

expressly incorporated by reference in their entirety. In cases of conflict, the present specification, including definitions, will control.

[0021] In addition, materials, methods, and examples described herein are illustrative only and are not intended to be limiting.

[0022] Other features and advantages of the invention will be apparent from and are encompassed by the following detailed description and claims.

#### BRIEF DESCRIPTION OF THE DRAWINGS

[0023] The following Detailed Description, given by way of example, but not intended to limit the invention to specific embodiments described, may be understood in conjunction with the accompanying Figures, incorporated herein by reference, in which:

[0024] FIG. 1 shows a Hold Gesture with flexible display surface (1). Note that flexible display surfaces and fingers in FIG. 1 through 10 may include some (hidden) marker(s) (3) according to FIG. 11 or FIG. 12 that have not been included in the drawings for reasons of clarity.

[0025] FIG. 2 shows a Collocate Gesture with flexible display surfaces (1).

[0026] FIG. 3 shows a Collate Gesture with flexible display surfaces (1).

[0027] FIG. 4 shows a Flip Gesture, Fold and Half-fold Gestures with flexible display surface (1).

[0028] FIG. 5 shows a Roll Gesture with flexible display surface (1) with markers (3).

[0029] FIG. 6 shows a Bend Gesture with flexible display surface (1) and foldline (2).

[0030] FIG. 7 shows a Rub Gesture with flexible display surface (1).

[0031] FIG. 8 shows a Staple Gesture with flexible display surface (1).

[0032] FIG. 9 shows a Pointing Gesture with flexible display surface (1).

[0033] FIG. 10 shows a Multi-handed Pointing Gesture with flexible display surface (1).

[0034] FIG. 11 shows a Flexible display surface (1) with markers (3).

[0035] FIG. 12 shows another embodiment of flexible display surface (1) made of fabric or similar materials with markers (3).

[0036] FIG. 13 shows a System apparatus for tracking flexible display surface (1) through computer vision cameras emitting infrared light (4) mounted above a workspace with user (7), where markers (3) affixed to flexible display surface (1) reflect infrared light emitted by computer vision cameras (4). Optionally, digital projection system (5) projects images of the modeled flexible display surfaces rendered with textures back onto said flexible display surfaces.

#### DETAILED DESCRIPTION OF THE INVENTION

##### Definitions

[0037] “Flexible Display” or “Flexible Display Surface” means any display surface made of any material, including,

but not limited to displays constituted by projection and including, but not limited to real and electronic paper known in the art, based on Organic Light Emitting Devices or other forms of thin, thin-film or e-ink based technologies such as, e.g., described in U.S. Pat. No. 6,639,578, cardboard, Liquid Crystal Diode(s), Light Emitting Diode(s), Stacked Organic, Transparent Organic or Polymer Light Emitting Device(s) or Diode(s), Optical Fibre(s), Styrofoam, Plastic(s), Epoxy Resin, Textiles, E-textiles, or clothing, skin or body elements of a human or other organism, living or dead, Carbon-based materials, or any other three-dimensional object or model, including but not limited to architectural models, and product packaging. Within the scope of this application, the term is can be interpreted interchangeably as paper, document or paper window, but will not be limited to such interpretation.

[0038] The term “Paper Window” refers to one embodiment of a flexible display surface implemented by tracking the shape, orientation and location of a sheet of paper, projecting back and image onto said sheet of paper using a projection system, such that it constitutes a flexible electronic display. Within the scope of this application, the term is may be interpreted as interchangeable with flexible display, flexible display surface or document, but the terms flexible display, document and flexible display surface shall not be limited to such interpretation.

[0039] The term “document” is synonymous for Flexible Display or Flexible Display Surface.

[0040] “Marker” refers to a device that is affixed to a specific location on a flexible display surface for the purpose of tracking the position or orientation of said location on said surface. Said marker may consist of a small half-sphere made of material that reflects light in the infrared spectrum for the purpose of tracking location with an infrared computer vision camera. Said marker may also consist of an accelerometer that reports to a computer system for the purpose of computing the location of said marker, or any other type of location tracking system known in the art. A similar term used in this context is “point.”

[0041] “Fold” is synonymous with “Bend,” wherein folding is interpreted to typically be limited to a horizontal or vertical axis of the surface, whereas Bends can occur along any axis (2). Folding does not necessary lead to a crease.

##### Interaction Styles

[0042] Position and shape of flexible displays can be adjusted for various tasks: these displays can be spread about the desk, organized in stacks, or held close for a detailed view. Direct manipulation takes place with the paper display itself: by selecting and pointing using the fingers, or with a digital pen. The grammar of the interaction styles provided by this invention follows that of natural manipulation of paper and other flexible materials that hold information.

[0043] FIGS. 1 through 10 show a set of gestures based on deformations and location of the flexible display(s). These gestures provide the basic units of interaction with the system:

[0044] Hold. Users can hold a flexible display with one or two hands during use. The currently held display is the active document (FIG. 1).