[0078] Another embodiment of the invention relates to FSA being applied to a substrate that has a first receptor region and a second receptor region. These regions may be of similar or different sizes. The objects that are contained in the slurry drop into the respective receptor regions that most closely match the size of the object.

[0079] A continuous process as in the invention offers the advantage of increasing the number of flat-panel displays produced, thereby reducing the cost of manufacturing the displays. FSA in conjunction with a deterministic method of placing blocks (e.g., "pick and place") with circuit elements of objects onto a rigid substrate or a web process material is disclosed. In this aspect of the invention, the recessed regions of the substrate are checked for empty regions. If there is an empty recessed region in the substrate, an object is robotically placed into the empty recessed region. The advantage offered by robotically placing an object into an empty recessed region of a substrate is that it increases the overall effectiveness and the quality of the displays.

[0080] In the following description, numerous specific details such as specific materials, processing parameters, processing steps, etc., are set forth in order to provide a thorough understanding of the invention. One skilled in the art will recognize that these details need not be specifically adhered to in order to practice the claimed invention. In other instances, well known processing steps, materials, etc. are not set forth in order not to obscure the invention.

[0081] **FIG. 6** shows pixel electrodes **46** on top of a substrate **48**.

[0082] **FIG. 7A** shows a flexible display device, one embodiment of the invention. Here, an active matrix display backplane is coupled to a flexible substrate **52**. The active matrix may include pixel electrodes and spatial light modulars. **FIG. 7B** shows a flexible display device wherein the active matrix display backplane **50** is coupled to a flexible substrate **52**. Bistable crystal may be used in conjunction with the flexible substrate **52**. A display of this type may be used in credit cards or some other type of card that has flexibility. Blocks **54** are deposited onto the flexible substrate and are part of the active matrix display backplane. The block **54** comprises an active circuit element (not shown) that drives a picture element (not shown). **FIG. 7C** shows the top view of a flexible display device wherein an active matrix display backplane **50** is coupled to a flexible substrate **52**. The flexible display device is coupled to an object **56**. The flexible display device conforms to the shape of the object **56**.

[0083] **FIG. 8A** shows an active matrix display backplane **60**. The plurality of blocks in the active matrix display backplane contain the active circuit element. This display backplane is flexible. **FIG. 8B** shows a passive matrix display backplane **62**. This display backplane is flexible. **FIG. 8C** shows the top layer of a passive matrix backplane. **FIG. 8D** shows the bottom layer of a passive matrix backplane.

[0084] **FIG. 9** shows one method of assembling a flexible display along the length of a flexible substrate **70** in accordance with an embodiment of the invention. First, blocks are assembled into the openings of the flexible substrate. Utilizing an FSA process, a plurality of blocks are deposited in a slurry that go into the recessed regions of the flexible substrate. Planarization of the assembly of blocks into substrate **72** is the next step. Planarization takes place by depositing a material that may be spun to flatten or may be subjected to conventional chemical-mechanical polishing. Then, the electrical coupling of the plurality of blocks takes place at step **74** by opening holes in the planarization layer and depositing metalization material or other conductive materials into the holes and beyond the holes to form an interconnect (e.g., a row or column interconnect). The interconnect between the rows and columns is comprised of flexible and conductive material. For example, the interconnect could be made of conductive polymers, metals (e.g., aluminum, copper, silver, gold, etc.), metal particles, conductive organic compounds, or conductive oxides. The display is made to conform the object's shape **78**. It should be noted that the operations for forming the display may be done in a different order than that found in **FIG. 9** and thus the operation **78** may be performed after operation **80**. A display generation substrate (e.g., a PDLC layer) is coupled to the active matrix backplane **80**.

[0085] **FIG. 10** shows a method of manufacturing multiple displays along a flexible substrate. Multiple display components are created on a flexible substrate **200**. The flexible substrate is advanced to a second region on the substrate **202**. A new display component is created on the flexible substrate in a different region of the substrate **204** by advancing the flexible substrate through a web processing of apparatus **206** and coupling a display material to the substrate **208**. Separation of the display panel occurs at the end of thee process **210**.

[0086] **FIG. 11** shows a flexible substrate with multiple display components. The flexible substrate **220** has display component **222** and display component **224** attached thereto. The substrate has three lengths: a first length **226**, a second length **228**, and a third length **230**. Display components **222** and **224** are active matrix display devices.

[0087] **FIG. 12A** shows display component **222** that has a passive matrix display backplane attached thereto. **FIG. 12B** shows a display component **224** that has an active matrix display backplane attached thereto.

[0088] **FIG. 13** shows a flexible substrate **50** attached to a display backplane.

[0089] **FIG. 14A** shows a reflective display backplane **48** coupled to a flexible substrate **46**. **FIG. 14B** shows a flexible reflective display backplane **48** coupled to a substrate **46**. Blocks **14** are coupled to the flexible substrate **46** and to the flexible reflective display backplane **48**. The reflective display backplane includes an interconnect layer **45**. This interconnect layer **45** typically is comprised of metallic material. Coupled to the flexible substrate is a flexible reflector **48**. **FIG. 14C** shows a flexible reflective display wherein recessed region **45** contains reflective material **44**. The substrate **46** is coupled to the reflective display backplane **48**.

[0090] **FIG. 15A** shows a method of fabricating a display device wherein a flexible substrate and a display tape undergo processing and are subsequently coupled. There, the flexible substrate is advanced along a process line **500**. A slurry containing a plurality of blocks is dispensed onto the flexible substrate **502**. A second slurry containing a plurality of blocks is again dispensed onto the substrate.