



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

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(45) **Date of Patent:** **Apr. 10, 2001**

(54) <b>APPARATUS FOR FORMING A PLURALITY OF SUBIMAGES HAVING DIFFERENT CHARACTERISTICS</b>	4,444,472	4/1984	Tanaka .....	359/676
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(75) Inventors: <b>David B. Duncan</b> , Auburn; <b>Gregory J. Leeson</b> , Colfax; <b>Judith G. Duncan</b> , Auburn, all of CA (US)	5,221,964	6/1993	Chamberlain et al. ....	358/229
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	5,870,228	2/1999	Kreitzer et al. ....	359/649
(73) Assignee: <b>Duncan Technologies, Inc.</b> , Auburn, CA (US)	5,889,555	3/1999	Kawase et al. ....	348/336

(\* ) 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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(51) **Int. Cl.**<sup>7</sup> ..... **G02B 27/14**  
(52) **U.S. Cl.** ..... **359/637; 359/634**  
(58) **Field of Search** ..... **359/618, 634, 359/640, 637**

(57) **ABSTRACT**  
Apparatus for forming multiple subimages including an image forming lens, a color separating prism, subimage receptors for receiving subimages from the prism, and lenses compensating for spherical aberrations caused by the prism and controlling the size of the subimages reaching the subimage receptors. Other features include structure for dissipating heat from the subimage receptors and from circuit boards associated with the subimage receptors.

(56) **References Cited**  
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**35 Claims, 11 Drawing Sheets**

