IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

DIVERSIFIED OBSERVATION LLC Plaintiff, v. PANASONIC CORPORATION OF NORTH AMERICA Defendant.	) Civil Action No. _____) **JURY TRIAL DEMANDED**

COMPLAINT

For its Complaint, Plaintiff Diversified Observation LLC ("Plaintiff" or "Diversified Observation"), by and through the undersigned counsel, alleges as to the activities of Panasonic Corporation of North America ("Panasonic" 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. Defendant Panasonic Corporation of North America is a Delaware corporation with a place of business located at Two Riverfront Plaza, 828 McCarter Hwy, Newark, New Jersey 07102.

JURISDICTION AND VENUE

3. This action arises under the Patent Act, 35 U.S.C. §1 *et seq.*

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

5. Panasonic has purposefully availed itself of the rights and benefits of Delaware law by engaging in systematic and continuous contacts with the state of Delaware, including by selling computers, scanners, notebook computers, printers, scanners, and other electronic products in

Delaware, directly or through affiliates, and by continuously and systematically placing goods into the stream of commerce for distribution throughout Delaware. Panasonic also derives substantial revenue from the sale of those products in Delaware. Panasonic also regularly conducts and solicits business within the State of Delaware.

6. Panasonic conceded personal jurisdiction and venue in seeking a declaration of patent invalidity and noninfringement in *St. Clair Intellectual Property v. Samsung Electronics Co, LTD, et al.*, 1:04-cv-01436-JJF (DED Wilmington, Nov. 9, 2004) and by conceding personal jurisdiction and venue under 28 U.S.C. §1400(b) in defending a claim of patent infringement in *Papst Licensing GmbH & Co. KG v. Panasonic Corporation et al*., 1:15-cv-00501-RGA (DED Wilmington, June 15, 2015).

7. Venue is proper in this district pursuant to §1400(b) because Panasonic is incorporated in Delaware.

THE PATENTS-IN-SUIT

8. 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.

9. On December 28, 1999, the USPTO duly and lawfully issued United States Patent No. 6,008,485 (the "'485 Patent"), entitled "Image Capturing Device Having De-Friction Function." A true and correct copy of the '485 Patent is attached hereto as Exhibit B.

10. 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.

11. On September 10, 2002, the USPTO duly and lawfully issued United States Patent No. 6,449,397 (the "'397 Patent"), entitled "Image Processing System for Scanning a Rectangular Document." A true and correct copy of the '397 Patent is attached hereto as Exhibit D.

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 E.

13. Diversified Observation is the assignee and owner of all rights, title, and interest in and to the '133, '485, '461, '397, and '432 Patents, including the right to assert all claims arising under the Patents and the right to any remedies for infringement.

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

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

15. Without license or authorization, and in violation of 35 U.S.C. § 271(a), Panasonic has infringed at least Claim 1 of the '133 Patent by making, using, importing, offering for sale, or selling image information reading apparatuses, including, but not limited to, the Panasonic KX-MB2030.

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;

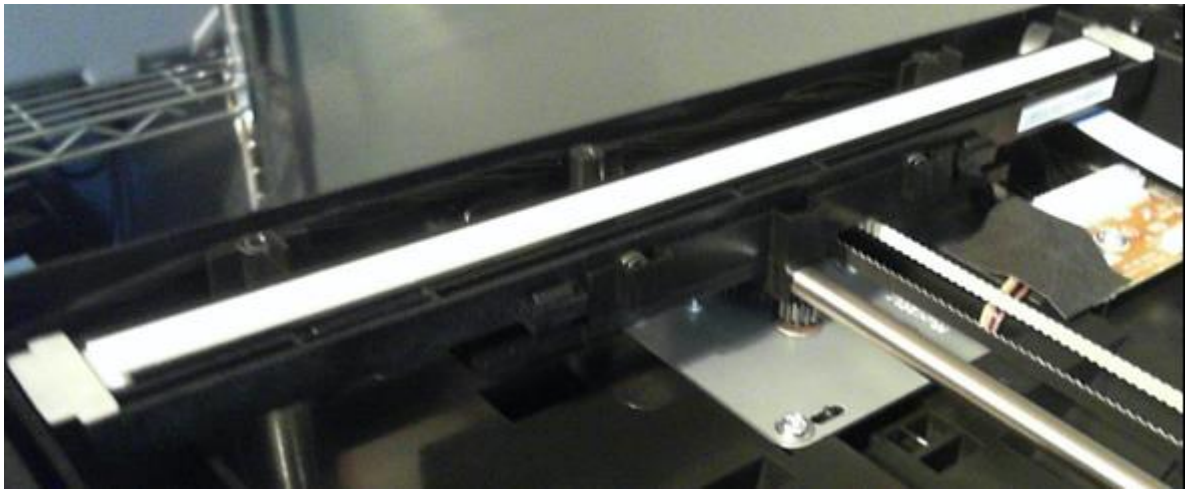
single guiding means crossed over the bottom center of said carriage for guiding said carriage along said sheet table, said single guiding means mounted on a pair of supports at opposite ends for holding and supporting said guiding means in a manner that said contact image sensor module can contact the bottom surface side of said sheet table tightly with said plurality of slide-blocks interposed therebetween; and

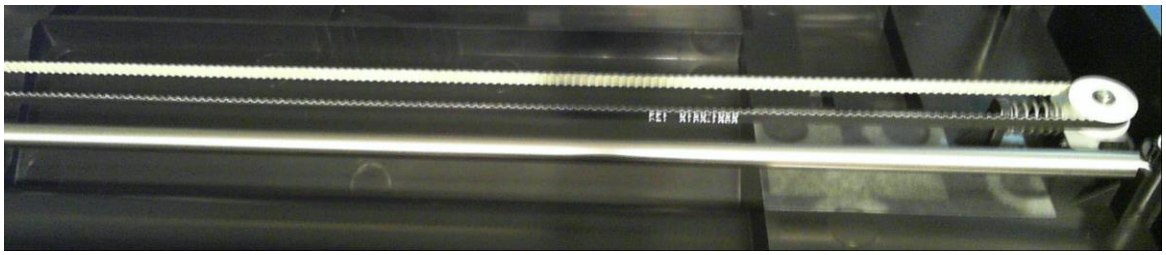
driving means located at one side of said single guiding means for reciprocally moving said carriage along said sheet table from a first direction to a second direction.

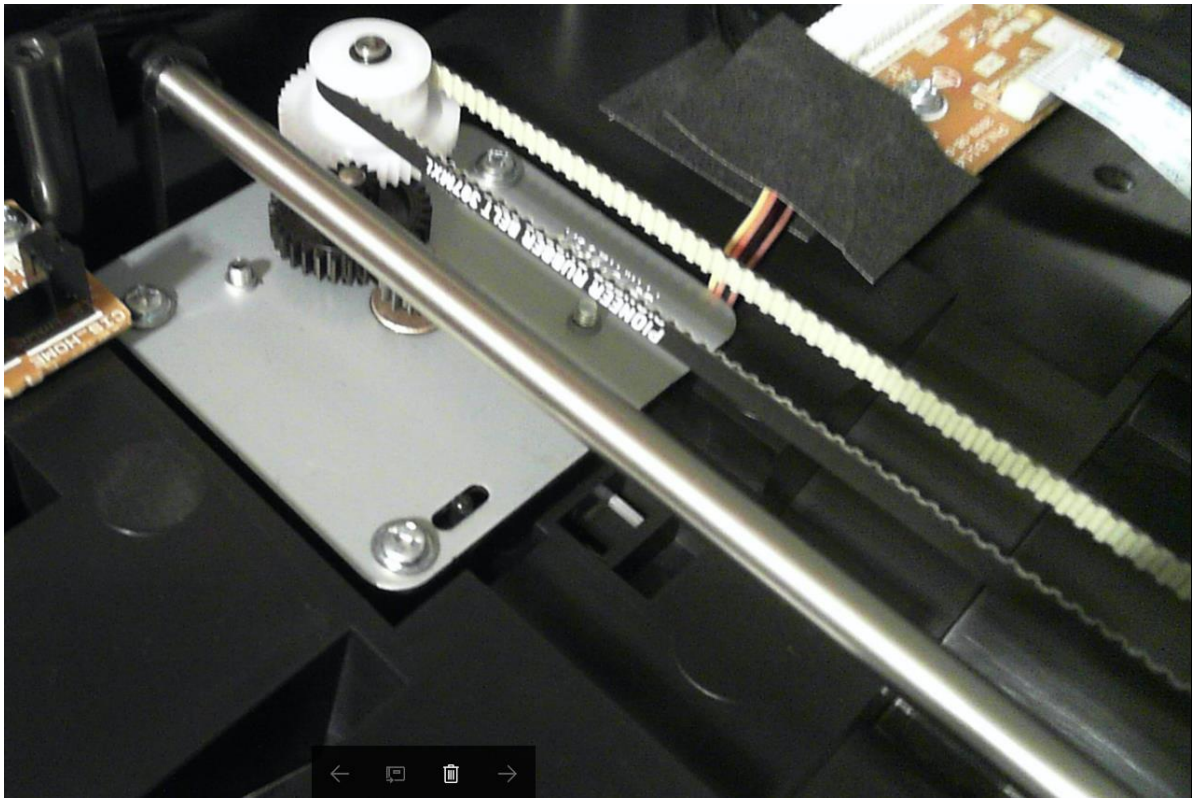
Exh. A at 5:2-22.

17. The Panasonic KX-MB2030 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 these images of a Panasonic KX-MB2030:


Panasonic

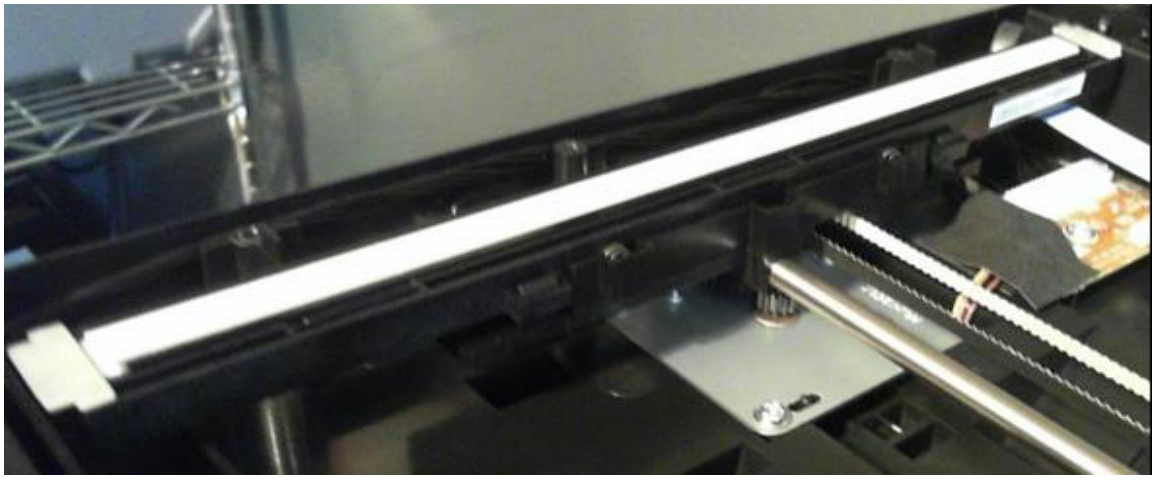




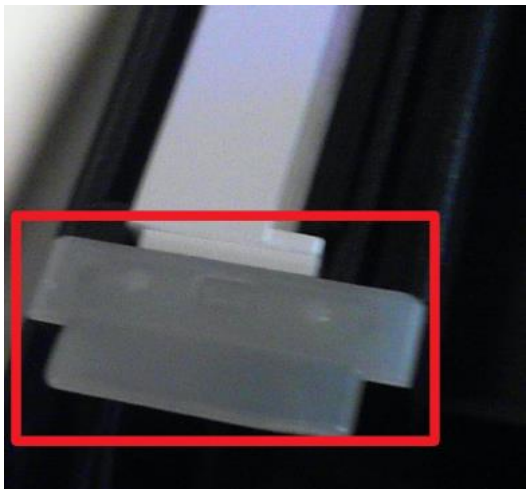


18. The Panasonic KX-MB2030 also includes a sheet table on top of the housing (first image below) for supporting a document sheet (second image below), as shown:

19. The Panasonic KX-MB2030 includes a contact image sensor module carried by a carriage beneath the bottom surface of the sheet table, as shown:



20. The Panasonic KX-MB2030 also has a contact image sensor module that has a plurality of slide blocks attached onto its top surface (red rectangle added for clarity):



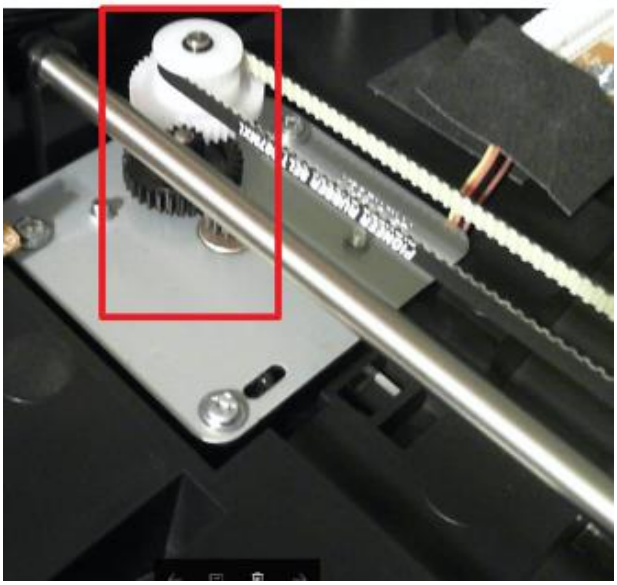
21. The Panasonic KX-MB2030 includes a single guiding means crossed over the bottom center of the carriage for guiding the carriage along the sheet table:

22. In Panasonic's KX-MB2030, the guiding means is mounted on a pair of supports at opposite ends for holding the guiding means:

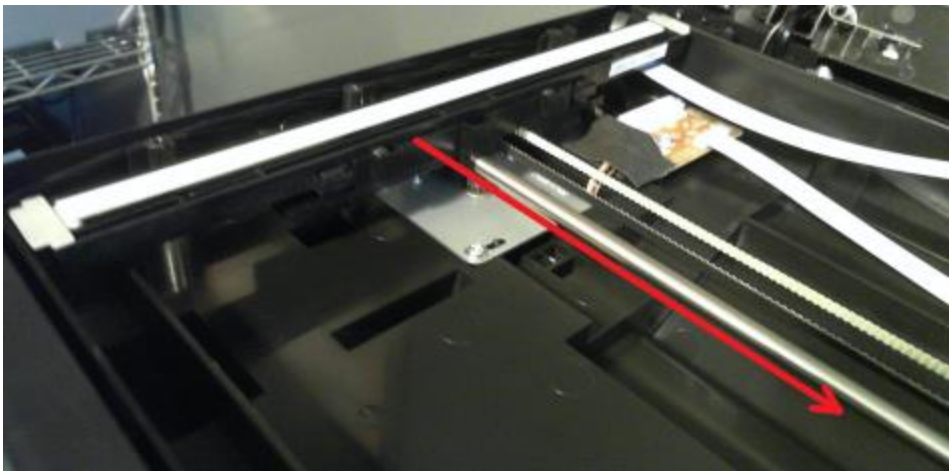
..

23. In Panasonic's KX-MB2030, the supports hold a 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 (orange rectangle added for clarity):

24. Panasonic's KX-MB2030 also includes a driving means located at one side of the single guiding means, as pinpointed by the added red rectangle:



25. In the Panasonic KX-MB2030, the guiding means moves the carriage along the sheet table from a first direction to a second direction (as shown by the added red arrow), the guiding means also reciprocally moves the carriage along the sheet table from the second direction to the first direction (not shown):



26. As shown above, the Panasonic KX-MB2030 includes every element of Claim 1 of the ’133 Patent.

27. Diversified Observation is entitled to recover from Panasonic the damages sustained by Diversified Observation as a result of Panasonic’s infringement 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. 6,008,485

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

29. Without license or authorization, and in violation of 35 U.S.C. §271(a), Panasonic has infringed and continues to infringe at least Claim 1 of the ’485 Patent by making, using, importing, offering for sale, or selling image capturing devices having a de-friction function, including, but not limited to, Panasonic’s KX-MB2030.

30. Claim 1 of the ’485 Patent reads:

> 1. An image capturing device having de-friction function, comprising:
>
> a substantially rectangular platform on which an object to be scanned being placed;

an image sensing module including:

a sensor means having a contact surface adjacent and parallel to said rectangular platform for capturing an image of said object to be scanned;

an accommodation base having a first surface for accommodating said sensor means; and

a supporting member provided beneath said image sensing module for driving said image sensing module along said rectangular platform and providing an elastic force to said image sensing module;

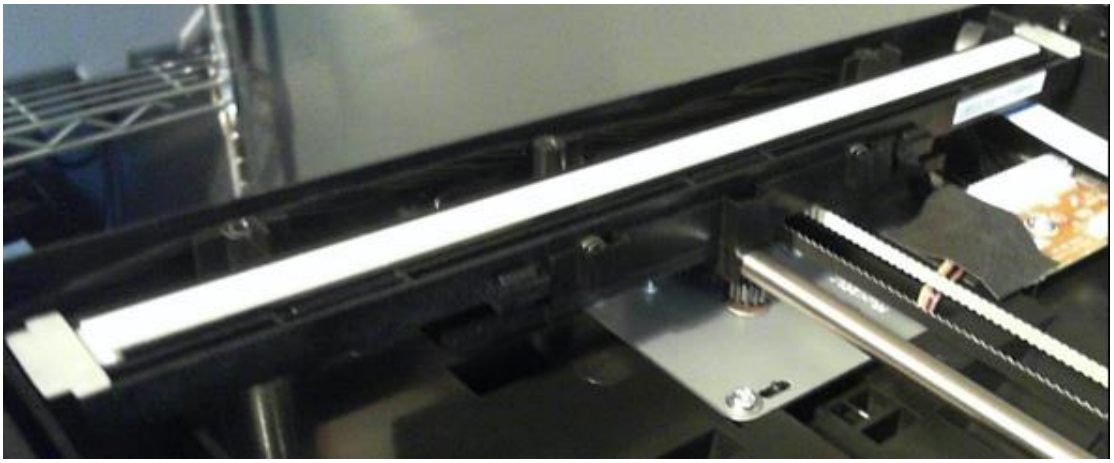
wherein at least a spherical element being provided on said first surface of said accommodation base and said spherical element being biased against said rectangular platform by said elastic force such that a gap being maintained between said contact surface of said sensor means and said rectangular platform.

Exh. B at 3:2 to 4:6.

31. Panasonic's KX-MB2030 includes an image scanning device having a de-friction function comprising a rectangular platform, an image sensing module with a sensor means and an accommodation base, a supporting member, and spherical elements provided on the surface of the accommodation base, as shown in the images below:

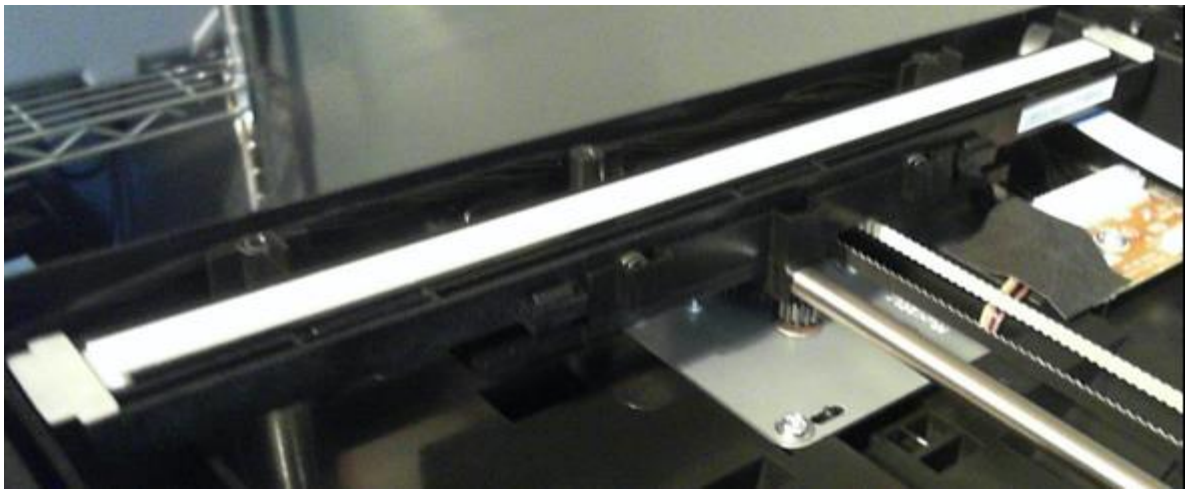

Panasonic
Scan
Copy
Fax
Start
USB 2.0
Fax
Copy


Panasonic



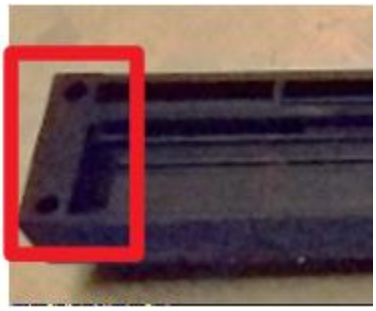
32. Panasonic's KX-MB2030 includes a substantially rectangular platform on which an object to be scanned may be placed:

33. Panasonic's KX-MB2030 also includes an image sensing module:



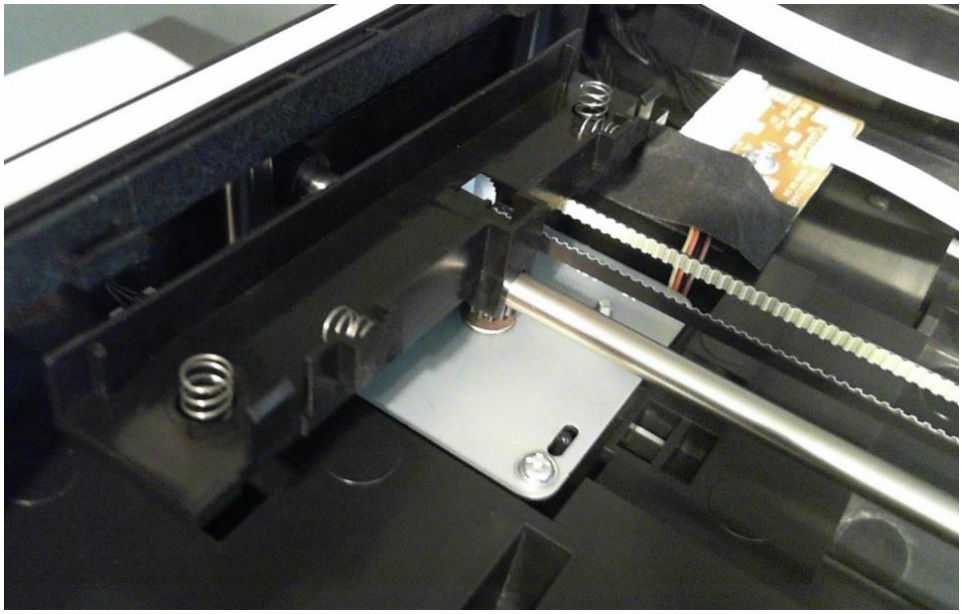
34. Panasonic's KX-MB2030 has an image sensing module that includes a sensor means having a contact surface adjacent to and parallel to the rectangular platform for capturing an image of the object to be scanned:

35. The image sensing module of Panasonic's KX-MB2030 includes an accommodation base that has a first surface for accommodating the sensor means (see red rectangle added to image below):

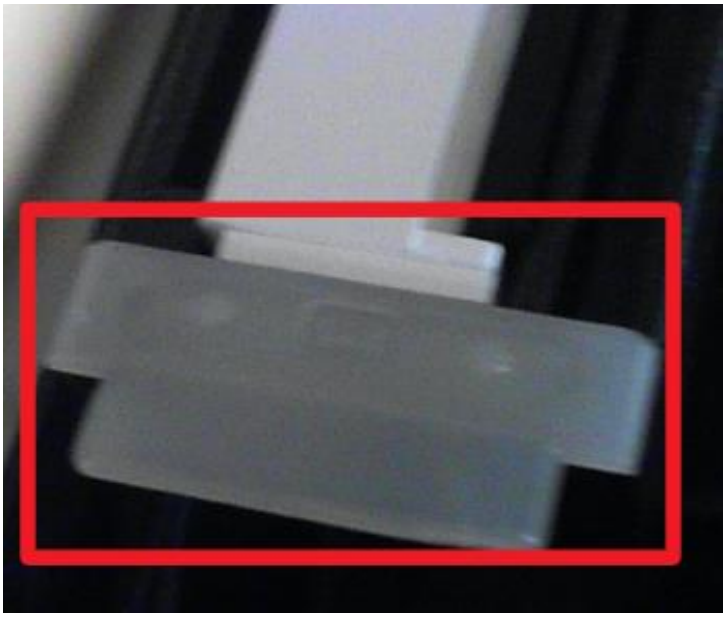


36. Panasonic's KX-MB2030 also includes a supporting member (e.g., for carrying the image sensing module and accommodation base) beneath the image sensing module for driving

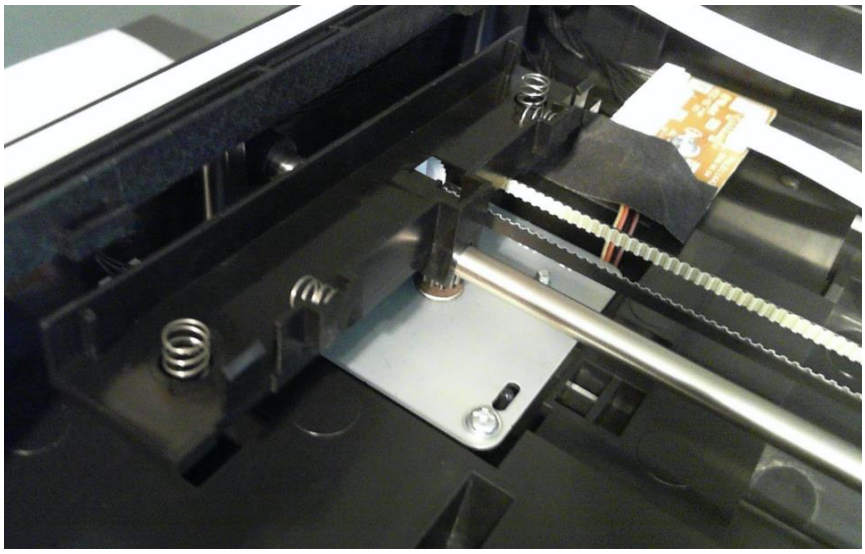
the image sensing module along the rectangular platform and providing an elastic force (e.g., via springs) to the image sensing module:



37. The Panasonic KX-MB2030 also includes spherical elements provided on the first surface of the accommodation base (red rectangles added for clarification):



38. The spherical elements of Panasonic's KX-MB2030 are biased against the rectangular platform by an elastic force:



39. A gap is maintained between the contact surface of the sensor means and the rectangular platform of Panasonic's KX-MB2030, as shown in the images below (orange rectangle added for clarity):

40. As shown above, the Panasonic KX-MB2030 includes every element recited by Claim 1 of the ’485 Patent.

41. Diversified Observation is entitled to recover from Panasonic the damages sustained by Diversified Observation as a result of Panasonic’s infringement of the ’485 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

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

43. Without license or authorization, and in violation of 35 U.S.C. §271(a), Panasonic has 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 Panasonic’s KX-MB2030.

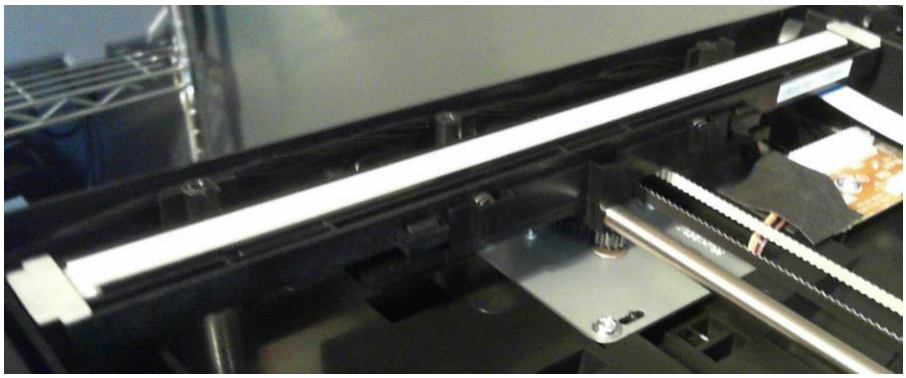
44. Claim 1 of the ’461 Patent reads:

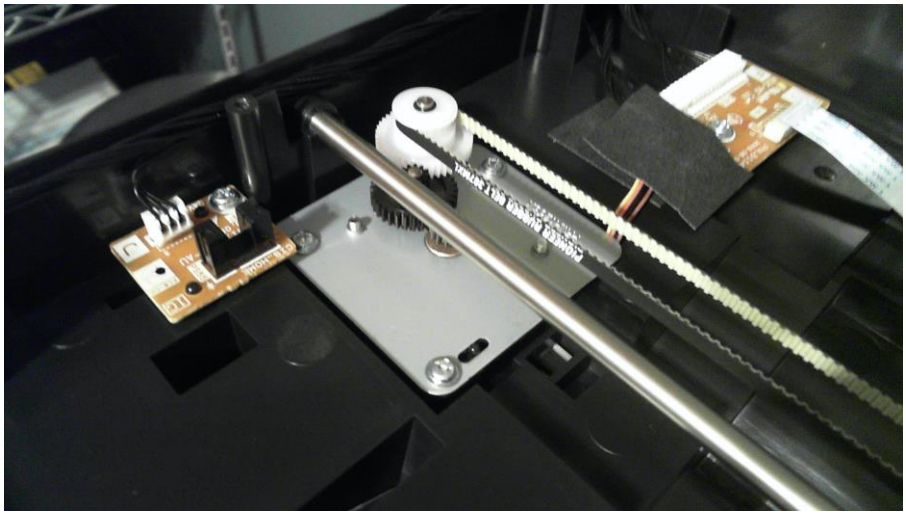
> 1. A scanner comprising: a housing having a transparent platform, a document to be scanned being placed on the transparent platform; a scanning module movably installed inside the housing for scanning the document; a driving module installed inside the housing for driving the scanning module, the driving 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.

45. The Panasonic KX-MB2030 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, as shown by the images, diagrams, and materials reproduced below:





46. The Panasonic KX-MB2030 includes a scanner motor and a scanner motor circuit:

6.7.2. Scanner Motor Drive Circuit

General

Scanner motor drive circuit is consist of motor current control circuit ,FB (Flat Bed) motor driver, ADF (Auto Document Feeder: equipped model only) motor driver and OCP (Over Current Protection) circuit.

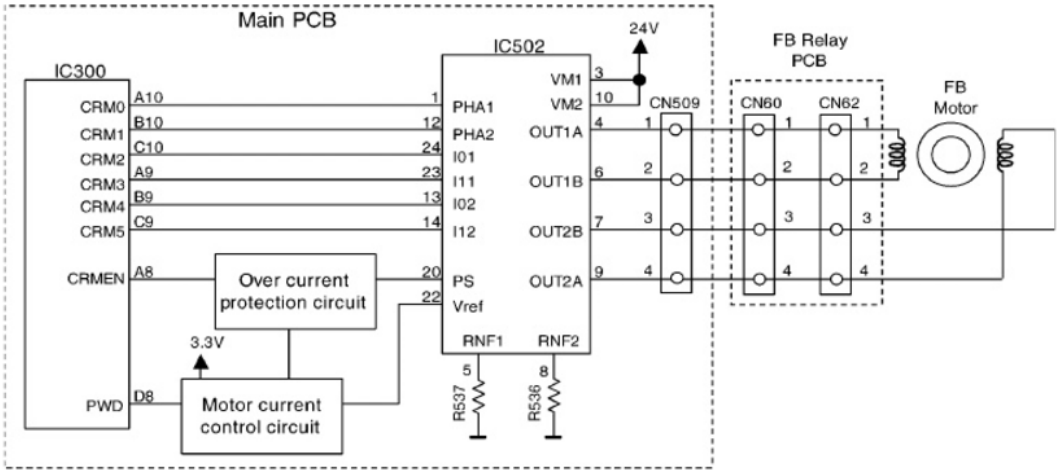
See Service Manual for the KX-MB202030 ("Service Manual") at 34 (available at https://www.scribd.com/doc/106080931/Panasonic-Kx-mb2025-2030-Service-Manual?doc_id=106080931&download=true&order=437004299) (lasted accessed Sept. 29, 2017).

6.7.2.3. FB (Flat Bed) Motor Drive Circuit

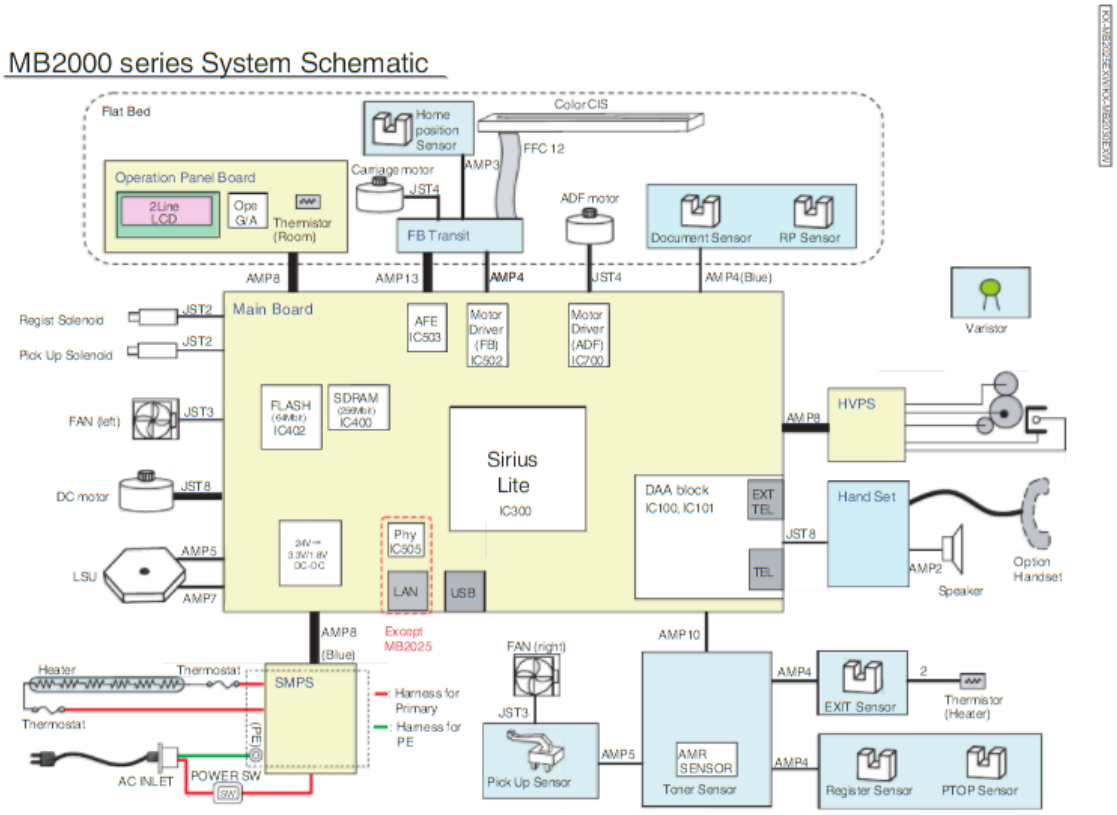
1. Functions
   This motor functions for main operations including FAX transmission, FB copy and PC scan.
   This motor feeds CIS unit with synchronizing for reading.

