IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

APELDYN CORPORATION,	)	
	)	
Plaintiff,	)	
	)	
v.	)	Civ. No. 08-568-SLR
	)	
AU Optronics Corporation, AU Optronics Corporation America, Chi Mei Optoelectronics Corporation, and Chi Mei Optoelectronics USA Inc., et al.,	)	
	)	
Defendants.	)	

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MEMORANDUM OPINION

Dated: December 19, 2011
Wilmington, Delaware

ROBINSON, District Judge

I. INTRODUCTION

The court issued its memorandum order on claim construction and memorandum opinion resolving the pending summary judgment motions on infringement and validity on November 15, 2011. (D.I. 626, 627) Thereby, the court denied AUO's motions for summary judgment of invalidity and of noninfringement[1] and granted CMO's motion for summary judgment of noninfringement. Currently before the court are several motions: Apeldyn's motion for reargument of the court's memorandum opinion (D.I. 633); AUO's motion for reargument of the court's claim construction (D.I. 636); and AUO's motion for reargument of the court's memorandum opinion (D.I. 637).

II. BACKGROUND

At the pretrial conference, Apeldyn argued that the court erred in granting summary judgment of noninfringement to CMO, specifically, at pages 16-17 of the court's memorandum opinion providing that "Apeldyn [did] not cite any evidence in opposition to CMO's motion demonstrating that the drive signal in CMO's products 'changes' such as to effectuate the changes in amplitude and, ultimately, retardance[.]" (D.I. 627 at 16-17) Apeldyn was given the opportunity to submit a short letter directing the court to any such evidence properly cited in its responsive brief. (D.I. 630 at 34-35, 37) Apeldyn's letter (filed under seal with an attached exhibit, D.I. 629) directed the court to the report of its technical expert, Dr. Allen R. Kmetz ("Kmetz") (¶¶ 115-52, 174-77, 185, 192, 198, 326-36 "and exhibits cited therein"), cited on page 14 of its responsive brief (D.I. 530). Apeldyn additionally referred to several sources that are

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[1]The court found that AUO did not induce infringement, and granted its motion on that limited ground.

either not record evidence (attorney argument at the summary judgment hearing and the parties' summary judgment slides) or were not adduced by Apeldyn (CMO's opening and responsive summary judgment briefs). (D.I. 629) AUO and CMO filed responsive letters. (D.I. 631, 632)

The following day, Apeldyn filed its motion for reargument per the court's instruction. (D.I. 633) Commensurately, on November 18, 2011, the court continued the pretrial conference and heard further oral argument on the pending motion. (D.I. 635) During the hearing, the court asked Apeldyn to identify those portions of Kmetz's opinion wherein he provided a means-plus-function infringement analysis with respect to AUO and CMO. Apeldyn did so, and thereafter submitted an email to the court identifying additional portions of Kmetz's opinion.[2] On November 28, 2011, AUO filed two motions for reargument regarding the court's claim construction and the court's memorandum opinion. The court entered an expedited briefing schedule.[3] (D.I. 640)

III. STANDARD

Motions for reconsideration are the "functional equivalent" of motions to alter or amend judgment under Federal Rule of Civil Procedure 59(e). *See Jones v. Pittsburgh Nat'l Corp.*, 899 F.2d 1350, 1352 (3d Cir. 1990) (citing *Fed. Kemper Ins. Co. v. Rauscher*, 807 F.2d 345, 348 (3d Cir. 1986)). The standard for obtaining relief under

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[2]Apeldyn's email of November 18, 2011 and CMO's responsive email dated November 22, 2011 are now docketed at D.I. 648 and 649.

[3]AUO relied on its letter submission and the oral argument record in support of its motion to reconsider the court's denial of its summary judgment motions. (D.I. 637) Therefore, the expedited schedule pertained to AUO's motion for reargument on the court's claim construction.