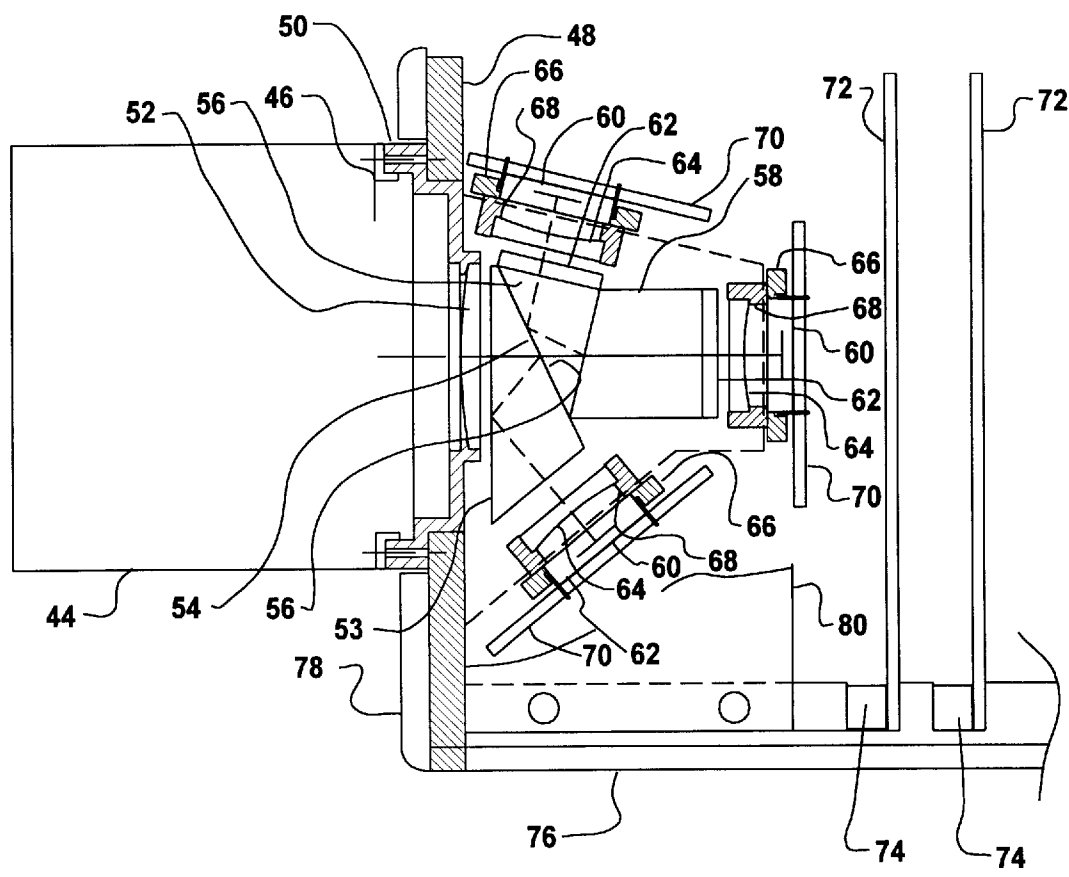


FIG. 1

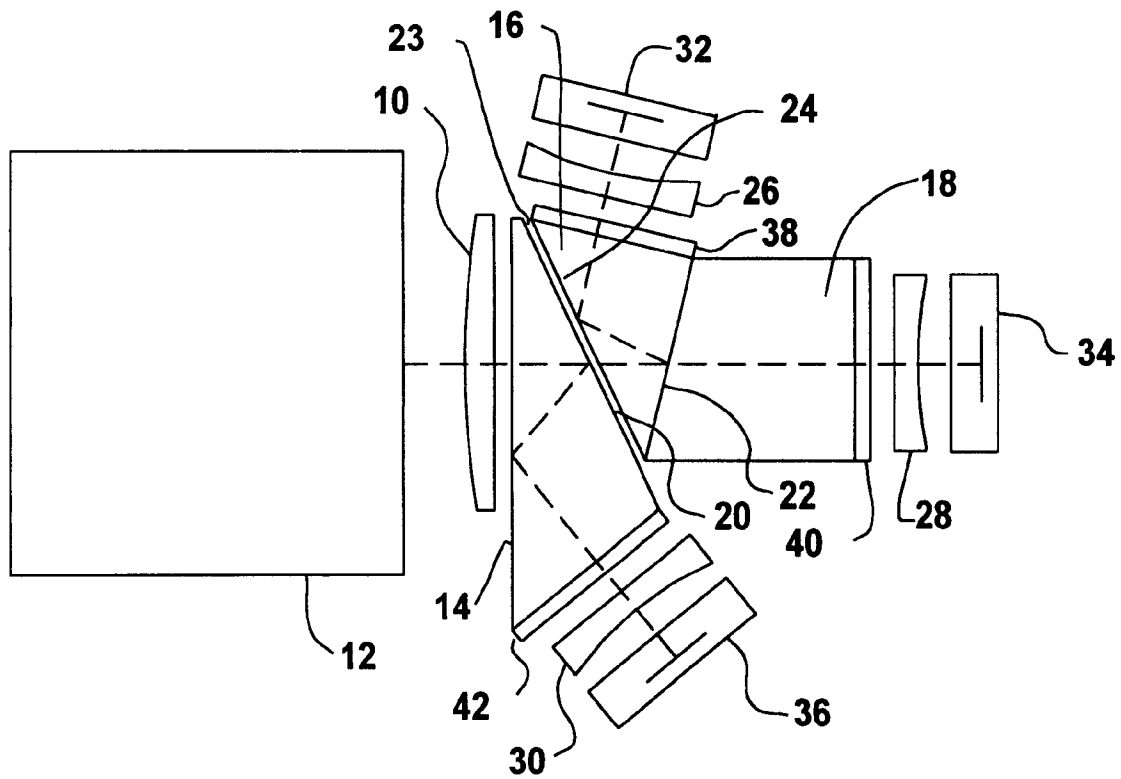


FIG. 2

