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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/256,275	02/23/1999	JEFFERY R. PARKER	LUMIPO111	9623

7590 08/29/2002  
DONALD L OTTO  
RENNER OTTO BOISSELLE & SKLAR  
1621 EUCLID AVENUE  
NINETEENTH FLOOR  
CLEVELAND, OH 44115

EXAMINER

SEMBER, THOMAS M

ART UNIT PAPER NUMBER

2875

DATE MAILED: 08/29/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

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# Office Action Summary

Application No.  
09/256,275

Applicant(s)

Parker et al

Examiner  
Thomas Sember

Art Unit  
2875

- The MAILING DATE of this communication appears on the cover sheet with the correspondence address -

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on Jun 4, 2002
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 183-289 is/are pending in the application.
- 4a) Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 183-289 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some\* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). \_\_\_\_\_ 6) ☐ Other:

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*Response to Arguments*

1. Claims 183-288 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 183, 272, 273, 281 and 288 rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: the limitation of "a curved surface" does not structurally relate to the light panel or the deformities. It is therefore not clear where the curved surfaces are located in relation to these structural elements.

*Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 183-239, 242-254, and 257-289 are rejected under 35 U.S.C. 102(b) as being by Kojima et al. Kojima et al discloses a light emitting panel member 2 having at least one

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input edge for receiving light from a light source, and a pattern of individual light extracting deformities on or in a panel surface of said panel member for producing a desired light output from the panel member, each of the deformities 7 has a length and width substantially smaller than the length and width of the panel surface and also has a well defined shape including at least one sloping for reflecting and refracting light rays impinging on the sloping surface out of the panel in a desired angular distribution, and at least one curved surface 71 (see figure 6 the sides of the recess has a circular cross-section) is provided for reflecting light rays impinging on the additional surface in different directions to spread light across the panel member to provide a more uniform distribution of light emitted from the panel.

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*Claim Rejections - 35 USC § 102*

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371 of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 183-239, 242-254, and 257-289 are rejected under 35 U.S.C. 102(e) as being by Ishikawa et al (figures 8-13, 20-23, 26, 29, 31 and 33-40). Ishikawa et al (figures 8-13,

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20-23, 26, 29, 31 and 33-40) discloses a light emitting panel member 1 having at least one input edge for receiving light from a light source, and a pattern of individual light extracting deformities on or in a panel surface of said panel member for producing a desired light output from the panel member, each of the deformities has a length and width substantially smaller than the length and width of the panel surface and also has a well defined shape including at least one sloping for reflecting and refracting light rays impinging on the sloping surface out of the panel in a desired angular distribution, and at least one curved surface in different directions to spread light across the panel member to provide a more uniform distribution of light emitted from the panel.

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*Claim Rejections - 35 USC § 102*

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

7. Claims 183-239 and 242-289 are rejected under 35 U.S.C. 102(e) as being by Yoshikawa et al. Yoshikawa et al (figures 3, 4 and 6b) discloses a light emitting panel member 1

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having at least one input edge for receiving light from a light source, and a pattern of individual light extracting deformities on or in a panel surface of said panel member for producing a desired light output from the panel, each of the deformities has a length and width substantially smaller than the length and width of the panel surface and also has a well defined shape including at least one sloping for reflecting and refracting light rays impinging on the sloping surface out of the panel in a desired angular distribution, and at least one curved surface is provided for reflecting light rays impinging on the additional surface in different directions to spread light across the panel member to provide a more uniform distribution of light emitted from the panel.

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*Claim Rejections - 35 USC § 102*

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371 of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

9. Claims 183-239, 242-254, and 257-289 are rejected under 35 U.S.C. 102(e) as being anticipated Hira et al. Hira et al (specifically figure 12b, 17b, 18, 21b, 22) discloses a

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light emitting panel member 2 having at least one input edge for receiving light from a light source, and a pattern of individual light extracting deformities on or in a panel surface of said panel member for producing a desired light output from the panel member. Kojima et al discloses a light emitting panel member 2 having at least one input edge for receiving light from a light source, and a pattern of individual light extracting deformities on or in a panel surface of said panel member for producing a desired light output from the panel member, each of the deformities has a length and width substantially smaller than the length and width of the panel surface and also has a well defined shape including at least one sloping for reflecting and refracting light rays impinging on the sloping surface out of the panel in a desired angular distribution, and at least one curved surface is provided for reflecting light rays impinging on the additional surface in different directions to spread light across the panel member to provide a more uniform distribution of light emitted from the panel.

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*Claim Rejections - 35 USC § 103*

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, 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 to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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11. Claims 240-241 are rejected under 35 U.S.C. 103(a) as being unpatentable over (Kojima et al, Yoshikawa et al, Ishikawa et al and Hira et al) in view of Iimura. (Kojima et al, Yoshikawa et al, Ishikawa et al and Hira et al) discloses the claimed invention except for the teaching that the panel member is made of film. Iimura teaches that it is known to use film to make light panels. (See column 6, lines 28-32). It would have been obvious to one skilled in the art at the time the invention was made to make the light panels of (Kojima et al, Yoshikawa et al, Ishikawa et al and Hira et al) out of film in order to provide a low cost easy to manufacture light panel.

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*Claim Rejections - 35 USC § 103*

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, 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 to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 255-256 are rejected under 35 U.S.C. 103(a) as being unpatentable over (Kojima et al, Ishikawa et al and Hira et al). (Kojima et al, Ishikawa et al and Hira et al) discloses the claimed invention except for the teaching that the light source is an LED. It would have been obvious to one skilled in the art at the time the invention was made to make the light panels of (Kojima et al, Ishikawa et al and Hira et al) out of film in order to provide a low cost easy to manufacture light panel.



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*Response to Arguments*

14. Applicant's arguments with respect to claims 183-289 have been considered but are moot in view of the new ground(s) of rejection.

*Response to Arguments*

15. Applicant's arguments with respect to claims 183-289 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas M. Sember whose telephone number is (703) 308-1938. The examiner can normally be reached on Monday - Thursday from 8:00 AM - 5:00 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea, can be reached at (703) 305-4939. The fax phone number for this group is (703) 308-7724.

Any inquiries of a general nature or relating to the status of this application should be directed to the group receptionist whose telephone number is (703) 305-4900.



Thomas M. Sember

Primary Examiner

August 26, 2002

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09-03-02

PTO/SB/05 (11-00)  
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**UTILITY  
PATENT APPLICATION  
TRANSMITTAL**

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	GL0LP0108USB
First Inventor	Jeffery R. Parker
Title	LIGHT EMITTING PANEL ASSEMBLIES
Express Mail Label No.	EV 040751379US

**APPLICATION ELEMENTS**

See MPEP chapter 600 concerning utility patent application contents

1. ☒ Fee Transmittal Form (e.g., PTO/SB/17)  
(Submit an original and a duplicate for fee processing)
2. ☐ Applicant claims small entity status  
See 37 CFR 1.27
3. ☒ Specification [Total Pages 26]  
(preferred arrangement set forth below)
  - Descriptive title of the invention
  - Cross Reference to Related Applications
  - Statement Regarding Fed sponsored R & D
  - Reference to sequence listing, a table, or a computer program listing appendix
  - Background of the Invention
  - Brief Summary of the Invention
  - Brief Description of the Drawings (if filed)
  - Detailed Description
  - Claim(s)
  - Abstract of the Disclosure
4. ☒ Drawing(s) (35 U.S.C. 113) [Total Sheets 4]  
- Drawings are Formal
5. ☐ Oath or Declaration [Total Pages 2]
  - a. ☒ Newly executed (original or copy)
  - b. ☐ Copy from a prior application (37 CFR 1.63 (d))  
(for continuation/divisional with Box 18 completed)
  - i. ☐ **DELETION OF INVENTOR(S)**  
Signed statement attached deleting inventor(s)  
named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b)
6. ☒ Application Data Sheet See 37 CFR 1.76

**ADDRESS TO:** Assistant Commissioner for Patents  
Box Patent Application  
Washington, DC 20231

7. ☐ CD-ROM or CD-R in duplicate, large table or Computer Program (Appendix)
8. Nucleotide and/or Amino Acid Sequence Submission  
(if applicable, all necessary)
  - a. ☐ Computer Readable Form (CRF)
  - b. Specification Sequence Listing on:
    - i. ☐ CD-ROM or CD-R (2 copies), or
    - ii. ☐ paper
  - c. ☐ Statements verifying identity of above copies

**ACCOMPANYING APPLICATION PARTS**

9. ☐ Assignment Papers (cover sheet & document(s))
10. ☐ 37 CFR 3.73(b) Statement of Attorney  
(when there is an assignee)
11. ☐ English Translation Document (if applicable)
12. ☐ Information Disclosure Statement (IDS)/PTO-1449
13. ☐ Preliminary Amendment
14. ☒ Return Receipt Postcard (MPEP 503)  
(Should be specifically itemized)
15. ☐ Certified Copy of Priority Document(s)  
(if foreign priority is claimed)
16. ☐ Request and Certification under 35 U.S.C. 122  
(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or its equivalent.
17. ☒ Other: Cert. of Express Mailing

18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment, or in an Application Data Sheet under 37 CFR 1.76:

<input type="checkbox"/> Continuation	<input checked="" type="checkbox"/> Divisional	<input type="checkbox"/> Continuation-in-part (CIP)	of prior application No. 09 256,275
Prior application information		Examiner Thomas M. Sember	Group Art Unit 2875

For CONTINUATION OR DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 5b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

**19. CORRESPONDENCE ADDRESS**

<input type="checkbox"/> Customer Number or Bar Code Label	(Insert Customer No. or Attach Bar code label here)	or	<input checked="" type="checkbox"/> Correspondence address below
Name	Donald L. Otto		
Address	Renner, Otto, Boisselle & Sklar, LLP 1621 Euclid Avenue, Nineteenth Floor		
City	Cleveland	State	Ohio
Zip Code	44115-2191	Telephone	(216) 621-1113
Country	U.S.	Fax	(216) 621-6165

Name (Print/Type)	Donald L. Otto	Registration No. (Attorney/Agent)	22,125
Signature		Date	8/30/02

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Box Patent Application, Washington, DC 20231.

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# FEE TRANSMITTAL

## for FY 2002

*Patent fees are subject to annual revision*

**Complete if Known**

Application Number	
Filing Date	Herewith
First Named Inventor	Jeffery R. Parker
Examiner Name	
Group Art Unit	
Attorney Docket No.	GLOLP0108USB

<b>TOTAL AMOUNT OF PAYMENT</b>	<b>(\$)</b>	<b>2462.00</b>
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## METHOD OF PAYMENT

1. ☒ The Commissioner is hereby authorized to charge indicated fees and credit any overpayments to:
- Deposit Account Number
- Deposit Account Name
- ☒ Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17
- ☐ Applicant claims small entity status See 37 CFR 1.27
- 
2. ☒ **Payment Enclosed:**
- ☒ Check ☐ Credit card ☐ Money Order ☐ Other

### FEE CALCULATION

### 1. BASIC FILING FEE

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee Code (\$)	Fee Code	Fee Code (\$)		
101	740	201	370	Utility filing fee	740
106	330	206	165	Design filing fee	
107	510	207	255	Plant filing fee	
108	740	208	370	Reissue filing fee	
114	160	214	80	Provisional filing fee	

<b>SUBTOTAL (1)</b>	<b>(\$)</b> 740.00
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## 2. EXTRA CLAIM FEES

		Extra Claims		Fee from below	Fee Paid
Total Claims	83	-20** =	63	X 18 =	1134
Independent Claims	10	-3** =	7	X 84 =	588
Multiple Dependent					

Large Entity		Small Entity		Fee Description
Fee Code	Fee (\$)	Fee Code	Fee (\$)	
103	18	203	9	Claims in excess of 20
102	84	202	42	Independent claims in excess of 3
104	280	204	140	Multiple dependent claim, if not paid
109	84	209	42	** Reissue independent claims over original patent
110	18	210	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2)	(\$1,722.00
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**\*\*or number previously paid, if greater. For Reissues, see above**

**FEE CALCULATION** (continued)

### 3. ADDITIONAL FEES

Fee Code	Large Entity Fee (\$)	Small Entity Fee (\$)	Fee Description	Fee Paid
105	130	65	Surcharge - late filing fee or oath	
127	50	25	Surcharge - late provisional filing fee or cover sheet	
139	130	130	Non-English specification	
147	2,520	2,520	For filing a request for <i>ex parte</i> reexamination	
112	920*	920*	Requesting publication of SIR prior to Examiner action	
113	1,840*	1,840*	Requesting publication of SIR after Examiner action	
115	110	55	Extension for reply within first month	
116	400	200	Extension for reply within second month	
117	920	460	Extension for reply within third month	
118	1,440	720	Extension for reply within fourth month	
128	1,960	980	Extension for reply within fifth month	
119	320	160	Notice of Appeal	
120	320	220	Filing a brief in support of an appeal	
121	280	140	Request for oral hearing	
138	1,510	1,510	Petition to institute a public use proceeding	
140	110	55	Petition to revive - unavoidable	
141	1,280	640	Petition to revive - unintentional	
142	1,280	640	Utility issue fee (or reissue)	
143	460	230	Design issue fee	
144	620	310	Plant issue fee	
122	130	130	Petitions to the Commissioner	
123	50	50	Processing fee under 37 CFR 1.17(q)	
126	180	180	Submission of Information Disclosure Stmt	
581	40	40	Recording each patent assignment per property (times number of properties)	
146	740	370	Filing a submission after final rejection (37 CFR § 1.129(a))	
149	740	370	For each additional invention to be examined (37 CFR § 1.129(b))	
179	740	370	Request for Continued Examination (RCE)	
169	900	900	Request for expedited examination of a design application	
Other fee (specify)				


Other fee (specify)

\*Reduced by Basic Filing Fee Paid

SUBTOTAL (3)	(\$)
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(\$ )

## SUBMITTED BY

Name (Print/Type)	Donald L. Otto	Registration No (Attorney/Agent)	22,125	Telephone	(216) 621-1113
Signature				Date	8-30-02

**WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

Burden Hour Statement This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

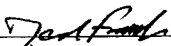
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Date of Deposit: August 30, 2002

I hereby certify that this PATENT APPLICATION (along with any other paper referred to as being attached or enclosed) is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to:

BOX PATENT APPLICATION  
COMMISSIONER FOR PATENTS  
WASHINGTON, DC 20231.

David Friedman  
(Typed or printed name of Sender)

  
(Signature)

D:\share\107\GLOL\108\USB\37 CFR 1.10 EXPRESS MAIL.wpd

## **Initial Information Data Sheet**

### **Inventor Information**

Inventor One Given Name:: Jeffery R.  
Family Name:: Parker  
Postal Address Line One:: 3050 Whitetail Ct.  
City:: Richfield  
State or Province:: Ohio  
Postal or Zip Code:: 44286  
Citizenship Country:: USA

### **Correspondence Information**

Name Line One:: Donald L. Otto  
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Address Line Two:: 19<sup>th</sup> Floor  
City:: Cleveland  
State or Province:: Ohio  
Postal or Zip Code:: 44115-2191  
Telephone One:: (216) 621-1113  
Fax:: (216) 621-6165  
Electronic Mail:: dotto@rennerotto.com

### **Application Information**

Title Line One:: LIGHT EMITTING PANEL ASSEMBLIES  
Total Drawing Sheets:: 4  
Formal Drawings?: Yes  
Application Type:: Utility  
Docket Number:: GLOLP0108USB

### **Continuity Information**

This application is a:: Division  
>Application One:: 09/256,275  
Filing Date:: February 23, 1999

which is a:: Continuation-in-part  
>Application Two:: 08/778,089  
Filing Date:: January 2, 1997  
U.S. Pat. No.: 6,079,838

which is a:: Division  
>Application Three:: 08/495,176  
Filing Date:: June 27, 1995  
U.S. Pat. No.: 5,613,751

D:\share\107\GLOLP108USB\APPLICATION DATA SHEET.wpd

ATTORNEY DOCKET GLOLP0108USB

5 TITLE: **LIGHT EMITTING PANEL ASSEMBLIES**

**CROSS-REFERENCE TO RELATED APPLICATIONS**

10 This application is a division of U.S. Patent Application No. 09/256,275,  
filed February 23, 1999, which is a continuation-in-part of U.S. Patent Application  
No. 08/778,089, filed January 2, 1997, now U.S. Patent No. 6,079,838, which is  
a division of U.S. Patent Application No. 08/495,176, filed June 27, 1995, now  
U.S. Patent No. 5,613,751.

15 **BACKGROUND OF THE INVENTION**

This invention relates generally, as indicated, to light emitting panel  
assemblies each including a transparent panel member for efficiently conducting  
light, and controlling the light conducted by the panel member to be emitted from  
one or more light output areas along the length thereof.

20 Light emitting panel assemblies are generally known. However, the  
present invention relates to several different light emitting panel assembly  
configurations which provide for better control of the light output from the panel  
assemblies and for more efficient utilization of light, which results in greater light  
output from the panel assemblies.

25 **SUMMARY OF THE INVENTION**

In accordance with one aspect of the invention, the light emitting panel  
assemblies include a light emitting panel member having a light transition area in  
which at least one light source is suitably mounted for transmission of light to the  
30 light input surface of the panel member.

In accordance with another aspect of the invention, the light source is  
desirably embedded, potted or bonded to the light transition area to eliminate  
any air gaps, decrease surface reflections and/or eliminate any lens effect

between the light source and light transition area, thereby reducing light loss and increasing the light output from the panel assembly.

In accordance with another aspect of the invention, the panel assemblies may include reflective or refractive surfaces for changing the path of a portion of the light, emitted from the light source, that would not normally enter the panel members at an acceptable angle that allows the light to remain in the panel members for a longer period of time and/or increase the efficiency of the panel members.

In accordance with another aspect of the invention, the light emitting panel members include a pattern of light extracting deformities or disruptions which provide a desired light output distribution from the panel members by changing the angle of refraction of a portion of the light from one or more light output areas of the panel members.

In accordance with still another aspect of the invention, the light source may include multiple colored light sources for supplying light to one or more light output areas, and for providing a colored or white light output distribution.

In accordance with yet another aspect of the invention, the panel assemblies include a transition area for mixing the multiple colored lights, prior to the light entering the panel members, in order to effect a desired colored or white light output distribution.

The various light emitting panel assemblies of the present invention are very efficient panel assemblies that may be used to produce increased uniformity and higher light output from the panel members with lower power requirements, and allow the panel members to be made thinner and/or longer, and/or of various shapes and sizes.

To the accomplishment of the foregoing and related ends, the invention then comprises the features hereinafter fully described and particularly pointed out in the claims, the following description and the annexed drawings setting forth in detail certain illustrative embodiments of the invention, these being indicative, however, of but several of the various ways in which the principles of the invention may be employed.



## BRIEF DESCRIPTION OF THE DRAWINGS

In the annexed drawings:

Figs. 1 through 3 are schematic perspective views of three different forms of light emitting panel assemblies in accordance with this invention;

5 Fig. 4a is an enlarged plan view of a portion of a light output area of a panel assembly showing one form of pattern of light extracting deformities on the light output area;

10 Figs. 4b, c and d are enlarged schematic perspective views of a portion of a light output area of a panel assembly showing other forms of light extracting deformities formed in or on the light output area;

Fig. 5 is an enlarged transverse section through the light emitting panel assembly of Fig. 3 taken generally on the plane of the line 5-5 thereof;

Fig. 6 is a schematic perspective view of another form of light emitting panel assembly in accordance with this invention;

15 Fig. 7 is a schematic top plan view of another form of light emitting panel assembly in accordance with this invention;

Fig. 8 is a schematic perspective view of another form of light emitting panel assembly in accordance with this invention;

20 Fig. 9 is a schematic top plan view of another form of light emitting panel assembly in accordance with this invention;

Fig. 10 is a schematic top plan view of still another form of light emitting panel assembly in accordance with this invention;

Fig. 11 is a side elevation view of the light emitting panel assembly of Fig. 10;

25 Fig. 11a is a fragmentary side elevation view showing a tapered or rounded end on the panel member in place of the prismatic surface shown in Figs. 10 and 11;

Fig. 12 is a schematic top plan view of another form of light emitting panel assembly in accordance with this invention;

30 Fig. 13 is a schematic side elevation view of the light emitting panel assembly of Fig. 12; and

Figs. 14 and 15 are schematic perspective views of still other forms of light emitting panel assemblies in accordance with this invention.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now in detail to the drawings, and initially to Fig. 1, there is schematically shown one form of light emitting panel assembly 1 in accordance with this invention including a transparent light emitting panel 2 and one or more light sources 3 which emit light in a predetermined pattern in a light transition member or area 4 used to make the transition from the light source 3 to the light emitting panel 2, as well known in the art. The light that is transmitted by the light transition area 4 to the transparent light emitting panel 2 may be emitted along the entire length of the panel or from one or more light output areas along the length of the panel as desired to produce a desired light output distribution to fit a particular application.

In Fig. 1 the light transition area 4 is shown as an integral extension of one end of the light emitting panel 2 and as being generally rectangular in shape. However, the light transition area may be of other shapes suitable for embedding, potting, bonding or otherwise mounting the light source. Also, reflective or refractive surfaces may be provided to increase efficiency. Moreover, the light transition area 4 may be a separate piece suitably attached to the light input surface 13 of the panel member if desired. Also, the sides of the light transition area may be curved to more efficiently reflect or refract a portion of the light emitted from the light source through the light emitting panel at an acceptable angle.

Fig. 2 shows another form of light emitting panel assembly 5 in accordance with this invention including a panel light transition area 6 at one end of the light emitting panel 7 with sides 8, 9 around and behind the light source 3 shaped to more efficiently reflect and/or refract and focus the light emitted from the light source 3 that impinges on these surfaces back through the light transition area 6 at an acceptable angle for entering the light input surface 18 at one end of the light emitting panel 7. Also, a suitable reflective material or

coating 10 may be provided on the portions of the sides of the light transition areas of the panel assemblies of Figs. 1 and 2 on which a portion of the light impinges for maximizing the amount of light or otherwise changing the light that is reflected back through the light transition areas and into the light emitting panels.

The panel assemblies shown in Figs. 1 and 2 include a single light source 3, whereas Fig. 3 shows another light emitting panel assembly 11 in accordance with this invention including two light sources 3. Of course, it will be appreciated that the panel assemblies of the present invention may be provided with any number of light sources as desired, depending on the particular application.

The panel assembly 11 of Fig. 3 includes a light transition area 12 at one end of the light emitting panel 14 having reflective and/or refractive surfaces 15 around and behind each light source 3. These surfaces 15 may be appropriately shaped including for example curved, straight and/or faceted surfaces, and if desired, suitable reflective materials or coatings may be provided on portions of these surfaces to more efficiently reflect and/or refract and focus a portion of the light emitted for example from an incandescent light source which emits light in a 360° pattern through the light transition areas 12 into the light input surface 19 of the light emitting panel 14.

The light sources 3 may be mechanically held in any suitable manner in slots, cavities or openings 16 machined, molded or otherwise formed in the light transition areas of the panel assemblies. However, preferably the light sources 3 are embedded, potted or bonded in the light transition areas in order to eliminate any air gaps or air interface surfaces between the light sources and surrounding light transition areas, thereby reducing light loss and increasing the light output emitted by the light emitting panels. Such mounting of the light sources may be accomplished, for example, by bonding the light sources 3 in the slots, cavities or openings 16 in the light transition areas using a sufficient quantity of a suitable embedding, potting or bonding material 17. The slots, cavities or openings 16 may be on the top, bottom, sides or back of the light transition areas. Bonding can also be accomplished by a variety of methods that do not

incorporate extra material, for example, thermal bonding, heat staking, ultrasonic or plastic welding or the like. Other methods of bonding include insert molding and casting around the light source(s).

5 A transparent light emitting material of any suitable type, for example acrylic or polycarbonate, may be used for the light emitting panels. Also, the panels may be substantially flat, or curved, may be a single layer or multi-layers, and may have different thicknesses and shapes. Moreover, the panels may be flexible, or rigid, and may be made out of a variety of compounds. Further, the panels may be hollow, filled with liquid, air, or be solid, and may have holes or  
10 ridges in the panels.

Each light source 3 may also be of any suitable type including, for example, any of the types disclosed in U.S. Patent Nos. 4,897,771 and 5,005,108, assigned to the same assignee as the present application, the entire disclosures of which are incorporated herein by reference. In particular, the light  
15 sources 3 may be an arc lamp, an incandescent bulb which also may be colored, filtered or painted, a lens end bulb, a line light, a halogen lamp, a light emitting diode (LED), a chip from an LED, a neon bulb, a fluorescent tube, a fiber optic light pipe transmitting from a remote source, a laser or laser diode, or any other suitable light source. Additionally, the light sources 3 may be a multiple colored  
20 LED, or a combination of multiple colored radiation sources in order to provide a desired colored or white light output distribution. For example, a plurality of colored lights such as LEDs of different colors (red, blue, green) or a single LED with multiple colored chips may be employed to create white light or any other colored light output distribution by varying the intensities of each individual  
25 colored light.

A pattern of light extracting deformities or disruptions may be provided on one or both sides of the panel members or on one or more selected areas on one or both sides of the panel members, as desired. Fig. 4a schematically shows one such light surface area 20 on which a pattern of light extracting  
30 deformities or disruptions 21 is provided. As used herein, the term deformities or disruptions are used interchangeably to mean any change in the shape or

geometry of the panel surface and/or coating or surface treatment that causes a portion of the light to be emitted. The pattern of light extracting deformities 21 shown in Fig. 4a includes a variable pattern which breaks up the light rays such that the internal angle of reflection of a portion of the light rays will be great enough to cause the light rays either to be emitted out of the panel through the side or sides on which the light extracting deformities 21 are provided or reflected back through the panel and emitted out the other side.

These deformities or disruptions 21 can be produced in a variety of manners, for example, by providing a painted pattern, an etched pattern, a machined pattern, a printed pattern, a hot stamped pattern, or a molded pattern or the like on selected light output areas of the panel members. An ink or printed pattern may be applied for example by pad printing, silk screening, ink jet, heat transfer film process or the like. The deformities may also be printed on a sheet or film which is used to apply the deformities to the panel member. This sheet or film may become a permanent part of the light panel assembly for example by attaching or otherwise positioning the sheet or film against one or both sides of the panel member similar to the sheet or film 27 shown in Figs. 3 and 5 in order to produce a desired effect.

By varying the density, opaqueness or translucence, shape, depth, color, area, index of refraction, or type of deformities 21 on an area or areas of the panels, the light output of the panels can be controlled. The deformities or disruptions may be used to control the percent of light emitted from any area of the panels. For example, less and/or smaller size deformities 21 may be placed on panel areas where less light output is wanted. Conversely, a greater percentage of and/or larger deformities may be placed on areas of the panels where greater light output is desired.

Varying the percentages and/or size of deformities in different areas of the panel is necessary in order to provide a uniform light output distribution. For example, the amount of light traveling through the panels will ordinarily be greater in areas closer to the light source than in other areas further removed from the light source. A pattern of light extracting deformities 21 may be used to

adjust for the light variances within the panel members, for example, by providing a denser concentration of light extracting deformities with increased distance from the light source 3 thereby resulting in a more uniform light output distribution from the light emitting panels.

5           The deformities 21 may also be used to control the output ray angle distribution of the emitted light to suit a particular application. For example, if the panel assemblies are used to provide a liquid crystal display backlight, the light output will be more efficient if the deformities 21 cause the light rays to emit from the panels at predetermined ray angles such that they will pass through the  
10       liquid crystal display with low loss.

          Additionally, the pattern of light extracting deformities may be used to adjust for light output variances attributed to light extractions of the panel members. The pattern of light extracting deformities 21 may be printed on the light output areas utilizing a wide spectrum of paints, inks, coatings, epoxies, or  
15       the like, ranging from glossy to opaque or both, and may employ half-tone separation techniques to vary the deformity 21 coverage. Moreover, the pattern of light extracting deformities 21 may be multiple layers or vary in index of refraction.

          Print patterns of light extracting deformities 21 may vary in shapes such  
20       as dots, squares, diamonds, ellipses, stars, random shapes, and the like, and are desirably .006 square inch per deformity/element or less. Also, print patterns that are 60 lines per inch or finer are desirably employed, thus making the deformities or shapes 21 in the print patterns nearly invisible to the human eye in a particular application thereby eliminating the detection of gradient or banding  
25       lines that are common to light extracting patterns utilizing larger elements. Additionally, the deformities may vary in shape and/or size along the length and/or width of the panel members. Also, a random placement pattern of the deformities may be utilized throughout the length and/or width of the panel members. The deformities may have shapes or a pattern with no specific angles  
30       to reduce moiré or other interference effects. Examples of methods to create these random patterns are printing a pattern of shapes using stochastic print

pattern techniques, frequency modulated half tone patterns, or random dot half tones. Moreover, the deformities may be colored in order to effect color correction in the panel members. The color of the deformities may also vary throughout the panel members, for example to provide different colors for the same or different light output areas.