Rule 59(e) is difficult to meet. The purpose of a motion for reconsideration is to "correct manifest errors of law or fact or to present newly discovered evidence." *Max's Seafood Café ex-rel Lou-Ann, Inc. v. Quinteros*, 176 F.3d 669, 677 (3d Cir. 1999) (citing *Harsco Corp. v. Zlotnicki*, 779 F.2d 906, 909 (3d Cir. 1985)). Therefore, a court should exercise its discretion to alter or amend its judgment only if the movant demonstrates one of the following: (1) a change in the controlling law; (2) a need to correct a clear error of law or fact or to prevent manifest injustice; or (3) availability of new evidence not available when the judgment was granted. *See id.*

A motion for reconsideration is not properly grounded on a request that a court rethink a decision already made. *See Glendon Energy Co. v. Borough of Glendon*, 836 F. Supp. 1109, 1122 (E.D. Pa. 1993). Motions for reargument or reconsideration may not be used "as a means to argue new facts or issues that inexcusably were not presented to the court in the matter previously decided." *Brambles USA, Inc. v. Blocker*, 735 F. Supp. 1239, 1240 (D. Del. 1990). Reargument, however, may be appropriate where "the Court has patently misunderstood a party, or has made a decision outside the adversarial issues presented to the Court by the parties, or has made an error not of reasoning but of apprehension." *Id.* at 1241 (citations omitted); *see also* D. Del. LR 7.1.5.

IV. DISCUSSION

A. Claim Construction

The court's understanding of the technology of the '382 patent, as articulated at the pretrial conference, may not have been most clearly conveyed in the claim

construction order. (D.I. 626) That understanding is as follows. The '382 patent consistently describes providing or applying a drive signal, voltage, signal voltage, or drive signal voltage **to** the cell, not across the cell. ('382 patent at col. 2:14-24; col. 5:20-28; col. 6:28-61; fig. 7) While the § 112 ¶ 6 function of the "first drive means" was described as "[t]he drive signal source provides the voltage **to** the liquid crystal cell that changes the alignment of the liquid crystal material" (D.I. 626 at 3) (emphasis added), the court's descriptions of the "first retarder means" and "first control means" were less specific. Therefore, the court's constructions are clarified as follows:

1. "**[F]irst retarder means** . . ."

§ 112 ¶ 6 function: In response to the application of an electrical charge ****to the liquid crystal cell [ ], the light output of polarized beams passing through the liquid crystal material can be selectively varied.** Each polarized light beam entering the liquid crystal cell has two components which are traveling in phase. These two components are orthogonal (intersecting) and disposed ninety degrees to each other. Each of these two components is called an "eigen-axis." As the polarized light beam passes through the charged liquid crystal cell, the two components move out of phase, that is, light travels faster along one eigen-axis than it does along the second eigen-axis. The amount of delay between the fast and slow eigen-axes is known as the "retardance." The retardance will determine how much light exits the cell. (col. 4:3-57; fig. 1)

3. "**[F]irst control means** . . ."

§ 112 ¶ 6 function: The waveshape control unit includes a circuit that determines when to change the [ ] voltage of the ac signal ****applied to the liquid crystal cell** in order to cause a change in the cell retardance. According to the invention, the first control means switches the voltage of the applied signal from an amplitude required to maintain a first retardance, to a voltage ***beyond**[4] that

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[4]The court agrees with AUO that "beyond" is preferable to "higher than," to the extent that "higher than" excludes, e.g., the amplitude variations disclosed in figures 6C and 6D (V8 → 0 → V7). The court notes that Apeldyn does not offer any substantive rebuttal to AUO's motion for reargument on claim construction, arguing only that "beyond" is less understandable to the jury. (D.I. 646)

corresponding to the amplitude required to maintain a second retardance, ***then** switches to the voltage corresponding to the amplitude required to maintain a second retardance. (col. 6:66-col. 7:26; fig. 7)

B. Infringement by CMO

In response to the court's request for identification of Kmetz's means-plus-function analysis correlating to figure 7 in the patent, Apeldyn provided citations to Kmetz's report at the hearing (¶¶ 304-20) and in its subsequent email to the court (¶¶ 51-52, 275-344). Both sets of citations expand those offered in Apendyn's opposition brief (¶¶ 115-52, 174-77, 185, 192, 198, 326-36).[5] While CMO objects to Apeldyn's expansion of the record, the court must ultimately address more of Kmetz's report than that which was cited in Apeldyn's opposition brief in order to fully articulate Apeldyn's infringement position and, ultimately, the sufficiency of Kmetz's noninfringement proffer.