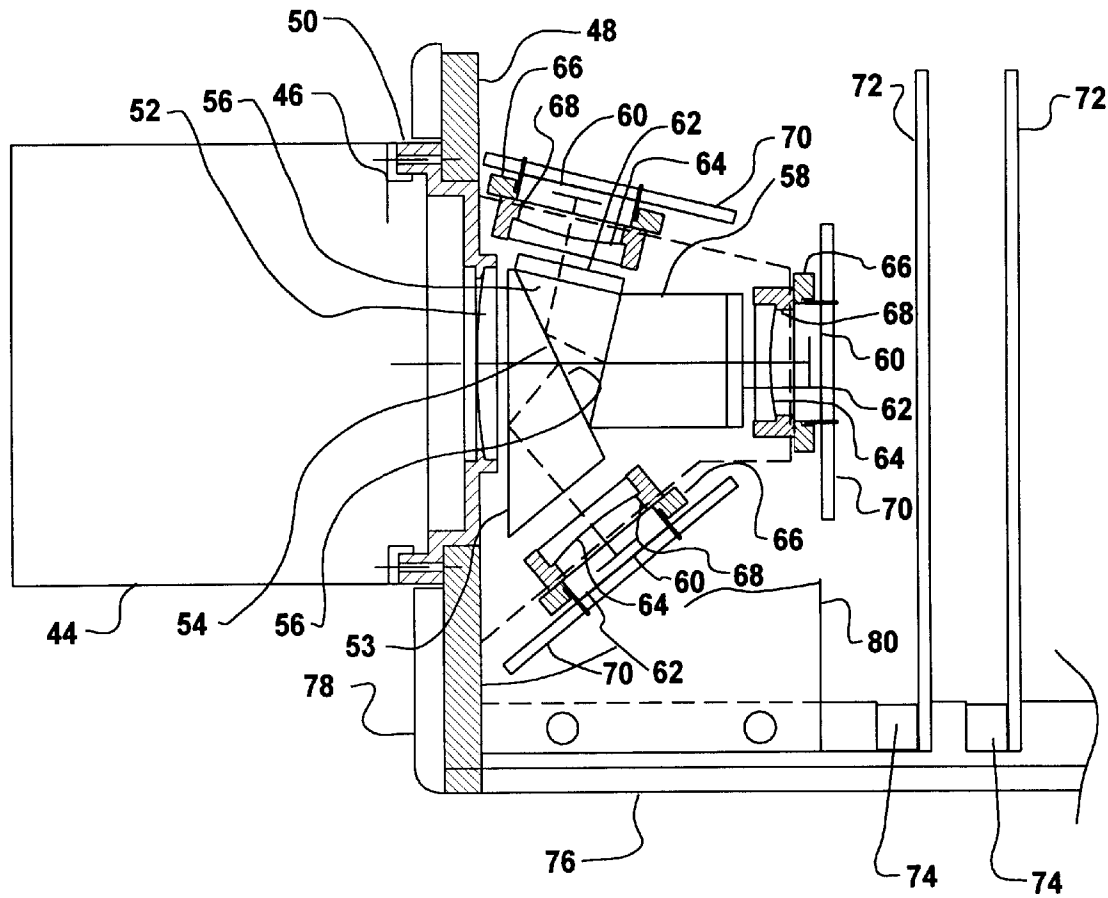


FIG. 3

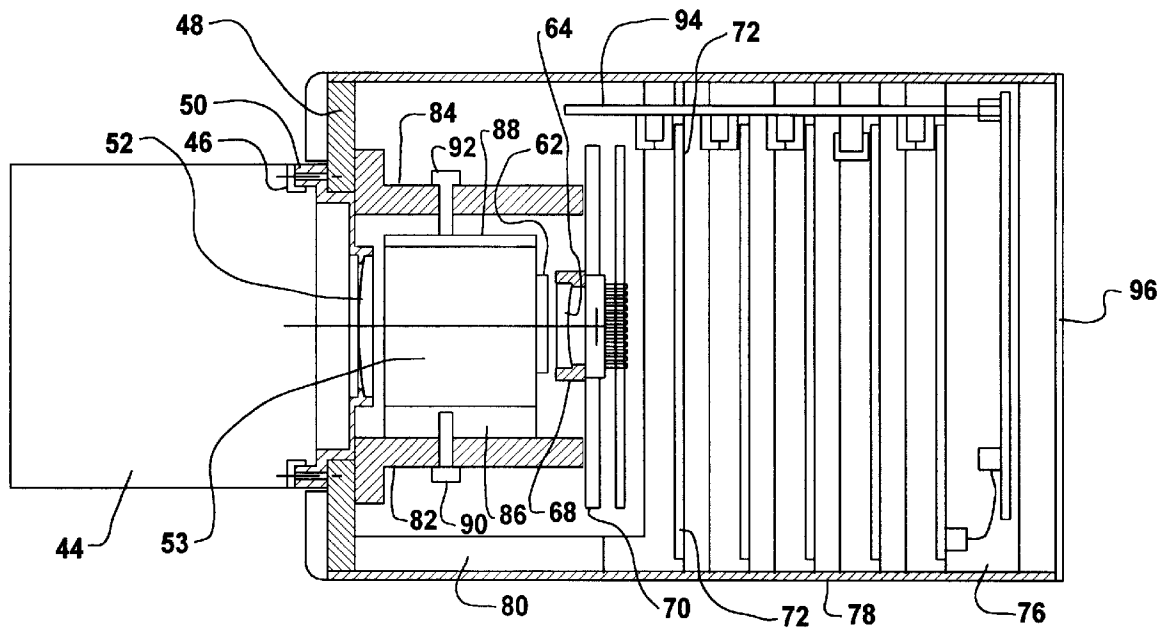


FIG. 4

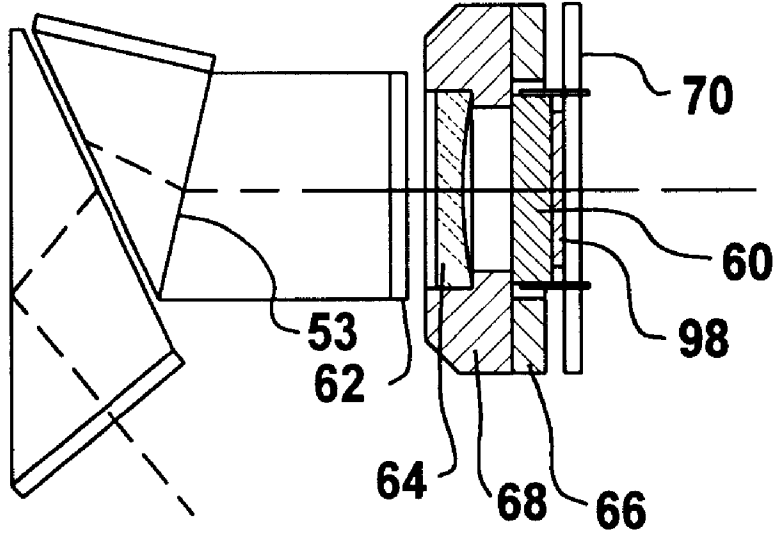
