IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

In re *Inter Partes* Review of: U.S. Patent No. 5,632,545	§	Attorney Docket No.: 42299.41
Issued: May 27, 1997	§	Customer No.: 27683
Applicant: Dan Kikinis	§	
Application No.: 08/686,809	§	
Filed: July 26, 1996	§	
Title: Enhanced Video Projection System	§	

PETITIONER POWER OF ATTORNEY PURSUANT TO 37 CFR 42.10(b)
FOR PETITION FOR *INTER PARTES* REVIEW

Petitioner **Xilinx, Inc.** hereby appoints the Practitioner(s) associated with **Customer Number 27683**, as its attorney(s) to prosecute and to transact all business in the Patent Trial & Appeal Board of the United States Patent and Trademark Office connected with the above-identified petition for *Inter Partes* Review.

Please direct all communication regarding this Petition to **Customer Number 27683**:

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The undersigned is authorized to sign this Power of Attorney on behalf of the Petitioner.

Executed at San Jose, CA on the 19th day of October, 2012.

Xilinx, Inc.

By: [signature]

Printed Name: Scott Hover-Smoot

Title: Vice President and General Counsel

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent of Kikinis	§	
	§	
U.S. Patent No. 5,632,545	§	Petition for *Inter Partes* Review
	§	
Issued: May 27, 1997	§	
	§	Attorney Docket No.: 42299.41
Title: ENHANCED VIDEO PROJECTION SYSTEM	§	Customer No.: 27683
	§	Real Party in Interest: Xilinx, Inc.
	§	

PETITION FOR INTER PARTES REVIEW

Mail Stop Inter Partes Review
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Pursuant to the provisions of 35 U.S.C. §§ 311-319, Xilinx, Inc. ("Petitioner") hereby petitions the Patent Trials and Appeals Board to institute an *Inter Partes* Review of claims 1-3 (all claims) of United States Patent No. 5,632,545 ("the '545 Patent," Exhibit XLNX-1001), which issued on May 27, 1997, to Dan Kikinis, resulting from a patent application no. 08/686,809 filed on July 26, 1996. According to USPTO records, the '545 Patent is assigned to Intellectual Ventures I LLC.

TABLE OF CONTENTS

I. Mandatory Notices

A. Real Party-in-Interest

The real party-in-interest is Xilinx, Inc.

B. Related matters

None.

C. Lead and Back-up Counsel and Service Information

Lead Counsel	Back-up Counsel
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USPTO Customer No. 27683 USPTO Reg. No. 32,271	USPTO Customer No. 27683 USPTO Reg. No. 69,721

II. Grounds for Standing

Petitioner certifies that it is not estopped or barred from requesting *inter partes* review of the ’545 Patent. The ’545 Patent issued more than 9 months ago and was not the subject of a post-grant review.

III. Relief Requested

Petitioner asks that the Board review the accompanying prior art and analysis, institute a trial for *Inter Partes* Review of claims 1-3 of the ’545 Patent, and cancel those claims as invalid under 35 U.S.C. §§ 102 and 103.

IV. Reasons for the Requested Relief

A. Summary of Petition

The ’545 Patent describes a system that uses liquid crystal display (“LCD”) technology to create a digital video projection. At a high level, this system shines colored light beams through LCD arrays, creating multiple image light beams. Each image light beam represents a color component of the complete video image (e.g., red, green, and blue). The system then combines these component light beams into a composite image light beam suitable for viewing.

This system was not new in mid-1996 when the application leading to the ’545 Patent was filed. Petitioner has identified several earlier patents that describe this light-combining video-projection system. These prior art patents both describe the claimed system in full and render it obvious. Specifically, U.S. Patent No. 5,108,172 to Flasck anticipates claims 1-3, or, in the alternative, renders them obvious. Claims 1-3 are also rendered obvious in view of U.S. Patent No. U.S. 5,264,951 to Takanashi and U.S. 5,287,131 to Lee. Claims 2-3 are further rendered obvious in view of Takanashi, Lee, and further in view of U.S. 5,784,038 to Irwin.

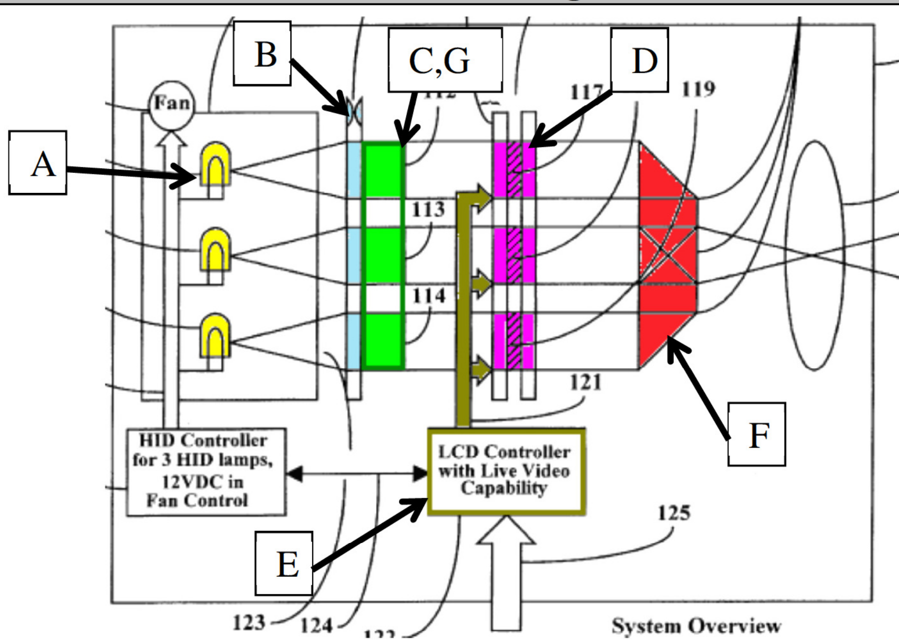
1. Background of ’545 Patent

The ’545 Patent issued on May 27, 1997 on an application filed by Dan Kikinis on July 26, 1996. (Ex. XLNX1001 (“the ’545 Patent”).) The ’545 Patent does not claim priority to an earlier application. (*Id.*) The patent office issued a notice of allowability on November 25, 1996, without rejecting or objecting to any of the claims in the original application. (XLNX-1008 at Notice of Allowability.)

The ’545 Patent has one independent claim and two dependent claims. (’545 Patent, 4:12-38.) The ’545 Patent also has one figure. The following claim chart illustrates claim 1 by mapping the claim language to the projection system shown in Figure 1 of the ’545 Patent:

	’545 Patent Claim 1		
	1. A video projector system comprising:	D	a light-shutter matrix system comprising a number of equivalent switching matrices equal to the number of beams and placed one each in the beam paths;
A	individual light sources, one each for each color to be projected, adapted to provide each a separate light beam;	E	a video controller adapted for controlling the light-shutter matrices; and
B	a lens system in the path of the separate light beams, adapted for focusing the beams;	F	an optical combination system adapted for combining the several beams into a single composite beam for projection on a surface to provide a video display;
C	a number of individual color filters equal to the number of beams, in the colors to be projected, and placed one each in each beam path;	G	wherein each beam passes through a color filter before being processed by a light-switching matrix.

’545 Patent Figure 1



As shown above, the ’545 Patent claims a video projection system having multiple light sources (A). These light sources create beams that are focused by a lens system (B) before entering the color filters (C, G). The light beams then enter the light shutter matrix system (D). The ’545 Patent teaches that an LCD array is one example of a light shutter matrix. (’545 Patent, 4:2-3). The LCD/light shutter array receives image information from a video controller (E), and encodes that information onto the light beams. Finally, the light beams are recombined by a mirror and prism system (F) into a single composite image beam that is ready for projection on a surface.

