IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
TYLER DIVISION

DIVERSIFIED OBSERVATION LLC Plaintiff, v. KONICA MINOLTA BUSINESS SOLUTIONS U.S.A., INC. Defendant.	) Civil Action No. 2:17-cv-688-JRG) **JURY TRIAL DEMANDED**

FIRST AMENDED COMPLAINT

For its Complaint, Plaintiff Diversified Observation LLC ("Plaintiff" or "Diversified Observation"), by and through the undersigned counsel, alleges on personal knowledge as to its own activities, and on information and belief as to the activities of Konica Minolta Business Solutions USA, Inc. ("Konica" or "Defendant"), as follows:

THE PARTIES

1. Diversified Observation is a Texas company with a place of business located at 5068 W. Plano Pkwy, Suite 300, Plano, Texas 75093.

2. Konica is a New York corporation with a place of business located at 3800 Paluxy Drive, Suite 410, Tyler, Texas 75703.

JURISDICTION AND VENUE

3. This action arises under the Patent Act, 35 U.S.C. §§271 *et seq.*

4. Subject matter jurisdiction is proper in this Court under 28 U.S.C. §§1331 and 1338.

5. Konica has purposefully availed itself of the rights and benefits of Texas law by engaging in systematic and continuous contacts with the State of Texas, including by selling printers, scanners, and other electronic products in the Eastern District of Texas, directly or through

affiliates, and by continuously and systematically placing goods into the stream of commerce for distribution throughout Texas, including the Eastern District. Konica also derives substantial revenue from the sale of those products in the Eastern District of Texas. Konica also regularly conducts and solicits business within the State of Texas.

6. Konica has settled multiple law suits brought in this District without filing a motion challenging either jurisdiction or venue: *See MyMail, Ltd. v. Honeywell International, Inc.*, 2:17-cv-00391-JRG-RSP (E.D. Tex., Tyler Div., May 3, 2017); *Freeny et al v. Brother International Corporation*, 2:17-cv-00183-JRG-RSP (E.D. Tex., Tyler Div., March 9, 2017); *Serenitiva LLC v. Konica Minolta Business Solutions U.S.*A., Inc., 6:16-cv-01373-RWS (E.D. Tex., Tyler Div., Dec. 13, 2016).

7. Moreover, Konica did not contest either personal jurisdiction or venue in *Dynamic Hosting Company LLC v. v. Konica Minolta Business Solutions U.S.A., Inc.*, 2:14-cv-01076-RWS-RSP (E.D. Tex., Tyler Div., Nov. 24, 2014) (Konica's Answer ¶4: "For purposes of this action only, KMBSUSA [Konica Minolta Business Solutions USA] does not contest that this is one District in which venue is proper." Konica's Answer ¶5: "For purposes of this action only, KMBSUSA does not contest that it is subject to personal jurisdiction in this judicial District.").

8. Venue is proper in this district pursuant to §1400(b) because Konica has a regular and established place of business in this District at 3800 Paluxy Drive, Suite 410, Tyler, Texas 75703, and Konica has infringed the Diversified Observation Patents (as shown below) in this District.

THE PATENTS-IN-SUIT

9. On January 5, 1999, the United States Patent and Trademark Office ("USPTO") duly and lawfully issued United States Patent No. 5,857,133 (the "'133 Patent"), entitled "Information

Reading Apparatus Having a Contact Image Sensor." A true and correct copy of the '133 Patent is attached hereto as Exhibit A.

10. On December 7, 1999, the USPTO duly and lawfully issued United States Patent No. 5,997,199 (the "'199 Patent"), entitled "Paper Feeding Module of a Color Picture Printer." A true and correct copy of the '199 Patent is attached hereto as Exhibit B.

11. On July 2, 2002, the USPTO duly and lawfully issued United States Patent No. 6,414,461 (the "'461 Patent"), entitled "Scanner that Controls Stepping Motor Torque." A true and correct copy of the '461 Patent is attached hereto as Exhibit C.

12. On February 18, 2003, the USPTO duly and lawfully issued United States Patent No. 6,522,432 (the "'432 Patent"), entitled "Image Scanner with Automatic Signal Compensation." A true and correct copy of the '432 Patent is attached hereto as Exhibit D.

13. Diversified Observation is the assignee and owner of all rights, title, and interest in and to the '133, '199, '461, and '432 Patents, including the right to assert all claims arising under said Patents and the right to any remedies for infringement of them. The assignments to the '133, '199, '461, and '432 Patents are recorded in the USPTO: for the '133 Patent at Reel/Frame 043617/0005; for the '461 Patent at Reel/Frame 043616/0950; for the '432 Patent at Reel/Frame 043616/0906; and for the '199 Patent at Reel/Frame 043616/0847.

COUNT I – INFRINGEMENT OF UNITED STATES PATENT NO. 5,857,133

14. Diversified Observation repeats and realleges the allegations of the previous paragraphs as if fully set forth herein.

15. Without license or authorization, and in violation of 35 U.S.C. §271(a), Konica infringed during the life of at least Claim 1 of the '133 Patent, which expired on August 25, 2017,

by making, using, importing, offering for sale, or selling image information reading apparatuses, including, but not limited to, the Konica 3320.

16. Claim 1 of the ’133 Patent reads:

> 1. An image information reading apparatus having a housing comprising:
>
> a sheet table on top of said housing for supporting a document sheet;
>
> a contact image sensor module carried by a carriage disposed beneath the bottom surface side of said sheet table, said contact image sensor having a plurality of slide-blocks attached onto the top surface of said contact image sensor module;
>
> single guiding means crossed over the bottom center of said carriage for guiding said carriage along said sheet table, said single guiding means mounted on a pair of supports at opposite ends for holding and supporting said guiding means in a manner that said contact image sensor module can contact the bottom surface side of said sheet table tightly with said plurality of slide-blocks interposed therebetween; and
>
> driving means located at one side of said single guiding means for reciprocally moving said carriage along said sheet table from a first direction to a second direction.

Exh. A at 5:2-22.

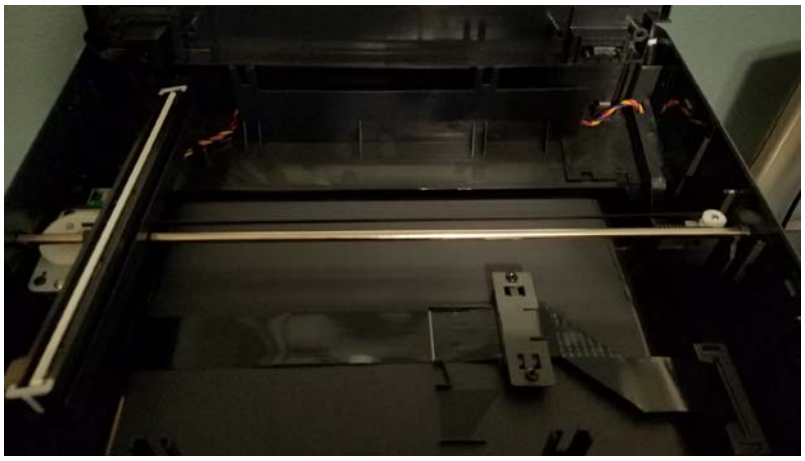
17. The Konica 3320 is an information reading apparatus having a housing, a sheet table, a contact image sensor carried by a carriage with a plurality of slide blocks, a single guiding means for the carriage, and a driving means for moving the carriage along the sheet table, as shown in the images below:

Scanning to a computer

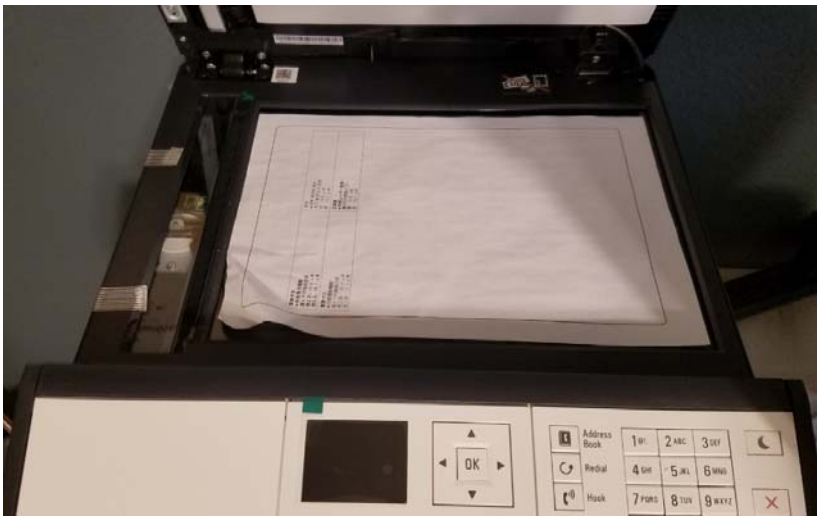
Automatic document feeder (ADF)	Scanner glass
	
Use the ADF for multiple-page documents.	Use the scanner glass for single pages, small items (such as postcards or photos), transparencies, photo paper, or thin media (such as magazine clippings).

The scanner lets you scan documents directly to a computer. The computer does not have to be directly connected to the printer for you to receive Scan to PC images. You can scan the document back to the computer over the network by creating a scan profile on the computer and then downloading the profile to the printer.

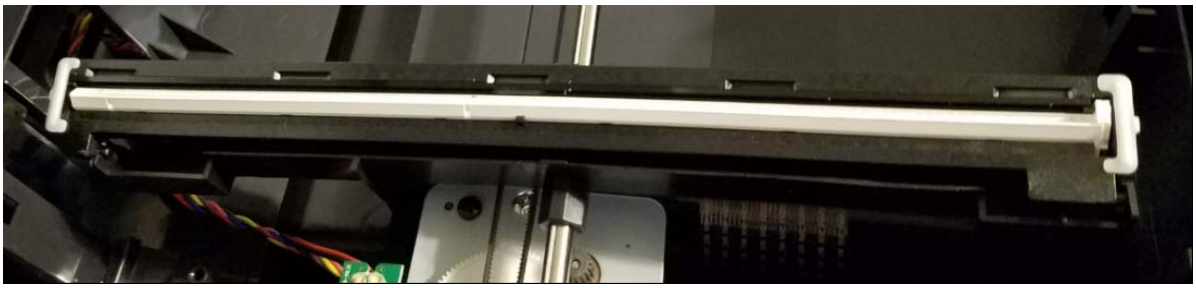
Konica 3320 User Guide at p. 104 (available at http://1fogf22l15n9fgimh2tp4cfl.wpengine.netdna-cdn.com/wp-content/uploads/2016/09/bizhub3320UserGuide.pdf (last visited Oct. 5, 2017)).



