(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
10 October 2019 (10.10.2019)

WIPO | PCT

(10) International Publication Number
WO 2019/194792 A1

(51) International Patent Classification:
B41J 29/00 (2006.01) *G01B 11/02* (2006.01)

(21) International Application Number: PCT/US2018/025914

(22) International Filing Date: 03 April 2018 (03.04.2018)

(25) Filing Language: English

(26) Publication Language: English

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(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:
— *as to the identity of the inventor (Rule 4.17(i))*

Published:
— *with international search report (Art. 21(3))*

(54) Title: WIDTH DETECTION

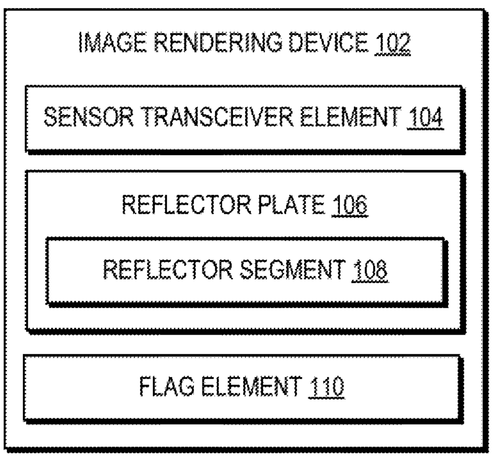

FIG. 1

(57) Abstract: Examples of devices for detecting width of a print medium are described. In one example, the device may include a reflector plate coupled to a shaft. The reflector plate is rotatable about an axis with respect to a transceiver element. The reflector plate may further comprise a plurality of reflective segments radially distributed about the axis, with the reflective segment having a different reflectivity.

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WIDTH DETECTION

BACKGROUND

[0001] Certain types of image rendering devices may render content onto a print medium. Examples of image rendering device may include, but are not limited to, print systems or printers, and photocopying machines. To carry out the image rendering process, the print medium may be fetched from a media tray, and conveyed through the image rendering device for rendering content.

BRIEF DESCRIPTION OF THE DRAWINGS

[0002] The following detailed description references the drawings, wherein:

[0003] FIG. 1 is a block diagram of an example image rendering device;

[0004] FIG. 2 is an illustration of various example components of an example image rendering device;

[0005] FIG. 3 is an illustration of various components of an image rendering device, as per another example;

[0006] FIG. 4 is an illustration of various components of an image rendering device, as per yet another example;

[0007] FIG. 5 is an illustration of various components of an image rendering device, as per still another example;

[0008] FIG. 6 is a block diagram of various example components of an example image rendering device;

[0009] FIG. 7 is a block diagram of an example print device; and

[0010] FIG. 8 is a block diagram of an example width detection device.

[0011] Throughout the drawings, identical reference numbers designate similar, but not necessarily identical, elements. The figures are not necessarily to scale, and the size of some parts may be exaggerated to more clearly illustrate the example shown. Moreover, the drawings provide examples and/or implementations consistent with the description; however, the description is not limited to the examples and/or implementations provided in the drawings.

DETAILED DESCRIPTION

[0012] Content (e.g., images and text) may be processed and rendered onto a print medium by an image rendering device. The print medium onto which content is to be rendered may vary in size. During a rendering operation, the print medium may pass through various sections within the image rendering device. As it passes through the different sections within the image rendering device, the print medium may undergo numerous rendering related operations. During such rendering operations, the print medium may be prone to media mishandling if the image rendering device is not adjusted to handle the width of the print medium. In some cases, the image rendering device may be adjusted to accommodate different print media sizes. In such cases, the rendering devices may be adjusted by conforming certain components of the image rendering device, like a media guide, to the size of the print medium being used. The image rendering device may include different mechanisms which may be adjusted to accommodate the size of the print medium.

[0013] In some image rendering devices, the adjustment mechanisms may be implemented through a mechanical arrangement. For example, a media tray may include manually adjustable brackets which may be moved across dedicated guide paths to accommodate the size of the print medium. Such mechanical arrangements may undergo wear over prolonged usage, and may be prone to damage arising due to repeated manual adjustments. Certain other image rendering devices may include mechanisms which may automatically control the adjustment mechanisms. In such cases, a user may provide inputs specifying a size of the print medium. In response to an input, the image rendering device may be adjusted automatically. Even though the image rendering device is configured to perform such adjustments automatically, a user may be expected to be aware of the print medium being used, and possess knowledge about how the settings of the image rendering device are to be changed.

[0014] The user may not, in some cases, be aware of the dimension of the print medium which is to be used. It may also happen that the user uses a print medium, the size of which is different from what the image rendering device may be configured for handling. In cases in which an incorrect print medium size is provided, a print medium jam may result. As a result, the print medium jam in the image rendering device may have to be manually cleared to continue the rendering process. In other cases, when a print media of a size which is different (e.g., smaller) than selected media size being used, overspray of ink over the printer ribs during printing may occur. This in turn may get transferred during the next print job when a larger media is being used, thereby affecting the quality of the rendering process, thus ruin the plots and/or causing media jam as what is mentioned above. In cases when larger print media than selected media size is being provided, it may result in an incorrectly scaled print medium.

[0015] Approaches for automatically determining a dimension of a print medium, are described. Such approaches may be implemented in an image rendering device to render content onto a print medium. In one example, the image rendering device for determining the dimension of the print medium may include a sensor transceiver element, and a reflector plate having a plurality of reflective segments. The reflector plate is rotatable with respect to the sensor transceiver element (hereinafter referred to as 'transceiver element'). As the reflector plate rotates, it may change the relative position of the reflective segments with respect to the transceiver element. The rotation of the reflector plate may be affected through a shaft to which the reflector plate may be coupled. The shaft may extend in a horizontal plane, and along the axis about which the reflector plate is to rotate.

[0016] The reflector plate may have a plurality of reflective segments arranged radially about the axis of rotation. Respective reflective segments may have different reflectivity. Reflectivity may indicate an extent to which any incident radiation may be reflected off from a given surface. The extent of radiation reflected may be assessed based on a measure of an intensity of incident radiation and radiation reflected from the given surface. In one example, the reflectivity may be based on a ratio of the intensity of an incident radiation and a reflected radiation. The reflectivity may vary depending on physical properties of the material off which the incident light is reflected. For example, polished or smooth surfaces may reflect an incident radiation more as compared to surfaces which are not polished or which do not reflect any of the incident radiation. The reflectivity may also change depending on material of a reflecting surface. As an example, surfaces of metallic materials may reflect more of the incident radiation as compared to material of non-metallic materials.

[0017] In the current example, an incident radiation may be generated by the transceiver element. The incident radiation may be in the form of a collimated light beam or laser beam which may be directed towards one of the reflective segments. The reflected radiation reflected off from one of the reflective segments is received by the transceiver element. The image rendering device may determine a ratio of the intensity of the incident radiation and the reflected radiation.

[0018] In operation, the reflector plate may rotate due to the rotation of the shaft on which it is mounted. As the reflector plate moves, the reflective segments may also move across a path of the incident radiation. As a result, the reflective segment may move out, and another reflective segment may move into the path of the incident radiation. As further rotation occurs, the reflective segments may move across the path of the incident radiation. The rotation of the reflector plate may be in response to movement of a flag element. The movement of the flag element may, in turn, be caused by placing a print media onto a media tray of the image rendering device. In one example, the image rendering device may further include a plurality of flag elements provided along the length of the shaft. The flag element may be any rigid member extending radially outward from the shaft. The position of the flag elements may depend on sizes of print media which may be used for printing by the image rendering device. For example, distance of a first flag element from the reflector plate may correspond to a specific print media size. Similarly, distances of subsequent flag elements may correspond to larger sizes of the print media. As a result, a print medium of a specific dimension may actuate a corresponding flag element.

