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# United States Patent [19]

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Haar et al.

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[54] APPARATUS FOR LIGHT REFLECTION MEASUREMENTS

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[73] Assignee: **Boehringer Mannheim GmbH**, Mannheim, Germany

[21] Appl. No.: **08/752,629**

[22] Filed: **Nov. 19, 1996**

### [30] Foreign Application Priority Data

Nov. 29, 1995 [DE] Germany ..... 195 44 501.5

[51] Int. Cl.<sup>6</sup> ..... **A61B 5/00**

[52] U.S. Cl. .... **600/310**; 600/476; 356/338

[58] Field of Search ..... 600/310-317,  
600/322-324, 336, 473, 474, 476, 477;  
356/39-41, 337, 338; 435/4; 436/43

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### [57] ABSTRACT

An apparatus for light transport measurements on a test object with a measuring head which includes a contact surface for placing against an interface of the test object, light irradiation device with a light transmitter for irradiating light through the contact surface and an interface into the test object, and detection device with a light receiver for detecting light leaving the test object. The contact surface comprises at least one optically transparent light passage point for the light, on which a large number of rigid light-conducting elements are arranged, wherein an optical connection with a light transmitter or light receiver assigned to a light passage point is produced by the whole of the light-conducting elements of the light passage site.

32 Claims, 5 Drawing Sheets

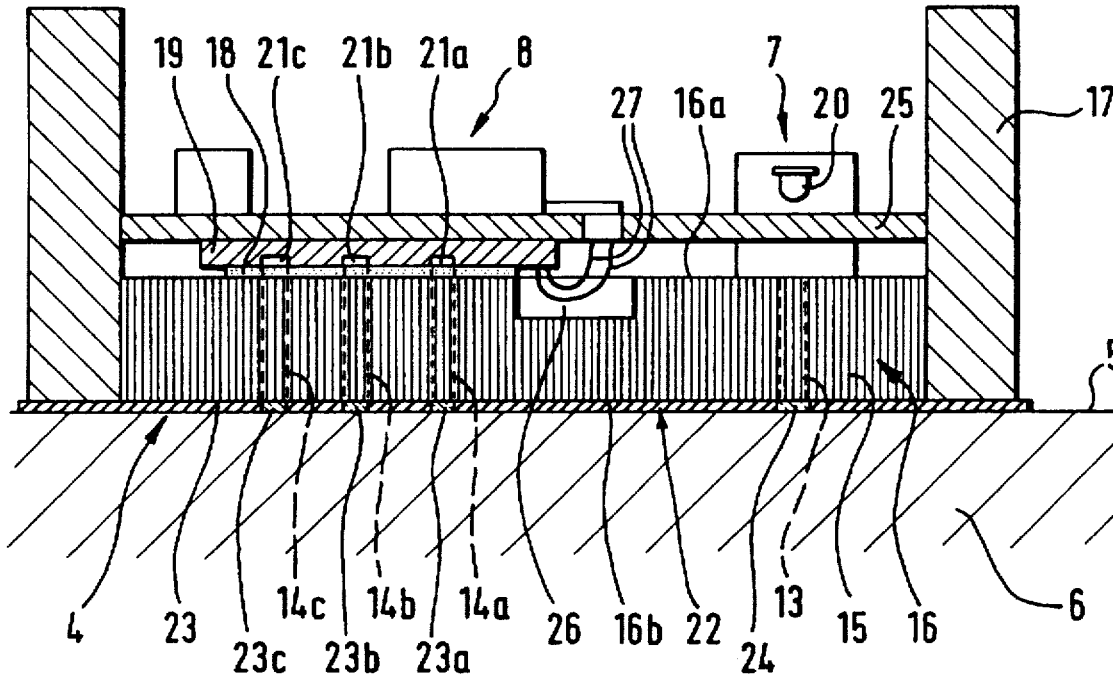


Fig. 1

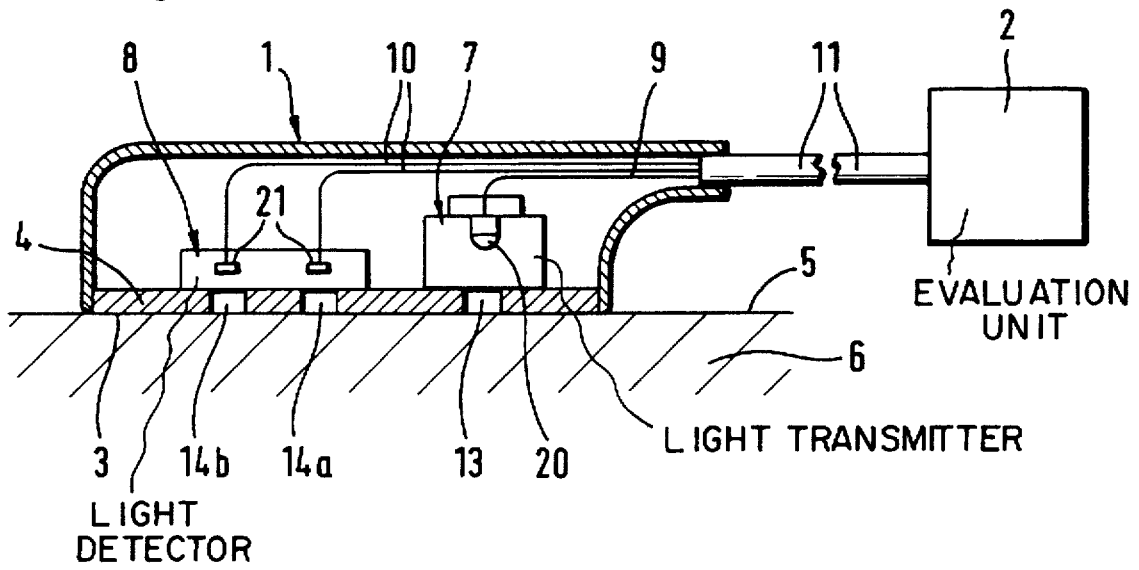


Fig. 2

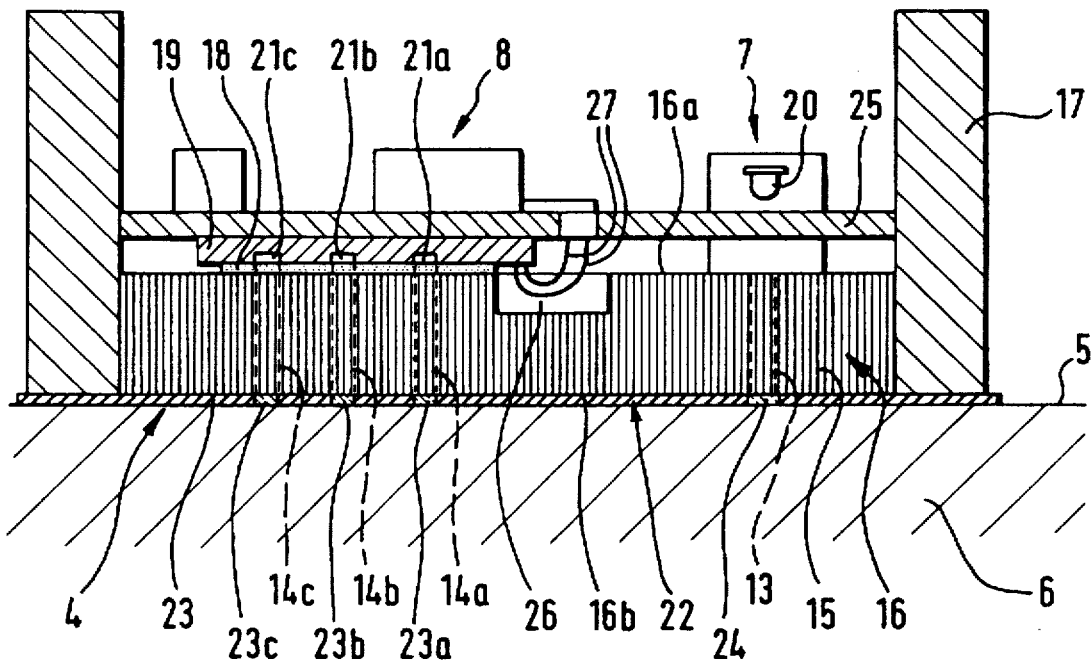


Fig. 3

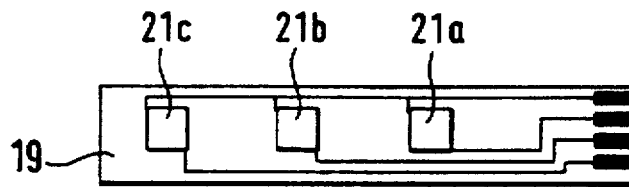


Fig. 4

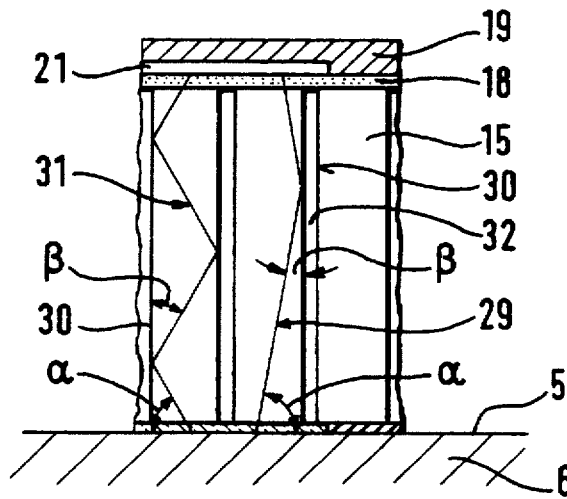


Fig. 6

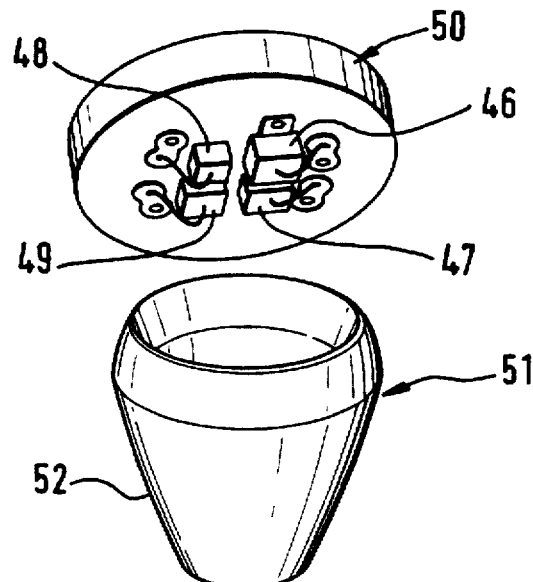


Fig. 5

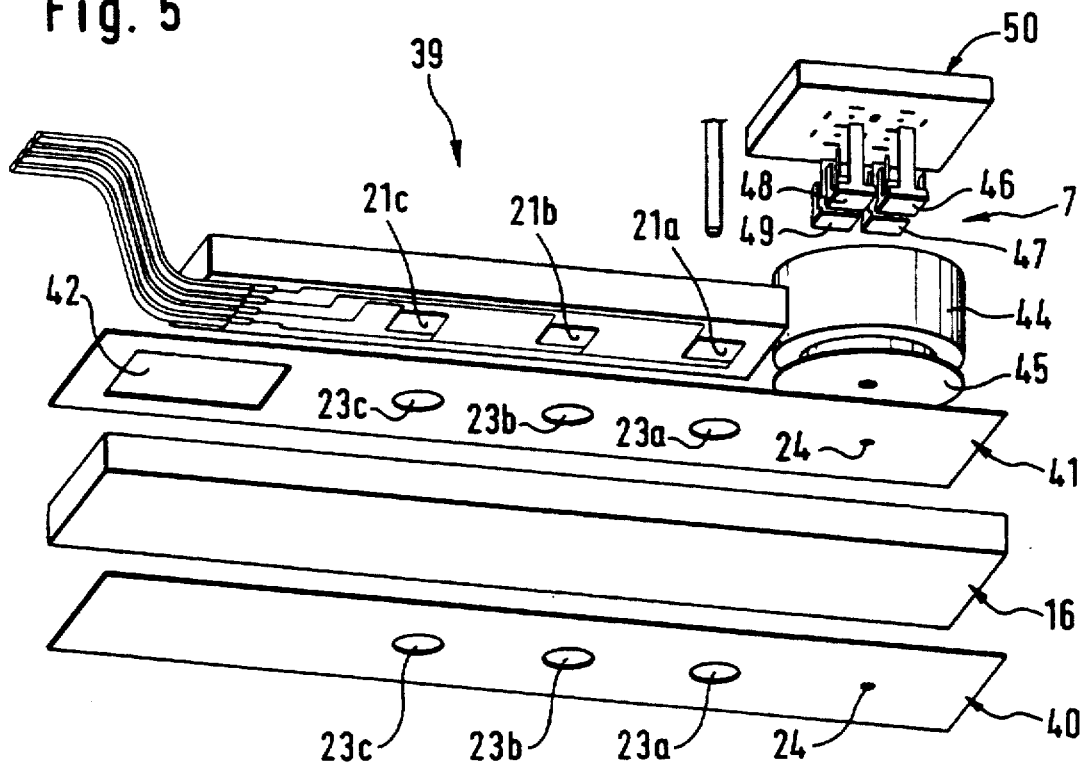
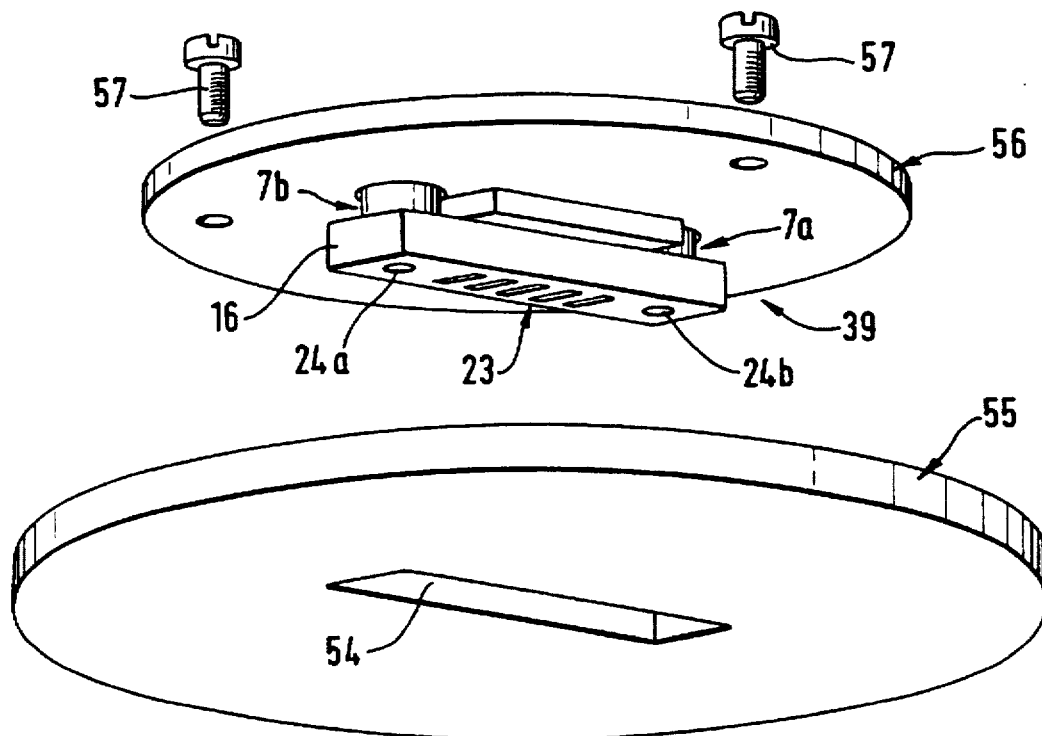