In addition to or in lieu of the patterns of light extracting deformities 21 shown in Fig. 4a, other light extracting deformities including prismatic surfaces, depressions or raised surfaces of various shapes using more complex shapes in a mold pattern may be molded, etched, stamped, thermoformed, hot stamped or the like into or on one or more areas of the panel member. Figs. 4b and 4c show panel areas 22 on which prismatic surfaces 23 or depressions 24 are formed in the panel areas, whereas Fig. 4d shows prismatic or other reflective or refractive surfaces 25 formed on the exterior of the panel area. The prismatic surfaces, depressions or raised surfaces will cause a portion of the light rays contacted thereby to be emitted from the panel member. Also, the angles of the prisms, depressions or other surfaces may be varied to direct the light in different directions to produce a desired light output distribution or effect. Moreover, the reflective or refractive surfaces may have shapes or a pattern with no specific angles to reduce moiré or other interference effects.

As best seen in the cross sectional view of Fig. 5, a back reflector (including trans reflectors) 26 may be attached or positioned against one side of the panel member 14 of Fig. 3 using a suitable adhesive 28 or other method in order to improve light output efficiency of the panel assembly 11 by reflecting the light emitted from that side back through the panel for emission through the opposite side. Additionally, a pattern of light extracting deformities 21, 23, 24 and/or 25 may be provided on one or both sides of the panel member in order to change the path of the light so that the internal critical angle is exceeded and a portion of the light is emitted from one or both sides of the panel. Moreover, a transparent film, sheet or plate 27 may be attached or positioned against the side or sides of the panel member from which light is emitted using a suitable adhesive 28 or other method in order to produce a desired effect.

The member 27 may be used to further improve the uniformity of the light output distribution. For example, the member 27 may be a colored film, a diffuser, or a label or display, a portion of which may be a transparent overlay that may be colored and/or have text or an image thereon.

5 If adhesive 28 is used to adhere the back reflector 26 and/or film 27 to the panel, the adhesive is preferably applied only along the side edges of the panel, and if desired the end edge opposite the light transition areas 12, but not over the entire surface area or areas of the panel because of the difficulty in consistently applying a uniform coating of adhesive to the panel. Also, the  
10 adhesive changes the internal critical angle of the light in a less controllable manner than the air gaps 30 (see Fig. 5) which are formed between the respective panel surfaces and the back reflector 26 and/or film 27 when only adhered along the peripheral edges. Additionally, longer panel members are achievable when air gaps 30 are used. If adhesive were to be used over the  
15 entire surface, the pattern of deformities could be adjusted to account for the additional attenuation in the light caused by the adhesive.

Referring further to Fig. 2, the panel assembly 5 shown therein also includes molded posts 31 at one or more corners of the panel 7 (four such posts being shown) which may be used to facilitate mounting of the panel assembly  
20 and providing structural support for other parts or components, for example, a display panel such as a liquid crystal display panel as desired.

Fig. 6 shows another form of light emitting panel assembly 32 in accordance with this invention including a panel member 33, one or more light sources 3, and one or more light output areas 34. In addition, the panel  
25 assembly 32 includes a tray 35 having a cavity or recess 36 in which the panel assembly 32 is received. The tray 35 may act as a back reflector as well as end edge and/or side edge reflectors for the panel 33 and side and/or back reflectors 37 for the light sources 3. Additionally, one or more secondary reflective or refractive surfaces 38 may be provided on the panel member 33 and/or tray 35 to  
30 reflect a portion of the light around one or more corners or curves in a non-rectangular shaped panel member 33. These secondary reflective/refractive



surfaces 38 may be flat, angled, faceted or curved, and may be used to extract a portion of the light away from the panel member in a predetermined pattern. Fig. 6 also shows multiple light output areas 34 on the panel member that emit light from one or more light sources 3.

Fig. 7 is a schematic illustration of still another form of light emitting panel assembly 40 in accordance with this invention including a panel member 41 having one or more light output areas 42 and one or more light transition areas (mixing areas) 43 containing a plurality of light sources 3 at one or both ends of the panel. Each transition area mixes the light from one or more light sources having different colors and/or intensities. In this particular embodiment, each of the light sources 3 desirably employs three colored LEDs (red, blue, green) in each transition mixing area 43 so that the light from the three LEDs can be mixed to produce a desired light output color that will be emitted from the light output area 42. Alternatively, each light source may be a single LED having multiple colored chips bonded to the lead film. Also, two colored LEDs or a single LED having two colored chips may be used for a particular application. By varying the intensities of the individual respective LEDs, virtually any colored light output or white light distribution can be achieved.

Fig. 8 shows yet another form of light emitting panel assembly 45 in accordance with this invention including a light emitting panel member 46 and a light source 3 in a light transition area 48 integral with one end of the panel member. In this particular embodiment, the panel member 46 is three-dimensionally curved, for example, such that light rays may be emitted in a manner that facilitates aesthetic design of a lighted display.

Fig. 9 schematically shows another form of light emitting panel assembly 50 in accordance with this invention, including a panel member 51 having multiple light output areas 52, and mounting posts and/or mounting tabs 53. This particular panel assembly 50 may serve as a structural member to support other parts or components as by providing holes or cavities 54, 55 in the panel member 51 which allow for the insertion of modular components or other parts into the panel member. Moreover, a separate cavity or recess 56 may be

provided in the panel member 51 for receipt of a correspondingly shaped light transition area 57 having one or more light sources 3 embedded, bonded, cast, insert molded, epoxied, or otherwise mounted or positioned therein and a curved reflective or refractive surface 58 on the transition area 57 and/or wall of the cavity or recess 56 to redirect a portion of the light in a predetermined manner. In this way the light transition area 57 and/or panel member may be in the form of a separate insert which facilitates the easy placement of the light source in a modular manner. A reflector 58 may be placed on the reflective or refractive surface of the cavity or recess 56 or insert 57. Where the reflector 58 is placed on the reflective or refractive surface of the cavity or recess 56, the cavity or recess may act as a mold permitting transparent material from which the transition area 57 is made to be cast around one or more light sources 3.

Figs. 10 and 11 schematically show another form of light emitting panel assembly 60 in accordance with this invention including a panel member 61 having one or more light output areas 62. In this particular embodiment, an off-axis light transition area 63 is provided that is thicker in cross section than the panel member to permit use of one or more light sources 3 embedded or otherwise mounted in the light transition area that are dimensionally thicker than the panel member. Also, a three-dimensional reflective surface 64 (Fig. 11) may be provided on the transition area 63. Moreover, a prism 65 (Fig. 11) or tapered, rounded, or otherwise shaped end 66 (Fig. 11a) may be provided at the end of the panel opposite the light sources 3 to perform the function of an end reflector. The light sources 3 may be oriented at different angles relative to each other and offset to facilitate better mixing of the light rays 67 in the transition area 63 as schematically shown in Fig. 10 and/or to permit a shorter length transition area 63 to be used.

Figs. 12 and 13 schematically show still another form of light emitting panel assembly 70 in accordance with this invention which includes one or more light transition areas 71 at one or both ends of the panel member 72 each containing a single light source 73. The transition area or areas 71 shown in Figs. 12 and 13 collect light with multiple or three-dimensional surfaces and/or

collect light in more than one plane. For example each transition area 71 shown in Figs. 12 and 13 has elliptical and parabolic shape surfaces 74 and 75 in different planes for directing the light rays 76 into the panel member at a desired angle.

5 Providing one or more transition areas at one or both ends of the panel member of any desired dimension to accommodate one or more light sources, with reflective and/or refractive surfaces on the transition areas for redirecting the light rays into the panel member at relatively low angles allows the light emitting panel member to be made much longer and thinner than would  
10 otherwise be possible. For example the panel members of the present invention may be made very thin, *i.e.*, 0.125 inch thick or less.

Fig. 14 schematically illustrates still another form of light emitting panel assembly 80 in accordance with this invention including a light emitting panel 81 and one or more light sources 3 positioned, embedded, potted, bonded or  
15 otherwise mounted in a light transition area 82 that is at an angle relative to the panel member 81 to permit more efficient use of space. An angled or curved reflective or refractive surface 83 is provided at the junction of the panel member 81 with the transition area 82 in order to reflect/refract light from the light source 3 into the body of the panel member 81 for emission of light from one or more  
20 light emitting areas 84 along the length of the panel member.

Fig. 15 schematically illustrates still another form of light emitting panel assembly 90 in accordance with this invention including a light transition area 91 at one or both ends of a light emitting panel member 92 containing a slot 93 for sliding receipt of an LED or other suitable light source 3. Preferably the slot 93  
25 extends into the transition area 91 from the back edge 94, whereby the light source 3 may be slid and/or snapped in place in the slot from the back, thus allowing the transition area to be made shorter and/or thinner. The light source 3 may be provided with wings, tabs or other surfaces 95 for engagement in correspondingly shaped recesses or grooves 96 or the like in the transition area  
30 91 for locating and, if desired, securing the light source in place. Also, the light source 3 may be embedded, potted, bonded or otherwise secured within the slot

93 in the light transition area 91 of the panel member 92. Light from a secondary light source 97 may be projected through the panel member 92 for indication or some other effect.

The various light emitting panel assemblies disclosed herein may be used for a great many different applications including for example LCD back lighting or lighting in general, decorative and display lighting, automotive lighting, dental lighting, phototherapy or other medical lighting, membrane switch lighting, and sporting goods and apparel lighting or the like. Also the panel assemblies may be made such that the panel members and deformities are transparent without a back reflector. This allows the panel assemblies to be used for example to front light an LCD or other display such that the display is viewed through the transparent panel members.

Although the invention has been shown and described with respect to certain preferred embodiments, it is obvious that equivalent alterations and modifications will occur to others skilled in the art upon the reading and understanding of the specification. The present invention includes all such equivalent alterations and modifications, and is limited only by the scope of the claims.

WHAT IS CLAIMED IS:

1. A backlight assembly comprising a light emitting member, a substrate overlying said light emitting member, said substrate having a pattern of deformities on at least one side of said substrate for controlling an output ray angle distribution of light emitted by said light emitting member to suit a particular application, said deformities varying in at least one of the following characteristics: size, shape, placement, index of refraction, density, angle, depth, height, and type.

2. The assembly of claim 1 wherein said substrate comprises any one of a sheet, film and plate.

3. The assembly of claim 1 wherein said deformities are shaped deformities.

4. The assembly of claim 3 wherein said deformities comprise depressions in said substrate.

5. The assembly of claim 3 wherein said deformities comprise projections on said substrate.

6. The assembly of claim 1 wherein said substrate is attached to said light emitting member.

7. The assembly of claim 1 wherein said substrate has at least one of a coating and surface treatment for causing the light to pass through a liquid crystal display with low loss.

8. The assembly of claim 1 wherein said deformities are on opposite sides of said substrate.

9. The assembly of claim 1 wherein said substrate comprises at least one of multiple layers and materials.

5 10. The assembly of claim 9 wherein said at least one of said multiple layers and materials have a different index of refraction.

11. The assembly of claim 1 wherein said substrate has both reflective and refractive surfaces.

10 12. The assembly of claim 1 wherein at least one of the characteristics of the deformities are varied to reduce moiré or other interference effects when said assembly is assembled to a liquid crystal display.

15 13. The assembly of claim 1 wherein more than one said substrate overlie said light emitting member.

14. The assembly of claim 1 wherein said deformities are at least one of prisms, prismatic and lenticular.

20 15. The assembly of claim 14 wherein the individual deformities are quite small in relation to the width and length of said substrate.

25 16. A backlight assembly comprising a light emitting member, a substrate overlying said light emitting member, said substrate having a pattern of deformities on at least one side of said substrate for controlling an output ray angle distribution of light emitted by said light emitting member to suit a particular application, said deformities being random in at least one of the following characteristics: size, shape, placement, index of refraction, density, angle, depth, height, type.

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17. The assembly of claim 16 wherein said substrate has at least one of a coating and surface treatment for causing the light to pass through a liquid crystal display with low loss.

5 18. The assembly of claim 16 wherein said deformities are on opposite sides of said substrate.

19. The assembly of claim 16 wherein said substrate comprises at least one of multiple layers and materials.

10

20. The assembly of claim 19 wherein said at least one of said multiple layers and materials have a different index of refraction.

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21. The assembly of claim 16 wherein said substrate has both reflective and refractive surfaces.

20

22. The assembly of claim 16 wherein at least one of the characteristics of the deformities are varied to reduce moiré or other interference effects when said assembly is assembled to a liquid crystal display.

25

23. The assembly of claim 16 wherein more than one said substrate overlie said light emitting member.

24. The assembly of claim 16 wherein said substrate has at least one of prismatic and lenticular deformities on at least one surface of said substrate.

25. The assembly of claim 24 wherein the individual deformities are quite small in relation to the width and length of said substrate.

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26. A backlight assembly comprising a light emitting member, a substrate overlying said light emitting member, said substrate having a multitude

of deformities on at least one side of said substrate for controlling an output ray  
angle distribution of light emitted by said light emitting member to suit a  
particular application, said deformities comprising at least one of depressions  
and projections on said one side, said projections having at least one of a shape  
5 and pattern with no specific angle.

27. A backlight assembly comprising a light emitting member, a  
substrate overlying said light emitting member, said substrate having a multitude  
of deformities on at least one side of said substrate for controlling an output ray  
10 angle distribution of light emitted by said light emitting member to suit a  
particular application, said deformities comprising at least one of shaped  
depressions and projections on said one side, at least some of said deformities  
including prismatic surfaces having angles that vary among said deformities.

28. A backlight assembly comprising a light emitting member, a  
substrate overlying said light emitting member, said substrate having a multitude  
of deformities on at least one side of said substrate for controlling an output ray  
angle distribution of light emitted by said light emitting member to suit a  
15 particular application, said deformities comprising at least one of shaped  
depressions and projections on said one side, at least some of said deformities  
20 having angles that vary among said deformities.

29. A liquid crystal backlight assembly comprising a light emitting  
member including at least one sheet or film having deformities or disruptions on  
25 at least one side, at least some of said deformities or disruptions varying in  
shape or geometry for causing light rays to be emitted from said backlight  
assembly at predetermined ray angles such that the light rays will pass through a  
liquid crystal display with low loss.



30. The assembly of claim 29 wherein said sheet or film has at least one of a coating and surface treatment for causing the light to pass through such liquid crystal display with low loss.

5            31.    The assembly of claim 29 wherein said deformities or disruptions  
are on opposite sides of said sheet or film.

32. The assembly of claim 29 wherein said sheet or film comprises at least one of multiple layers and materials.

33. The assembly of claim 9 wherein said at least one of said multiple layers and materials have a different index of refraction.

34. The assembly of claim 29 wherein said sheet or film has both  
15 reflective and refractive surfaces.

35. The assembly of claim 29 wherein at least one of the characteristics of the deformities or disruptions is varied to reduce moiré or other interference effects when said assembly is assembled to a liquid crystal display.

36. The assembly of claim 29 wherein said light emitting member includes more than one sheet or film.

37. The assembly of claim 29 wherein said one surface of said sheet or  
25 film has at least one of prismatic and lenticular deformities.

38. The assembly of claim 37 wherein the individual deformities are quite small in relation to the width and length of said substrate.

39. A liquid crystal backlight assembly comprising a light emitting member including at least one sheet or film having deformities or disruptions on

at least one side, at least some of said deformities or disruptions having random shapes or geometries for causing light rays to be emitted from said backlight assembly at predetermined ray angles such that the light rays will pass through a liquid crystal display with low loss.

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40. The assembly of claim 39 wherein said sheet or film has at least one of a coating and surface treatment for causing the light to pass through such liquid crystal display with low loss.

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41. The assembly of claim 39 wherein said deformities or disruptions are on opposite sides of said sheet or film.

42. The assembly of claim 39 wherein said sheet or film comprises at least one of multiple layers and materials.

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43. The assembly of claim 42 wherein said at least one of said multiple layers and materials have a different index of refraction.

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44. The assembly of claim 39 wherein said sheet or film has both reflective and refractive surfaces.

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45. The assembly of claim 39 wherein at least one of the characteristics of the deformities or disruptions is varied to reduce moiré or other interference effects when said assembly is assembled to a liquid crystal display.

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46. The assembly of claim 39 wherein said light emitting member includes more than one sheet or film.

47. The assembly of claim 39 wherein said one surface of said sheet or film has at least one of prismatic and lenticular deformities.

48. The assembly of claim 47 wherein the individual deformities are quite small in relation to the width and length of said substrate.

49. A liquid crystal backlight assembly comprising a light emitting member including at least one sheet or film having deformities or disruptions on at least one side, at least some of said deformities or disruptions having random or varying changes in shape or geometry for causing light rays to be emitted from said backlight assembly at predetermined ray angles such that the light rays will pass through a liquid crystal display with low loss.

50. The assembly of claim 49 wherein said sheet or film has at least one of a coating and surface treatment for causing the light to pass through such liquid crystal display with low loss.

51. The assembly of claim 49 wherein said deformities or disruptions are on opposite sides of said sheet or film.

52. The assembly of claim 49 wherein said sheet or film comprises at least one of multiple layers and materials.

53. The assembly of claim 52 wherein said at least one of said multiple layers and materials have a different index of refraction.

54. The assembly of claim 49 wherein said sheet or film has both reflective and refractive surfaces.

55. The assembly of claim 49 wherein at least one of the characteristics of the deformities or disruptions is varied to reduce moiré or other interference effects when said assembly is assembled to a liquid crystal display.

56. The assembly of claim 49 wherein said light emitting member includes more than one sheet or film.

57. The assembly of claim 49 wherein said one surface of said sheet or film has at least one of prismatic and lenticular deformities.

58. The assembly of claim 57 wherein the individual deformities are quite small in relation to the width and length of said substrate.

59. A liquid crystal backlight assembly comprising a light emitting member including at least one sheet or film having random or varying changes in at least one of a coating and surface treatment on at least one side for causing light rays to be emitted from said backlight assembly and pass through a liquid crystal display with low loss.

60. The assembly of claim 59 wherein the at least one of the coating and surface treatment varies in at least one of the following characteristics: density, color, index of refraction, reflection, opaqueness, translucence, area, depth, shape, size, and type.

61. The assembly of claim 59 wherein the at least one of the coating and surface treatment is at least one of paint, ink and epoxy.

62. The assembly of claim 59 wherein said deformities or disruptions are on opposite sides of said sheet or film.

63. The assembly of claim 59 wherein said sheet or film comprises at least one of multiple layers and materials.

64. The assembly of claim 63 wherein said at least one of said multiple layers and materials have a different index of refraction.

65. The assembly of claim 59 wherein said sheet or film has both reflective and refractive surfaces.

5 66. The assembly of claim 59 wherein said sheet or film has deformities that reduce moiré or other interference effects when said assembly is assembled to a liquid crystal display.

10 67. The assembly of claim 59 wherein said light emitting member includes more than one sheet or film.

68. The assembly of claim 59 wherein said one surface of said sheet or film has at least one of prismatic and lenticular deformities.

15 69. The assembly of claim 68 wherein the individual deformities are quite small in relation to the width and length of said substrate.

20 70. A liquid crystal backlight assembly comprising a light emitting member including at least one sheet or film having changes in the shape or geometry of at least one surface, and at least one of a coating and surface treatment on said one surface for causing light rays to be emitted from said backlight assembly and pass through a liquid crystal display with low loss.

25 71. The assembly of claim 70 wherein the coating is selected to improve at least one of the following characteristics of the backlight assembly: color correction, opaqueness, diffusion, reflection, translucence, and transmission.

30 72. The assembly of claim 70 wherein said one surface of said sheet or film has at least one of prismatic and lenticular deformities.

73. The assembly of claim 72 wherein the individual deformities are quite small in relation to the width and length of said substrate.

5 74. The assembly of claim 70 wherein said sheet or film has varying changes in the shape or geometry of said one surface.

75. The backlight assembly of claim 70 wherein said sheet or film has random changes in the shape or geometry of said one surface.

10 76. The assembly of claim 70 wherein the at least one coating and surface treatment varies on said one surface of the sheet or film.

15 77. The assembly of claim 70 wherein the at least one coating and surface treatment is at random on said one surface of the sheet or film.

78. The assembly of claim 70 wherein said sheet or film has deformities on opposite sides of said sheet or film.

20 79. The assembly of claim 70 wherein said sheet or film comprises at least one of multiple layers and materials.

80. The assembly of claim 79 wherein said at least one of said multiple layers and materials have a different index of refraction.

25 81. The assembly of claim 70 wherein said sheet or film has both reflective and refractive surfaces.

30 82. The assembly of claim 70 wherein said sheet or film has deformities that reduce moiré or other interference effects when said assembly is assembled to a liquid crystal display.

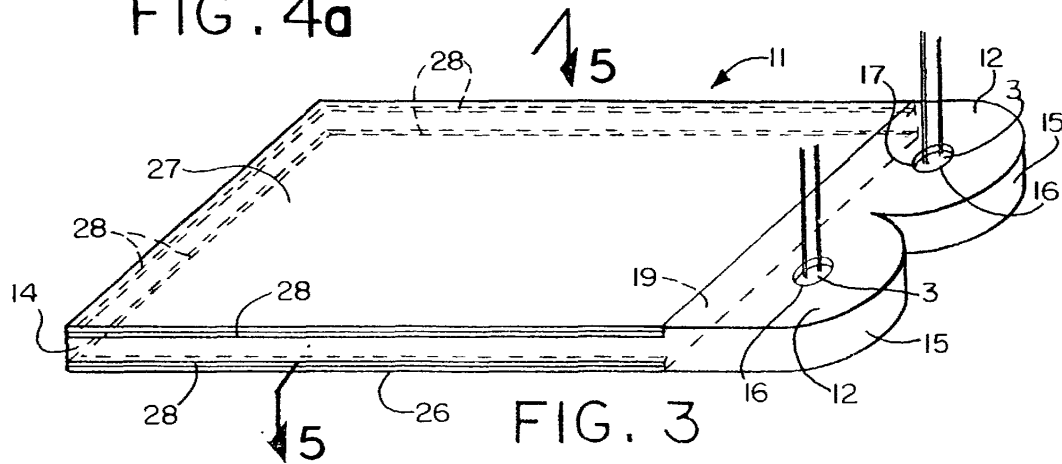
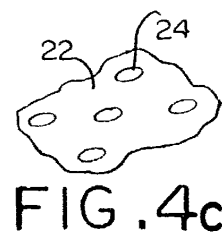
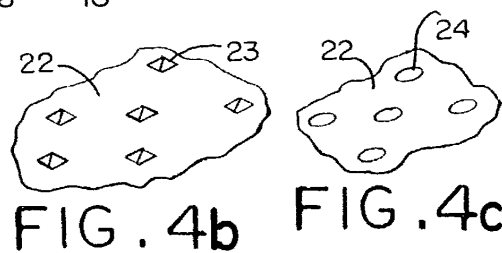
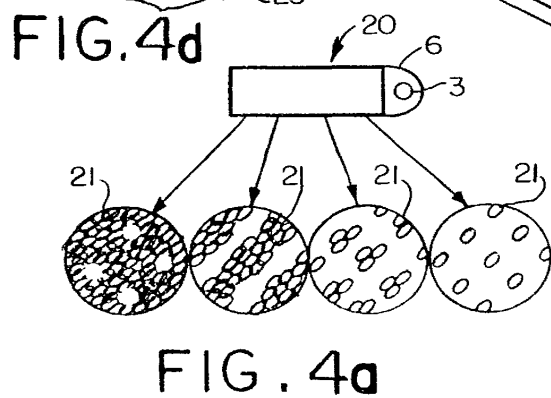
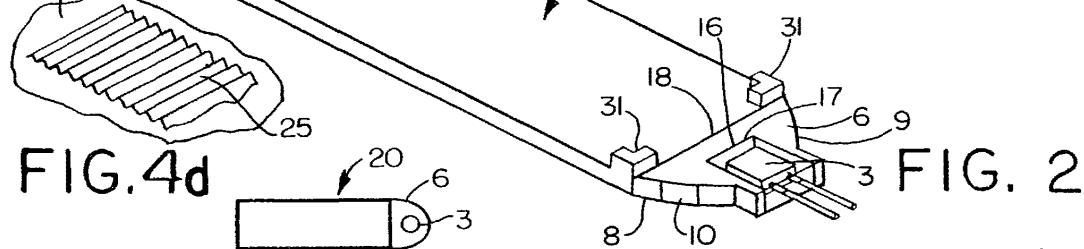
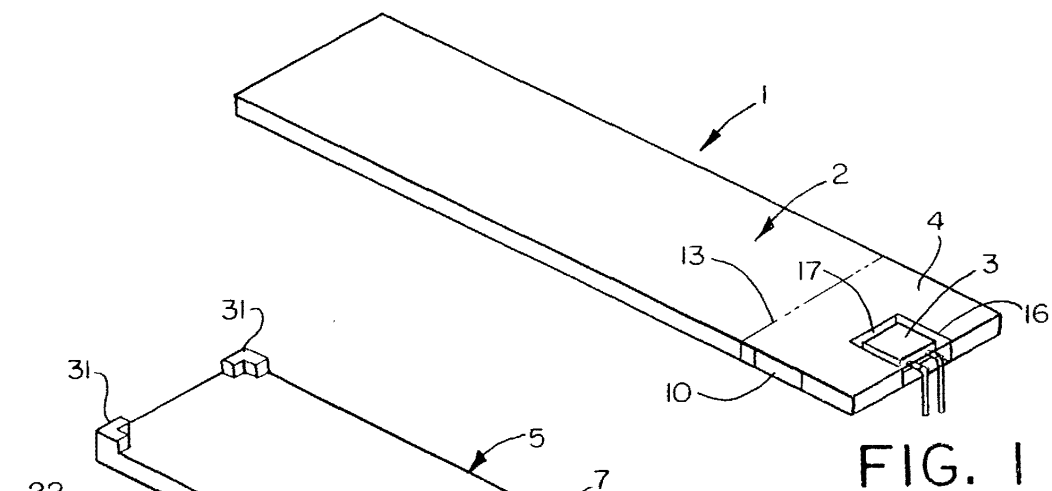
83. The assembly of claim 70 wherein said light emitting member includes more than one sheet or film.

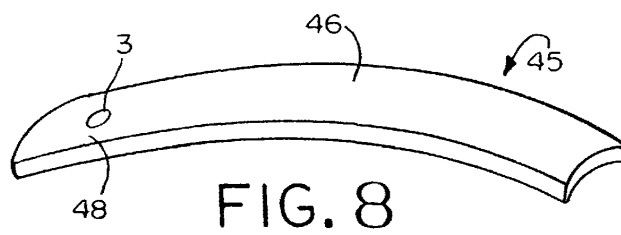
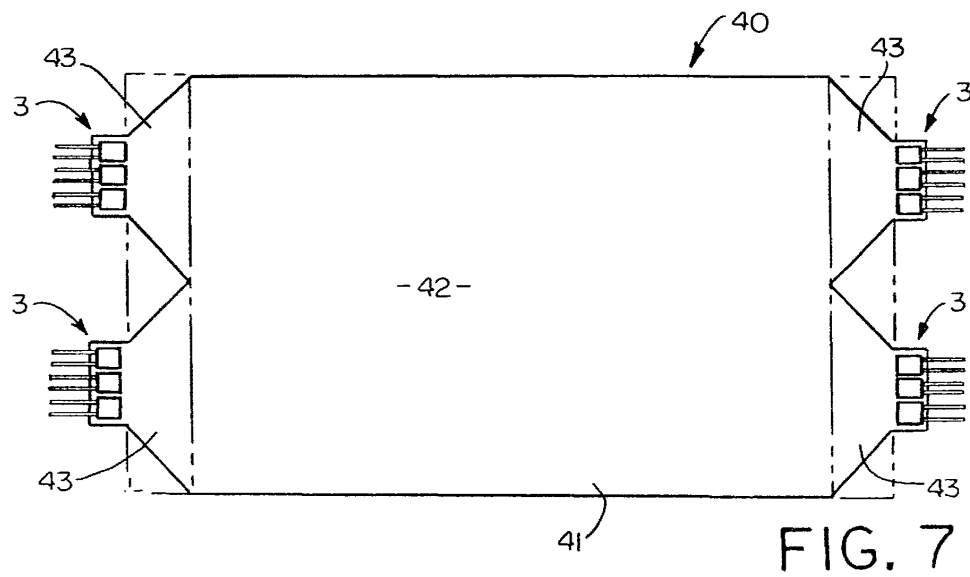
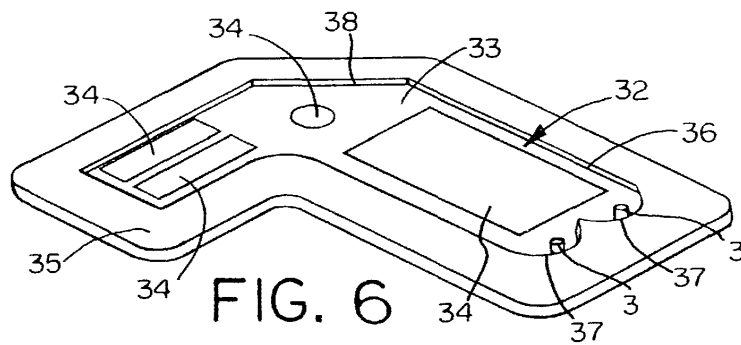
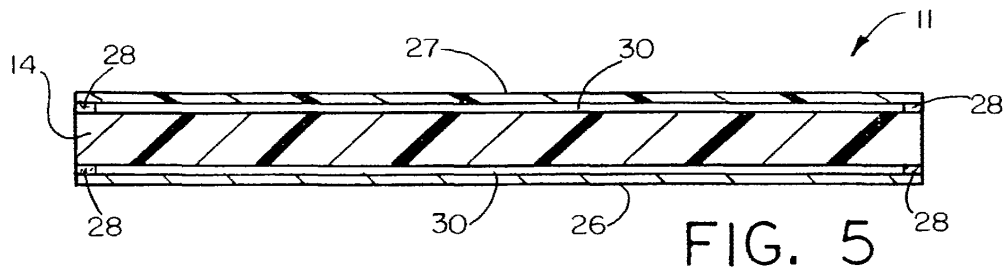
## ABSTRACT

Light emitting panel assemblies include a sheet, film or plate overlying a light emitting member. The sheet, film or plate has a pattern of deformities on one or both sides that may vary or be random in size, shape or geometry, placement, index of refraction, density, angle, depth, height and type for controlling the light output distribution to suit a particular application. Also the sheet, film or plate may have a coating or surface treatment for causing the light to pass through a liquid crystal display with low loss.

