IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

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| 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: November 15, 2011
Wilmington, Delaware

**ROBINSON, District Judge**

## I. INTRODUCTION

Plaintiff Apeldyn Corporation ("plaintiff" or "Apeldyn") filed the complaint in this action on September 8, 2008 against, inter alia, defendants AU Optronics Corporation and AU Optronics Corporation America (collectively, "AUO") and Chi Mei Optoelectronics Corporation and Chi Mei Optoelectronics USA, Inc. (collectively, "CMO"). (D.I. 1) Therein, plaintiff alleged infringement of its U.S. Patent No. 5,347,382 ("the '382 patent"), which is directed to the response time of liquid crystal material in VA mode Liquid Crystal Display modules ("LCDs"). Currently pending before the court are: (1) AUO's motion for summary judgment of invalidity (D.I. 503); (2) AUO's motion for summary judgment of noninfringement (D.I. 504); (3) CMO's motion for summary judgment of no inducement of patent infringement (D.I. 505); and (4) CMO's motion for summary judgment of noninfringement (D.I. 508). Trial is scheduled to commence on December 5, 2011.

## II. BACKGROUND

### A. Technology Overview[1]

The applications for LCDs are well-known and include computer monitors, televisions, cell phones, and other digital displays. LCDs are composed of pixels containing a layer of liquid crystal molecules between two polarizing filters (also called polarizers). The polarizers contain (or are adjacent to) electrodes so that voltage can

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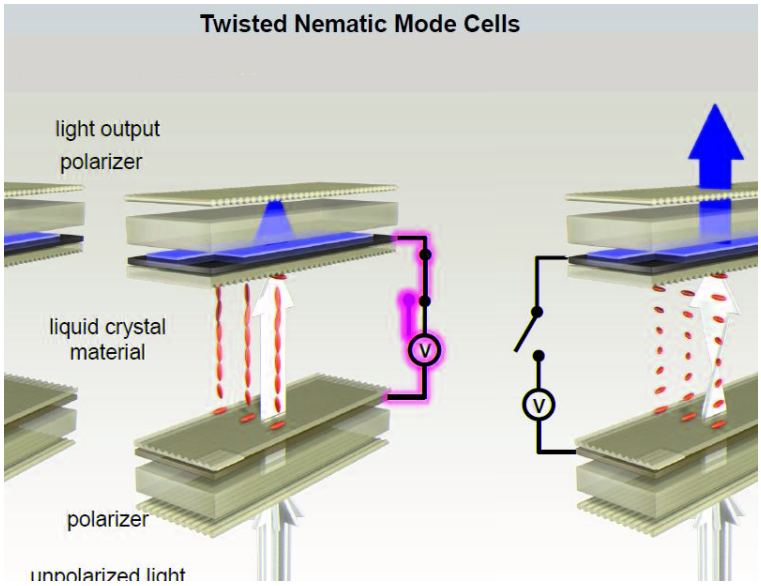
[1]The court draws upon the transcript and slides presented at oral argument. (D.I. 606 at 20-24) The slides were not separately docketed. The court's description of the technology is its best attempt to give context to and frame the claim construction and summary judgment issues presented; nothing stated herein should be construed to be a binding determination by the court, or supplant record evidence in this regard.

be applied to the cell. The two polarizers typically are arranged such that the axes of transmission are perpendicular to each other. A polarizer can be analogized to a picket fence – it will screen out light except where there is an opening for it to pass through. Per the analogy, the slots in the fence do not align, and light cannot pass all of the way through unless it is altered within the cell.

LCDs do not produce light; they require an external light source. LCDs use the light modulating properties of liquid crystals to emit light. Light entering the cell is unpolarized, which means that light waves are moving simultaneously in many directions in space. Unpolarized light then passes through the cell's first polarizer. The slice of light's electromagnetic spectrum that is allowed to pass into the cell is called polarized light.

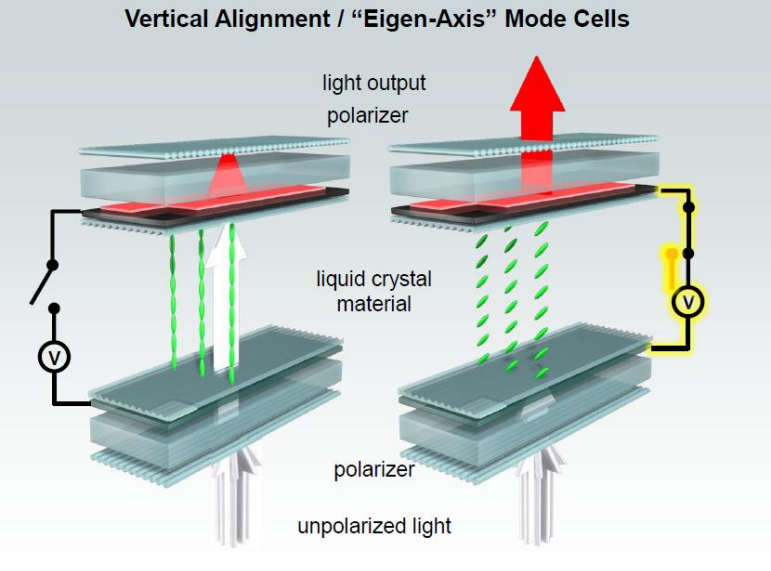
Polarized light can be thought of as the sum of two components, which are orthogonal (intersecting) and at 90 degree angles to each other. Polarized light entering the cell does so "in phase," meaning that the two components are lined up precisely to each other. Applying a voltage to the cell causes the liquid crystals to move, bringing the two components of light out of phase. The degree to which the components are brought out of phase with each other is called the "retardance." One phase will remain unchanged (the "fast phase"), while the other will be delayed in effect (the "slow phase"). The amount of delay will determine how much light exits the cell.

There are several different types of liquid crystal cells. A schematic of a twisted nematic mode cell (or "TN" mode cell) appears below.




A TN cell is also referred to as an “optical rotator” because the polarized light is turned or rotated in the liquid crystal material. The light is not brought out of phase and, therefore, there is no retardance occurring. In the power-off state, the liquid crystal molecules are oriented in a helical configuration (a 90 degree twist) between the two plates. Polarized light may pass through the first polarizer, become rotated by the helical structure of the liquid crystal material, and pass through the light output polarizer. In the power-on state, the polarized light entering the liquid crystal material from the first polarizer will not be rotated, and it is blocked by the light output polarizer on the other side of the cell, which is set at 90 degrees from (or perpendicular to) the first polarizer.

Another type of cell is referred to as a vertical alignment mode cell (“VA” or “eigen-axis” mode cell), as depicted below.