[0019] With one end of flag element fixed to the shaft and the other end being free, an actuation of the flag element causes it to move in a vertical plane. The vertical movement in turn affects rotation of the shaft. In one example, the flag elements have differing profiles (e.g., a profile of one flag element may be different from a profile of a second flag element, etc.). Owing to the profiles, the flag elements affect rotation of the reflector plate by different angles. As a result of the profile, an actuation of one of the flag elements would rotate the shaft by a related specific predefined angle. Similarly, actuation of another flag element would rotate the shaft by another angle. The flag elements may be arranged in an order such that the flag elements along the shaft rotate the shaft by a progressively increasing angle.

[0020] In another example, the flag elements may be actuated by print media placed on a media tray. Depending on the width of the print medium, the corresponding flag elements may be actuated. For example, the first flag element of the plurality of flag elements may be actuated when a print medium of a first dimension is placed on the media tray. In a similar manner, a second flag element may be actuated when a print medium of a second dimension is placed on the media tray. Depending on whether the print medium is of the first dimension or the second dimension, corresponding flag elements may be actuated. For example, print medium of the first dimension may lead to actuation of a corresponding flag element causing a first rotation of the shaft and the rotatable reflector plate. As a result, a first reflective segment may be brought into the path of the incident radiation emanating from the transceiver element. In a similar manner, print medium of the second dimension may lead to actuation of a corresponding second flag element causing a second rotation of the shaft and the rotatable reflector plate. As a result, the reflector plate rotates across the path of the incident radiation, to position a second reflective segment in the path of the incident radiation from the transceiver element.

[0021] In one example, the transceiver element may either transmit the incident radiation continuously or periodically, towards a reflector plate. To this end, the transceiver element may have sensors to detect any radiation reflected off from the reflector plate. As explained in the previous example, the reflective segment onto which the detection signal is incident may depend on the angular displacement of the reflector plate, and hence, on the size of the print media on the media tray. The incident radiation is reflected off the reflective segment positioned in the path of the incident radiation, and is detected by the transceiver element.

[0022] The reflective segments provided on the reflector plate have different reflectivity. As a result, the attributes of the reflected incident radiation (hereinafter referred to as the reflected radiation) may also be different from the incident radiation. One example of such an attribute may be intensity. In such instances, the intensity of the reflected radiation may differ depending on the reflective segments reflecting the incident radiation. Other examples of such attributes include, but are not limited to, wavelength and frequency. Continuing with the operation of the image rendering device, the transceiver element may compare attributes of the incident radiation and the reflected radiation (e.g., intensity, frequency, amplitude, etc.). Depending on the comparison, the image rendering device may determine which one of the plurality of reflective segments is positioned in the path of the incident radiation. Since the position of reflective segments in the path of the incident radiation indirectly corresponds to the flag element which would have been activated, the image rendering device is able to estimate the size of the print media that have been positioned on the media tray.

[0023] The present approaches may be used for automatically detecting a width of print media present within the image rendering device. The mechanisms as discussed above are simple, involve less material for implementation, less costly, and are scalable. Furthermore, the sensor based mechanism provide accurate detection of the width of the print media. These and other aspects are further described in conjunction with the FIGS. 1-8.

[0024] FIG. 1 is a block diagram of an example image rendering device 102. The image rendering device 102 may include any device which may render content onto a print medium. Examples of such an image rendering device 102 includes, but is not limited to, printers and photocopying machines. The print medium may include a variety of media on which content may be rendered. The print medium may be manufactured from a variety of material, or may differ in terms of their physical properties, such as thickness and stiffness. Commonly used print medium, either for personal use or for commercial purposes, may vary in size. The size of the print medium may conform to certain standards, such as ISO 216 and the North American Paper Sizes. In other cases, a user may also use a specifically procured print medium having a user defined but a non-standardized size.

[0025] During the course of use, print media onto which content is to be rendered may be stored within the image rendering device 102. In one example, the image rendering device 102 as illustrated may automatically detect the width of the print medium onto which the content is to be rendered. It should be noted that the term 'width' is used to refer to the dimension of an edge of the print medium facing the direction in which the print medium would be conveyed through the image rendering device 102.

[0026] The image rendering device 102 may further include a transceiver element 104. The transceiver element 104 may include a transmitter and a receiver. These may be implemented using specific hardware elements or through electronic circuitry, for transmitting incident radiation and for detecting reflected radiation. Furthermore, the transmitters and receivers may be implemented as either single units or through a combination of multiple units. Examples of an incident radiation include, but is not limited, electromagnetic radiation such laser beam or a beam of infrared radiation. In one example, the transceiver element 104 may be a reflective edge detection sensor. The reflector plate 106 may be further coupled to a shaft such that the reflector plate 106 is rotatable with respect to the transceiver element 104. The coupling of the reflector plate 106 may be direct, i.e., the reflector plate 106 may be mounted on the shaft. In another example, the reflector plate 106 may be indirectly coupled, such as through a motion transfer mechanism, which allows transferring motion of the shaft to the reflector plate 106.

[0027] The reflector plate 106 may further include a plurality of reflective segments 108. The reflective segments 108 may be radially distributed about the axis of rotation of the reflector plate, with the respective reflective segments 108 having differing reflectivity. The shaft (not shown in FIG. 1) may further include flag elements 110. The flag elements 110 may be any rigid member extending radially outward from the shaft. The position of the flag elements 110 may depend on sizes of print media to be used by the image rendering device. For example, a distance of a first flag element from a certain point of reference may correspond to a certain print media size. Similarly, distances of subsequent flag elements may correspond to smaller sizes of the print media. As a result, a print medium of a specific dimension may actuate a corresponding flag element. One end of the flag elements 110 is fixedly coupled onto the shaft, with the other end capable of moving in a vertical plane. As the other end of one of the flag elements 110 moves, it rotates the shaft and also the reflector plate 106. In one example, the image rendering device may further include moveable mechanism. Such a moveable mechanism, responsive to placement of a print media, actuates the flag element.

[0028] A print medium (not shown in FIG. 1) in a media tray may laterally displace one end of one of the flag elements 110. The transceiver element 104 may be further activated, and may begin emitting an incident radiation. The lateral movement of one of the flag element 110 rotates the shaft and rotates the reflector plate 106 with respect to the transceiver element 104. As the reflector plate 106 rotates, a first reflective segment of amongst the reflective segments 108 may move into the path of the incident radiation. The incident radiation may get reflected off the first reflective segment. The reflected radiation from the first reflective segment is detected by the transceiver element 104. The image rendering device 102 may compare attributes of the incident radiation and the reflected radiation. Based on the comparison, the image rendering device 102 may ascertain the width of the print media present on the media tray of the image rendering device 102. In case the print media is replaced by another print media of a different width, yet another of the flag elements 110 may get actuated which eventually may cause a second reflective segment (amongst the reflective segments 108) to move into the path of the incident radiation. The image rendering device 102 may compare the reflected radiation with the incident radiation, and accordingly ascertain the width of the print media placed on the media tray.

[0029] FIG. 2 depicts certain internal components of the image rendering device 102, as per another example. The present figure depicts certain other components. However, this is one of the possible other examples, and should not be considered as limiting the scope of the claimed subject matter. The image rendering device 102 includes the transceiver element 104, the reflector plate 106, the reflective segments 108 and the flag elements 110. The present figure depicts three reflective segments 108, namely, reflective segment 108-1, 108-2, and 108-3. Furthermore, the present figure additionally depicts three flag elements 110, which have been referenced as flag element 110-1, 110-2, and 110-3. Other examples with fewer or greater number of reflective segments 108 and flag elements 110 may be possible as well within the scope of the protection being sought.

[0030] The reflector plate 106 and the flag elements 110 are mounted on to the shaft 202, which is rotatable about an axis 204. As a result of the coupling with the shaft 202, reflector plate 106 and the flag elements 110 are rotatable about the axis 204. The flag elements 110 may be positioned along the length of the shaft 202, such that their position correspond to predefined widths or sizes of print media that are to be used by the image rendering device 102. For example, the distance of flag element 110-1 from a common point of reference may be such that it corresponds to a specific sized print medium, such as A6-sized paper. Similarly, positions of the flag elements 110-2 and 110-3 may, in one example, correspond to larger sizes of print medium, such as A2-sized paper and A4-sized paper, respectively.

