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(21) International Application Number: PCT/US96/07396 (22) International Filing Date: 8 May 1996 (08.05.96) (30) Priority Data: 441,506 15 May 1995 (15.05.95) US (71) Applicant: HE HOLDINGS, INC., doing business as HUGHES ELECTRONICS [US/US]; 7200 Hughes Terrace, Los Angeles, CA 90045-0066 (US). (72) Inventors: CHEN, Chungte, W.; 33 Allegheny, Irvine, CA 92714 (US). EFRON, Uzi; 11650 National Place #34, Los Angeles, CA 90064 (US). CHESTER, Arthur, N.; 19062 Pacific Coast Highway, Malibu, CA 90265 (US). (74) Agents: GRUNEBACH, Georgann, S. et al.; Hughes Electronics, 7200 Hughes Terrace, Los Angeles, CA 90045-0066 (US).	(81) Designated States: AU, CA, KR, (SG) European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>Without international search report and to be republished upon receipt of that report.</i>	

(54) Title: **LOW-COST LIGHT-WEIGHT HEAD-MOUNTED VIRTUAL-IMAGE PROJECTION DISPLAY WITH LOW MOMENTS OF INERTIA AND LOW CENTER OF GRAVITY**

(57) Abstract

A head-mounted display device (10) offers light weight, a low center of gravity, and low moments of inertia about the azimuthal and elevational axes of head movement. The display device (10) employs an angulated beam splitter mirror (16) disposed between a user's (22) eye (20) and an inner combiner surface (18a) of a visor (28). A projector (36) is carried laterally of the user's eye with a low center of gravity and a position close to the horizontal axis of elevational movement of the head. This projector (36) includes an image source (12) and a compact light-weight relay optics module (14) along with a projection fold mirror (30) disposed at eye level and laterally of the beam splitter mirror (16) to project image light to the beam splitter mirror (16). The beam splitter mirror (16) reflects the light onto the inner surface (18a) of the combiner (18) for reflection back through the beam splitter mirror (16) and to the user's eye (20). Alternative embodiments provide for color correction, or for mono-chrome image projection at even lighter weight. An alternative embodiment provides for both color correction and weight nearly as light as the monochrome version by use of diffractive lenses in the relay optics module.

