



(12) **United States Patent**  
**Wheatley et al.**

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(54) **LIGHT SOURCE AND DISPLAY SYSTEM INCORPORATING SAME**

USPC ..... 362/97.1, 19, 600-634; 349/64  
See application file for complete search history.

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(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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This patent is subject to a terminal disclaimer.

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*Primary Examiner* — Julie Bannan

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**Related U.S. Application Data**

(63) Continuation of application No. 13/502,060, filed as application No. PCT/US2010/053719 on Oct. 22, 2010, now Pat. No. 8,922,733.

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(51) **Int. Cl.**  
**F21V 9/14** (2006.01)  
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(57) **ABSTRACT**

(52) **U.S. Cl.**  
CPC . **F21V 13/14** (2013.01); **F21V 9/14** (2013.01); **G02B 6/005** (2013.01); **G02B 6/0096** (2013.01); **G02F 1/133602** (2013.01); **G02B 6/0051** (2013.01)

Light sources are disclosed. A disclosed light source includes an optically reflective cavity that includes an input port for receiving light and an output port for transmitting light, a lamp that is disposed at the input port, and an optical stack that is disposed at the output port. The optical stack includes a forward scattering optical diffuser that is disposed at the output port and has an optical haze that is not less than about 20%, and an optical film that is disposed on the optical diffuser. The optical film enhance total internal reflection at the interface between the optical film and the optical diffuser. The optical film has an index of refraction that is not greater than about 1.3 and an optical haze that is not greater than about 5%. The optical stack also includes a reflective polarizer layer that is disposed on the optical film. Substantial portions of each two neighboring major surfaces in the optical stack are in physical contact with each other.

(58) **Field of Classification Search**  
CPC ..... F21V 13/14; F21V 9/14; G02B 6/005; G02B 6/0051; G02B 6/0096

**10 Claims, 16 Drawing Sheets**