The court identified as the corresponding § 112 ¶ 6 structure of the disputed "first drive means" limitation the "the square wave generator, waveshape control unit, and an amplitude modulator, and equivalents thereof" as described in the '382 patent. (D.I. 626 at 3; '382 patent at col. 6:66-col. 7:26; fig. 7) The structure identified by Kmetz as corresponding to the "first drive means" in CMO's accused products is "an interconnected assembly of timing controllers (often shown in connection with an overdrive look-up table and/or frame buffer), source drivers, thin-film transistors, and

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[5]Paragraphs 115-152 reference Kmetz's discussion of CMO's technology, as well as Kmetz's overdrive testing results. At paragraphs 174-177, 185 and 192, Kmetz describes CMO's look-up tables and overdrive. Paragraph 198 pertains to the timing controller. There is no particular discussion herein relating to infringement under the doctrine of equivalents as applied to the disputed means-plus-function limitations. Only cited paragraphs 326-336 pertain to infringement. The court cited paragraphs 328 and 329 in detail in its prior memorandum opinion. (D.I. 627 at 15-16)

storage capacitors." (D.I. 531, ex. 7 at ¶¶ 276-77) According to Kmetz, the drive signal source in CMO's products is comprised of "the signal input (usually an LVDS interface), timing controller (typically shown with the frame buffer and overdrive look-up tables), and source driver (or data driver)." (*Id.* at ¶ 266) "**Collectively**, the timing controller, look-up tables, source driver, thin film transistors, and storage capacitors comprise a drive signal source that includes a waveshape control circuit, amplitude modulator, and square wave generator." (*Id.* at ¶ 278) (emphasis added)

Because the circuitry identified in the patent is not identical to the circuitry as described by Kmetz, infringement of the "first drive means" limitation must be demonstrated through equivalence. After articulating that it is an "interconnected assembly" of drive circuitry that makes up the "first drive means" (and collectively comprise the drive signal source), Kmetz proceeds to identify particular components of this assembly that arguably correspond to a waveshape control circuit, amplitude modulator, and square wave generator.[6] He does not do so, however, under the familiar rubric of the "function, way, result" or "insubstantial differences" tests.

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[6]Kmetz opines that the timing controller, which compares incoming data to an overdrive look-up table to determine what voltage should be applied to the pixel (and then sends that digital value to the source driver) is a waveshape control unit, either literally or by equivalence. (D.I. 531, ex. 7 at ¶ 279) The source drivers are amplitude modulators either literally or by equivalence because they convert digital data from the timing controller into an AC signal. (*Id.* at ¶ 283) Finally, Kmetz opines that "[t]he source drivers, thin-film-transistors, and storage capacitors, working in conjunction with the timing controller and gate drivers, in the accused CMO products. . . are the same as or equivalent to the square wave generator" in that they "generate an AC drive signal that is **ultimately** applied to the liquid crystal cells in the accused CMO products." (*Id.* at ¶¶ 284, 289) (emphasis added)

In CMO's products, the (AC) drive signal fires and charges up the storage capacitor. Regardless of whether the drive signal "returns to zero,"[7] the parties do not dispute that the drive signal is not maintained across the frame. Rather, the storage capacitor holds the charge causing the pixel to hold the resultant voltage across the entire frame. (D.I. 635 at 46-50) As noted in the court's prior opinion, Kmetz focuses on the ultimate voltage changes from frame to frame, not the initial signals supplied by the drive means. (D.I. 627 at 15-16) Kmetz opines that CMO's overdrive circuitry and corresponding look-up tables operate to apply voltages V1, V2 and V3 at the beginning of frames 1, 2 and 3, respectively. While the amplitude from frame to frame may change, Kmetz provides no indication that the **signal supplied by the drive means** changes from a first amplitude required for the first retardance to a second amplitude and beyond a third amplitude required for the second retardance, and then back to a second amplitude required for a second retardance.[8] Rather, the liquid crystal molecules change their orientation due to the voltage differential between the display and bias electrodes. (*Id.* at ¶¶ 119, 286, 304)