2. Flasck Anticipates the Claims of The ’545 Patent and Renders Them Obvious

The ’545 Patent is anticipated and rendered obvious by U.S. Patent No. 5,108,172 to Flasck. As shown below, Flasck teaches the light-combining projection system claimed by the ’545 Patent. The following claim chart compares claim 1 of the ’545 Patent to Figures 11 and 2C of Flasck.

’545 Patent Claim 1			
	1. A video projector system comprising:	D	a light-shutter matrix system comprising a number of equivalent switching matrices equal to the number of beams and placed one each in the beam paths;
A	individual light sources, one each for each color to be projected, adapted to provide each a separate light beam;	E	a video controller adapted for controlling the light-shutter matrices; and
B	a lens system in the path of the separate light beams, adapted for focusing the beams;	F	an optical combination system adapted for combining the several beams into a single composite beam for projection on a surface to provide a video display;
C	a number of individual color filters equal to the number of beams, in the colors to be projected, and placed one each in each beam path;	G	wherein each beam passes through a color filter before being processed by a light-switching matrix.

Flasck

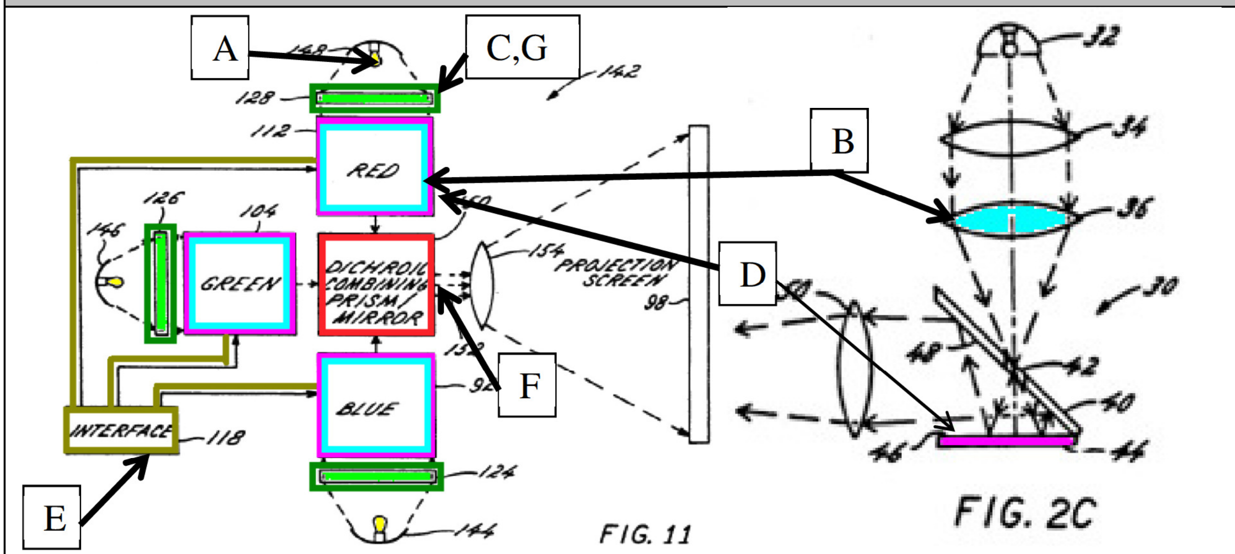


FIG. 11

FIG. 2C

As shown above, Flasck discloses all of the elements of the enhanced video projection system claimed by the ’545 Patent. Three light sources (A) generate light beams. These light beams pass through color filters (C, G) 124, 126, or 128. (Flasck, 7:64-66 (“[t]he separate light sources again require the respective B, G and R filters 124, 126, and 128 to provide the B, G and R. [sic] light components.”)) The color-tinted light beams then enter the “image plane modules” shown as 92, 104, or 112 on Figure 11 (B, D). Figure 2C shows the internal workings of these image plane modules. For each image plane module, the light first passes through a lens system (B) that focuses the light. The light then passes through other components and eventually reaches an LCD panel (D), which is a light shutter matrix. The LCD panel encodes the color-tinted light beams with image information from the interface (E). Finally, the color images from each of the image plane modules are combined by a prism/mirror system (F) to create a composite image beam for viewing.

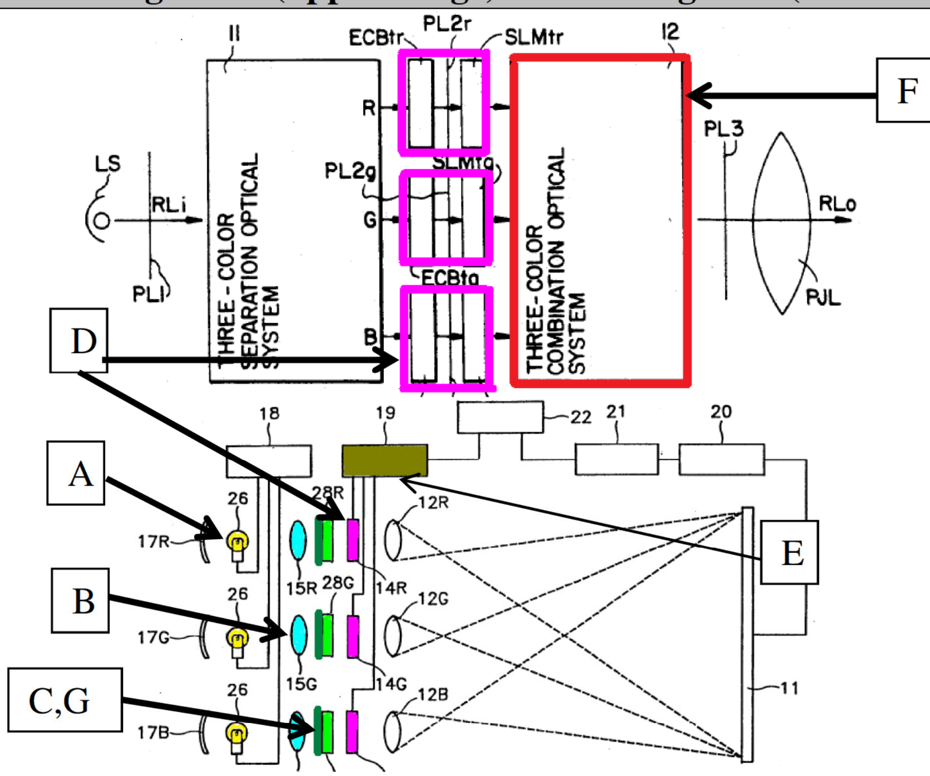
The Flasck video projection system invalidates the claims of the ’545 Patent, as explained in further detail below and in the attached Buckman Declaration (Exhibit XLNX-1006).

3. Takanashi Renders the Claims of The ’545 Patent Obvious

U.S. Patent No. U.S. 5,264,951 to Takanashi also renders the claims of the ’545 Patent obvious in combination with other references. As shown below, Takanashi in combination with Lee teaches the light-combining video projection system claimed by the ’545 Patent. The following claim chart compares claim 1 of the ’545 Patent to Figure 17 of Takanashi and Figure 2 of Lee. As shown below, the combination of the left half of Lee Figure 2 and the right half of Takanashi Figure 17 would contain all elements of the claimed invention.

’545 Patent Claim 1			
	1. A video projector system comprising:	D	a light-shutter matrix system comprising a number of equivalent switching matrices equal to the number of beams and placed one each in the beam paths;
A	individual light sources, one each for each color to be projected, adapted to provide each a separate light beam;	E	a video controller adapted for controlling the light-shutter matrices; and
B	a lens system in the path of the separate light beams, adapted for focusing the beams;	F	an optical combination system adapted for combining the several beams into a single composite beam for projection on a surface to provide a video display;
C	a number of individual color filters equal to the number of beams, in the colors to be projected, and placed one each in each beam path;	G	wherein each beam passes through a color filter before being processed by a light-switching matrix.