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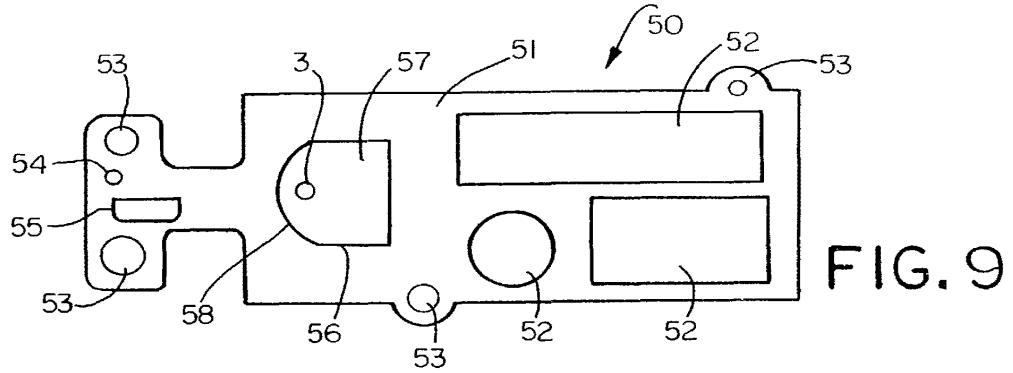


FIG. 9

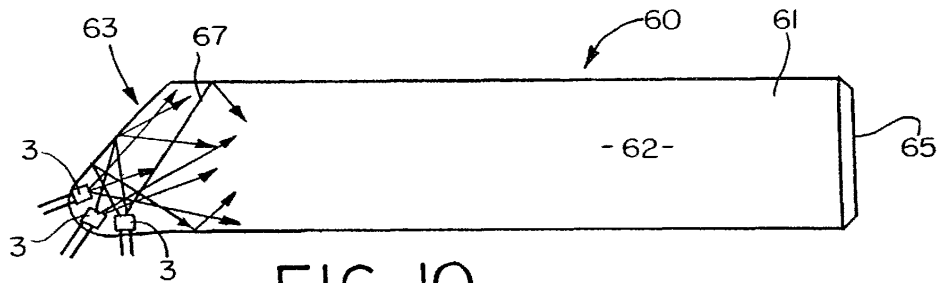


FIG. 10

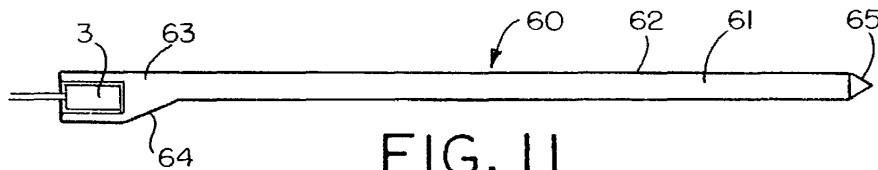


FIG. 11

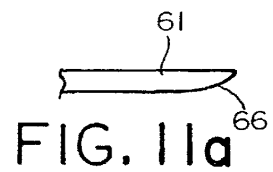


FIG. 11a

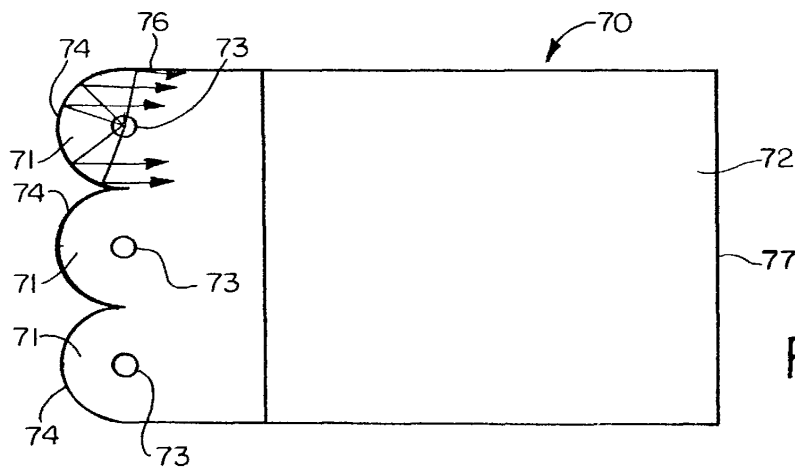
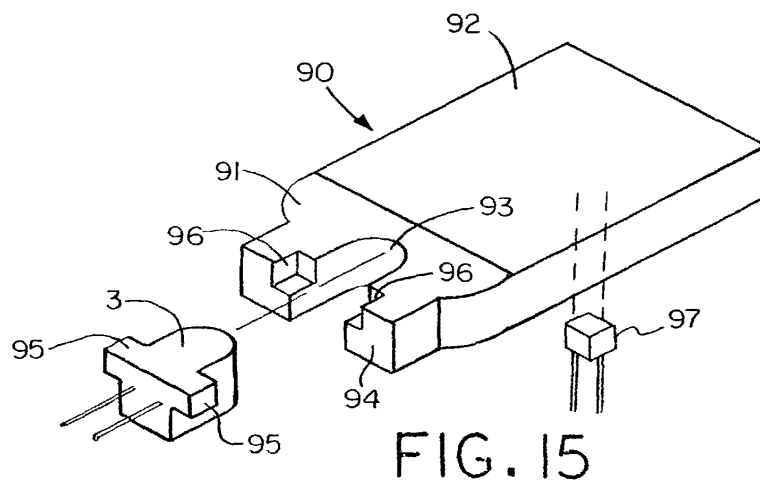
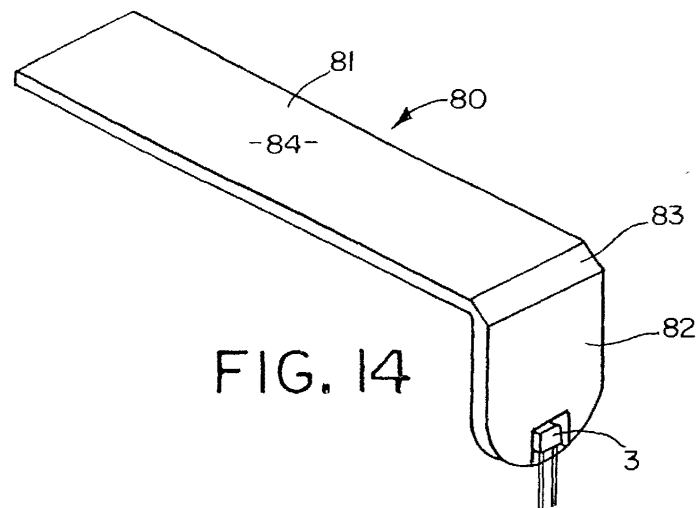


FIG. 12





POWER OF ATTORNEY

As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (List name and registration number)

Name	Registration No.	Name	Registration No.
Donald L. Otto	22,125		

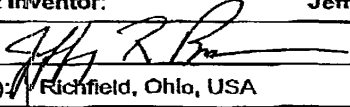
Send Correspondence To:

Donald L. Otto  
Renner, Otto, Boisselle & Sklar, LLP  
1621 Euclid Ave. - 19th Floor  
Cleveland, Ohio 44115-2191

Direct Telephone Calls To:

Name: Donald L. Otto  
Tel. No: 216/621-1113  
Fax No: 216/621-6165

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full Name of Sole or First Inventor:		Jeffery R. Parker	
Inventor's signature:		Date:	8/30/02
Residence: (City & State/Country):	Richfield, Ohio, USA	Citizenship:	USA
Post Office Address:	3050 Whitetail Ct. Richfield, Ohio 44286		

End of Declaration and Power of Attorney (D-US-1.FRM)

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10371 U.S. PTO  
10/23/04  
08/30/02

U.S. UTILITY Patent Application

PATENT NUMBER and  
ISSUE DATE

APPL NUM	FILING DATE	CLASS	SUBCLASS	GAU	EXAMINER
10232047	08/30/2002	362		2875	WARD

**\*\*APPLICANTS:** Parker Jeffery;

**\*\*CONTINUING DATA VERIFIED:**  
This application is a DIV of 09/256,275 02/23/1999  
which is a CIP of 08/778,089 01/02/1997 PAT 6,079,838  
which is a DIV of 08/495,176 06/27/1995 PAT 5,613,751

**\*\* FOREIGN APPLICATIONS VERIFIED:**

PG-PUB	DO NOT PUBLISH <input type="checkbox"/>	RESCIND <input type="checkbox"/>
Foreign priority claimed <input type="checkbox"/> yes <input type="checkbox"/> no		ATTORNEY DOCKET NO
35 USC 119 conditions met <input type="checkbox"/> yes <input type="checkbox"/> no		GL0LP0108USB
Verified and Acknowledged Examiners's initials		
TITLE : Light emitting panel assemblies		

U.S. DEPT. OF COMM. PAT & TM-PTO-436L (Rev. 12-94)

<b>NOTICE OF ALLOWANCE MAILED</b>		<b>CLAIMS ALLOWED</b>	
		Total Claims	Print Claim for O.G
<b>ISSUE FEE</b>		<b>DRAWING</b>	
Amount Due	Date Paid	Sheets Drwg.	Figs. Drwg. Print Fig.
		Application Examiner	
<input type="checkbox"/> <b>TERMINAL DISCLAIMER</b>		<b>PREPARED FOR ISSUE</b>	
<b>WARNING:</b> The information disclosed herein may be restricted. Unauthorized disclosure may be prohibited by the United States Code Title 35, Sections 122, 181 and 368, Possession outside the U.S. Patent & Trademark Office is restricted to authorized employees and contractors only.			

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SEARCH			
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	Date	Exmr.
SEARCH DETERMINE	5-1-05	JAW

INTERFERENCE SEARCHED			
Class	Sub.	Date	Exmr.



**ISSUE SLIP STAPLE AREA (for additional cross-references)**

**ISSUING CLASSIFICATION**

ISSUING CLASSIFICATION															
ORIGINAL					CROSS REFERENCE(S)										
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INTERNATIONAL CLASSIFICATION															
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## INDEX OF CLAIMS

✓	..... Rejected	- (Through numeral) ...	..... Canceled	N	..... Non-elected	A	..... Appeal
=	..... Allowed	+	..... Restricted	I	..... Interference	O	..... Objected

Final	Claim	Date
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UTILITY  
PATENT APPLICATION  
TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	GLOLP0108USB
First Inventor	Jeffery R. Parker
Title	LIGHT EMITTING PANEL ASSEMBLIES
Express Mail Label No.	EV 040751379US

jc971 U.S. PTO  
10/232047  
08/30/02

## APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

1. ☒ Fee Transmittal Form (e.g., PTO/SB/17)  
(Submit an original and a duplicate for fee processing)
2. ☐ Applicant claims small entity status.  
See 37 CFR 1.27.
3. ☒ Specification (Total Pages 26)  
(preferred arrangement set forth below)
- Descriptive title of the invention
  - Cross Reference to Related Applications
  - Statement Regarding Fed sponsored R & D
  - Reference to sequence listing, a table, or a computer program listing appendix
  - Background of the Invention
  - Brief Summary of the Invention
  - Brief Description of the Drawings (if filed)
  - Detailed Description
  - Claim(s)
  - Abstract of the Disclosure
4. ☒ Drawing(s) (35 U.S.C. 113) [Total Sheets 4]  
- Drawings are Formal
5. Oath or Declaration [Total Pages 2]
- a. ☒ Newly executed (original or copy)  
Copy from a prior application (37 CFR 1.63 (d))  
(for continuation/divisional with Box 18 completed)
- b. ☐ DELETION OF INVENTOR(S)  
Signed statement attached deleting inventor(s)  
named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).
6. ☒ Application Data Sheet. See 37 CFR 1.76

ADDRESS TO: Assistant Commissioner for Patents  
Box Patent Application  
Washington, DC 20231

7. ☐ CD-ROM or CD-R in duplicate, large table or Computer Program (Appendix)
8. Nucleotide and/or Amino Acid Sequence Submission (if applicable, all necessary)
- a. ☐ Computer Readable Form (CRF)
- b. Specification Sequence Listing on:
- i. ☐ CD-ROM or CD-R (2 copies); or
  - ii. ☐ paper
- c. ☐ Statements verifying identity of above copies

## ACCOMPANYING APPLICATION PARTS

9. ☐ Assignment Papers (cover sheet & document(s))
10. ☐ 37 CFR 3.73(b) Statement (when there is an assignee) ☐ Power of Attorney
11. ☐ English Translation Document (if applicable)
12. ☐ Information Disclosure Statement (IDS)/PTO-1449 ☐ Copies of IDS Citations
13. ☐ Preliminary Amendment
14. ☒ Return Receipt Postcard (MPEP 503) (Should be specifically itemized)
15. ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed)
16. ☐ Request and Certification under 35 U.S.C. 122 (b)(2)(B)(i). Applicant must attach form PTO/SB/35 or its equivalent.
17. ☒ Other: Cert. of Express Mailing

18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment, or in an Application Data Sheet under 37 CFR 1.76:

☐ Continuation ☒ Divisional ☐ Continuation-in-part (CIP)of prior application No.: 09 / 256,275

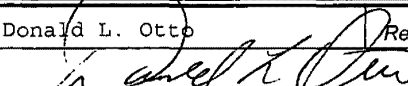
Prior application information:

Examiner Thomas M. SemberGroup Art Unit: 2875

For CONTINUATION OR DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 5b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

## 19. CORRESPONDENCE ADDRESS

<input type="checkbox"/> Customer Number or Bar Code Label	(Insert Customer No. or Attach bar code label here)	or	<input checked="" type="checkbox"/> Correspondence address below
Name	Donald L. Otto		
Address	Renner, Otto, Boisselle & Sklar, LLP 1621 Euclid Avenue, Nineteenth Floor		
City	Cleveland	State	Ohio
Zip Code	44115-2191		
Country	U.S.	Telephone	(216) 621-1113
Fax	(216) 621-6165		

Name (Print/Type)	Donald L. Otto	Registration No. (Attorney/Agent)	22,125
Signature		Date	8/30/02

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# FEE TRANSMITTAL for FY 2002

Patent fees are subject to annual revision.

TOTAL AMOUNT OF PAYMENT (\$) 2462.00

## Complete if Known

Application Number	
Filing Date	Herewith
First Named Inventor	Jeffery R. Parker
Examiner Name	
Group Art Unit	
Attorney Docket No.	GLOLP0108USB

## METHOD OF PAYMENT

1. ☒ The Commissioner is hereby authorized to charge indicated fees and credit any overpayments to:
- Deposit Account Number: 18-0988
- Deposit Account Name: Renner, Otto, Boisselle & Sklar, LLP
- ☒ Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17
- ☐ Applicant claims small entity status. See 37 CFR 1.27
2. ☒ Payment Enclosed:
- ☒ Check ☐ Credit card ☐ Money Order ☐ Other

## FEE CALCULATION

1. BASIC FILING FEE		Large Entity	Small Entity	Fee Description	Fee Paid
Fee Code (\$)	Fee Code (\$)	Fee Code (\$)	Fee Code (\$)		
101	740	201	370	Utility filing fee	740
106	330	206	165	Design filing fee	
107	510	207	255	Plant filing fee	
108	740	208	370	Reissue filing fee	
114	160	214	80	Provisional filing fee	
SUBTOTAL (1)					(\$ 740.00)

## 2. EXTRA CLAIM FEES

Total Claims	Extra Claims	Fee from below	Fee Paid
83	-20** = 63	X 18	= 1134
Independent Claims	10	-3** = 7	X 84 = 588
Multiple Dependent			

.Large Entity Small Entity		Fee Code (\$)	Fee Code (\$)	Fee Description
103	18	203	9	Claims in excess of 20
102	84	202	42	Independent claims in excess of 3
104	280	204	140	Multiple dependent claim, if not paid
109	84	209	42	** Reissue independent claims over original patent
110	18	210	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) (\$ 1,722.00)

\*\*or number previously paid, if greater; For Reissues, see above

## FEE CALCULATION (continued)

## 3. ADDITIONAL FEES

Large Entity	Small Entity	Fee Code (\$)	Fee Code (\$)	Fee Description	Fee Paid
105	130	205	65	Surcharge - late filing fee or oath	
127	50	227	25	Surcharge - late provisional filing fee or cover sheet	
139	130	139	130	Non-English specification	
147	2,520	147	2,520	For filing a request for <i>ex parte</i> reexamination	
112	920*	112	920*	Requesting publication of SIR prior to Examiner action	
113	1,840*	113	1,840*	Requesting publication of SIR after Examiner action	
115	110	215	55	Extension for reply within first month	
116	400	216	200	Extension for reply within second month	
117	920	217	460	Extension for reply within third month	
118	1,440	218	720	Extension for reply within fourth month	
128	1,960	228	980	Extension for reply within fifth month	
119	320	219	160	Notice of Appeal	
120	320	220	160	Filing a brief in support of an appeal	
121	280	221	140	Request for oral hearing	
138	1,510	138	1,510	Petition to institute a public use proceeding	
140	110	240	55	Petition to revive - unavoidable	
141	1,280	241	640	Petition to revive - unintentional	
142	1,280	242	640	Utility issue fee (or reissue)	
143	460	243	230	Design issue fee	
144	620	244	310	Plant issue fee	
122	130	122	130	Petitions to the Commissioner	
123	50	123	50	Processing fee under 37 CFR 1.17(q)	
126	180	126	180	Submission of Information Disclosure Stmt	
581	40	581	40	Recording each patent assignment per property (times number of properties)	
146	740	246	370	Filing a submission after final rejection (37 CFR § 1.129(a))	
149	740	249	370	For each additional invention to be examined (37 CFR § 1.129(b))	
179	740	279	370	Request for Continued Examination (RCE)	
169	900	169	900	Request for expedited examination of a design application	

Other fee (specify)

\*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$)

## SUBMITTED BY

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Signature

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Date

8-30-02

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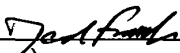
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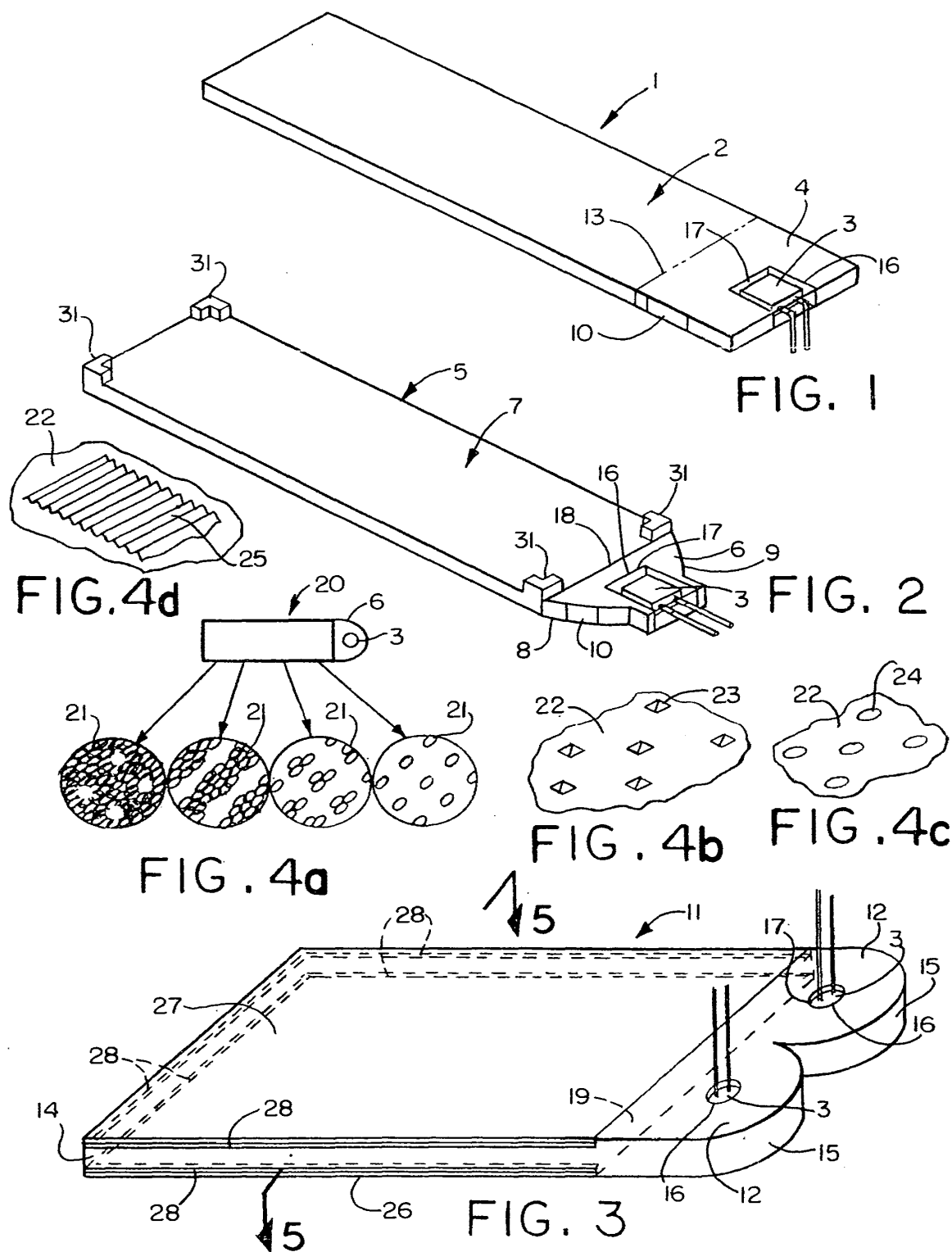
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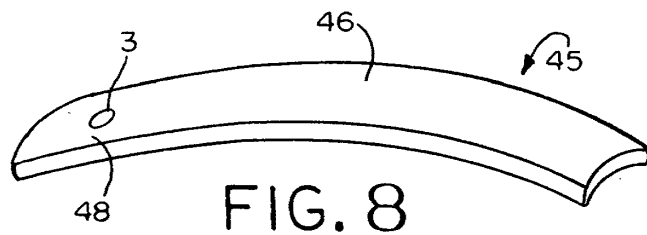
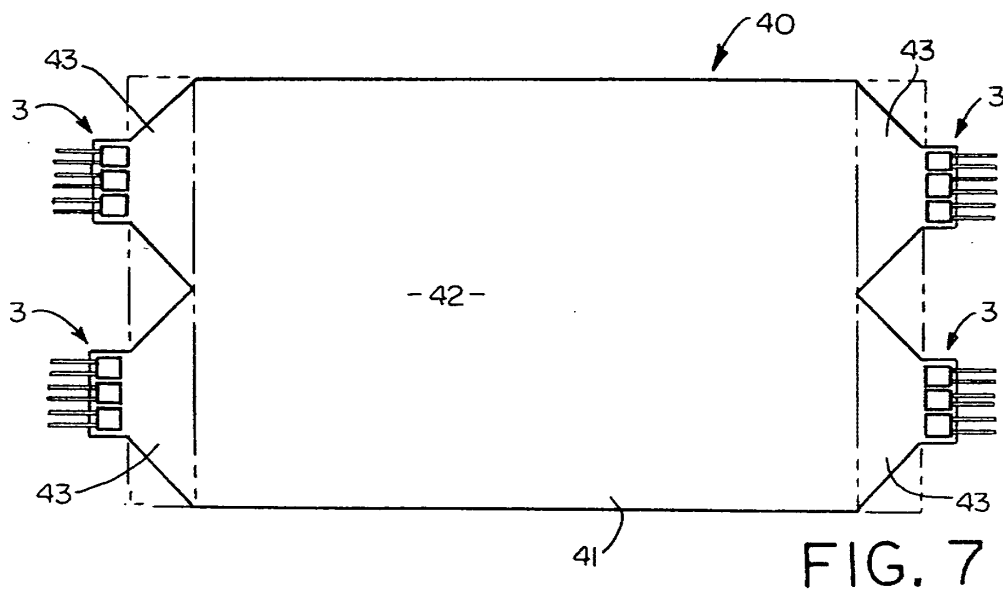
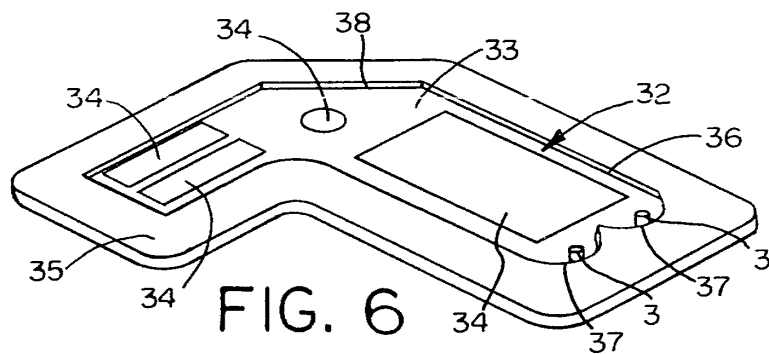
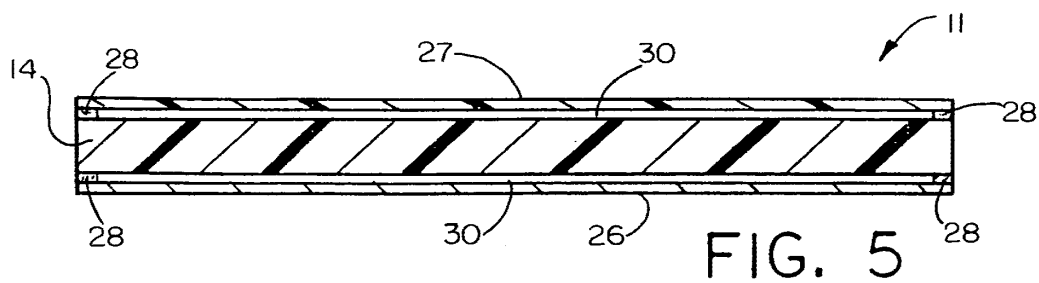
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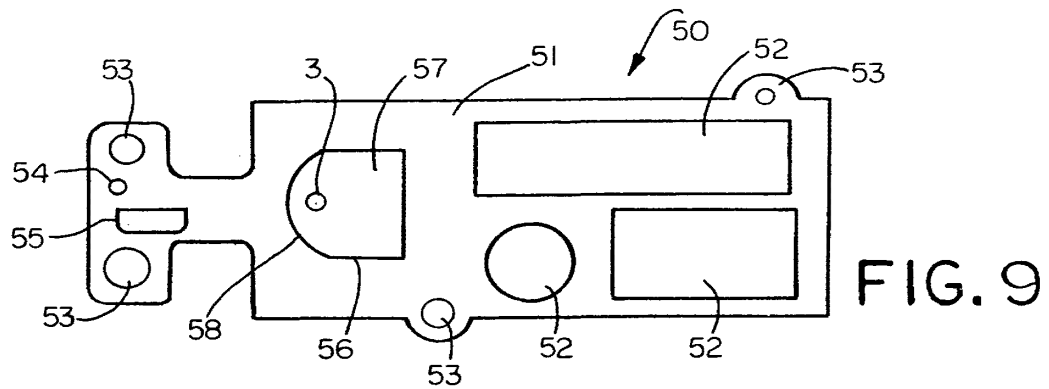