Kmetz provides at paragraph 335 of his report that,

> [t]o the extent it may be argued that there is no literal infringement, this [changing to three amplitudes] limitation is satisfied under the doctrine of equivalents because CMO's overdrive functions [ ] perform substantially the same function as the claim limitation (driving from a first to a second retardance, expressed in terms of gray-scale values) in substantially the same way (applying voltages

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[7]Apeldyn argues (in its November 29, 2011 letter) that the drive signal does not return to zero during the intervals when a subpixel's transistor is turned off. (D.I. 639 at 4)

[8]Consistent with his efforts to conform the structure of CMO's overdrive circuitry (minus the LVDS transmitter, the AC signal source) to figure 7.

> higher than that which corresponds to the second gray-scale, or retardance, value) to achieve substantially the same result (faster response time). These differences remain insubstantial even when different overdrive versions are considered; in other words, CMO's overdrive version OD-1 is indeed representative of the overdrive version (OD-2, OD-3, OD-4, OD-5, OD-6 and OD-7, and combinations thereof) used by CMO.

(*Id.* at ¶ 335) This is the entirety of Kmetz's doctrine of equivalents analysis.[9]

It is Apeldyn's position that Kmetz provided appropriate foundation upon which it could be concluded that "the initial pulse from the source driver is equivalent to the amplitudes of the claims." (D.I. 530 at 14) In other words, Apeldyn argues that, so long as the voltage is varied over the **frames** in CMO's liquid crystal cells, it is of no moment that only a single driving pulse is applied.[10]

The Federal Circuit has held that

> a patentee must . . . provide particularized testimony and linking argument as to the "insubstantiality of the differences" between the claimed invention and the accused device or process, or with respect to the "function, way, result" test when such evidence is presented to support a finding of infringement under the doctrine of equivalents. Such evidence must be presented on a limitation-by-limitation basis. The same rule applies in the summary judgment context.

American Calcar, Inc. v. American Honda Motor Co., Inc., 651 F.3d 1318, 1338-39

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[9]The court does not discount the foregoing on the basis that it was rendered under Apeldyn's construction of ". . . from a first amplitude which is required for said first retardance to a second amplitude, beyond a third amplitude. . ." etc., as suggested by CMO (D.I. 632). Kmetz stated that it was his understanding that Apeldyn proposed that the terms did not require separate construction beyond that already proposed for "retardance" (D.I. 531, ex. 7 at ¶ 326). With respect to "retardance" generally, the parties agreed in principle that the term refers to the phase shift between the two components of light. (D.I. 487 at 2) The court found no occasion to construe the term for the purpose of resolving the disputes on summary judgment.

[10]Kmetz's literal infringement theory is inconsistent with the court's claim construction requiring that the signal from the source driver changes the retardance within the cell.

(Fed. Cir. 2011) (internal citations and quotations omitted).

Kmetz's analysis is insufficient to pass muster under this standard. Kmetz does not articulate how the overdrive's selection of the various gray-scale values from look-up tables (for frames N-1, N, and N+1) is equivalent to changing the retardance in the cell by changing the first drive signal, nor does he provide any other foundation for Apeldyn's position that CMO can infringe by applying only a single driving pulse to the cells so long as the voltage (carried along by the storage capacitor) varies from frame to frame. Because Kmetz's report does not provide the limitation-by-limitation discussion of equivalence contemplated by the Federal Circuit, the court denies Apeldyn's motion and does not amend its grant of summary judgment of noninfringement with respect to CMO. *See Texas Instruments Inc. v. Cypress Semiconductor Corp.*, 90 F.3d 1558, 1566-67 ("[W]ithout these requirements, the fact-finder has no analytical framework for making its decision and is put to sea without guiding charts when called upon to determine infringement under the doctrine of equivalents") (internal quotation and citation omitted).