Takanashi Figure 17 (upper image) and Lee Figure 2 (lower image)



As shown in the figures above, the combination of Takanashi and Lee teaches all of the elements of the enhanced video projection system claimed by the '545 Patent. In particular, the combination of the right half of Takanashi and the left half of Lee renders claims 1-3 obvious. First, Takanashi teaches a projector system that uses a single light source to generate three colored light beams. The three colored light beams are processed by a light-shutter matrix (D) that includes liquid crystal elements ECBtr, ECBtg, ECBtb, polarizing elements PL2r, PL2g, PL2b, and spatial light modulator elements SLMtr, SLMtg, SLMtg. The light-shutter matrix (D) encodes the color light beams with image information. The encoded color light beams pass to a three-color combination optical system (F) where they are combined to create a single composite image beam for projection. Although Takanashi does not teach the use of separate light sources for this light-combining system, another prior art reference, Lee teaches using three light sources (A) 26 to generate three light beams. These light beams pass through lenses (B) 15R, 15G, and 15B and are focused on color filters (C, G) 28R, 18G, and 18B to produce three colored light beams. The light shutter (D) 14R, 14G, and 14B encodes the three colored light beams with image information from the controller (E) 19.

The Takanashi and Lee combination invalidates the claims of the '545 Patent, as explained in further detail below and in the attached Buckman Declaration (Exhibit XLNX-1006).

B. Identification of Challenges

Petitioner challenges the validity of claims 1-3 of the ’545 Patent as follows:

1. Challenged Claims

Claims 1-3.

2. Statutory Grounds for Challenges

Challenge 1: Claims 1-3 of the ’545 Patent are anticipated under 35 U.S.C. § 102(b) by U.S. Patent No. 5,108,172 to Flasck (Exhibit XLNX-1002). Flasck was filed on September 24, 1990, and issued on April 28, 1992, and thus is prior art to the ’545 Patent at least under 35 U.S.C. § 102(b).

Challenge 2: In the alternative, Claims 1-3 of the ’545 Patent are obvious under 35 U.S.C. § 103(a) over U.S. Patent No. 5,108,172 to Flasck (Exhibit XLNX-1002).

Challenge 3: Claims 1-3 of the ’545 Patent are also obvious under 35 U.S.C. §103(a) in view of U.S. 5,264,951 to Takanashi (Exhibit XLNX-1003) and U.S. 5,287,131 to Lee (Exhibit XLNX-1004). Takanashi was filed on November 23, 1992, and issued on November 23, 1993, and thus is prior art to the ’545 Patent at least under 35 U.S.C. § 102(b). Lee was filed on November 25, 1992, and issued on February 15, 1994, and thus is prior art to the ’545 Patent at least under 35 U.S.C. § 102(b).

Challenge 4: Claims 2-3 are also rendered obvious under 35 U.S.C. §103(a) in view of Takanashi, Lee, and further in view of U.S. 5,784,038 to Irwin (Exhibit XLNX-1005). Irwin was filed on October 24, 1995, and issued on July 21, 1998, and thus is prior art to the '545 Patent at least under 35 U.S.C. § 102(e).

Petitioner requests that the Board accept each of these challenges and cancel claims 1-3 of the '545 Patent.

3. Claim Construction

This petition presents the following claim analysis in a manner that is consistent with the broadest reasonable interpretation consistent with the specification. *See* 37 C.F.R. § 42.100(b). Petitioner reserves the right to advocate a different claim interpretation in district court or any other forum if necessary.

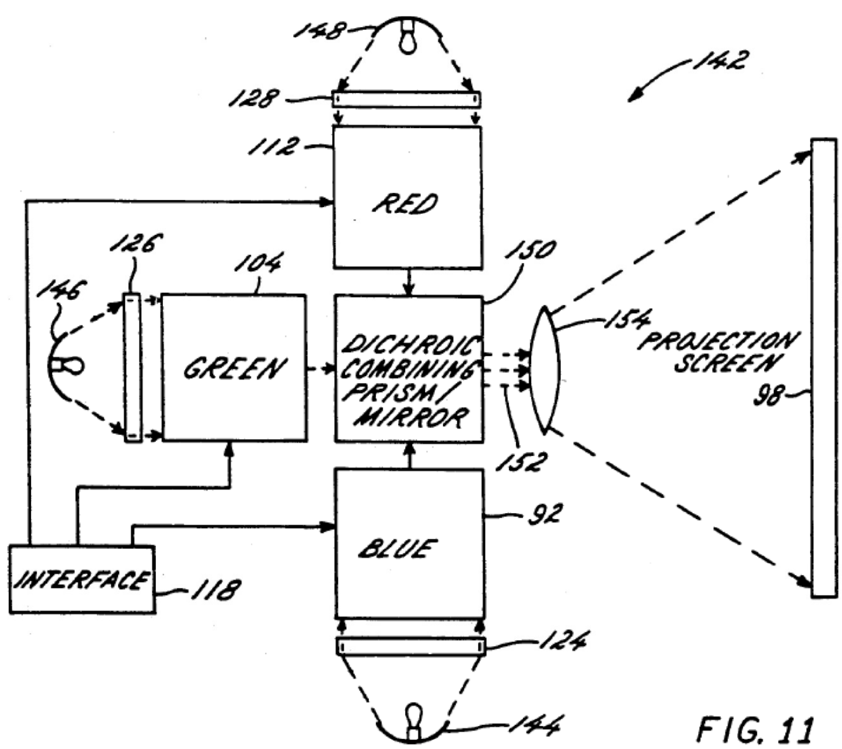
C. Unpatentability of Claims 1-3 Of '545 Patent

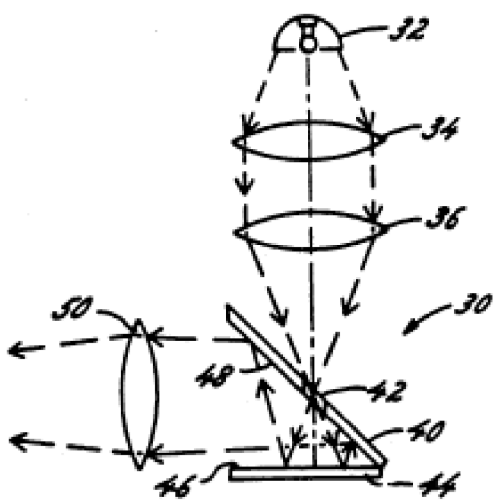
The charts below show where each element of claims 1-3 is found in the prior art relied upon.

1. Challenge #1: Anticipation by U.S. 5,108,172 to Flasck

Claims 1-3 are anticipated over Flasck as set forth below:

Claim	Challenge #1: Analysis of Flasck
[1.0] A video projector system comprising:	Flasck teaches a projection system: The invention relates generally to **projection systems** and more particularly to an improved active matrix reflective image plane module and projection system. (Flasck, 1:13-15.)

