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SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,  
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

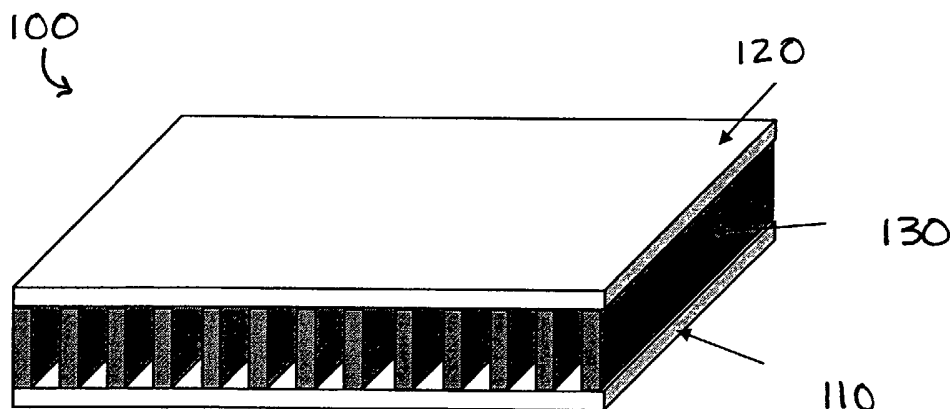
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(54) Title: PRECISION PHASE RETARDATION DEVICES AND METHOD OF MAKING SAME



(57) Abstract: A birefringent device of substantially uniform thickness less than about 10 microns, and being suitable for operating in a wavelength range about a central wavelength is disclosed. The device includes a base substrate, a layer of periodic index regions of alternating refractive indices applied to a first surface of the base substrate, and a cap substrate located substantially adjacent to the layer distal to the base substrate. The layer of periodic index regions has a periodicity of less than the central wavelength. The device being suitable to produce an arbitrary phase retardation between 0 and  $2\pi$  phase.

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**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/US03/23980

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) : G02B 5/30  
 US CL : 359/352

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. : 359/352,498,566,568,569,572,576,589,590; 349/201,19,119,186; 385/16,10,11,24,37; 428/001.200

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
 NONE

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. |
|------------|--|-----------------------|
| Y,E        | US 6,618,104 B1 (DATE et al.) 09 September 2003 (09.09.2003), see col. 17, lines 8-10, Fig. 6A | 1-30                  |
| Y,E        | US 6,692,797 B1 (OWEN et al.) 17 February 2004 (17.02.2004), see entire document.              | 1-30                  |
| Y,E        | US 6,661,952 B2 (SIMPSON et al.) 09 December 2003 (09.12.2003), see entire document.           | 1-30                  |
| Y          | US 5,852,688 A (BRINKMAN et al.) 22 December 1998 (22.12.1998), see entire document.           | 24,25                 |

Further documents are listed in the continuation of Box C.

See patent family annex.

\* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
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**Continuation of B. FIELDS SEARCHED Item 3:**

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