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Mercado

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(54) **SMALL FORM FACTOR TELEPHOTO CAMERA**

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G02B 13/02 (2006.01)

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CPC **G02B 13/0045** (2013.01); **G02B 13/004** (2013.01); **G02B 13/02** (2013.01); **H04N 5/225** (2013.01); **H04N 5/2254** (2013.01); **H04N 5/232** (2013.01); **H04N 5/23212** (2013.01)

(58) **Field of Classification Search**
CPC combination set(s) only.
See application file for complete search history.

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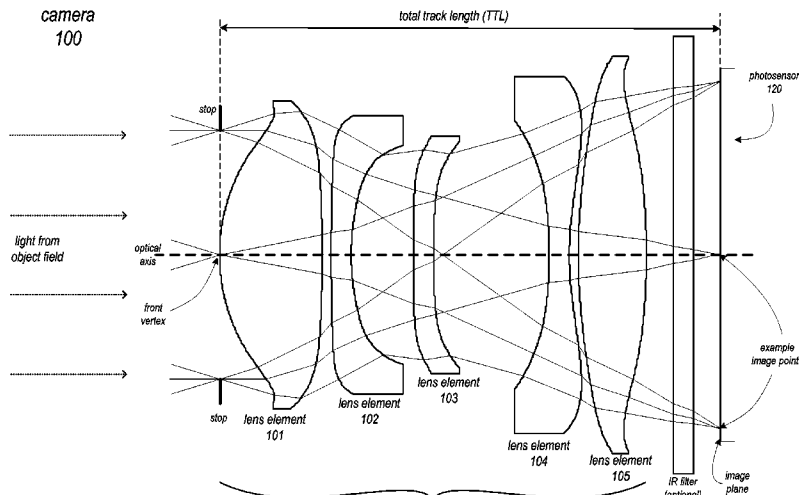
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(57) **ABSTRACT**

A compact telephoto lens system that may be used in a small form factor cameras. The lens system may include five lens elements with refractive power. Alternatively, the lens system may include four lens elements with refractive power. At least one of the object side and image side surfaces of at least one of the lens elements is aspheric. Total track length (TTL) of the lens system may be 6.0 mm or less. Focal length *f* of the lens system may be at or about 7.0 mm (for example, within a range of 6.5-7.5 mm). Lens elements are selected and configured so that the telephoto ratio (TTL/*f*) satisfies the relation 0.74 < TTL/*f* < 1.0. Materials, radii of curvature, shapes, sizes, spacing, and aspheric coefficients of the lens elements may be selected to achieve quality optical performance and high image resolution in a small form factor telephoto camera.

20 Claims, 17 Drawing Sheets



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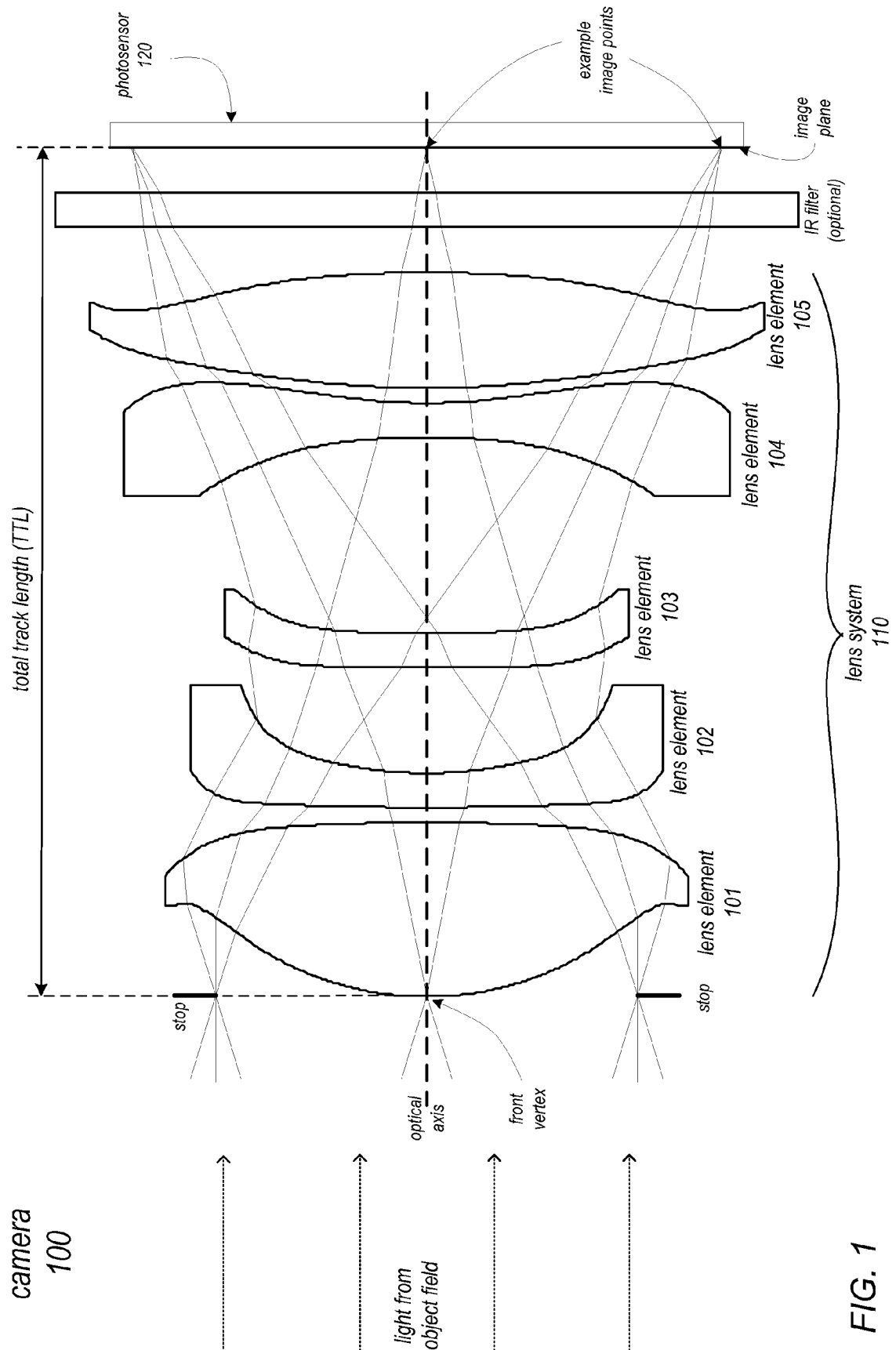


