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with different stacked matrices to produce multiple display surfaces having different tactile graphic images thereat for simultaneous access.

**8.** An extended refreshable tactile graphic array apparatus for scanned tactile display comprising:

a multiplicity of movable pins, each pin including a shaft between an enlarged head and an end;

a matrix of stacked elements including a display surface element and a laterally movable pin retention element having a plurality of locations configured to engage said movable pins for locking said multiplicity of movable pins in a selected raised or lowered display position after said display is set, said display surface element having a user accessible display surface and an array of openings each having one of said movable pins maintained therein with said enlarged heads of said pins above said display surface and said pin ends below said display surface element, said display surface element formed at least at said openings so that pin extension relative to said user accessible display surface is retained without further support of said pins yet yields to change of pin extension upon application of an applied force; and

actuating means for selectively contacting said pin ends after lateral movement of said pin retention element to release said multiplicity of movable pins from engagement and thereby to apply said applied force for moving pins maintained at said array of openings at said display surface element between at least first and second positions, a single actuator in said actuating means for moving a number of said pins.

**9.** The apparatus of claim **8** wherein said display surface element of said matrix of stacked elements is formed of a compressible material sheet, and wherein said pin retention element is a sheet, said plurality of locations comprising ovoid openings equal in number to said pins, each said pin extending through a different one of said ovoid openings and freely movable therethrough when said sheet is laterally moved to a first position, said pin captured in said ovoid openings when said sheet is moved to a second position thereby locking pin position.

**10.** The apparatus of claim **8** wherein said actuating means includes one of a one-dimensional scanned actuator array, a raster scanning array, or a vector drawing system.

**11.** The apparatus of claim **8** further comprising a flexible cover over said matrix of stacked elements at said display surface element, said enlarged heads of said pins bearing there against.

**12.** The apparatus of claim **8** further comprising one of a roller mechanism or a plate element in said matrix for movement of said pins to a default position preparatory to resetting the display.

**13.** The apparatus of claim **8** further comprising means for creation of permanent copies of a display at said display surface of said display surface element.

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**14.** The apparatus of claim **8** wherein at least one of said display surface element and said pin retention element includes a plurality of clips arrayed at a unitary sheet.

**15.** A method for extended refreshable tactile graphic display comprising the steps of:

maintaining an array of at least hundreds of movable pins at a display surface;

using a single actuator to move multiple said pins in said array between at least first and second elevation positions relative to said display surface;

continuing to move said pins until a desired configuration is attained at said display surface;

retaining pins in a position when moved without continued influence from said actuator;

locking said pins in position after attainment of said desired configuration; and

unlocking said pin positions to allow movement of said pins utilizing force sufficient to overcome retention of pin position when desired to attain a different configuration at said display surface.

**16.** The method of claim **15** wherein the step of retaining moved pins in a position includes the step of configuring said display surface to hold said pins temporarily in place as selected said pins in said array are being moved, and wherein the step of locking said pins in position includes resisting forces applied that are greater than forces applied for moving said pins to attain said configurations at said display surface thereby to maintain establishment of pin positions as a user senses the tactile display.

**17.** The method of claim **15** wherein the steps of moving pins include moving said pins to a selected one of plural pin extension positions relative to said display surface to provide a tactile graphic relief display.

**18.** The method of claim **15** further comprising the step of making a copy of said desired configuration using a thermal sheet at said display surface.

**19.** The method of claim **15** wherein said steps are computer controlled and further comprise the steps of:

receiving a user issued command for the display of a tactile graphic image;

conversion of a selected graphical image to a format suitable for graphic display;

determining that said pins are ready to be moved;

if a tactile display is already set at said display surface, moving said pins to a default position after receiving said user issued command; and

when signaled by the user, receiving another user issued command for display of a new tactile graphic image.

**20.** The method of claim **15** further comprising configuring said array of pins at said display surface for display of one of high resolution graphic images, standard or nearstandard dimension Braille text, or a combination thereof.

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