[0031] Although the present FIG. 2 does not depict any print media, the flag elements 110 may be actuated in response to placement of print media onto a media tray of the image rendering device 102. In such a case, the flag elements 110 may get actuated directly, or may be actuated indirectly through specific mechanisms. As an example of the latter where the shaft 202 and the flag elements 110 are arranged vertically beneath the media tray, the image rendering device 102 may further include a moveable mechanism which may protrude through slits or openings in a media tray. The print media when placed on the media tray may bear down and push the moveable mechanism. The moveable mechanism may thereafter engage with one of the flag elements 110 to affect rotation of the shaft 202.

[0032] In one example, the moveable mechanism may be implemented as moveable plates 206-1, 206-2, and 206-3 (collectively referred to as plates 206). The plates 206 are moveable about an axis 210 which extends in parallel to the axis 204. The plates further include protruding members 208, interchangeably referred to as members 208, which may extend through openings in the media tray (not shown in FIG. 2). When the print media is placed on the media tray, it may push against one of the members 208 (e.g., member 208-1). As the member 208-1 is pushed, the corresponding plate 206-1 rotate about the axis 210 and moves downwards to engage with the corresponding flag element 110-1 to actuate it. The actuation the flag element 110-1, in the present example, may affect the rotation of the reflector plate 106. The image rendering device 102 may subsequently, based on the movement of the reflector plate 106, determine the width of the print media present on the media tray.

[0033] These above-mentioned aspects are further explained in conjunction with FIGS. 3-5. FIG. 3 depicts the working and interaction of various components of the image rendering device 102, as depicted in FIG. 2 when a print media 302 is provided within the image rendering device 102 (e.g., on a media tray). The print media 302 may be either a single unit or sheet, or may be a bundle of print media 302. In the present example, the width of the print media 302 is smallest as compared to the examples described in conjunction with later drawings. In the present example, the print media 302 may be an A6-sized sheet of print medium. It should also be noted that references to width does not preclude determining the measure of longer edges of the print media 302. Dimensions of longer edges may be performed as per the examples of the present subject matter, without deviating from the scope of the present subject matter. Furthermore, reference to print media 302 may include within its scope multiple or single units of the print medium.

[0034] Returning to the working of the image rendering device 102, the print media 302 may be positioned onto the media tray (not shown). In one example, the media tray may include visual identifiers to aid any user in identifying where the print media 302 is to be placed. In the present example, the print media 302 when placed onto the media tray, may lie above the plate 206-1. When the print media 302 is placed onto the media tray, the print media 302 may push the member 208-1 downwards in the direction A (as indicated in FIG. 3). As the member 208-1 is pushed downwards, the plate 206-1 moves downwards as well to engage with the flag element 110-1.

[0035] The flag elements 110, such as the flag element 110-1, may have a profile that differs from that of other flag elements 110, such as the flag element 110-2. In one example, the flag elements 110 may have a curved concaved inner profile such that the inner portion of the flag elements 110 form an obtuse angle. In another example, the value of the obtuse angle may vary between the flag elements 110 as a result of which the flag elements 110 may have different profiles, respectively. In one example, the obtuse angle may decrease from flag element 110-1 to flag element 110-

3. As a result, the obtuse angle of the flag element 110-1 and 110-3, is maximum and minimum, respectively, with the value of the obtuse angle of flag element 110-2 being intermediate to that of flag element 110-1 and 110-3. In another example, the flag elements 110 may have a curved profile.

[0036] Returning to the operation of the image rendering device 102, the flag element 110-1 may move vertically downwards. The movement of the flag element 110-1 results in the shaft 202 to rotate about the axis 204 in the direction B, as depicted. As the shaft 202 rotates, the reflector plate 106 also rotates about the axis 204. At this stage, the image rendering device may activate the transceiver element 104 to emit, either continuously or periodically, incident radiation in the direction of the reflector plate 106. The incident radiation may travel in a linear path towards the reflector plate 106. In the present instance, owing to the rotation of the reflector plate 106, one of the reflective segments 108, say reflective segment 108-1 may be present in the path of the incident radiation. The incident radiation may further impinge the reflective segment 108-1 at a point of incidence, depicted as point 304. The incident radiation is reflected off from the point 304 back towards the transceiver element 104. The transceiver element 104 detects, and may further determine certain attributes of the reflected radiation. In one example, the attributes may include, but are not limited to intensity, frequency, and wavelength.

[0037] It may be the case that during the course of use, a user may replace or provide print media 402, which is larger in width as compared to the print media 302. The manner in which the image rendering device 102 operates on being provided print media 402 is depicted in FIG. 4. It should be noted that FIG. 4 is one of other possible examples and should not be construed as limiting the scope of the claimed subject matter. The print media 402 may be positioned onto the media tray of the image rendering device 102. In one example, a user may utilize visual identifiers to determine positions where the print media 402 is to be placed. In the present example, the print media 402 when placed onto the media tray, may lie above the plates 206-1 and 206-2. When the print media 402 is placed onto the media tray, the print media 402 may also push the member 208-2 downwards in the direction A (as indicated by the movement of the member 208-2 in FIG. 4). As the member 208-2 is pushed downwards, the plate 206-2 moves downwards as well to engage with the flag element 110-2.

[0038] The flag element 110-2 is so profiled such that it affects a rotation of the shaft

202 by a predefined angle, which may be greater than the angle through which the shaft is rotated by the flag element 110-1. In an example where the inner profile of the flag elements 110 form an obtuse angle, the angle formed by the flag element 110-2 is less than that of the flag element 110-1. Responsive to placing the print media 402 onto the media tray, the flag element 110-2 may move vertically downwards when pushed by the plate 206-2. The movement of the flag element 110-2 results in the shaft 202 to rotate further about the axis 204 in the direction B, as depicted. As the shaft 202 rotates, the reflector plate 106 also rotates about the axis 204.

[0039] In the present instance, owing to the further rotation of the reflector plate 106 in the direction C, as the reflective segment 108-1 moves away, the reflective segment 108-2 moves into the path of the incident radiation, with the point of incidence now coinciding on reflective segment 108-2. The incident radiation from the transceiver element 104 may be reflected off from the reflective segment 108-2 towards the transceiver element 104. The transceiver element 104 detects, and may further determine certain attributes of the reflected radiation, for ascertaining the width of the print media 402.

[0040] FIG. 5 depicts the operation of the image rendering device 102 when a print media 502 is provided, in an example. The print media 502 is such that it is larger in width as compared to the print media 302 and 402. The print media 502 when placed onto the media tray, may lie above the plates 206-1, 206-2 and 206-3. When placed onto the media tray, the print media 502 may push the member 208-3 downwards in the direction A (as indicated by the movement of the member 208-3 in FIG. 5). As the member 208-3 is pushed downwards, the plate 206-3 moves downwards to engage with the flag element 110-3.

[0041] The flag element 110-3 is so profiled such that it affects a rotation of the shaft 202, more than the rotation affected by the flag elements 110-1 and 110-2. In an example, the angle formed by the flag element 110-3 is less than that of the flag elements 110-1 and 110-2. Responsive to placing the print media 502 onto the media tray, the flag element 110-3 may move vertically downwards when pushed by the plate 206-3. The movement of the flag element 110-3 results in the shaft 202 to rotate still further about the axis 204 in the direction B. As the shaft 202 rotates, the reflector plate 106 also rotates about the axis 204. With the reflector plate 106 moving, the reflective segment 108-3 moves into the path of the incident radiation. As it moves into the path of the incident radiation, the point 304 now falls onto the reflective segment

108-3. The incident radiation from the transceiver element 104 may be reflected off from the reflective segment 108-3. The transceiver element 104 detects, and may further determine certain attributes of the reflected radiation, for ascertaining the width of the print media 502.