In contrast to the TN cell, the VA mode cell is dark in the power-off state. The liquid crystal material in the VA system is naturally horizontal. Absent an applied voltage, the liquid crystals remain perpendicular to the polarizers; polarized light enters the cell but is blocked by the light output polarizer on the top of the cell. As the blockage is complete, VA cells produce a high-quality black image. When a voltage is applied, the molecules of the liquid crystal material will uniformly shift to a tilted position allowing light to pass through the light output polarizer. The light output varies by the amount of tilt (towards horizontal, for a bright white image) generated by the electric charge.

"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. Polarized light traveling along either eigen-axis will remain linearly polarized and will exit the liquid crystal cell

along the same eigen-axis. VA cells may be referred to as "eigen-axis" mode cells (as per the illustration above) where polarized light exits the cell along the same eigen-axes upon which the components traveled through the cell.[2]

**B. The '382 Patent**

The '382 patent, entitled "Liquid crystal cell retarder with driving beyond retardance value and two cells for high speed," was filed April 23, 1992 and issued September 13, 1994; Scott H. Rumbaugh is the sole inventor. The specification provides that liquid crystal cell retarder systems known at the time of filing and "used to vary polarization by switching between intermediate values over a range of retardances" suffered from "two significant drawbacks." ('382 patent, col. 1:45-48)

> First, a change in retardance in one direction must be effectuated by the application of an increased ac voltage, but the response speed of the retarder in that direction is limited by the responsiveness of the liquid crystal cell material. Second, a change in retardance in the other direction must be effectuated by reducing the applied voltage and allowing the liquid crystal material to relax back to a new retardance; that is, it cannot be driven by the application of a voltage. These two drawbacks greatly limit the response speed of a liquid crystal cell retarder and, therefore, the applications to which the retarder may be put. In particular, the slow response time of known liquid crystal cell retarder systems limits the speed with which they can switch between intermediate values, and corresponding polarization states, over a wide range of retardances.

(*Id.*, col. 1:49-65) The disclosed invention purports to solve these needs with "impulse switching," or "the application of a voltage in excess of the voltage corresponding to the target retardance," and through the use of stacked, "opposing" retarders. (*Id.*, col. 2:6-10, 2:24-27)

Increasing the applied voltage was discovered to increase the rate at which a

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[2]It is not clear to the court whether this property is inherent to all VA cells. The court's disposition of the issues at bar does not turn on this fact.

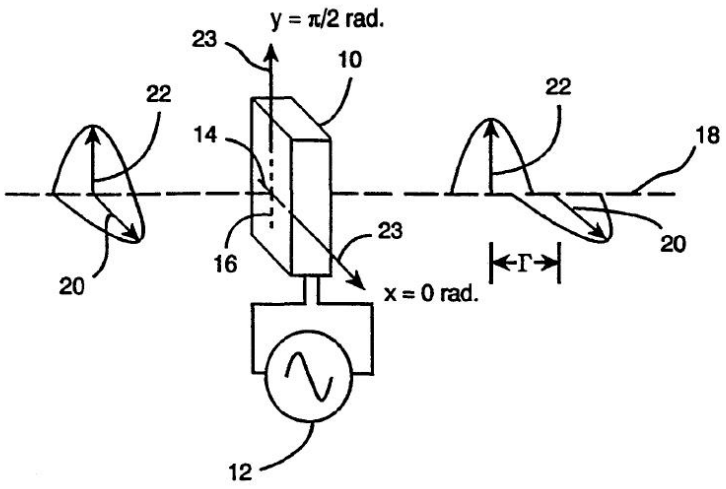
liquid crystal cell retarder switches from one resistance to another resistance under the influence of an electric field. (*Id.*, col. 2:10-15) The invention employs this relationship to decrease switching time by: (1) initially applying a switching voltage higher than the voltage corresponding to the target retardance, causing the liquid crystal cell to move toward the target retardance rapidly; (2) before or substantially at the time when the target retardance has been reached, switching the applied voltage to the voltage corresponding to the target retardance; and (3) maintaining that voltage (corresponding to the target retardance) until a new retardance is desired. (*Id.*, col. 2:14-23)

To decrease the switching time in the other direction, the invention discloses using two "opposed" liquid crystal cells – or two cells each having a fast axis, the fast axes disposed at π/2 radians to one another. (*Id.*, col. 2:28-36)

> The total retardance of both cells will therefore be the difference between the retardances produced by the two cells. Consequently, the retardance can be switched positively in one direction by application of a higher voltage to one cell and positively in the other direction by application of a higher voltage to the other cell. Impulse switching is applied to both cells to obtain the maximum switching speed in both directions.

(*Id.*, col. 2:36-43) The invention takes advantage of the linear manner in which the retardance relaxes and provides for the reducing of the voltage on both cells simultaneously between switching events to zero (or some other acceptable bias voltage), thereby allowing the cells to drift back to retardances corresponding to a lower voltage simultaneously, while the total retardance does not vary. (*Id.*, col. 2:44-57) The specification further provides that additional pairs of opposed retarders may be added to the stack to further decrease the delay time between retardance switching. (*Id.*, col. 2: 58-col. 3:12)

An illustration of “a liquid crystal cell retarder, showing two eigen-axes, an ac drive signal source and two polarization components of a light beam before and after passing through the retarder” is provided as Figure 1, reproduced below. (*Id.*, col. 3:14-17)




As depicted above, a typical liquid crystal optical retarder comprises a liquid crystal cell (10) having two eigen-axes, a fast axis (14) and a slow axis (16). (*Id.*, col. 3:60-64) Light moving along axis 18 from left to right can be considered as having two polarization axes, fast (20) and slow (22). (*Id.*, col. 4:25-28) Upon entering the cell, the fast and slow components are in phase. (*Id.*, col. 4:39-42) When the fast and slow axes emerge from the cell, the slow axis (22) has been delayed by some amount Γ (the retardance). In the example pictured in figure 1, the slow component has been delayed

in an amount causing the light emerging from the cell to be elliptically polarized.[3] (*Id.*, col. 4:53-58)

Apeldyn asserts that defendants each infringe claims 1-6, 10-11, 20 and 22-29 of the '382 patent. (D.I. 509, ex. 1 at ¶ 16; D.I. 513, ex. B at ¶ 16) Of these, claims 1, 20 and 22-29 are all independent claims. Claim 1 is exemplary, and provides as follows:

> 1. An optical retarder system, comprising:
>
> (a) first 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; and
>
> (b) first drive means, connected to said first retarder means, for supplying said first signal to said first retarder means, said drive means including first control means for changing said retardance from a first retardance to a second retardance by causing said first signal to change, in a direction to move toward said second retardance, from a first amplitude which is required for said first retardance to a second amplitude, beyond a third amplitude which is required for said second retardance, for a period of time, and then causing said first signal to change to the said second amplitude required for a second retardance.