Claim	**Challenge #1: Analysis of Flasck**
	Flask further teaches that projection systems are designed to operate from a "**video** or computer signal source." (Flasck, 4:9-10.) Thus, Flasck's projection system is a "video projector system" as recited in the claim. (*See* Exhibit XLNX-1007, Declaration of Bruce Buckman ("Buckman") ¶ 18.)
[1.1] individual light sources, one each for each color to be projected, adapted to provide each a separate light beam;	Flasck teaches three individual light sources 144, 146, & 148: > The color projection system 142 again includes the **three color reflective image plane modules** 92, 104, and 112, but each reflective image plane module now **includes its own light source 144, 146, and 148**. The separate light sources again require the respective B, G, and R filters 124, 126 and 128 to provide the B, G, and R light components. (Flasck, 7:60-66.) As further illustrated in Fig. 11, each light source provides a separate light beam. (*See* Buckman ¶ 19.) The light beams are for the colors red, green, and blue (the three colors to be projected):  FIG. 11

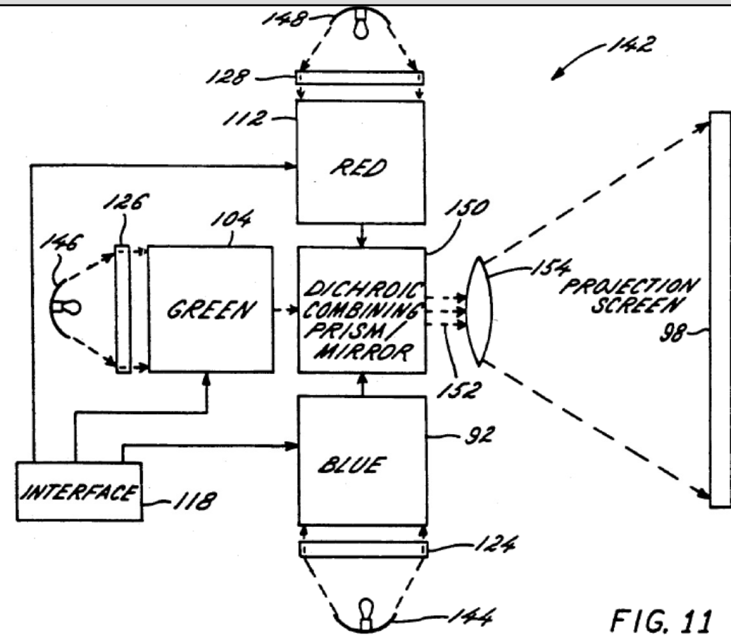
Claim	**Challenge #1: Analysis of Flasck**
[1.2] a lens system in the path of the separate light beams, adapted for focusing the beams;	As shown in Fig. 11, three "reflective image plane modules 92, 104, and 112" (Flask, 7:61-62) lie in the path of the three separate light beams. Flasck illustrates details of a reflective image plane module in Fig. 2C and teaches that each image plane module includes a lens system to focus the light beams: Referring to FIGS. 2A, 2B and 2C…. **The light is columnated [sic] by a lens 34 and condensed or focused by a lens 36** to the reflective image plane module 30. … **The reflective image plane module 30 can, however, include** the light 32 and other **light directing elements 34, 36 and 50** if desired. (Flasck, 4:65-5:4 & 5:50-53.) (See also Buckman ¶ 20.)  FIG. 2C
[1.3] a number of individual color filters equal to the number of beams, in the	Flasck illustrates in Fig. 11 that each of the three light beams passes through a red, blue, or green color filter: The color projection system 142 again includes the three color reflective image plane modules 92, 104, and 112, but each reflective image plane module now includes its own light source 144, 146, and 148. The separate light

Claim	Challenge #1: Analysis of Flasck
colors to be projected, and placed one each in each beam path;	sources again require the respective **B, G, and R filters 124, 126 and 128 to provide the B, G, and R light components**. (Flasck, 7:60-66.) (See also Buckman ¶ 21.)
[1.4] a light-shutter matrix system comprising a number of equivalent switching matrices equal to the number of beams and placed one each in the beam paths;	Flasck teaches that the projection system includes equivalent image plane modules (e.g., Fig. 11 elements 92, 104, and 112) that are equal to the number of beams (three) and placed one each in the beam paths. Flasck further teaches that each image plane module includes an active matrix for encoding information on the light beam: The reflective image plane module 30 includes a first mirrored wall 40 which has an aperture 42 through which the light passes and impinges on a back wall 44 of the reflective image plane module 30. The back wall 44 has attached thereto or is formed of a wafer based active matrix 46. **The light has the information imparted to or encoded on it by the wafer based active matrix** 46 as it is reflected from the wafer based active matrix 46. (Flasck, 5:9-16.) Flasck further teaches that the preferred active matrix provides "faster switching speeds" (Flasck, 5:36). Thus, Flasck's active matrices are "switching matrices." Flasck also teaches that three reflective image plane modules, with three switching matrices, can be combined to form a full-color projection system. (Flask, 6:65-7:3.) (See Buckman ¶ 22.)
[1.5] a video controller adapted for controlling the light-shutter matrices; and	Flasck illustrates in Fig. 11 an interface 118: "[t]he information encoding is provided by an electronic interface 118 coupled to the reflective image plane modules 92, 104 and 112." (Flasck, 7:32-34.) The electronic interface 118 is described as a "TV OR COMPUTER INTERFACE ELECTRONICS" (Flasck, Figs. 9, 11) Thus, interface 118 discloses the "video controller adapted for controlling the light-shutter matrices" as claimed. (See Buckman ¶

<table>
<tr><th>Claim</th><th>Challenge #1: Analysis of Flasck</th></tr>
<tr><td></td><td>23.)</td></tr>
<tr><td>[1.6] an optical combination system adapted for combining the several beams into a single composite beam for projection on a surface to provide a video display;</td><td>Flasck illustrates in Fig. 11 a dichroic combining prism 150 used to combine the three light beams into a single composite beam for projection onto a screen:

The encoded B, G and R light components are each directed to a respective dichroic prism section of a conventional dichroic combining prism 150. The combining prism 150 <u>combines the three B, G and R light components and outputs a single combined and encoded color signal</u> 152, which is directed to a lens or lens system 154 and then is <u>projected onto the screen</u> 98.

(Flasck, 7:66-8:5.) (See also Buckman ¶ 26.)</td></tr>
<tr><td>[1.7] wherein each beam passes through a color filter before being processed by a light-switching matrix.</td><td>Flasck illustrates in Fig. 11 that each beam passes through a color filter (e.g., filters 124, 126, and 128) before being processed by the image plane modules (e.g., 92, 104, and 112) and their respective switching matrices. (See Buckman ¶ 27.)</td></tr>
</table>

Claim	**Challenge #1: Analysis of Flasck**
	 FIG. 11
[2.0] The video projection system of claim 1 wherein the light-shutter matrices are monochrome LCD arrays.	Flasck teaches that each active matrix is preferably an LCD matrix: The reflective image plane module 30 includes a…wafer based active matrix 46…The wafer based active matrix is covered by an **<u>LCD</u>** or similar characteristic material, such as an electrophoretic material. (Flasck, 5:11-26.) Additionally, Flasck shows that each image plane module is used for only one color of light. Flasck further teaches that each reflective image plane module may be used in a monochrome projection system: Each of the above reflective image plane modules can be utilized as part of a **<u>monochrome projection system</u>**... (Flasck, 6:65-66.) Thus, Flasck teaches that each active matrix in each reflective image plane module as a monochrome LCD array. (See Buckman ¶ 28.)
[3.0] The video	Flasck illustrates in Fig. 11 that the three light sources (e.g., 144, 146, and 148) provide three beams.