18. The Konica 3320 includes a sheet table on top of the housing for supporting a document sheet:

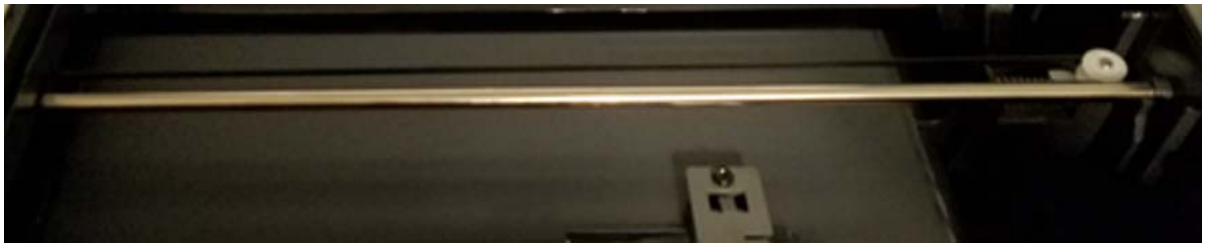


19. The Konica 3320 includes a contact image sensor module carried by a carriage beneath the bottom surface of the sheet table:

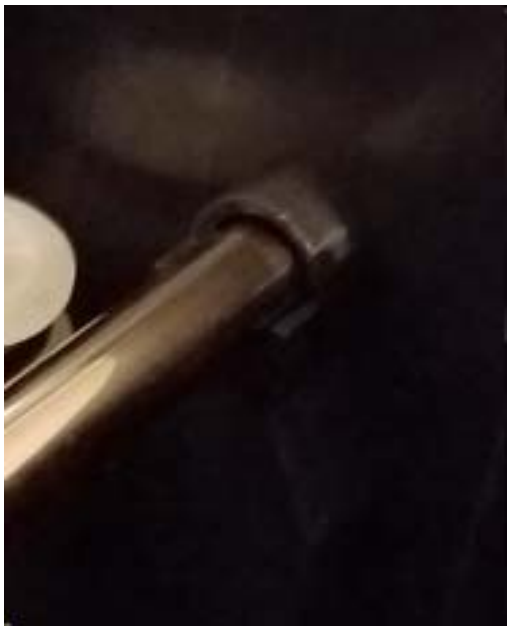


20. The contact image sensor module of the Konica 3320 has a plurality of slide blocks attached onto its top surface, as shown below (red rectangle added for clarity):

21. The Konica 3320 includes a single guiding means crossed over the bottom center of the carriage for guiding the carriage along the sheet table:



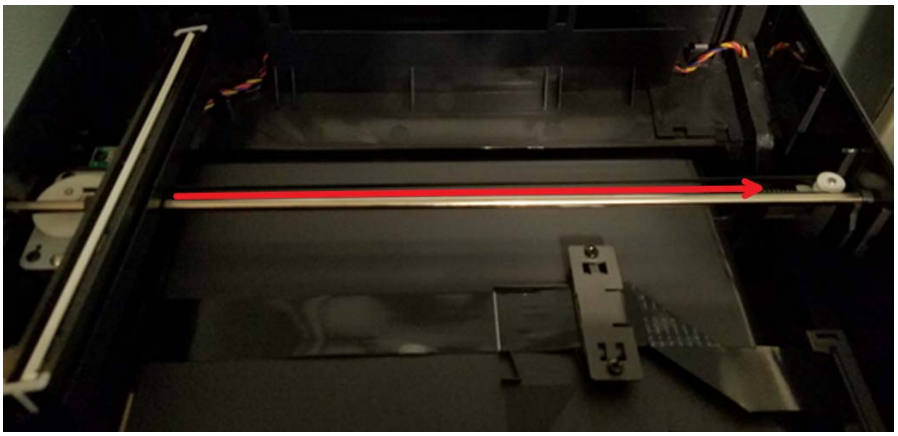
22. The guiding means of the Konica 3320 is mounted on a pair of supports at opposite ends for holding the guiding means:



23. The supports of the Konica 3320 hold the contact image sensor module in a manner such that the contact image sensor module can contact the bottom surface side of the sheet table tightly with the plurality of slide blocks interposed therebetween, as shown below (orange rectangle added for clarity):

24. The Konica 3320 includes a driving means located at one side of the single guiding means as shown (red rectangle added for clarity):

25. The guiding means of the Konica 3320 reciprocally moves the carriage along the sheet table from a first direction to a second direction, as shown below (red arrow added to show a first direction of movement, which is reversed for the second direction):



26. As shown above, each element of Claim 1 of the ’133 Patent is found in the Konica 3320.

27. Diversified Observation is entitled to recover from Konica the damages sustained by Diversified Observation as a result of Konica's infringement of at least Claim 1 of the ’133 Patent in an amount subject to proof at trial, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. §284.

COUNT II – INFRINGEMENT OF UNITED STATES PATENT NO. 5,997,199

28. Diversified Observation repeats and realleges the allegations of the previous paragraphs as if fully set forth herein.

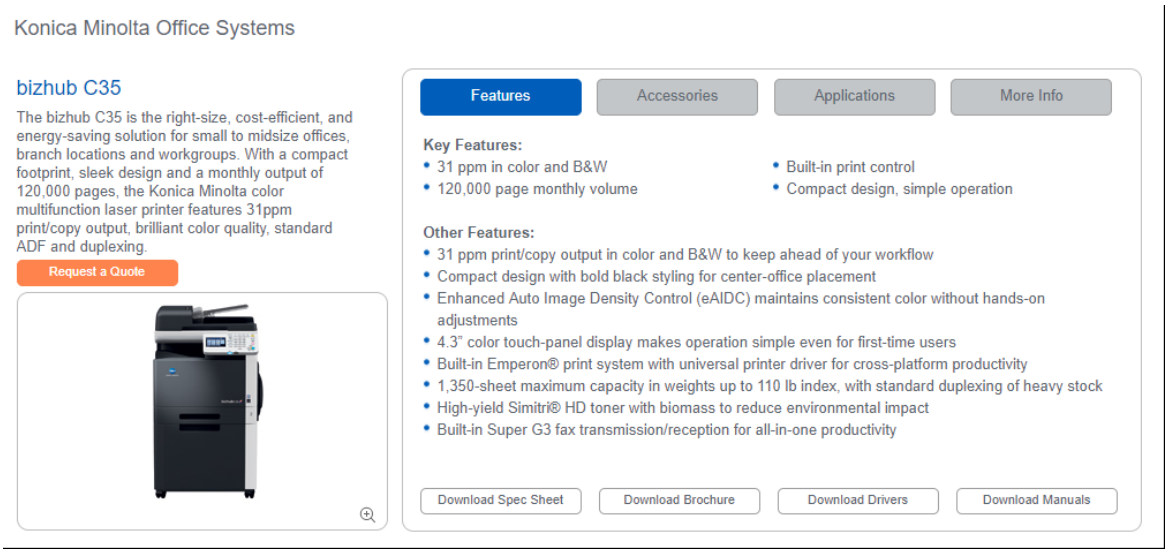
29. Without license or authorization, and in violation of 35 U.S.C. §271(a), Konica infringed and continues to infringe at least Claim 1 of the ’199 Patent by making, using, importing, offering for sale, or selling paper feeding modules of a color picture printer for driving a paper back and forth through a printing module of the printer, including, but not limited to, the Konica c35.

30. Claim 1 of the ’199 Patent reads:

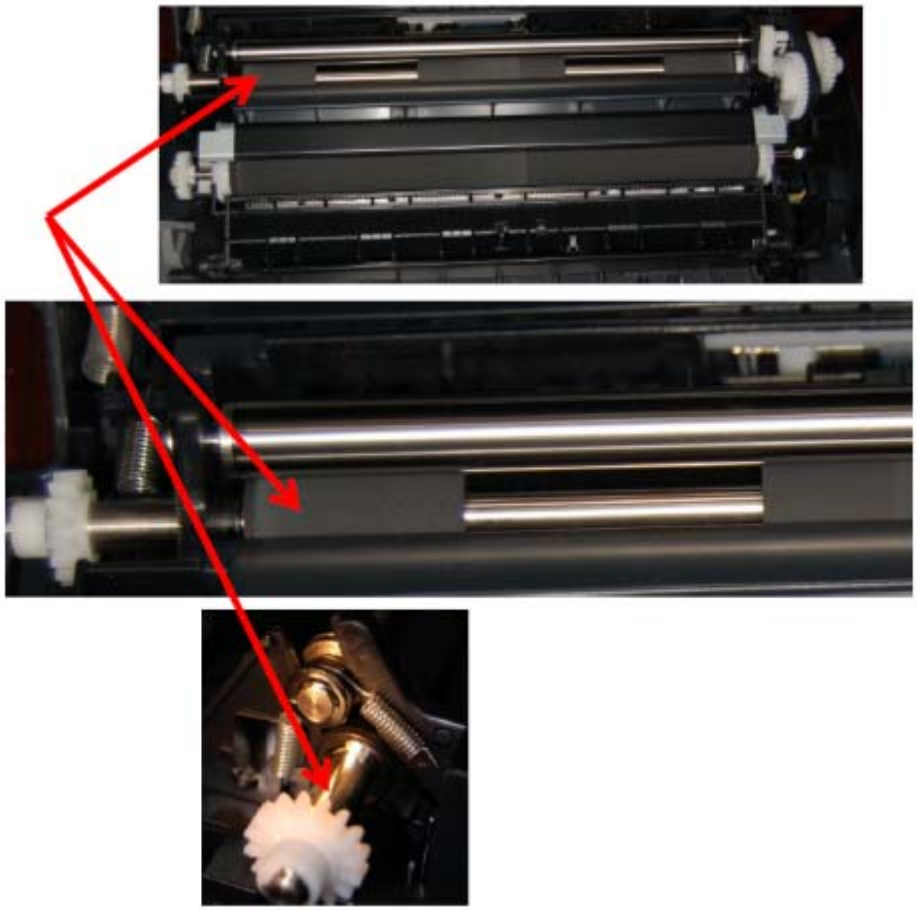
> 1. A paper feeding module of a color picture printer for driving a paper back and forth through a printing module of the printer for printing, the printer comprising a housing, the printing module being installed inside the housing for printing the paper, the paper feeding module comprising:
>
> a first roller horizontally oriented and rotatably installed inside the housing;
>
> a second roller having a revolving axle and at least two cylindrical sleeves fixed on the revolving axle for clamping the paper with the first roller wherein the second roller is moveable in a vertical direction above the first roller inside the housing, and is rotatably in contact with the first roller when printing; and
>
> an elastic device installed between the second roller and the housing comprising a plurality of elastic arms, each having a free end in contact with two ends of the revolving axle of the second roller and the portion of the revolving axle between each adjacent pair of sleeves for uniformly depressing the revolving axle of the second roller so that each sleeve of the second roller is in even and tight contact with the first roller so as to clamp the paper.

Exh. B at 3:25 – 4:13.

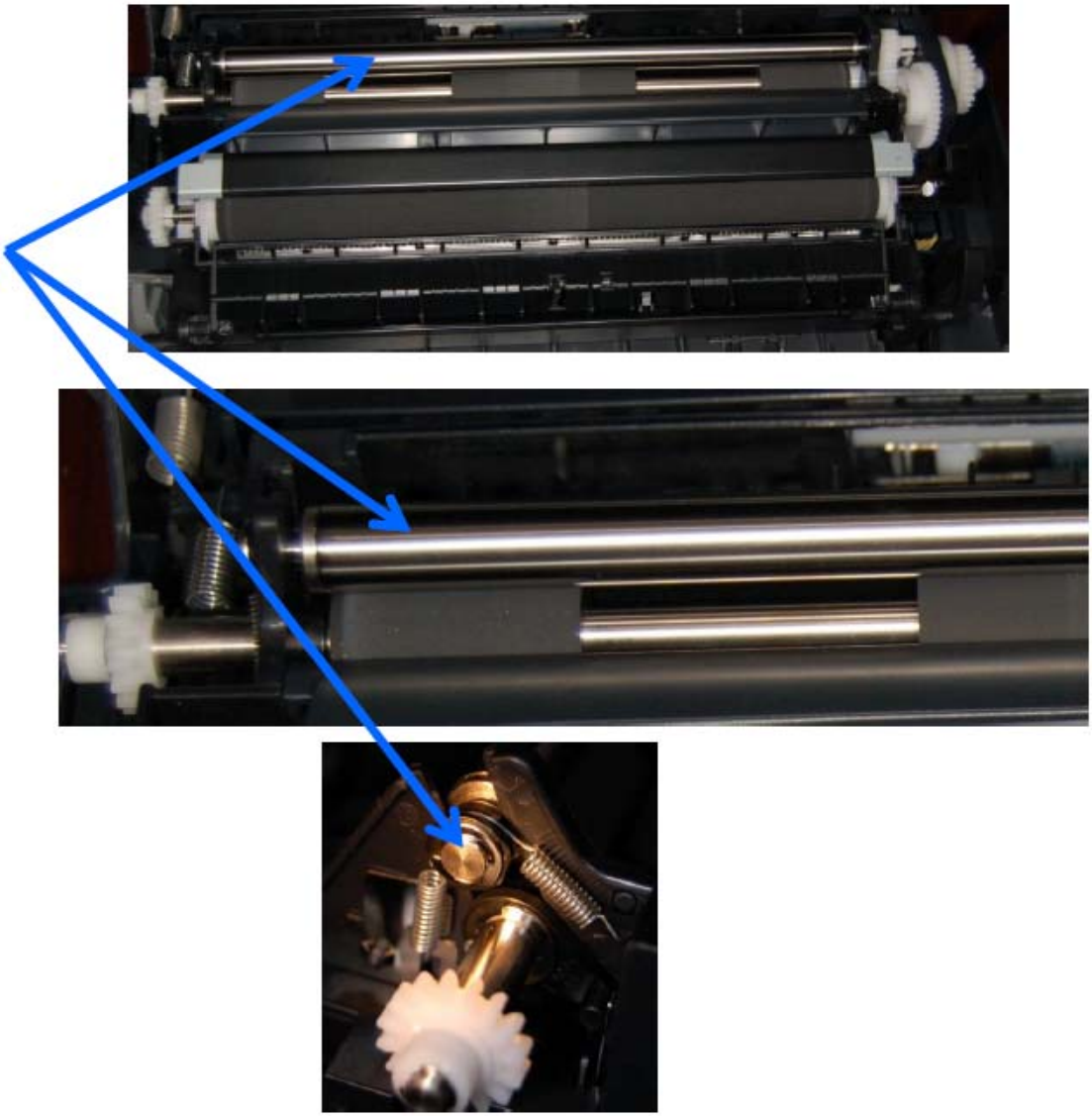
31. The Konica c35 includes a printer that includes a paper feeding module of a color picture printer for driving a paper back and forth through a printing module of the printer for printing. The Konica c35 includes a housing and the printing module is installed inside the housing for printing paper, as shown at: https://www.biz.konicaminolta.com/colour/c35/spec.html (last visited Oct. 1, 2017):