2. Motor operation
   During motor driving, pin A8 of IC 300 become "H" level, then motor driver IC502 is activated.
   Stepping pulses are output from IC300 pins A9, B9, C9, A10, B10, and C10, causing driver IC502 pin 4, 6, 7 and 9 to drive the motor coil.
   A 1-step rotation of this motor feeds 0.021mm of CIS unit.

3. Circuit Diagram



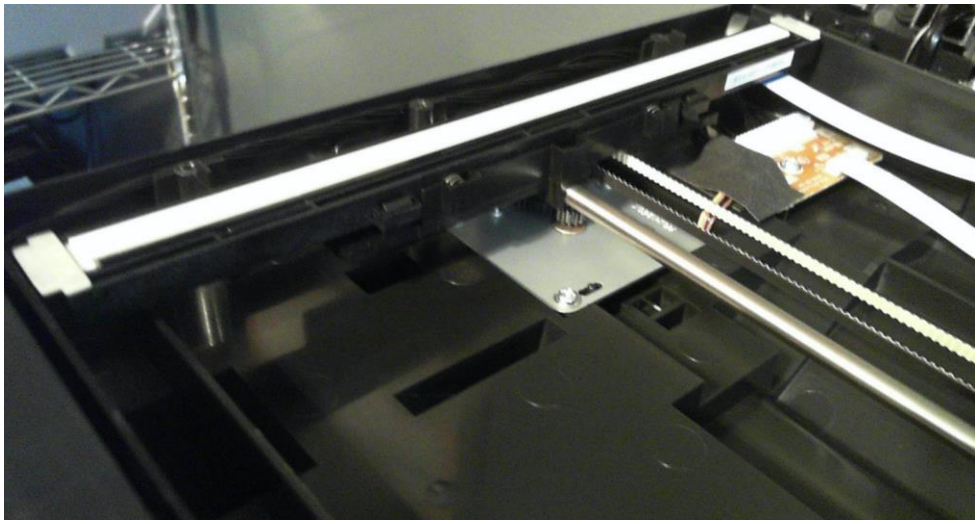
Id. at 35.



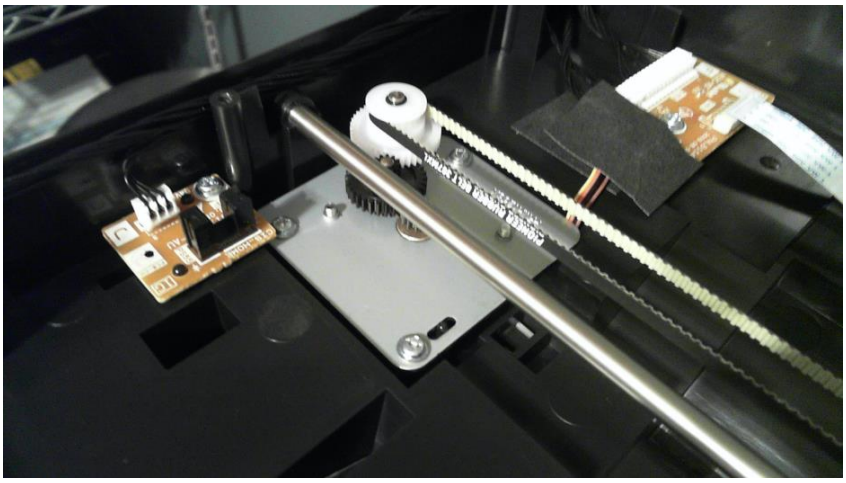
Id. at 16 (color in original).

47. Panasonic's KX-MB2030 includes a housing having a transparent platform (first image below) upon which the user may place a document (second image below) to be scanned:

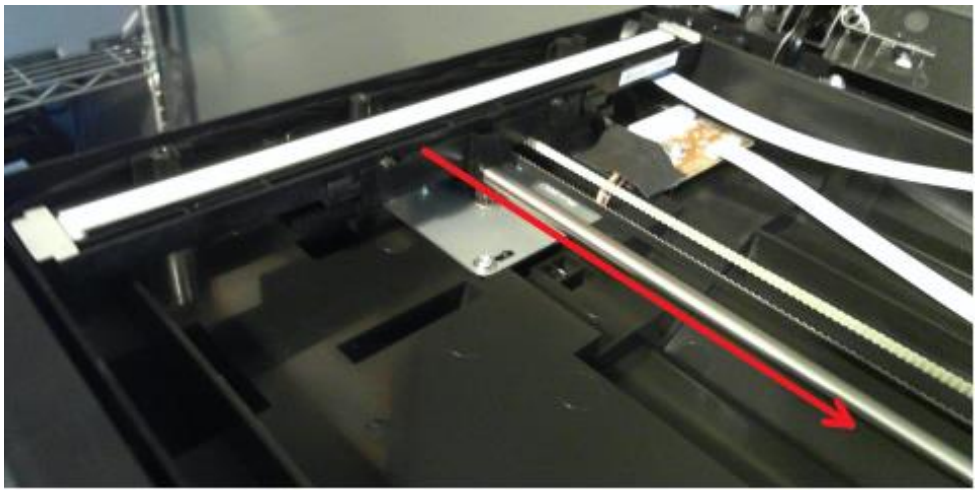
48. Panasonic's KX-MB2030 includes a scanning module moveably installed inside the housing for scanning a document:



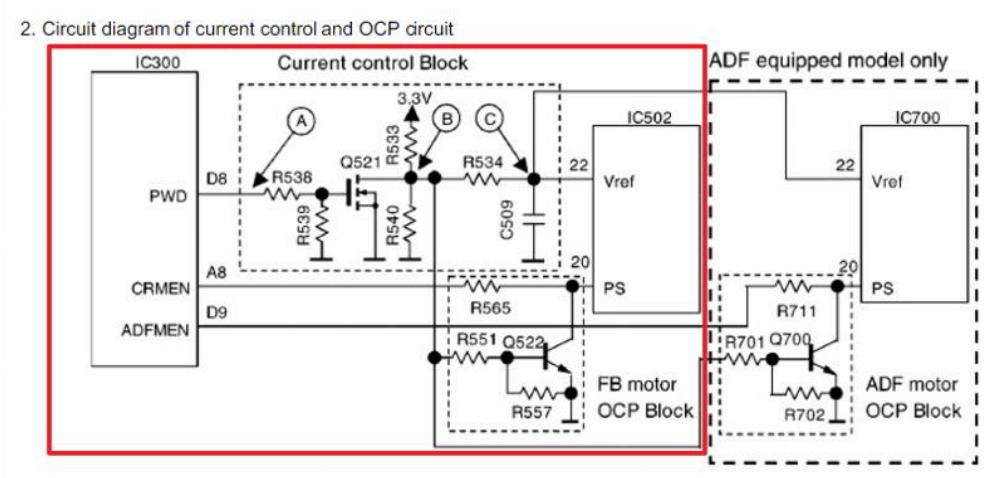
49. Panasonic's KX-MB2030 also includes a driving module installed inside the housing for driving the scanning module:



50. The driving module of Panasonic's KX-MB2030 includes a stepping motor for driving the scanning module forward (as indicated by the addition of the red arrow) and backward (not shown) so that the scanning module scans the document:



51. The driving module of Panasonic's KX-MB2030 includes a motor driving circuit for controlling the stepping motor according to a driving signal:



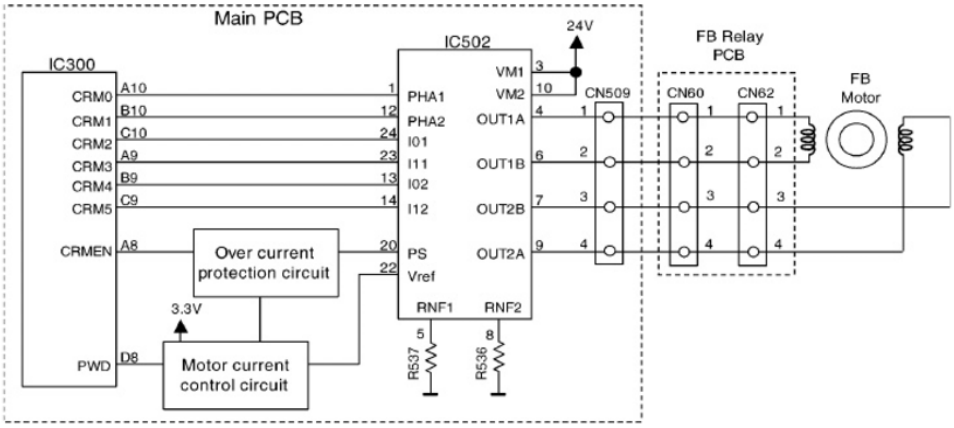
Service Manual at 34 (red rectangle added).

6.7.2.3. FB (Flat Bed) Motor Drive Circuit

1. Functions
   This motor functions for main operations including FAX transmission, FB copy and PC scan.
   This motor feeds CIS unit with synchronizing for reading.

2. Motor operation
   During motor driving, pin A8 of IC 300 become "H" level, then motor driver IC502 is activated.
   Stepping pulses are output from IC300 pins A9, B9, C9, A10, B10, and C10, causing driver IC502 pin 4, 6, 7 and 9 to drive the motor coil.
   A 1-step rotation of this motor feeds 0.021mm of CIS unit.

3. Circuit Diagram



Id. at 35.

52. The Panasonic KX-MB2030 also includes a control circuit for controlling the operations of the scanner (e.g., system on a chip including an ARM9 Processor and 8 MB FLASH ROM):

6.2. General Block Diagram

MAIN UNIT

SOC (IC300)

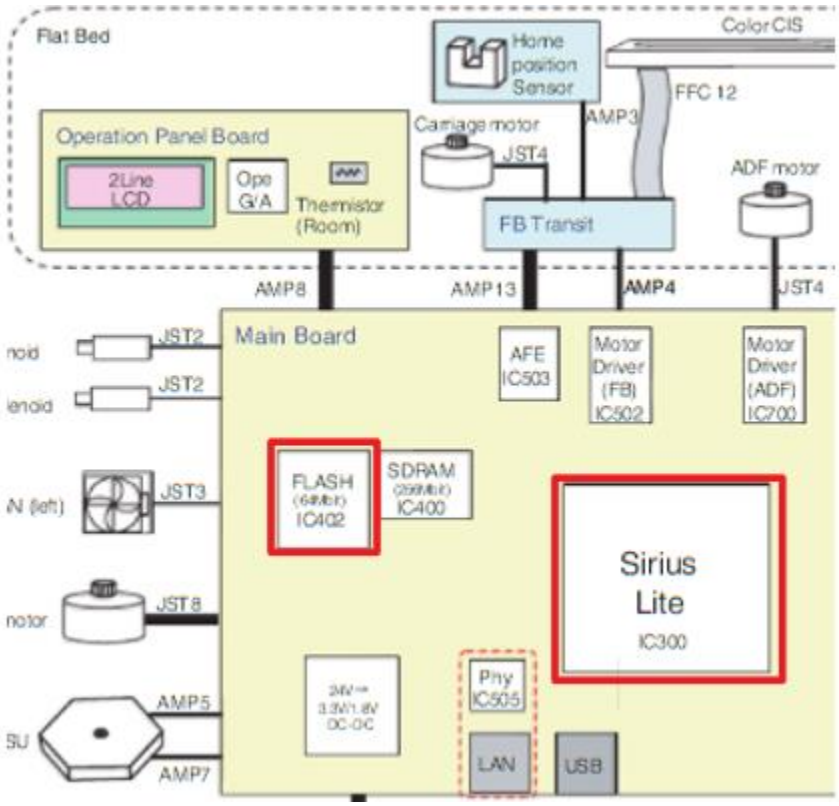
This custom IC is used for general MFP operations.

