# MOBILE DEVICE WITH INDIVIDUALLY CONTROLLABLE TACTILE SENSATIONS

## CROSS REFERENCE TO RELATED APPLICATIONS

This application is a continuation of U.S. patent application Ser. No. 14/485,246 filed Sep. 12, 2014, which is a continuation of U.S. patent application Ser. No. 13/291,375 filed Nov. 8, 2011, which issued as U.S. Pat. No. 8,866,766 on Oct. 21, 2014, which is a continuation of U.S. patent application Ser. No. 12/406,273 filed Mar. 18, 2009, which issued as U.S. Pat. No. 8,686,951 on Apr. 1, 2014, the contents of which are all hereby incorporated by reference herein as if fully set forth.

## FIELD OF INVENTION

This application is related to an apparatus and method for providing and configuring an elevated, indented, or texturized display device. Moreover, processes are provided and described involving elevated, indented, or texturized portions of a display device.

## BACKGROUND

Display devices have become commonplace in electronic devices such as mobile devices, cellular phones, personal digital assistants, smart phones, televisions, monitors, touchscreens, picture frames, or the like. Display devices may be based on liquid crystal, plasma, or organic light emitting technologies using ridged substrates or soon to be flexible substrates. Although commonplace, when a display device functions as an input device, such as a touchscreen, their applications are limited to two dimensions. Another limitation or problem of current display devices is the lack of texture. As the world becomes more electronic, texture is needed for enhancing and enabling certain applications and computer processes. Therefore, it is desirable to have display devices that can provide three dimensional and/or texturized structures or processes.

## SUMMARY

An apparatus and method for providing and configuring an elevated, indented, or texturized display device is disclosed. Processes are also given involving elevated, indented, or texturized portions of a display device. By providing an elevated, indented, or texturized display device enhanced input/output functions are provided.

## BRIEF DESCRIPTION OF THE DRAWINGS

A more detailed understanding may be had from the following description, given by way of example in conjunction with the accompanying drawings wherein:

FIG. **1** is a diagram of an electronic device having an elevated, indented, or texturized display device in accordance with one embodiment;

FIGS. **2***a*-**2***e* are diagrams of elevated, indented, or texturized display devices in accordance with another embodiment;

FIG. **3** is a diagram of an elevated or texturized display device in accordance with another embodiment;

FIG. **4** is a diagram comprising of processes for an electronic device having a display device with elevated, indented, or texturized display portions in accordance with another embodiment;



FIG. **5** is a process for detecting objects or shapes using a display device with an elevated, indented, or texturized display portions in accordance with another embodiment;

FIG. **6** is a process using an elevated, indented, or texturized display device in accordance with another embodiment; and

FIG. **7** is a process using an elevated, indented, or texturized display device for identifying intellectual property assets in accordance with another embodiment.

## DETAILED DESCRIPTION

The present invention will be described with reference to the drawing figures wherein like numerals represent like elements throughout. In the description forthcoming, elevation or elevated describes an orientation where a given surface level is higher or raised relative to another surface level. As an example, the relative elevation may be by one or more millimeters to one or more centimeters or up to an inch. Indenting describes an orientation where a given surface level is lower or depressed relative to another surface level. As an example, the relative indentation may be by one or more millimeters to one or more centimeters. Texturizing or texturing describes a process where a surface provides or mimics friction, variable smoothness, sandpaper like granularity, variable thickness, variable hardness, coarseness, fineness, irregularity, a movement sensation, bumpiness, or rigidness that is sensed by a human touch or detectable by electronic or mechanical sensors.

In addition, lines shown in the accompanying figures for areas having elevated, indented, or texturized portions or cells are for illustrative purposes. Actual display devices may not show lines on the display surface. In addition, in the processes described below the steps recited may be performed out of sequence and substeps not explicitly described or shown may be performed by one of ordinary skill in the art.

FIG. **1** is a diagram of a fixed or mobile subscriber unit, user equipment (UE), mobile station, pager, cellular telephone, personal digital assistant (PDA), computing device, surface computer, monitor, general display, automobile computer system, vehicle computer system, or television device **100** for mobile or fixed applications. Device **100** comprises computer bus **140** that couples one or more processors **102**, one or more interface controllers **104**, memory **106** having software **108**, storage device **110**, power source **112**, one or more displays controller **120**. In addition to one or more displays controller **120**, device **100** comprises a display(s) elevation, indenting, or texturizing controller **121** for one or more display devices **122**.

One or more display devices **122** can be configured as a liquid crystal display (LCD), light emitting diode (LED), field emission display (FED), organic light emitting diode (OLED), or flexible OLED display device. The one or more display devices **122** may be configured, manufactured, produced, or assembled based on the descriptions provided in US Patent Publication Nos. 2007-247422, 2007-139391, 2007-085838, or 2006-096392 or U.S. Pat. No. 7,050,835 or WO Publication 2007-012899 all herein incorporated by reference as if fully set forth. In the case of a flexible display device, the one or more electronic display devices **122** may be configured and assembled using organic light emitting diodes (OLED), liquid crystal displays using flexible substrate technology, flexible transistors, field emission displays (FED) using flexible substrate technology, as desired. One or more display devices **122** can be configured as a touch screen display using resistive, surface-acoustic wave (SAW)