FIG. 9

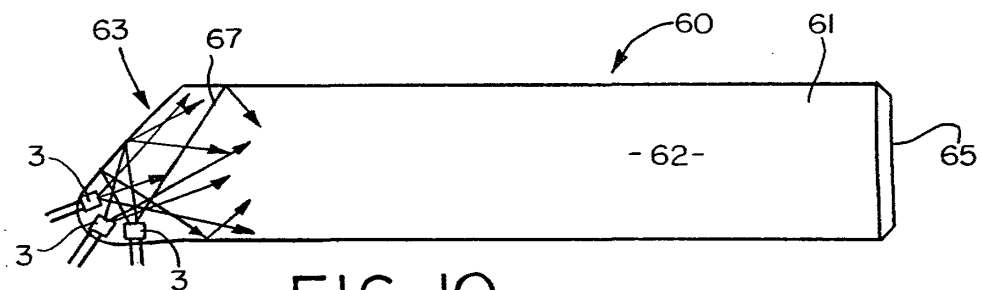


FIG. 10

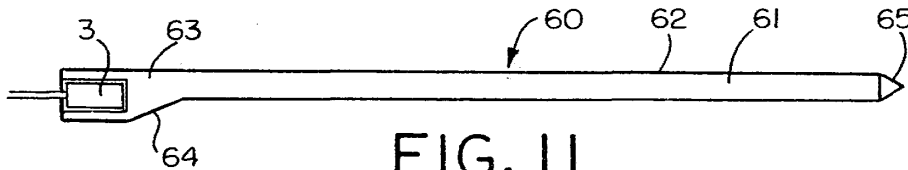


FIG. 11

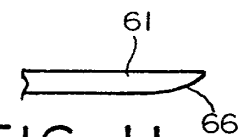


FIG. 11a

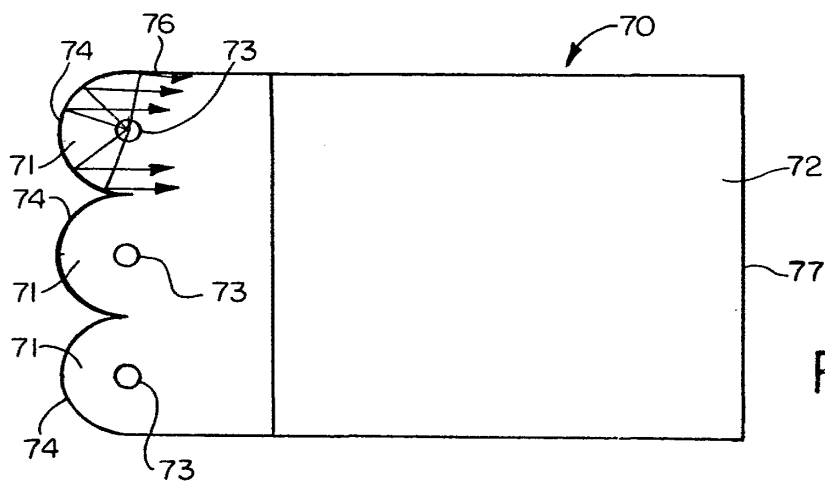
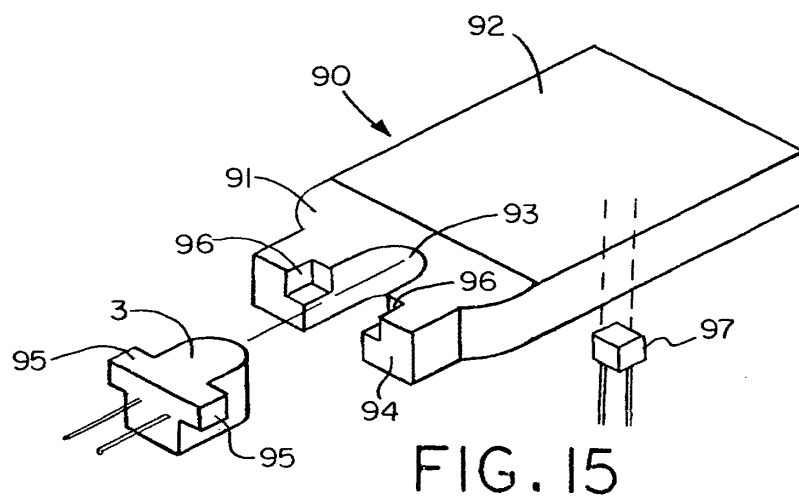
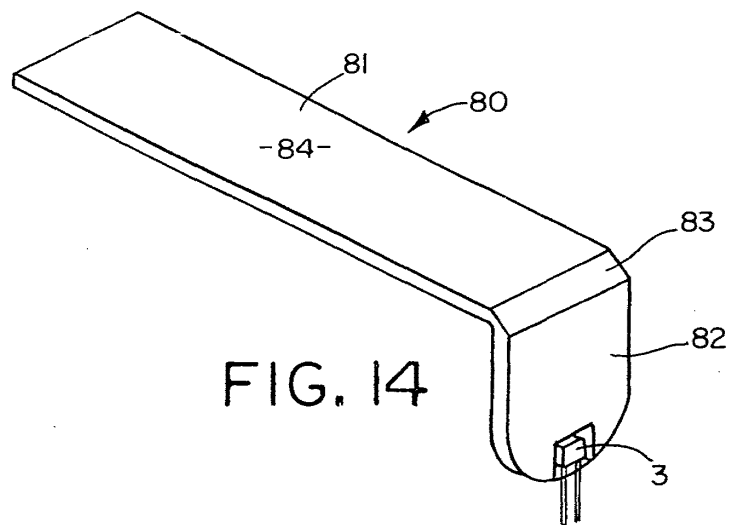
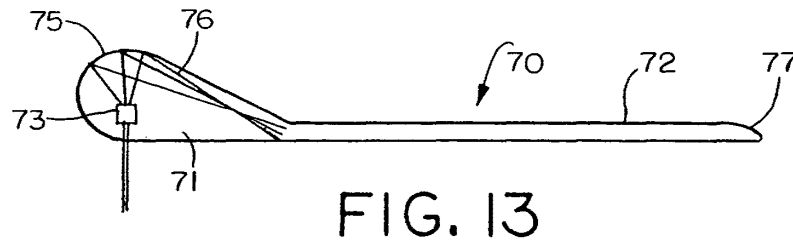


FIG. 12





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5 TITLE: **LIGHT EMITTING PANEL ASSEMBLIES****CROSS-REFERENCE TO RELATED APPLICATIONS**

10 This application is a division of U.S. Patent Application No. 09/256,275, filed February 23, 1999, which is a continuation-in-part of U.S. Patent Application No. 08/778,089, filed January 2, 1997, now U.S. Patent No. 6,079,838, which is a division of U.S. Patent Application No. 08/495,176, filed June 27, 1995, now U.S. Patent No. 5,613,751.

15 **BACKGROUND OF THE INVENTION**

This invention relates generally, as indicated, to light emitting panel assemblies each including a transparent panel member for efficiently conducting light, and controlling the light conducted by the panel member to be emitted from one or more light output areas along the length thereof.

20 Light emitting panel assemblies are generally known. However, the present invention relates to several different light emitting panel assembly configurations which provide for better control of the light output from the panel assemblies and for more efficient utilization of light, which results in greater light output from the panel assemblies.

25

**SUMMARY OF THE INVENTION**

In accordance with one aspect of the invention, the light emitting panel assemblies include a light emitting panel member having a light transition area in which at least one light source is suitably mounted for transmission of light to the light input surface of the panel member.

30

In accordance with another aspect of the invention, the light source is desirably embedded, potted or bonded to the light transition area to eliminate any air gaps, decrease surface reflections and/or eliminate any lens effect

between the light source and light transition area, thereby reducing light loss and increasing the light output from the panel assembly.

5 In accordance with another aspect of the invention, the panel assemblies may include reflective or refractive surfaces for changing the path of a portion of the light, emitted from the light source, that would not normally enter the panel members at an acceptable angle that allows the light to remain in the panel members for a longer period of time and/or increase the efficiency of the panel members.

10 In accordance with another aspect of the invention, the light emitting panel members include a pattern of light extracting deformities or disruptions which provide a desired light output distribution from the panel members by changing the angle of refraction of a portion of the light from one or more light output areas of the panel members.

15 In accordance with still another aspect of the invention, the light source may include multiple colored light sources for supplying light to one or more light output areas, and for providing a colored or white light output distribution.

20 In accordance with yet another aspect of the invention, the panel assemblies include a transition area for mixing the multiple colored lights, prior to the light entering the panel members, in order to effect a desired colored or white light output distribution.

25 The various light emitting panel assemblies of the present invention are very efficient panel assemblies that may be used to produce increased uniformity and higher light output from the panel members with lower power requirements, and allow the panel members to be made thinner and/or longer, and/or of various shapes and sizes.

30 To the accomplishment of the foregoing and related ends, the invention then comprises the features hereinafter fully described and particularly pointed out in the claims, the following description and the annexed drawings setting forth in detail certain illustrative embodiments of the invention, these being indicative, however, of but several of the various ways in which the principles of the invention may be employed.

## BRIEF DESCRIPTION OF THE DRAWINGS

In the annexed drawings:

Figs. 1 through 3 are schematic perspective views of three different forms of light emitting panel assemblies in accordance with this invention;

5           Fig. 4a is an enlarged plan view of a portion of a light output area of a panel assembly showing one form of pattern of light extracting deformities on the light output area;

          Figs. 4b, c and d are enlarged schematic perspective views of a portion of a light output area of a panel assembly showing other forms of light extracting  
10           deformities formed in or on the light output area;

          Fig. 5 is an enlarged transverse section through the light emitting panel assembly of Fig. 3 taken generally on the plane of the line 5-5 thereof;

          Fig. 6 is a schematic perspective view of another form of light emitting panel assembly in accordance with this invention;

15           Fig. 7 is a schematic top plan view of another form of light emitting panel assembly in accordance with this invention;

          Fig. 8 is a schematic perspective view of another form of light emitting panel assembly in accordance with this invention;

          Fig. 9 is a schematic top plan view of another form of light emitting panel  
20           assembly in accordance with this invention;

          Fig. 10 is a schematic top plan view of still another form of light emitting panel assembly in accordance with this invention;

          Fig. 11 is a side elevation view of the light emitting panel assembly of Fig.  
10;

25           Fig. 11a is a fragmentary side elevation view showing a tapered or rounded end on the panel member in place of the prismatic surface shown in Figs. 10 and 11;

          Fig. 12 is a schematic top plan view of another form of light emitting panel assembly in accordance with this invention;

30           Fig. 13 is a schematic side elevation view of the light emitting panel assembly of Fig. 12; and

Figs. 14 and 15 are schematic perspective views of still other forms of light emitting panel assemblies in accordance with this invention.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

5 Referring now in detail to the drawings, and initially to Fig. 1, there is schematically shown one form of light emitting panel assembly 1 in accordance with this invention including a transparent light emitting panel 2 and one or more light sources 3 which emit light in a predetermined pattern in a light transition member or area 4 used to make the transition from the light source 3 to the light  
10 emitting panel 2, as well known in the art. The light that is transmitted by the light transition area 4 to the transparent light emitting panel 2 may be emitted along the entire length of the panel or from one or more light output areas along the length of the panel as desired to produce a desired light output distribution to fit a particular application.

15 In Fig. 1 the light transition area 4 is shown as an integral extension of one end of the light emitting panel 2 and as being generally rectangular in shape. However, the light transition area may be of other shapes suitable for embedding, potting, bonding or otherwise mounting the light source. Also, reflective or refractive surfaces may be provided to increase efficiency.  
20 Moreover, the light transition area 4 may be a separate piece suitably attached to the light input surface 13 of the panel member if desired. Also, the sides of the light transition area may be curved to more efficiently reflect or refract a portion of the light emitted from the light source through the light emitting panel at an acceptable angle.

25 Fig. 2 shows another form of light emitting panel assembly 5 in accordance with this invention including a panel light transition area 6 at one end of the light emitting panel 7 with sides 8, 9 around and behind the light source 3 shaped to more efficiently reflect and/or refract and focus the light emitted from the light source 3 that impinges on these surfaces back through the light  
30 transition area 6 at an acceptable angle for entering the light input surface 18 at one end of the light emitting panel 7. Also, a suitable reflective material or

coating 10 may be provided on the portions of the sides of the light transition areas of the panel assemblies of Figs. 1 and 2 on which a portion of the light impinges for maximizing the amount of light or otherwise changing the light that is reflected back through the light transition areas and into the light emitting panels.

The panel assemblies shown in Figs. 1 and 2 include a single light source 3, whereas Fig. 3 shows another light emitting panel assembly 11 in accordance with this invention including two light sources 3. Of course, it will be appreciated that the panel assemblies of the present invention may be provided with any number of light sources as desired, depending on the particular application.

The panel assembly 11 of Fig. 3 includes a light transition area 12 at one end of the light emitting panel 14 having reflective and/or refractive surfaces 15 around and behind each light source 3. These surfaces 15 may be appropriately shaped including for example curved, straight and/or faceted surfaces, and if desired, suitable reflective materials or coatings may be provided on portions of these surfaces to more efficiently reflect and/or refract and focus a portion of the light emitted for example from an incandescent light source which emits light in a 360° pattern through the light transition areas 12 into the light input surface 19 of the light emitting panel 14.

The light sources 3 may be mechanically held in any suitable manner in slots, cavities or openings 16 machined, molded or otherwise formed in the light transition areas of the panel assemblies. However, preferably the light sources 3 are embedded, potted or bonded in the light transition areas in order to eliminate any air gaps or air interface surfaces between the light sources and surrounding light transition areas, thereby reducing light loss and increasing the light output emitted by the light emitting panels. Such mounting of the light sources may be accomplished, for example, by bonding the light sources 3 in the slots, cavities or openings 16 in the light transition areas using a sufficient quantity of a suitable embedding, potting or bonding material 17. The slots, cavities or openings 16 may be on the top, bottom, sides or back of the light transition areas. Bonding can also be accomplished by a variety of methods that do not

incorporate extra material, for example, thermal bonding, heat staking, ultrasonic or plastic welding or the like. Other methods of bonding include insert molding and casting around the light source(s).

5 A transparent light emitting material of any suitable type, for example acrylic or polycarbonate, may be used for the light emitting panels. Also, the panels may be substantially flat, or curved, may be a single layer or multi-layers, and may have different thicknesses and shapes. Moreover, the panels may be flexible, or rigid, and may be made out of a variety of compounds. Further, the panels may be hollow, filled with liquid, air, or be solid, and may have holes or  
10 ridges in the panels.

Each light source 3 may also be of any suitable type including, for example, any of the types disclosed in U.S. Patent Nos. 4,897,771 and 5,005,108, assigned to the same assignee as the present application, the entire disclosures of which are incorporated herein by reference. In particular, the light  
15 sources 3 may be an arc lamp, an incandescent bulb which also may be colored, filtered or painted, a lens end bulb, a line light, a halogen lamp, a light emitting diode (LED), a chip from an LED, a neon bulb, a fluorescent tube, a fiber optic light pipe transmitting from a remote source, a laser or laser diode, or any other suitable light source. Additionally, the light sources 3 may be a multiple colored  
20 LED, or a combination of multiple colored radiation sources in order to provide a desired colored or white light output distribution. For example, a plurality of colored lights such as LEDs of different colors (red, blue, green) or a single LED with multiple colored chips may be employed to create white light or any other colored light output distribution by varying the intensities of each individual  
25 colored light.

A pattern of light extracting deformities or disruptions may be provided on one or both sides of the panel members or on one or more selected areas on one or both sides of the panel members, as desired. Fig. 4a schematically shows one such light surface area 20 on which a pattern of light extracting  
30 deformities or disruptions 21 is provided. As used herein, the term deformities or disruptions are used interchangeably to mean any change in the shape or

geometry of the panel surface and/or coating or surface treatment that causes a portion of the light to be emitted. The pattern of light extracting deformities 21 shown in Fig. 4a includes a variable pattern which breaks up the light rays such that the internal angle of reflection of a portion of the light rays will be great  
5 enough to cause the light rays either to be emitted out of the panel through the side or sides on which the light extracting deformities 21 are provided or reflected back through the panel and emitted out the other side.

These deformities or disruptions 21 can be produced in a variety of manners, for example, by providing a painted pattern, an etched pattern, a  
10 machined pattern, a printed pattern, a hot stamped pattern, or a molded pattern or the like on selected light output areas of the panel members. An ink or printed pattern may be applied for example by pad printing, silk screening, ink jet, heat transfer film process or the like. The deformities may also be printed on a sheet or film which is used to apply the deformities to the panel member. This sheet or  
15 film may become a permanent part of the light panel assembly for example by attaching or otherwise positioning the sheet or film against one or both sides of the panel member similar to the sheet or film 27 shown in Figs. 3 and 5 in order to produce a desired effect.

By varying the density, opaqueness or translucence, shape, depth, color,  
20 area, index of refraction, or type of deformities 21 on an area or areas of the panels, the light output of the panels can be controlled. The deformities or disruptions may be used to control the percent of light emitted from any area of the panels. For example, less and/or smaller size deformities 21 may be placed on panel areas where less light output is wanted. Conversely, a greater  
25 percentage of and/or larger deformities may be placed on areas of the panels where greater light output is desired.

Varying the percentages and/or size of deformities in different areas of the panel is necessary in order to provide a uniform light output distribution. For example, the amount of light traveling through the panels will ordinarily be  
30 greater in areas closer to the light source than in other areas further removed from the light source. A pattern of light extracting deformities 21 may be used to



adjust for the light variances within the panel members, for example, by providing a denser concentration of light extracting deformities with increased distance from the light source 3 thereby resulting in a more uniform light output distribution from the light emitting panels.

5           The deformities 21 may also be used to control the output ray angle distribution of the emitted light to suit a particular application. For example, if the panel assemblies are used to provide a liquid crystal display backlight, the light output will be more efficient if the deformities 21 cause the light rays to emit from the panels at predetermined ray angles such that they will pass through the  
10       liquid crystal display with low loss.

          Additionally, the pattern of light extracting deformities may be used to adjust for light output variances attributed to light extractions of the panel members. The pattern of light extracting deformities 21 may be printed on the light output areas utilizing a wide spectrum of paints, inks, coatings, epoxies, or  
15       the like, ranging from glossy to opaque or both, and may employ half-tone separation techniques to vary the deformity 21 coverage. Moreover, the pattern of light extracting deformities 21 may be multiple layers or vary in index of refraction.

          Print patterns of light extracting deformities 21 may vary in shapes such  
20       as dots, squares, diamonds, ellipses, stars, random shapes, and the like, and are desirably .006 square inch per deformity/element or less. Also, print patterns that are 60 lines per inch or finer are desirably employed, thus making the deformities or shapes 21 in the print patterns nearly invisible to the human eye in a particular application thereby eliminating the detection of gradient or banding  
25       lines that are common to light extracting patterns utilizing larger elements. Additionally, the deformities may vary in shape and/or size along the length and/or width of the panel members. Also, a random placement pattern of the deformities may be utilized throughout the length and/or width of the panel members. The deformities may have shapes or a pattern with no specific angles  
30       to reduce moiré or other interference effects. Examples of methods to create these random patterns are printing a pattern of shapes using stochastic print

pattern techniques, frequency modulated half tone patterns, or random dot half tones. Moreover, the deformities may be colored in order to effect color correction in the panel members. The color of the deformities may also vary throughout the panel members, for example to provide different colors for the same or different light output areas.

In addition to or in lieu of the patterns of light extracting deformities 21 shown in Fig. 4a, other light extracting deformities including prismatic surfaces, depressions or raised surfaces of various shapes using more complex shapes in a mold pattern may be molded, etched, stamped, thermoformed, hot stamped or the like into or on one or more areas of the panel member. Figs. 4b and 4c show panel areas 22 on which prismatic surfaces 23 or depressions 24 are formed in the panel areas, whereas Fig. 4d shows prismatic or other reflective or refractive surfaces 25 formed on the exterior of the panel area. The prismatic surfaces, depressions or raised surfaces will cause a portion of the light rays contacted thereby to be emitted from the panel member. Also, the angles of the prisms, depressions or other surfaces may be varied to direct the light in different directions to produce a desired light output distribution or effect. Moreover, the reflective or refractive surfaces may have shapes or a pattern with no specific angles to reduce moiré or other interference effects.

As best seen in the cross sectional view of Fig. 5, a back reflector (including trans reflectors) 26 may be attached or positioned against one side of the panel member 14 of Fig. 3 using a suitable adhesive 28 or other method in order to improve light output efficiency of the panel assembly 11 by reflecting the light emitted from that side back through the panel for emission through the opposite side. Additionally, a pattern of light extracting deformities 21, 23, 24 and/or 25 may be provided on one or both sides of the panel member in order to change the path of the light so that the internal critical angle is exceeded and a portion of the light is emitted from one or both sides of the panel. Moreover, a transparent film, sheet or plate 27 may be attached or positioned against the side or sides of the panel member from which light is emitted using a suitable adhesive 28 or other method in order to produce a desired effect.

The member 27 may be used to further improve the uniformity of the light output distribution. For example, the member 27 may be a colored film, a diffuser, or a label or display, a portion of which may be a transparent overlay that may be colored and/or have text or an image thereon.

5 If adhesive 28 is used to adhere the back reflector 26 and/or film 27 to the panel, the adhesive is preferably applied only along the side edges of the panel, and if desired the end edge opposite the light transition areas 12, but not over the entire surface area or areas of the panel because of the difficulty in consistently applying a uniform coating of adhesive to the panel. Also, the  
 10 adhesive changes the internal critical angle of the light in a less controllable manner than the air gaps 30 (see Fig. 5) which are formed between the respective panel surfaces and the back reflector 26 and/or film 27 when only adhered along the peripheral edges. Additionally, longer panel members are achievable when air gaps 30 are used. If adhesive were to be used over the  
 15 entire surface, the pattern of deformities could be adjusted to account for the additional attenuation in the light caused by the adhesive.

Referring further to Fig. 2, the panel assembly 5 shown therein also includes molded posts 31 at one or more corners of the panel 7 (four such posts being shown) which may be used to facilitate mounting of the panel assembly  
 20 and providing structural support for other parts or components, for example, a display panel such as a liquid crystal display panel as desired.

Fig. 6 shows another form of light emitting panel assembly 32 in accordance with this invention including a panel member 33, one or more light sources 3, and one or more light output areas 34. In addition, the panel  
 25 assembly 32 includes a tray 35 having a cavity or recess 36 in which the panel assembly 32 is received. The tray 35 may act as a back reflector as well as end edge and/or side edge reflectors for the panel 33 and side and/or back reflectors 37 for the light sources 3. Additionally, one or more secondary reflective or refractive surfaces 38 may be provided on the panel member 33 and/or tray 35 to  
 30 reflect a portion of the light around one or more corners or curves in a non-rectangular shaped panel member 33. These secondary reflective/refractive

surfaces 38 may be flat, angled, faceted or curved, and may be used to extract a portion of the light away from the panel member in a predetermined pattern. Fig. 6 also shows multiple light output areas 34 on the panel member that emit light from one or more light sources 3.

5 Fig. 7 is a schematic illustration of still another form of light emitting panel assembly 40 in accordance with this invention including a panel member 41 having one or more light output areas 42 and one or more light transition areas (mixing areas) 43 containing a plurality of light sources 3 at one or both ends of the panel. Each transition area mixes the light from one or more light sources  
10 having different colors and/or intensities. In this particular embodiment, each of the light sources 3 desirably employs three colored LEDs (red, blue, green) in each transition mixing area 43 so that the light from the three LEDs can be mixed to produce a desired light output color that will be emitted from the light output area 42. Alternatively, each light source may be a single LED having multiple  
15 colored chips bonded to the lead film. Also, two colored LEDs or a single LED having two colored chips may be used for a particular application. By varying the intensities of the individual respective LEDs, virtually any colored light output or white light distribution can be achieved.

Fig. 8 shows yet another form of light emitting panel assembly 45 in  
20 accordance with this invention including a light emitting panel member 46 and a light source 3 in a light transition area 48 integral with one end of the panel member. In this particular embodiment, the panel member 46 is three-dimensionally curved, for example, such that light rays may be emitted in a manner that facilitates aesthetic design of a lighted display.

25 Fig. 9 schematically shows another form of light emitting panel assembly 50 in accordance with this invention, including a panel member 51 having multiple light output areas 52, and mounting posts and/or mounting tabs 53. This particular panel assembly 50 may serve as a structural member to support other parts or components as by providing holes or cavities 54, 55 in the panel  
30 member 51 which allow for the insertion of modular components or other parts into the panel member. Moreover, a separate cavity or recess 56 may be

provided in the panel member 51 for receipt of a correspondingly shaped light transition area 57 having one or more light sources 3 embedded, bonded, cast, insert molded, epoxied, or otherwise mounted or positioned therein and a curved reflective or refractive surface 58 on the transition area 57 and/or wall of the cavity or recess 56 to redirect a portion of the light in a predetermined manner. In this way the light transition area 57 and/or panel member may be in the form of a separate insert which facilitates the easy placement of the light source in a modular manner. A reflector 58 may be placed on the reflective or refractive surface of the cavity or recess 56 or insert 57. Where the reflector 58 is placed on the reflective or refractive surface of the cavity or recess 56, the cavity or recess may act as a mold permitting transparent material from which the transition area 57 is made to be cast around one or more light sources 3.

Figs. 10 and 11 schematically show another form of light emitting panel assembly 60 in accordance with this invention including a panel member 61 having one or more light output areas 62. In this particular embodiment, an off-axis light transition area 63 is provided that is thicker in cross section than the panel member to permit use of one or more light sources 3 embedded or otherwise mounted in the light transition area that are dimensionally thicker than the panel member. Also, a three-dimensional reflective surface 64 (Fig. 11) may be provided on the transition area 63. Moreover, a prism 65 (Fig. 11) or tapered, rounded, or otherwise shaped end 66 (Fig. 11a) may be provided at the end of the panel opposite the light sources 3 to perform the function of an end reflector. The light sources 3 may be oriented at different angles relative to each other and offset to facilitate better mixing of the light rays 67 in the transition area 63 as schematically shown in Fig. 10 and/or to permit a shorter length transition area 63 to be used.

Figs. 12 and 13 schematically show still another form of light emitting panel assembly 70 in accordance with this invention which includes one or more light transition areas 71 at one or both ends of the panel member 72 each containing a single light source 73. The transition area or areas 71 shown in Figs. 12 and 13 collect light with multiple or three-dimensional surfaces and/or

collect light in more than one plane. For example each transition area 71 shown in Figs. 12 and 13 has elliptical and parabolic shape surfaces 74 and 75 in different planes for directing the light rays 76 into the panel member at a desired angle.

5 Providing one or more transition areas at one or both ends of the panel member of any desired dimension to accommodate one or more light sources, with reflective and/or refractive surfaces on the transition areas for redirecting the light rays into the panel member at relatively low angles allows the light emitting panel member to be made much longer and thinner than would  
10 otherwise be possible. For example the panel members of the present invention may be made very thin, *i.e.*, 0.125 inch thick or less.

Fig. 14 schematically illustrates still another form of light emitting panel assembly 80 in accordance with this invention including a light emitting panel 81 and one or more light sources 3 positioned, embedded, potted, bonded or  
15 otherwise mounted in a light transition area 82 that is at an angle relative to the panel member 81 to permit more efficient use of space. An angled or curved reflective or refractive surface 83 is provided at the junction of the panel member 81 with the transition area 82 in order to reflect/refract light from the light source 3 into the body of the panel member 81 for emission of light from one or more  
20 light emitting areas 84 along the length of the panel member.

Fig. 15 schematically illustrates still another form of light emitting panel assembly 90 in accordance with this invention including a light transition area 91 at one or both ends of a light emitting panel member 92 containing a slot 93 for sliding receipt of an LED or other suitable light source 3. Preferably the slot 93  
25 extends into the transition area 91 from the back edge 94, whereby the light source 3 may be slid and/or snapped in place in the slot from the back, thus allowing the transition area to be made shorter and/or thinner. The light source 3 may be provided with wings, tabs or other surfaces 95 for engagement in correspondingly shaped recesses or grooves 96 or the like in the transition area  
30 91 for locating and, if desired, securing the light source in place. Also, the light source 3 may be embedded, potted, bonded or otherwise secured within the slot

93 in the light transition area 91 of the panel member 92. Light from a secondary light source 97 may be projected through the panel member 92 for indication or some other effect.