Claim	Challenge #1: Analysis of Flasck
projector system of claim 1 wherein three light sources provide three beams, and	The color projection system 142 again includes the three color reflective image plane modules 92, 104, and 112, but each reflective image plane module now includes its own **light source 144, 146, and 148**. The separate light sources again require the respective B, G, and R filters 124, 126 and 128 to provide the B, G, and R light components. Flasck, 7:60-66. (See Buckman ¶ 30.)
[3.1] red, green, and blue filters are used to provide red, green, and blue beams to an LCD matrix system.	Flasck teaches that red, green, and blue filters (e.g., 124, 126, and 128) are used to provide red, green and blue light beams to the image plane modules (e.g., 92, 104, and 112) including the active matrix system: The light 86 includes all three light components **red, blue and green** (hereinafter R, B and G). … The color projection system 142 again includes the three color reflective image plane modules 92, 104, and 112, but each reflective image plane module now includes its own light source 144, 146, and 148. The separate light sources again require the respective **B, G, and R filters** 124, 126 and 128 to provide the B, G, and R light components. (Flasck, 7:6-8 & 7:60-66.) Flasck illustrates in Fig. 11 that the red, blue, and green light beams pass from the colored filters124, 126, and 128 to the reflective image plane modules 92, 104, 112.

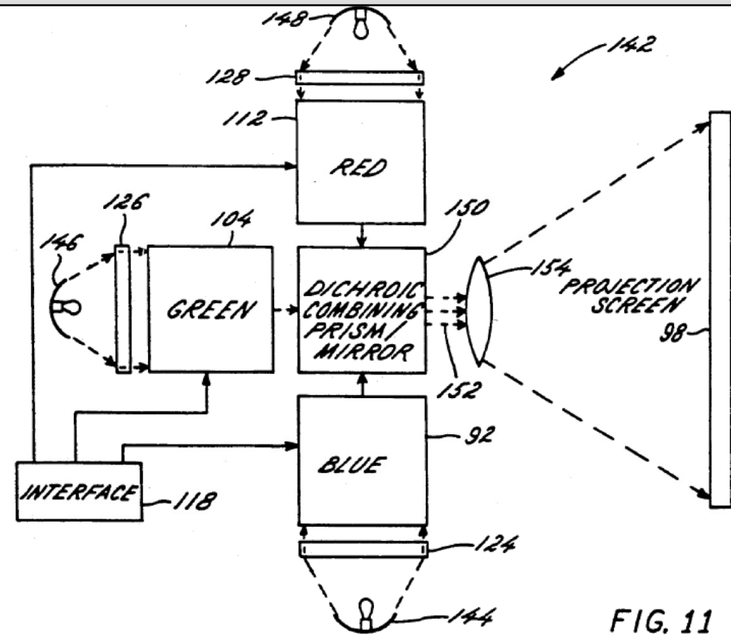
<table>
<tr><th>Claim</th><th>Challenge #1: Analysis of Flasck</th></tr>
<tr><td></td><td>


FIG. 11
Further, as analyzed above in claim 2, each reflective image plane module preferably includes an LCD matrix:
<blockquote>The reflective image plane module 30 includes a…wafer based active matrix 46…The wafer based active matrix is covered by an <u>LCD</u> or similar characteristic material, such as an electrophoretic material.</blockquote>
(Flasck, 5:11-26.)
As such, the reflective image plane modules are collectively an “LCD matrix system” as claimed. (See Buckman ¶ 30.)
Thus, using red, green , and blue filters to provide red, green, and blue beams to the reflective image plane modules, as disclosed by Flask, teaches, that “red, green, and blue filters are used to provide red, green, and blue beams to an LCD matrix system,” as recited in the claim. (See Buckman ¶ 30.)
</td></tr>
</table>

2. Challenge #2: Obviousness in View Of U.S. 5,108,172 to Flasck

In the alternative, Flasck renders the claims of the ’545 Patent obvious.

As noted above, Flasck describes an "Interface 118" that controls the LCD display elements of the projection system. Petitioner submits that a person having ordinary skill in the art would recognize that Interface 118 is the claimed "video controller." To the extent that the patent owner argues, or the Board holds, that this Interface 118 does not disclose a video controller, Flasck nevertheless renders claims 1-3 obvious to a person having ordinary skill in the art.

Flasck teaches that it was known in the art to use a video drive circuit to control liquid crystal display (LCD) elements, such as the active matrices in the reflective image plane modules:

> A video or computer signal source (not illustrated) is coupled by a line 18 to a video drive circuit 20. **The video drive circuit 20 operates on the signal coupled thereto and generates the required drive signals coupled over a line 22 to the LCD 16.** Typically the drive signals will be the audio, red video, blue video, green video, vertical sync, horizontal sync, reset and pixel clock signals. The drive signals cause the pixels of the LCD 16 to block or transmit light to impart the required information onto the light transmitted through the LCD 16 to a lens or lens system 24 which projects the composite color picture onto the screen 26.

(Flasck, 4:9-21.)

It would have been obvious to implement the interface 118 as a video drive circuit because a person having ordinary skill in the art would have viewed the use of such video drive circuitry as a predictable use of priori art elements according to their established functions. Such an interface / video drive circuit would thus satisfy the "video controller adapted for controlling the light-shutter matrices" as claimed. (See Buckman ¶¶ 24-25.)

Claim 2 of the '545 Patent requires a system having a monochrome LCD array as the light shutter matrix. As set forth above, Flask teaches the claimed LCD light shutter matrices inside the image plane modules discussed above. .

> Each of the above reflective image plane modules can be utilized as part of a **monochrome projection system**...

(Flasck, 6:65-66.)

To the extent that the patent owner argues, or the Board holds, that Flasck does not teach a monochrome LCD array, Flasck nevertheless renders claim 2 obvious to a person having ordinary skill in the art. As described above, Flasck teaches the combination of monochrome light rays (red, green, and blue) to create a full-color composite image. Each of these monochrome light rays is associated with its own dedicated set of system components, including an LCD array inside the reflective image plane module. (Flasck, Figs. 2C, 11). As cited above, a given image plane module can be utilized as part of a "monochrome projection system." Thus, to the extent Flasck does not teach "monochrome LCD arrays" in the system of Figure 11, a person having ordinary skill in the art would be motivated by Flasck and from their experience developing optical video systems to implement the reflective image plane modules using monochrome LCD arrays. (Buckman ¶ 29).

The following chart sets forth the evidence supporting Petitioner's argument that Flasck renders obvious claims 1-3 of the '545 Patent.

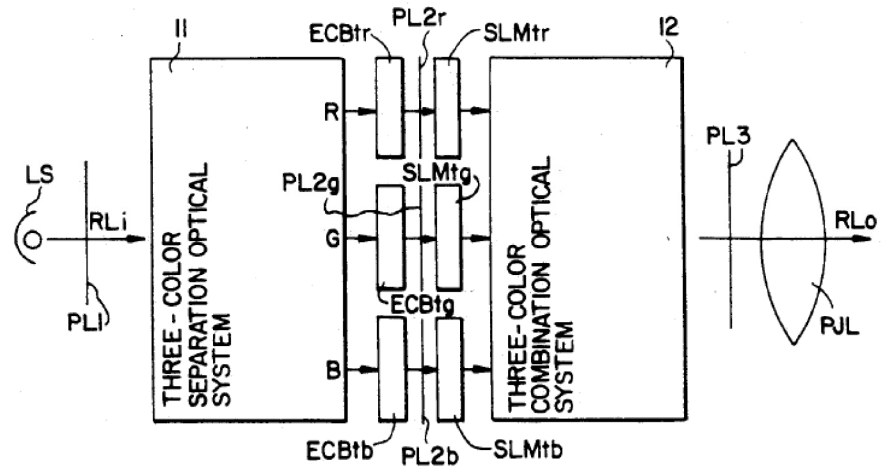
Claim	Challenge #2: Analysis of Flasck
[1.0]-[1.4]	*See Challenge #1, [1.0]-[1.4] above*
[1.5] a video controller adapted for controlling the light-shutter matrices; and	Flasck illustrates in Fig. 11 an "electronic interface 118 coupled to the reflective image plane modules 92, 104 and 112." (Flasck, 7:32-34.) The electronic interface 118 is described labeled in Fig. 9 as "TV OR COMPUTER INTERFACE ELECTRONICS." Flasck further teaches that it was known in the art to use a video drive circuit to control liquid crystal display (LCD) elements, such as the active matrices in the reflective image plane modules: A video or computer signal source (not illustrated) is coupled by a line 18 to a video drive circuit 20. **The video drive circuit 20 operates on the signal coupled thereto and generates the required drive signals coupled over a line 22 to the LCD 16.** Typically the drive signals will be the audio, red video, blue video, green video, vertical sync, horizontal sync, reset and pixel clock signals. The drive signals cause the pixels of the LCD 16 to block or transmit light to impart the required information onto the light transmitted through the LCD 16 to a lens or lens system 24 which projects the composite color picture onto the screen 26. (Flasck, 4:9-21.) It would have been obvious to implement the interface 118 as a video drive circuit, which would satisfy the "video controller adapted for controlling the light-shutter matrices" as claimed. (See Buckman ¶¶ 24-25.)
[1.6]-[1.7]	*See Challenge #1, [1.6]-[1.7] above*
[2.0] The video projection	Flasck teaches that each active matrix is preferably an LCD matrix: The reflective image plane module 30 includes a…wafer

