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(54) **THIN DUAL-APERTURE ZOOM DIGITAL CAMERA**

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This patent is subject to a terminal disclaimer.

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(Continued)

(52) **U.S. Cl.**
CPC ........... *G02B 27/646* (2013.01); *G02B 1/041* (2013.01); *G02B 9/60* (2013.01); *G02B 13/009* (2013.01); (Continued)

(58) **Field of Classification Search**
CPC .. H04N 5/2254; H04N 5/2258; H04N 5/2257; H04N 5/23296; H04N 9/045; (Continued)

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(57)          **ABSTRACT**

A dual-aperture zoom camera comprising a Wide camera with a respective Wide lens and a Tele camera with a respective Tele lens, the Wide and Tele cameras mounted directly on a single printed circuit board, wherein the Wide and Tele lenses have respective effective focal lengths $EFL_W$ and $EFL_T$ and respective total track lengths $TTL_W$ and $TTL_T$ and wherein $TTL_W/EFL_W>1.1$ and $TTL_T/EFL_T<1.0$. Optionally, the dual-aperture zoom camera may further comprise an optical OIS controller configured to provide a compensation lens movement according to a user-defined zoom factor (ZF) and a camera tilt (CT) through $LMV=CT*EFL_{ZF}$, where $EFL_{ZF}$ is a zoom-factor dependent effective focal length.

**18 Claims, 9 Drawing Sheets**