C. Infringement by AUO

The court denied AUO's motion for summary judgment of noninfringement because AUO did not support its noninfringement arguments with an expert's opinion.[11] (D.I. 627 at 11-12) By its motion for reargument, AUO asserts that the court made an

[11]While Kmetz's testimony was subject to a motion to exclude by AUO, that motion focused only on the sufficiency of Kmetz's testing (and photographic) data and testimony regarding sales – not the issues at bar. (D.I. 625) Having found this testimony sufficient to withstand the *Daubert* challenge, the court denied AUO's motion for summary judgment.

"error not of reasoning but of apprehension" with respect to the operation of the accused AUO products compared to the accused CMO products. (D.I. 637 at 2) (citation omitted) The court agrees that reargument is appropriate in this case. There is no dispute as to how the accused products operate. As discussed below, Kmetz's proffer with respect to AUO parallels that for CMO and, therefore, the judgment must be amended to prevent manifest injustice to AUO by allowing Apeldyn to go forward to a jury trial on legally insufficient evidence.

According to Kmetz, the drive signal source in AUO's products is also an interconnected assembly of circuitry.[12] Included within this collectively-functioning assembly, however, are specific components arguably corresponding to waveshape control circuit, amplitude modulator, and square wave generator made up of particular components.[13] (*Id.* at ¶ 274) Again, there is no mention of the "function, way, result" or "insubstantial differences" tests for infringement under the doctrine of equivalence (and

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[12]AUO's "LVDS and/or RSDS receivers and transmitters, timing controller, lookup tables, source driver, gate driver, thin-film transistors, and storage capacitors" that respond to a drive signal source. (D.I. 533-1, ex. 7 at ¶¶ 269-73) The drive signal source is "the LVDS interface (depicted as "LVDS_I/F"), timing controller (depicted as "Tcon"), and source driver (depicted "Source_I/F")." (*Id.* at ¶ 257) "Collectively, the LVDS receiver, LVDS transmitter, timing controller, look-up tables, source driver, gate driver, thin-film transistors, and storage capacitors correspond to a drive signal source that includes a waveshape control circuit, amplitude modulator, and square wave generator." (*Id.* at ¶ 274)

[13] As with CMO, Kmetz follows his identification of this "interconnected assembly" of drive circuitry making up the "first drive means" with the identification of particular components that correspond to a waveshape control unit (timing controller and overdrive look-up tables), amplitude modulator (source drivers), and square wave generator ("source drivers, thin-film transistors, and storage capacitors working in conjunction with the timing controller and gate drivers in the accused AUO products"). (D.I. 533-1, ex. 7 at ¶¶ 274-76)

the comparisons are not drawn under either legal framework).

Kmetz also describes the operation of the drive signals in AUO and CMO's products identically: both sets of accused products have drive signals that return to a zero amplitude between pulses.[14] (*Id.* (citing D.I. 531, ex. 7 at ¶ 119 (CMO) and D.I. 533-1, ex. 7 at ¶ 145 (AUO)) Kmetz described the accused AUO and CMO products identically as being driven by a single charge. (D.I. 531, ex. 7 at ¶ 119 and D.I. 533-1, ex. 7 at ¶ 145) In discussing AUO's infringement of the "three amplitudes" limitation, Kmetz discussed the differences in amplitudes from frame to frame. (D.I. 533-1, ex. 7 at ¶¶ 315-20) Kmetz discusses the one-frame overdrive and two-frame overdrive practiced by the accused AUO products and correlates the relevant gray-scale values to the resultant amplitudes in each frame. (*Id.* at ¶¶ 317-18) Two-frame overdrive used by certain of AUO's accused products differs from one-frame overdrive in that "the next frame (N) frame is split into two sub-frames and a value from the first look-up table is used in the first sub-frame and a value from the second look-up table that is depicted below is used in the second sub-frame." (*Id.* at ¶ 152) Kmetz does not articulate how either of AUO's overdrive selection of the various gray-scale values from look-up tables is equivalent to changing the retardance in the cell by changing the drive **signal**. There is no foundation for Apeldyn's position that AUO infringes so long as the **voltage** (carried along by the storage capacitor) varies from frame to frame. (*Id.* at ¶¶ 317-20)