1)	CPU	ARM9 operating at 250MHz.
2)	SDRAM Controller	Controls SDRAM Memory.
3)	USB Controller with PHY	Apply to USB2.0 HS
4)	Scanner I/F	Controls the CIS and AFE, and process the scan images.
5)	LSU I/F	Controls the polygon motor and outputs the VIDEO signal to LSU.
6)	MOTOR I/F	Controls the DC motor and Stepping Motor.
7)	FAN I/F	Controls FAN MOTOR and detect the rotation of FAN MOTOR.
8)	OPERATION PANEL I/F	Serial interface with Operation Panel.
9)	SENSOR I/F	Detects the sensor signal.
10)	I/O PORT	I/O Port Interface.
11)	A/D, D/A converter	Sends beep tones, etc. Convert the analog signal to the digital signal.
12)	RTC	Real time clock.
13)	MODEM	Performs the modulation and the demodulation for FAX communication.
14)	Analog Front End I/F	Controls the DAA device for TEL/FAX function.
15)	LAN Controller	Ethernet Control. (KX-MB2030 ONLY)

ROM (IC402)

This 8MB FLASH ROM contains all of the program instructions on the unit operations.
And support the backup of user setting and FAX receive data.

Id. at 15.



Id. at 16 (colors in original, image cropped, solid-line red rectangles added).

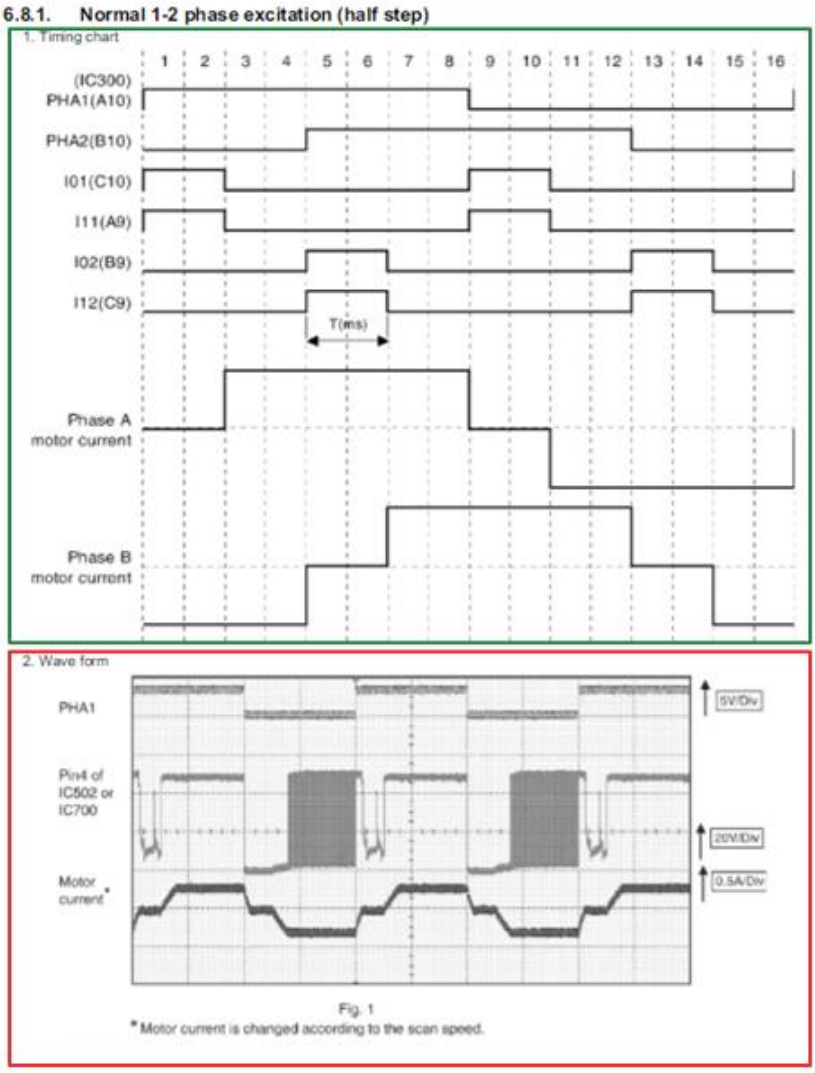
53. The control circuit of Panasonic's KX-MB2030 includes a memory (e.g., 8MB FLASH ROM) that stores a torque table and a driving program. A plurality of torque values are recorded in the torque table, and each of the torque values corresponds to a predetermined condition (e.g., scan resolution) when the stepping motor produces a corresponding torque (see, e.g., motor current waveform chart below) wherein the driving program chooses one of the torque values according to a predetermined condition (e.g., scan resolution):

6.8.4. Drive mode of FB and ADF motor

Correspondent table of operation

Operation	Color mode	ADF/FB	Time & Figure \ Resolution (dpi)	Pre Scan	75 x 75	100 x 100	150 x 150	200 x 200	300 x 300	400 x 400	600 x 600	1200 x 1200	>1200
PC scan	Color	ADF	T(msec)		1.0			2.5		2.0			
			Figure			②				③			
		FB	T(msec)		0.5					2.0			
			Figure				②					③	
	Black & White	ADF	T(msec)			0.67				1.33			
			Figure			①				②			
		FB	T(msec)		0.22				0.67			1.33	
			Figure		①				②				

Id. at 40 (red added for clarity).



Id. at 37 (green and red rectangles added for clarity).

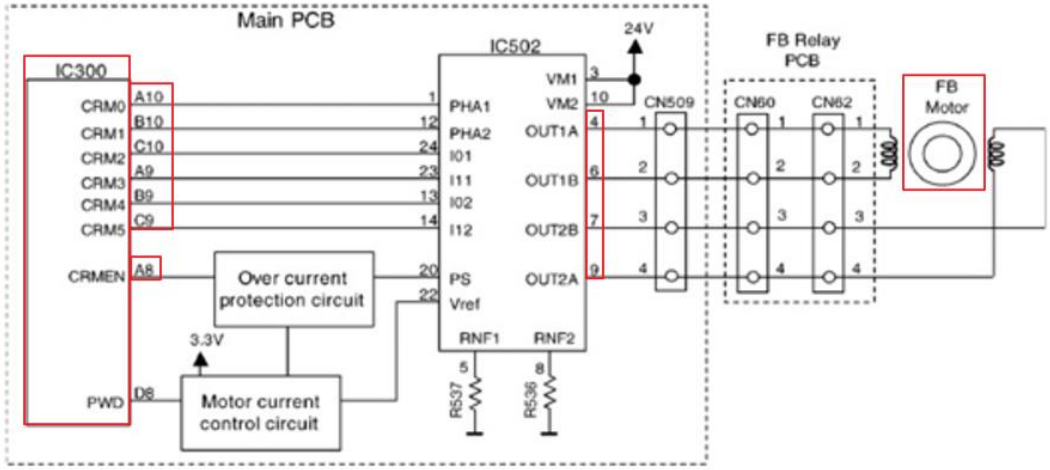
54. The motor driving circuit of Panasonic's KX-MB2030 receives the corresponding driving signal according to the torque value chosen by the driving program and controls the stepping motor so that the stepping motor generates a torque according to the driving signal:

6.7.2.3. FB (Flat Bed) Motor Drive Circuit

1. Functions
This motor functions for main operations including FAX transmission, FB copy and PC scan.
This motor feeds CIS unit with synchronizing for reading.

2. Motor operation
During motor driving, pin A8 of IC 300 become "H" level, then motor driver IC502 is activated.
Stepping pulses are output from IC300 pins A9, B9, C9, A10, B10, and C10, causing driver IC502 pin 4, 6, 7 and 9 to drive the motor coil.
A 1-step rotation of this motor feeds 0.021mm of CIS unit.

3. Circuit Diagram



Id. at 35 (red added for clarity).

55. The control circuit of Panasonic's KX-MB2030 controls the stepping motor to generate different torque values so that the scanning module scans the document at different speeds. Depending on the scan resolution and color settings, the control circuit causes the stepping motor to generate different torque values to scan the document at different speeds:

6.8.4. Drive mode of FB and ADF motor

Correspondent table of operation

Operation	Color mode	ADF/FB	Time & Figure	Pre Scan	75 x 75	100 x 100	150 x 150	200 x 200	300 x 300	400 x 400	600 x 600	1200 x 1200	>1200
PC scan	Color	ADF	T(msec)		1.0			2.5		2.0			
			Figure			②				③			
		FB	T(msec)		0.5					2.0			
			Figure				②					③	
	Black & White	ADF	T(msec)		0.67					1.33			
			Figure			①				②			
		FB	T(msec)		0.22				0.67			1.33	
			Figure			①				②			

Id. at 40 (red added for clarity).

56. As shown above, the Panasonic KX-MB2030 includes every element of Claim 1 of the ’461 Patent.

57. Diversified Observation is entitled to recover from Panasonic the damages sustained by Diversified Observation as a result of Panasonic’s infringement 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. 6,449,397

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

59. Without license or authorization, and in violation of 35 U.S.C. §271(a), Panasonic has infringed and continues to infringe at least Claim 1 of the ’397 Patent by making, using, importing, offering for sale, or selling an image processing system including, but not limited to the Panasonic KV-S7075C.

1. Claim 1 of the ’397 Patent reads:

> 1. An image processing system comprising:
>
> a scanner comprising a scanning module for scanning a rectangular document and generating corresponding image signals, the rectangular document comprising four right angles, the image signals comprising a document image of the document in it; and
>
> a computer connected to the scanner comprising:
>
> a memory for storing programs and files; a processor for executing the programs stored in the memory;

a scanner control program stored in the memory for controlling operations of the scanner and storing the image signals generated by the scanner into a main image file; and

an image processing program stored in the memory for detecting a tilting angle of the document image in the main image file over which the document image is tilted about the tilting angle from an upright position and also angle variation of at least one right angle of the document image, and for correcting the document image to generate a rectangular and upright document image of the document according to the tilting angle and the angle variation of the document image.

Exh. D at 3:39 to 4:22

60. Specifically, the Panasonic KV-S7075C includes a document scanner and therefore an image processing system:

See https://www.newegg.com/Product/Product.aspx?Item=9SIAA0T5B71395&cm_re=KV-S7075C-_-9SIAA0T5B71395-_-Product (last accessed Oct. 6, 2017).

61. The KV-S7075C includes a scanning module that is capable of scanning a rectangular document and generating corresponding image signals. The scanning module includes

hardware that scans documents. The Panasonic KV-S7075C includes a contact-type color image sensor ("CIS"):

Specifications

Item		Model No. KV-S7075C
Scanner	Scanning face	Duplex scanning
	Scanning method	CIS (Contact-type color Image Sensor)

Panasonic, Operating Manual High Speed Color Scanner Model No. KV-S7075C, at p. 49. The image signals comprise a document image of the document:

https://panasonic.net/cns/office/products/scanner/kv-s7075c/pdf/kvs7075_eu_cat.pdf (last accessed Sept. 29, 2017).