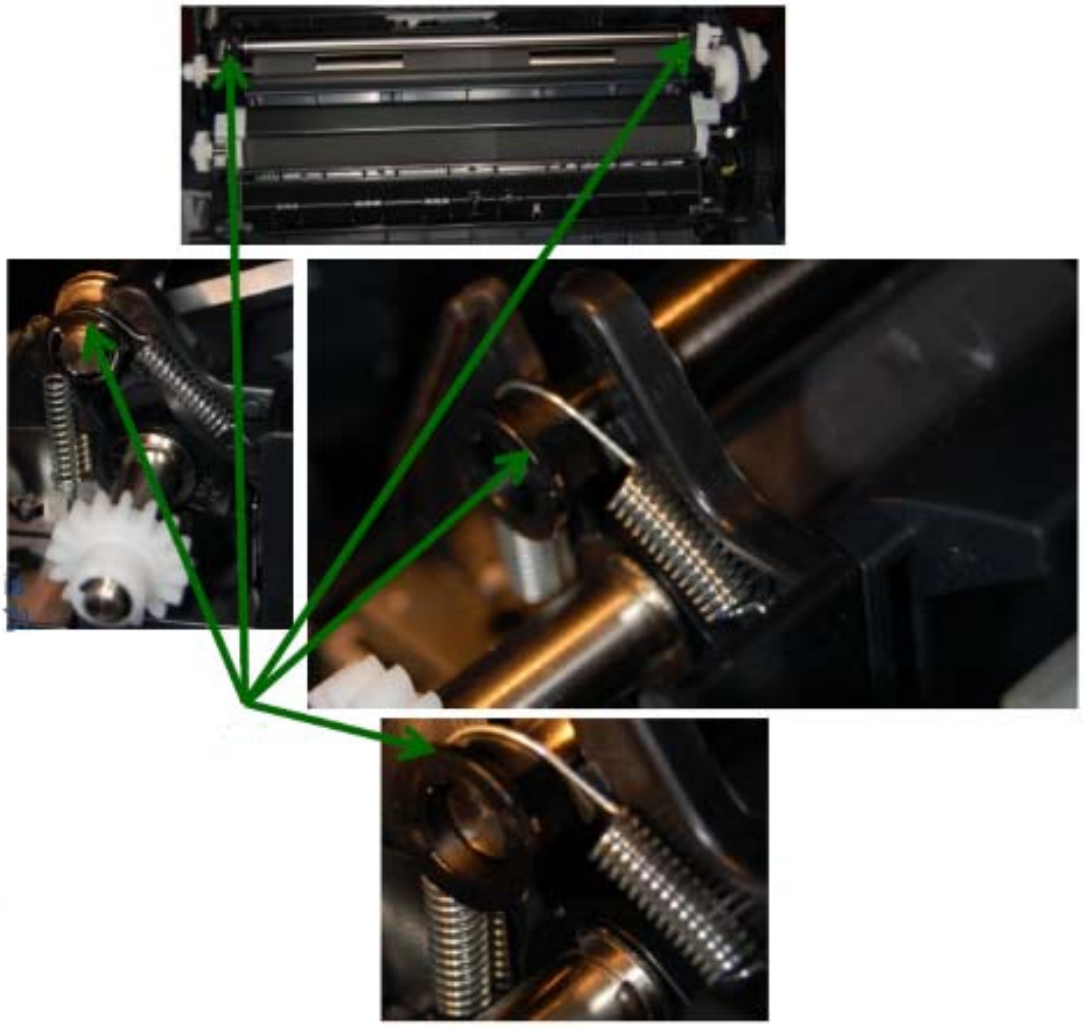
32. The Konica c35 includes a first roller horizontally oriented and rotatably installed inside the housing, as shown below (red arrows added for clarity):



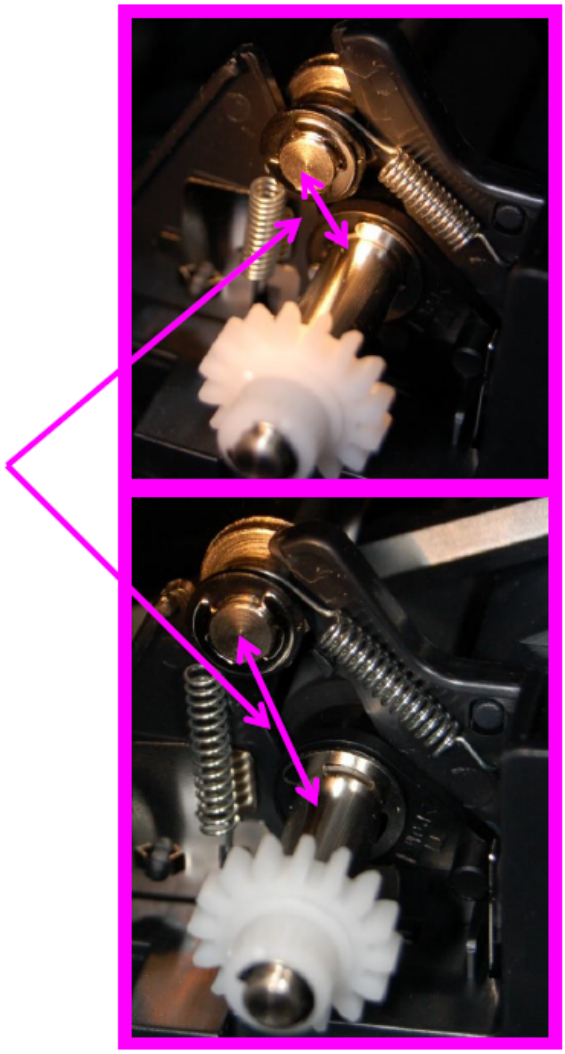
33. The Konica c35 also includes a second roller which has a revolving axle, as shown below (blue arrows added for clarity):



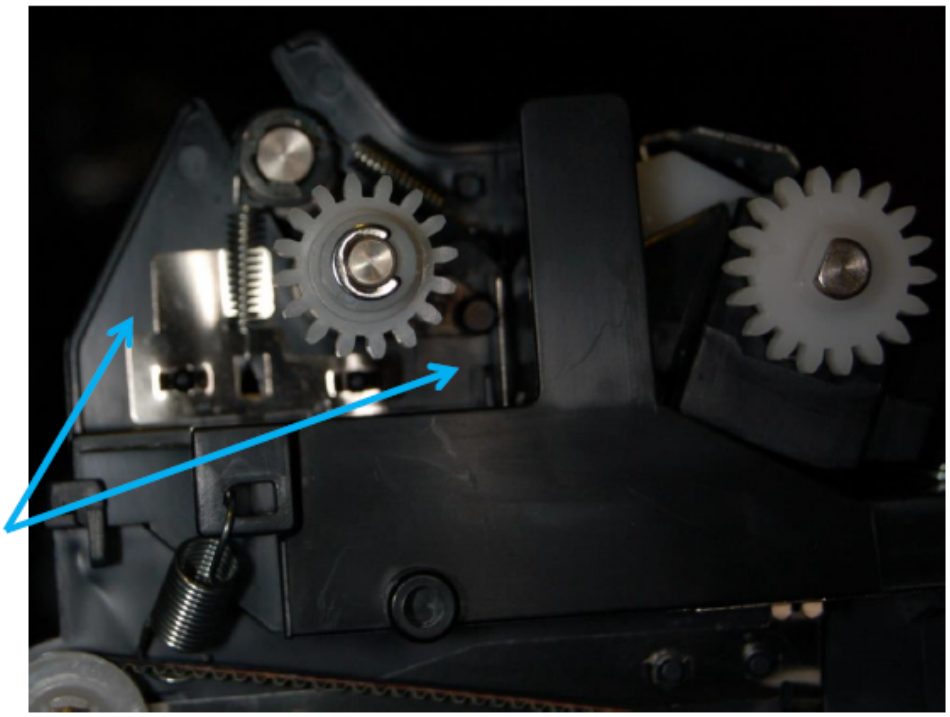
34. The roller on the Konica c35 includes multiple cylindrical sleeves fixed on the revolving axle for clamping the paper with the first roller as shown below (green arrows added for clarity):



35. The second roller is moveable in a vertical direction above the first roller inside the housing and is rotatably in contact with the first roller when printing, as shown below (fuchsia rectangles and arrows added for clarity):

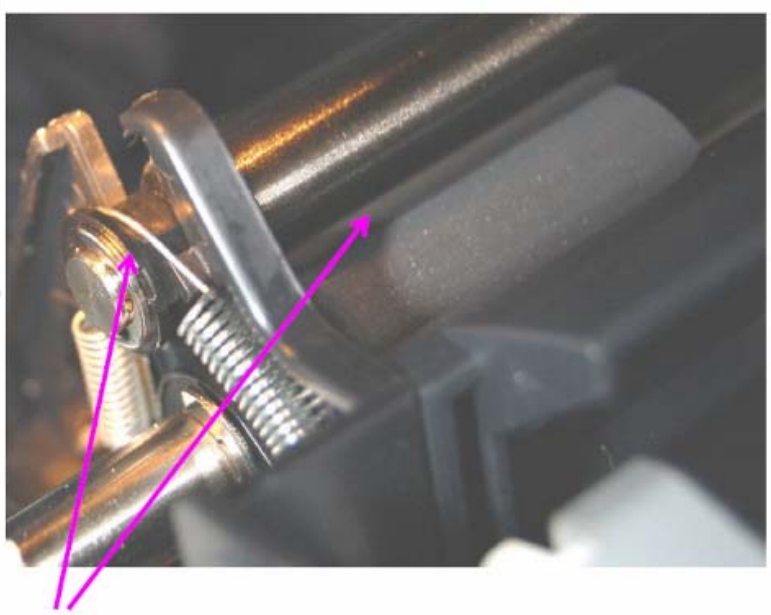


36. The Konica c35 includes an elastic device (aquamarine arrows added for clarity):



37. The elastic device, installed between the second roller and the housing, comprises a plurality of elastic arms as shown below (goldenrod arrows added for clarity). The free ends of the arms are in contact with the revolving axle of the second roller for uniformly depressing the revolving axle of the second roller as pictured below:

38. The elastic arms (see the goldenrod arrows above) depress the revolving axle of the second roller so that each sleeve of the second roller is in even and tight contact with the first roller so as to clamp the paper (fuchsia arrows added for clarity):



39. As shown above, each element of Claim 1 of the ’199 Patent is found in the Konica c35.

40. Diversified Observation is entitled to recover from Konica the damages sustained by Diversified Observation as a result of Konica's infringement of at least Claim 1 of the ’199 Patent in an amount subject to proof at trial, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. §284.