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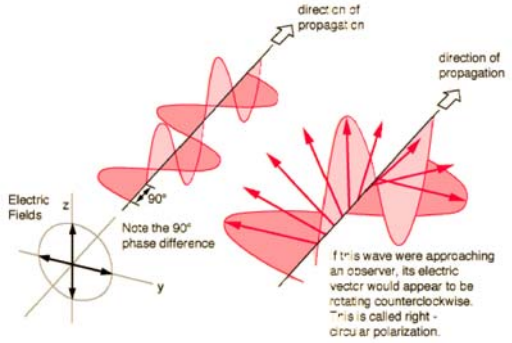
[3]If light is composed of two waves of equal amplitude differing in phase by 90 degrees, then the light is said to be circularly polarized. If two waves of differing amplitude are related in phase by 90 degrees, or if the relative phase is other than 90 degrees, then the light is said to be elliptically polarized. The following is a helpful schematic of the elliptical polarization of light.




*See* http://hyperphysics.phy-astr.gsu.edu/hbase/phyopt/polclas.html (last accessed November 3, 2011).

The parties dispute the meaning of many of the foregoing claim terms, falling into four categories: (1) retardance-related terms (e.g., "first retarder means" and "eigen-axis); (2) drive circuitry terms (e.g., "first drive means"); and (3) impulse switching terms (e.g., "amplitude").

## III. STANDARD OF REVIEW

A court shall grant summary judgment only if "the pleadings, depositions, answers to interrogatories, and admissions on file, together with the affidavits, if any, show that there is no genuine issue as to any material fact and that the moving party is entitled to judgment as a matter of law." Fed. R. Civ. P. 56(c). The moving party bears the burden of proving that no genuine issue of material fact exists. *See Matsushita Elec. Indus. Co. v. Zenith Radio Corp.*, 475 U.S. 574, 586 n.10 (1986). "Facts that could alter the outcome are 'material,' and disputes are 'genuine' if evidence exists from which a rational person could conclude that the position of the person with the burden of proof on the disputed issue is correct." *Horowitz v. Fed. Kemper Life Assurance Co.*, 57 F.3d 300, 302 n.1 (3d Cir. 1995) (internal citations omitted). If the moving party has demonstrated an absence of material fact, the nonmoving party then "must come forward with 'specific facts showing that there is a genuine issue for trial.'" *Matsushita*, 475 U.S. at 587 (quoting Fed. R. Civ. P. 56(e)). The court will "view the underlying facts and all reasonable inferences therefrom in the light most favorable to the party opposing the motion." *Pa. Coal Ass'n v. Babbitt*, 63 F.3d 231, 236 (3d Cir. 1995). The mere existence of some evidence in support of the nonmoving party, however, will not be sufficient for denial of a motion for summary judgment; there must be enough evidence to enable a jury reasonably to find for the nonmoving party on that issue. *See Anderson*

*v. Liberty Lobby, Inc.*, 477 U.S. 242, 249 (1986). If the nonmoving party fails to make a sufficient showing on an essential element of its case with respect to which it has the burden of proof, the moving party is entitled to judgment as a matter of law. *See Celotex Corp. v. Catrett*, 477 U.S. 317, 322 (1986).

## IV. DISCUSSION

### A. Direct Infringement

#### 1. Standards

A patent is infringed when a person "without authority makes, uses or sells any patented invention, within the United States . . . during the term of the patent." 35 U.S.C. § 271(a). A two-step analysis is employed in making an infringement determination. *See Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976 (Fed. Cir. 1995). First, the court must construe the asserted claims to ascertain their meaning and scope. *See id*. Construction of the claims is a question of law subject to de novo review. *See Cybor Corp. v. FAS Techs.*, 138 F.3d 1448, 1454 (Fed. Cir. 1998). The trier of fact must then compare the properly construed claims with the accused infringing product. *See Markman*, 52 F.3d at 976. This second step is a question of fact. *See Bai v. L & L Wings, Inc.*, 160 F.3d 1350, 1353 (Fed. Cir. 1998).

"Direct infringement requires a party to perform each and every step or element of a claimed method or product." *BMC Res., Inc. v. Paymentech, L.P.*, 498 F.3d 1373, 1378 (Fed. Cir. 2007). "If any claim limitation is absent from the accused device, there is no literal infringement as a matter of law." *Bayer AG v. Elan Pharm. Research Corp.*, 212 F.3d 1241, 1247 (Fed. Cir. 2000). If an accused product does not infringe an

independent claim, it also does not infringe any claim depending thereon. *See Wahpeton Canvas Co. v. Frontier, Inc.*, 870 F.2d 1546, 1553 (Fed. Cir. 1989). However, "[o]ne may infringe an independent claim and not infringe a claim dependent on that claim." *Monsanto Co. v. Syngenta Seeds, Inc.*, 503 F.3d 1352, 1359 (Fed. Cir. 2007) (quoting *Wahpeton Canvas*, 870 F.2d at 1552) (internal quotations omitted). A product that does not literally infringe a patent claim may still infringe under the doctrine of equivalents if the differences between an individual limitation of the claimed invention and an element of the accused product are insubstantial. *See Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 24, 117 S. Ct. 1040, 137 L. Ed. 2d 146 (1997). The patent owner has the burden of proving infringement and must meet its burden by a preponderance of the evidence. *See SmithKline Diagnostics, Inc. v. Helena Lab. Corp.*, 859 F.2d 878, 889 (Fed. Cir. 1988) (citations omitted).

**2. AUO's motion for summary judgment of noninfringement (D.I. 504)**

**a. AUO's accused products**

Apeldyn accuses 281 LCD products made by AUO of infringing its '382 patent, which Kmetz characterizes as falling into four categories: (1) products practicing the MVA or premium MVA ("PMVA") alignment mode and having one-frame overdrive; or (2) two-frame overdrive; and (3) products practicing the advanced MVA ("AMVA") (versions I-IV) alignment mode and having one-frame overdrive; or (4) two-frame overdrive.[4] (D.I. 533-1, ex. 7 at ¶ 84) Representative models are AUO's T260XW04

[4]The court has not been supplied with exhibit 4 to Kmetz's report detailing these products, and relies instead on Kmetz's characterizations of them. The court's reliance on Kmetz's descriptions of the accused products by both AUO and CMO is appropriate

V7, T315HW04 V4, T513XW01 and T260XW01 V7 panels using MVA-mode and overdrive (hereinafter, the "accused AUO products"). (*Id.* at ¶ 87)

**b. Discussion**

AUO's first asserted ground for noninfringement is that the accused products do not have signals with the claimed "third amplitude." AUO argues in this regard that the overdrive employed in the accused products does not involve returning to the target value (and the signal in frame N is never dropped to a third amplitude constituting the target value). AUO's argument, however, is not supported by citation to expert testimony (or other evidence). (D.I. 512 at 3-8) AUO's remaining arguments concern the asserted inadequacies of Kmetz's testing method for eigen-axes, dismissed in the court's concurrent memorandum order. (*Id.* at 8-14) AUO's motion is denied on this record.