5      11215      ~ The various light emitting panel assemblies disclosed herein may be used  
WRT  
PBP  
for a great many different applications including for example LCD back lighting or  
lighting in general, decorative and display lighting, automotive lighting, dental  
lighting, phototherapy or other medical lighting, membrane switch lighting, and  
sporting goods and apparel lighting or the like. Also the panel assemblies may  
be made such that the panel members and deformities are transparent without a  
10 back reflector. This allows the panel assemblies to be used for example to front  
light an LCD or other display such that the display is viewed through the  
transparent panel members.

15      Although the invention has been shown and described with respect to  
certain preferred embodiments, it is obvious that equivalent alterations and  
modifications will occur to others skilled in the art upon the reading and  
understanding of the specification. The present invention includes all such  
equivalent alterations and modifications, and is limited only by the scope of the  
claims.

## WHAT IS CLAIMED IS:

1. A backlight assembly comprising a light emitting member, a substrate overlying said light emitting member, said substrate having a pattern of deformities on at least one side of said substrate for controlling an output ray angle distribution of light emitted by said light emitting member to suit a particular application, said deformities varying in at least one of the following characteristics: size, shape, placement, index of refraction, density, angle, depth, height, and type.

2. The assembly of claim 1 wherein said substrate comprises any one of a sheet, film and plate.

3. The assembly of claim 1 wherein said deformities are shaped deformities.

4. The assembly of claim 3 wherein said deformities comprise depressions in said substrate.

5. The assembly of claim 3 wherein said deformities comprise projections on said substrate.

6. The assembly of claim 1 wherein said substrate is attached to said light emitting member.

7. The assembly of claim 1 wherein said substrate has at least one of a coating and surface treatment for causing the light to pass through a liquid crystal display with low loss.

8. The assembly of claim 1 wherein said deformities are on opposite sides of said substrate.



9. The assembly of claim 1 wherein said substrate comprises at least one of multiple layers and materials.

10. The assembly of claim 9 wherein said at least one of said multiple layers and materials have a different index of refraction.

11. The assembly of claim 1 wherein said substrate has both reflective and refractive surfaces.

12. The assembly of claim 1 wherein at least one of the characteristics of the deformities are varied to reduce moiré or other interference effects when said assembly is assembled to a liquid crystal display.

13. The assembly of claim 1 wherein more than one said substrate overlie said light emitting member.

14. The assembly of claim 1 wherein said deformities are at least one of prisms, prismatic and lenticular.

15. The assembly of claim 14 wherein the individual deformities are quite small in relation to the width and length of said substrate.

16. A backlight assembly comprising a light emitting member, a substrate overlying said light emitting member, said substrate having a pattern of deformities on at least one side of said substrate for controlling an output ray angle distribution of light emitted by said light emitting member to suit a particular application, said deformities being random in at least one of the following characteristics: size, shape, placement, index of refraction, density, angle, depth, height, type.

17. The assembly of claim 16 wherein said substrate has at least one of a coating and surface treatment for causing the light to pass through a liquid crystal display with low loss.

5 18. The assembly of claim 16 wherein said deformities are on opposite sides of said substrate.

19. The assembly of claim 16 wherein said substrate comprises at least one of multiple layers and materials.

10

20. The assembly of claim 19 wherein said at least one of said multiple layers and materials have a different index of refraction.

15 21. The assembly of claim 16 wherein said substrate has both reflective and refractive surfaces.

22. The assembly of claim 16 wherein at least one of the characteristics of the deformities are varied to reduce moiré or other interference effects when said assembly is assembled to a liquid crystal display.

20

23. The assembly of claim 16 wherein more than one said substrate overlie said light emitting member.

25 24. The assembly of claim 16 wherein said substrate has at least one of prismatic and lenticular deformities on at least one surface of said substrate.

25. The assembly of claim 24 wherein the individual deformities are quite small in relation to the width and length of said substrate.

30 26. A backlight assembly comprising a light emitting member, a substrate overlying said light emitting member, said substrate having a multitude

of deformities on at least one side of said substrate for controlling an output ray angle distribution of light emitted by said light emitting member to suit a particular application, said deformities comprising at least one of depressions and projections on said one side, said projections having at least one of a shape and pattern with no specific angle.

27. A backlight assembly comprising a light emitting member, a substrate overlying said light emitting member, said substrate having a multitude of deformities on at least one side of said substrate for controlling an output ray angle distribution of light emitted by said light emitting member to suit a particular application, said deformities comprising at least one of shaped depressions and projections on said one side, at least some of said deformities including prismatic surfaces having angles that vary among said deformities.

28. A backlight assembly comprising a light emitting member, a substrate overlying said light emitting member, said substrate having a multitude of deformities on at least one side of said substrate for controlling an output ray angle distribution of light emitted by said light emitting member to suit a particular application, said deformities comprising at least one of shaped depressions and projections on said one side, at least some of said deformities having angles that vary among said deformities.

29. A liquid crystal backlight assembly comprising a light emitting member including at least one sheet or film having deformities or disruptions on at least one side, at least some of said deformities or disruptions varying in shape or geometry for causing light rays to be emitted from said backlight assembly at predetermined ray angles such that the light rays will pass through a liquid crystal display with low loss.

30. The assembly of claim 29 wherein said sheet or film has at least one of a coating and surface treatment for causing the light to pass through such liquid crystal display with low loss.

5 31. The assembly of claim 29 wherein said deformities or disruptions are on opposite sides of said sheet or film.

32. The assembly of claim 29 wherein said sheet or film comprises at least one of multiple layers and materials.

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33. The assembly of claim 9 wherein said at least one of said multiple layers and materials have a different index of refraction.

15 34. The assembly of claim 29 wherein said sheet or film has both reflective and refractive surfaces.

35. The assembly of claim 29 wherein at least one of the characteristics of the deformities or disruptions is varied to reduce moiré or other interference effects when said assembly is assembled to a liquid crystal display.

20

36. The assembly of claim 29 wherein said light emitting member includes more than one sheet or film.

25 37. The assembly of claim 29 wherein said one surface of said sheet or film has at least one of prismatic and lenticular deformities.

38. The assembly of claim 37 wherein the individual deformities are quite small in relation to the width and length of said substrate.

30 39. A liquid crystal backlight assembly comprising a light emitting member including at least one sheet or film having deformities or disruptions on

at least one side, at least some of said deformities or disruptions having random shapes or geometries for causing light rays to be emitted from said backlight assembly at predetermined ray angles such that the light rays will pass through a liquid crystal display with low loss.

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40. The assembly of claim 39 wherein said sheet or film has at least one of a coating and surface treatment for causing the light to pass through such liquid crystal display with low loss.

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41. The assembly of claim 39 wherein said deformities or disruptions are on opposite sides of said sheet or film.

42. The assembly of claim 39 wherein said sheet or film comprises at least one of multiple layers and materials.

15

43. The assembly of claim 42 wherein said at least one of said multiple layers and materials have a different index of refraction.

20

44. The assembly of claim 39 wherein said sheet or film has both reflective and refractive surfaces.

25

45. The assembly of claim 39 wherein at least one of the characteristics of the deformities or disruptions is varied to reduce moiré or other interference effects when said assembly is assembled to a liquid crystal display.

30

46. The assembly of claim 39 wherein said light emitting member includes more than one sheet or film.

47. The assembly of claim 39 wherein said one surface of said sheet or film has at least one of prismatic and lenticular deformities.

48. The assembly of claim 47 wherein the individual deformities are quite small in relation to the width and length of said substrate.

49. A liquid crystal backlight assembly comprising a light emitting member including at least one sheet or film having deformities or disruptions on at least one side, at least some of said deformities or disruptions having random or varying changes in shape or geometry for causing light rays to be emitted from said backlight assembly at predetermined ray angles such that the light rays will pass through a liquid crystal display with low loss.

50. The assembly of claim 49 wherein said sheet or film has at least one of a coating and surface treatment for causing the light to pass through such liquid crystal display with low loss.

51. The assembly of claim 49 wherein said deformities or disruptions are on opposite sides of said sheet or film.

52. The assembly of claim 49 wherein said sheet or film comprises at least one of multiple layers and materials.

53. The assembly of claim 52 wherein said at least one of said multiple layers and materials have a different index of refraction.

54. The assembly of claim 49 wherein said sheet or film has both reflective and refractive surfaces.

55. The assembly of claim 49 wherein at least one of the characteristics of the deformities or disruptions is varied to reduce moiré or other interference effects when said assembly is assembled to a liquid crystal display.

56. The assembly of claim 49 wherein said light emitting member includes more than one sheet or film.

57. The assembly of claim 49 wherein said one surface of said sheet or film has at least one of prismatic and lenticular deformities.

58. The assembly of claim 57 wherein the individual deformities are quite small in relation to the width and length of said substrate.

59. A liquid crystal backlight assembly comprising a light emitting member including at least one sheet or film having random or varying changes in at least one of a coating and surface treatment on at least one side for causing light rays to be emitted from said backlight assembly and pass through a liquid crystal display with low loss.

60. The assembly of claim 59 wherein the at least one of the coating and surface treatment varies in at least one of the following characteristics: density, color, index of refraction, reflection, opaqueness, translucence, area, depth, shape, size, and type.

61. The assembly of claim 59 wherein the at least one of the coating and surface treatment is at least one of paint, ink and epoxy.

62. The assembly of claim 59 wherein said deformities or disruptions are on opposite sides of said sheet or film.

63. The assembly of claim 59 wherein said sheet or film comprises at least one of multiple layers and materials.

64. The assembly of claim 63 wherein said at least one of said multiple layers and materials have a different index of refraction.

65. The assembly of claim 59 wherein said sheet or film has both reflective and refractive surfaces.

5 66. The assembly of claim 59 wherein said sheet or film has deformities that reduce moiré or other interference effects when said assembly is assembled to a liquid crystal display.

10 67. The assembly of claim 59 wherein said light emitting member includes more than one sheet or film.

68. The assembly of claim 59 wherein said one surface of said sheet or film has at least one of prismatic and lenticular deformities.

15 69. The assembly of claim 68 wherein the individual deformities are quite small in relation to the width and length of said substrate.

20 70. A liquid crystal backlight assembly comprising a light emitting member including at least one sheet or film having changes in the shape or geometry of at least one surface, and at least one of a coating and surface treatment on said one surface for causing light rays to be emitted from said backlight assembly and pass through a liquid crystal display with low loss.

25 71. The assembly of claim 70 wherein the coating is selected to improve at least one of the following characteristics of the backlight assembly: color correction, opaqueness, diffusion, reflection, translucence, and transmission.

30 72. The assembly of claim 70 wherein said one surface of said sheet or film has at least one of prismatic and lenticular deformities.



73. The assembly of claim 72 wherein the individual deformities are quite small in relation to the width and length of said substrate.

5 74. The assembly of claim 70 wherein said sheet or film has varying changes in the shape or geometry of said one surface.

75. The backlight assembly of claim 70 wherein said sheet or film has random changes in the shape or geometry of said one surface.

10 76. The assembly of claim 70 wherein the at least one coating and surface treatment varies on said one surface of the sheet or film.

77. The assembly of claim 70 wherein the at least one coating and surface treatment is at random on said one surface of the sheet or film.

15 78. The assembly of claim 70 wherein said sheet or film has deformities on opposite sides of said sheet or film.

20 79. The assembly of claim 70 wherein said sheet or film comprises at least one of multiple layers and materials.

80. The assembly of claim 79 wherein said at least one of said multiple layers and materials have a different index of refraction.

25 81. The assembly of claim 70 wherein said sheet or film has both reflective and refractive surfaces.

30 82. The assembly of claim 70 wherein said sheet or film has deformities that reduce moiré or other interference effects when said assembly is assembled to a liquid crystal display.

83. The assembly of claim 70 wherein said light emitting member includes more than one sheet or film.

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A<sup>1</sup>

**ABSTRACT**

Light emitting panel assemblies include a sheet, film or plate overlying a light emitting member. The sheet, film or plate has a pattern of deformities on one or both sides that may vary or be random in size, shape or geometry, placement, index of refraction, density, angle, depth, height and type for controlling the light output distribution to suit a particular application. Also the sheet, film or plate may have a coating or surface treatment for causing the light to pass through a liquid crystal display with low loss.

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Attorney Docket No. GLOLP0108USB

PATENT (US)

**COMBINED DECLARATION AND POWER OF ATTORNEY**  
(ORIGINAL, DESIGN, NATIONAL STAGE OF PCT)

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Title: **LIGHT EMITTING PANEL ASSEMBLIES**

the specification of which

☒ is attached hereto, or

☐ was filed as United States Application or Application No.:  
PCT International Application (give (Express Mail Label No.)  
Express Mail label number and deposit Filing Date:  
date if Application number not yet (Deposit Date)  
known): Amended on (if applicable):

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability as defined in Title 37, Code of Federal Regulations § 1.56(a).

**CLAIM FOR BENEFIT OF EARLIER U.S./PCT APPLICATION(S) UNDER 35 U.S.C. 120**

I hereby claim the benefit under 35 U.S.C. 120 of any United States application(s) or PCT International application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of 35 USC 112, I acknowledge the duty to disclose material information as defined in 37 CFR 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

Application No.	Filing Date	Patent Number
09/256,275	February 23, 1999	
08/778,089	January 2, 1997	6,079,838
08/495,176	June 27, 1995	5,613,751

**CLAIM FOR BENEFIT OF EARLIER U.S. PROVISIONAL APPLICATION(S) UNDER 35 U.S.C. 119(e)**

I hereby claim the benefit under 35 USC 119(e) of any United States provisional application(s) that is/are listed below

Application No.	Filing Date

## POWER OF ATTORNEY

As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (List name and registration number)

Name	Registration No.	Name	Registration No.
Donald L. Otto	22,125		

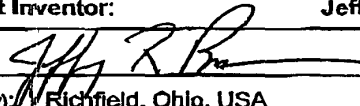
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 Cleveland, Ohio 44115-2191

## Direct Telephone Calls To:

Name: Donald L. Otto  
 Tel. No: 216/621-1113  
 Fax No. 216/621-6165

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full Name of Sole or First Inventor:		Jeffery R. Parker	
Inventor's signature:		Date:	8/30/02
Residence: (City & State/Country):		Citizenship:	USA
Post Office Address:		3050 Whitetail Ct. Richfield, Ohio 44286	

End of Declaration and Power of Attorney (D-US-1.FRM)

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PATENT APPLICATION SERIAL NO. \_\_\_\_\_

U.S. DEPARTMENT OF COMMERCE  
PATENT AND TRADEMARK OFFICE  
FEE RECORD SHEET

09/04/2002 VYANG1 00000013 10232047

01 FC:101	740.00 OP
02 FC:103	1134.00 OP
03 FC:102	588.00 OP

PTO-1556  
(5/87)

# PATENT APPLICATION FEE DETERMINATION RECORD

Effective October 1, 2001

Application or Docket Number

10232047

## CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS	83	
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	83 minus 20 =	* 63
INDEPENDENT CLAIMS	10 minus 3 =	* 7
MULTIPLE DEPENDENT CLAIM PRESENT <input type="checkbox"/>		

\* If the difference in column 1 is less than zero, enter "0" in column 2

## CLAIMS AS AMENDED - PART II

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	* 131	Minus ** 83	= 48
Independent	* 16	Minus *** 10	= 6
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <input type="checkbox"/>			

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	* 31	Minus ** 131	=
Independent	* 1	Minus *** 16	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <input type="checkbox"/>			

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	*	Minus **	=
Independent	*	Minus ***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <input type="checkbox"/>			

\* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."

\*\*\*If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

### SMALL ENTITY

TYPE ☐

OR

### OTHER THAN SMALL ENTITY

RATE	FEE
BASIC FEE	370.00
X\$ 9=	
X42=	
+140=	
TOTAL	

RATE	FEE
BASIC FEE	740.00
X\$18=	1134
X84=	588
+280=	
TOTAL	2462

### SMALL ENTITY

OR

### OTHER THAN SMALL ENTITY

RATE	ADDITIONAL FEE
X\$ 9=	
X42=	
+140=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$18=	86400 pd.
X84=	50400 pd.
+280=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$ 9=	
X42=	
+140=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$18=	
X84=	
+280=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$ 9=	
X42=	
+140=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$18=	
X84=	
+280=	
TOTAL ADDIT. FEE	

**Initial Information Data Sheet**

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**Inventor Information**

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Postal or Zip Code:: 44286  
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**Application Information**

Title Line One:: LIGHT EMITTING PANEL ASSEMBLIES  
Total Drawing Sheets:: 4  
Formal Drawings?:: Yes  
Application Type:: Utility  
Docket Number:: GLOLP0108USB

**Continuity Information**

This application is a:: Division  
>Application One:: 09/256,275  
Filing Date:: February 23, 1999



0232347 083002

which is a::	Continuation-in-part
>Application Two::	08/778,089
Filing Date::	January 2, 1997
U.S. Pat. No.::	6,079,838

which is a::	Division
>Application Three::	08/495,176
Filing Date::	June 27, 1995
U.S. Pat. No.::	5,613,751

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CERTIFICATE OF MAILING (37 CFR 1.8a)

# 2/Pre-Amend A  
11.7-02  
C. Moore

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, U.S. Patent and Trademark Office, Washington, DC 20231.

Date: October 14, 2002

*Donald L. Otto*

Donald L. Otto

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Attorney Docket GLOLP0108USB

in re PATENT application of

Jeffery R. Parker

Serial No. 10/232,047

Filed August 30, 2002

For: LIGHT EMITTING PANEL ASSEMBLIES

Art Unit 2875  
(Confirmation No. 6402)

Commissioner for Patents  
U.S. Patent and Trademark Office  
Washington, DC 20231

PRELIMINARY AMENDMENT

Sir:

Please add the following additional claims:

*a1*

84. (New) An optical assembly comprising at least a light emitter and a sheet or film, where light from said light emitter passes through said sheet or film, a pattern of deformities on at least one side of said sheet or film for controlling an output ray angle distribution of light emitted by said assembly to suit a particular application, said deformities being quite small in relation to a width and length of said sheet or film, at least some of said deformities varying in at least one of the

10/23/2002 HBERHE 00000034 10232047

01 FC:1202  
02 FC:1201

864.00 OP  
504.00 OP

following characteristics: size, shape, placement, index of refraction, density, angle, depth, height, and type.

85. (New) The assembly of claim 84 wherein said deformities are shaped depressions or projections on said sheet or film.

86. (New) The assembly of claim 84 wherein said sheet or film has at least one of a coating and surface treatment for causing the light emitted by said assembly to pass through a display with low loss.

87. (New) The assembly of claim 84 wherein said deformities are on opposite sides of said sheet or film.

88. (New) The assembly of claim 84 wherein said sheet or film comprises multiple layers or materials.

89. (New) The assembly of claim 88 wherein said multiple layers or materials have a different index of refraction.

90. (New) The assembly of claim 84 wherein said sheet or film has both reflective and refractive surfaces.

91. (New) The assembly of claim 84 wherein at least one of the characteristics of said deformities are varied to reduce moiré or other interference effects in association with a display.

92. (New) The assembly of claim 84 which includes more than one said sheet or film.

93. (New) The assembly of claim 84 wherein said deformities are at least one of prisms, prismatic and lenticular.

94. (New) An optical assembly comprising at least a light emitter and a sheet or film, where light from said light emitter passes through said sheet or film, a pattern of deformities on at least one side of said sheet or film for controlling an output ray angle distribution of light emitted by said assembly to suit a particular application, said deformities being quite small in relation to a width and length of said sheet or film, at least some of said deformities being random in at least one of the following characteristics: size, shape, placement, index of refraction, density, angle, depth, height, and type.

Cont  
A1

95. (New) The assembly of claim 94 wherein said sheet or film has a coating or surface treatment for causing the light to pass through a display with low loss.

96. (New) The assembly of claim 94 wherein said deformities are on opposite sides of said sheet or film.

97. (New) The assembly of claim 94 wherein said sheet or film comprises multiple layers or materials.

98. (New) The assembly of claim 97 wherein said multiple layers or materials have a different index of refraction.

99. (New) The assembly of claim 94 wherein said sheet or film has both reflective and refractive surfaces.

100. (New) The assembly of claim 94 wherein at least one of the characteristics of the deformities are varied to reduce moiré or other interference effects in association with a display.

101. (New) The assembly of claim 94 which includes more than one said sheet or film.

102. (New) The assembly of claim 94 wherein said sheet or film has at least one of prismatic and lenticular deformities on at least one surface of said sheet or film.

Cont  
A1  
103. (New) An optical assembly comprising at least a light emitter and a sheet or film, where light from said light emitter passes through said sheet or film, a multitude of deformities on at least one side of said sheet or film for controlling an output ray angle distribution of light emitted by said assembly to suit a particular application, said deformities being quite small in relation to a width and length of said sheet or film, said deformities comprising depressions or projections on said one side, said depressions or projections having at least one of a shape and pattern with no specific angle.

104. (New) An optical assembly comprising at least a light emitter and a sheet or film, where light from said light emitter passes through said sheet or film, a multitude of deformities on at least one side of said sheet or film for controlling an output ray angle distribution of light emitted by said assembly to suit a particular application, said deformities being quite small in relation to a width and length of said sheet or film, said deformities comprising shaped depressions or projections on said one side, at least some of said deformities having angles that vary among said deformities.

105. (New) An optical assembly comprising at least a light emitter, at least one sheet or film having changes in shape or geometry of at least one surface, where the changes in shape or geometry are well defined optical elements that are depressions or raised surfaces on said one surface that are quite small in relation to a width and length of the sheet or film, and at least one

of a coating or surface treatment on said sheet or film for causing light rays to be emitted from said assembly and pass through a display with low loss.

106. (New) The assembly of claim 105 wherein the coating is selected to improve at least one of the following characteristics of the assembly: color correction, opaqueness, diffusion, reflection, translucence, and transmission.

107. (New) The assembly of claim 105 wherein said one surface of said sheet or film has prismatic or lenticular deformities.

108. (New) The assembly of claim 105 wherein the changes in the shape or geometry of said one surface vary.

109. (New) The backlight assembly of claim 105 wherein the changes in the shape or geometry of said one surface are random.

110. (New) The assembly of claim 105 wherein the coating or surface treatment on said one surface of the sheet or film varies.

111. (New) The assembly of claim 105 wherein the coating or surface treatment on said one surface of the sheet or film is random.

112. (New) The assembly of claim 105 wherein said sheet or film has deformities on opposite sides of said sheet or film.

113. (New) The assembly of claim 105 wherein said sheet or film comprises multiple layers or materials.

114. (New) The assembly of claim 113 wherein said multiple layers or materials have a different index of refraction.

115. (New) The assembly of claim 105 wherein said sheet or film has both reflective and refractive surfaces.

116. (New) The assembly of claim 105 wherein said sheet or film has deformities that reduce moiré or other interference effects in association with a display.

117. (New) The assembly of claim 105 which includes more than one sheet or film.

118. (New) An optical assembly comprising at least a light emitter and a sheet or film, where light from said light emitter passes through said sheet or film, a pattern of deformities on at least one side of said sheet or film for controlling an output ray angle distribution of light emitted by said assembly to suit a particular application, said deformities being quite small in relation to a width and length of said sheet or film, at least some of said deformities touching, intersecting or overlapping other of said deformities.

119. (New) The assembly of claim 118 wherein all of said deformities are the same.

120. (New) The assembly of claim 118 wherein at least some of said deformities vary in at least one of the following characteristics: size, shape, placement, index of refraction, density, angle, depth, height, and type.

121. (New) The assembly of claim 118 wherein at least some of said deformities are random in at least one of the following characteristics: size, shape, placement, index of refraction, density, angle, depth, height, and type.

122. (New) The assembly of claim 118 wherein said deformities comprise shaped depressions or projections on said sheet or film.

123. (New) The assembly of claim 122 wherein at least some of said deformities have angles that vary among said deformities.

124. (New) The assembly of claim 118 wherein said sheet or film has at least one of a coating and surface treatment for causing the light emitted by said assembly to pass through a display with low loss.

125. (New) The assembly of claim 118 wherein said deformities are on opposite sides of said sheet or film.

126. (New) The assembly of claim 118 wherein said sheet or film comprises multiple layers or materials.

127. (New) The assembly of claim 126 wherein said multiple layers or materials have a different index of refraction.

128. (New) The assembly of claim 118 wherein said sheet or film has both reflective and refractive surfaces.

129. (New) The assembly of claim 118 wherein there is more than one said sheet or film.

130. (New) The assembly of claim 118 wherein said deformities are at least one of prisms, prismatic and lenticular.

131. (New) The assembly of claim 118 further comprising a coating or surface treatment on said sheet or film for causing the light emitted by said assembly to pass through a display with low loss.

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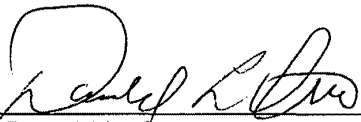
**REMARKS**

By the present amendment, claims 84-131 have been added. Favorable consideration of all of the pending claims 1-131 is respectfully requested.

Extra claims fees in the amount of \$1,368.00 are enclosed. In the event any additional fees are due in connection with the filing of this paper, the Commissioner is authorized to charge those fees to our Deposit Account No. 18-0988 (Charge No. GLOLP0108USB).

Respectfully submitted,

RENNER, OTTO, BOISSELLE & SKLAR, LLP


By   
Donald L. Otto  
Registration No. 22,125

1621 Euclid Avenue  
Nineteenth Floor  
Cleveland, Ohio 44115-2191  
Phone: 216-621-1113  
Fax: 216-621-6165

PRELIMINARY AMENDMENT.doc

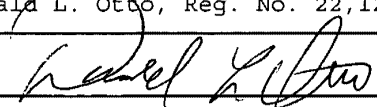
2875/4

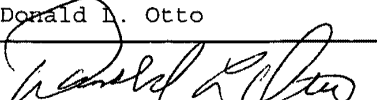
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

 <p><b>TRANSMITTAL FORM</b>          (to be used for all correspondence after initial filing)</p>	Application Number	10/232,047	
	Filing Date	August 30, 2002	
	First Named Inventor	Jeffery R. Parker	
	Group Art Unit	2875	
	Examiner Name		
Total Number of Pages in This Submission	10	Attorney Docket No.	GLOLP0108USB

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ENCLOSURES (check all that apply)		
<input checked="" type="checkbox"/> Fee Transmittal Form <input checked="" type="checkbox"/> Fee Attached <input checked="" type="checkbox"/> Amendment / Reply (Preliminary) <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Response to Missing Parts/Incomplete Application <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Assignment Papers (for an Application) <input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s) _____	<input type="checkbox"/> After Allowance Communication to Group <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Other Enclosure(s) (please identify below): Postcard
Remarks		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm or Individual name	Donald L. Otto, Reg. No. 22,125
Signature	
Date	October 14, 2002

CERTIFICATE OF MAILING			
I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, Washington, DC 20231 on this date: 10-14-02			
Typed or printed name	Donald L. Otto		
Signature		Date	10-14-02

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

**FEE TRANSMITTAL**  
**For FY 2002**  
Patent fees are subject to annual revision.  
**TOTAL AMOUNT OF PAYMENT** (\$) 1368.00

**Complete if Known**

Application Number	10/232,047
Filing Date	August 30, 2002
First Named Inventor	Jeffery R. Parker
Examiner Name	
Group Art Unit	2875
Attorney Docket No.	GL0LP0108USB

**METHOD OF PAYMENT**

1. ☒ The Commissioner is hereby authorized to charge indicated fees and credit any overpayments to:

Deposit Account Number: 18-0988

Deposit Account Name: Renner, Otto, Boisselle & Sklar, LLP

☒ Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17

☐ Applicant claims small entity status. See 37 CFR 1.27

2. ☒ **Payment Enclosed:**

☒ Check ☐ Credit card ☐ Money Order ☐ Other

**FEE CALCULATION**

**1. BASIC FILING FEE**

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
101-740	201-370	Utility filing fee	
106-330	206-165	Design filing fee	
107-510	207-255	Plant filing fee	
108-740	208-370	Reissue filing fee	
114-160	214-80	Provisional filing fee	

**SUBTOTAL (1)** (\$)

**2. EXTRA CLAIM FEES**

Total Claims: 131  
Independent Claims: 16  
Multiple Dependent: -10

Extra Claims: 83  
Fee from below: 48  
Fee Paid: 864

Extra Claims: 6  
Fee from below: 84  
Fee Paid: 504

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
103-18	203-9	Claims in excess of 20	
102-84	202-42	Independent claims in excess of 3	
104-280	204-140	Multiple dependent claim, if not paid	
109-84	209-42	** Reissue independent claims over original patent	
110-18	210-9	** Reissue claims in excess of 20 and over original patent	

**SUBTOTAL (2)** (\$) 1,368.00

**3. ADDITIONAL FEES**

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
105-130	205-65	Surcharge - late filing fee or oath	
127-50	227-25	Surcharge - late provisional filing fee or cover sheet	
139-130	139-130	Non-English specification	
147-2,520	147-2,520	For filing a request for ex parte reexamination	
112-920*	112-920*	Requesting publication of SIR prior to Examiner action	
113-1,840*	113-1,840*	Requesting publication of SIR after Examiner action	
115-110	215-55	Extension for reply within first month	
116-400	216-200	Extension for reply within second month	
117-920	217-460	Extension for reply within third month	
118-1,440	218-720	Extension for reply within fourth month	
128-1,960	228-980	Extension for reply within fifth month	
119-320	219-160	Notice of Appeal	
120-320	220-160	Filing a brief in support of an appeal	
121-280	221-140	Request for oral hearing	
138-1,510	138-1,510	Petition to institute a public use proceeding	
140-110	240-55	Petition to revive - unavoidable	
141-1,280	241-640	Petition to revive - unintentional	
142-1,280	242-640	Utility issue fee (or reissue)	
143-460	243-230	Design issue fee	
144-620	244-310	Plant issue fee	
122-130	122-130	Petitions to the Commissioner	
123-50	123-50	Processing fee under 37 CFR 1.17(q)	
126-180	126-180	Submission of Information Disclosure Stmt	
581-40	581-40	Recording each patent assignment per property (times number of properties)	
146-740	246-370	Filing a submission after final rejection (37 CFR § 1.129(a))	
149-740	249-370	For each additional invention to be examined (37 CFR § 1.129(b))	
179-740	279-370	Request for Continued Examination (RCE)	
169-900	169-900	Request for expedited examination of a design application	

Other fee (specify) \_\_\_\_\_

**SUBTOTAL (3)** (\$)

**SUBMITTED BY**

Name (Print/Type)	Donald L. Otto	Registration No. (Attorney/Agent)	22,125	Telephone	(216) 621-1113
Signature		Date	10-14-02		

**WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**

**Burden Hour Statement:** This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

MBI\_000111



2875

Attorney Docket No. GLOLP0108USB

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of

Applicant: Jeffery R. Parker  
Serial No.: 10/232,047  
Filed: August 30, 2002  
For: LIGHT EMITTING PANEL ASSEMBLIES

Art Unit: 2875  
Examiner:

TECHNOLOGY CENTER 2800

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#3  
D. Scott  
12/19/02

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents  
U.S. Patent and Trademark Office  
Washington, D.C. 20231

Sir:

1. Pursuant to 37 C.F.R. 1.97 and 1.98, and in compliance with 37 C.F.R. 1.56, the Office's attention is directed to the patents, pending applications, publications and other information listed on the attached PTO-1449. A copy of each listed document is enclosed except for those previously cited or submitted to the Office in the following application(s) upon which this application relies for an earlier filing date under 35 U.S.C. 120:

Serial No.:	<u>09/256,275</u>	<u>08/778,089</u>	<u>08/495,176</u>
Filing Date:	<u>2/23/99</u>	<u>01/02/97</u>	<u>6/27/95</u>
Pat. No.:		<u>6,079,838</u>	<u>5,613,751</u>

Regarding any document, publication or other information for which a date is not given on the attached PTO-1449, Applicant(s) believe(s) the same may qualify as "prior" art to this application and should be treated accordingly, although Applicant(s) reserve(s) the right to contest the prior art status of any document, publication or information, should issue arise.