Fig. 7



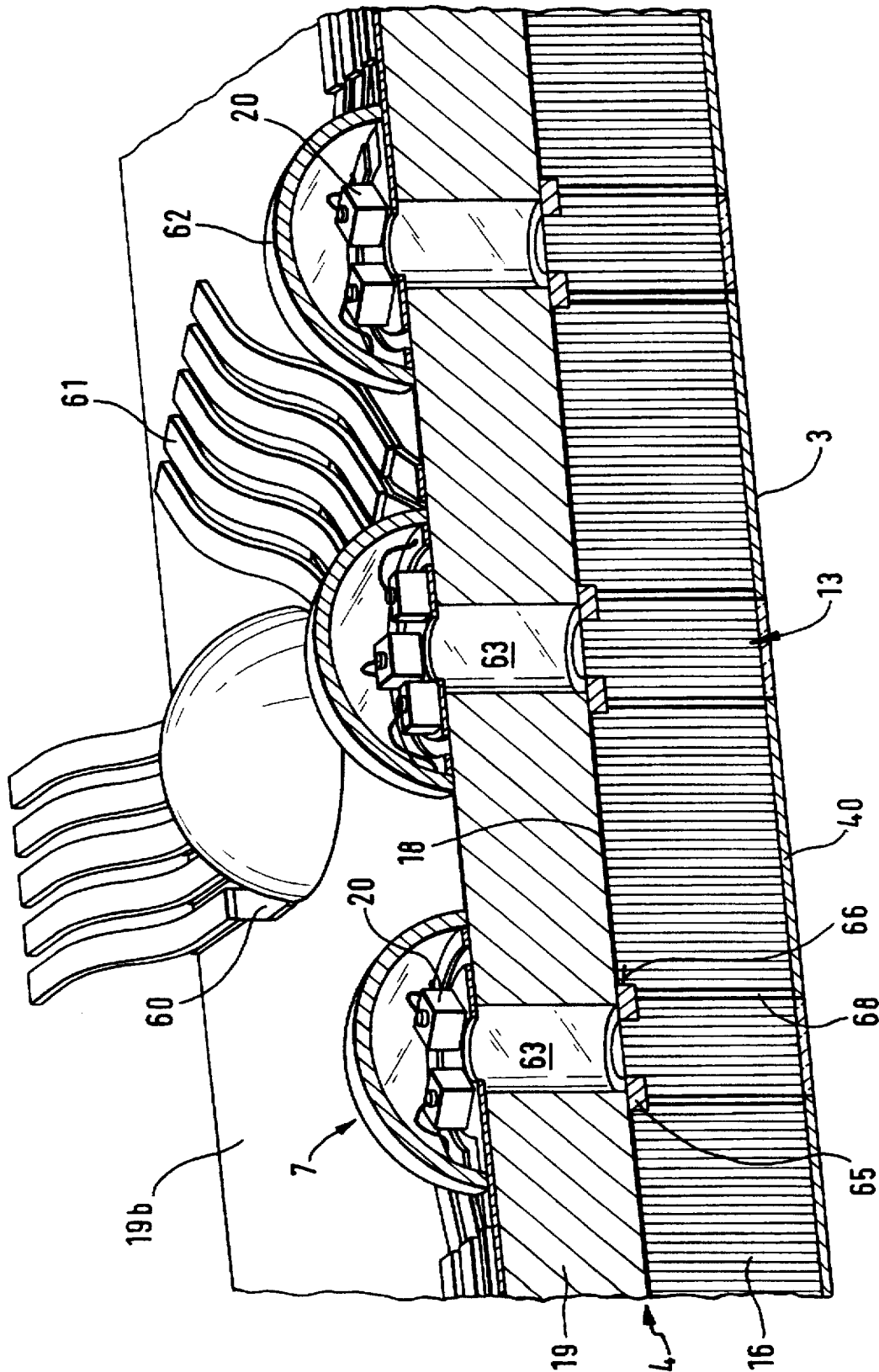


Fig. 8

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