[0042] In any of the examples as explained in conjunction with FIGS. 3-5, the image rendering device 102, on determining an attribute the reflected radiation (e.g., intensity) from any one of the reflective segments 108, the image rendering device 102 may compare the same with an attribute the incident radiation. In one example, the image rendering device 102 may determine a ratio of the attribute of the incident radiation and the attribute of the reflected radiation. The image rendering device 102 may then ascertain the width of the print media 302 based the comparison and predefined look-up data. In one example, the look-up data may provide a correlation between predefined widths of print media and comparative values of the incident radiation and the reflected radiation. In the present example, the correlation may be provided through a mapping between comparative values and widths of print medium (e.g., a first comparative value may correspond to a first width of print media, a second comparative value may correspond to a second width of print media, etc.). In this manner, based on the reflected radiation from one of the reflective segments 108, the image rendering device 102 may determine the width of the print media, i.e., one of print media 302, 402 and 502.

[0043] FIG. 6 illustrate a block diagram of an image rendering device 602, as per another example. The image rendering device 602 may be similar to the image rendering device 102 as explained in conjunction with the preceding drawings. Furthermore, the image rendering device 602 may also include certain similar, if not the same, components as present in the image rendering device 102. For the present example, such similar components have been provided with the same reference numeral as relied in the previous figures. It is to be noted that such components may be implemented in a different manner without deviating from the scope of the present subject matter.

[0044] The image rendering device 602 is to detect width of a print medium that may be placed onto a media tray of the image rendering device 602. In one example, the image rendering device 602 may process digital files and render corresponding content onto print media stored therein. The image rendering device 602 may be implemented as a standalone device communicatively connected through a network to other computing devices or other systems (not shown in FIG. 6). The image rendering device 602 includes interface(s) 604, memory 606, transceiver element 104, reflector plate 106, reflective segments 108, and flag elements 110. The interface(s) 604 may include a variety of interfaces, for example, interfaces for data input and output devices, referred to as I/O devices, storage devices, network devices, and the like. The interface(s) 604 facilitate communication between the image rendering device 602 and various computing devices connected in a networked environment. The interface(s) 604 may also be used to communicatively couple components of the image rendering device 602 with each other.

[0045] The memory 606 may store computer-readable instructions, which may be fetched and executed to set a system state as one of wakeable through a trigger and non-wakeable. The memory 606 may include any non-transitory computer-readable medium including, for example, volatile memory such as RAM, or non-volatile memory such as EPROM, flash memory, and the like. The image rendering device 602 further includes engines 608 and data 610.

[0046] The engines 608 may be implemented as a combination of hardware and programming (for example, programmable instructions) to implement certain functionalities of the engines 608, for example to detect width of print medium being processed by the image rendering device 602. In examples described herein, such combinations of hardware and programming may be implemented in several different ways. For example, the programming for the engines 608 may be processor executable instructions stored on a non-transitory machine-readable storage medium and the hardware for the engines 608 may include a processing resource (for example, implemented as either a single processor or a combination of multiple processors), to execute such instructions. In the present examples, the machine-readable storage medium may store instructions that, when executed by the processing resource, implement engines 608. In such examples, the image rendering device 602 may include the machine-readable storage medium storing the instructions and the processing resource to execute the instructions, or the machine-readable storage medium may be separate but accessible to image rendering device 602 and the processing resource. In other examples, engines 608 may be implemented by electronic circuitry.

[0047] The data 610 includes data that is either stored or generated as a result of functionalities implemented by any of the engines 608. In an example, the engines

608 include a detection engine 612, control engine 614 and other engines 616. The other engines 616 may implement functionalities that supplement applications or functions performed by the image rendering device 602 or the engines 608. Further, the data 610 may include attribute values 618, comparative values 620, look-up data 622, and other data 624. It should also be noted that some or all components of the engines 608 and data 610 may be implemented external to, although in communication with, the image rendering device 602, without deviating from the scope of the present subject matter.

[0048] Responsive to the placement of print media being placed on a media tray of the image rendering device 602, corresponding flag elements 110 may be actuated. Once actuated, the flag elements 110 may move downward in a vertical plane affecting rotation of a shaft on which the flag elements 110 may be fixed. The rotation of the shaft, such as the shaft 202, may in turn affect the rotation of the reflector plate 106. As the reflector plate 106 rotates, the reflective segments 108 may move across a path of incident radiation being emitted by the transceiver element 104. Depending on which one of the flag elements 110 was actuated, one of the corresponding reflective segments 108 is positioned in the path of the incident radiation emitted by the transceiver element 104. The incident radiation is reflected back by one of the corresponding reflective segments 108, and detected by the transceiver element 104.

[0049] The transceiver element 104 may detect the reflected radiation from one of the reflective segments 108. Once detected, detection engine 612 may determine the attributes of the reflected radiation. Examples of such attributes include, but are not limited to, intensity, frequency, and amplitude. Other examples of attributes may also be possible without deviating from the scope of the present subject matter. In one example, the detection engine 612 may store the values of the attributes as attribute values 618. The detection engine 612 may then fetch the attribute values 618 corresponding to the incident radiation. Once obtained, the detection engine 612 may further compare the attribute values 618 of the incident radiation and the reflected radiation to determine a comparative value 620. In one example, the detection engine 612 may determine such a comparative value 620 by either obtaining a ratio of the attribute values 618 of the incident radiation and the reflected radiation. In another example, the comparative value may be obtained by obtaining a difference between the attribute values 618 of the incident radiation and the reflected radiation.

[0050] Once the comparative value 620 is obtained, the detection engine 612 may compared the obtained comparative value 620 with the look-up data 622. In one example, the look-up data 622 provides mapping between multiple comparative values, such as comparative value 620, with corresponding dimension of print media. For the corresponding the attribute values 618 and the resulting comparative value 620, the detection engine 612 may determine the dimension of the print media. In this manner, the image rendering device 602 automatically determines the width of any other sized print media positioned onto the image rendering device 602.

[0051] Once the width of the print medium placed on the media tray is determined, the control engine 614 may generate control instruction for adjusting the print media guide mechanisms within the image rendering device 602. Such control instructions when executed may configure and adjust internal machinery and other components of the image rendering device 602, for handling the print media.

[0052] The above-mentioned approaches may be implemented in other devices, besides the image rendering device. FIG. 7 illustrates a block diagram of an example print device 702. The print device 702 may be any print system which is capable of rendering content corresponding to a digital file by way of printing. The print device 702, and its components may function in a manner which is similar to functioning of the components as described in conjunction with image rendering device 102 and image rendering device 602. In certain cases, the working of the components of the print device 702 may have been described with reference to similar components as described in the preceding figures. In the present example, the print device 702 may include a transceiver element 704, a reflector plate 706 and a detection engine 708. The detection engine 708 is in communication with the transceiver element 704. In one example, the transceiver element 704 may emit an incident radiation directed to the reflector plate 706.

[0053] The print device 702 may further include flag elements, similar to flag elements 110 of the image rendering device 102. The flag elements are attached to the shaft. Any vertical movement of the flag elements affect rotation of the shaft. The reflector plate 706 is rotatable about an axis, such as the axis 204. In the present example, the angle through which the reflector plate 706 rotates is dependent on a size of the print medium which is present within the print device 702. The reflector plate 106 may rotate in response to placing such print media on a media tray of the print device 702. In one example, the print device 702 may further include a moveable mechanism beneath the media tray of the print device 702. In the present example, the print media being placed on the media pushes such a moveable mechanism in a downward direction. As the moveable mechanism moves, it actuates a corresponding flag element, which in turn rotates the shaft and the reflector plate 706.

[0054] Any incident radiation directed towards the reflector plate 706 may be reflected from one of the reflective segments 710 which is present in the path of the incident radiation. The reflective segments may have differing reflectivity. The incident radiation may then be reflected as reflected radiation by one of the reflective segments 710, and is detected by the transceiver element 704.