2. Regarding each listed document that is not in the English language, an English-language translation accompanies this Statement as indicated on the attached PTO-1449 or a concise explanation of the relevance of the document is set forth in the following document(s):

- (a) ☐ A copy of each English language version of a search report (or EPO Search Report) indicating the degree of relevance found by the foreign office of each document being submitted from the search report, is being submitted herewith or has previously been submitted.
- (b) ☐ Attached is a "Concise Explanation of Relevance of Non-English Language Documents".

3. Pursuant to 37 C.F.R. 1.97(b) this Statement is being filed (one must be checked):

- (a) ☐ Within 3 months of the filing date, date of entry into the National Stage, or filing date of CPA.
- (b) ☒ Before the mailing date of a first Office Action on the merits. If this Statement is not filed before the mailing date of a first Office Action on the merits, the required certification is given below or, in the absence thereof, the Office is authorized to charge the required fee set forth in 37 C.F.R. 1.17(p) to Deposit Account No. 18-0988 for consideration of this Statement.
- (c) ☐ Before the mailing date of a first Office Action on the merits after a first or second submission after final rejection under 37 C.F.R. 1.129(a).

(d) \_\_\_ After the period set forth in 37 C.F.R. 1.97(b) but before the mailing date of either a final action or a notice of allowance.

(1) \_\_\_ The required certification is given below, or

(2) \_\_\_ Enclosed is a check covering the fee set forth in 37 C.F.R. 1.17(p) for consideration of this Statement, or

(3) \_\_\_ Charge the fee set forth in 37 C.F.R. 1.17(p) to Deposit Account No. 18-0988

(e) \_\_\_ After the mailing date of either a final action or a notice of allowance, but before payment of the issue fee. Petition hereby is made for consideration of this Statement and the required certification is indicated below.

(1) \_\_\_ Enclosed is a check covering the fee set forth in 37 C.F.R. 1.17(p), or

(2) \_\_\_ Charge the fee set forth in 37 C.F.R. 1.17(p) to Deposit Account No. 18-0988.

4. Certification (if applicable)

(a) \_\_\_ The undersigned hereby certifies that each item of information contained in this Statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than 3 months prior to the filing of this Statement.

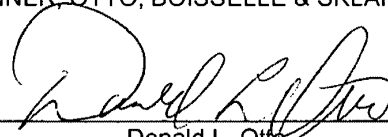
(b) \_\_\_ The undersigned hereby certifies that no item of information contained in this Statement was cited in a communication from a foreign patent office in a counterpart foreign application or, to the undersigned's knowledge after making reasonable inquiry, was known to any individual designated in 37 C.F.R. 1.56(c) more than 3 months prior to the filing of this Statement.

5. The Commissioner is hereby authorized to charge any additional fees or credit any overpayment to Deposit Account No. 18-0988.

Respectfully Submitted,

RENNER, OTTO, BOISSELLE & SKLAR, LLP

By



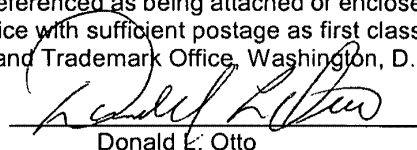
Donald L. Otto  
Reg. No. 22,125

1621 Euclid Avenue, 19th Floor  
Cleveland, Ohio 44115  
(216) 621-1113

**CERTIFICATE OF MAILING UNDER 37 C.F.R. §1.8**

I hereby certify that this correspondence (along with any paper referenced as being attached or enclosed) is being deposited on the below date with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to Commissioner for Patents, U.S. Patent and Trademark Office, Washington, D.C. 20231.

Date: December 9, 2002



Donald L. Otto

D:\share\107\GLO\IP108\US\IDS-1449.wpd IDS-1.FRM (2/98)



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/232,047	08/30/2002	Jeffery R. Parker	GLOLP0108USB	6402

7590 01/10/2003  
Donald L. Otto  
Renner, Otto, Boisselle & Sklar, LLP  
19th Floor  
1621 Euclid Avenue  
Cleveland, OH 44115-2191

EXAMINER

WARD, JOHN A

ART UNIT	PAPER NUMBER
----------	--------------

2875

DATE MAILED: 01/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/232,047

Applicant(s)

PARKER, JEFFERY R.

Examiner

John A. Ward

Art Unit

2875

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 August 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-131 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-131 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Election/Restrictions***

This application contains claims directed to the following patentably distinct species of the claimed invention:

<b>Species:</b>	<b>Figures:</b>
1	1
2	2
3	3, 5
4	4a-4d
5	6
6	7
7	8
8	9
9	10, 11, 11a
10	12, 13
11	14, 15

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, no claims are generic.



Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim

Application/Control Number: 10/232,047  
Art Unit: 2875

Page 4

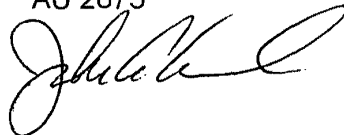
remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John A. Ward whose telephone number is 703-305-5157. The examiner can normally be reached on Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on 703-305-4939. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

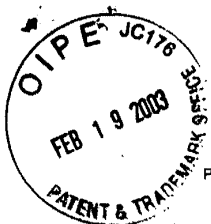
Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0596.

Patent Examiner  
John A. Ward  
AU 2875



JAW  
January 8, 2003

2875



Please type a plus sign (+) inside this box → ☐

PTO/SB/21 (08-00)  
Approved for use through 10/31/2002. OMB 0651-0031  
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE  
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<b>TRANSMITTAL FORM</b> <i>(to be used for all correspondence after initial filing)</i>	<b>Application Number</b>	10/232,047	
	<b>Filing Date</b>	August 30, 2002	
	<b>First Named Inventor</b>	Jeffery R. Parker	
	<b>Group Art Unit</b>	2875	
	<b>Examiner Name</b>	John A. Ward	
<b>Total Number of Pages in This Submission</b>	4	<b>Attorney Docket Number</b>	GLOLP0108USB

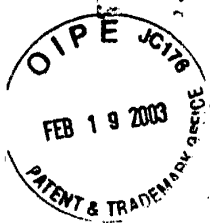
ENCLOSURES (check all that apply)		
<input type="checkbox"/> Fee Transmittal Form	<input type="checkbox"/> Assignment Papers (for an Application)	<input type="checkbox"/> After Allowance Communication to Group
<input type="checkbox"/> Fee Attached	<input type="checkbox"/> Drawing(s)	<input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences
<input checked="" type="checkbox"/> Amendment / Reply	<input type="checkbox"/> Licensing-related Papers	<input type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief)
<input type="checkbox"/> After Final	<input type="checkbox"/> Petition	<input type="checkbox"/> Proprietary Information
<input type="checkbox"/> Affidavits/declaration(s)	<input type="checkbox"/> Petition to Convert to a Provisional Application	<input type="checkbox"/> Status Letter
<input type="checkbox"/> Extension of Time Request	<input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address	<input type="checkbox"/> Other Enclosure(s) (Please identify below):
<input type="checkbox"/> Express Abandonment Request	<input type="checkbox"/> Terminal Disclaimer	
<input type="checkbox"/> Information Disclosure Statement	<input type="checkbox"/> Request for Refund	
<input type="checkbox"/> Certified Copy of Priority Document(s)	<input type="checkbox"/> CD, Number of CD(s) _____	
<input type="checkbox"/> Response to Missing Parts/Incomplete Application	<b>Remarks</b>	
<input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53		

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SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm or Individual name	Donald L. Otto, Registration No. 22,125
Signature	
Date	February 10, 2003

CERTIFICATE OF MAILING			
I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, Washington, DC 20231 on this date: 2-10-03			
Typed or printed name	Donald L. Otto	Date	2-10-03
Signature			

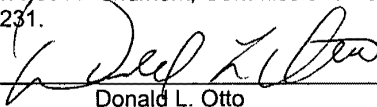
Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.



CERTIFICATE OF MAILING (37 CFR 1.8a)

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Box Non-Fee Amendment, Commissioner for Patents, U.S. Patent and Trademark Office, Washington, DC 20231.

Date: February 10, 2003

  
Donald L. Otto

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Attorney Docket GLOLP0108USB

In re PATENT application of

Jeffery R. Parker

Serial No. 10/232,047

Filed August 30, 2002

For: LIGHT EMITTING PANEL ASSEMBLIES

Art Unit 2875  
(Confirmation No. 6402)

John A. Ward, Examiner

#5/Election  
Marsha  
2/24/03  
RECEIVED  
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**REPLY TO OFFICE ACTION MAILED JANUARY 10, 2003**

Box Non-Fee Amendment  
Commissioner for Patents  
U.S. Patent and Trademark Office  
Washington, DC 20231

Sir:

In response to the election of species requirement, applicant hereby elects with traverse the species of Figs. 3, 5, on which claims 1-13, 15-23, 26-36, 39-46, 49-56, 59-67, 70, 71, 74-92, 94-101, 103-106 and 108-117 read.

## REMARKS

In the Office Action mailed January 10, 2003, the Examiner stated that this application contains claims directed to eleven patentably distinct species of the claimed invention. Therefore the Examiner required applicant to elect one of these species for prosecution on the merits and to list all of the claims readable thereon. In response to this requirement, applicant elected the species of Figs. 3, 5, on which claims 1-13, 15-23, 26-36, 39-46, 49-56, 59-67, 70, 71, 74-92, 94-101, 103-106 and 108-117 read.

However, applicant respectfully submits that Figs. 4a-4d are not directed to a species that is patentably distinct from the species of Figs. 3, 5 (or any of the other disclosed species). Rather, Figs. 4a-d show various forms of light extracting deformities that may be provided on one or both sides of any of the disclosed panel members including the panel members disclosed in Figs. 3, 5 as well as the sheet or film disclosed in Figs. 3, 5. See for example the paragraph bridging pages 6 and 7 which states that a pattern of light extracting deformities or disruptions 21 of the type shown in Fig. 4a may be provided on one or both sides of the panel members or on one or more selected areas on one or both sides of the panel members as desired. Also see page 7, lines 13-18 which states that the deformities may be printed on a sheet or film which may be attached or otherwise positioned against one or both sides of the panel member similar to the sheet or film 27 shown in Figs. 3 and 5 in order to produce a desired effect. Also see the first full paragraph on page 9 which states that other light extracting deformities including prismatic surfaces, depressions or raised

surfaces of various shapes such as shown in Figs. 4b-c may be provided on or in one or more areas of the panel member in addition to or in lieu of the patterns of light extracting deformities 21 shown in Fig. 4a. Accordingly, withdrawal of the election of species requirement between the elected species of Figs. 3, 5 and Figs. 4a-4d is respectfully requested. Moreover, since all of the non-elected claims 14, 24, 25, 37, 38, 47, 48, 57, 58, 68, 69, 72, 73, 93, 102, 107 and 118-131 recite different shapes or arrangements of the deformities as shown in Figs. 4a-4d that may be provided in or on the elected species of Figs. 3, 5, prosecution on the merits of all of the claims is respectfully requested.

In the event an extension of time is necessary, this should be considered a petition for such an extension. If required, fees are enclosed for the extension of time and/or for the presentation of new and/or amended claims. In the event any additional fees are due in connection with the filing of this amendment, the Commissioner is authorized to charge those fees to our Deposit Account No. 18-0988 (Charge No. GLOLP0108USB).

Respectfully submitted,

RENNER, OTTO, BOISSELLE & SKLAR , LLP

By   
Donald L. Otto  
Registration No. 22,125

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/232,047	08/30/2002	Jeffery R. Parker	GLOLP0108USB	6402

7590

05/08/2003

Donald L. Otto  
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19th Floor  
1621 Euclid Avenue  
Cleveland, OH 44115-2191

EXAMINER

WARD, JOHN A

ART UNIT

PAPER NUMBER

2875

DATE MAILED: 05/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/232,047

Applicant(s)

PARKER, JEFFERY R.

Examiner

John A. Ward

Art Unit

2875

-- **The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 February 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-131 is/are pending in the application.
- 4a) Of the above claim(s) See Continuation Sheet is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13, 15-23, 26-36, 39-46, 49-56, 59-67, 70, 71, 74-92, 94-101, 103-106 and 108-117 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3. 6) ☐ Other: \_\_\_\_\_

MBI\_000124



Continuation of Disposition of Claims: Claims withdrawn from consideration are 14,24,25,37,38,47,48,57,58,68,69,72,73,93,102,107 and 118-131.

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election with traverse of figures 3, and 5 in Paper No. 6 is acknowledged. The traversal is on the ground(s) that there are not eleven patentably distinct species. This is not found persuasive because even if 4a-4d are not a group of patentably distinct species there are still a number of patentably distinct species in the figures, along with the a number of independent claims that are broader in scope than specified in the specifications.

The requirement is still deemed proper and is therefore made FINAL.

### ***Drawings***

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "27" has been used to designate sheet or film, member and sheet or plate. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 29-36, 39-46, 49-56, 59-67, 70-71, 74-83 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Page 14, second paragraph briefly mention the use of the backlight assembly with use with a LCD display, but does not fully disclose in the specification or supply adequate support for the claims.

Claims 84-92, 94-101, 103-106, and 108-117 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. These claims refer to an optical system which is broader in scope than what is disclosed in the specifications and does not supply adequate support for the claims.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-6, 11, and 14-15 are rejected under 35 U.S.C. 102(e) as being anticipated by Nakamura et al (US 5,467,417).

Regarding claim 1, Nakamura et al ('417) discloses a backlight assembly (figure 1) comprising a light emitting member 3, a substrate 6 overlying the light emitting member (figure 1), and the substrate member shows in figure 6 having deformities on at least one side of the substrate. The deformities on one side of the substrate is for controlling an output ray angle distribution of light emitted by the light emitting member to suit a particular application (column 4, lines 43-56), and the deformities vary by angle (column 4, lines 52-56). Figure 7, and column 1, lines 58-67, and column 2, lines 1-14, teach that the deformities varying at least by angle.

Regarding claim 2, the substrate 6 comprises a prism plate.

Regarding claim 3, figure 3 shows that the deformities are shaped.

Regarding claim 4, figure 3 shows that the deformities comprise depression in the substrate 43.

Regarding claim 5, figure 3 shows that the deformities comprise a projection 42 on the substrate next to the depression.

Regarding claim 6, claim 1 of the prior art of record teaches that the substrate is attached to the light-emitting member (also see figure 1).

Regarding claim 11, figure 4 shows that the substrate has both reflective and refractive surfaces.

Regarding claim 14, figure 4 shows that the deformities are at least prisms.

Regarding claim 15, figure 2 shows that the deformities are quite small in relation to the width and length of the substrate.

Claims 16, 18-21 and 23-25 are rejected under 35 U.S.C. 102(e) as being anticipated by Hou et al (US 6,129,439).

Regarding claim 16, Hou et al ('439) discloses a light emitting member 16, a substrate 82 overlying the light emitting member (figure 3), the substrate having a pattern of deformities on at least one side 80 of the substrate for controlling an output ray (figure 3) angle distribution of light emitted by the light emitting member to suit a particular application (abstract), and the deformities being random in at by the characteristic of depth (column 6, lines 13-18).

Regarding claim 18, the deformities are on the opposite side of the substrate 28 (figure 3).

Regarding claim 19, the substrate as shown in figure 3 have a have at least one of multiple layers and materials (column 4, lines 37-64).

Regarding claim 20, figure 3 shows that the substrate includes at least two layers which will yield a different index of refraction.

Regarding claim 21, figure 3 shows that the substrate have reflective and refractive surfaces.

Regarding claim 23, figure 3 shows that more than one substrate overlie the light emitter member.

Regarding claim 24, figure 3, and shows that 28 are micro prismatic deformities.

Regarding claim 25, the micro prismatic deformities are quite small in relation to the width and length of the substrate (figure 3).

Claim 26 is rejected under 35 U.S.C. 102(e) as being anticipated by Hou et al ('439).

Regarding claim 26, Hou et al ('439) shows a backlight assembly (figure 1) comprising of a light-emitting member 16, substrate 82 overlying the light emitting member the substrate having a multitude of deformities 80, on at least one side. The deformities on at least one side of the substrate for controlling an output ray angle distribution (figure 3) of light emitted by light emitted member. The deformities of the substrate comprise at least one depressions and projection having at least one of shape and pattern with no specific angle (figure 4).

Claim 27 is rejected under 35 U.S.C. 102(e) as being anticipated by Nakamura et al ('417).

Regarding claim 27, Nakamura et al ('559) shows a backlight assembly (figure 1) comprising of a light-emitting member 3, substrate 6 overlying the light emitting member the substrate having a multitude of deformities 42, 43, on at least one side. The deformities on at least one side of the substrate for controlling an output ray angle distribution (figure 4) of light emitted by light emitted member. The deformities

comprising at least one depressions and projection including prismatic surfaces having angles that vary among the deformities (figure 4).

Claim 28 is rejected under 35 U.S.C. 102(e) as being anticipated by Ishikawa et al ('439).

Regarding claim 28, Ishikawa et al ('439) shows a backlight assembly (figure 1) comprising of a light-emitting member 16, substrate 26 overlying the light emitting member the substrate having a multitude of deformities 28, on at least one side. The deformities on at least one side of the substrate for controlling an output ray angle distribution (figure 1) of light emitted by light emitted member. The deformities comprising at least one of shaped depressions and projection having angles that varies among the deformities (figure 1).

### ***Claim Rejections - 35 USC § 103***

Claims 7-10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al as applied to claim 1 above, and further in view of Ando et al (US 5,808,784).

Regarding claim 7-10, and 12 Nakamura et al discloses all the limitations of the claimed invention as disclosed in claim 1 above including a substrate overlying a light emitting member and deformities on one side of the substrate.

Nakamura et al does not disclose a coating, substrate on the opposite side, multiple layers, or the deformities varied to reduced moiré or other interference effects.

Regarding claim 7, Ando et al ('784) disclose a substrate 1, having at least one coating teaches of at least one coating and surface treatment for causing the light to pass through a liquid crystal display with low loss (column 33, lines 26-57).

Regarding claim 8, figure 1, shows deformities located on both sides of the substrate.

Regarding claim 9, figure 22 shows that the substrate has multiple layers.

Regarding claim 10, column 30, and lines 36-40 teaches that each layer can have a refractive index.

Regarding claim 12, column 14, lines 54-67, and column 15, lines 1-16 teaches that the deformities are varied to reduce moiré or other interferences effects when said assembly is assembled to a liquid crystal display.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the backlight assembly of Nakamura et al with the substrate of Ando et al in order to provide a back light display having a substrate that is used for a liquid crystal display device, as taught by Ando et al (column 13, lines 2-4). Since it is old and well known to use a substrate having an edge light property and evenly display light to illuminate a liquid crystal display.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al as applied to claim 16 above, and further in view of Ando et al (US 5,808,784).



Regarding claim 17, Nakamura et al discloses all the limitations of the claimed invention as disclosed in claim 16 above including a substrate overlying a light emitting member and deformities on one side of the substrate.

Nakamura does not disclose the substrate having at least one coating.

Regarding claim 17, Ando et al ('784) disclose a substrate 1, having at least one coating teaches of at least one coating and surface treatment for causing the light to pass through a liquid crystal display with low loss (column 33, lines 26-57).

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the backlight assembly of Nakamura et al with the substrate of Ando et al in order to provide a back light display having a substrate that is used for a liquid crystal display device, as taught by Ando et al (column 13, lines 2-4). Since it is old and well known to use a substrate having an edge light property and evenly display light to illuminate a liquid crystal display.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John A. Ward whose telephone number is 703-305-5157. The examiner can normally be reached on Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on 703-305-4939. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Application/Control Number: 10/232,047  
Art Unit: 2875

Page 10

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0596.

JAW  
May 5, 2003



John A. Ward  
Patent Examiner AU 2875

NOTICE OF DRAFTSPERSON'S  
PATENT DRAWING REVIEWThe drawing(s) filed (insert date) 08/30/02 are:

- A. ☒ approved by the Draftsperson under 37 CFR 1.84 or 1.152.  
B. ☐ objected to by the Draftsperson under 37 CFR 1.84 or 1.152 for the reasons indicated below. The Examiner will require submission of new, corrected drawings when necessary. Corrected drawing must be submitted according to the instructions on the back of this notice.

<p>1. DRAWINGS. 37 CFR 1.84(a): Acceptable categories of drawings: Black ink. Color. Color drawings are not acceptable until petition is granted. Fig(s) _____ Pencil and non black ink not permitted. Fig(s) _____</p> <p>2. PHOTOGRAPHS. 37 CFR 1.84(b) 1 full-tone set is required. Fig(s) _____ Photographs may not be mounted. 37 CFR 1.84(e) Poor quality (half-tone). Fig(s) _____</p> <p>3. TYPE OF PAPER. 37 CFR 1.84(e) Paper not flexible, strong, white, and durable. Fig(s) _____ Erasures, alterations, overwritings, interlineations, folds, copy machine marks not accepted. Fig(s) _____ Mylar, velum paper is not acceptable (too thin). Fig(s) _____</p> <p>4. SIZE OF PAPER. 37 CFR 1.84(f): Acceptable sizes: 21.0 cm by 29.7 cm (DIN size A4) 21.6 cm by 27.9 cm (8 1/2 x 11 inches) All drawing sheets not the same size. Sheet(s) _____ Drawings sheets not an acceptable size. Fig(s) _____</p> <p>5. MARGINS. 37 CFR 1.84(g): Acceptable margins: Top 2.5 cm Left 2.5cm Right 1.5 cm Bottom 1.0 cm SIZE: A4 Size Top 2.5 cm Left 2.5 cm Right 1.5 cm Bottom 1.0 cm SIZE: 8 1/2 x 11 Margins not acceptable. Fig(s) _____ Top (T) _____ Left (L) Right (R) _____ Bottom (B)</p> <p>6. VIEWS. 37 CFR 1.84(h) REMINDER: Specification may require revision to correspond to drawing changes. Partial views. 37 CFR 1.84(h)(2) Brackets needed to show figure as one entity. Fig(s) _____ Views not labeled separately or properly. Fig(s) _____ Enlarged view not labeled separately or properly. Fig(s) _____</p> <p>7. SECTIONAL VIEWS. 37 CFR 1.84 (h)(3) Hatching not indicated for sectional portions of an object. Fig(s) _____ Sectional designation should be noted with Arabic or Roman numbers. Fig(s) _____</p>	<p>8. ARRANGEMENT OF VIEWS. 37 CFR 1.84(i) Words do not appear on a horizontal, left-to-right fashion when page is either upright or turned so that the top becomes the right side, except for graphs. Fig(s) _____</p> <p>9. SCALE. 37 CFR 1.84(k) Scale not large enough to show mechanism without crowding when drawing is reduced in size to two-thirds in reproduction. Fig(s) _____</p> <p>10. CHARACTER OF LINES, NUMBERS, &amp; LETTERS. 37 CFR 1.84(j) Lines, numbers &amp; letters not uniformly thick and well defined, clean, durable, and black (poor line quality). Fig(s) _____</p> <p>11. SHADING. 37 CFR 1.84(m) Solid black areas pale. Fig(s) _____ Solid black shading not permitted. Fig(s) _____ Shade lines, pale, rough and blurred. Fig(s) _____</p> <p>12. NUMBERS, LETTERS, &amp; REFERENCE CHARACTERS. 37 CFR 1.84(p) Numbers and reference characters not plain and legible. Fig(s) _____ Figure legends are poor. Fig(s) _____ Numbers and reference characters not oriented in the same direction as the view. 37 CFR 1.84(p)(1) Fig(s) _____ English alphabet not used. 37 CFR 1.84(p)(2) Figs _____ Numbers, letters and reference characters must be at least .32 cm (1/8 inch) in height. 37 CFR 1.84(p)(3) Fig(s) _____</p> <p>13. LEAD LINES. 37 CFR 1.84(q) Lead lines cross each other. Fig(s) _____ Lead lines missing. Fig(s) _____</p> <p>14. NUMBERING OF SHEETS OF DRAWINGS. 37 CFR 1.84(t) Sheets not numbered consecutively, and in Arabic numerals beginning with number 1. Sheet(s) _____</p> <p>15. NUMBERING OF VIEWS. 37 CFR 1.84(u) Views not numbered consecutively, and in Arabic numerals, beginning with number 1. Fig(s) _____</p> <p>16. CORRECTIONS. 37 CFR 1.84(w) Corrections not made from prior PTO-948 dated _____</p> <p>17. DESIGN DRAWINGS. 37 CFR 1.152 Surface shading shown not appropriate. Fig(s) _____ Solid black shading not used for color contrast. Fig(s) _____</p>
<p>COMMENTS</p>	

REVIEWER Draftsman: Sullivan DATE 05/05/03 TELEPHONE NO. \_\_\_\_\_

703/306-0366

ATTACHMENT TO PAPER NO. \_\_\_\_\_

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**Notice of References Cited**

Application/Control No.

10/232,047

Applicant(s)/Patent Under  
Reexamination  
PARKER, JEFFERY R.

