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(54) **LIQUID CRYSTAL PANEL BACKLIGHT MODULE**

(75) Inventors: **Wen-Pao Tseng**, Yangmei Taoyuan (TW); **Hsin-Chien Chiang**, Yangmei Taoyuan (TW); **Yu-Hsiu Chiang**, Yangmei Taoyuan (TW)

Correspondence Address:
TROXELL LAW OFFICE PLLC
SUITE 1404
5205 LEESBURG PIKE
FALLS CHURCH, VA 22041 (US)

(73) Assignee: **K-Bridge Electronics Co., Ltd.**

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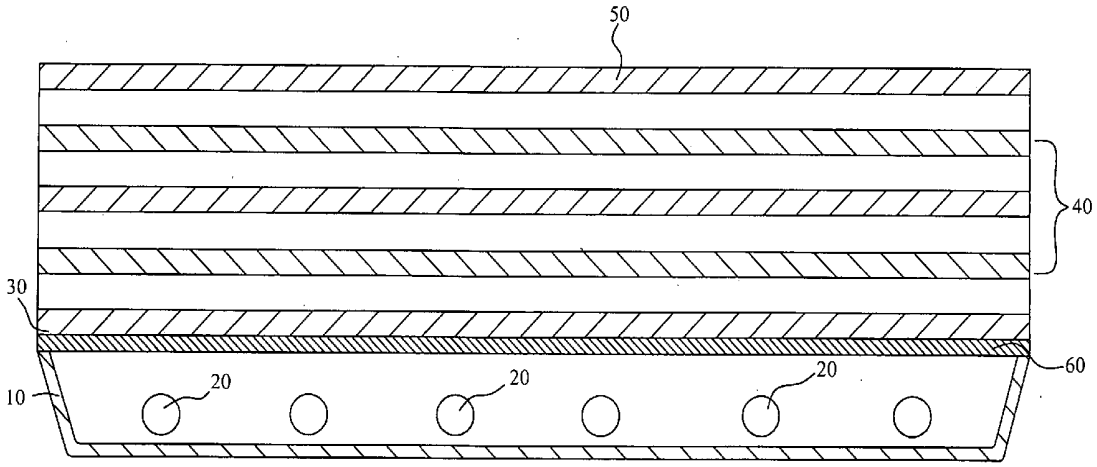
(57) **ABSTRACT**

An LCD backlight module construction has a reflector that gives light reflection and transmission features disposed at where the light is emitted from each light source for light diffused from both sides of the light source to be consistently diffused towards the diffuser after proper reflection and transmission through the reflector thus to eliminate the dim areas between light sources for providing effective solution to the problem of developing the light and shade bands found with the prior art.