[0055] Once the reflected radiation is detected, the detection engine 708 may further determine an attribute of the incident radiation and the reflected radiation. In one example, the attribute may include intensity, frequency, or wavelength. In another example, the values may be stored, such as the attribute values 618, within the print device 702. The detection engine 708 may subsequently compare the attribute values of the incident radiation and the reflected radiation, to arrive at a comparative value. The comparative value may in turn be compared a look-up data available within the print device 702. In one example, the look-up data correlates multiple predefined detector responses with predefined media sizes to determine the width of the print medium.

[0056] FIG. 8 illustrates a block diagram of an example width detection device 802. The width detection device 802 may be implemented for determining a width of print medium for printing or rendering content by the width detection device 802. Examples of width detection device 802 may include, but are not limited to, printers and photocopying machines.

[0057] The width detection device 802 may include a transceiver element 804, a reflector plate 806 mounted on a shaft, a plurality of flag element 808 and a detection engine 810. The reflector plate 806 may further include a plurality of reflective segments 812. The detection engine 810 is in communication with the transceiver element 804. The flag element 808 extend radially outwards from the shaft onto which the reflector plate 806 is mounted. Any print medium when positioned onto a media tray may actuate the flag element 808. The number of flag element 808 which may be actuated may depend on the size of the print medium positioned onto the media tray. The actuation of the flag element 808 results in the rotation of the reflector plate 806. As a result, the reflective segments 812 present on the reflector plate 806 also move with respect to the transceiver element 804. The angle by which the reflector plate 806 rotates may be detected by the transceiver element 804 as a result of movement of reflective segments 812. Based on the rotation detected by the transceiver element 804, the detection engine 810 may determine the size of the print medium positioned onto the media tray.

[0058] Although examples for the present disclosure have been described in language specific to structural features, it should be understood that the appended claims are not necessarily limited to the specific features described. Rather, the specific features are disclosed and explained as examples of the present disclosure.

What is claimed is:

1. An image rendering device comprising:

a transceiver element;

a reflector plate coupled to a shaft and rotatable with respect to the transceiver element, wherein the reflector plate comprises a plurality of reflective segments radially distributed about an axis of rotation of the reflector plate, wherein reflective segments within the plurality of reflective segments have a different reflectivity; and

a flag element, extending radially outward and axially spaced away from the reflector plate on the shaft, wherein a lateral movement of the flag element is to affect rotation of the shaft and the reflector plate.

2. The image rendering device as claimed in claim 1, the device comprising a moveable mechanism, wherein the moveable mechanism is to actuate the flag element responsive to placement of a print media.

3. The image rendering device as claimed in claim 1, wherein the flag element is profiled so as to affect the rotation of the shaft by a predefined angle, and further wherein the flag element may have a profile that is different than that of other flag elements of the image rendering device.

4. The image rendering device as claimed in claim 1, wherein a position of the flag element along the shaft is based on a predefined width of print media.

5. The image rendering device as claimed in claim 1, the device comprising a detection engine to:

determine an attribute of a reflected radiation received by the transceiver element, wherein the reflected radiation is from one of the plurality of reflective segments;

determine an attribute of an incident radiation, wherein the incident radiation is emitted by the transceiver element;

compare the attribute of the incident radiation and the attribute of the reflected radiation to obtain a comparative value; and

determine a width of a print medium placed on a media tray of the image rendering device based on the comparative value and a look-up data.

6. The image rendering device as claimed in claim 5, wherein the attribute of the incident radiation and the attribute of the reflected radiation comprises intensity, amplitude, or frequency.

7. The image rendering device as claimed in claim 1, wherein the transceiver element is a reflective edge detection sensor.

8. A print device comprising:

a transceiver element to generate an incident radiation; and

a reflector plate coupled to a shaft and rotatable with respect to the transceiver element, wherein the reflector plate comprises a plurality of reflective segments radially distributed about an axis of rotation of the reflector plate, with the plurality of reflective segments having a different reflectivity;

a detection engine in communication with the transceiver element, wherein the detection engine is to:

determine an attribute of the incident radiation and an attribute of a reflected radiation, wherein the reflected radiation is reflected off from one of the plurality of reflective segments; and

determine a width of a print medium placed on a media tray of the print device based on the respective attributes of the incident radiation and the reflected radiation.

9. The print device as claimed in claim 8, wherein the attributes comprise intensity, amplitude, or frequency.

10. The print device as claimed in claim 8, wherein the detection engine is to further:

compare the attribute of the incident radiation and the attribute of the reflected radiation to obtain a comparative value; and

further compare the comparative value with look-up data to determine the width of the print medium, wherein the look-up data maps comparative values to widths of print medium.

11. The print device as claimed in claim 8, further comprising a plurality of flag elements extending radially outward from the shaft and axially spaced away from the reflector plate along a length of the shaft.

12. The print device as claimed in claim 11, wherein the plurality of flag elements are positioned at locations on the shaft at a distance from a point of reference, wherein the distance corresponds to a standardized size of the print medium.

13. A width detection device of a printing device, the width detection device comprising:

a transceiver element;

a reflector plate coupled to a shaft and rotatable about an axis with respect to the transceiver element, wherein the reflector plate comprises a plurality of reflective segments distributed radially about the axis and having a different reflectivity ;

a plurality of flag elements extending radially outward and axially spaced away from the reflector plate on the shaft, wherein the plurality of flag elements are profiled to affect rotation of the reflector plate by different angles; and

a detection engine coupled to the transceiver element, wherein the detection engine is to determine a width of a print medium based on a signal reflected from one of the plurality of reflective segments.

14. The width detection device as claimed in claim 13, wherein one of the plurality of flag elements is actuated by a print medium positioned on a media tray of the printing device.

15. The width detection device as claimed in claim 13, wherein the detection engine is to:

determine an attribute of an incident radiation emitted from the transceiver element and a reflected radiation, wherein the reflected radiation is reflected off from one of the plurality of reflective segments; and

wherein the width of the print medium placed on the media tray is to be determined based on the attributes of the incident radiation and the reflected radiation.