**3. CMO's motion for summary judgment of noninfringement (D.I. 508)**

**a. CMO's accused products**

Apeldyn accuses over 250 LCD products made by CMO of infringing its '382 patent. (D.I. 509, ex. 4) As with the accused AUO products, Kmetz has divided the accused CMO products into four major categories based on alignment mode and overdrive versions: (1) products practicing MVA and overdrive, overdrive version OD-1, and combinations of OD-1; (2) products practicing super MVA ("SMVA") (versions I or II) and overdrive, overdrive version OD-1, and combinations of OD-1; (3) products practicing MVA and overdrive version OD-2, and combinations of OD-2; and (4)

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on defendants' motions for summary judgment. (D.I. 529-1, ex. 7; D.I. 533-1, ex. 7)

products practicing SMVA (versions I or II) and overdrive version OD-2, and combinations of OD-2. (*Id.*, ex. 1 at ¶ 58) Representative models are CMO's V315B6-L01, V420H1-L07, V296W1-L01 and V470H2-LH2 modules (hereinafter, the "accused CMO products"). (*Id.* at ¶ 68) The court will discuss below only those components and functionalities of the accused CMO products necessary to resolve the pending motions.[5]

**b. Three amplitudes**

CMO's first noninfringement argument is that the drive signals generated to change retardance in the accused products each consist of a single pulse, and do not include a first amplitude that corresponds to a first retardance, a third amplitude that corresponds to the second retardance, and a second amplitude. (D.I. 509 at 7) In support, CMO relies on defendants' expert, Yeh, who tested CMO's V420H1-L07 (representative) module. (*Id.* at 3 (citing *id.*, ex. 3 at 33-40 and 54-62[6])) In his test, Yeh sent an input signal to light up a first row of pixels of the display panel with an initial gray level of F1 and then a final gray level of F2, leaving the remainder of the panel dark (0 gray level). (*Id.*, ex. 3 at ¶ 80) Yeh's test "demonstrates the driving signal applied to a pixel of the display." (*Id.*) Yeh measured the voltage waveform during the signal input and, at both F1 and F2 gray levels, discovered only a single driving voltage. (*Id.* at ¶ 81 & figs. 13(a), 13(b), 13(c)) Yeh repeated the measurement for product V315B6-L01, a panel representative of the accused CMO products, and again measured a single

[5]The court was presented with 45 briefs and exhibit books totaling several thousands of pages on claim construction, summary judgment and the Kmetz motion.

[6]CMO cited pages "54-44"; the court reads this to reference the remainder of the section.

driving voltage. (*Id.* & figs. 13(d)-(f)) It is Yeh's opinion, therefore, that the "single pulse drive signals generated by the accused [CMO] products do not have a waveform with three different amplitudes" and do not "change from a first amplitude to a second amplitude for a period of time and then change from a second amplitude to a third amplitude." (*Id.* at ¶ 96 & figs. 20(a)-(f))

Apeldyn does not dispute Yeh's testing (or provide citation to its own). Nor does Apeldyn dispute that: a single pulse drive signal is generated by the accused CMO products; and that this drive signal does not change from a first amplitude to a second amplitude for a period of time, and then change from a second amplitude to a third amplitude. (D.I. 530 at 10-14) Apeldyn's infringement position is best described against a background of CMO's drive circuitry.

CMO's accused products include timing controllers, source drivers and related circuitry for applying signals to the liquid crystal cells. (D.I. 531, ex. 7 at ¶ 120) The source driver receives digital information from the timing controller, converts this digital information to an analog voltage and delivers that voltage (through a thin-film transistor) to the subpixel. (*Id.* at ¶ 119)

> The thin-film transistor gates the desired amplitude onto the LCD capacitor as a sample-and-hold circuit, which charges one of the transparent electrodes known as the display or pixel electrode. The other electrode (i.e., the common electrode) is in direct contact with [the] drive circuitry of the LCD panel so that it is charged to a reference or bias voltage. The voltage difference between the pixel electrode and common electrode creates an electric field, which causes the liquid crystal molecules to change their orientation.

(*Id.*)(internal citations omitted) Apeldyn also cites testimony that in CMO's products, a voltage is applied to the two electrodes, creating an electrical field between them that determines the position of the liquid crystal between them. The position of the liquid

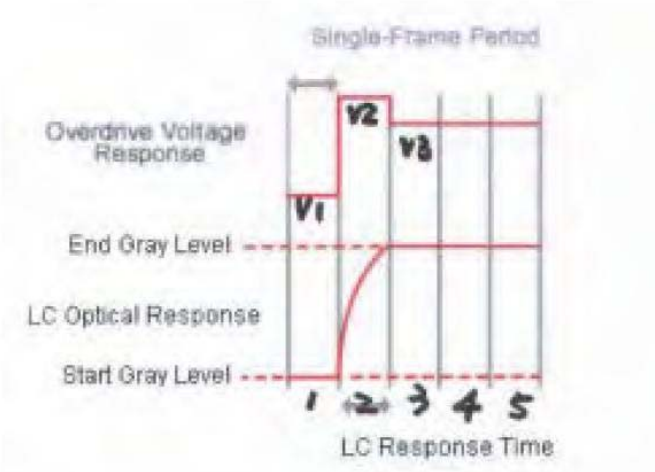
crystal affects the brightness. (D.I. 531 at ex. 12, 56:3-58:3) Kmetz explains that the degree of tilt of the liquid crystal molecules is controlled by the electric field. (*Id.*, ex. 7 at ¶ 114) The tilt "results in a delay between the two components of the linearly polarized light along one eigen-axis relative to the second eigen-axis." (*Id.* at ¶ 113)

Apeldyn argues that the CMO (single-pulse) drive signal is not what is referred to by the claims. That is, because the voltage differential across the electrodes is what creates the electric field that changes the tilt of the liquid crystal molecules in CMO's products, "it is the applied voltage (from the stored charge) and not the initial pulse from the source driver that actually changes the retardance of the cell, as required by the claims." (D.I. 530 at 11 (citing D.I. 509, ex. 1 at ¶¶ 113-19)) Put another way, while Yeh analyzed the "waveform of the drive signal **provided to** a pixel during each frame period" (*id.* at ¶ 97) (emphasis added), Kmetz argues that the proper measurement should be taken of the signal **across** the subpixels themselves.[7] Kmetz opines that, for each of the overdrive versions used by the accused products, "the previous (or initial) gray-scale value for the current frame (N-1 frame) corresponds to the first amplitude; the overdrive gray-scale value selected from the look-up table corresponds to the second amplitude; and the target gray-scale value for the next frame (N frame) corresponds to the third amplitude when the gray-scale remains the same in the subsequent frame (N+1)." (D.I. 509, ex. 1 at ¶ 328) According to Kmetz, the subsequent diagram indicates that, in CMO's overdrive,

a first voltage is applied at the beginning of frame one, where V1 corresponds to

[7]Kmetz's deposition testimony cited by Apeldyn in this regard does not appear to be of record. (D.I. 530 at 10 (citing D.I. 531, ex. 5 at 195:12-197:11))

the optical response for the starting gray-scale value. A second voltage V2 is then applied at the beginning of frame two. A third voltage V3 is then applied at the beginning of frame three, where V3 corresponds to the optical response for the second gray-scale level, and V2 is higher than V3.