COUNT III – INFRINGEMENT OF UNITED STATES PATENT NO. 6,414,461

41. Diversified Observation repeats and realleges the allegations of the previous paragraphs as if fully set forth herein.

42. Without license or authorization, and in violation of 35 U.S.C. §271(a), Konica infringed and continues to infringe at least Claim 1 of the ’461 Patent by making, using, importing, offering for sale, or selling scanners, including, but not limited to the Konica 3320.

43. Claim 1 of the ’461 Patent reads:

1. A scanner comprising:

a housing having a transparent platform, a document to be scanned being placed on the transparent platform;

a scanning module movably installed inside the housing for scanning the document;

a driving module installed inside the housing for driving the scanning module, the driving module comprising:

a stepping motor for driving the scanning module forward and backward so that the scanning module scans the document; and

a motor driving circuit for controlling the stepping motor according to a driving signal; and

a control circuit for controlling the operations of the scanner, the control circuit comprising a memory, the memory storing a torque table and a driving program, the torque table recording a plurality of torque values, each of the torque values corresponding a predetermined condition when the stepping motor produces the corresponding torque, and the driving program chooses one of the torque values according to the predetermined condition, the motor driving circuit receiving the corresponding driving signal according to the torque value chosen by the driving program and controlling the stepping motor so that the stepping motor generates a torque according to the driving signal;

wherein the control circuit controls the stepping motor to generate different torque so that the scanning module scans the document at different speeds.

Exh. C at 4:58 to 5:18.

44. The Konica 3320 includes a scanner comprising a housing, a scanning module, a driving module, a stepping motor, a motor driving circuit for controlling the stepping motor, and a control circuit for controlling the operations of the scanner. *See* the Konica Service Manual for the Konica 3320 (available at https://data2.manualslib.com/pdf6/123/12229/1222829-konica_minolta/bizhub_4020.pdf?f9570a175f24ee7adde9783cb4fa1a1a) (last visited Oct. 1, 2017)). *See also* the images below (red rectangle added for clarity):

Scanning to a computer

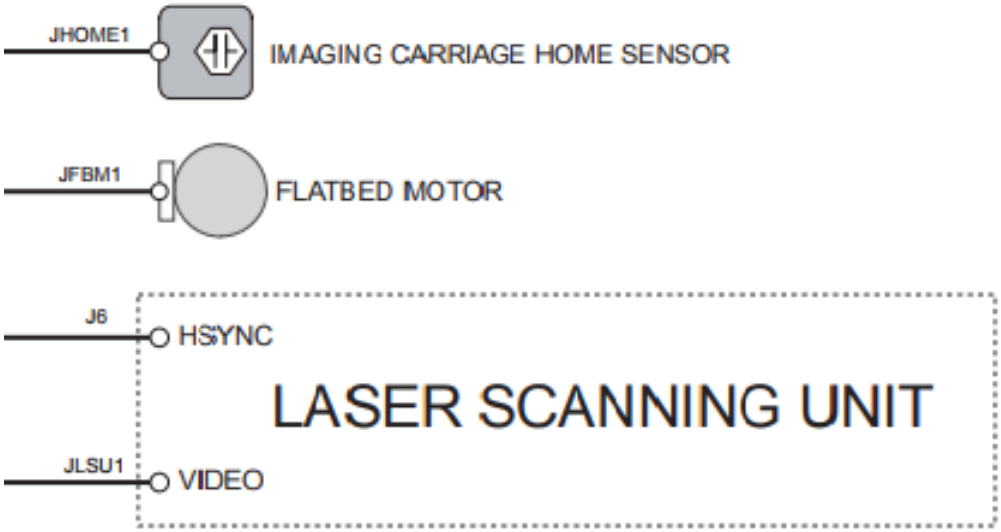
Automatic document feeder (ADF)	Scanner glass
	
Use the ADF for multiple-page documents.	Use the scanner glass for single pages, small items (such as postcards or photos), transparencies, photo paper, or thin media (such as magazine clippings).

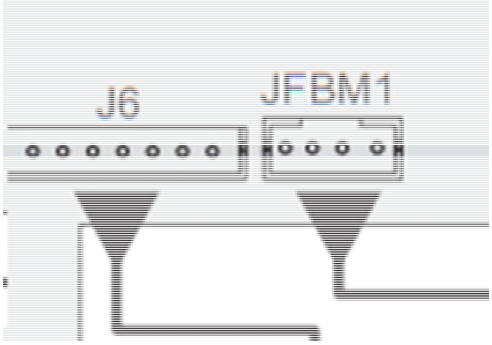
The scanner lets you scan documents directly to a computer. The computer does not have to be directly connected to the printer for you to receive Scan to PC images. You can scan the document back to the computer over the network by creating a scan profile on the computer and then downloading the profile to the printer.

Konica 3320 User's Guide at p. 104 (available at http://1fogf22l15n9fgimh2tp4cfl.wpengine.netdna-cdn.com/wp-content/uploads/2016/09/bizhub3320UserGuide.pdf. (last visited Oct. 5, 2017)).


KONICA MINOLTA
bizhub
3320

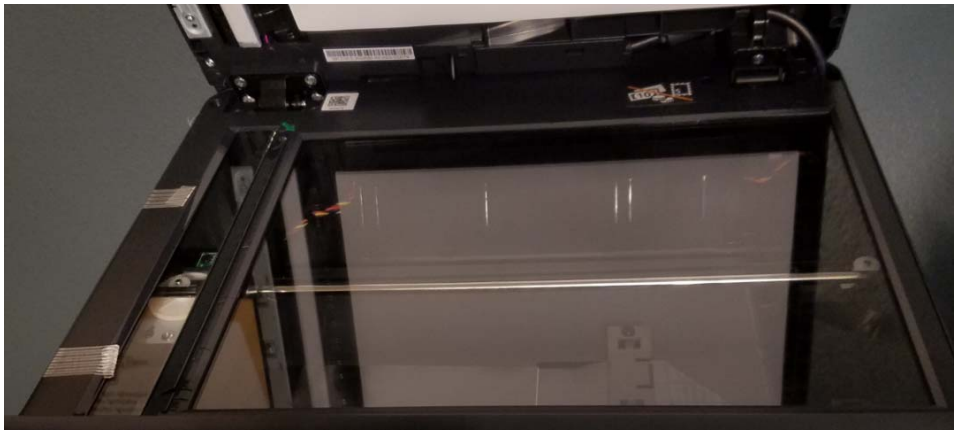

HEOCENE 2T3542296
6.4Ω 1510010101


JHOME1
IMAGING CARRIAGE HOME SENSOR
JFBM1
FLATBED MOTOR
J6
HSYNC
LASER SCANNING UNIT
JLSU1
VIDEO

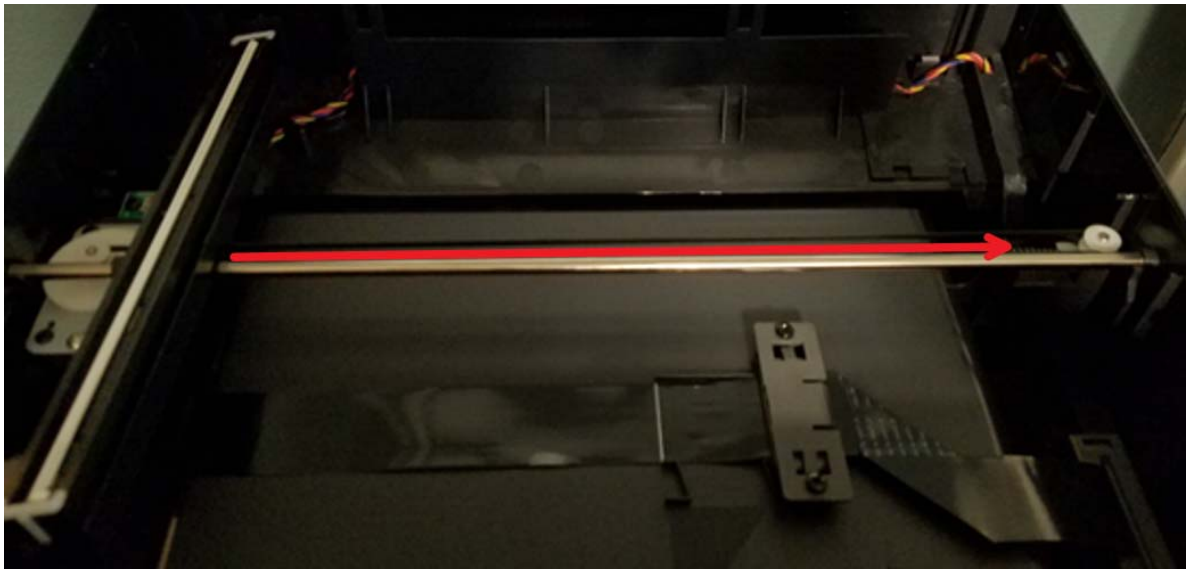


See Service Manual at p. 395 (red rectangles added for clarity):

45. The Konica 3320 includes a housing having a transparent platform, a document to be scanned may be placed on the transparent platform:

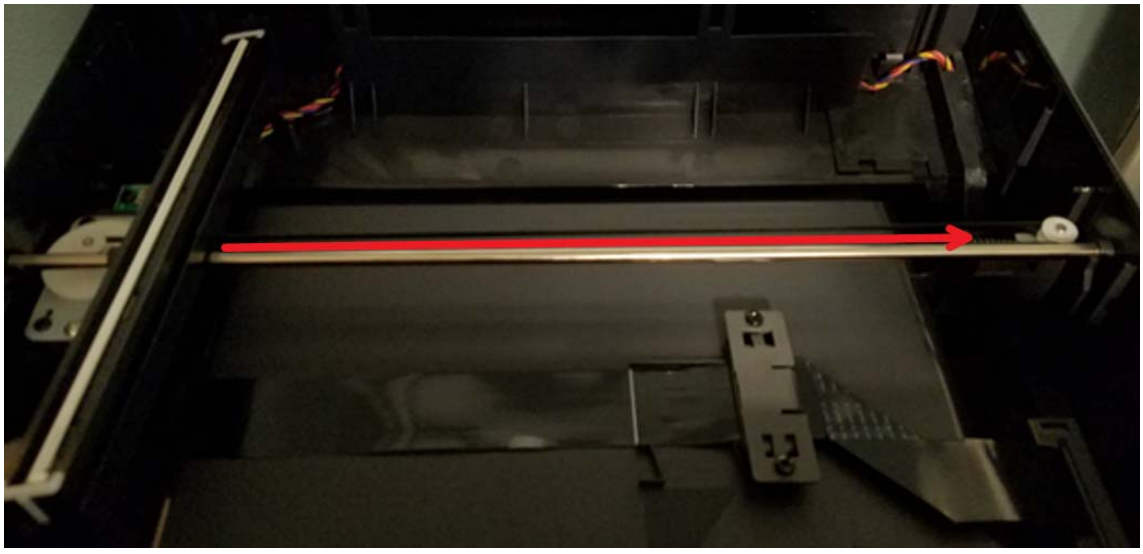


46. The Konica 3320 includes a scanning module moveably installed inside the housing for scanning the document as shown below (red arrow added for clarity):



47. The Konica 3320 includes a driving module installed inside the housing for driving the scanning module:

48. The driving module of the Konica 3320 includes a stepping motor for driving the scanning module so that the scanning module scans the document as illustrated below (red arrow added for clarity to show reversible direction of forward and backward movement):



產品型錄 General Data Sheet

Neocene

笙茂科技 Neocene Technology Corp.