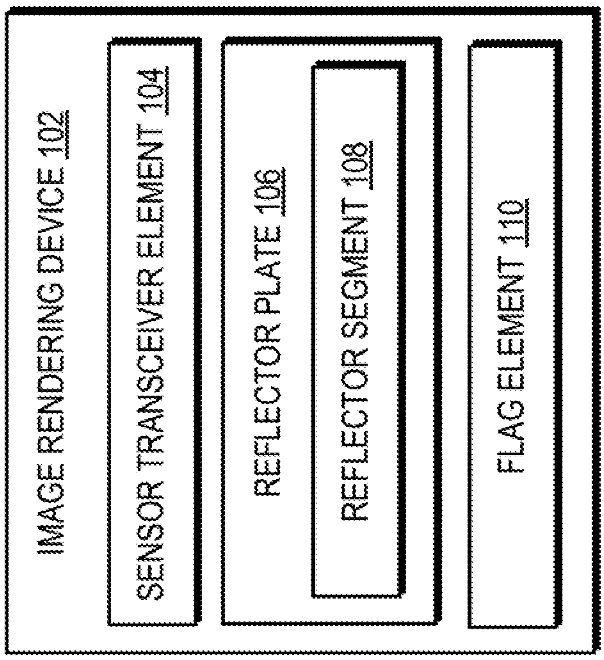
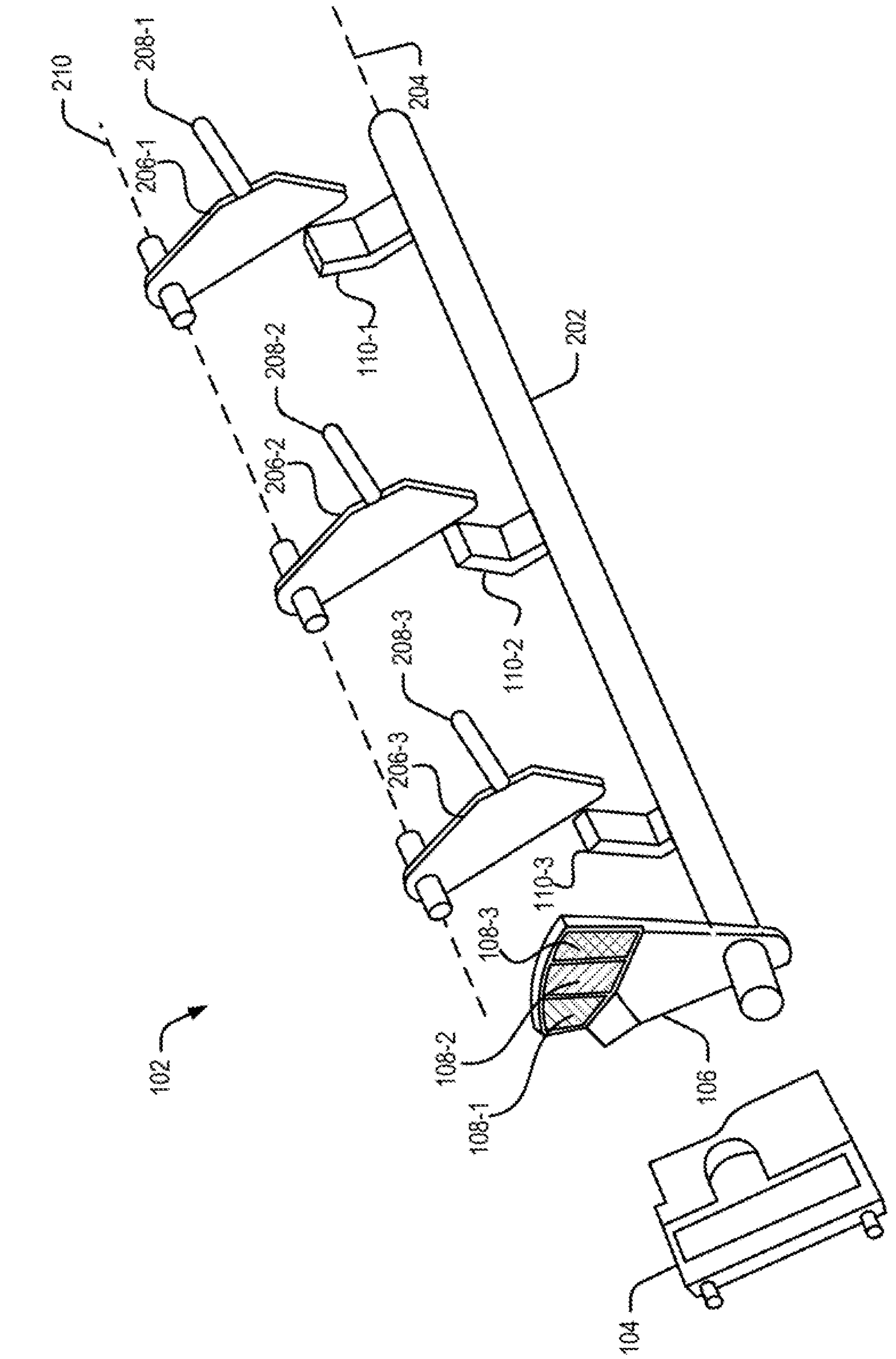


IMAGE RENDERING DEVICE 102
SENSOR TRANSCEIVER ELEMENT 104
REFLECTOR PLATE 106
REFLECTOR SEGMENT 108
FLAG ELEMENT 110

FIG. 1



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206-1
110-1
202
208-2
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208-3
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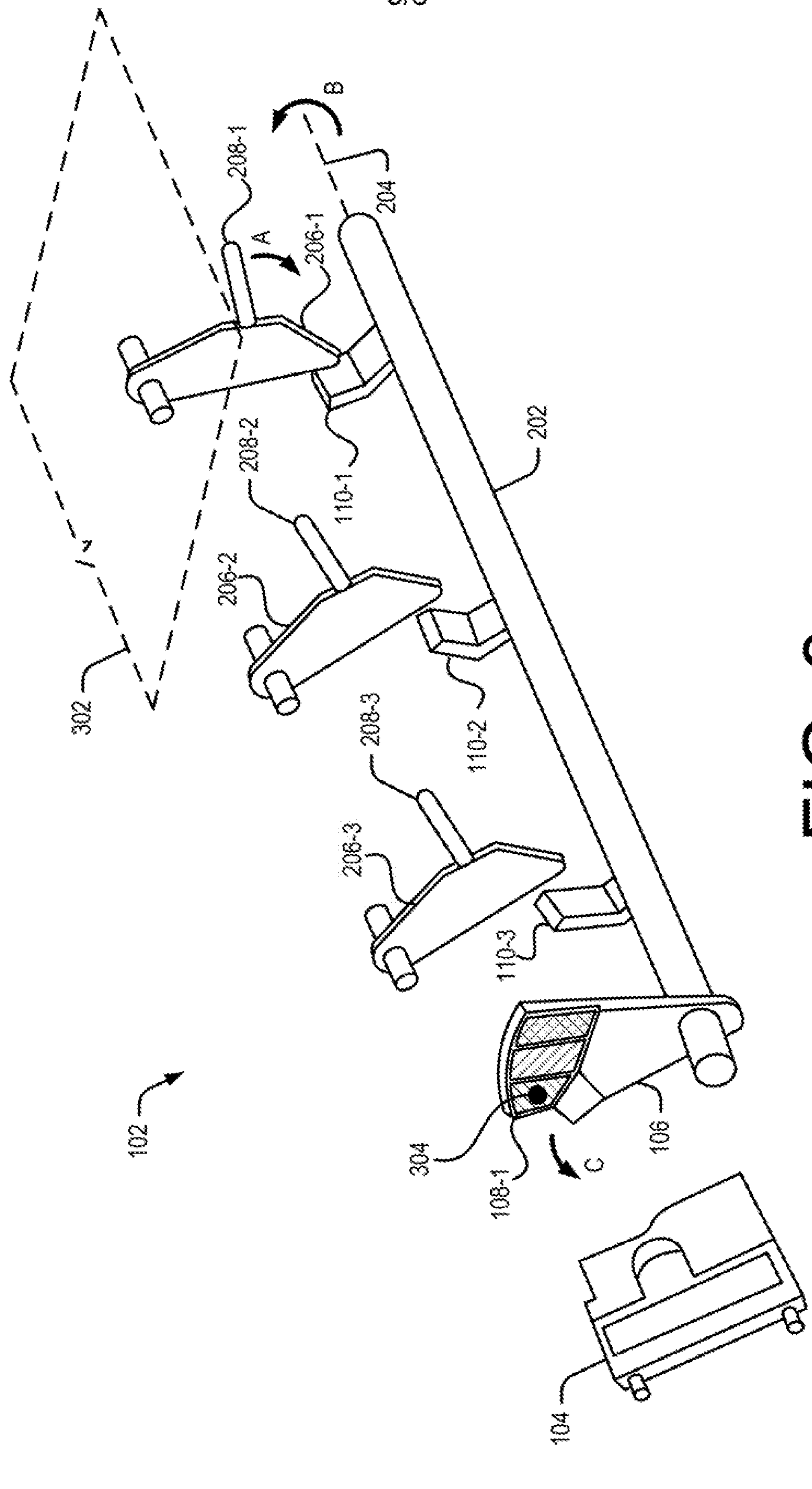
106
102
104