The entirety of Kmetz's doctrine of equivalents analysis with respect to the "three

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[14]At oral argument, AUO's counsel explained that AUO's system has a "dual frame," meaning that there are two drive signal spikes (returning to amplitude zero) in each frame. (D.I. 635 at 50) Kmetz's report comports with this description. (D.I. 533-1, ex. 7 at ¶ 318)

amplitudes" limitation is as follows:

> 321. To the extent it may be argued that there is no literal infringement, this limitation ["three amplitudes"] is satisfied under the doctrine of equivalents because AUO's one-frame overdrive and two-frame overdrive both perform substantially the same function as the claim limitation (driving from a first to a second retardance, expressed in terms of gray-scale values) in substantially the same way (applying a voltage higher or lower than that which corresponds to the second gray-scale, or retardance, value) to achieve substantially the same result (faster response time).

(D.I. 533-1, ex. 7 at ¶ 321) Because Kmetz did not provide particularized testimony describing his doctrine of equivalents theory on a limitation-by-limitation basis, and provided only conclusory opinions with respect to the function-way-result test, the court grants AUO's motion for reargument and will enter judgment of noninfringement with respect to AUO. *See American Calcar,* 651 F.3d at 1338-39; *Texas Instruments Inc. v. Cypress Semiconductor Corp.*, 90 F.3d at 1566-67.

V. CONCLUSION

For the foregoing reasons, Apeldyn's motion for reargument of the court's memorandum opinion (D.I. 633) is denied; AUO's motion for reargument of the court's claim construction (D.I. 636) is granted;[15] and AUO's motion for reargument of the court's memorandum opinion (D.I. 637) is granted. An appropriate order shall issue.

[15]The court does not amend the memorandum opinion granting summary judgment of noninfringement for CMO, but will amend its claim construction order consistent with section IV(A) above.

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

APELDYN CORPORATION,	)	
	)	
Plaintiff,	)	
	)	
v.	)	Civ. No. 08-568-SLR
	)	
AU Optronics Corporation, AU Optronics Corporation America, Chi Mei Optoelectronics Corporation, and Chi Mei Optoelectronics USA Inc., et al.,	)	
	)	
Defendants.	)	

ORDER

At Wilmington this 19th day of December, 2011, consistent with the memorandum opinion issued this same date;

IT IS ORDERED that:

1. Apeldyn's motion for reargument of the court's memorandum opinion (D.I. 633) is denied.

2. AUO's motion for reargument of the court's claim construction (D.I. 636) is granted.

3. AUO's motion for reargument of the court's memorandum opinion (D.I. 637) is granted.

4. On or before **December 28, 2011** at **5:00 p.m.**, the parties shall inform the court (by letter submission) whether a trial is needed on validity.

United States District Judge

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

APELDYN CORPORATION, Plaintiff, v. AU Optronics Corporation, AU Optronics Corporation America, Chi Mei Optoelectronics Corporation, and Chi Mei Optoelectronics USA Inc., et al. Defendants.	)	Civ. No. 08-568-SLR

****AMENDED MEMORANDUM ORDER**

At Wilmington this 19th day of December, 2011, consistent with the memorandum opinion issued this same date and with the tenets of claim construction set forth by the United States Court of Appeals for the Federal Circuit in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005);

IT IS ORDERED that the disputed claim language of the patent in suit, U.S. Patent No. 5,347,382 ("the '382 patent"), shall be construed as follows:

1. "**[F]irst retarder means for controlling the retardance of light passing therethrough along a first eigen-axis thereof relative to a second eigen-axis thereof in response to the application of a first signal thereto**:"

§ 112 ¶ 6 function: In response to the application of an electrical charge ****to the liquid crystal cell [ ], the light output of polarized beams passing through the liquid crystal material can be selectively varied.** Each polarized light beam entering the liquid crystal cell has two components which are traveling in phase. These two

components are orthogonal (intersecting) and disposed ninety degrees to each other. Each of these two components is called an "eigen-axis." As the polarized light beam passes through the charged liquid crystal cell, the two components move out of phase, that is, light travels faster along one eigen-axis than it does along the second eigen-axis. The amount of delay between the fast and slow eigen-axes is known as the "retardance." The retardance will determine how much light exits the cell. (col. 4:3-57; fig. 1)