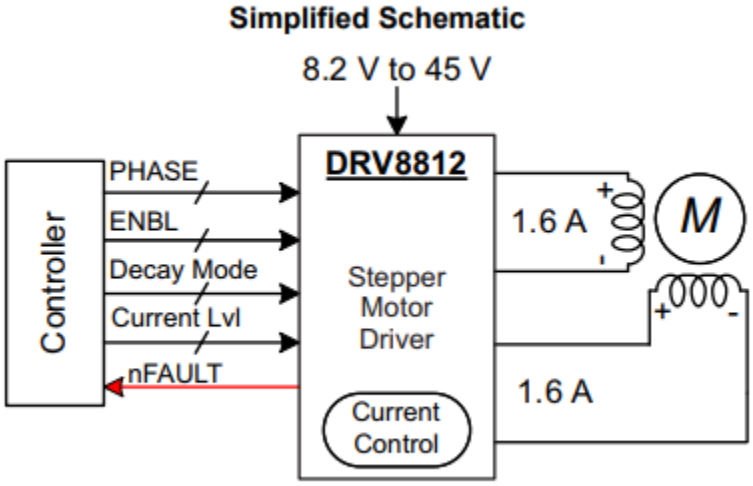
ϕ35–Slim 永磁型步進馬達 ϕ35–Slim PM-Type Stepper Motors

■ 應用領域 *Applications*

- OA產品： 掃描器
- OA Equipment : Scanners

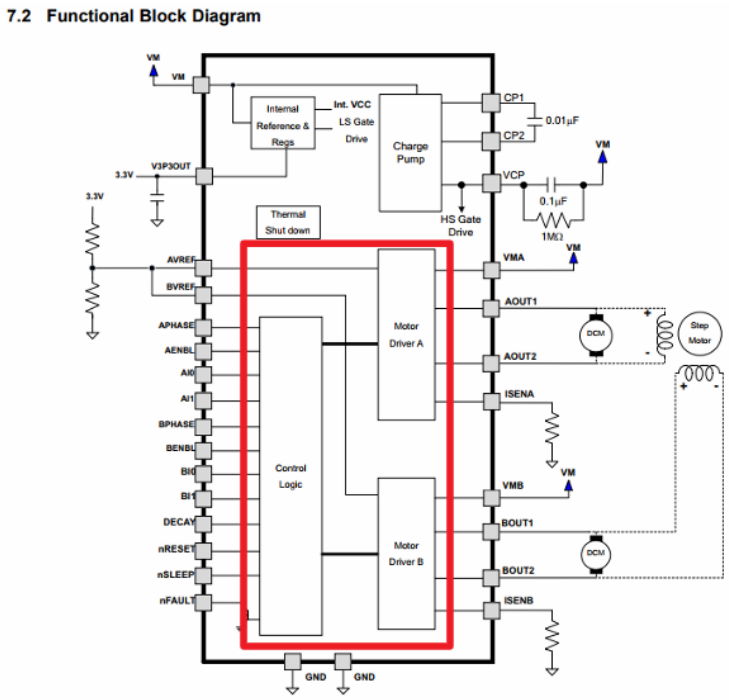
See http://www.neocene-tech.com.cn/cn/2T35.htm (last visited Oct. 1, 2017).

49. The driving module of the Konica 3320 includes a motor driving circuit (e.g., Texas Instruments DRV8812) (red rectangle in image below) for controlling the stepping motor according to a driving signal:



Texas Instruments DRV8812 Dual-Bridge Motor Controller IC (available at http://www.ti.com/lit/ds/symlink/drv8812.pdf at p. 1 (last visited Oct. 1, 2017) (red arrow "nFAULT" in original)).

50. The Konica 3320 includes a control circuit for controlling the operations of the scanner:



Id. at p. 8 (red rectangle added for clarity).

51. The control circuit in the Konica 3320 includes a memory. The memory stores a torque table and a driving program. When the stepper is in normal operation, the VREF of Texas Instruments DRV8818 is about 2 V; when the stepper enters into the holding state, the VREF automatically drops down to 1 V:

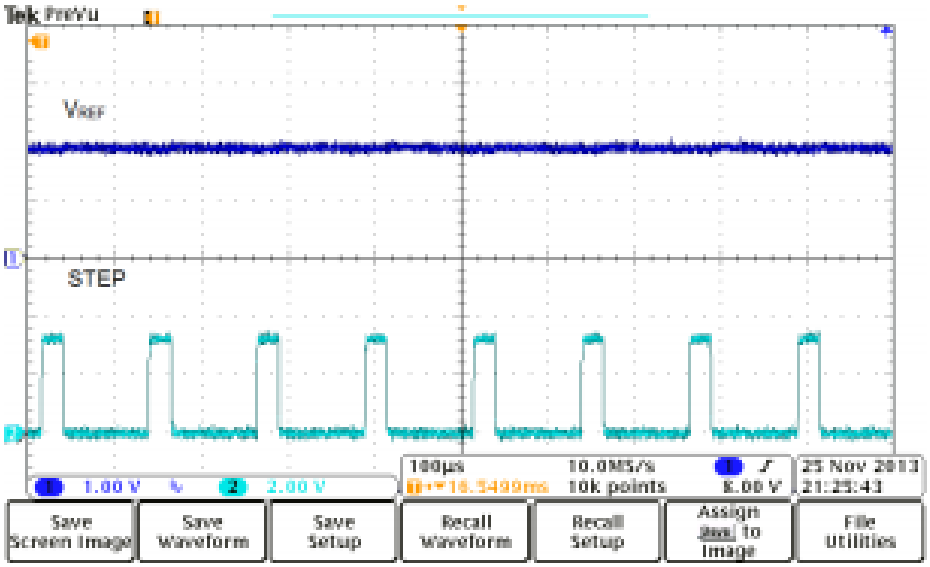


Figure 5. Normal Operation Waveform

Fig. 5 above shows the normal operation waveform. *See* http://www.ti.com/lit/an/slva640/slva640.pdf at p. 4 (last visited Oct. 1, 2017).

52. The torque table reproduced below shows a plurality of torque values, each of the torque values corresponding to a predetermined condition when the stepping motor produces the corresponding torque, and the driving program, e.g., the Control Logic shown above in "7.2 Functional Block diagram," chooses one of the torque values according to a predetermined condition.

- **MAX speed versus stepping mode**

  Using half step driving can achieve higher torque and higher MAX speed.

Stepping mode	MAX speed	Average Current @12V
Half	~130Hz (26RPM; 3.5s)	43mA
Full	~100Hz (20RPM; 4.6s)	30mA

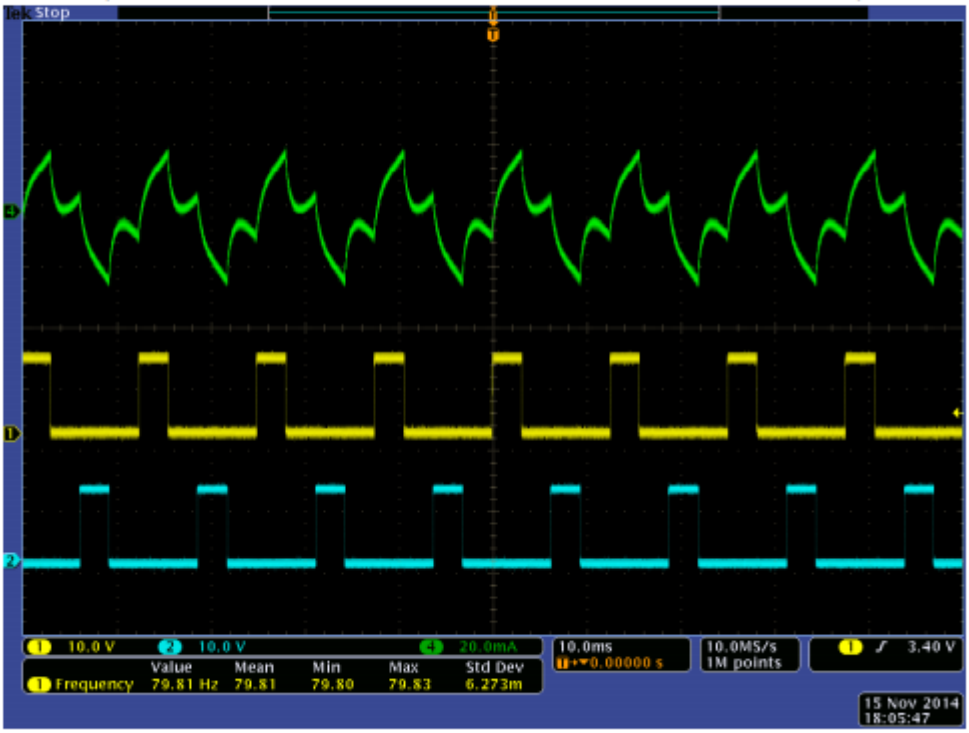
See http://www.ti.com/lit/ug/tidu669/tidu669.pdf at p. 6 (last visited Oct. 1, 2017).

53. The wave charts below illustrate a full step driving waveform, a half step driving waveform, and a full stepping waveform at low speed:

- **Full step driving waveform**

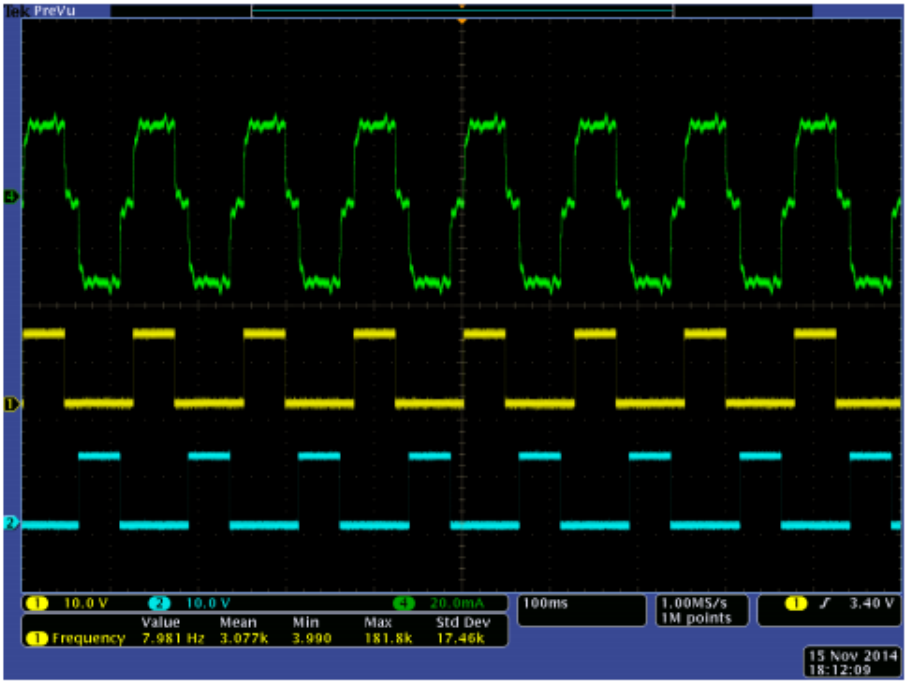
  Running at 79.81Hz (16.0 RPM; 5.76s fully opening or closing time)

  (Green: Phase B Current; Yellow: BOUT1; Blue: BOUT2)



Id. at p. 4. A half step driving waveform:

- **Half stepping at low speed**
  (7.98Hz; 1.6RPM; 57.6s fully opening or closing time)