FIG. 2



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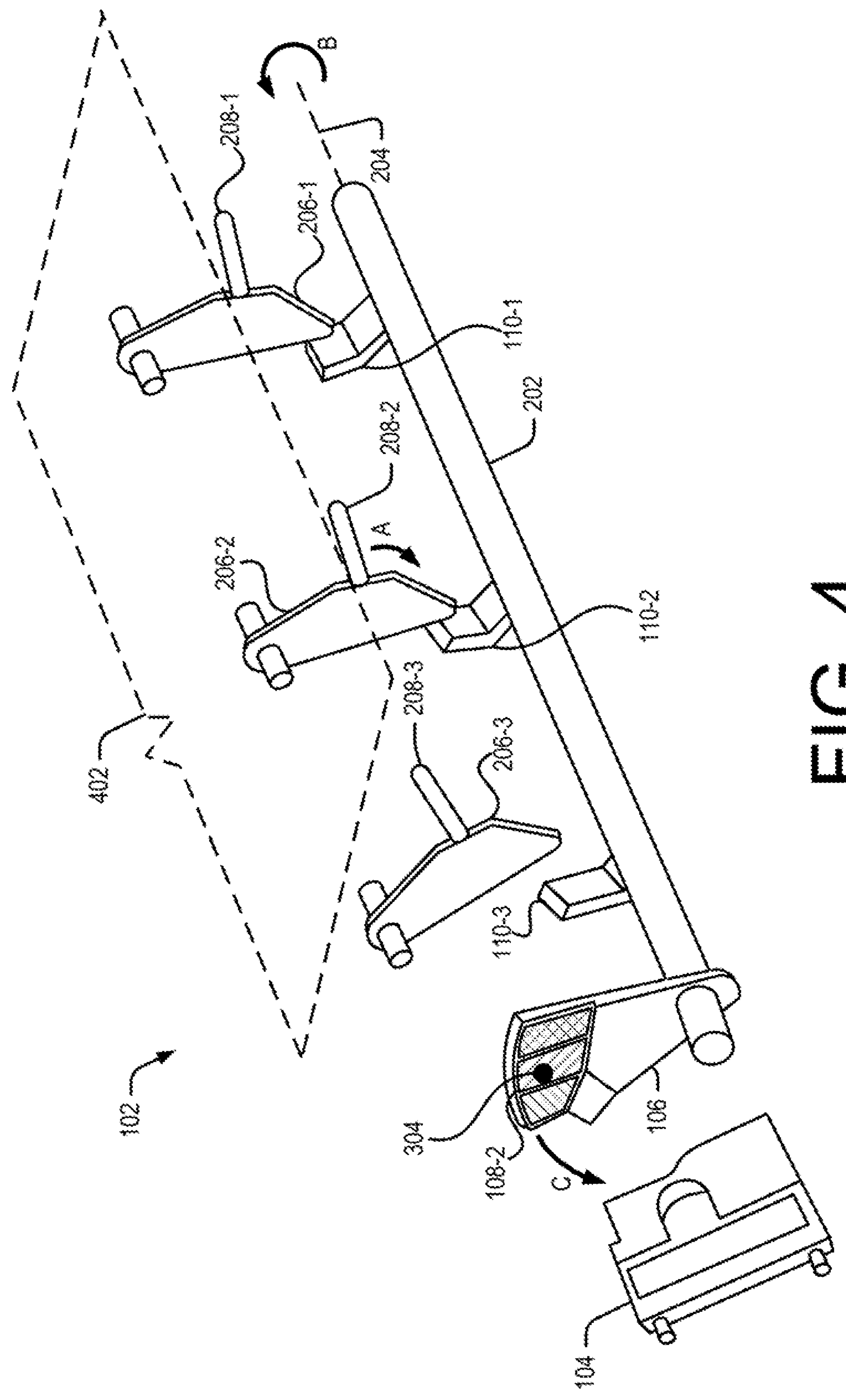
304
108-1
C
106
104

FIG. 3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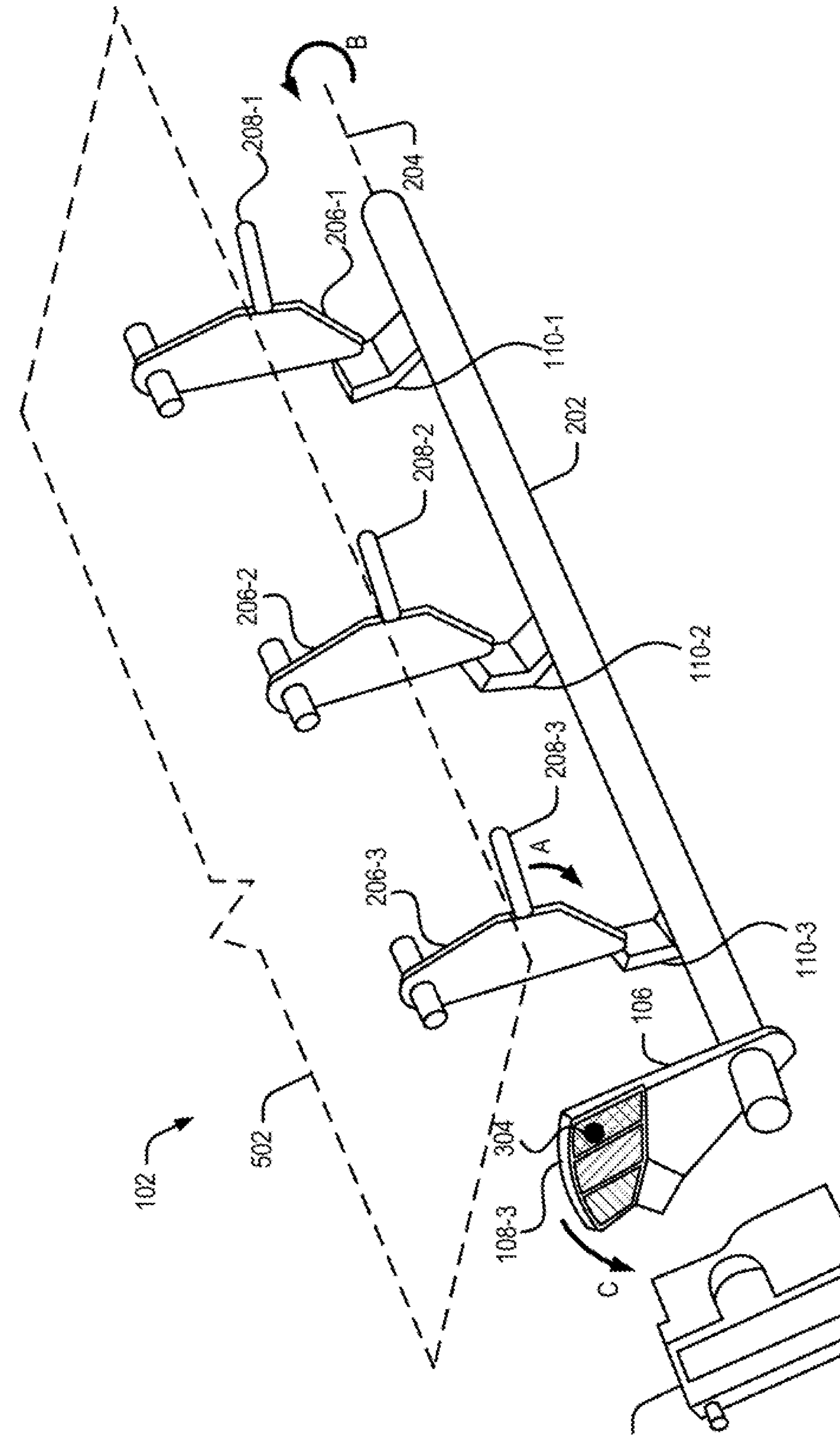
304
108-2
C
106
104