Examiner

John A. Ward

Art Unit

2875

Page 1 of 1

**U.S. PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-6,129,439	10-2000	Hou et al.	362/31
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

**FOREIGN PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

**NON-PATENT DOCUMENTS**

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

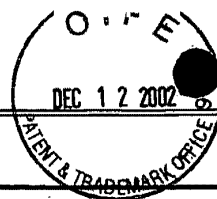
\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Form PTO-1449 (Modified)		Atty Docket No. GLOLP0108USB	Serial No. 10/232,047
<p>LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT</p> <p>(Use several sheets if necessary)</p>		Applicant: Jeffery R. Parker	
		Filing Date August 30, 2002	Group 2875



U.S. PATENT DOCUMENTS

Examiner Initial	Document Number	Date (MM/YYYY)	Name	Class	Sub-class	Filing Date if Appropriate
<i>JPW</i>	3,043,947	7/1962	Albinger, Jr.			
	3,328,570	6/1967	Balchunas			
	3,752,974	8/1973	Baker et al			
	3,892,959	7/1975	Pulles			
	3,958,113	5/1976	Termohlen			
	4,043,636	8/1997	Eberhardt et al			
	4,257,084	3/1981	Reynolds			
	4,446,508	5/1984	Kinzie			
	4,573,766	3/1986	Bournay, Jr. et al			
	4,630,895	12/1986	Abdala, Jr. et al			
	4,714,983	12/1984	Lang			
	4,729,185	3/1988	Baba			
	4,751,615	6/1988	Abrams			
	4,765,701	8/1988	Cheslak			
	4,974,122	11/1990	Shaw			
	4,975,808	12/1990	Bond et al			
	4,978,952	12/1990	Irwin			
	5,005,108	4/1991	Pristash et al			
	5,027,258	6/1991	Schoniger et al			
	5,070,431	12/1991	Kitazawa et al			
	5,093,765	3/1992	Kashima et al			
	5,134,549	7/1992	Yokoyama			
	5,136,483	8/1992	Schoniger et al			
<i>JPW</i>	5,207,493	5/1993	Murase et al			



Examiner Initial	Document Number	Date (MM/YYYY)	Name	Class	Sub-class	Filing Date if Appropriate
JAW	5,262,928	11/1993	Kashima et al			
	5,283,673	2/1994	Murase et al			
	5,303,322	4/1994	Winston et al (enclosed)			
	5,339,179	8/1994	Rudisill et al			
	5,349,503	9/1994	Blonder et al			
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	5,390,085	2/1995	Mari-Roca et al			
	5,394,308	2/1995	Watanabe et al			
	5,396,350	3/1995	Beeson et al (enclosed)			
	5,442,523	8/1995	Kashima et al (enclosed)			
	5,467,208	11/1995	Kokawa et al			
	5,467,417	11/1995	Nakamura et al			
	5,485,291	1/1996	Qiao et al			
	5,506,929	4/1996	Tai et al (enclosed)			
	5,579,134	11/1996	Lengyel (enclosed)			
	5,598,281	1/1997	Zimmerman et al (enclosed)			
	5,618,095	4/1997	Kashima et al			
	5,664,862	9/1997	Redmond et al			
	5,671,994	9/1997	Tai et al			
	5,719,649	2/1998	Shono et al (enclosed)			
	5,771,328	6/1998	Wortman et al (enclosed)			
	5,775,791	7/1998	Yoshikawa et al			
	5,779,338	7/1998	Ishikawa et al			
JAW	5,808,784	9/1998	Ando et al (enclosed)			

## FOREIGN PATENT DOCUMENTS

Examiner Initial	Document Number	Date (MM/YYYY)	Country	Class	Sub-class	Translation	
						Yes	No
Jaa	0 453 092	23/10/91	EP				
Jba	WO 96/17207	060696	PCT				

## OTHER ART

Examiner Initial	Author, Title, Date, Pertinent Pages, etc.

EXAMINER <i>Jah</i>	DATE CONSIDERED 5-3-2003
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EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Information Disclosure Statement PTO-1449 (Modified)

The identification of any reference is not intended to be, and should not be understood as being, an admission that such publication, in fact, constitutes "prior art" within the meaning of applicable law since, for example, a given reference may have a later effective date than first seems apparent or the reference may have an effective date which can be antedated. The "prior art" status of any reference is a matter to be resolved during prosecution.

D:\share\107\GLOLIP108USB\IDS-1449.wpd (IDS1449.FRM) (2/97)



2875

PTO/SB/21 (05-03)  
Approved for use through 04/30/2003. OMB 0651-0031  
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

<b>TRANSMITTAL FORM</b>  (to be used for all correspondence after initial filing)	Application Number	10/232,047	
	Filing Date	August 30, 2002	
	First Named Inventor	Jeffery R. Parker	
	Art Unit	2875	
	Examiner Name	John A. Ward	
Total Number of Pages in This Submission	14	Attorney Docket Number	GLOLP0108USB

ENCLOSURES (Check all that apply)		
<input type="checkbox"/> Fee Transmittal Form	<input type="checkbox"/> Drawing(s)	<input type="checkbox"/> After Allowance communication to Group
<input type="checkbox"/> Fee Attached	<input type="checkbox"/> Licensing-related Papers	<input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences
<input checked="" type="checkbox"/> Amendment/Reply	<input type="checkbox"/> Petition	<input type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief)
<input type="checkbox"/> After Final	<input type="checkbox"/> Petition to Convert to a Provisional Application	<input type="checkbox"/> Proprietary Information
<input type="checkbox"/> Affidavits/declaration(s)	<input type="checkbox"/> Power of Attorney, Revocation	<input type="checkbox"/> Status Letter
<input type="checkbox"/> Extension of Time Request	<input type="checkbox"/> Change of Correspondence Address	<input type="checkbox"/> Other Enclosure(s) (please identify below):
<input type="checkbox"/> Express Abandonment Request	<input type="checkbox"/> Terminal Disclaimer	
<input type="checkbox"/> Information Disclosure Statement	<input type="checkbox"/> Request for Refund	
<input type="checkbox"/> Certified Copy of Priority Document(s)	<input type="checkbox"/> CD, Number of CD(s) _____	
<input type="checkbox"/> Response to Missing Parts/Incomplete Application	Remarks	
<input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53		

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TECHNOLOGY CENTER 2800

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm or Individual name	Donald L. Otto Reg. No. 22,125
Signature	
Date	August 5, 2003

CERTIFICATE OF TRANSMISSION/MAILING	
I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below.	
Typed or printed name	Donald L. Otto
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Date	8/5/03

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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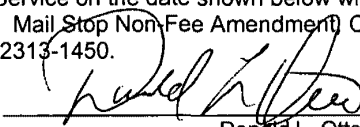




CERTIFICATE OF MAILING (37 CFR 1.8a)

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Mail Stop Non-Fee Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Date: August 5, 2003

  
Donald L. Otto

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Attorney Docket GLOLP0108USB

In re PATENT application of

Jeffery R. Parker

Serial No. 10/232,047

Filed August 30, 2002

For: **LIGHT EMITTING PANEL ASSEMBLIES**

Art Unit 2875

Confirmation No. 6402

John A. Ward, Examiner

#7B Aut  
J. Bauman  
8/28/03

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**REPLY TO OFFICE ACTION OF MAY 8, 2003**

Mail Stop Non-Fee Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Sir:

In reply to the Office Action of May 8, 2003, please amend the above-identified application as follows:

**Amendments to the Specification** begin on page 2 of this paper.

**Amendments to the Claims** are reflected in the listing of claims which begins on page 4 of this paper.

**Remarks/Arguments** begin on page 10 of this paper.

### Amendments to the Specification

Please replace the paragraph beginning at page 9, line 20 with the following amended paragraph:

As best seen in the cross sectional view of Fig. 5, a back reflector (including trans reflectors) 26 may be attached or positioned against one side of the panel member 14 of Fig. 3 using a suitable adhesive 28 or other method in order to improve light output efficiency of the panel assembly 11 by reflecting the light emitted from that side back through the panel for emission through the opposite side. Additionally, a pattern of light extracting deformities 21, 23, 24 and/or 25 may be provided on one or both sides of the panel member in order to change the path of the light so that the internal critical angle is exceeded and a portion of the light is emitted from one or both sides of the panel. Moreover, a transparent film, ~~sheet or plate~~ sheet or film 27 may be attached or positioned against the side or sides of the panel member from which light is emitted using a suitable adhesive 28 (see Fig. 5) or other method in order to produce a desired effect.

Please replace the paragraph beginning at page 10, line 1 with the following amended paragraph:

The ~~member~~ sheet or film 27 may be used to further improve the uniformity of the light output distribution. For example, the ~~member~~ sheet or film 27 may be a colored film, a diffuser, or a label or display, a portion of which may be a transparent overlay that may be colored and/or have text or an image thereon.


Please replace the paragraph beginning at page 10, line 5, with the following amended paragraph:

BI  
cont.

If adhesive 28 is used to adhere the back reflector 26 and/or sheet or film 27 to the panel, the adhesive is preferably applied only along the side edges of the panel, and if desired the end edge opposite the light transition areas 12, but not over the entire surface area or areas of the panel because of the difficulty in consistently applying a uniform coating of adhesive to the panel. Also, the adhesive changes the internal critical angle of the light in a less controllable manner than the air gaps 30 (see Fig. 5) which are formed between the respective panel surfaces and the back reflector 26 and/or sheet or film 27 when only adhered along the peripheral edges. Additionally, longer panel members are achievable when air gaps 30 are used. If adhesive were to be used over the entire surface, the pattern of deformities could be adjusted to account for the additional attenuation in the light caused by the adhesive.

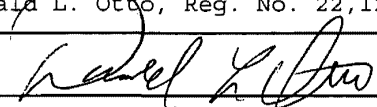
2875/7

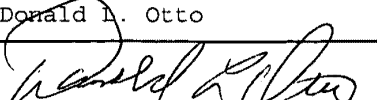
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 <b>TRANSMITTAL FORM</b> <small>(to be used for all correspondence after initial filing)</small>	<b>Application Number</b>	10/232,047	
	<b>Filing Date</b>	August 30, 2002	
	<b>First Named Inventor</b>	Jeffery R. Parker	
	<b>Group Art Unit</b>	2875	
	<b>Examiner Name</b>		
<b>Total Number of Pages in This Submission</b>	10	<b>Attorney Docket No.</b>	GLOLP0108USB

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<input checked="" type="checkbox"/> Amendment / Reply (Preliminary)	<input type="checkbox"/> Licensing-related Papers	<input type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief)
<input type="checkbox"/> After Final	<input type="checkbox"/> Petition	<input type="checkbox"/> Proprietary Information
<input type="checkbox"/> Affidavits/declaration(s)	<input type="checkbox"/> Petition to Convert to a Provisional Application	<input type="checkbox"/> Status Letter
<input type="checkbox"/> Extension of Time Request	<input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address	<input checked="" type="checkbox"/> Other Enclosure(s) (please identify below): Postcard
<input type="checkbox"/> Express Abandonment Request	<input type="checkbox"/> Terminal Disclaimer	
<input type="checkbox"/> Information Disclosure Statement	<input type="checkbox"/> Request for Refund	
<input type="checkbox"/> Certified Copy of Priority Document(s)	<input type="checkbox"/> CD, Number of CD(s) _____	
<input type="checkbox"/> Response to Missing Parts/Incomplete Application	<b>Remarks</b>	
<input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm or Individual name	Donald L. Otto, Reg. No. 22,125
Signature	
Date	October 14, 2002

CERTIFICATE OF MAILING			
I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, Washington, DC 20231 on this date: 10-14-02			
Typed or printed name	Donald L. Otto		
Signature		Date	10-14-02

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**FEE TRANSMITTAL**  
**For FY 2002**  
Patent fees are subject to annual revision.

**TOTAL AMOUNT OF PAYMENT** (\$) 1368.00

**Complete if Known**

Application Number	10/232,047
Filing Date	August 30, 2002
First Named Inventor	Jeffery R. Parker
Examiner Name	
Group Art Unit	2875
Attorney Docket No.	GL0LP0108USB

**METHOD OF PAYMENT**

1. ☒ The Commissioner is hereby authorized to charge indicated fees and credit any overpayments to:

Deposit Account Number: 18-0988

Deposit Account Name: Renner, Otto, Boisselle & Sklar, LLP

☒ Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17

☐ Applicant claims small entity status. See 37 CFR 1.27

2. ☒ **Payment Enclosed:**

☒ Check ☐ Credit card ☐ Money Order ☐ Other

**FEE CALCULATION**

**1. BASIC FILING FEE**

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
101 740	201 370	Utility filing fee	
106 330	206 165	Design filing fee	
107 510	207 255	Plant filing fee	
108 740	208 370	Reissue filing fee	
114 160	214 80	Provisional filing fee	

**SUBTOTAL (1)** (\$)

**2. EXTRA CLAIM FEES**

Total Claims: 131  
Independent Claims: 16  
Multiple Dependent: -10

Extra Claims: 83  
Fee from below: 48  
Fee Paid: 864

Extra Claims: 6  
Fee from below: 84  
Fee Paid: 504

**Large Entity Fee Code (\$)** **Small Entity Fee Code (\$)** **Fee Description**

103 18	203 9	Claims in excess of 20
102 84	202 42	Independent claims in excess of 3
104 280	204 140	Multiple dependent claim, if not paid
109 84	209 42	** Reissue independent claims over original patent
110 18	210 9	** Reissue claims in excess of 20 and over original patent

**SUBTOTAL (2)** (\$) 368.00

\*\*or number previously paid, if greater; For Reissues, see above

**3. ADDITIONAL FEES**

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
105 130	205 65	Surcharge - late filing fee or oath	
127 50	227 25	Surcharge - late provisional filing fee or cover sheet	
139 130	139 130	Non-English specification	
147 2,520	147 2,520	For filing a request for ex parte reexamination	
112 920*	112 920*	Requesting publication of SIR prior to Examiner action	
113 1,840*	113 1,840*	Requesting publication of SIR after Examiner action	
115 110	215 55	Extension for reply within first month	
116 400	216 200	Extension for reply within second month	
117 920	217 460	Extension for reply within third month	
118 1,440	218 720	Extension for reply within fourth month	
128 1,960	228 980	Extension for reply within fifth month	
119 320	219 160	Notice of Appeal	
120 320	220 160	Filing a brief in support of an appeal	
121 280	221 140	Request for oral hearing	
138 1,510	138 1,510	Petition to institute a public use proceeding	
140 110	240 55	Petition to revive - unavoidable	
141 1,280	241 640	Petition to revive - unintentional	
142 1,280	242 640	Utility issue fee (or reissue)	
143 460	243 230	Design issue fee	
144 620	244 310	Plant issue fee	
122 130	122 130	Petitions to the Commissioner	
123 50	123 50	Processing fee under 37 CFR 1.17(q)	
126 180	126 180	Submission of Information Disclosure Stmt	
581 40	581 40	Recording each patent assignment per property (times number of properties)	
146 740	246 370	Filing a submission after final rejection (37 CFR § 1.129(a))	
149 740	249 370	For each additional invention to be examined (37 CFR § 1.129(b))	
179 740	279 370	Request for Continued Examination (RCE)	
169 900	169 900	Request for expedited examination of a design application	

Other fee (specify) \_\_\_\_\_

**SUBTOTAL (3)** (\$)

**SUBMITTED BY**

Name (Print/Type)	Donald L. Otto	Registration No. (Attorney/Agent)	22,125	Telephone	(216) 621-1113
Signature		Date	10-14-02		

**WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**

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**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

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Claims 1-131 (canceled)

B2  
Claim 132 (new): A backlight assembly comprising a light emitting member having at least one light emitting area that emits light that is internally reflected within the light emitting member, a separate transparent sheet or film overlying the light emitting area with an air gap therebetween, a pattern of deformities on one side of the sheet or film having a width and length that is quite small in relation to the width and length of the sheet or film, the deformities varying at different locations on the sheet or film to direct the light that is emitted by the light emitting member in different directions to produce a desired light output distribution such that the light will pass through a liquid crystal display with low loss.

Claim 133 (new): The assembly of claim 132 wherein the deformities vary in size at different locations on the sheet or film to direct the light in different directions.

Claim 134 (new): The assembly of claim 132 wherein the deformities vary in shape at different locations on the sheet or film to direct the light in different directions.

Claim 135 (new): The assembly of claim 132 wherein the deformities vary in placement at different locations on the sheet or film to direct the light in different directions.

3/2/2.

Claim 136 (new): The assembly of claim 132 wherein the deformities vary in index of refraction at different locations on the sheet or film to direct the light in different directions.

Claim 137 (new): The assembly of claim 132 wherein the deformities vary in density at different locations on the sheet or film to direct the light in different directions.

Claim 138 (new): The assembly of claim 132 wherein the deformities vary in angle at different locations on the sheet or film to direct the light in different directions.

Claim 139 (new): The assembly of claim 132 wherein the deformities vary in depth or height at different locations on the sheet or film to direct the light in different directions.

Claim 140 (new): The assembly of claim 132 wherein the deformities vary in type at different locations on the sheet or film to direct the light in different directions.

Claim 141 (new): The assembly of claim 132 wherein the deformities comprise depressions on the sheet or film.

Claim 142 (new): The assembly of claim 132 wherein the deformities comprise projections on the sheet or film.

Claim 143 (new): The assembly of claim 132 wherein the sheet or film has at least one of a coating and surface treatment for causing the light to pass through a liquid crystal display with low loss.

Claim 144 (new): The assembly of claim 132 wherein the sheet or film comprises at least one of multiple layers and materials.

Claim 145 (new): The assembly of claim 144 wherein the at least one of the multiple layers and materials has a different index of refraction.

Claim 146 (new): The assembly of claim 132 wherein the deformities are varied to reduce moiré or other interference effects when the light passes through a liquid crystal display.



Claim 147 (new): The assembly of claim 132 wherein the deformities are at least one of prisms, prismatic and lenticular.

Claim 148 (new): The assembly of claim 132 wherein the deformities randomly vary in size on the sheet or film to direct the light in different directions.

Claim 149 (new): The assembly of claim 132 wherein the deformities randomly vary in shape on the sheet or film to direct the light in different directions.

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Claim 150 (new): The assembly of claim 132 wherein the deformities randomly vary in placement on the sheet or film to direct the light in different directions.

Claim 151 (new): The assembly of claim 132 wherein the deformities randomly vary in density on the sheet or film to direct the light in different directions.

Claim 152 (new): The assembly of claim 132 wherein the deformities randomly vary in angle on the sheet or film to direct the light in different directions.

Claim 153 (new): The assembly of claim 132 wherein the deformities randomly vary in depth or height on the sheet or film to direct the light in different directions.

Claim 154 (new): The assembly of claim 132 wherein the deformities randomly vary in type on the sheet or film to direct the light in different directions.

Claim 155 (new): The assembly of claim 132 wherein the deformities have a pattern with no specific angle.

Claim 156 (new): The assembly of claim 132 wherein at least some of the deformities include prismatic surfaces having angles that vary at different locations on the sheet or film to direct the light in different directions.

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CMTA

Claim 157 (new): The assembly of claim 132 wherein at least some of the deformities have random or varying changes in shape or geometry on the sheet or film to direct the light in different directions.

Claim 158 (new): The assembly of claim 132 wherein the sheet or film has random or varying changes in at least one of a coating or surface treatment to direct the light in different directions.

Claim 159 (new): The assembly of claim 158 wherein the at least one of the coating and surface treatment varies in at least one of the following characteristics: density, color, index of refraction, reflection, opaqueness, translucence, area, depth, shape, size, and type.

Claim 160 (new): The assembly of claim 158 wherein the at least one of the coating and surface treatment is at least one of paint, ink and epoxy.

Claim 161 (new): The assembly of claim 132 wherein the sheet or film has a coating that is selected to improve at least one of the following characteristics of the backlight assembly: color correction, opaqueness, diffusion, reflection, translucence, and transmission.

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Claim 162 (new): The assembly of claim 132 wherein at least some of the deformities touch, intersect or overlap other deformities.

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### **REMARKS/ARGUMENTS**

The Examiner objected to the drawings on the ground that reference character "27" has been used to designate sheet or film, member and sheet or plate. However, these are all the same element. To avoid any ambiguity in that regard, the term "sheet or film" has been substituted for the term "member or plate" throughout the specification. Accordingly, withdrawal of the objection to the drawings is respectfully requested.

Claims 132-162 remain in the application. Claims 1-131 have been canceled. All of the pending claims 132-162 read on the elected species of Figs. 3, 5.

Claim 132 is directed to a backlight assembly including, *inter alia*, a light emitting member having at least one light emitting area that emits light that is internally reflected within the light emitting member and a separate transparent sheet or film overlying the light emitting area with an air gap therebetween. On one side of the sheet or film is a pattern of deformities having a width and length that is quite small in relation to the width and length of the sheet or film, the deformities varying at different locations of the sheet or film to direct the light that is emitted by the light emitting member in different directions to produce a desired light output distribution such that the light will pass through a liquid crystal display with low loss, in a manner clearly nowhere disclosed or suggested in any of the cited references.

Exception is taken with the Examiner's statement that the deformities of Nakamura et al ('417) vary at least by angle. The references made by the Examiner to Fig. 7 and column 1, lines 58-67, column 2, lines 1-14 and column 4,

lines 43-56 of Nakamura et al merely disclose that the light emitted from the light guide plate 3 is uniformly distributed through the scattering plate 5 over a wide range of angles, not that the angles of the deformities vary at different locations to direct the light that is emitted by the light emitting member in different directions to produce a desired light output distribution such that the light will pass through a liquid crystal display with low loss as claimed.

In Hou et al ('439) the reflecting means 18 (including the spacer 82 that separates the microlenses 80 and microprisms 28) is optically coupled to the wave guide 16 (column 4, lines 14-17 and column 6, lines 61 and 62). Thus there is no air gap in Hou et al between the light emitting area of a light emitting member and a separate transparent sheet or film as claimed. Moreover, there is no disclosure or suggestion in Hou et al of varying the deformities 28 or 80 at different locations on the spacer 82 to direct the light that is emitted by the light guide 16 in different directions to produce a desired light output distribution such that the light will pass through a liquid crystal display with low loss. Ando et al ('784) is even less pertinent. Accordingly, claim 132 is submitted as clearly allowable.

Claims 133-162 depend from claim 132 and are submitted as allowable for substantially the same reasons. Moreover, claims 133-140 and 148-154 further patentably distinguish over the cited references by more particularly reciting how the deformities vary at different locations on the sheet or film. Admittedly, it is generally known to vary the deformities in size, placement, density and depth or height at different locations on a surface of a light guide, but not on a sheet or film overlying a light emitting area of a light emitting member with an air gap

therebetween as recited in claims 133, 135, 137 and 139, respectively, or to randomly vary the deformities in size, placement, density, or depth or height on the sheet or film as recited in claims 148, 150, 151 and 153, respectively. The statement in column 6, lines 13-18 of Hou et al ('439) that the lengths 52 and 53 of microprisms 28 may vary widely depending on the dimensions and resolution of the display in no way discloses that the lengths are random.

Moreover, nowhere do the cited references disclose or suggest varying the shape, index of refraction, angle or type of the deformities at different locations on the sheet or film to direct the light in different directions as recited in claims 134, 136, 138 and 140, respectively, or randomly varying the shape, angle or type of the deformities on the sheet or film to direct the light in different directions as recited in claims 149, 152 and 154, respectively. Nor do any of the cited references disclose or suggest that at least some of the deformities include prismatic surfaces having angles that vary at different locations on the sheet or film to direct the light in different directions as recited in claim 156, or that at least some of the deformities have random or varying changes in shape or geometry on the sheet or film to direct the light in different directions as recited in claim 157. Accordingly, these claims are submitted as allowable in their own right in addition to being dependent on claim 132.

Claims 158-160 also further patentably distinguish over the cited references by reciting that the sheet or film has random or varying changes in at least one of a coating or surface treatment to direct the light in different directions. The disclosure in column 33, lines 26-57 of Ando et al ('784) that an intermediate sheet having a lens array formed by coating an ultraviolet ray

curable resin solution on a polyethylene terephthalate as a transparent substrate in no way teaches providing a sheet or film with random or varying changes in at least one of a coating or surface treatment to direct the light in different directions as recited in these claims.

Where, as here, the differences in the claimed structure give advantageous results not disclosed or suggested in the cited references, more than a matter of design is involved. Accordingly, this application is now believed to be in condition for final allowance of all of the pending claims 132-162, and early action to that end is earnestly solicited. Should the Examiner disagree with applicant's attorney in any respect, it is respectfully requested that the Examiner telephone applicant's attorney in an effort to resolve such differences.

In the event that an extension of time is necessary, this should be considered a petition for such an extension. If required, fees are enclosed for the extension of time and/or for the presentation of new and/or amended claims. In the event any additional fees are due in connection with the filing of this amendment, the Commissioner is authorized to charge those fees to our Deposit Account No. 18-0988 (Charge No. GLOLP0108USB).

Respectfully submitted,

RENNER, OTTO, BOISSELLE & SKLAR, LLP

By 

Donald L. Otto, Registration No. 22,125

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AW

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/232,047	08/30/2002	Jeffery R. Parker	GLOLP0108USB	6402
7590 11/03/2003			EXAMINER	
Donald L. Otto Renner, Otto, Boisselle & Sklar, LLP 19th Floor 1621 Euclid Avenue Cleveland, OH 44115-2191			WARD, JOHN A	
			ART UNIT	PAPER NUMBER
			2875	

DATE MAILED: 11/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.



# Office Action Summary

Application No.

10/232,047

Applicant(s)

PARKER, JEFFERY R.

Examiner

John A. Ward

Art Unit

2875

AW

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 07 August 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 132-160 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 132 is/are rejected.
- 7) ☒ Claim(s) 133-160 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other:

## DETAILED ACTION

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claim 132 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-4, 6, 12, 17, and 25 of U.S. Patent No. 5,613,751. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1-4, 6, 12, 17, and 25 of the prior art of Parker et al incorporate all the limitations of the claimed invention in claim 132 of the instant application.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine all the limitations of the prior art of Parker et al and provide the same invention as claimed in the instant application since each limitation cited in the prior art of Parker et al would yield the same results.

### ***Allowable Subject Matter***


Claims 133-160 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John A. Ward whose telephone number is 703-305-5157. The examiner can normally be reached on Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on 703-305-4939. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0596.

JAW  
October 27, 2003



John A. Ward  
Patent Examiner AU 2875

g-

**Notice of References Cited**

Application/Control No.

10/232,047

Applicant(s)/Patent Under  
Reexamination  
PARKER, JEFFERY R.

Examiner

John A. Ward

Art Unit

2875

Page 1 of 1

**U.S. PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-5,613,751	03-1997	Parker et al.	362/31
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

**FOREIGN PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

**NON-PATENT DOCUMENTS**

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.



CERTIFICATE OF MAILING (37 CFR 1.8a)

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Date: 2/3/04

Donald L. Otto  
Donald L. Otto

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Attorney Docket GLOLP0108USB

In re PATENT application of

Jeffery R. Parker

Serial No. 10/232,047

Filed August 30, 2002

For: LIGHT EMITTING PANEL ASSEMBLIES

Art Unit 2875

Confirmation No. 6402

John A. Ward, Examiner

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**REPLY TO OFFICE ACTION OF NOVEMBER 3, 2003**

Commissioner for Patents

P.O. Box 1450

Alexandria, Virginia 22313-1450

Sir:

In reply to the Office Action of November 3, 2003, further and favorable consideration of all of the pending claims 132-162 is respectfully requested in view of the following remarks/arguments.

### **REMARKS/ARGUMENTS**

Claims 132-162 remain in the application. Claims 1-131 have been canceled.

All of the pending claims 132-162 read on the elected species of Figs. 3, 5.

Claim 132 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-4, 6, 12, 17 and 25 of U.S. Patent No. 5,613,751 (the '751 patent). According to the Examiner, although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1-4, 6, 12, 17 and 25 of the '751 patent incorporate all of the limitations of the claimed invention in claim 132 of the instant application.

Applicant's attorney respectfully disagrees with this rejection. Nevertheless, a terminal disclaimer in compliance with 37 CFR 1.321(c) is filed herewith to overcome this rejection based on a non-statutory double patenting ground. Accordingly, claim 132 is submitted as allowable.

Claims 133-160 were objected to as being dependent upon a rejected base claim (*i.e.*, claim 132) but were indicated to be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. However, since claim 132 is now presumably allowable, claims 133-160 are also allowable. Moreover, claims 161 and 162 depend from claim 132 and are also submitted as allowable.

In view of the obviousness-type double patenting rejection of claim 132 based on the '751 patent, the Examiner's attention is directed to the following pending U.S. patent applications which rely on the '751 patent for an earlier filing date:

Serial No. 09/256,275

Serial No. 10/324,880

Serial No. 10/324,882

Serial No. 10/325,573

Serial No. 10/619,815

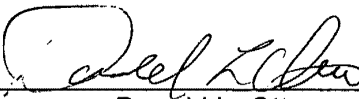
Serial No. 10/688,296

In view of the foregoing, this application is now believed to be in condition for final allowance of all of the pending claims 132-162, and early action to that end is earnestly solicited. Should the Examiner disagree with applicant's attorney in any respect, it is respectfully requested that the Examiner telephone applicant's attorney in an effort to resolve such differences.

In the event that an extension of time is necessary, this should be considered a petition for such an extension. If required, fees are enclosed for the extension of time and/or for the presentation of new and/or amended claims. In the event any additional fees are due in connection with the filing of this amendment, the Commissioner is authorized to charge those fees to our Deposit Account No. 18-0988.