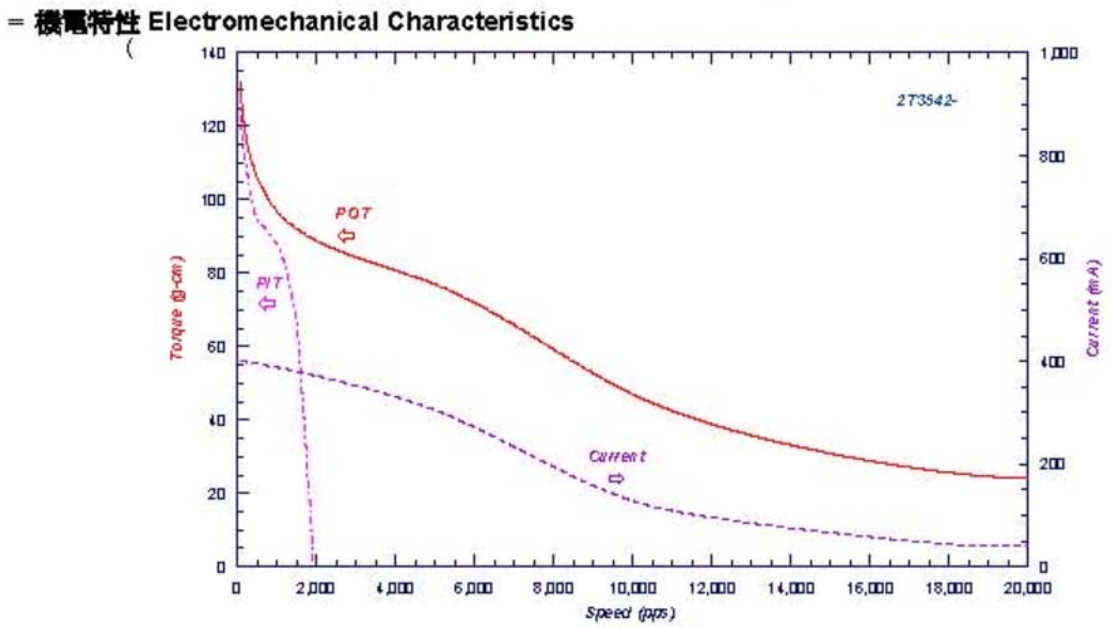


Id. at p. 5. A full stepping waveform at low speed:

- **Full stepping at low speed**
  (7.98Hz; 1.6RPM; 57.6s fully opening or closing time)

Id. at 4.

54. The motor driving circuit receives the corresponding driving signal according to the torque value chosen by the driving program and controls the stepping motor so that the stepping motor generates a torque according to the driving signal:



See http://www.neocene-tech.com.cn/cn/2T35.htm (last visited Oct. 1, 2017).

55. The control circuit of the Konica 3320 controls the stepping motor to generate different torque so that the scanning module is capable of scanning the document at different speeds. As an example, the control circuit modifies the torque output of the stepping motor so that the scanning module scans more slowly for color documents and faster for black and white documents:

Scanning Specifications

		bizhub 4020	bizhub 3320
Type		Full-Colour Scanner	
Interface		Ethernet (10BASE-T / 100BASE-TX)	
Driver		TWAIN Driver	
Protocol		TCP/IP (FTP, SMB, SMTP)	
Scanning Speed (A4, 300 dpi)	Simplex	B&W/Colour: 41/19 opm	B&W/Colour: 42/19 opm
	Duplex	B&W/Colour: 18/8 opm	—
Scanning Size		Max. A4 or Legal (8-1/2" × 14")	Max. A4 or Letter
Output Format		TIFF, JPEG, PDF, XPS	
Scanning Resolution	Push	200dpi / 300dpi / 400dpi / 600dpi	
	Pull	200 × 100 dpi / 300 dpi / 400 dpi / 600 dpi	
Main Functions		Scan to E-Mail, Scan to FTP, Network TWAIN, Scan to USB, Scan to Web Service (WSD Scan), Device Profile for Web Services (DPWS)	Scan to E-Mail, Scan to FTP, Network TWAIN, Scan to Web Service (WSD Scan), Device Profile for Web Services (DPWS)
Other Functions		Multi-Method Send, Authentication at the time of E-Mail send (SMTP authentication,POP before SMTP)	

See https://www.biz.konicaminolta.com/bw/4020_3320/spec.html (last visited Oct. 1, 2017).

56. As shown above, each element of Claim 1 of the ’461 Patent is found in the Konica 3320.

57. Diversified Observation is entitled to recover from Konica the damages sustained by Diversified Observation as a result of Konica’s infringement of at least Claim 1 of the ’461 Patent in an amount subject to proof at trial, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. §284.

COUNT IV – INFRINGEMENT OF UNITED STATES PATENT NO. 6,522,432

58. Diversified Observation repeats and realleges the allegations of the previous paragraphs as if fully set forth herein.

59. Without license or authorization, and in violation of 35 U.S.C. §271(a), Konica has infringed and continues to infringe at least Claim 1 of the ’432 Patent by making, using, importing, offering for sale, or selling an image scanner for scanning a document including but not limited to the Konica 3320.

1. Claim 1 of the ’432 Patent reads:

> 1. An image scanner for scanning a document comprising:

(1) a test region;

(2) a light source for illuminating the document and the test region;

(3) optical means for conveying the light reflected from the document and the test region;

(4) a line image sensor for receiving the light from the optical means and generating an image signal corresponding to the light reflected from the document and a brightness signal corresponding to the light reflected from the test region; the line image sensor comprising an array of (red, green, blue)(R,G,B) sensing elements for converting the light received from the optical means into an array of corresponding (R,G,B) signals wherein both the image signal and the brightness signals generated by the line image sensor are formed by an array of (R,G,B) signals; and

(5) a signal compensation circuit for amplifying the image signal according to the brightness signal to compensate the instability of the light source;

the signal compensation circuit comprising an A/D converter for digitizing the (R,G,B) signals of the image signal and the brightness signal, and a digital processor for adjusting the digitized (R,G,B) signals of the image signal according to the digitized (R,G,B) signals of the brightness signal.

Exh. D at 5:12-38 (numerals (1)-(5) in original).

60. The Konica 3320 includes an image scanner for scanning a document, as shown in the images below:

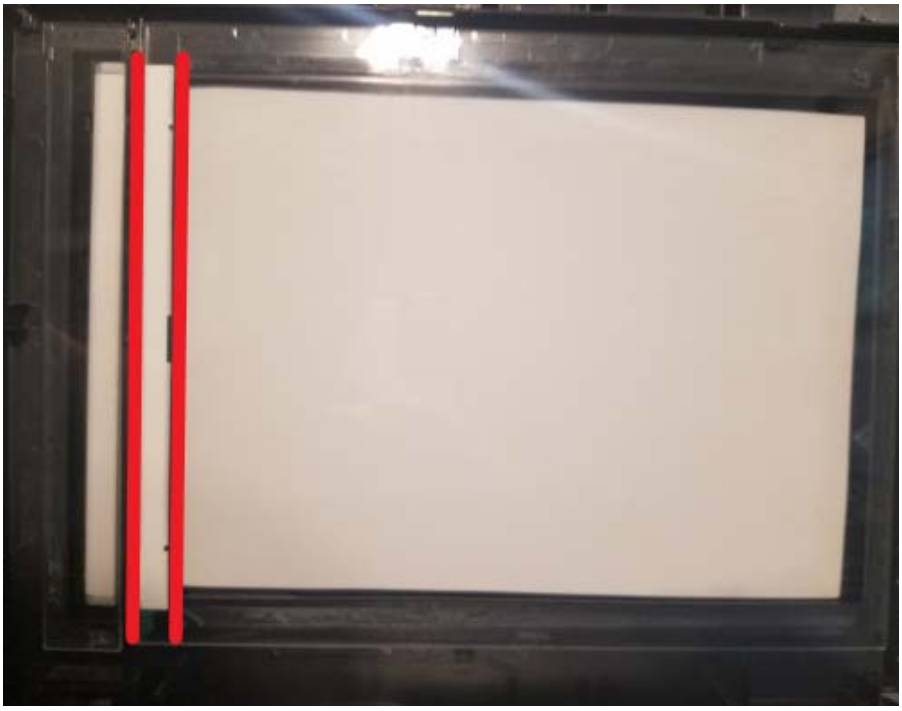
Scanning to a computer

Automatic document feeder (ADF)	Scanner glass
	
Use the ADF for multiple-page documents.	Use the scanner glass for single pages, small items (such as postcards or photos), transparencies, photo paper, or thin media (such as magazine clippings).

The scanner lets you scan documents directly to a computer. The computer does not have to be directly connected to the printer for you to receive Scan to PC images. You can scan the document back to the computer over the network by creating a scan profile on the computer and then downloading the profile to the printer.

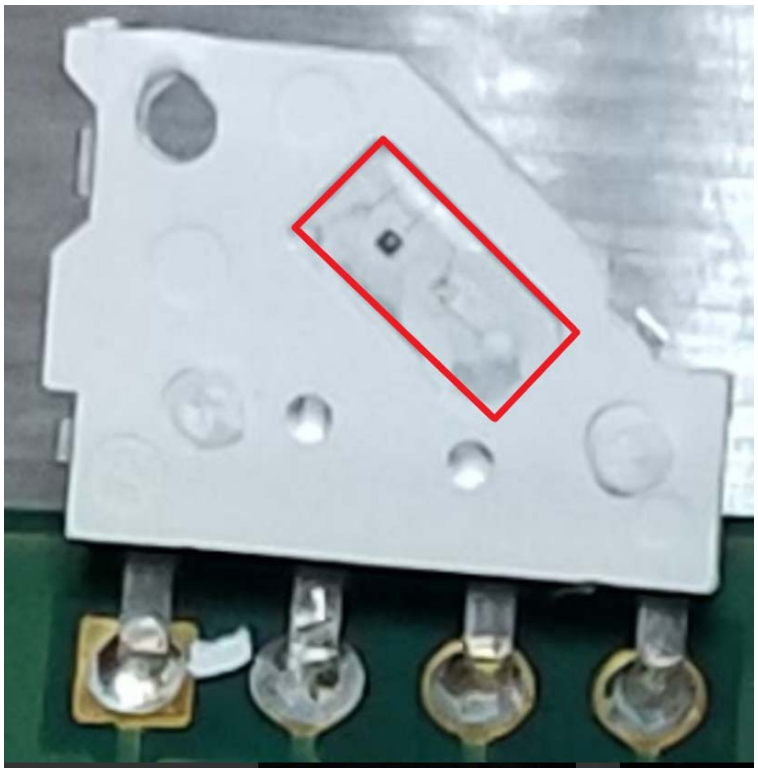
Konica 3320 User Guide at p. 104 (available at http://1fogf22l15n9fgimh2tp4cfl.wpengine.netdna-cdn.com/wp-content/uploads/2016/09/bizhub3320UserGuide.pdf (last visited Oct. 5, 2017)).