FIG. 4



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206-1
208-1
204
B

FIG. 5

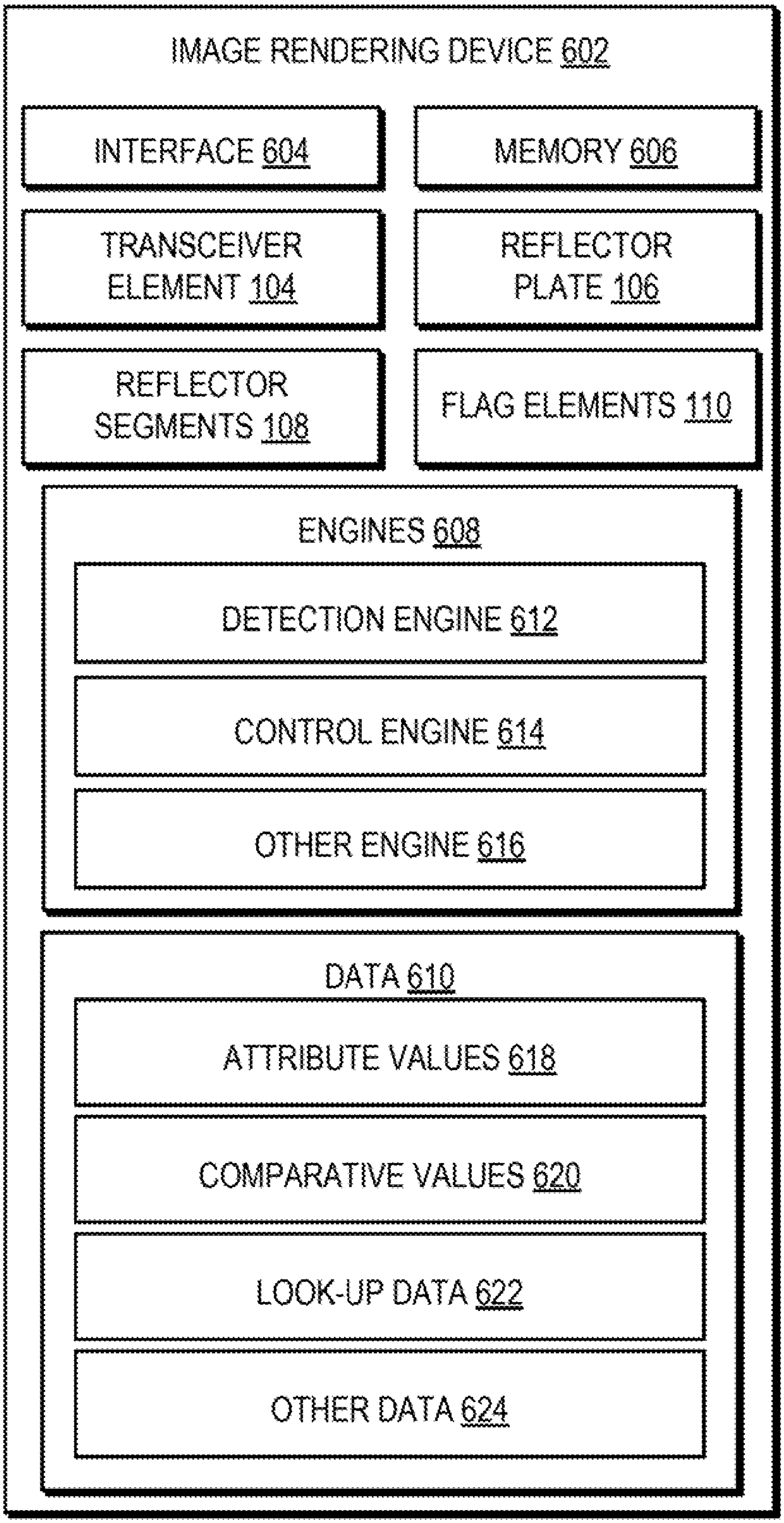
IMAGE RENDERING DEVICE 602
INTERFACE 604
MEMORY 606
TRANSCEIVER ELEMENT 104
REFLECTOR PLATE 106
REFLECTOR SEGMENTS 108
FLAG ELEMENTS 110
ENGINES 608
DETECTION ENGINE 612
CONTROL ENGINE 614
OTHER ENGINE 616
DATA 610
ATTRIBUTE VALUES 618
COMPARATIVE VALUES 620
LOOK-UP DATA 622
OTHER DATA 624

FIG. 6

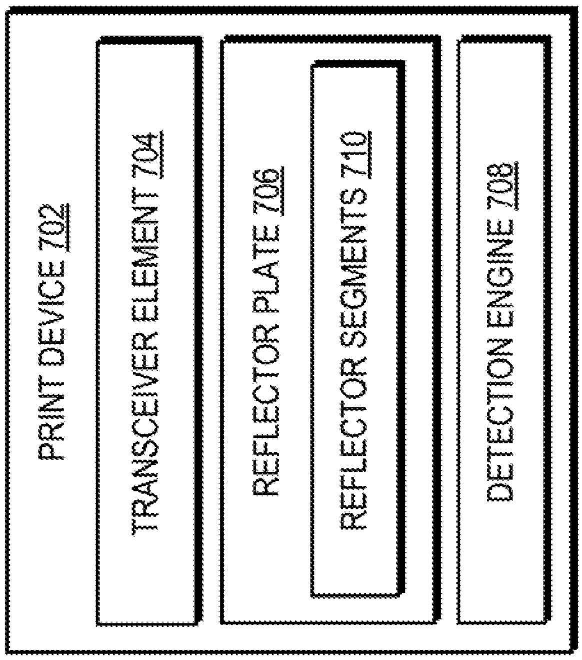
PRINT DEVICE 702
TRANSCEIVER ELEMENT 704
REFLECTOR PLATE 706
REFLECTOR SEGMENTS 710
DETECTION ENGINE 708

FIG. 7

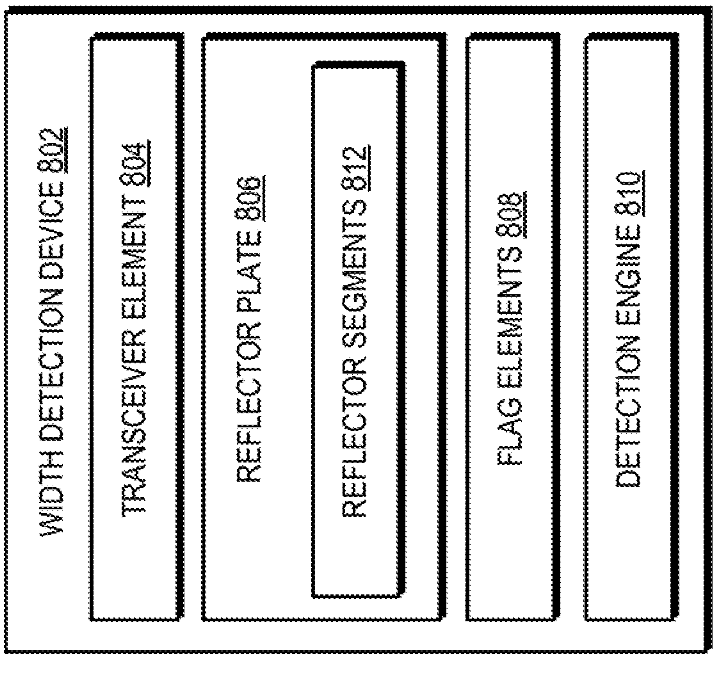
WIDTH DETECTION DEVICE 802
TRANSCEIVER ELEMENT 804
REFLECTOR PLATE 806
REFLECTOR SEGMENTS 812
FLAG ELEMENTS 808
DETECTION ENGINE 810

FIG. 8

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 2018/025914

A. CLASSIFICATION OF SUBJECT MATTER

B41J 29/00 *(2006.01)*
G01B 11/02 *(2006.01)*

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 11/00-11/46, 29/00, B41L 21/00-21/12, G01B 11/02

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)

PatSearch (RUPTO internal), Esp@cenet, PAJ, USPTO, Information Retrieval System of FIPS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2012/0301202 A1 (SOURCE TECHNOLOGIES, LLC) 29.11.2012, paragraphs [0021] - [0025], fig. 1	1-15
A	US 7246957 B2 (BROTHER KOGYO KABUSHIKI KAISHA) 24.07.2007	1-15
A	WO 1999/065697 A2 (ENCAD, INC.) 23.12.1999	1-15
A	EP 1193075 B1 (SEIKO EPSON CORPORATION) 14.11.2007	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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"O" document referring to an oral disclosure, use, exhibition or other means

"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

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
12 November 2018 (12.11.2018)	22 November 2018 (22.11.2018)

Name and mailing address of the ISA/RU:	Authorized officer
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	P. Bystrov Telephone No. (495)531-64-81