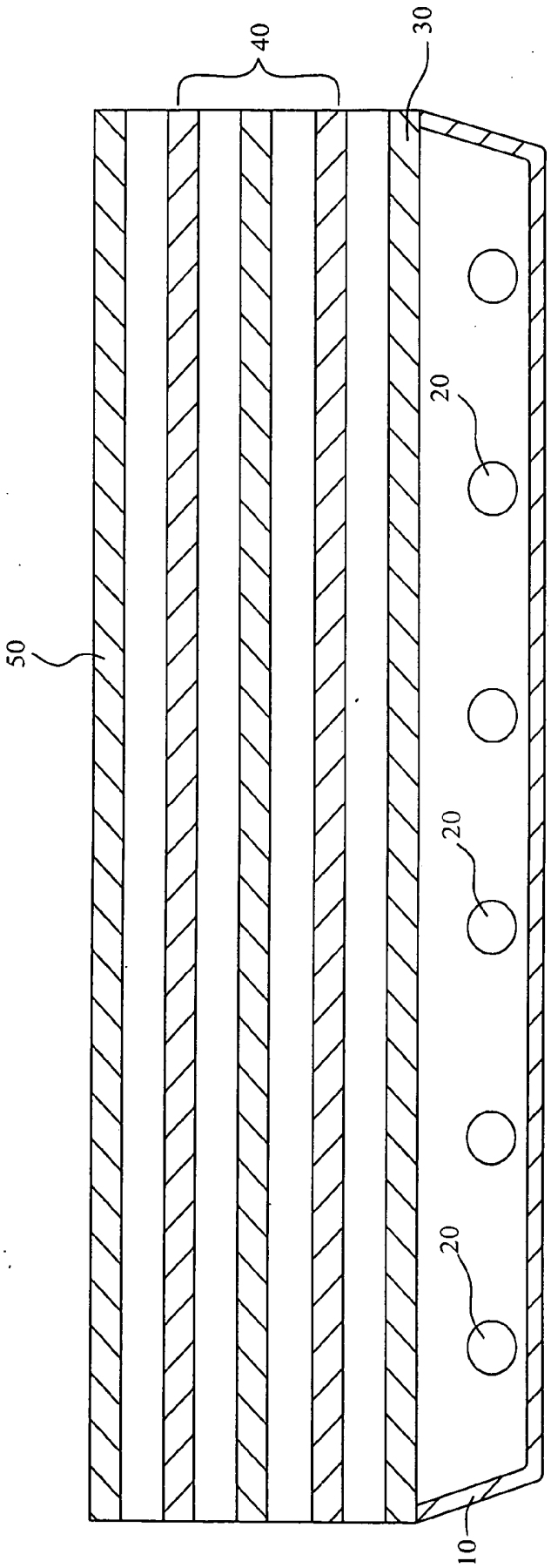


FIG. 1
PRIOR ART

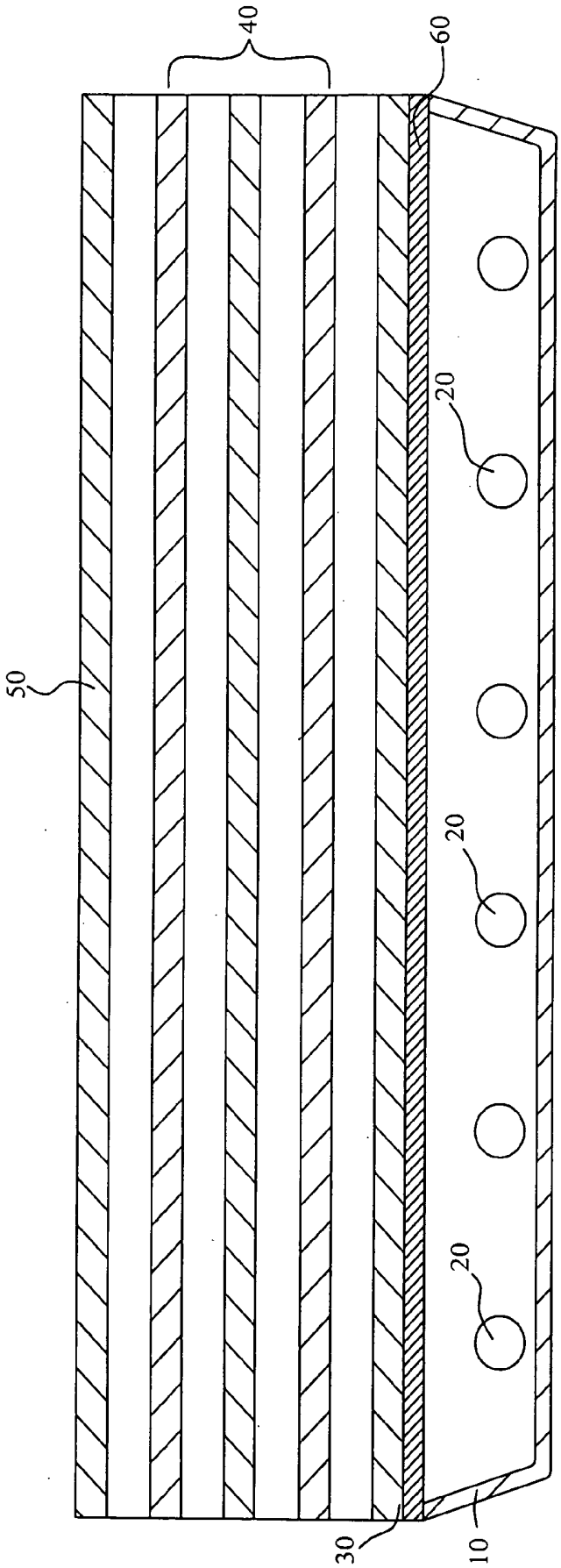


FIG.2

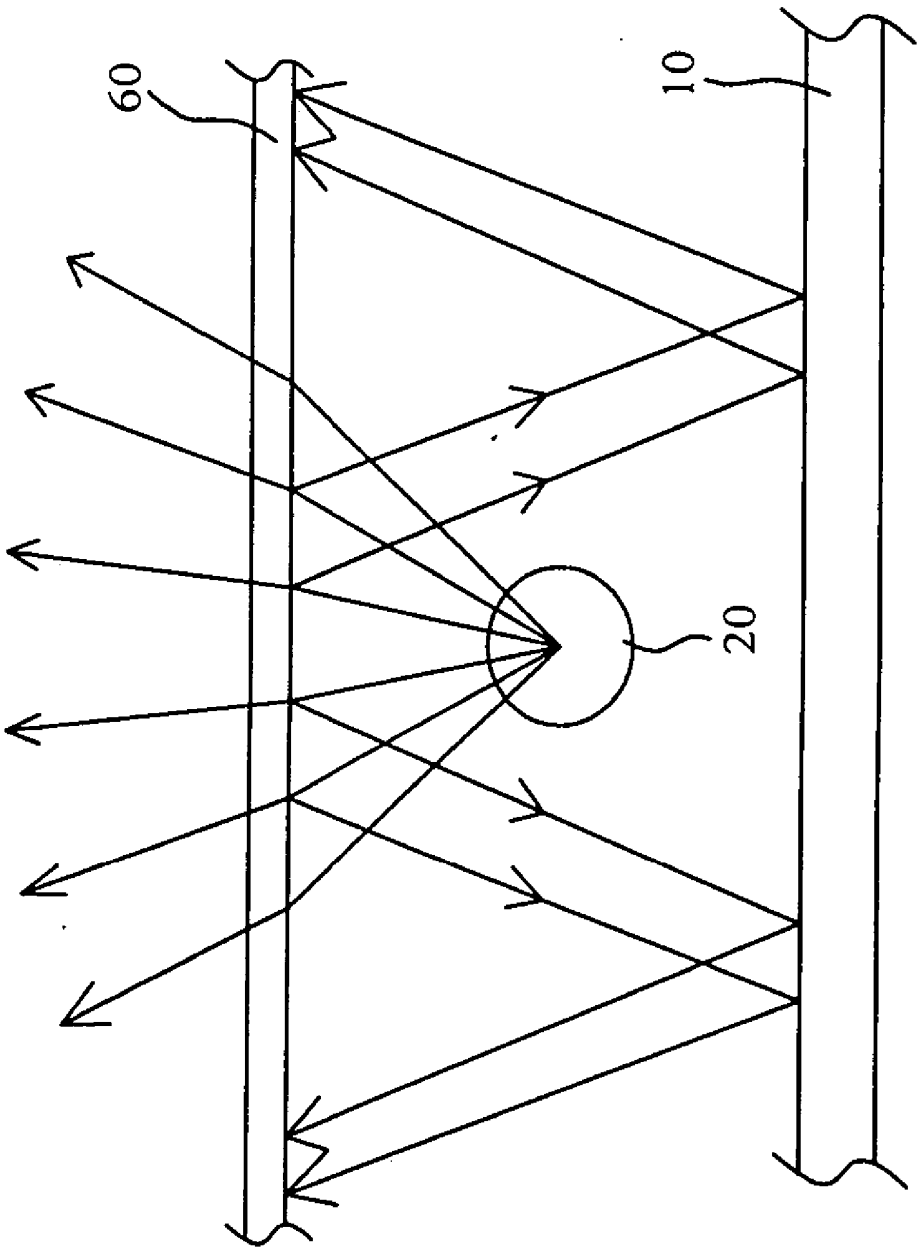


FIG.3

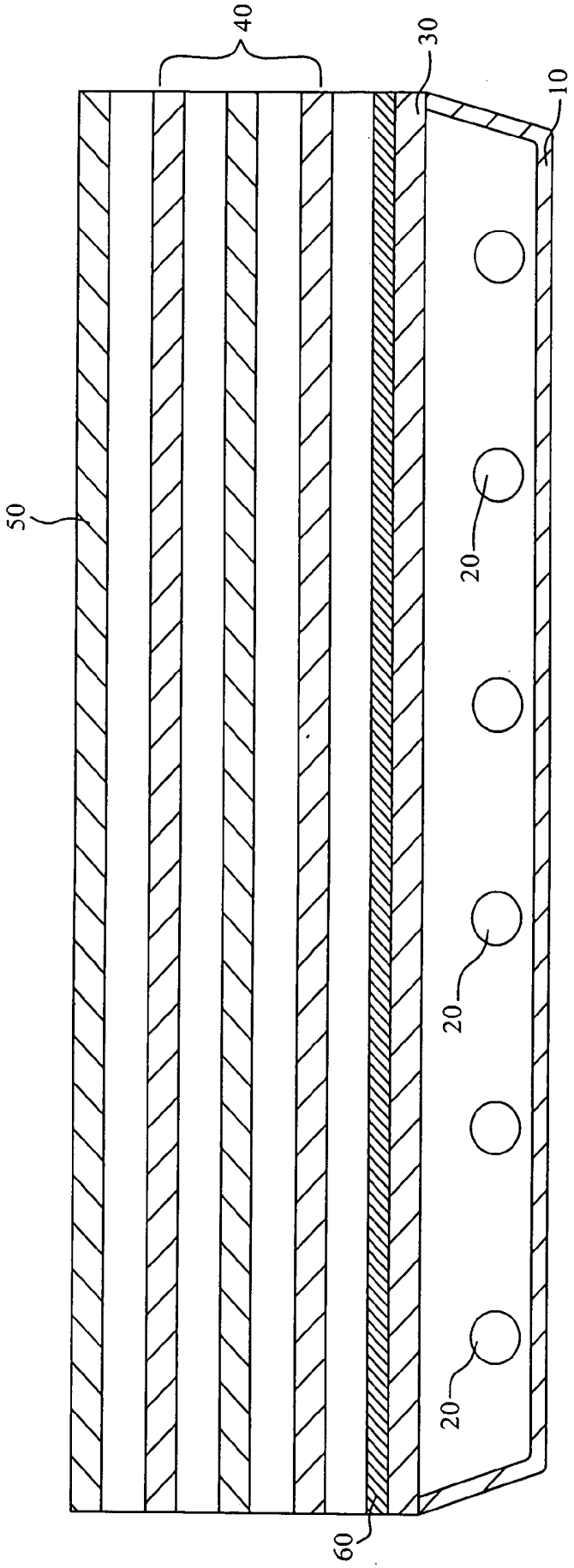


FIG.4

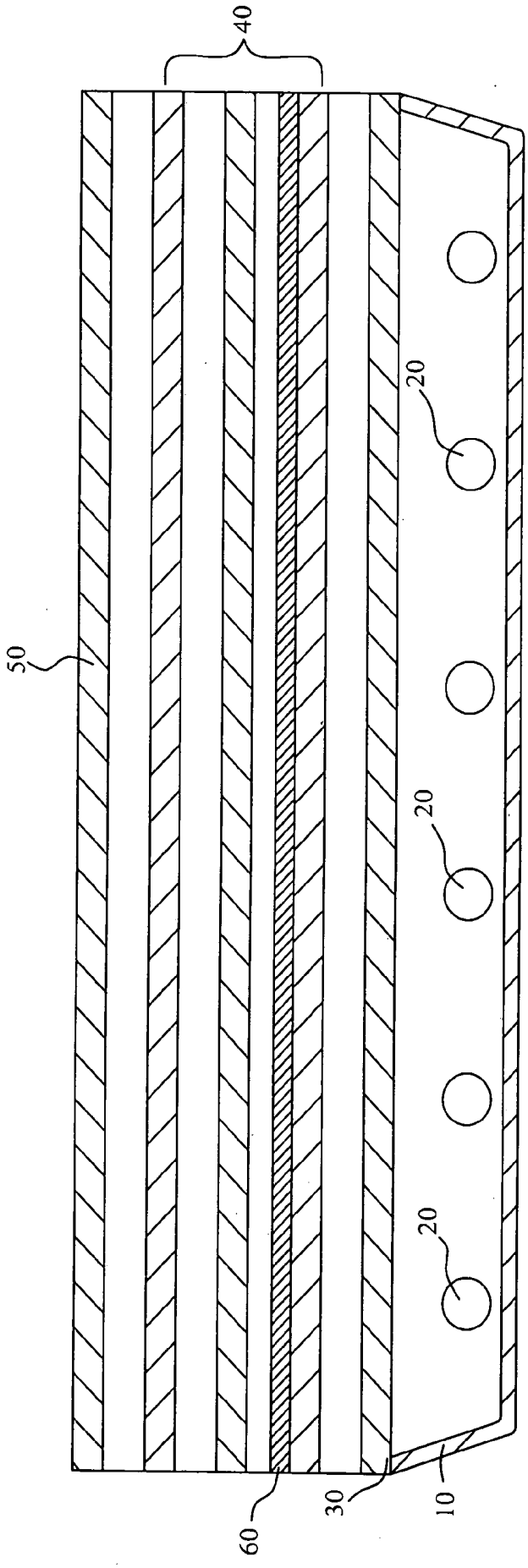


FIG.5

LIQUID CRYSTAL PANEL BACKLIGHT MODULE

BACKGROUND OF THE INVENTION

[0001] (a) Field of the Invention

[0002] The present invention is related to a construction of a liquid crystal panel backlight module, and more particularly to one that effectively distribute the light emitted from the light source without causing light and shade bands.

[0003] (b) Description of the Prior Art

[0004] Referring to **FIG. 1** of the accompanying drawings for a sectional view of a construction of a backlight module of the prior art, the backlight module generally adapted to a liquid crystal module includes in sequence from inner side to outer side a reflection mask **10**, multiple light sources **20**, a diffuser **30**, an optimal film **40** comprised