61. The Konica 3320 has a flatbed scanner module that includes a test region:

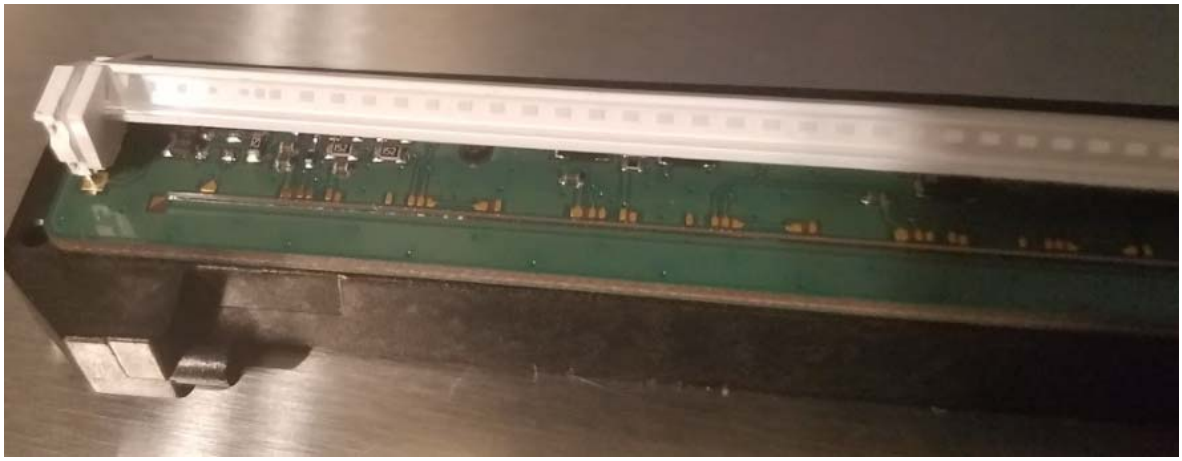


62. The Konica 3320 includes a light source for illuminating a document and the test region. The Konica 3320 includes a contact image sensor ("CIS") that includes a light source for illuminating the document to be scanned and the test region:

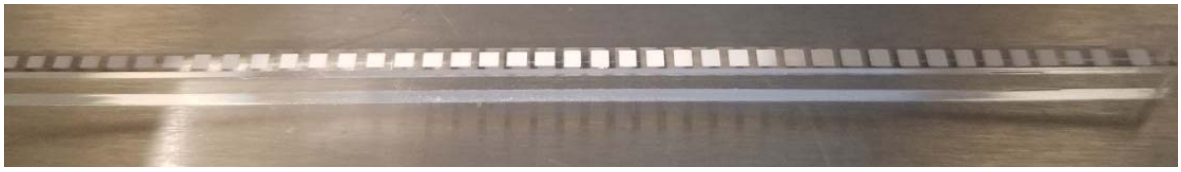
63. The light source of the Konica 3320 CIS module includes an RGB LED, as pictured below (red rectangle added for clarity):



64. The CIS module of the Konica 3320 includes a rod lens that directs light generated by LEDs to the document and the test region:

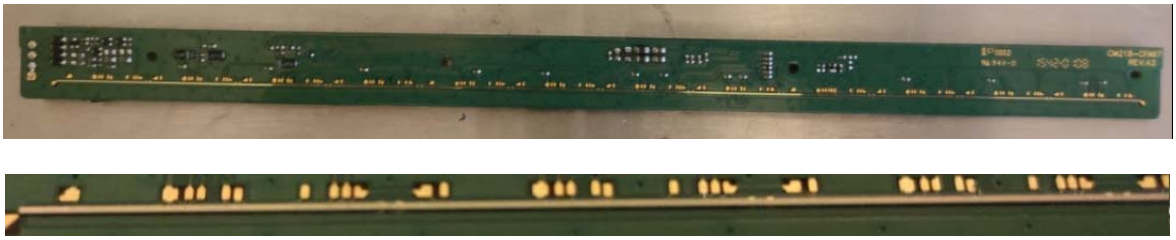


65. The rod lens of the Konica 3320 can be removed from the housing:

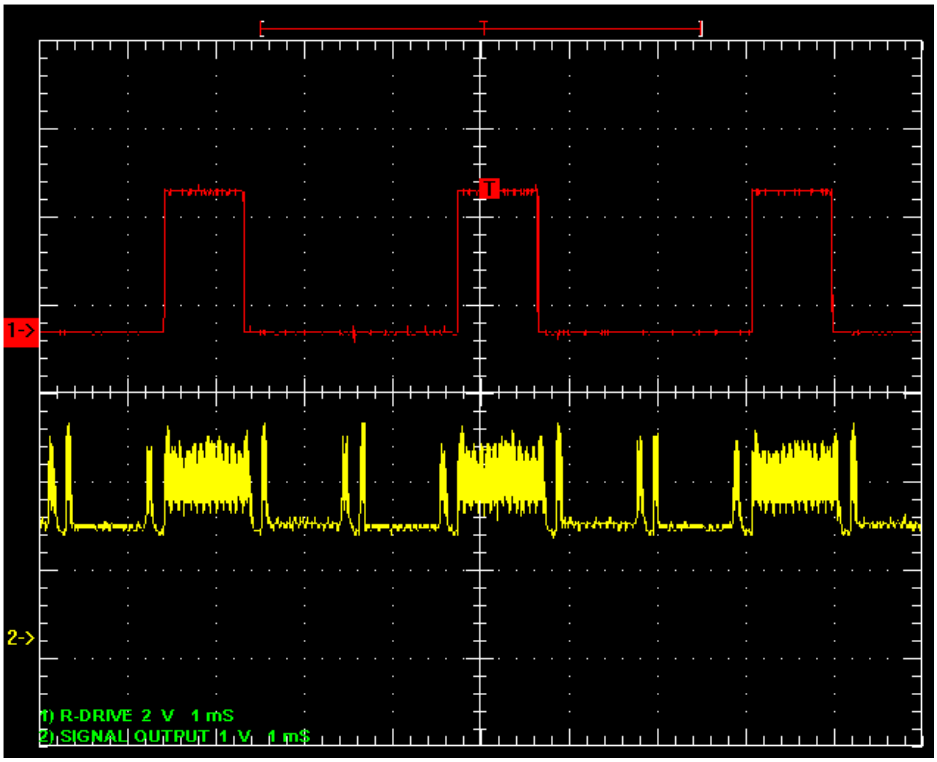


66. The Konica 3320 includes an optical means for conveying the light reflected from the document and the test region. A light guide is built into the housing of the CIS module:

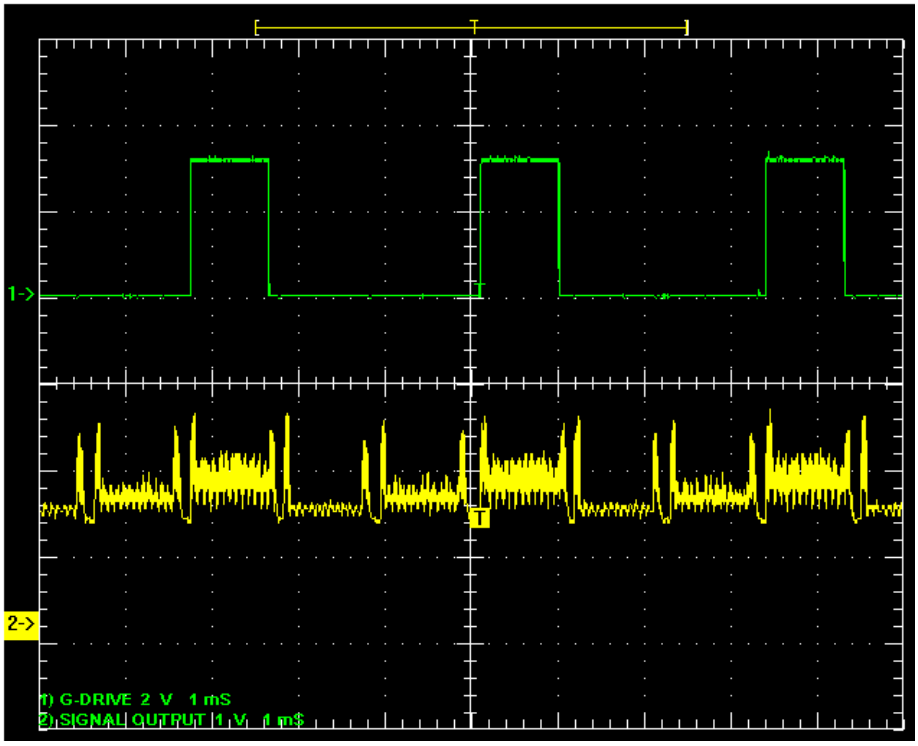
67. The Konica 3320 includes a line image sensor for receiving light from the optical means and generating an image signal:



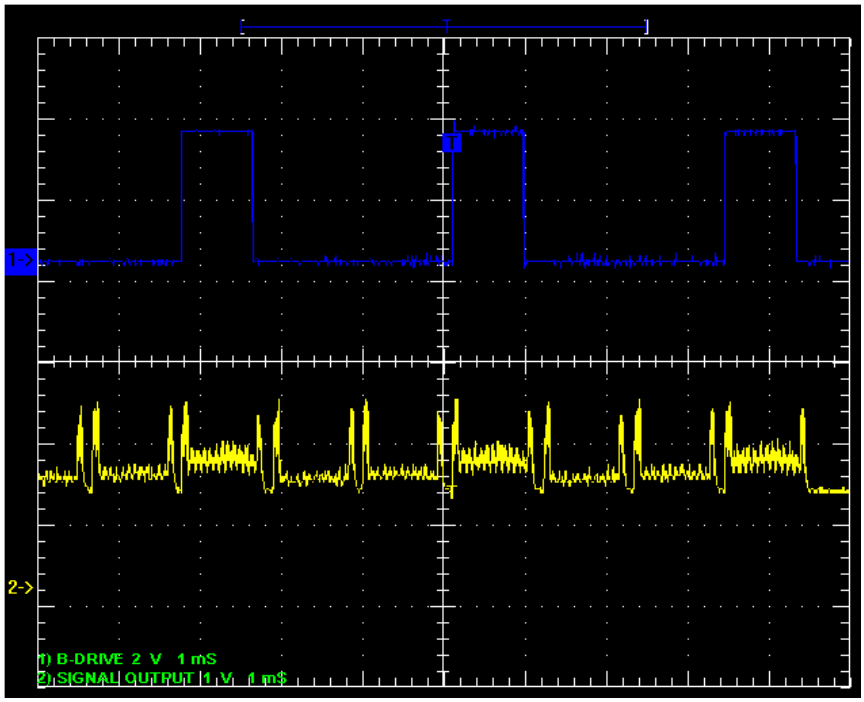
68. The image signal generated by the line image sensor corresponds to the light reflected from the document and the test region. A CIS module output from scanning a Red test pattern at the document region appears as follows:



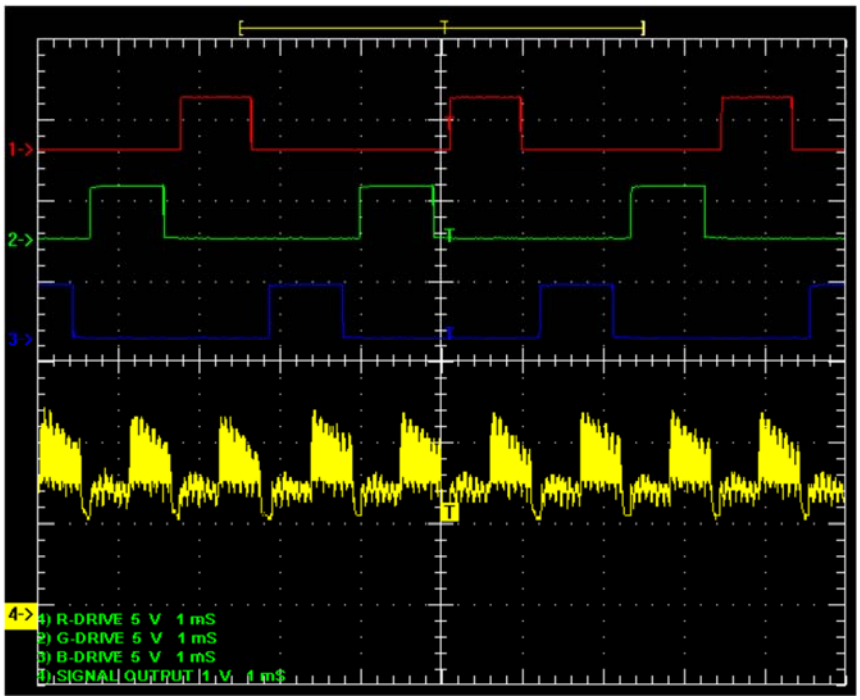
69. A CIS module output from scanning a Green test pattern at the document region appears as:



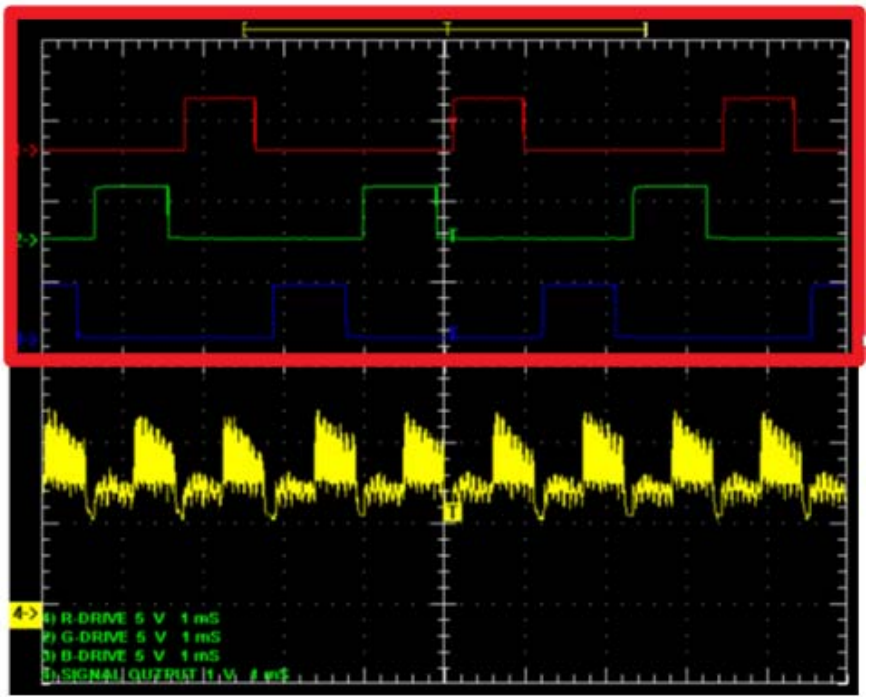
70. A CIS module output from scanning a Blue test pattern at the document region appears as:



71. A CIS module output from scanning the test region appears as:



72. The line image sensor of the CIS module comprises an array of (red, green, blue) (R,G,B) sensing elements for converting the light received from the optical means into an array of corresponding (R,G,B) signals. The measured CIS module output illustrated below shows the RGB signals (red rectangle added for clarity):



73. Both the image signal and the brightness signals generated by the line image sensor are formed by an array of RGB signals. As shown above, the image and brightness signals generated by the line image sensor include isolatable signals from the RGB signal array. The CIS module includes a signal compensation circuit for amplifying the image signals according to the brightness signal to compensate for instability of the light source:

74. The Texas Instruments VSP5610 16-Bit, 4-Channel, CCD/CMOS Sensor Analog Front-End with Timing Generator chip in the Konica 3320 includes an analog-to-digital converter that is operable to adjust the offset level of an analog input signal that is operable to apply a programmable gain to support pixel level inflection (e.g., light source instability) caused by luminance. TI describes the chip as:

> **DESCRIPTION**
>
> The VSP5610/11/12 are high-speed, high-performance, 16-bit analog-to-digital-converters (ADCs) that have four independent sampling circuit channels for multi-output charge-coupled device (CCD) and complementary metal oxide semiconductor (CMOS) line sensors. Pixel data from the sensor are sampled by the sample/hold (SH) or correlated double sampler (CDS) circuit, and are then converted to digital data by an ADC. Data output is selectable in low-voltage differential signaling (LVDS) or CMOS modes.
>
> The VSP5610/11/12 include a programmable gain to support the pixel level inflection caused by luminance. The integrated digital-to-analog-converter (DAC) can be used to adjust the offset level for the analog input signal. Furthermore, the timing generator (TG) is integrated in these devices for the control of sensor operation.

See http://www.ti.com/product/VSP5610 at p. 1 (last visited Oct. 1, 2017).

75. The signal compensation circuit of the Konica 3320 includes an A/D (i.e., analog-to-digital) converter (i.e., ADC) for digitizing RGB signals of an image signal and a brightness signal, as shown in the following functional block diagram:

FUNCTIONAL BLOCK DIAGRAM

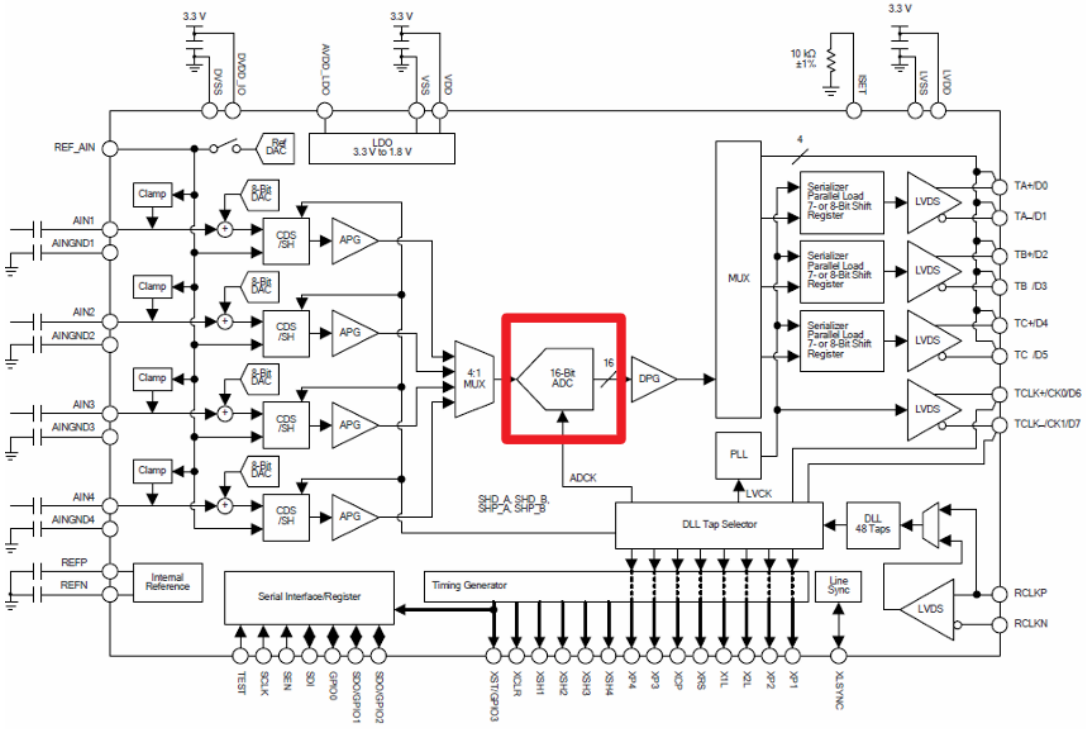


Figure 3. VSP5610/11/12 Block Diagram

Id. at p. 17 (red rectangle added for clarity).

76. The signal compensation circuit includes a digital processor ("DPG" or "Digital Programmable Gain" unit) for adjusting digitized RGB signals of the image signal according to digitized RGB signals of the brightness signal, as shown in the following functional block diagram:

FUNCTIONAL BLOCK DIAGRAM

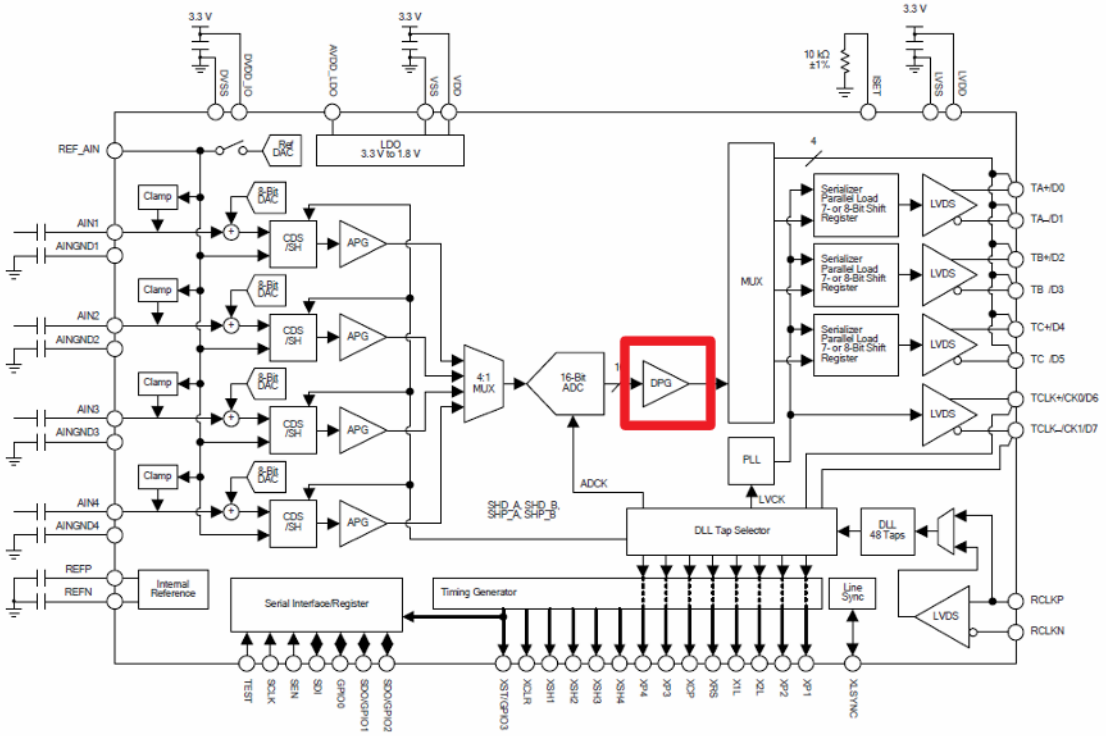


Figure 3. VSP5610/11/12 Block Diagram

Id. at p. 17 (red rectangle surrounding opamp added for clarity).

77. A Digital Programmable Gain unit is operable to modify the brightness and image signals generated by the CIS module, as described by TI:

> **DIGITAL PROGRAMMABLE GAIN (DPG)**
>
> The VSP5610/11/12 provide a maximum digital gain of 2 V/V. The total gain is fixed by the combination of CDS/SH analog gain (APG) and digital gain (DPG). DPG is controlled by an 8-bit internal register (DPG_x) that can set the gain from 1 V/V to 2 V/V, as defined by Equation 2. This register is included in each of the four channels, so the gain of each channel can be set independently.
>
> Figure 14 shows the relationship between the digital gain and register code. Note that the default value is 1 V/V.
>
> $$\text{DPG (V/V)} = \frac{1}{256} \times \text{Code} + 1 \qquad \text{(Code = 0 LSB to 255 LSB)} \qquad (2)$$

Id. at 26 (blue font in original).

78. As shown above, each element of Claim 1 of the ’432 Patent is found in the Konica 3320.

79. Diversified Observation is entitled to recover from Konica the damages sustained by Diversified Observation as a result of Konica's infringement of at least Claim 1 of the '432 Patent in an amount subject to proof at trial, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. §284.

JURY DEMAND

Diversified Observation hereby demands a trial by jury on all issues so triable.

PRAYER FOR RELIEF

WHEREFORE, Diversified Observation requests that this Court enter judgment against Konica as follows:

A. An adjudication that Konica has infringed the '133, '199, '461, and '432 Patents;

B. An award of damages to be paid by Konica adequate to compensate Diversified Observation for Konica's past infringement of the '133 Patent, including interest, costs, expenses and an accounting of all infringing acts including, but not limited to, those acts not presented at trial;

C. An award of damages to be paid by Konica adequate to compensate Diversified Observation for Konica's past infringement of the '199, '461, and '432 Patents and any continuing or future infringement through the date such judgment is entered, including interest, costs, expenses and an accounting of all infringing acts including, but not limited to, those acts not presented at trial;

D. A declaration that this case is exceptional under 35 U.S.C. § 285, and an award of Diversified Observation's reasonable attorneys' fees; and

E. An award to Diversified Observation of such further relief at law or in equity as the Court deems just and proper.

Dated: December 12, 2017

/s/Aakash S. Parekh

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