US008160400B2

(12) **United States Patent**
Snavely et al.

(10) **Patent No.: US 8,160,400 B2**
(45) **Date of Patent: Apr. 17, 2012**

(54) **NAVIGATING IMAGES USING IMAGE BASED GEOMETRIC ALIGNMENT AND OBJECT BASED CONTROLS**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1245 days.

(21) Appl. No.: **11/493,436**

(22) Filed: **Jul. 25, 2006**

(65) **Prior Publication Data**

US 2007/0110338 A1 May 17, 2007

Related U.S. Application Data

(60) Provisional application No. 60/737,908, filed on Nov. 17, 2005.

(51) **Int. Cl.**
G06K 9/54 (2006.01)
G06K 9/46 (2006.01)

(52) **U.S. Cl.** **382/305**; 382/100; 382/154; 382/190; 382/201; 382/206; 707/E17.029

(58) **Field of Classification Search** 382/100, 382/154, 190, 201, 206, 214, 216, 305, 325; 707/E17.029
See application file for complete search history.

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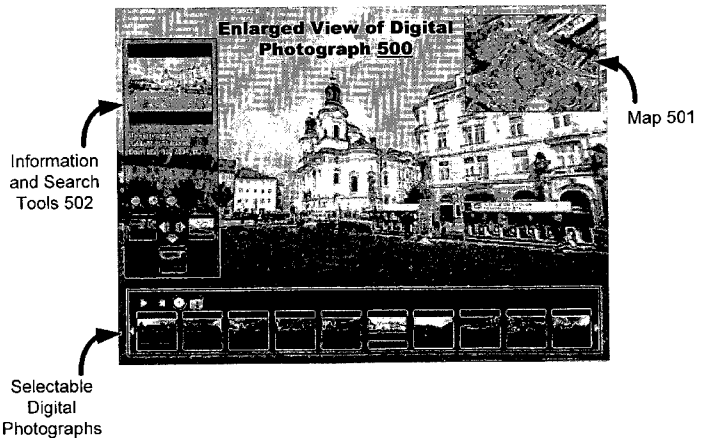
(57) **ABSTRACT**

Over the past few years there has been a dramatic proliferation of digital cameras, and it has become increasingly easy to share large numbers of photographs with many other people. These trends have contributed to the availability of large databases of photographs. Effectively organizing, browsing, and visualizing such .seas. of images, as well as finding a particular image, can be difficult tasks. In this paper, we demonstrate that knowledge of where images were taken and where they were pointed makes it possible to visualize large sets of photographs in powerful, intuitive new ways. We present and evaluate a set of novel tools that use location and orientation information, derived semi-automatically using structure from motion, to enhance the experience of exploring such large collections of images.

9 Claims, 10 Drawing Sheets



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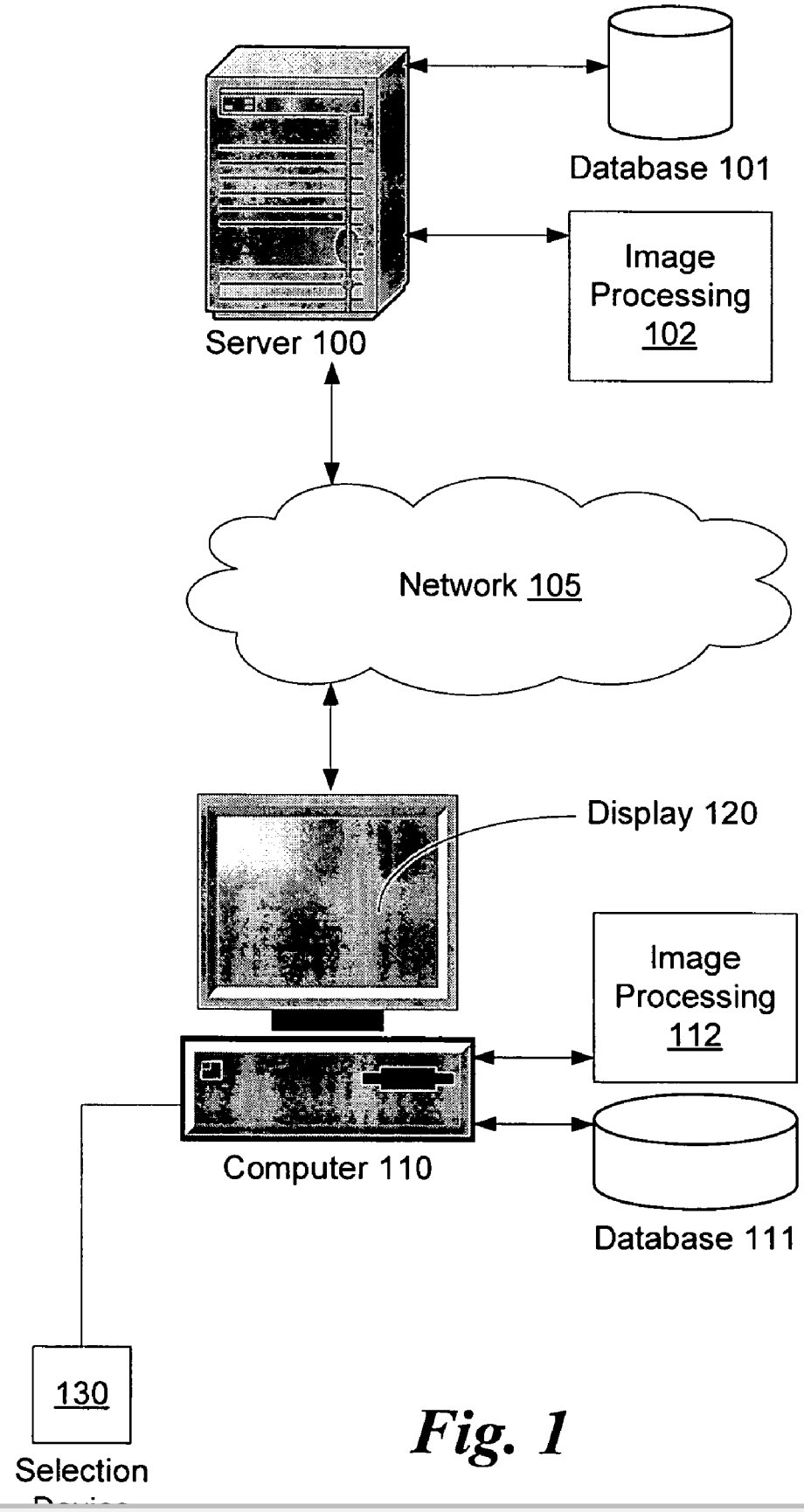