FIG. 1

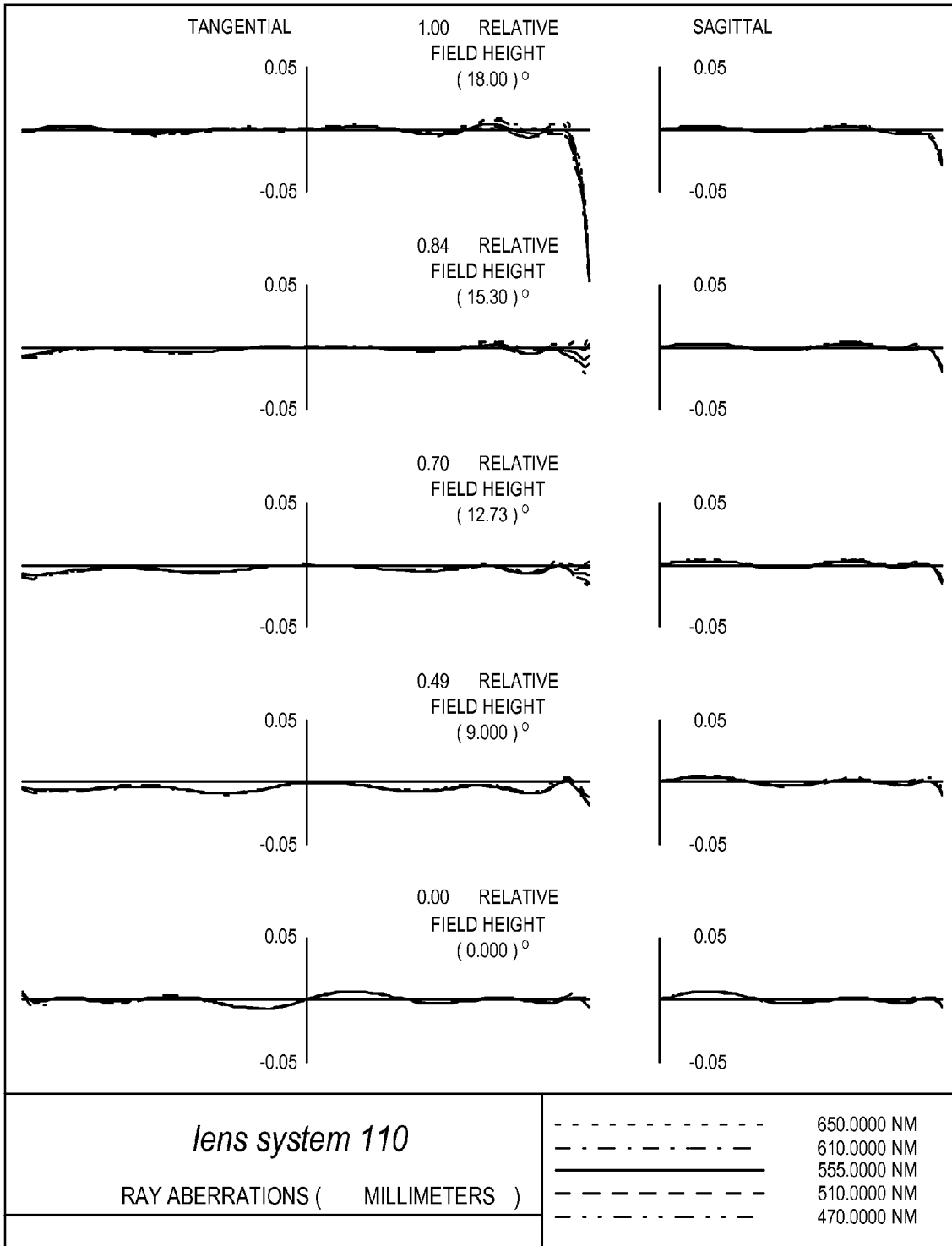


FIG. 2

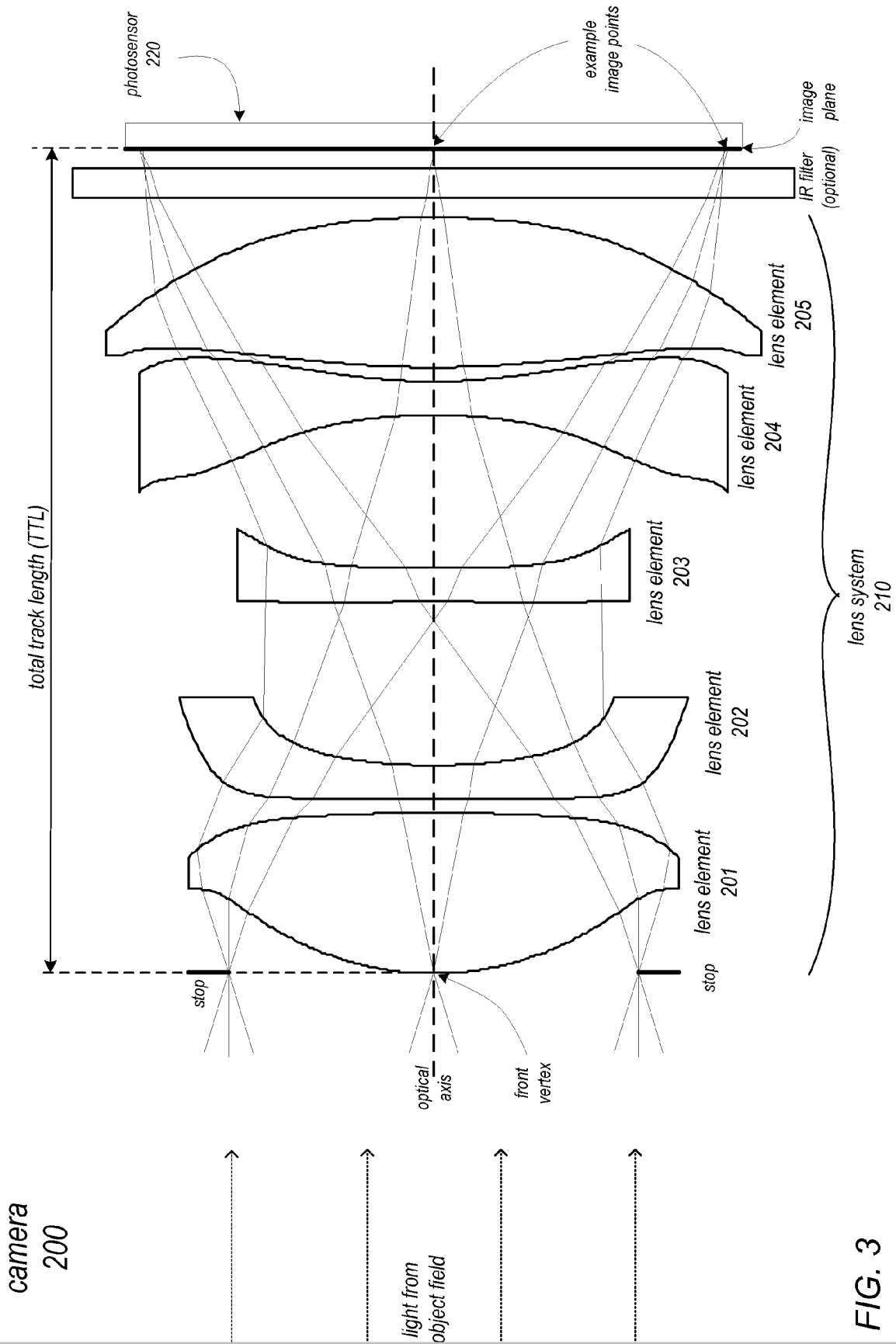


FIG. 3

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