(*Id.* at ¶ 329[8])

In order to adopt Apeldyn's infringement argument, the court would need to construe the claims to allow the retardance of the cell to be changed, not by the first "signal," but by the "applied voltage from the stored charge." (D.I. 530 at 11) Such a construction is not consistent with the language of the claims or the specification. (*e.g.,* '382 patent, col. 2:14-24 ("[T]he degree of birefringence of the cell can be controlled by control of the amplitude of the ac signal supplied by the drive signal source 12"; fig. 7 (showing an ac drive signal circuit including an amplitude modulator); fig. 8 (showing a dymanic ac voltage drive signal generated by the drive signal circuit of fig. 7)) As Apeldyn does not cite any evidence in opposition to CMO's motion demonstrating that

[8]The diagram was hand-labeled by CMO's witness, Yung Yu Tsai, during his deposition to correspond to the general features of CMO's overdrive. (D.I. 509, ex. 1 at ¶ 329)

the drive signal in CMO's products "changes" such as to effectuate the changes in amplitude and, ultimately, retardance,[9] CMO's motion for summary judgment of noninfringement is granted.

**c. Eigen-axes**

Notwithstanding the foregoing, the court briefly addresses CMO's alternative argument that the accused CMO products do not have eigen-axes, and cannot "control[ ] 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 signal." (D.I. 509 at 9-11)

CMO proffered a claim construction with respect to the eigen-axes limitations that "[t]he liquid crystal cell controls a delay between a slow axis component and a fast axis component of light that propagates along a fixed fast axis and a fixed slow axis of a birefringent material that does not twist light polarization while a signal is applied to the retarder." (D.I. 487 at 1) As explained by Yeh, eigen-axes cannot exist where the transmitted beam is multi-polarized due to the spread in the orientation of the LC director[10] in the xy-plane, causing the polarization state of the output beam to differ from that of the input beam. (D.I. 509, ex. 3 at ¶¶ 65-68 & figs. 5, 6)

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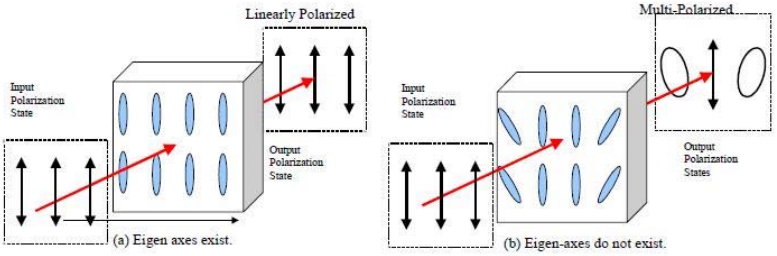
[9]The asserted independent claims of the '382 patent require that the three amplitudes ("changing said retardance") are achieved "by causing the [first] signal to change." During the claim construction exercise, neither Apeldyn nor CMO advocated construction of "changing" or "to change" outside of their ordinary meaning. (D.I. 487 at 5 (claim 1); *id.* at 9 (claim 20))

[10]The liquid crystal director, or the unit vector representing the preferred orientation (or the averaged direction of the long axes) in the intermediate neighborhood of the point. (D.I. 509, ex. 3 at ¶ 63)




(*Id.* at fig. 6)

CMO argues, therefore, that both parties' constructions are satisfied "when the liquid crystals tilt in the same direction in response to the application of a voltage." (D.I. 509 at 10) Yeh conducted "an inspection of [CMO's accused products'] liquid cell design, simulation of the electric field and liquid crystal movement within the cells, and measurement of liquid crystal twist." (D.I. 509, ex. 3 at ¶¶ 107-22) Yeh's data indicated that the liquid crystals within a pixel twist at angles of 45, 135, 225 and 315 degrees, denoting the absence of eigen-axes.[11] (*Id.*)

As discussed in the court's concurrent memorandum opinion on AUO's *Daubert* motion, Kmetz's photograph of CMO's V315B6-L01 panel contrasting the normal polarizer configuration with the eigen-axis configuration constitutes Kmetz's sole basis for concluding that CMO's MVA panels infringe. Kmetz dismissed the presence of light in the eigen-axis photograph as leakage caused by "fringe effects" without extensive discussion. (*Id.*, ex. 1 at ¶ 99) By contrast, Yeh performed a light leakage test and determined that leakage was miniscule and could not account for the illumination of the

[11]Yeh also advanced a noninfringement argument under a very narrow construction of the term "retarder." The court declined to construe "retarder" in its concurrent memorandum opinion. (D.I. 509, ex. 3 at ¶ 122)

panel. (*Id.*, ex. 3 at ¶¶ 125-128) ("What Kmetz measured was due to the transmission of light in the LC pixel where eigen-axes do not exist.")

While Kmetz arguably made certain "assumption[s] about light leakage" (D.I. 509 at 11), CMO did not move to exclude Kmetz's opinion on this ground (nor did it join AUO's motion). As discussed in the court's memorandum order of the same date, AUO did not provide evidence indicating that Kmetz's method was scientifically unsound. The court declined to exclude Kmetz's testimony and, for the aforementioned reasons, concludes that there are genuine issues of material fact in this regard. CMO's motion for summary judgment of noninfringement based on the eigen-axis limitation is denied.

**B. Inducement of Infringement**

Both AUO and CMO move for summary judgment of no inducement of patent infringement.[12] Because the court grants CMO's motion for summary judgment of noninfringement, CMO's motion for summary judgment of no inducement of infringement is also granted. (D.I. 505); *See BMC Resources v. Paymentech, L.P.*, 498 F.3d 1373, 1379 (Fed. Cir. 2007) (inducement of infringement "requires, as a predicate, a finding that [defendant] has committed the entire act of direct infringement").