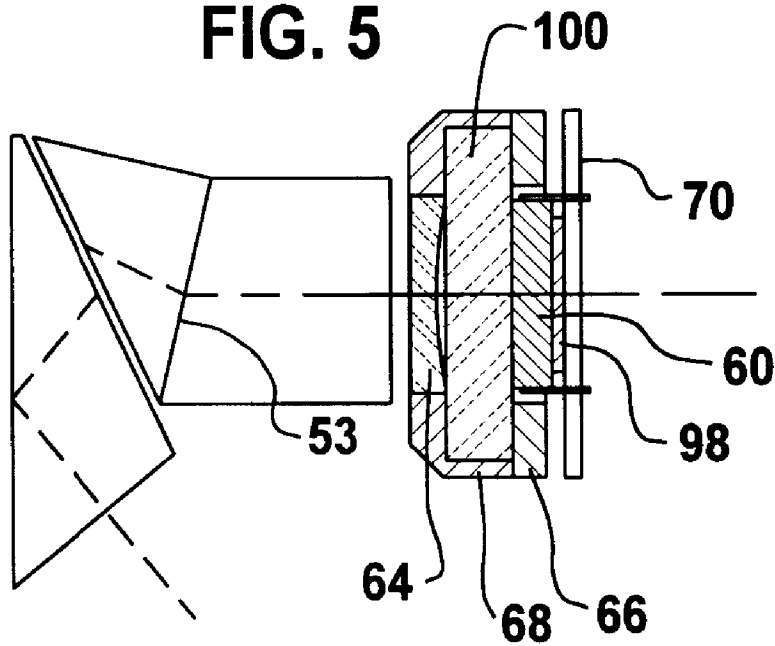


FIG. 5



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