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(54) Title: A METHOD FOR MAPPING AN INTERNAL STRUCTURE OF A SAMPLE

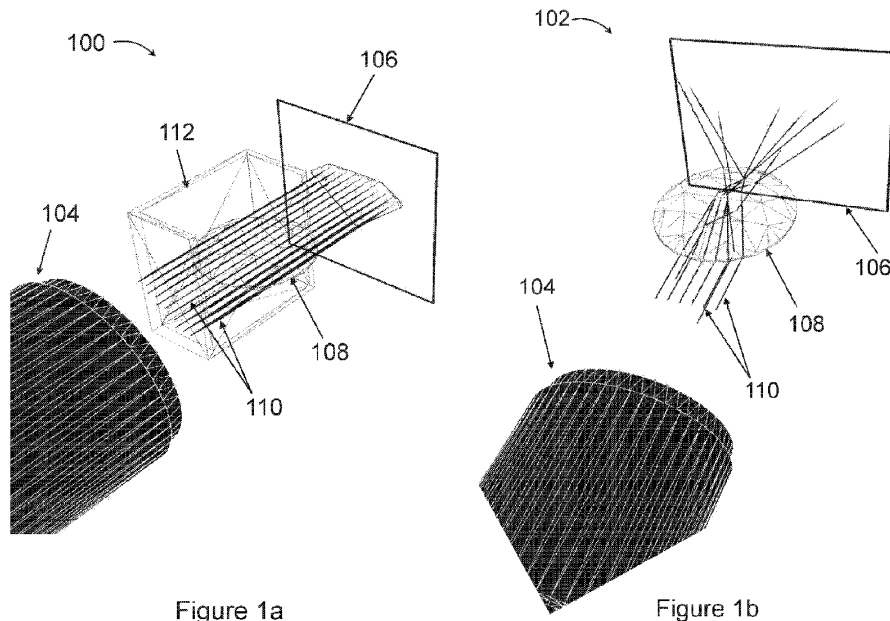


Figure 1a

Figure 1b

(57) **Abstract:** The disclosure provides a method (200) for determining one or more features associated with an internal structure of a gemstone, the gemstone being at least partially transmissive to electromagnetic radiation. The method comprises directing electromagnetic radiation towards the gemstone using a source of incident electromagnetic radiation; in response to directing electromagnetic radiation, detecting electromagnetic radiation using an optical detecting means, including detecting electromagnetic radiation following an interaction between the gemstone and the incident electromagnetic radiation; and processing the detected electromagnetic radiation, wherein the processing accounts for a determination of an external surface geometry of the gemstone and for refraction and reflection effects due to the external surface geometry of the gemstone, and obtains information indicative of the one or more features associated with the internal structure of the gemstone. A system for determining one or more features associated with an internal structure of a

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gemstone is also provided.