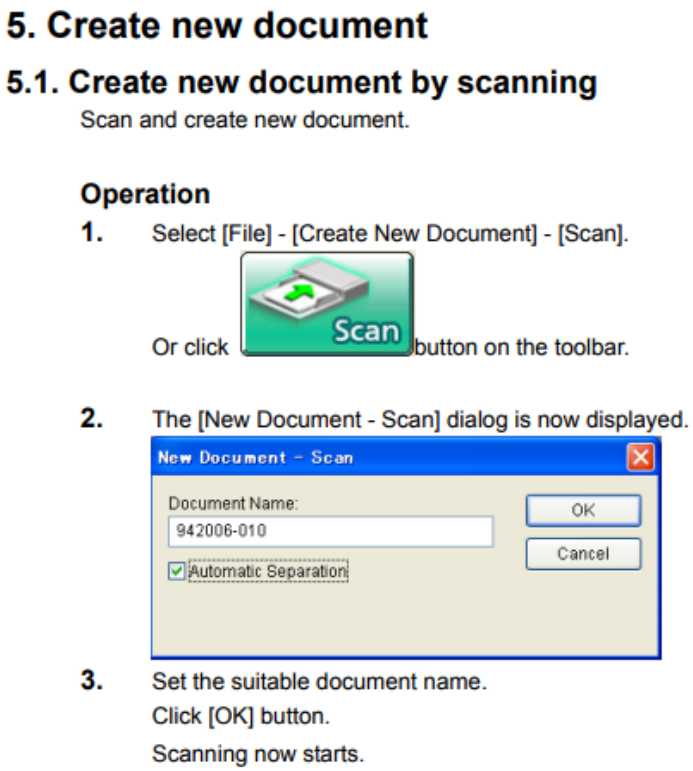


Image Capture Reference Manual ("Reference Manual") at p. 19 (available at https://www.multifunction-printers.com/products/files//panasonic/6220/Image%20capture%20software%20reference%20manual.pdf (last accessed Sept. 29, 2017)).

62. Once the Panasonic KV-S7075C scans the rectangular document, it generates corresponding image signals. As noted above, the KV-S7075C as sold includes software (e.g., the RTIV application software). According to Panasonic, "RTIV is application software that scans documents from the scanner and effectively produces the image file on PC." *See* https://panasonic.net/cns/pcc/support/scanner/download.html#RTIV

63. Panasonic includes in its instructions for using the KV-S7075C minimum system requirements for a computer and illustrates how to connect the KV-S7075C to the computer:

■ System Requirements

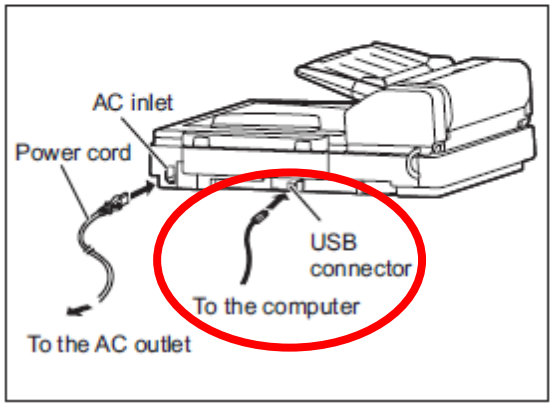
Computer	IBM® PC/AT® or compatible machine with a CD-ROM drive
CPU	Intel® Core™ 2 Duo, 1.8 GHz or higher
Operating System	Windows 2000 / Windows XP / Windows Vista
Interface	USB 2.0
Memory	1 GB or higher
Hard Disk	5 GB or more free space is required.

Operating Manual ("Operating Manual") at p. 3 (color in original) (available at ftp://ftp.panasonic.com/scanner/kvs7075c/kv-s707c_oi.pdf (last accessed Sept. 29, 2017). The computer includes a memory for storing programs and files. For example, the Panasonic KV-S7075C specifies a computer with at least 1GB of RAM.

4. Connect the power cord and the USB cable to the unit.

Notice

- Use only the power cord that is provided with the unit.
- Use the included USB cable or a certified Hi-Speed USB 2.0 cable.



Panasonic, Installation Manual High Speed Color Scanner Model No. KV-S7075C, at p. 12 (red oval added for demarcation) available at https://www.manualslib.com/manual/1100626/Panasonic-Kv-S7075c.html (last accessed Oct. 5, 2017).

64. Panasonic distributes with the Panasonic KV-S7075C a scanner control program (e.g., RTIV software). A portion of the RTIV software is a scanner control program. The Panasonic "Image Capture Software Reference Manual" describes RTIV functions for the KV-S7075C. *See* Image Capture Software Reference Manual, High Speed Scanner, at p. 2 available at https://www.manualslib.com/manual/1100626/Panasonic-Kv-S7075c.html ("Image Capture Software Reference Manual") (last accessed Oct. 5, 2017).

65. The RTIV software is stored in the memory of a computer:

2. System requirements

Item	Requirements
OS	Windows® 2000 SP4 or later Windows® XP SP1 or later Windows Vista® 32-bit Operating System*1 Windows Vista® 64-bit Operating System*1
CPU	Pentium 4, 2 GHz and the above recommended
Memory	Windows® 2000 SP4 / Windows® XP SP1 Minimum 256 M byte Recommended 512 M byte or higher Windows Vista® 32-bit Operating System*1 Windows Vista® 64-bit Operating System*1 Minimum 512 M byte Recommended 1 G byte or higher
Display	65535 colors or higher
I/F	Please refer the Installation Manual bundled with the scanner. ASPI driver cannot be used Windows Vista® 32-bit / 64-bit Operating System.

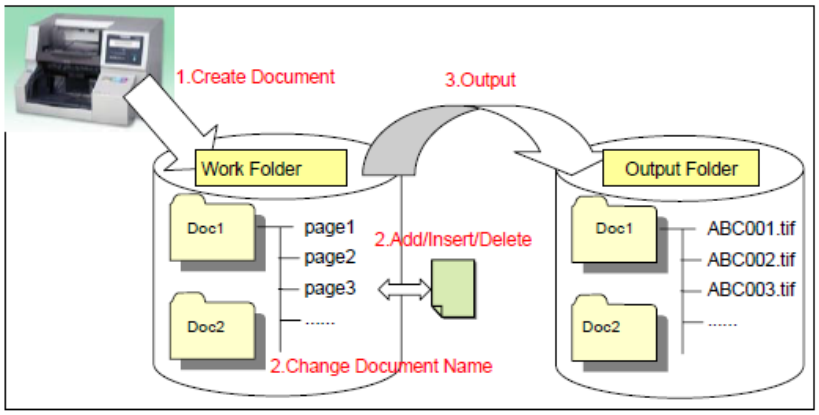
*1 How to check vour OS

Image Capture Software Reference Manual, High Speed Scanner, at p..

66. The scanner control program portion of the RTIV software for the Panasonic KV-S7075C is used for controlling operations of the scanner and storing image signals generated by the scanner into a main image file:

1. Introduction

This software treats a batch of the scanned images as a 'Document' in the Work Folder.
And then this software can output the image files from the Document.



1.Create Document
Create a document of scanned images or image files into the Work Folder.
One document consists of multi pages.
Multiple documents can be created in one Work Folder.

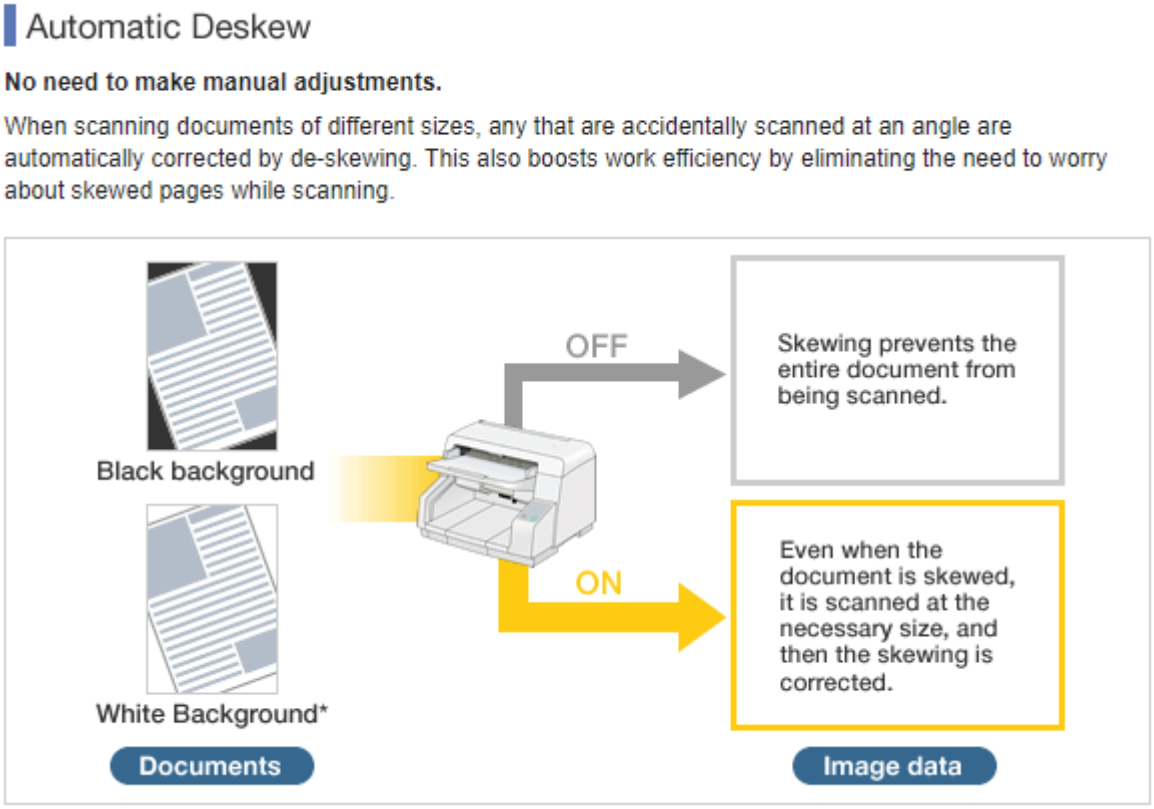
2.Edit Document
The Document can be edited.
Changing document name, Adding / Inserting the page, Deleting the page,
Moving the page, Deleting the document, Merging the document…

3.Output Document
After the document is edited and confirmed, the document can be output to image files.

Image Capture Software Reference Manual, High Speed Scanner, at p. 7.

67. Another portion of the RTIV software for the Panasonic KV-S7075C constitutes an image processing program. As detailed above, the RTIV software is stored in the memory of the computer.

68. The image processing program portion of the RTIV software detects a tilting angle of the document image in the main image file over which the document image is tilted about the tilting angle from an upright position and also angle variation of at least one right angle of the document image. The image processing program is operable to correct the document image to generate a rectangular and upright document image of the document according to the tilting angle and the angle variation of the document image.



https://panasonic.net/cns/office/products/scanner/image_capture_plus/#feature06 (last accessed Sept. 29, 2017).

ftp://ftp.panasonic.com/scanner/flyer/scanners_image_capture_plus_flyer.pdf (last accessed Sept. 29, 2017)).

69. As shown above, every element of Claim 1 of the ’397 Patent is found in the Panasonic KV-S7075C.

70. Diversified Observation is entitled to recover from Panasonic the damages sustained by Diversified Observation as a result of Panasonic’s infringement of the ’397 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 V – INFRINGEMENT OF UNITED STATES PATENT NO. 6,522,432

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

72. Without license or authorization, and in violation of 35 U.S.C. §271(a), Panasonic has infringed 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 Panasonic KX-MB2030.

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. E. at 5:12-38 (numerals (1) – (5) in original.)

