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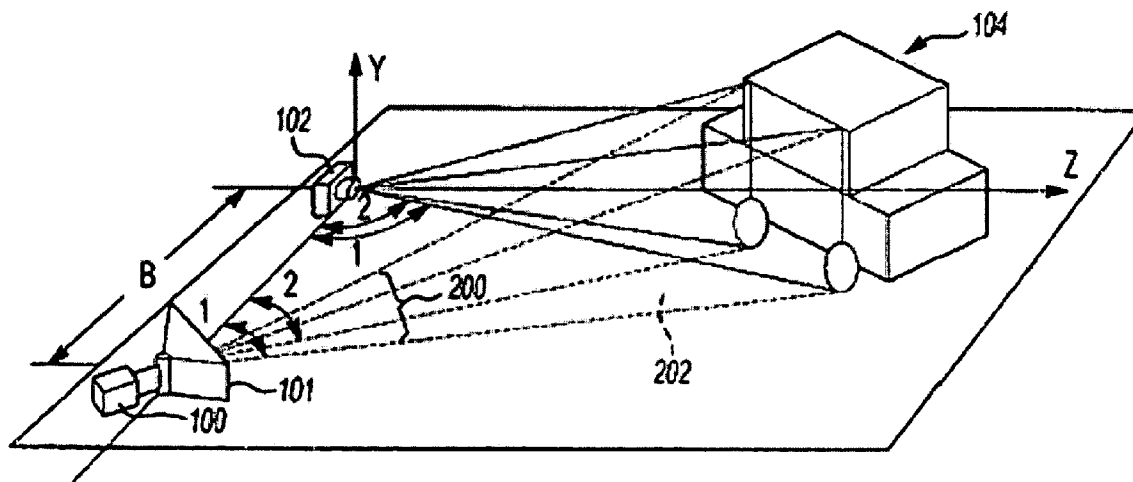
(19) **United States**(12) **Patent Application Publication** (10) **Pub. No.: US 2005/0088529 A1**  
Geng (43) **Pub. Date: Apr. 28, 2005**(54) **SYSTEM AND A METHOD FOR  
THREE-DIMENSIONAL IMAGING SYSTEMS****Publication Classification**(76) Inventor: **Z. Jason Geng**, Rockville, MD (US)(51) **Int. Cl.<sup>7</sup>** ..... **H04N 5/225**(52) **U.S. Cl.** ..... **348/207.99**

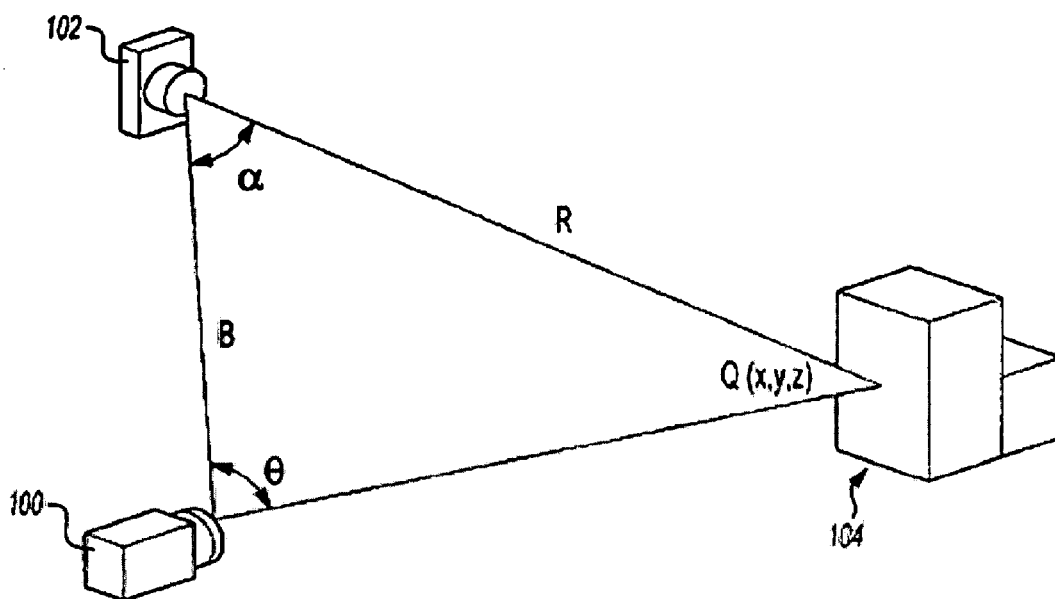
Correspondence Address:

**STEVEN L. NICHOLS****RADER, FISHMAN & GRAVER PLLC****10653 S. RIVER FRONT PARKWAY****SUITE 150****SOUTH JORDAN, UT 84095 (US)**(57) **ABSTRACT**(21) Appl. No.: **10/973,533**(22) Filed: **Oct. 25, 2004****Related U.S. Application Data**

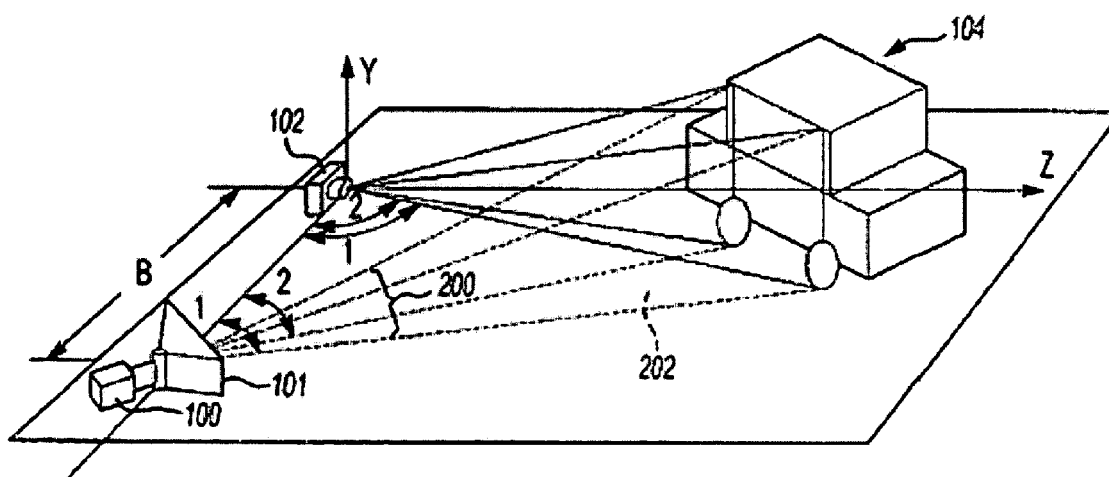
(60) Provisional application No. 60/514,177, filed on Oct. 23, 2003.

A method for acquiring a surface profile 3D data set of an object includes illuminating a surface of the object with a sequence of multiple rainbow projection (MRP) structural light patterns, capturing light reflected from the object, and calculating 3D data (X, Y, Z) for each visible point on the object based upon triangulation mathematical principles of the captured reflected light.