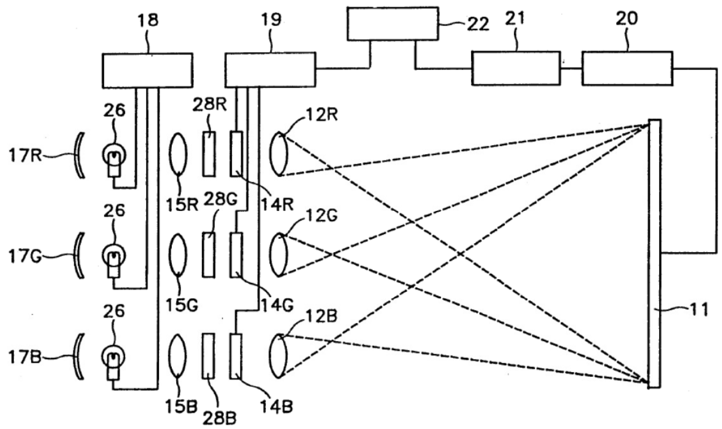
Claim	**Challenge #2: Analysis of Flasck**
system of claim 1 wherein the light-shutter matrices are monochrome LCD arrays.	based active matrix 46…The wafer based active matrix is covered by an **<u>LCD</u>** or similar characteristic material, such as an electrophoretic material. (Flasck, 5:11-26.) Flasck further teaches that each reflective image plane module may be used in a monochrome projection system: Each of the above reflective image plane modules can be utilized as part of a **<u>monochrome projection system</u>**... (Flasck, 6:65-66.) Thus, it would have been obvious to one of ordinary skill to implement the active matrix in each reflective image plane module as a monochrome LCD array. (See Buckman ¶ 29.)
[3.0]-[3.1]	*See Challenge #1, [3.0]-[3.1] above*

3. Challenge #3: Invalidity over U.S. 5,264,951 to Takanashi and U.S. 5,287,131 to Lee

Petitioner also requests Inter Partes Review and the cancellation of claims 1-3 because those claims are obvious over Takanashi and Lee.

As explained below and in the Buckman Declaration, it would have been obvious to combine the teachings of Takanashi and Lee since both are generally directed to related technologies for optical projection systems, and more particularly, to optical projection systems that create a composite image beam using off-the-shelf components such as light filters, optics, LCD matrices and light sources. Their combination is merely the application of known techniques (as taught by Lee) to a known system (Takanashi) to yield predictable results. (See Buckman ¶¶ 32-54.)

Claim	Challenge #3: Analysis of Takanashi and Lee
[1.0] A video projector system comprising:	Takanashi teaches a video projector system. As illustrated below in FIG. 17, the projection system includes a light source (LS), three-color separation optical system (11), light-shutter matrix system (ECBtr, ECBtg, ECBtb, PL2r, PL2g, PL2b, and SLMtr, SLMtg, and SLMtb), three-color combination optical system (e.g., 12), and projection lens (PJL). (*See, e.g.*, Takanashi, 16:1-63.) FIG. 17  Takanashi further notes that the "spatial light modulator according to this invention can be used not only for said display unit but also effectively for the optical computer and many other applications." (Takanashi, 17:13-16.) It would have been obvious to one of ordinary skill in the art that Takanashi's projection system could be used as a video projector system. (*See* Buckman, ¶¶ 32-33.)
[1.1] individual light sources, one each for each color to be projected,	Takanashi teaches that the projection system uses a *single* light source (LS) to produce three separately colored light beams (R, G, B), as shown in Fig. 17. Lee, however, teaches that *three* individual light sources producing separate beams of light may be used. For example, Fig. 2 of Lee shows three individual light sources 26 each providing a separate

Claim	**Challenge #3: Analysis of Takanashi and Lee**
adapted to provide each a separate light beam;	light beam, one for each color (red, blue, and green) to be projected. (*See* Lee, 4:14-20.) (See also Buckman ¶¶ 35-37.)  Lee Fig. 2 In view of Lee, it would have been obvious to one of ordinary skill in the art to use three light sources and three color filters, in the projection system taught by Takanashi. (*See* Buckman, ¶¶ 35-37.)
[1.2] a lens system in the path of the separate light beams, adapted for focusing the beams;	Lee also illustrates in Fig. 2 that "**<u>focusing lenses 15R, 15G, 15B</u>**" (Lee, 4:19-20) are placed in the path of the separate light beams from the light sources 26. The focusing lenses are "for focusing the light emitted from the respective light source[s]." (Lee, 3:21-22.) The three focusing lenses are a "lens system in the path of the separate light beams, adapted for focusing the beams." In view of Lee, it would have been obvious to one of ordinary skill in the art to use three lenses, in the projection system taught by Takanashi. (*See* Buckman, ¶¶ 38-39.)
[1.3] a number of individual color filters equal to the number of beams, in the	Lee teaches that "in order to obtain the respective light beams of the colors red, green and blue, **<u>filters of the colors red 28R, green 28G, and blue 28B</u>** are disposed between the focusing lenses 15R, 15G, 15B and the light shutters 14R, 14G, 14B." (Lee, 4:15-20.) Lee illustrates in Fig. 2 that the placement of the three individual color filters between the focusing lenses and the light shutters, the filters are "placed one each in each beam path."

Claim	**Challenge #3: Analysis of Takanashi and Lee**
colors to be projected, and placed one each in each beam path;	In view of Lee, it would have been obvious to one of ordinary skill in the art to use three color filters in combination with the three light sources and lenses, in the projection system taught by Takanashi. (*See* Buckman, ¶¶ 40-41.)
[1.4] a light-shutter matrix system comprising a number of equivalent switching matrices equal to the number of beams and placed one each in the beam paths;	Takanashi teaches a light-shutter matrix system comprising a number of equivalent switching matrices equal to the number of beams and placed one each in the beam paths: > The linearly polarized light of red light emitted from the three-color separation optical system 11 is incident on the **<u>liquid crystal element ECBtr</u>**, the linearly polarized light of green light emitted from the three-color separation optical system 11 is incident on the **<u>liquid crystal element ECBtg</u>** and the linearly polarized light of blue light emitted from the three-color separation optical system 11 is incident on the **<u>liquid crystal element ECBtb</u>**. > The light emitted from each of liquid crystal elements ECBtr, ECBtg or ECBtb is supplied to the respective **<u>modulator element SLMtr, SLMtg or SLMtb</u>** through the respective polarizer PL2r, PL2g or PL2b respectively. (Takanashi, 16:6-19.) > In this spatial light modulator shown in FIG. 17, the polarizer PL1, the liquid crystal elements ECBtg, ECBtr and ECBtb, the polarizers PL2r, PL2g and PL2b, the modulator elements SLMtr, SLMtg and SLMtb and the polarizer PL3 form the wavelength selection filter. (Takanashi, 16:6-19.) One of skill in the art would have recognized that Takanashi's combination of ECB elements, polarizers PL2, and the SLM elements is a "light-shutter matrix system." (See Buckman, ¶¶ 42-44.) Thus, Takanashi teaches a light-shutter matrix system comprising a number of equivalent switching matrices (e.g., ECB, PL2, and