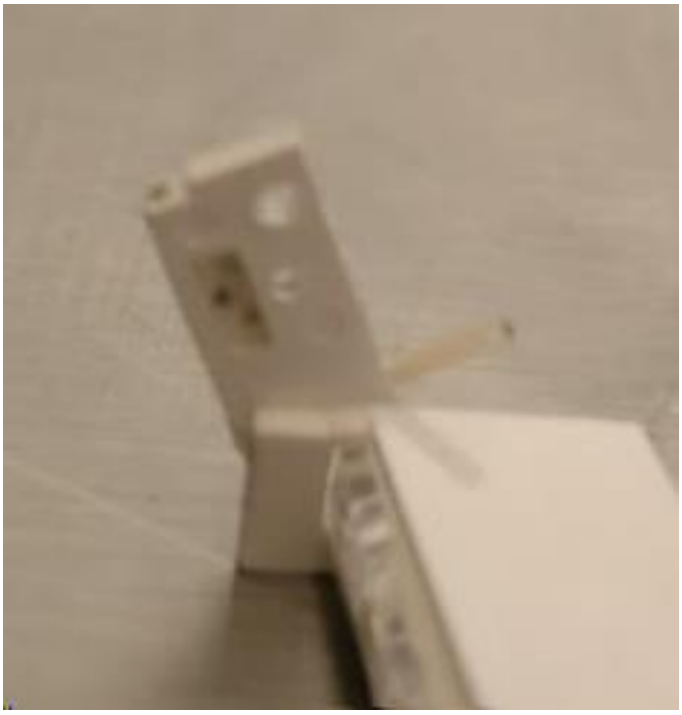
73. Specifically, the Panasonic KX-MB2030 includes an image scanner for scanning a document:

74. The Panasonic KX-MB2030 flatbed scanner module includes a test region:

The test region:

75. The Panasonic KX-MB2030 includes a light source for illuminating the document and the test region. It includes a contact image sensor (CIS) that includes a light source for illuminating the document to be scanned and the test region.

76. The light source CIS module includes an RGB LED:



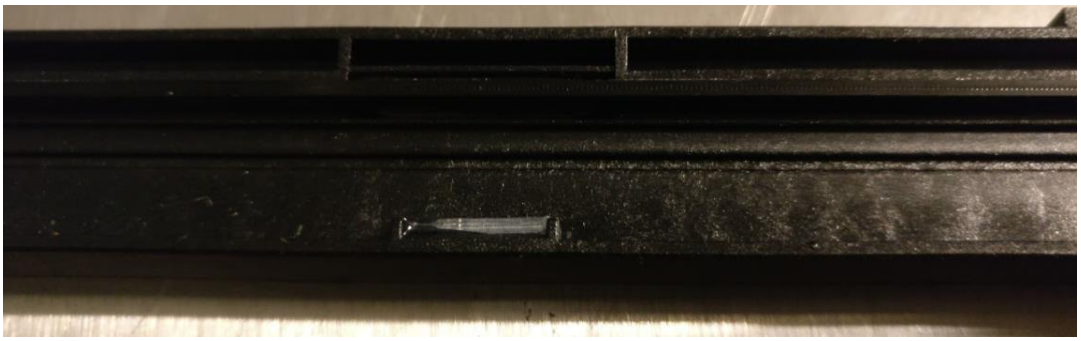
LED light of CIS properties:	LED radiation output: Max. 1 mW Wavelength: Red 630 nm typ. Green 520 nm typ. Blue 465 nm typ. Emission duration: Continuous

Service-Manual at p. 10.

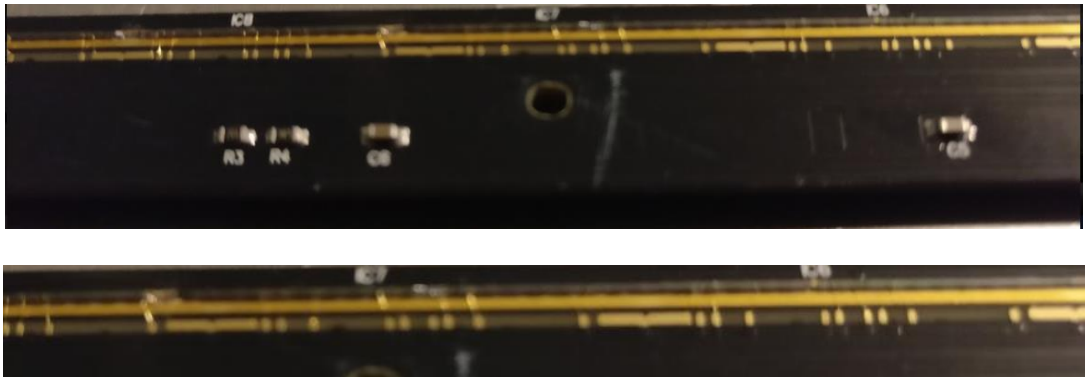
77. The CIS module of the Panasonic KX-MB2030 includes a rod lens that directs light generated by the LEDs to the document and the test region:

78. The rod lens removed from the housing:

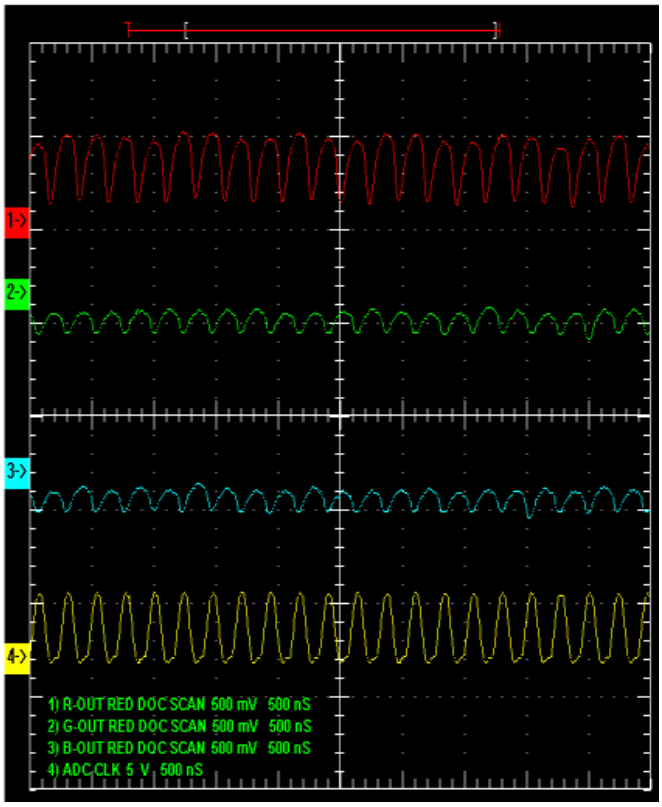
79. The Panasonic KX-MB2030 includes an optical means for conveying the light reflected from the document and the test region. A light guide is built into the housing of the CIS module:



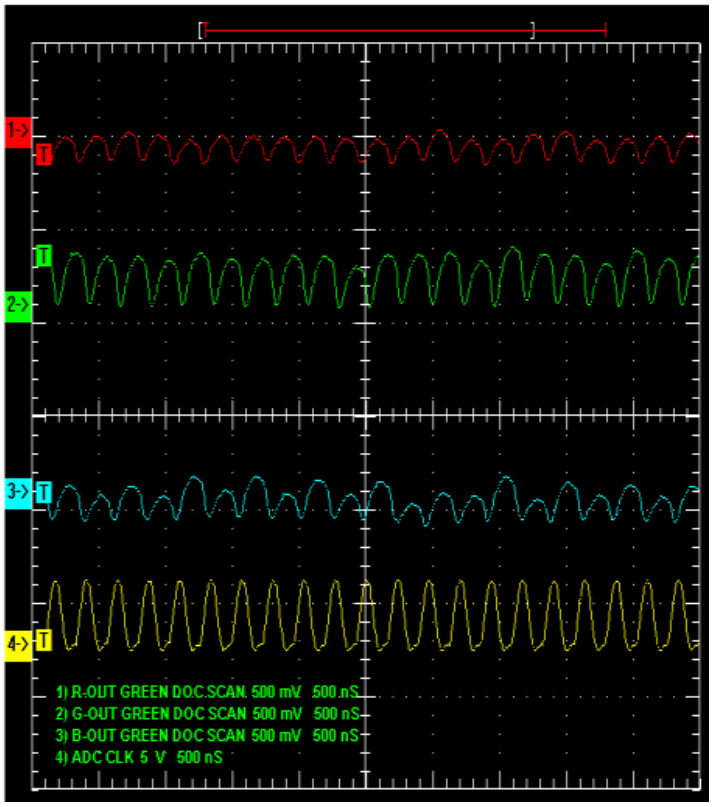
80. The Panasonic KX-MB2030 includes a line image sensor for receiving light from the optical means and for generating an image signal:



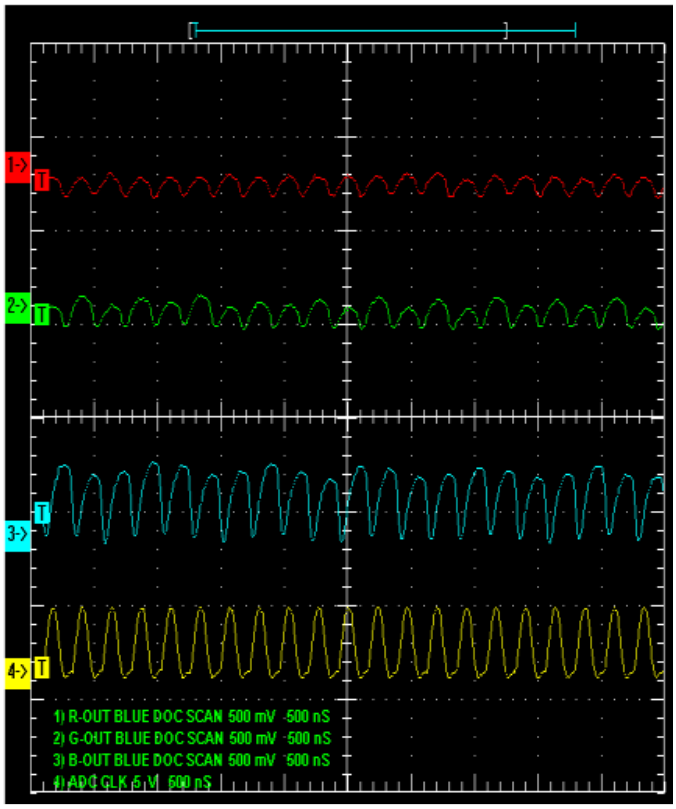
81. The image signal generated by the line image sensor of the Panasonic KX-MB2030 corresponds to the light reflected from the document and the test region. The CIS module output from scanning a Red test pattern at the document region appear as follows:



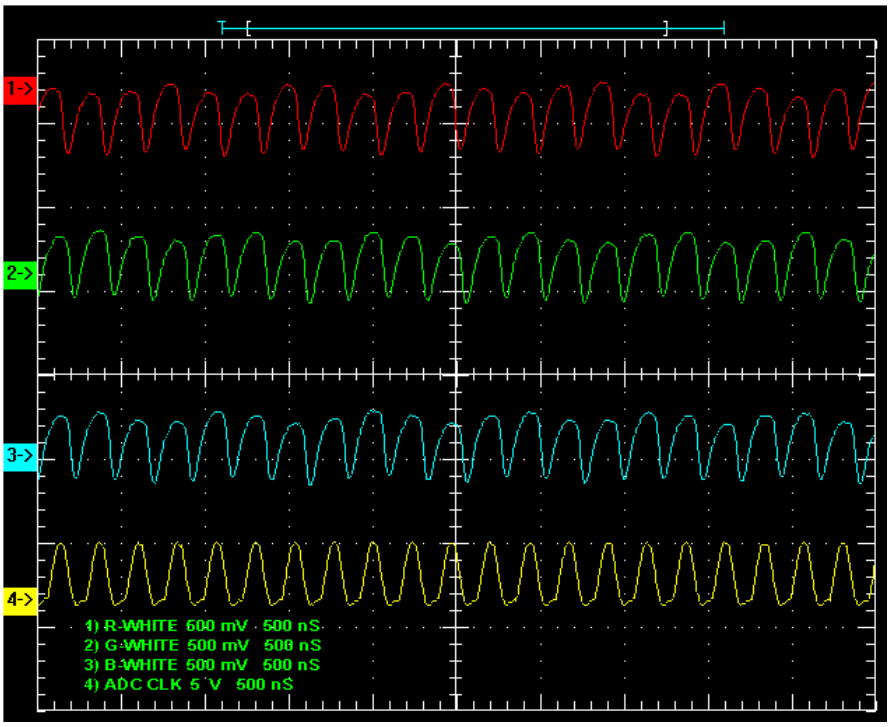
82. The CIS module output from scanning a green test pattern at the document region appears as follows:



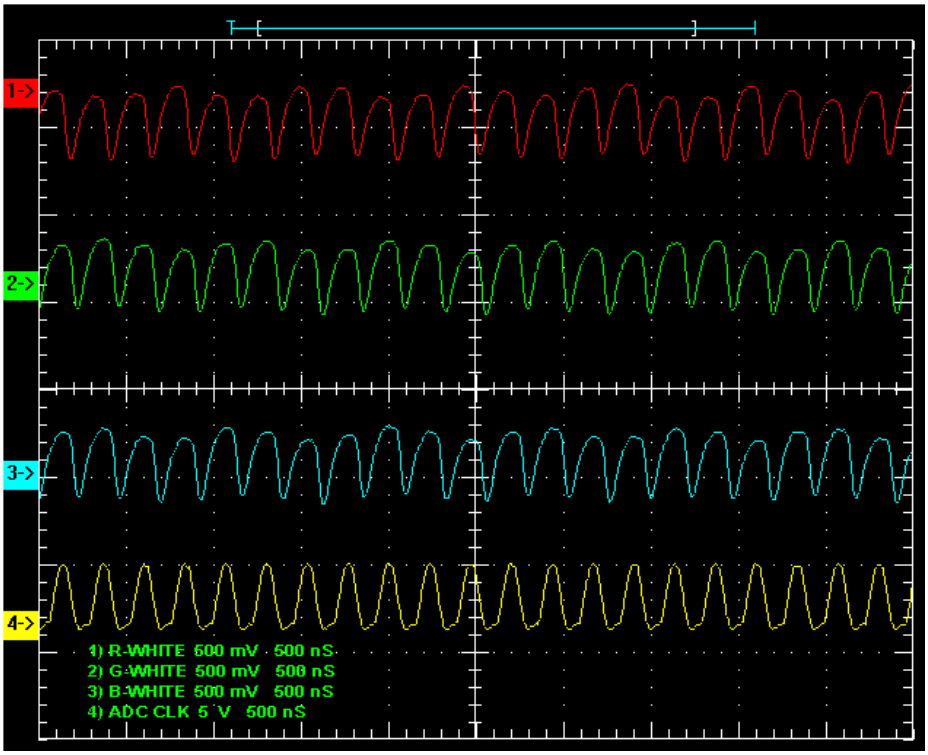
83. The CIS module output from scanning a blue test pattern at the document region appears as follows:



84. The CIS module output from scanning the test region appears as follows:



85. 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:

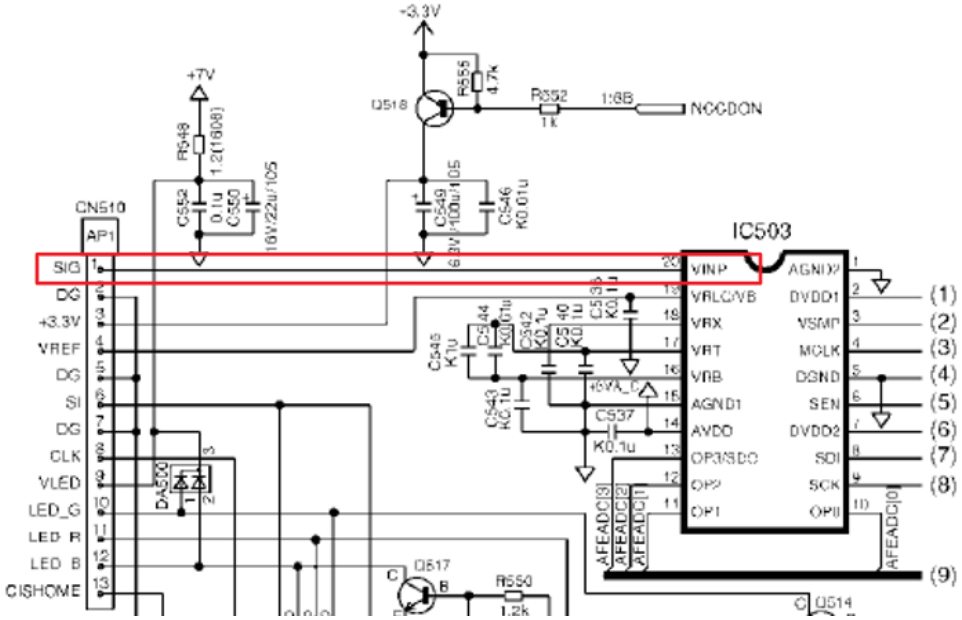


86. Both the image signal and the brightness signals generated by the line image sensor are formed by an array of RGB signals. As shown above, the image and brightness signals generated by the line image sensor include isolatable signals from the RGB signal array.

87. The CIS module also includes a signal compensation circuit for amplifying the image signals according to the brightness signal to compensate for the instability of the light source.

When an original document is inserted and the start button pressed, pin A3 of IC300 goes to a low level and the transistor Q518 turns on.
This applies voltage to the CIS. The CIS is driven by each of the CCDSH , CCDCLK signals output from IC300, and the original image illuminated by the LED to output an analog image signal.
The analog image signal is input to the AFE on VINP(20pin of IC503) and converted into 16-bit data by the A/D converter inside IC503. Then this signal undergoes digital processing in order to obtain a high-quality image.

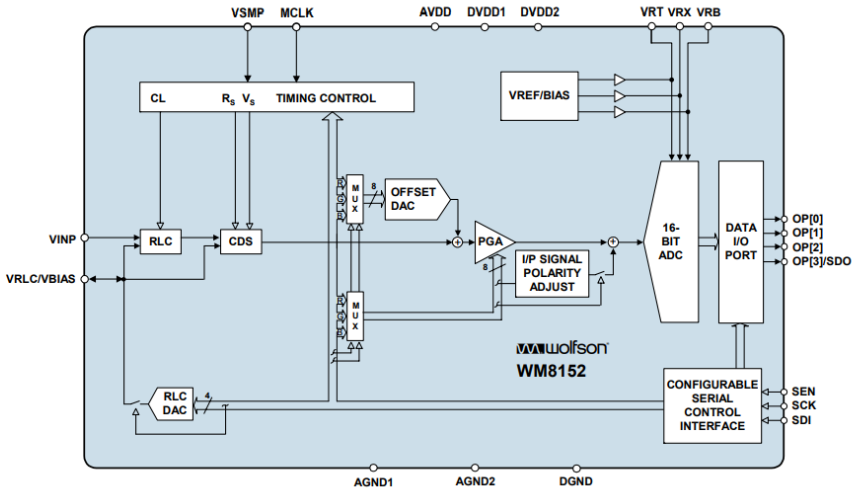
Service Manual at p. 31 ("The analog image signal is input to the AFE … of [the] IC503 … and converted into 16-bit data by the A/D converter inside the IC503."):



Id. at pp. 31, 266 (image cropped, red rectangle added for clarity).

88. The Panasonic KX-MB2030 includes a chip to process and digitize the analog out signals, e.g., a Wolfson Microelectronics WM8152 Single Channel 16-bit CIS/CCD AFE with 4-bit Wide Output chip is a 16-bit analogue front end/digitizer IC that processes and digitizes the analog output signals from contact image sensors. *See* http://www.datasheet4u.com/datasheet-pdf/WolfsonMicroelectronics/ WM8152/pdf.php?id=570430 at linked pdf (http://www.mouser.com/ds/2/76/WM8152_v4.3-532340.pdf) (last accessed Sept. 29, 2017). An image of the IC503 is reproduced here:

A block diagram of the Wolfson IC is shown below:



http://www.datasheet4u.com/datasheet-pdf/WolfsonMicroelectronics/WM8152/pdf.php?id=570430 at p. 2 (color in original) (last accessed Sept. 29, 2017).

89. The Panasonic KX-MB2030 includes a signal compensation circuit that includes an A/D (i.e., analog to digital) converter (i.e., ADC) for digitizing the RGB signals of the image

signal and the brightness signal. The Single Channel 16-bit CIS/CCD AFE with 4-bit Wide Output performs these functions.

> The WM8152 processes the sampled video signal on VINP with respect to the video reset level or an internally/externally generated reference level through the analogue processing channel.
>
> This processing channel consists of an Input Sampling block with optional Reset Level Clamping (RLC) and Correlated Double Sampling (CDS), an 8-bit programmable offset DAC and an 8-bit Programmable Gain Amplifier (PGA).
>
> The ADC then converts each resulting analogue signal to a 16-bit digital word. The digital output from the ADC is presented on a 4-bit wide bus.
>
> On-chip control registers determine the configuration of the device, including the offsets and gains applied to each channel. These registers are programmable via a serial interface.

See http://www.mouser.com/ds/2/76/WM8152_v4.3-532340.pdf at p. 10 (last accessed Sept. 29, 2017).

90. The signal compensation circuit of the Panasonic KX-MB2030 includes a digital processor for adjusting digitized RGB signals of an image signal according to digitized RGB signals of a brightness signal.

> **Colour Line-by-Line:** VINP is sampled and processing by the analogue channel before being converted by the ADC. The gains and offset register values applied to the PGA and offset DAC can be switched between the independent Red, Green and Blue digital registers (e.g. Red → Green→ Blue → Red…) at the start of each line in order to facilitate line-by-line colour operation. The INTM[1:0] bits determine which register contents are applied (see Table 2) to the PGA and offset DAC. By using the INTM[1:0] bits to select the desired register values only one register write is required at the start of each new colour line.

Id. at p. 12.

91. The Digital Programmable Gain unit of the Panasonic KX-MB2030 is operable to modify the brightness and image signals generated by the CIS module.

OFFSET ADJUST AND PROGRAMMABLE GAIN

The output from the CDS block is a differential signal, which is added to the output of an 8-bit Offset DAC to compensate for offsets and then amplified by an 8-bit PGA. The gain and offset can be set for each of three colours by writing to control bits DACx[7:0] and PGAx[7:0] (where x can be R, G or B).

In colour line-by-line mode the gain and offset coefficients that are applied to the PGA and offset DAC can be multiplexed by control of the INTM[1:0] bits as shown in Table 2.

INTM[1:0]	DESCRIPTION
00	Red offset and gain registers are applied to offset DAC and PGA (DACR[7:0] and PGAR[7:0])
01	Green offset and gain registers applied to offset DAC and PGA (DACG[7:0] and PGAG[7:0])
10	Blue offset and gain registers applied to offset DAC and PGA (DACB[7:0] and PGAB[7:0])
11	Reserved.

Table 2 Offset DAC and PGA Register Control

Id. at p. 14.

92. As shown above, the Panasonic KX-MB2030 includes every element of Claim 1 of the ’432 Patent.

93. Diversified Observation is entitled to recover from Panasonic the damages sustained by Diversified Observation as a result of Panasonic's infringement 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 Panasonic as follows:

A. An adjudication that Panasonic has infringed the ’133, ’485, ’461, ’397, and ’432 Patents;

B. An award of damages to be paid by Panasonic adequate to compensate Diversified Observation for Panasonic'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 Panasonic adequate to compensate Diversified Observation for Panasonic’s past infringement of the ’485, ’461, ’397, 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: October 7, 2017

/s/Stamatios Stamoulis

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