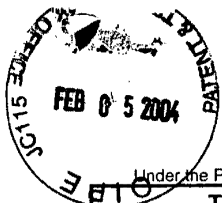
Respectfully submitted,

RENNER, OTTO, BOISSELLE & SKLAR, LLP

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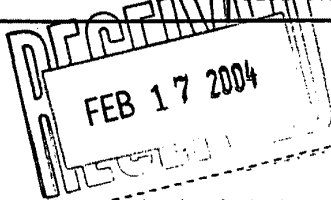
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**TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING  
REJECTION OVER A PRIOR PATENT**

Docket Number (Optional)

GLDP0108USB

In re Application of: Jeffery R. Parker  
Application No.: 10/232,047  
Filed: August 30, 2002  
For: LIGHT EMITTING PANEL ASSEMBLIES



The owner\*, Solid State Opto Limited, of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application, which would extend beyond the expiration date of the full statutory term defined in 35 U.S.C. 154 and 173, as presently shortened by any terminal disclaimer, of prior Patent No. 5,613,751. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term as defined in 35 U.S.C. 154 and 173 of the prior patent, as presently shortened by any terminal disclaimer, in the event that it later: expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321, has all claims canceled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. ☐ For submissions on behalf of an organization (e.g., corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the organization.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2. ☒ The undersigned is an attorney or agent of record.

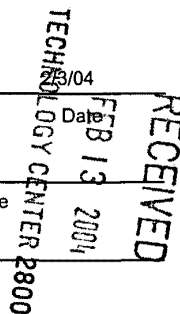
Signature

Donald L. Otto

Typed or printed name

216-621-1113

Telephone Number



- ☒ Terminal disclaimer fee under 37 CFR 1.20(d) included.

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\*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).  
Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

This collection of information is required by 37 CFR 1.321. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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PTO/SB/21 (08-03)  
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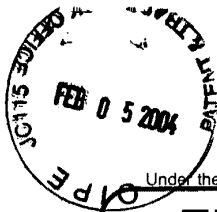
<b>TRANSMITTAL FORM</b>  (to be used for all correspondence after initial filing)	Application Number	10/232,047	
	Filing Date	August 30, 2002	
	First Named Inventor	Jeffery R. Parker	
	Art Unit	2875	
	Examiner Name	John A. Ward	
Total Number of Pages in This Submission	6	Attorney Docket Number	GL0LP0108USB

ENCLOSURES (Check all that apply)		
<input checked="" type="checkbox"/> Fee Transmittal Form <input checked="" type="checkbox"/> Fee Attached <input checked="" type="checkbox"/> Amendment/Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Response to Missing Parts/Incomplete Application <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation <input type="checkbox"/> Change of Correspondence Address <input checked="" type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s) _____	<input type="checkbox"/> After Allowance communication to Technology Center (TC) <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input type="checkbox"/> Other Enclosure(s) (please identify below):
<div>RECEIVED FEB 13 2004 TECHNOLOGY CENTER 2800</div>		
Remarks		
SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT		
Firm or Individual name	Donald L. Otto, Reg. No. 22,125	
Signature		
Date	February 3, 2004	

CERTIFICATE OF TRANSMISSION/MAILING		
I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below.		
Typed or printed name	Donald L. Otto	
Signature		Date 2/3/04

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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PTO/SB/17 (08-03)  
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# FEE TRANSMITTAL for FY 2003

Effective 01/01/2003. Patent fees are subject to annual revision.

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$) 110.00

## Complete if Known

Application Number	10/232,047
Filing Date	August 30, 2002
First Named Inventor	Jeffery R. Parker
Examiner Name	John A. Ward
Art Unit	2875
Attorney Docket No.	GLOLP0108USB

## METHOD OF PAYMENT (check all that apply)

☒ Check ☐ Credit card ☐ Money Order ☐ Other ☐ None

☒ Deposit Account:

Deposit Account Number: 18-0988  
Deposit Account Name: Renner, Otto, Boisselle & Sklar, LLP

The Director is authorized to: (check all that apply)

☐ Charge fee(s) indicated below ☒ Credit any overpayments

☒ Charge any additional fee(s) during the pendency of this application

☐ Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.

## FEE CALCULATION

### 1. BASIC FILING FEE

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
1001	770	2001	385	Utility filing fee	
1002	340	2002	170	Design filing fee	
1003	530	2003	265	Plant filing fee	
1004	770	2004	385	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	
SUBTOTAL (1)				(\$)	

### 2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

Total Claims:  -20\*\* =  X  =   
Independent Claims:  -3\*\* =  X  =   
Multiple Dependent:  =

Large Entity		Small Entity		Fee Description
Fee Code	Fee (\$)	Fee Code	Fee (\$)	
1202	18	2202	9	Claims in excess of 20
1201	86	2201	43	Independent claims in excess of 3
1203	290	2203	145	Multiple dependent claim, if not paid
1204	86	2204	43	** Reissue independent claims over original patent
1205	18	2205	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) (\$)

\*\*or number previously paid, if greater; For Reissues, see above

## FEE CALCULATION (continued)

### 3. ADDITIONAL FEES

Large Entity Small Entity

Fee Code	Fee (\$)	Fee Code	Fee (\$)	Fee Description	Fee Paid
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for ex parte reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	
1252	420	2252	210	Extension for reply within second month	
1253	950	2253	475	Extension for reply within third month	
1254	1,480	2254	740	Extension for reply within fourth month	
1255	2,010	2255	1,005	Extension for reply within fifth month	
1401	330	2401	165	Notice of Appeal	
1402	330	2402	165	Filing a brief in support of an appeal	
1403	290	2403	145	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive - unavoidable	
1453	1,330	2453	665	Petition to revive - unintentional	
1501	1,330	2501	665	Utility issue fee (or reissue)	
1502	480	2502	240	Design issue fee	
1503	640	2503	320	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	770	2809	385	Filing a submission after final rejection (37 CFR 1.129(a))	
1810	770	2810	385	For each additional invention to be examined (37 CFR 1.129(b))	
1801	770	2801	385	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	
Other fee (specify) Terminal Disclaimer					110

\*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$) 110.00

## SUBMITTED BY

(Complete if applicable)

Name (Print/Type)	Donald L. Otto	Registration No. (Attorney/Agent)	22,125	Telephone (216) 621-1113
Signature		Date	2/3/04	

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NOTICE OF ALLOWANCE AND FEE(S) DUE

7590 03/09/2004

Donald L. Otto  
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19th Floor  
1621 Euclid Avenue  
Cleveland, OH 44115-2191

EXAMINER

WARD, JOHN A

ART UNIT

PAPER NUMBER

2875

DATE MAILED: 03/09/2004

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/232,047	08/30/2002	Jeffery R. Parker	GLOLP0108USB	6402

TITLE OF INVENTION: LIGHT EMITTING PANEL ASSEMBLIES

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1330	\$300	\$1630	06/09/2004

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE REFLECTS A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE APPLIED IN THIS APPLICATION. THE PTOL-85B (OR AN EQUIVALENT) MUST BE RETURNED WITHIN THIS PERIOD EVEN IF NO FEE IS DUE OR THE APPLICATION WILL BE REGARDED AS ABANDONED.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status is changed, pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above and notify the United States Patent and Trademark Office of the change in status, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check the box below and enclose the PUBLICATION FEE and 1/2 the ISSUE FEE shown above.

☐ Applicant claims SMALL ENTITY status.  
See 37 CFR 1.27.

II. PART B - FEE(S) TRANSMITTAL should be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). Even if the fee(s) have already been paid, Part B - Fee(s) Transmittal should be completed and returned. If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER:** Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

# PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail

**Mail Stop ISSUE FEE**  
**Commissioner for Patents**  
**P.O. Box 1450**  
**Alexandria, Virginia 22313-1450**  
**or Fax (703) 746-4000**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 4 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Legibly mark-up with any corrections or use Block 1)

7590 03/09/2004

Donald L. Otto  
 Renner, Otto, Boisselle & Sklar, LLP  
 19th Floor  
 1621 Euclid Avenue  
 Cleveland, OH 44115-2191

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

## Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/232,047	08/30/2002	Jeffery R. Parker	GL0LP0108USB	6402

TITLE OF INVENTION: LIGHT EMITTING PANEL ASSEMBLIES

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1330	\$300	\$1630	06/09/2004

EXAMINER	ART UNIT	CLASS-SUBCLASS
WARD, JOHN A	2875	362-031000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.  
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1	_____
2	_____
3	_____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. Inclusion of assignee data is only appropriate when an assignment has been previously submitted to the USPTO or is being submitted under separate cover. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent); ☐ individual ☐ corporation or other private group entity ☐ government

4a. The following fee(s) are enclosed:

- ☐ Issue Fee  
☐ Publication Fee  
☐ Advance Order - # of Copies \_\_\_\_\_

4b. Payment of Fee(s):

- ☐ A check in the amount of the fee(s) is enclosed.  
☐ Payment by credit card. Form PTO-2038 is attached.  
☐ The Director is hereby authorized by charge the required fee(s), or credit any overpayment, to Deposit Account Number \_\_\_\_\_ (enclose an extra copy of this form).

Director for Patents is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above.

(Authorized Signature)	(Date)
<p>NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.</p> <p>This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, Alexandria, Virginia 22313-1450.</p> <p>Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.</p>	

TRANSMIT THIS FORM WITH FEE(S)



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/232,047	08/30/2002	Jeffery R. Parker	GLOLP0108USB	6402
7590	03/09/2004			
Donald L. Otto Renner, Otto, Boisselle & Sklar, LLP 19th Floor 1621 Euclid Avenue Cleveland, OH 44115-2191			EXAMINER WARD, JOHN A	
			ART UNIT	PAPER NUMBER
			2875	

DATE MAILED: 03/09/2004

## Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 0 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 0 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) system (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (703) 305-1383. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at (703) 305-8283.

<b>Notice of Allowability</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/232,047	PARKER, JEFFERY R.	
	<b>Examiner</b>	<b>Art Unit</b>	
	John A. Ward	2875	

-- **The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**  
 All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 05 February 2004.
2. ☒ The allowed claim(s) is/are 132-162.
3. ☒ The drawings filed on 30 August 2002 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☒ Certified copies of the priority documents have been received in Application No. 08/637,607.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

**Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |   |  |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)  | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date _____ | 7. <input type="checkbox"/> Examiner's Amendment/Comment                               |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material          | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance   |
|   | 9. <input type="checkbox"/> Other _____.   |

**DETAILED ACTION**

***Drawings***

Drawing objection given on May 8, 2003 have been withdrawn.

***Terminal Disclaimer***

The terminal disclaimer filed on February 5, 2004 disclaiming the terminal portion of any patent granted on this application, which would extend beyond the expiration date of 5613751 has been reviewed and is accepted. The terminal disclaimer has been recorded.

***Allowable Subject Matter***

Claims 132-162 are allowed.

The following is an examiner's statement of reasons for allowance: Regarding claim 132, the terminal disclaimer as indicated above, overcomes the obvious double patenting rejection given in the prior office action of May 8, 2003.

Claims 133-162 are allowable because of its dependency upon claim 132.

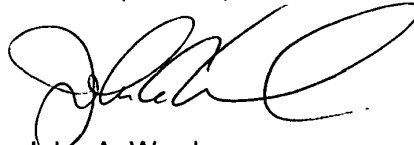
Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John A. Ward whose telephone number is 571-272-2386. The examiner can normally be reached on Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on 571-272-2378. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JAW  
February 27, 2004



John A. Ward  
Patent Examiner AU 2875



<input type="checkbox"/> Claims renumbered in the same order as presented by applicant						<input type="checkbox"/> CPA		<input type="checkbox"/> T.D.		<input type="checkbox"/> R.1.47		
Final	Original		Final	Original		Final	Original		Final	Original		
	1			31			121		20	151		181
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	3			33			123		22	153		183
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	27			57			16 147			177		207
	28			58			17 148			178		208
	29			59			18 149			179		209
	30			60			19 150			180		210

# Index of Claims



Application No.

10/232,047

Examiner

John A. Ward

Applicant(s)

PARKER, JEFFERY R.

Art Unit

2875

√	Rejected
=	Allowed

—	(Through numeral) Cancelled
+	Restricted

N	Non-Elected
I	Interference

A	Appeal
O	Objected

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# Index of Claims (continued)



Application No.

10/232,047

Examiner

John A. Ward

Applicant(s)

PARKER, JEFFERY R.

Art Unit

2875

✓	Rejected
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—	(Through numeral) Cancelled
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N	Non-Elected
I	Interference

A	Appeal
O	Objected

Claim		Date											
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<b>Search Notes</b> 	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/232,047	PARKER, JEFFERY R.	
	<b>Examiner</b>	<b>Art Unit</b>	
	John A. Ward	2875	

SEARCHED			
Class	Subclass	Date	Examiner

INTERFERENCE SEARCHED			
Class	Subclass	Date	Examiner
Files Unavailable		2/27/2004	JAW

SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
	DATE	EXMR
Updated Search	2/27/2004	JAW



## PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: MailMail Stop ISSUE FEE  
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or Fax (703) 746-4000

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7590

03/09/2004

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Renner, Otto, Boisselle & Sklar, LLP  
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1621 Euclid Avenue  
Cleveland, OH 44115-2191

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

## Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO, on the date indicated below.

Donald L. Otto	(Depositor's name)
<i>Donald L. Otto</i>	(Signature)
May 17, 2004	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/232,047	08/30/2002	Jeffery R. Parker	GLOLP0108USB	6402

TITLE OF INVENTION: LIGHT EMITTING PANEL ASSEMBLIES

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WARD, JOHN A	2875	362-031000

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2. For printing on the patent front page, list (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

Renner, Otto, Boisselle  
& Sklar, LLP

## 3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

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(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Solid State Opto Limited

British Virgin Islands

Please check the appropriate assignee category or categories (will not be printed on the patent); ☐ individual ☒ corporation or other private group entity ☐ government

## 4a. The following fee(s) are enclosed:

☒ Issue Fee \$1330  
☒ Publication Fee \$300  
☒ Advance Order - # of Copies 5 (\$15)

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☒ A check in the amount of the fee(s) is enclosed. \$1645  
☐ Payment by credit card. Form PTO-2038 is attached. Charge deficiencies only.☒ The Director is hereby authorized to charge the required fee(s), or credit any overpayment, to Deposit Account Number 18-0988 (enclose an extra copy of this form).

Director for Patents is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above.

(Authorized Signature) Donald L. Otto (Date)

5/17/04

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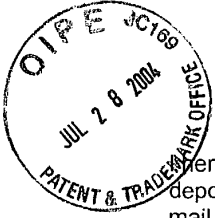
This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, Alexandria, Virginia 22313-1450.

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05/20/2004 HVUONG2 00000015 10232047

01 FC:1504	300.00 OP
02 FC:1501	1330.00 OP
03 FC:8001	15.00 OP

TRANSMIT THIS FORM WITH FEE(S)



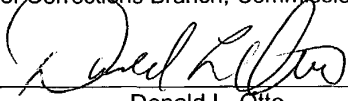
10,232,047.

U.S. Patent & Trademark Office

CERTIFICATE OF MAILING (37 CFR 1.8a)

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Attention: Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Date: July 26, 2004

  
Donald L. Otto

Docket No. GLOLP0108USB

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Number: 6,755,547 *B2*  
Issued: June 29, 2004  
Name of Patentee: Jeffery R. Parker  
Title: LIGHT EMITTING PANEL ASSEMBLIES

Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Certificate  
JUL 30 2004  
of Correction

ATTENTION: Decision and Certificate of Correction  
Branch of the Patent Issue Division

REQUEST FOR CERTIFICATE OF CORRECTION OF PATENT  
FOR PTO MISTAKE (37 C.F.R. section 1.322(a))

Request is made for issuance of a certificate of correction to correct USPTO mistakes in the printing of the subject patent. Attached hereto in duplicate is Form PTO/SB/44 with at least one copy being suitable for printing.

The exact page and line numbers in the application where the correct language is found are:

Reply filed August 7, 2003, claim 132, line 7  
Reply filed August 7, 2003, claim 148, line 2  
Reply filed August 7, 2003, claim 149, line 2  
Reply filed August 7, 2003, claim 150, line 2  
Reply filed August 7, 2003, claim 151, line 2  
Reply filed August 7, 2003, claim 152, line 2  
Reply filed August 7, 2003, claim 153, line 2  
Reply filed August 7, 2003, claim 154, line 2  
Reply filed August 7, 2003, claim 156, line 2

AUG 02 2004

Reply filed August 7, 2003, claim 159, line 4  
Reply filed August 7, 2003, claim 161, lines 2 and 3

Please send the Certificate to:

Name: Donald L. Otto

Address: Renner, Otto, Boisselle & Sklar, LLP  
1621 Euclid Avenue  
Nineteenth Floor  
Cleveland, Ohio 44115-2191

No fee is believed to be necessary. However, if the errors are found to be those of the applicant, please charge any required fee to Deposit Account No. 18-0988, Docket No. GLOLP0108USB.

Date: July 26, 2004



---

Donald L. Otto  
Registration No. 22,125  
Attorney of Record

RENNER, OTTO, BOISSELLE & SKLAR, LLP  
1621 Euclid Avenue  
Nineteenth Floor  
Cleveland, Ohio 44115-2191

(216) 621-1113

Z:\SEC177\GLOLP108USB\REQUEST FOR CERTIFICATE OF CORRECTION OF PATENT.wpd

## UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO. : 6,755,547 *B2*  
DATED : June 29, 2004  
INVENTOR(S) : Jeffery R. Parker

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Claim 1, line 10, after "the" delete ",".

Claim 17, line 2, after "sheet" insert "or".

Claim 18, line 2, after "sheet" insert "or".

Claim 19, line 2, after "sheet" insert "or".

Claim 20, line 2, after "sheet" insert "or".

Claim 21, line 2, after "sheet" insert "or".

Claim 22, line 2, after "sheet" insert "or".

Claim 23, line 2, after "sheet" insert "or".

Claim 25, line 2, replace "hayng" with "having".

Claim 28, line 4, after "shape" insert ",".

Claim 30, line 2, after "least" delete "to"; line 4, after "correction" insert ","; after "reflection" insert ",".

MAILING ADDRESS OF SENDER:

PATENT NO.

6,755,547 *B2*

No. of additional copies



This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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www.uspto.gov

APPLICATION NUMBER	PATENT NUMBER	GROUP ART UNIT	FILE WRAPPER LOCATION
10/232,047	6755547	2875	06B0

**Change of Address/Power of Attorney**

The following fields have been set to Customer Number 23908 on 02/28/2005

- Correspondence Address
- Power of Attorney

**The address of record for Customer Number 23908 is:**

RENNER OTTO BOISSELLE & SKLAR, LLP  
1621 EUCLID AVENUE  
NINETEENTH FLOOR  
CLEVELAND, OH 44115

**The Practitioners of record for Customer Number 23908 are:**

**PTO INSTRUCTIONS:**

Please take the following action when the correspondence address has been changed to a customer number:

- 1) Add 'ADDRESS CHANGE TO CUSTOMER NUMBER' on the next available content line of the File Jacket.
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- 3) File this Notice in the File Jacket.

Please take the following action when the correspondence address has NOT been changed:

- 1) File this Notice in the File Jacket

## UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO. : 6,755,547 *B2*

DATED : June 29, 2004

INVENTOR(S) : Jeffery R. Parker

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Claim 1, line 10, after "the" delete ",".

Claim 17, line 2, after "sheet" insert "or".

Claim 18, line 2, after "sheet" insert "or".

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Claim 20, line 2, after "sheet" insert "or".

Claim 21, line 2, after "sheet" insert "or".

Claim 22, line 2, after "sheet" insert "or".

Claim 23, line 2, after "sheet" insert "or".

Claim 25, line 2, replace "hayng" with "having".

Claim 28, line 4, after "shape" insert ",".

Claim 30, line 2, after "least" delete "to"; line 4, after "correction" insert ","; after "reflection" insert ",".

MAILING ADDRESS OF SENDER:

PATENT NO.

*6,755,547 B2*

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This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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AUG 02 2004

UNITED STATES PATENT AND TRADEMARK OFFICE  
**CERTIFICATE OF CORRECTION**

PATENT NO. : 6,755,547 B2  
APPLICATION NO. : 10/232047  
DATED : June 29, 2004  
INVENTOR(S) : Jeffery R. Parker

Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Claim 1, line 10, after "the" delete ",".

Claim 17, line 2, after "sheet" insert --or--.

Claim 18, line 2, after "sheet" insert --or--.

Claim 19, line 2, after "sheet" insert --or--.

Claim 20, line 2, after "sheet" insert --or--.

Claim 21, line 2, after "sheet" insert --or--.

Claim 22, line 2, after "sheet" insert --or--.

Claim 23, line 2, after "sheet" insert --or--.

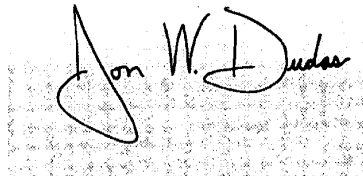
Claim 25, line 2, replace "hayng" with --having--.

Claim 28, line 4, after "shape" insert --,--.

Claim 30, line 2, after "least" delete "to"; line 4, after "correction" insert --,--; after "reflection" insert --,--.

Signed and Sealed this

Twelfth Day of December, 2006

A handwritten signature in black ink, reading "Jon W. Dudas". The signature is written in a cursive style with a large, stylized "J" and "D".

JON W. DUDAS  
*Director of the United States Patent and Trademark Office*



UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NUMBER	PATENT NUMBER	GROUP ART UNIT	FILE WRAPPER LOCATION
10/232,047	6755547	2875	06B0



**Correspondence Address/Fee Address Change**

The following fields have been set to Customer Number 93969 on 03/09/2010

- Correspondence Address
- Power of Attorney Address

The address of record for Customer Number 93969 is:

**93969**  
**Rambus International Ltd**  
**c/o Rambus Inc.**  
**4440 El Camino Real**  
**Los Altos, CA 94022**



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United States Patent and Trademark Office  
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www.uspto.gov

APPLICATION NUMBER	PATENT NUMBER	GROUP ART UNIT	FILE WRAPPER LOCATION
10/232,047	6755547	2875	06B0



**Correspondence Address/Fee Address Change**

The following fields have been set to Customer Number 93969 on 03/23/2010

- Correspondence Address
- Power of Attorney Address

The address of record for Customer Number 93969 is:

93969  
Donald L. Otto (Rambus)  
Renner, Otto, Boisselle & Sklar, LLP  
1621 Euclid Avenue  
19th Floor  
Cleveland, OH 44115

AO 120 (Rev. 08/10)

<b>TO:</b> <b>Mail Stop 8</b> <b>Director of the U.S. Patent and Trademark Office</b> <b>P.O. Box 1450</b> <b>Alexandria, VA 22313-1450</b>	<b>REPORT ON THE</b> <b>FILING OR DETERMINATION OF AN</b> <b>ACTION REGARDING A PATENT OR</b> <b>TRADEMARK</b>
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In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Eastern District of Texas, Marshall Division on the following

☐ Trademarks or ☒ Patents. ( ☐ the patent action involves 35 U.S.C. § 292.);

DOCKET NO. 2:13-cv-00522	DATE FILED 6/28/2013	U.S. DISTRICT COURT Eastern District of Texas, Marshall Division
PLAINTIFF INNOVATIVE DISPLAY TECHNOLOGIES LLC		DEFENDANT ACER INC., and ACER AMERICA CORPORATION
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 U.S. No. 6,755,547	6/29/2004	Innovative Display Technologies LLC
2 U.S. No. 7,300,194	11/27/2007	Innovative Display Technologies LLC
3 U.S. No. 7,384,177	6/10/2008	Innovative Display Technologies LLC
4 U.S. No. 7,404,660	7/29/2008	Innovative Display Technologies LLC
5 U.S. No. 7,434,974	10/14/2008	Innovative Display Technologies LLC

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY <input type="checkbox"/> Amendment <input type="checkbox"/> Answer <input type="checkbox"/> Cross Bill <input type="checkbox"/> Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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In the above—entitled case, the following decision has been rendered or judgement issued:

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☐ Trademarks or ☒ Patents. ( ☐ the patent action involves 35 U.S.C. § 292.);

DOCKET NO. 2:13-cv-00523	DATE FILED 6/28/2013	U.S. DISTRICT COURT Eastern District of Texas, Marshall Division
PLAINTIFF INNOVATIVE DISPLAY TECHNOLOGIES LLC		DEFENDANT DELL, INC.
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 U.S. No. 6,755,547	6/29/2004	Innovative Display Technologies LLC
2 U.S. No. 7,300,194	11/27/2007	Innovative Display Technologies LLC
3 U.S. No. 7,384,177	6/10/2008	Innovative Display Technologies LLC
4 U.S. No. 7,404,660	7/29/2008	Innovative Display Technologies LLC
5 U.S. No. 7,434,974	10/14/2008	Innovative Display Technologies LLC

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY <input type="checkbox"/> Amendment <input type="checkbox"/> Answer <input type="checkbox"/> Cross Bill <input type="checkbox"/> Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Eastern District of Texas, Marshall Division on the following

☐ Trademarks or ☒ Patents. ( ☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO. 2:13-cv-00524	DATE FILED 6/28/2013	U.S. DISTRICT COURT Eastern District of Texas, Marshall Division
PLAINTIFF INNOVATIVE DISPLAY TECHNOLOGIES LLC		DEFENDANT HEWLETT-PACKARD COMPANY
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 U.S. No. 6,755,547	6/29/2004	Innovative Display Technologies LLC
2 U.S. No. 7,300,194	11/27/2007	Innovative Display Technologies LLC
3 U.S. No. 7,384,177	6/10/2008	Innovative Display Technologies LLC
4 U.S. No. 7,404,660	7/29/2008	Innovative Display Technologies LLC
5 U.S. No. 7,434,974	10/14/2008	Innovative Display Technologies LLC

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

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PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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DOCKET NO. 2:13-cv-00525	DATE FILED 6/28/2013	U.S. DISTRICT COURT Eastern District of Texas, Marshall Division
PLAINTIFF INNOVATIVE DISPLAY TECHNOLOGIES LLC		DEFENDANT HUAWEI INVESTMENT AND HOLDING CO., LTD., HUAWEI TECHNOLOGIES CO., LTD., and HUAWEI DEVICE USA INC.
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 U.S. No. 6,755,547	6/29/2004	Innovative Display Technologies LLC
2 U.S. No. 7,300,194	11/27/2007	Innovative Display Technologies LLC
3 U.S. No. 7,384,177	6/10/2008	Innovative Display Technologies LLC
4 U.S. No. 7,404,660	7/29/2008	Innovative Display Technologies LLC
5 U.S. No. 7,434,974	10/14/2008	Innovative Display Technologies LLC

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY <input type="checkbox"/> Amendment <input type="checkbox"/> Answer <input type="checkbox"/> Cross Bill <input type="checkbox"/> Other Pleading		
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK	
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT
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AO 120 (Rev. 08/10)

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In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Eastern District of Texas, Marshall Division on the following

☐ Trademarks or ☒ Patents. ( ☐ the patent action involves 35 U.S.C. § 292.);

DOCKET NO. 2:13-cv-00526	DATE FILED 6/28/2013	U.S. DISTRICT COURT Eastern District of Texas, Marshall Division
PLAINTIFF INNOVATIVE DISPLAY TECHNOLOGIES LLC		DEFENDANT RESEARCH IN MOTION LIMITED, and RESEARCH IN MOTION CORPORATION
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 U.S. No. 6,755,547	6/29/2004	Innovative Display Technologies LLC
2 U.S. No. 7,300,194	11/27/2007	Innovative Display Technologies LLC
3 U.S. No. 7,384,177	6/10/2008	Innovative Display Technologies LLC
4 U.S. No. 7,404,660	7/29/2008	Innovative Display Technologies LLC
5 U.S. No. 7,434,974	10/14/2008	Innovative Display Technologies LLC

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

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AO 120 (Rev. 08/10)

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☐ Trademarks or ☒ Patents. ( ☐ the patent action involves 35 U.S.C. § 292.);

DOCKET NO. 2:13-cv-00527	DATE FILED 6/28/2013	U.S. DISTRICT COURT Eastern District of Texas, Marshall Division
PLAINTIFF INNOVATIVE DISPLAY TECHNOLOGIES LLC		DEFENDANT ZTE CORPORATION, and ZTE (USA) INC.
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 U.S. No. 6,755,547	6/29/2004	Innovative Display Technologies LLC
2 U.S. No. 7,300,194	11/27/2007	Innovative Display Technologies LLC
3 U.S. No. 7,384,177	6/10/2008	Innovative Display Technologies LLC
4 U.S. No. 7,404,660	7/29/2008	Innovative Display Technologies LLC
5 U.S. No. 7,434,974	10/14/2008	Innovative Display Technologies LLC

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