**Fig. 1**



**Fig. 2**

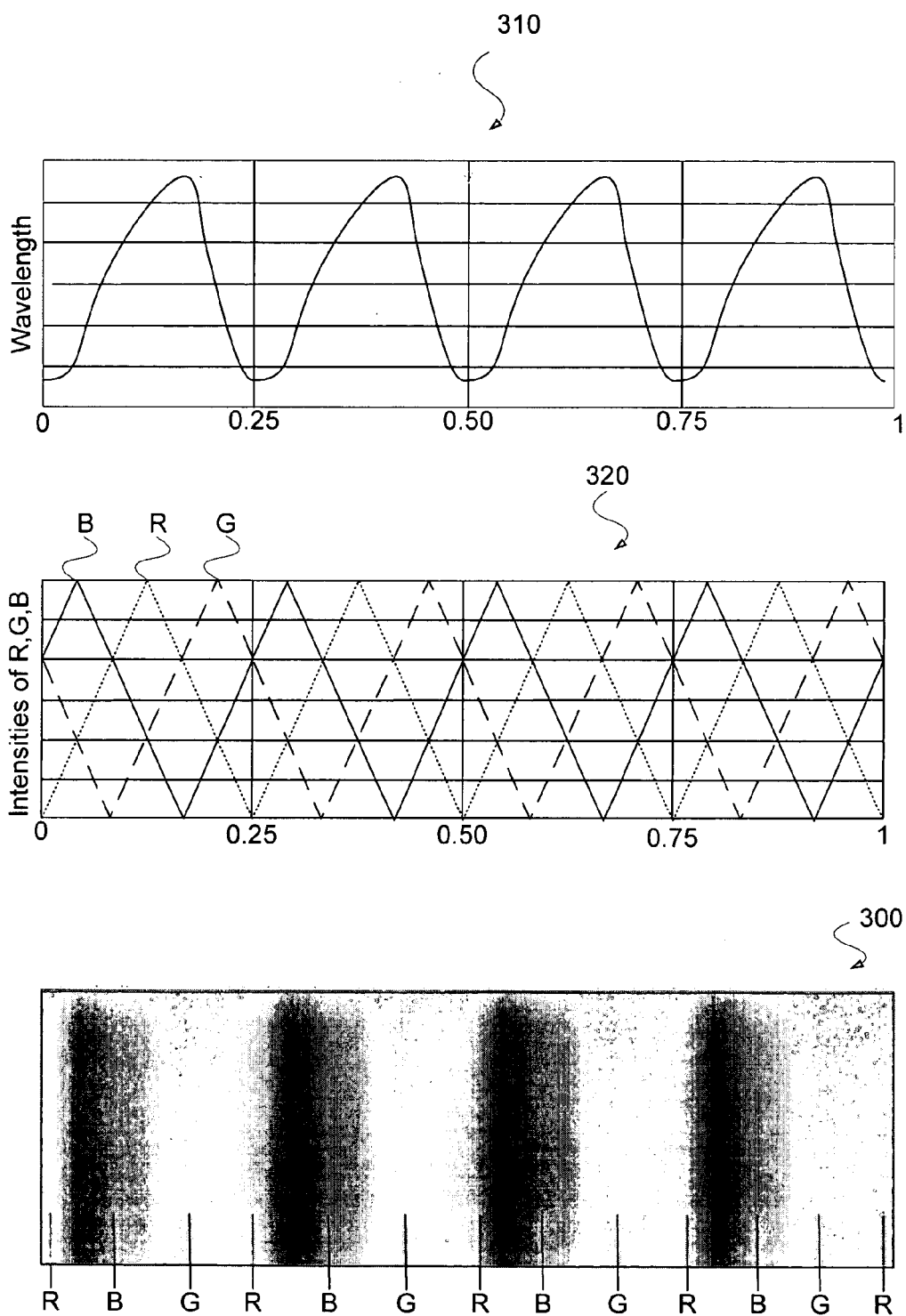
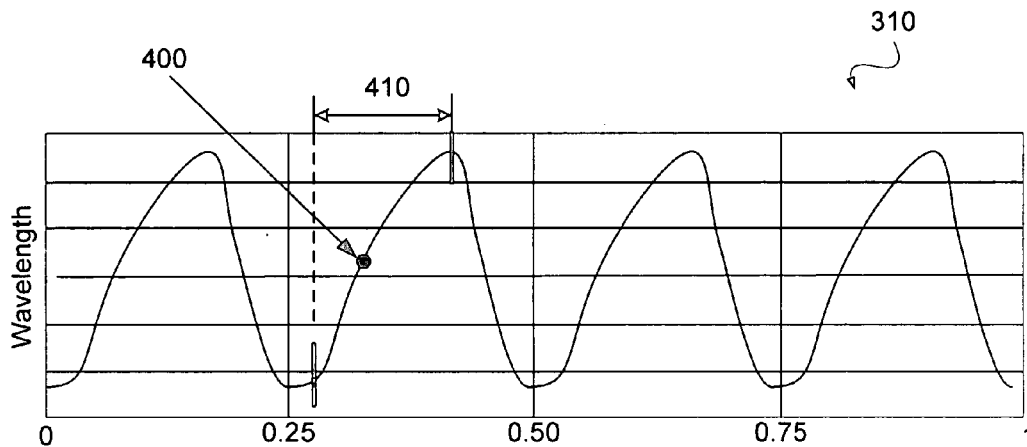
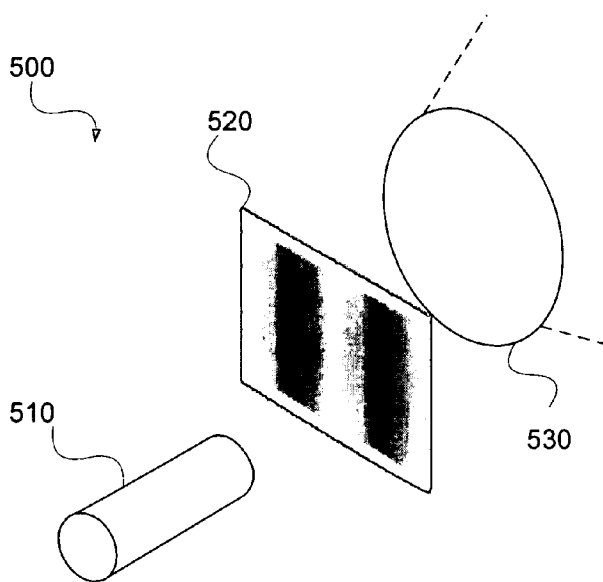