of a lower sheet diffuser, a prism, a deflector or an upper sheet diffuser, and a liquid crystal panel **50**. Each light source **20** may be made in the form of a straight tube, U-shaped tube or a tube with continuous curvatures, and all light sources are arrange at a given spacing between the reflector mask **10** and the diffuser **30**. The display effects of the liquid crystal module are comprised of beams emitted from those multiple light sources **20**. Wherein, the beams passing through the diffuser **30** and the optical film **40** are diffused to correct the light and shade bands on the liquid crystal module due to the absence of light emitted from where between any two abutted light sources **20**.

[0005] However, the diffuser **30** only helps consistent diffusion of light and has very limited effects to correct the phenomenon of light and shade bands on the liquid crystal module. Therefore, an improvement is made in some backlight modules to extend on purpose the spacing between the light sources **20** and the diffuser **30** to create a larger space for the beams from each light source **20** to enter into the diffuser **30** hopefully to reduce the light and shade bands. However, the result is very limited; and the design is also contradictory to a compact design since the backlight module has to be made thicker for the extra range between the light source **20** and the diffuser **30**.

[0006] Another improvement involves the light diminishing process. That is, ink containing SiO_2 or TiO_2 is printed on the diffuser for the surface of the diffuser to provide light diminish (astigmatism) function for reducing the area of the light and shade bands. However, this improvement not only increases the production cost of the diffuser, makes the process more complicated, but also presents a passive way to eliminate the significant light and shade bands found on the liquid crystal module of the prior art since the light diminishing function is commenced only after the light reaches on the surface of the diffuser.

SUMMARY OF THE INVENTION

[0007] The primary purpose of the present invention is to provide a more active means to eliminate the light and shade bands developed among multiple light sources in a liquid crystal backlight module while effectively distribute beams from the light sources. To achieve the purpose, a reflector that reflects and transmits light is disposed at where the beams are emitted from light sources so that beams diffused from both sides of each light source are properly reflected and transmitted through the reflector backwards and consistently to diffuse toward the diffuser.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] **FIG. 1** is a sectional view of a backlight module of the prior art.

[0009] **FIG. 2** is a sectional view of a backlight module of the present invention.

[0010] **FIG. 3** is a schematic view showing the travel route of the light in the backlight module of the present invention.

