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(54) **TRANSFER SUBSTRATE UTILIZING SELECTABLE SURFACE ADHESION TRANSFER ELEMENTS**

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(58) **Field of Classification Search**

None

See application file for complete search history.

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(57) **ABSTRACT**

An apparatus includes a transfer substrate with two or more transfer elements. Each of the transfer elements includes an adhesion element having a first surface adhesion at a first temperature and a second surface adhesion at a second temperature. The second surface adhesion less than the first surface adhesion. Each transfer element has a thermal element operable to change a temperature of the adhesion element in response to an input. A controller is coupled to provide the inputs to the thermal elements of the two or more transfer elements to cause a subset of the transfer elements to selectively hold objects to and release the objects from the transfer substrate in response to changes between the first and second surface adhesion of the subset of the transfer elements.

21 Claims, 9 Drawing Sheets