<table>
<tr><th>Claim</th><th>Challenge #3: Analysis of Takanashi and Lee</th></tr>
<tr><td></td><td>SLM) equal to the number of beams (R, B, B beams) and placed one each in the beam paths.</td></tr>
<tr><td>[1.5] a video controller adapted for controlling the light-shutter matrices; and</td><td>Takanashi teaches controlling the light-shutter matrix system (e.g., ECB, PL2, and SLM) to encode the three light beams (R, G, B) with color image information, (see Takanashi 16:38-42; discussion of [1.4] above), but provides relatively few details regarding how this control is accomplished. Nevertheless, the details of a video controller that controls a light-shutter were well-known in the art at the time the ’545 Patent was filed.

Lee teaches using a control circuit (19) that is adapted for controlling light shutters:

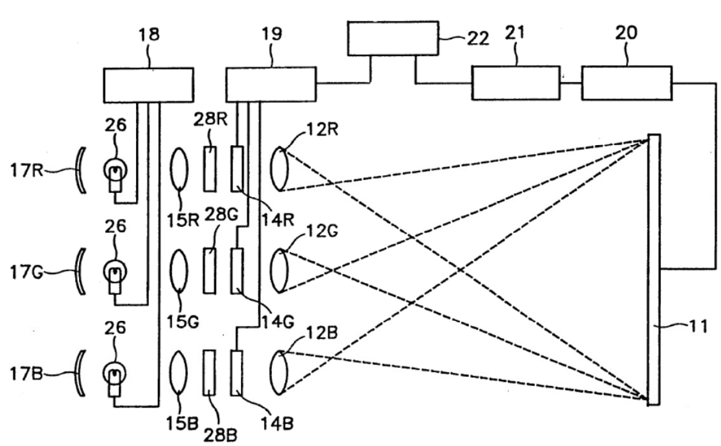
“A <u>light shutter controlling circuit 19</u> which successively permits a respective unicolor light beam connected to a respective light shutter 14R, 14G, 14B to pass there-through during the frequency 1/3 and to cut off during the frequency of 2/3 is connected to respective light shutter 14R, 14G, 14B.”

(Lee, 3:27-33.)

Thus, to the extent that Takanashi does not contain an adequate disclosure of the claimed video controller, it would have been obvious to one of ordinary skill in the art in view of the teaching of Lee to utilize a video controller, because it would allow the control of the light-shutter matrices of Takanashi. (See Buckman ¶¶ 45-48.)</td></tr>
<tr><td>[1.6] an optical combination system adapted for combining the several beams into a single composite beam for</td><td>Takanashi teaches three-color combination optical system 12 for combining the several beams into a single composite beam for projection on a screen to provide a video display:

Since information is written in said each modulator element SLMtr, SLMtg or SLMtb by the write light WL, the linearly polarized <u>light of each color incident on the modulator element SLMtr, SLMtg or SLMtb as described above is incident to the three-color combination optical system 12</u> in the condition modulated by the information which is written in each</td></tr>
</table>

Claim	Challenge #3: Analysis of Takanashi and Lee
projection on a surface to provide a video display;	modulator element SLMtr, SLMtg or SLMtb. … In this spatial light modulator shown in FIG. 17. Also, the **<u>optical image projected on the screen by the projection lens PJL is obtained as the image having good contrast in the color image of the object of display</u>**. (Takanashi, 16:21-42; *see also* Takanashi FIG. 17 reproduced above.) Thus, Takanashi teaches that the three-color combination optical system 12 is adapted for combining the separate beams after the light-shutter matrix system into a single composite beam for projection on a screen to provide a display. As noted in portion [1.0], it would have been obvious to use the projector system of Takanashi for a video display. (*See* Buckman, ¶¶ 49-50.)
[1.7] wherein each beam passes through a color filter before being processed by a light-switching matrix.	As discussed in [1.4], Takanashi teaches a light-switching matrix that processes colored light beams. Lee teaches that each light beam is colored by passing through a color filter before being processed by a light-switching matrix. For example, Lee illustrates in Fig. 2 that each light beam passes through a color filter (28R, 28G, 28B) before being processed by a light shutter (14R, 14G, 14B). Thus, in view of Lee, passing each light beam through a color filter before being processed by a light switching matrix was simply a matter of ordinary skill and common sense, not innovation. (*See* Buckman, ¶¶ 51-52.)
[2.0] The video projection system of claim 1 wherein the light-shutter matrices are monochrome	As discussed above in [1.4], Takanashi teaches a light-switching matrix (e.g., a liquid crystal element ECB, a polarizer PL2, and a spatial light modulator elements SLM) that only process beams of one color, where there are three matrices (one for each color). A person of ordinary skill in the art would have understood that each light-switching matrix comprises a monochrome LCD array. (*See* Buckman, ¶¶ 53-54.) Lee also discloses light shutter matrices that are monochrome LCD

Claim	**Challenge #3: Analysis of Takanashi and Lee**
LCD arrays.	arrays. “The present invention proposes a color LCD system of the projection type including: a plurality of unicolor light sources . . . a reflecting liquid crystal panel screen . . . to selectively reflect the light beams according to information to be displayed of the same color as that of the unicolor light beam” (Lee, 2:1-18) Thus, Takanashi and Lee show that a projection system of claim 1 wherein the light-shutter matrices are monochrome LCD arrays would have involved nothing more than using known elements in a known system according to known methods to achieve predictable results. (*See* Buckman ¶¶ 55 and 57.)
[3.0] The video projector system of claim 1 wherein three light sources provide three beams, and	Lee illustrates in Fig. 2 a projection system using three light sources (all labeled 26) to provide three light beams. Lee also notes that “in order to obtain the respective **<u>light beams of the colors red, green and blue</u>**, filters of the colors red 28R, green 28G, and blue 28B are disposed between the focusing lenses 15R, 15G, 15B and the light shutters 14R, 14G, 14B.” (Lee, 4:15-20.) FIG.2 

Claim	Challenge #3: Analysis of Takanashi and Lee
	Thus, using three light sources to provide three beams, as taught by Lee, in the system of Takanashi was simply a matter of ordinary skill and common sense, not innovation. (*See* Buckman, ¶ 58.)
[3.1] red, green, and blue filters are used to provide red, green, and blue beams to an LCD matrix system.	Lee teaches that "in order to obtain the respective light beams of the colors red, green and blue, **filters of the colors red 28R, green 28G, and blue 28B** are disposed between the focusing lenses 15R, 15G, 15B and the light shutters 14R, 14G, 14B." (Lee, 4:15-20.) Further, as discussed above Takanashi discloses two filters to provide red, green and blue beams. Thus, using red, green, and blue filters to provide red, green, and blue beams to an LCD matrix system, as taught by Lee, to the projection system of Takanashi, was simply a matter of ordinary skill and common sense, not innovation. (*See* Buckman, ¶ 58.)

