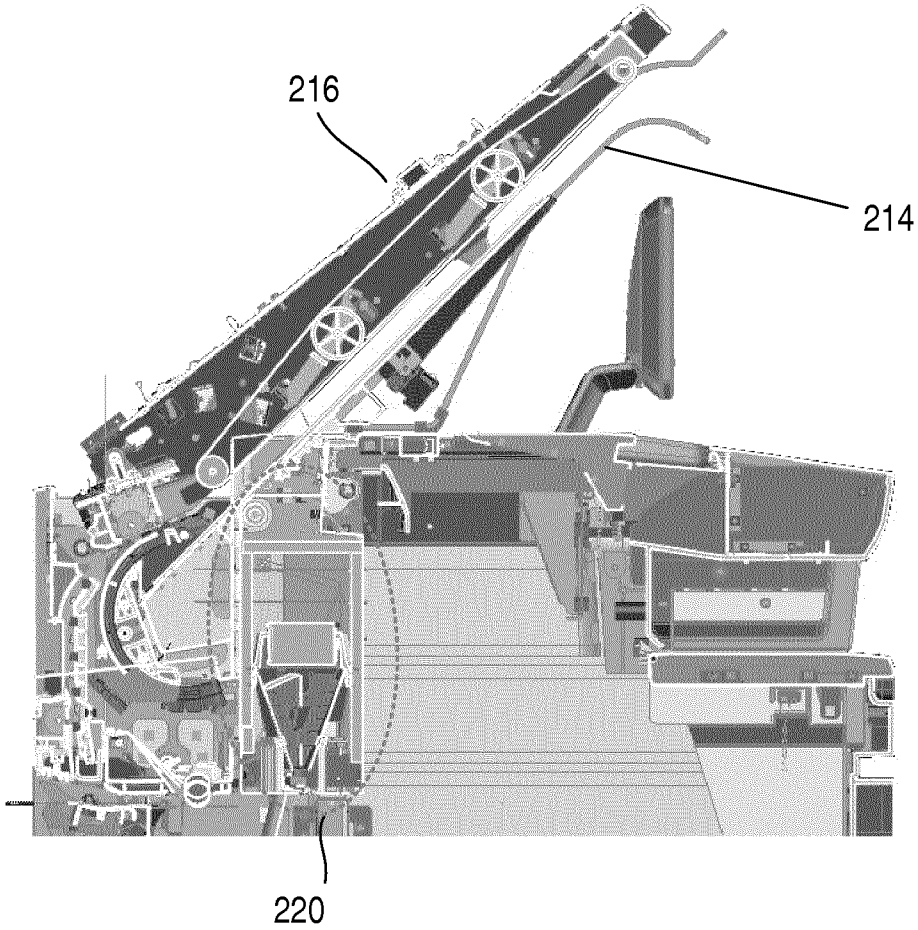


Figure 8

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2014/061660

A. CLASSIFICATION OF SUBJECT MATTER
INV. G03G15/00 G03G21/16
ADD.

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)
G03G

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)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/232672 A1 (NAKAMURA HIROYUKI [JP] ET AL) 20 October 2005 (2005-10-20) paragraph [0135] - paragraph [0137]; figures 3A, 4	1-15
X	JP 2002 308520 A (CANON KK) 23 October 2002 (2002-10-23) abstract	1-15
X	US 2006/133849 A1 (YOSHIDA KENZO [JP] ET AL) 22 June 2006 (2006-06-22) paragraph [0032] - paragraph [0043]	1-15

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
27 October 2014	04/11/2014

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Götsch, Stefan

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2014/061660

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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		JP 2006178011 A	06-07-2006
		US 2006133849 A1	22-06-2006