



US 20120306787A1

(19) **United States**

(12) **Patent Application Publication**  
**Ciesla et al.**

(10) **Pub. No.: US 2012/0306787 A1**

(43) **Pub. Date: Dec. 6, 2012**

(54) **USER INTERFACE SYSTEM**

Jan. 5, 2009, now Pat. No. 8,154,527, Continuation-in-part of application No. 11/969,848, filed on Jan. 4, 2008.

(76) Inventors: **Craig Michael Ciesla**, Mountain View, CA (US); **Micah B. Yairi**, Palo Alto, CA (US)

(60) Provisional application No. 61/223,002, filed on Jul. 3, 2009.

**Publication Classification**

(21) Appl. No.: **13/481,676**

(51) **Int. Cl.**  
**G06F 3/041** (2006.01)

(22) Filed: **May 25, 2012**

(52) **U.S. Cl.** ..... **345/173**

(57) **ABSTRACT**

**Related U.S. Application Data**

(63) Continuation-in-part of application No. 12/652,708, filed on Jan. 5, 2010, now Pat. No. 8,199,124, which is a continuation-in-part of application No. 12/319,334, filed on Jan. 5, 2009, now Pat. No. 8,154,527, which is a continuation-in-part of application No. 11/969,848, filed on Jan. 4, 2008, Continuation-in-part of application No. 13/414,589, filed on Mar. 7, 2012, which is a continuation of application No. 12/319,334, filed on

A user interface system of one embodiment includes a layer defining a surface; a substrate supporting the layer and at least partially defining a cavity; a displacement coupled to the cavity that expands the cavity, thereby deforming a particular region of the surface; and a touch sensor coupled to the substrate and adapted to sense a user touch proximate the particular region of the surface. The layer and the substrate are connected at an attachment point, and the location of the attachment point relative to the layer, substrate, and cavity at least partially defines the shape of the deformed particular region of the surface.