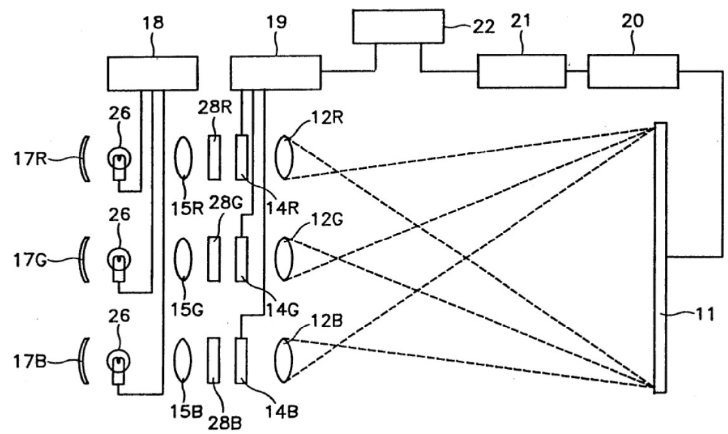
D. Challenge #4: Invalidity over U.S. 5,264,951 to Takanashi, U.S. 5,287,131 to Lee, and U.S. 5784038 to Irwin

Petitioner also requests Inter Partes Review and the cancellation of claims 2-3 because the claims are obvious over Takanashi in view of Lee and Irwin.

As explained below and in the Buckman Declaration, it would have been obvious to combine the teachings of Takanashi, Lee, and Irwin, since all three are generally directed to related technologies for optical projection systems. Their combination is merely the application of known techniques (as taught by Lee and Irwin) to a known system (Takanashi) to yield predictable results. (See Buckman ¶ 56.)

Claim	Challenge #4: Analysis of Takanashi, Lee, and Irwin

Claim	**Challenge #4: Analysis of Takanashi, Lee, and Irwin**
[2.0] The video projection system of claim 1 wherein the light-shutter matrices are monochrome LCD arrays.	As discussed above in [1.4], Challenge #3, Takanashi teaches a light-switching matrix (e.g., liquid crystal elements ECB, polarizer PL2, and spatial light modulator elements SLM) that only process beams of one color each. A person of ordinary skill in the art would have understood that the light-switching matrix comprises a monochrome LCD array. (*See* Buckman, ¶¶ 53-54.) Furthermore, Irwin teaches a spatial light modulator, used in a projection system, that is formed as a monochrome active matrix LCD: FIG. 3 illustrates, as an example, a color projection system 30 employing a single monochrome display active matrix LCD 46. The **monochrome active matrix LCD 46 is conventionally constructed as a transmission type display including an active matrix LCD panel 48 formed of liquid crystal material**... (Irwin, 4:20-26; *see also* 1:15.) Thus, to the extent that Takanashi does not contain an adequate disclosure of the monochrome LCD array, in view of the teaching of Irwin, implementing the light-shutter matrices of Takanashi as monochrome LCD arrays was simply a matter of ordinary skill and common sense, not innovation. (*See* Buckman, ¶ 56.)
[3.0] The video projector system of claim 1 wherein three light sources provide three beams, and	Lee illustrates in Fig. 2 a projection system using three light sources (all labeled 26) to provide three light beams. Lee also notes that "in order to obtain the respective **light beams of the colors red, green and blue**, filters of the colors red 28R, green 28G, and blue 28B are disposed between the focusing lenses 15R, 15G, 15B and the light shutters 14R, 14G, 14B." (Lee, 4:15-20.)

<table>
<tr><th>Claim</th><th>Challenge #4: Analysis of Takanashi, Lee, and Irwin</th></tr>
<tr><td></td><td>FIG.2


Thus, using three light sources to provide three beams, as taught by Lee, in the system of Takanashi was simply a matter of ordinary skill and common sense, not innovation. (See Buckman, ¶ 58.) </td></tr>
<tr><td>[3.1] red, green, and blue filters are used to provide red, green, and blue beams to an LCD matrix system.</td><td> Lee teaches that “in order to obtain the respective light beams of the colors red, green and blue, <u>filters of the colors red 28R, green 28G, and blue 28B</u> are disposed between the focusing lenses 15R, 15G, 15B and the light shutters 14R, 14G, 14B.” (Lee, 4:15-20.) Further, Irwin teaches implementing the light-shutter matrices as an LCD matrix system, as discussed above in [2.1]. Thus, using red, green, and blue filters to provide red, green, and blue beams to an LCD matrix system, as taught by Lee and Irwin, in the system of Takanashi was simply a matter of ordinary skill and common sense, not innovation. (See Buckman, ¶ 58.) </td></tr>
</table>

V. Conclusion

For the reasons set forth above, Petitioner has established a reasonable likelihood of prevailing with respect to at least one claim of the ’545 Patent. Indeed, Petitioner has set forth multiple independent prima facie cases of invalidity with respect to all of claims 1-3 of the '545 Patent. Therefore, Petitioner asks that the Patent Office order an *Inter Partes* Review trial and then proceed to cancel claims 1-3.

Respectfully submitted,

/David l. McCombs/

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Attorney Docket No.: 42299.41

Dated: October 19, 2012

R-312275_2.docx

PETITIONER'S EXHIBIT LIST

October 19, 2012

XLNX-1001	U.S. 5,632,545 to Kikinis
XLNX-1002	U.S. 5,108,172 to Flasck
XLNX-1003	U.S. 5,264,951 to Takanashi
XLNX-1004	U.S. 5,287,131 to Lee
XLNX-1005	U.S. 5,784,038 to Irwin
XLNX-1006	Declaration of A. Bruce Buckman, Ph.D. Under 37 C.F.R. § 1.68
XLNX-1007	Curriculum vitae of A. Bruce Buckman, Ph.D.
XLNX-1008	File History of U.S. 5,632,545

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent of Kikinis	§	
	§	
U.S. Patent No. 5,632,545	§	Petition for *Inter Partes* Review
	§	
Issued: May 27, 1997	§	
	§	Attorney Docket No.: 42299.41
Title: ENHANCED VIDEO PROJECTION SYSTEM	§	Customer No.: 27683
	§	
	§	Real Party in Interest: Xilinx, Inc.

CERTIFICATE OF SERVICE

The undersigned certifies, in accordance with 37 C.F.R. § 42.205, that service was made on the Patent Owner as detailed below.

Date of service	October 19, 2012
Manner of service	FEDERAL EXPRESS
Documents served	Petition for *Inter Partes* Review
	Petitioner's Exhibit List (10/19/2012)
	Exhibits XLNX -1001 through XLNX -1008
Persons served	STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C. 1100 NEW YORK AVENUE, N.W. WASHINGTON DC 20005

/David L. McCombs/

David L. McCombs
Registration No. 32,271

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

In re *Inter Partes* Review of: U.S. Patent No. 5,632,545	§	Attorney Docket No.: 42299.41
Issued: May 27, 1997	§	Customer No.: 27683
Applicant: Dan Kikinis	§	
Application No.: 08/686,809	§	
Filed: July 26, 1996	§	
Title: Enhanced Video Projection System	§	

PETITIONER POWER OF ATTORNEY PURSUANT TO 37 CFR 42.10(b)
FOR PETITION FOR *INTER PARTES* REVIEW

Petitioner **Xilinx, Inc.** hereby appoints the Practitioner(s) associated with **Customer Number 27683**, as its attorney(s) to prosecute and to transact all business in the Patent Trial & Appeal Board of the United States Patent and Trademark Office connected with the above-identified petition for *Inter Partes* Review.

Please direct all communication regarding this Petition to **Customer Number 27683**:

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The undersigned is authorized to sign this Power of Attorney on behalf of the Petitioner.

Executed at San Jose, CA on the 19th day of October, 2012.

Xilinx, Inc.

By: [signature]

Printed Name: Scott Hover-Smoot

Title: Vice President and General Counsel