Structure: A liquid crystal cell that includes a liquid crystal material located between two electrodes that are connected to a drive signal source that supplies an ac drive signal, or equivalents thereof. (col. 3:60-64; fig. 1)

2. "**Eigen-axes**" are indices of refraction along which polarized light travels through a liquid crystal cell. The eigen-axes are orthogonal to each other (they are intersecting). The eigen-axis along which light travels faster is known as the fast axis, the eigen-axis along which light travels slower is known as the slow axis. (col. 3:63-col.4:8; col. 4:25-28) Polarized light traveling along either eigen-axis remains linearly polarized and exits the liquid crystal cell along the same eigen-axis. (fig. 1, col. 4:43-57)

The court declines to add the additional language suggested by Apeldyn, i.e., that linearly polarized light will exit the cell along the same eigen-axis "independent of the applied voltage." (D.I. 487 at 2) This concept is not discussed in the specification. Moreover, the requirement that the polarized light must exit along the same eigen-axis negates any need for further limitation.

3. "**[F]irst drive means, connected to said first retarder means, for**

supplying said first signal to said first retarder means:"

§ 112 ¶ 6 function: The drive signal source provides the voltage to the liquid crystal cell that changes the alignment of the liquid crystal material which, in turn, causes the eigen-axes of a polarized light beam to go out of phase. It does so through the operation, *inter alia*, of the first control means. (col. 3:60-64; 4:19-21; 4:43-53)

Structure: A square wave generator, a waveshape control unit, and an amplitude modulator, or equivalents thereof. (col. 6:66-col. 7:26; fig. 7)

4. "**[F]irst control means for changing said retardance from a first retardance to a second retardance by causing said first signal to change**:"

§ 112 ¶ 6 function: The waveshape control unit includes a circuit that determines when to change the [ ] voltage of the ac signal ****applied to the liquid crystal cell** in order to cause a change in the cell retardance. According to the invention, the first control means switches the voltage of the applied signal from an amplitude required to maintain a first retardance, to a voltage ***beyond** that corresponding to the amplitude required to maintain a second retardance, ***then** switches to the voltage corresponding to the amplitude required to maintain a second retardance. (col. 6:66-col. 7:26; fig. 7)

Structure: The waveshape control unit of figure 7, or equivalents thereof. (*Id.*)

5. "**[M]eans for aligning said liquid crystal material in a predetermined manner**:"

§ 112 ¶ 6 function: Aligning the liquid crystal material in a predetermined manner.

Structure: Alignment layers of the liquid crystal cell retarder made of rubbed

polyimid or sputtered silicon monoxide and disposed on the inside of the electrodes, or equivalents thereof. (col. 5:3-8; fig. 2)

6. "**[M]eans for applying to said transparent electrodes as said first signal an ac voltage of selected amplitude, and said control means comprises means for selecting said amplitude**:"

§ 112 ¶ 6 function: Producing an ac signal of selected amplitude that is applied to the transparent electrodes.

Structure: The waveshape control unit and amplitude modulator, or equivalents thereof. (col. 6:66-7:26; fig. 7)

7. "**[M]eans for reducing, for a period of time, said amplitude of said signal below that amount needed to change the retardance of said retarder means to a new, selected value**:"

§ 112 ¶ 6 function: Reducing the amplitude of the signal to change the retardance to a new selected value, and determining when to change the signal to an amplitude that corresponds to a new selected retardance value.

Structure: A waveshape control unit determines when to change the signal to an amplitude that corresponds to a new selected retardance value, and an amplitude modulator reduces the amplitude of the signal to change the retardance to a new selected value, or equivalents thereof. (col. 6:66-7:26; fig. 7)

8. "**[C]ontrol means for controlling said amplitude**:"

§ 112 ¶ 6 function: Controlling the amplitude of the signal.

Structure: An amplitude modulator, or equivalents thereof. (col. 6:66-7:26; fig. 7)

United States District Judge