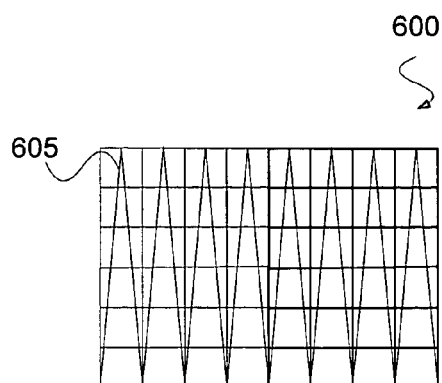
Fig. 3



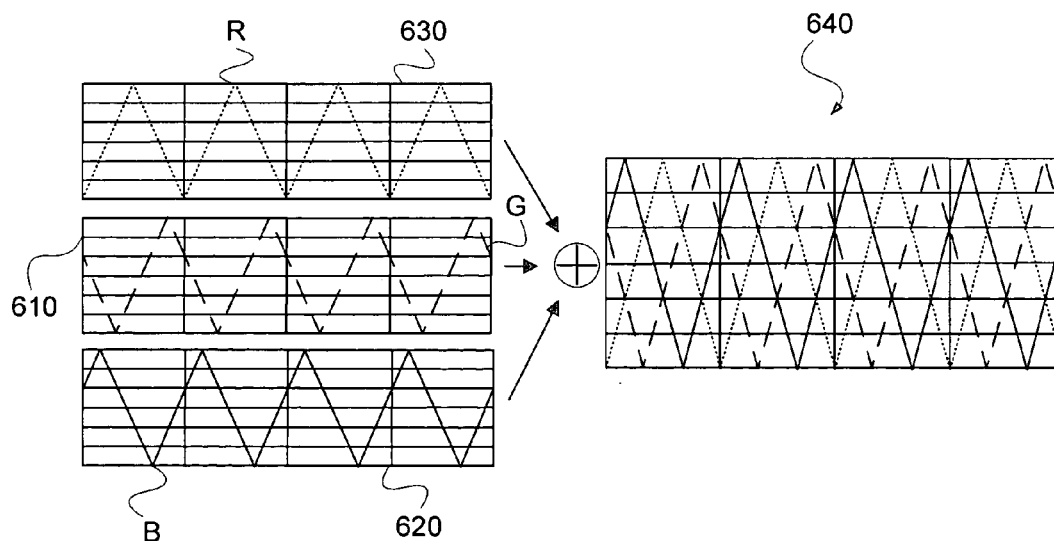
**Fig. 4**



**Fig. 5**



**Fig. 6**



**Fig. 7**



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