AUO asserts that there is no evidence that it had knowledge of the existence of the '382 patent before Apeldyn's filing of this lawsuit on September 8, 2008. (D.I. 512 at 13-14) Apeldyn asserts that AUO had knowledge of the '382 patent as early as December 16, 2003 because: (1) AUO acquired a license to the intellectual property rights of Fujitsu Display Technologies Corporation ("FDTC") in March 2003; (2) FDTC is

[12]AUO raises the issue as part of its motion for summary judgment of noninfringement, not by separate motion. (D.I. 512 at 13-14)

the assignee of U.S. Patent No. 6,738,107 ("the '107 patent"), which was allowed by the PTO on December 16, 2003; and (3) the '107 patent cites U.S. Patent Nos. 5,640,259 and 6,144,353 (the "'259" and "'353" patents, respectively); and (4) the '259 and '353 list, on **their** faces, the '382 patent. (D.I. 532 at 18) Apeldyn cites no caselaw in support of its "transitive knowledge" theory. (D.I. 532 at 18) Nor has the court located an example of a finding of constructive knowledge based on the listing of a patent on the face of another patent, twice removed. There is simply no indication that constructive notice is meant to embrace the hundreds, if not thousands, of listed patents that would be generated in many cases by such an extrapolation.

Alternatively, Apeldyn asserts that an issue of fact exists as to whether AUO "willfully blinded itself" to its customers' infringement, *Global-Tech Appliance, Inc. v. SEB S.A.*, 131 S.Ct. 2060 (2011), and may be held liable for inducement because: (1) AUO is a large company with thousands of patents; (2) AUO has a large intellectual property division and ample resources to monitor patents; and (3) AUO's 30(b)(6) witness testified that AUO's lawyers do not collect patents issued to competitors unless requested to do so. (D.I. 532 at 18-20)

The Supreme Court has recently articulated that the doctrine of willful blindness applies in civil lawsuits for induced patent infringement, and has provided "an appropriate limited scope that surpasses recklessness and negligence." *Global-Tech*, 131 S.Ct. at 2070. That is, a "willfully blind defendant is one who takes deliberate actions to avoid confirming a high probability of wrongdoing and who can almost be said to have actually known the critical facts. By contrast, a reckless defendant is one who merely knows of a substantial and unjustified risk of such wrongdoing, and a negligent

defendant is one who should have known of a similar risk but, in fact, did not." *Id.* at 2070-71 (internal citations omitted).

At best, Apeldyn has framed AUO as a reckless or negligent defendant – not a willfully deliberate one. Apeldyn cites the corporate testimony of Mr. Yihsheng (Spencer) Yu ("Yu") that AUO's patent prosecution department "would not initiate the collection [of patents issued to other companies that involve LCD overdrive technology] . . . unless we received requests from our internal lawyers that we need to do such a thing." (D.I. 532 at 19 (citing D.I. 533-2, ex. 23 at 62:11-63:10)) Yu also stated that AUO has "not tried to gain knowledge" as to whether any of AUO's overdrive patents cite to the '382 patent. (*Id.* (citing D.I. 533-2, ex. 23 at 70:20-71:12)) These actions fall short of willful blindness as articulated by the *Global-Tech* Court. 131 S.Ct. at 2070-71. Accordingly, the court grants summary judgment of no inducement of infringement by AUO.

### C. Validity

The court next addresses AUO's motion for summary judgment that the asserted claims of the '382 patent are invalid as anticipated and/or obvious, and because the specification fails to disclose the best mode for practicing the invention. (D.I. 503)

#### 1. Anticipation

##### a. Standards

An anticipation inquiry involves two steps. First, the court must construe the claims of the patent in suit as a matter of law. *See Key Phar. v. Hercon Labs. Corp.*, 161 F.3d 709, 714 (Fed. Cir. 1998). Second, the finder of fact must compare the

construed claims against the prior art. *See id.* Proving a patent invalid by anticipation "requires that the four corners of a single, prior art document describe every element of the claimed invention, either expressly or inherently, such that a person of ordinary skill in the art could practice the invention without undue experimentation." *Advanced Display Sys. Inc. v. Kent State Univ*., 212 F.3d 1272, 1282 (Fed. Cir. 2000) (citations omitted). The Federal Circuit has stated that "[t]here must be no difference between the claimed invention and the referenced disclosure, as viewed by a person of ordinary skill in the field of the invention." *Scripps Clinic & Research Found. v. Genentech, Inc*., 927 F.2d 1565, 1576 (Fed. Cir. 1991). The elements of the prior art must be arranged or combined in the same manner as in the claim at issue, but the reference need not satisfy an *ipsissimis verbis* test. *In re Gleave*, 560 F.3d 1331, 1334 (Fed. Cir. 2009) (citations omitted). "In determining whether a patented invention is [explicitly] anticipated, the claims are read in the context of the patent specification in which they arise and in which the invention is described." *Glaverbel Societe Anonyme v. Northlake Mktg. & Supply, Inc*., 45 F.3d 1550, 1554 (Fed. Cir. 1995). The prosecution history and the prior art may be consulted "[i]f needed to impart clarity or avoid ambiguity" in ascertaining whether the invention is novel or was previously known in the art. *Id.* (internal citations omitted).