Fig. 1

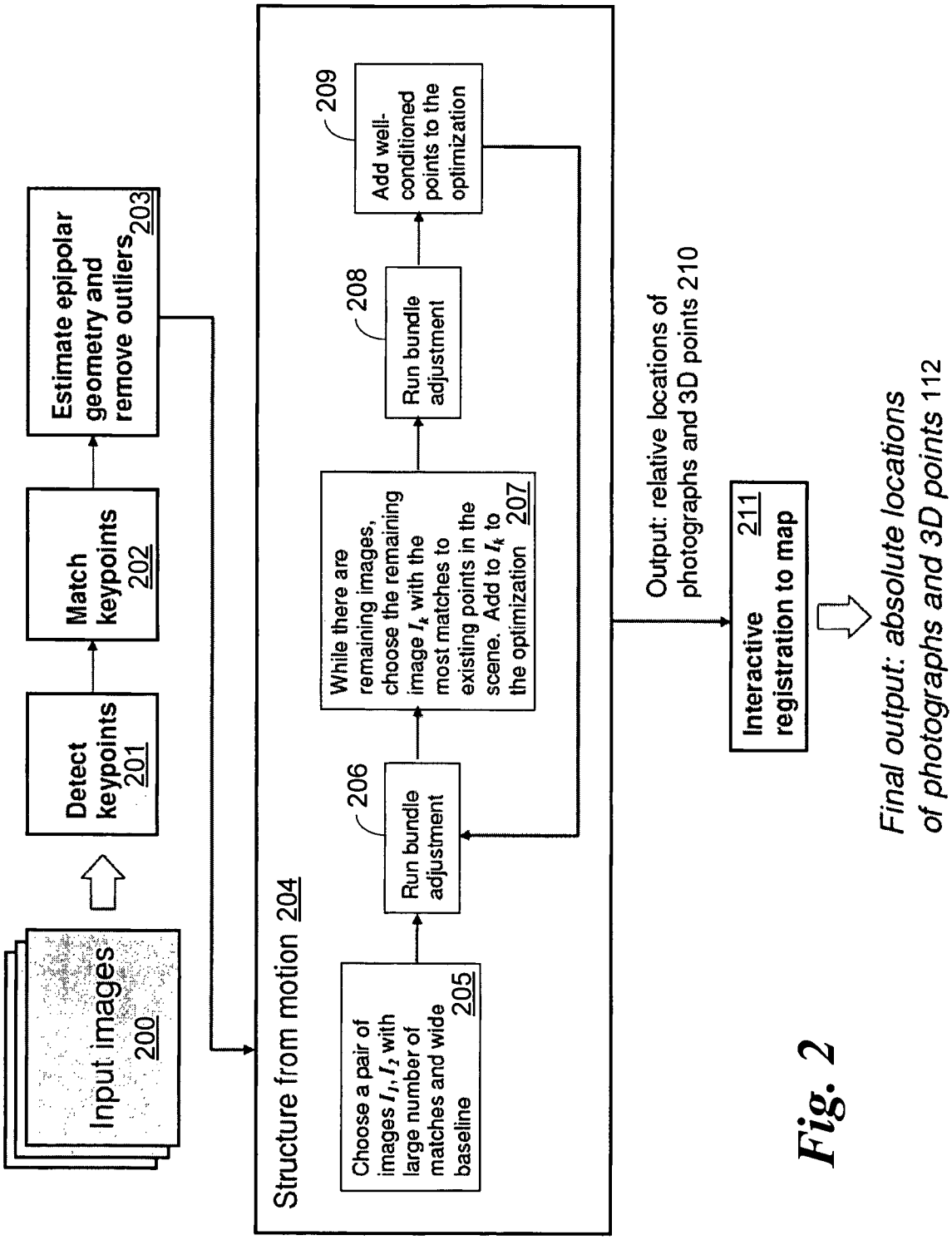

Fig. 2

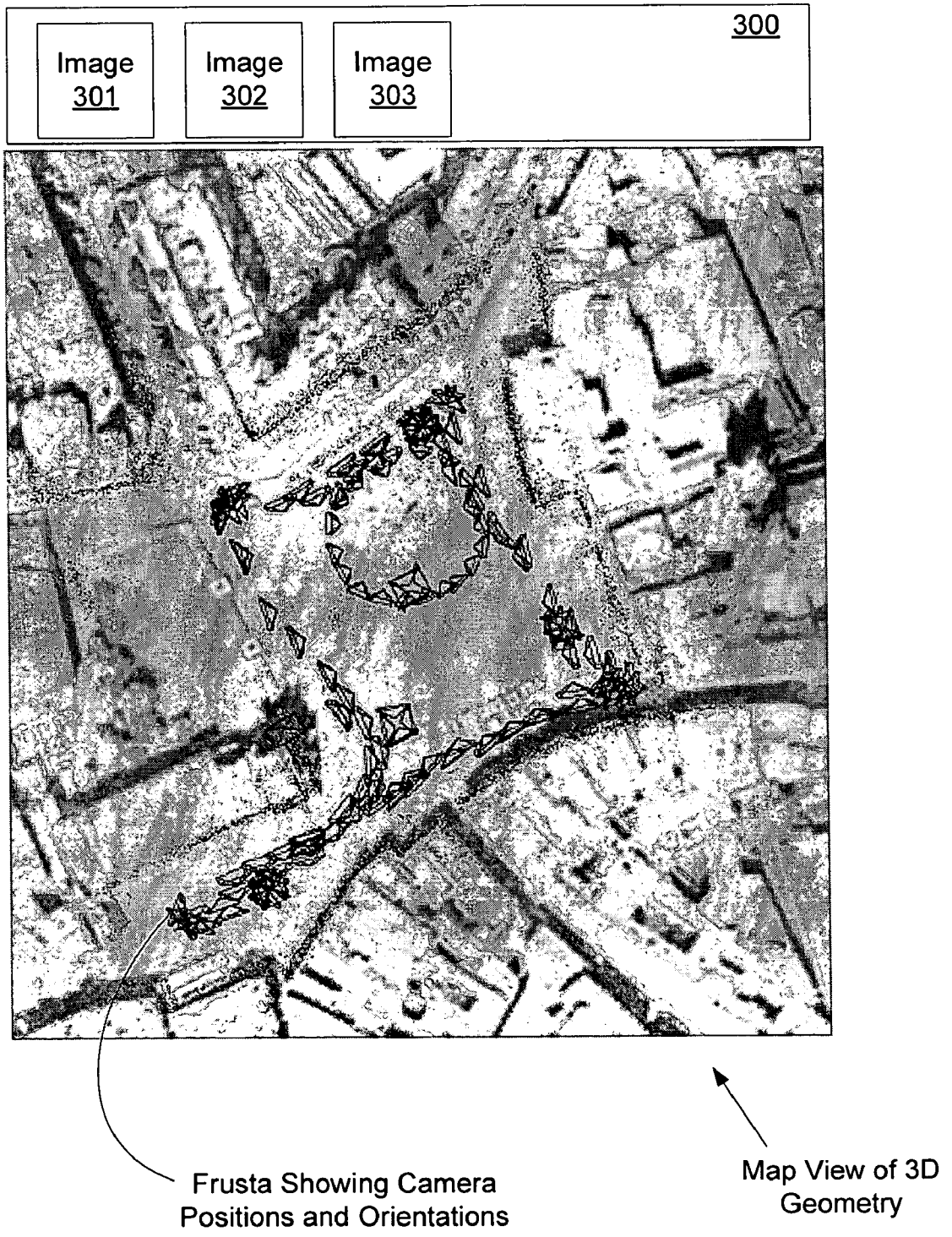

Fig. 3

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