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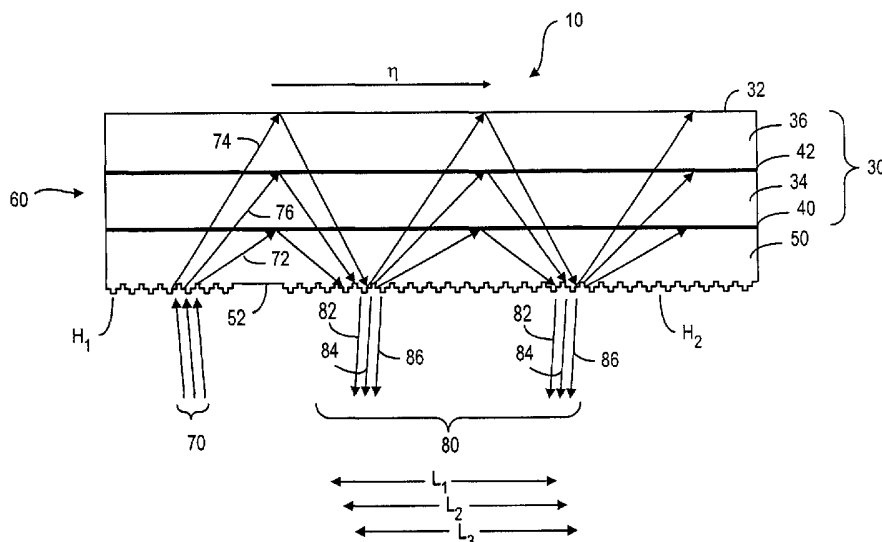
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[Continued on next page]

(54) Title: METHOD AND SYSTEM FOR BEAM EXPANSION IN A DISPLAY DEVICE



(57) Abstract: A planar substrate (60) having a first diffractive element (H1) for coupling light waves of different colors into the substrate and guiding the light waves by successive internal reflections. A second diffractive element (H2), disposed on the substrate, causes the guided light waves to be partially transmitted out of the substrate where the light waves encounter the second diffractive element. Because light waves of each color are reflected at different reflection angles, the light waves with smaller reflection angles encounter the second diffractive element at more locations than those with larger reflection angles, resulting in color non-uniformity in the light transmitted out from the substrate surface. One or more interfaces (40, 42) are provided between the surfaces of the substrate to selectively reflect the light waves having larger reflection angles toward the second diffraction element, so that light waves of different colors encounter the second diffraction element substantially at the same number of locations.

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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

# INTERNATIONAL SEARCH REPORT

PCT/IB03/04261

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) : G03H 1/00  
 US CL : 359/13

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
 U.S. : 35359/13,15,19,24,16,629,634; 385/67,147,24,37; 362/31,328; 348/115

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
 Please See Continuation Sheet

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4946253 A (KOSTUCK) 07 August 1990 (07.08.1990) see entire document.	1-22
A	US 5724163 A(DAVID et al) 03 March 1998 (03.03.1998) see entire document.	1-22
A	US 5966223 A (FREISEM et al) 12 October 1999 (12.10.1999) see entire document.	1-22
A	US 6185015 B1 (REINHORN et al) 06 February 2001 (06.02.2001) see entire document.	1-22
A	US 6580529 B1 (AMITAI et al) 17 June 2003 (17.06.2003) see entire document.	1-22

Further documents are listed in the continuation of Box C.  See patent family annex.

* Special categories of cited documents:	"T"
"A" document defining the general state of the art which is not considered to be of particular relevance	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 09 February 2004 (09.02.2004)	Date of mailing of the international search report <b>06 MAY 2004</b>
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer <i>Sandra O'Shea</i> Sandra O'Shea Telephone No. 703-308-0956

**INTERNATIONAL SEARCH REPORT**

**Continuation of B. FIELDS SEARCHED Item 3:**

EAST

search terms: wavelength or color, light, reflect