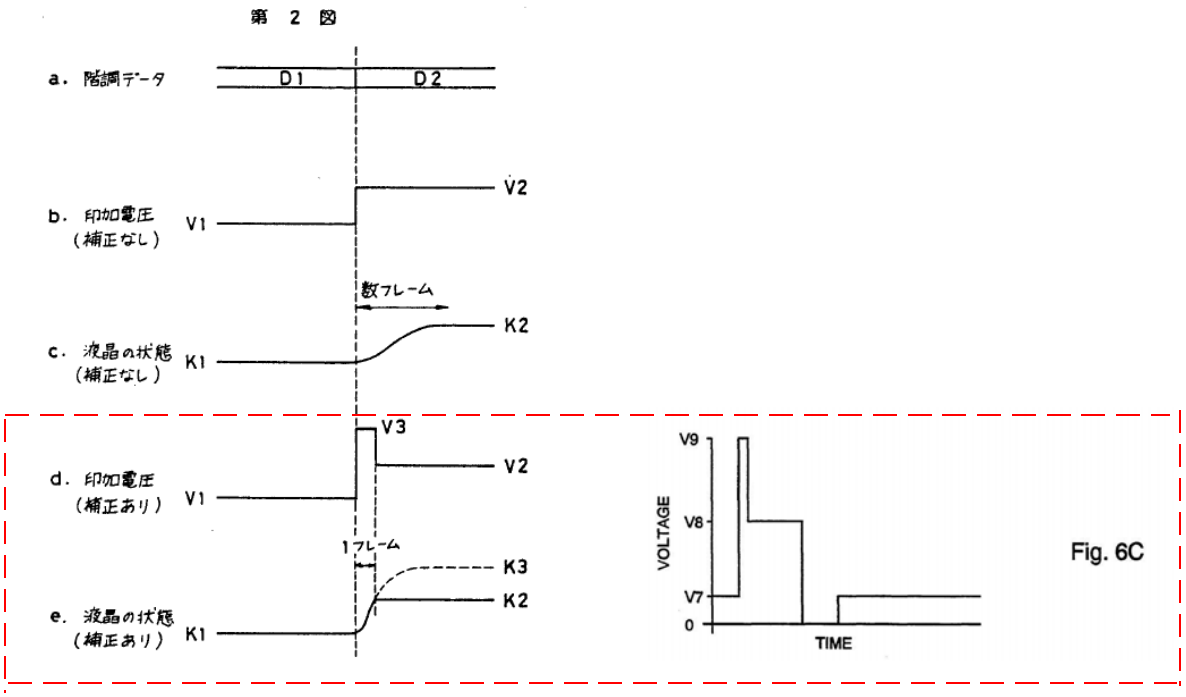
**b. JP '299**

The invalidity reference asserted in AUO's motion is Japanese publication no. JP-S64-10299 (hereinafter, "JP '299"), an unexamined patent application published January 13, 1989 and entitled "liquid crystal control unit." (D.I. 511, ex. B) The "field of the invention" states that "[t]he present invention relates to a liquid crystal control circuit,

and especially relates to a liquid crystal control circuit for applying appropriate voltage to a liquid crystal panel and performing gradation sequence control." (*Id.*) The "claim" of the application is as follows.

> Within a liquid crystal display device being capable of gradation sequence display, a liquid crystal control circuit comprises: a field memory for storing data corresponding to a transmission factor of liquid crystal right before the gradation sequence alteration; and a correction circuit for performing data conversion by combining data of the field memory and gradation sequence data sent from a preceding section.

(*Id.*) According to AUO, JP '299 discloses the impulse switching concept at subsections (d) and (2) of figure 2, and as contrasted with fig. 6(c) of the '382 patent in the callout below.




(D.I. 510 at 6-7) AUO also quotes the JP '299 reference's disclosure of a "liquid crystal control device" for "applying appropriate voltage to a liquid crystal panel." (*Id.* at 7)

Outside of the foregoing, AUO does not describe the disclosure of the JP '299

reference from a technical perspective, whether by citation to an expert opinion or otherwise. AUO asserts, without citation, that "[t]he JP '299 reference does not limit or restrict its teachings to a particular type of panel or particular liquid crystal alignment" and, consequently, it anticipates the asserted claims of the '382 patent. (*Id.* at 7-8[13]) Apeldyn's expert, Kmetz, does not dispute that JP '299 does not specify a particular type of liquid crystal alignment but, due to this lack of specificity, "JP '299 does not disclose, expressly or inherently, any eigen-axes, an eigen-axis retarder, or controlling the retardance of light along first and second eigen-axes as required by the asserted claims[.]" (D.I. 529-1, ex. 12 at ¶ 131; *see also id.* at ¶ 135 ("In the absence of any evidence to the contrary, it is more likely than not that JP '299 concerned a TN cell, given that TN cells were the most widely applied type of liquid crystal cell in the late 1980's when JP '299 was filed and published."))

AUO argues that even if JP '299 concerned a TN cell, Yeh testified that TN cells have eigen-axes (D.I. 528 at 9 (citing D.I. 511-2, ex. H at 9:11-15[14])), which AUO asserts is consistent with the disclosure of the '382 patent that "twisted nematic material will work, and other liquid crystal materials may also work without departing from the principles of the invention." (*Id.* (citing '382 patent at col. 4:64-67); *see also id.* (citing '382 patent col. 5:13-16 ("while a liquid crystal call [of the type of figure 2] is preferred,

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[13]Similarly, AUO argues (without citation) that "the fact that the JP '299 reference is silent on the subject of the liquid crystal alignment suggests that the driving method could be used with any type of liquid crystal cell[.]" (D.I. 528 at 8)

[14]"I said earlier that if given this definition of eigen-axis, an axis of a liquid crystal molecule, that is either a fast axis or a slow axis. Then all liquid crystel cell[s], including TN, VA, whatever, have eigen-ax[e]s."

other types of liquid crystal cells may be used without departing from the principles of the invention))

Upon review, the court finds the record provides insufficient basis to grant AUO's motion for summary judgment of invalidity based on anticipation by JP '299. Even if JP '299 indisputably concerned VA panels, it is not clear that eigen-axes are inherent to VA panels, and AUO does not make this argument. While the '382 patent specification states that TN (or other types of) mode cells might work, AUO cannot escape the conclusion that the asserted claims require that the material selected must allow light to pass therethrough along a contain first and second eigen-axis. There is no dispute that JP '299 does not expressly describe eigen-axes, only the resultant amplitudes of the application of a voltage to the cell. Yeh's deposition testimony is cursory and insufficient to clearly and convincingly prove that TN cells contain eigen-axes. Notwithstanding, Kmetz has opined that a TN cell "has no common set of orthogonal axes along which linearly polarized light would remain linearly polarized as it passes through the cell" and, as a result, a TN cell "does not create a phase shift or the retardance of light along **any** such eigen-axes as described and claimed in the '382 patent." (D.I. 529-1, ex. 12 at ¶ 45) (emphasis added) A question of fact remains on this issue; AUO's motion is denied on this ground.

**2. Obviousness**

**a. Standards**

"A patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole

would have been obvious at the time the invention was made to a person having ordinary skill in the art." 35 U.S.C. § 103(a). Obviousness is a question of law, which depends on several underlying factual inquiries.

> Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.

*KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007) (quoting *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966)).

"[A] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." *KSR*, 550 U.S. at 418. Likewise, a defendant asserting obviousness in view of a combination of references has the burden to show that a person of ordinary skill in the relevant field had a reason to combine the elements in the manner claimed. *Id*. at 418-19. The Supreme Court has emphasized the need for courts to value "common sense" over "rigid preventative rules" in determining whether a motivation to combine existed. *Id*. at 419-20. "[A]ny need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." *Id*. at 420. In addition to showing that a person of ordinary skill in the art would have had reason to attempt to make the composition or device, or carry out the claimed process, a defendant must also demonstrate that "such a person would have had a reasonable expectation of success in doing so." *PharmaStem Therapeutics,*

*Inc. v. ViaCell, Inc.*, 491 F.3d 1342, 1360 (Fed. Cir. 2007). "Because patents are presumed to be valid, *see* 35 U.S.C. § 282, an alleged infringer seeking to invalidate a patent on obviousness grounds must establish its obviousness by facts supported by clear and convincing evidence." *Kao Corp. v. Unilever U.S., Inc.*, 441 F.3d 963, 968 (Fed. Cir. 2006) (citation omitted). In conjunction with this burden, the Federal Circuit has explained that,

> [w]hen no prior art other than that which was considered by the PTO examiner is relied on by the attacker, he has the added burden of overcoming the deference that is due to a qualified government agency presumed to have properly done its job, which includes one or more examiners who are assumed to have some expertise in interpreting the references and to be familiar from their work with the level of skill in the art and whose duty it is to issue only valid patents.