[0011] **FIG. 4** is another sectional view of the backlight module of the present invention.

[0012] **FIG. 5** is another sectional view yet of the backlight module of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0013] Referring to **FIG. 2** for a basic configuration of a backlight module of the present invention, similar to that of the prior art, the backlight module of the present invention also includes in sequence from inner side to outer side a reflection mask **10**, multiple light sources **20**, a diffuser **30**, an optimal film **40** comprised of a lower sheet diffuser, a prism, a deflector or an upper sheet diffuser, and a liquid crystal panel **50**. Each light source **20** may be made in the form of a straight tube, U-shaped tube or a tube with continuous curvatures, and all light sources are arrange at a given spacing between the reflector mask **10** and the diffuser **30**. The display effects of the liquid crystal module are comprised of beams emitted from those multiple light sources **20**.

[0014] The present invention is characterized by having a reflector **60** capable of reflecting and transmitting light disposed at where beams are emitted from each light source **20**. As illustrated in **FIG. 2** for a sectional view of a preferred embodiment of the present invention, the reflector is disposed between the diffuser and those light sources **20** for the light diffused from both sides of each light source **20** to be reflected and transmitted through the reflector **60**. The light transmitted above the light source **20** has a comparatively higher reflectivity but a lower transmittance; on the contrary, the light between abutted light sources **20** has a lower reflectivity and a higher transmittance as illustrated in **FIG. 3**. Accordingly, while achieving more effective light distribution, the present invention provides a positive means to eliminate the light and shade bands developed on the liquid crystal module due to the absence of light at where between any abutted light sources **20**

[0015] It can be appreciated that the reflector **60** may be disposed between the diffuser **30** and the optical film **40** as illustrated in **FIG. 4**, or between any abutted optical films **40** as illustrated in **FIG. 5** to achieve the same purpose of eliminating the light and shade bands developed on the liquid crystal module.

[0016] The prevent invention provides an improved construction of a liquid crystal panel backlight module, and the application for a utility patent is duly filed accordingly. However, it is to be noted that that the preferred embodiments disclosed in the specification and the accompanying drawings are not limiting the present invention; and that any

construction, installation, or characteristics that is same or similar to that of the present invention should fall within the scope of the purposes and claims of the present invention.

I claim:

1. A liquid crystal panel backlight module includes in sequence from within out a reflector mask, multiple light sources, diffuser, multiple optical films, and a liquid crystal panel; wherein, each light source related to a straight tube, a U-shaped tube, or any other tube with continuous curvatures disposed at proper spacing at where between the reflector mask and the diffuser; a reflector capable of reflecting and transmitting light being disposed at where the light is emitted from each light source; and light diffused from both sides of each light source being properly reflected and transmitted by the reflector to effectively and consistently distribute and diffuse the light.

2. The liquid crystal panel backlight module of claim 1, wherein the reflector is disposed between the diffuser and those multiple light sources.

3. The liquid crystal panel backlight module of claim 1, wherein the reflector is disposed between the diffuser and any of the optical film.

4. The liquid crystal panel backlight module of claim 1, wherein the reflector is disposed between any two abutted optical films.

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专利名称(译)	液晶面板背光模组		
公开(公告)号	US20060139511A1	公开(公告)日	2006-06-29
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[标]申请(专利权)人(译)	科桥电子股份有限公司		
申请(专利权)人(译)	K-BRIDGE ELECTRONICS CO.，LTD.		
当前申请(专利权)人(译)	K-BRIDGE ELECTRONICS CO.LTD.		
[标]发明人	TSENG WEN PAO CHIANG HSIN CHIEN CHIANG YU HSIU		
发明人	TSENG, WEN-PAO CHIANG, HSIN-CHIEN CHIANG, YU-HSIU		
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摘要(译)

LCD背光模块结构具有反射器，该反射器提供光反射和透射特征，所述光反射和透射特征设置在从每个光源发射光的位置，用于从光源的两侧漫射的光，以在经过适当的反射和透射之后始终朝向漫射器漫射。因此，反射器消除了光源之间的昏暗区域，从而有效地解决了现有技术中发现的光影带的问题。