*PowerOasis, Inc. v. T-Mobile USA, Inc.*, 522 F.3d 1299, 1304 (Fed. Cir. 2008) (quoting *Am. Hoist & Derrick Co. v. Sowa & Sons*, 725 F.2d 1350, 1359 (Fed. Cir. 1984)).

**b. JP '299**

AUO argues that, even if the court construed eigen-axes such as to exclude TN liquid crystal cells, "it would have been obvious to apply the impulse switching taught in the JP '299 reference to eigen-axis mode retarders." (D.I. 510 at 10) AUO's rationale is that "one of ordinary skill in the art would have been motivated to apply the impulse switching techniques that were used to improve the response time in TN liquid crystal cells to solve the same problem in eigen-axis mode liquid crystal cells." (*Id.*) AUO's obviousness argument in this regard is substantially devoid of reference to Yeh's report or any other evidence in support.[15] (D.I. 510 at 10-11) The court declines to invalidate

[15]AUO's discussion of the remaining limitations of the asserted claims is also founded primarily on attorney argument. (D.I. 510 at 11-17)

a presumably valid (and reexamined) patent based on obviousness on the present record; AUO's motion is denied on this ground.

**3. Best mode**

AUO's final argument for invalidity is that the '382 patent specification fails to identify the best mode for practicing the invention. Whether the patent satisfies the best mode requirement is a question of fact, but the appropriate legal standard to apply to the analysis of the facts is a question of law, subject to *de novo* review by the Federal Circuit. *See Bayer AG v. Schein Pharms., Inc.*, 301 F.3d 1306, 1312 (Fed. Cir. 2002). Violation of the best mode requirement of 35 U.S.C. § 112, 1 ¶, is evidenced by: (1) the inventor subjectively knowing of a better mode of practicing the invention at the time of filing the patent application; and (2) the inventor concealing that better mode during the prosecution of the application. *See High Concrete Structures, Inc. v. New Enterprise Stone and Lime Co.*, 377 F.3d 1379, 1382 (Fed. Cir. 2004). In those occasions when the Federal Circuit holds a patent invalid for violation of the best mode requirement, the patent either (1) failed to disclose the inventor's preferred embodiment or (2) failed to disclose the inventor's preference in the use or fabrication of the invention that materially affected the properties of the claimed invention. *See Bayer*, 301 F.3d at 1316.

According to AUO, the inventor of the '392 patent, Scott Rumbaugh ("Rumbaugh"), did not disclose his preference for anti-parallel alignment liquid crystal cells. (D.I. 510 at 18) That is, "[b]ecause each of the asserted claims is directed to a liquid crystal retarder, the failure to disclose the best mode for aligning the liquid crystals in the retarder renders each of the asserted claims invalid." (*Id.* at 20) AUO states that

Rumbaugh's best mode is evidenced by Apeldyn's Phase I Feasibility Research Report for work sponsored by the National Science Foundation Small Business Innovation Research Program (hereinafter, "the NSF report"). (*Id.*) The NSF report, dated for "contract period: January 1991 - September 1991," states that "[n]ematic liquid crystal cells with an anti-parallel alignment are the most appropriate type for variable retardance devices [ ] and were used in this contract[.]"[16] (D.I. 511-2, ex. I at 0080302) This statement was made over six months before the application for the '382 patent was filed on April 23, 1992.

While AUO alleges that the '382 patent does not indicate what sort of alignment should be obtained, the parties agree that U.S. Patent No. 5,005,952 ("Clark"), incorporated by reference in its entirety in the '382 patent's "background of the invention," discloses anti-parallel alignment. (D.I. 528 at 19; D.I. 557 at 7) AUO asserts that this is insufficient, however, because Clark is listed among prior art having "two significant drawbacks," and not in the context of discussing the preferred embodiment of the invention. (D.I. 510 at 19)

On the subjective, first prong of the best mode analysis, Apeldyn essentially argues that Rumbaugh's subjective views changed between the NSF report and the date the application for the '382 patent was filed, six months later. AUO does not proffer any evidence of Rumbaugh's subjective beliefs more proximate to the filing date in its reply. At his deposition in 2011, Rumbaugh stated that he only knew of using liquid crystal cells with anti-parallel alignment at the time the patent was filed, and it was

[16]This report was attached to the declaration of Rumbaugh submitted on reexamination of the '382 patent. (D.I. 511-2 at 2, ¶ 5)

his "understanding that at that time that was the way that one skilled in the art would make [a] variable liquid crystal retarder." (D.I. 529-2, ex. 21 at 121:18-22, 172:6-14) While this testimony was taken years after the invention was made, it is up to the jury to weigh the evidence and either credit or discredit Rumbaugh's testimony that he had no "best mode" in mind for his invention in 1992. Because that factual issue remains, and because AUO has not clearly demonstrated that a person of ordinary skill in the art would not have considered anti-parallel alignment to be the sort of routine detail that need not have been disclosed in the specification, the court cannot adjudge the nature and quality of Clark's disclosure as a matter of law.[17] AUO's motion is denied on this ground.

## V. CONCLUSION

For the aforementioned reasons, the court denies AUO's motions for summary judgment of invalidity and noninfringement and grants CMO's motions for summary judgment of noninfringement and no inducement of patent infringement. An appropriate order shall issue.

[17]AUO does not provide, and the court has not located, specific caselaw supporting AUO's proposition that the best mode can not be incorporated by reference in the background portion of the specification. *Liquid Dynamics Corporation v. Vaughan Company*, 449 F.3d 1209, 1223-24 (Fed. Cir. 2006), cited by AUO, does not affirmatively establish that a best mode can only be incorporated by reference under certain circumstances.

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 15th day of November, 2011, consistent with the memorandum opinion issued this same date;

IT IS ORDERED that:

1. AUO's motion for summary judgment of invalidity (D.I. 503) is denied.

2. AUO's motion for summary judgment of noninfringement (D.I. 504) is granted with respect to inducement of infringement and denied in all other respects.

3. CMO's motion for summary judgment of no inducement of patent infringement (D.I. 505) is granted.

4. CMO's motion for summary judgment of noninfringement (D.I. 508) is granted.

United States District Judge