

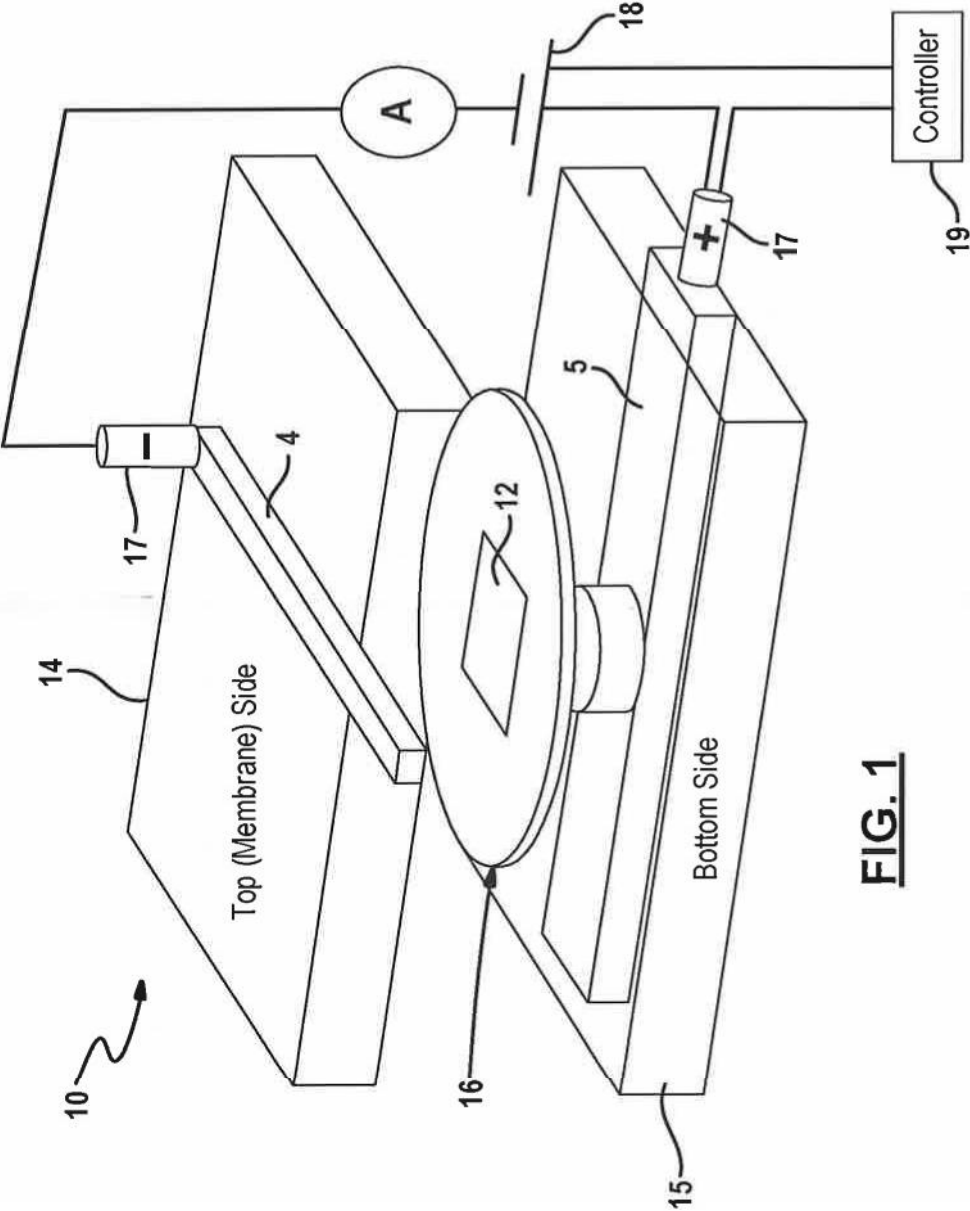


FIG. 1

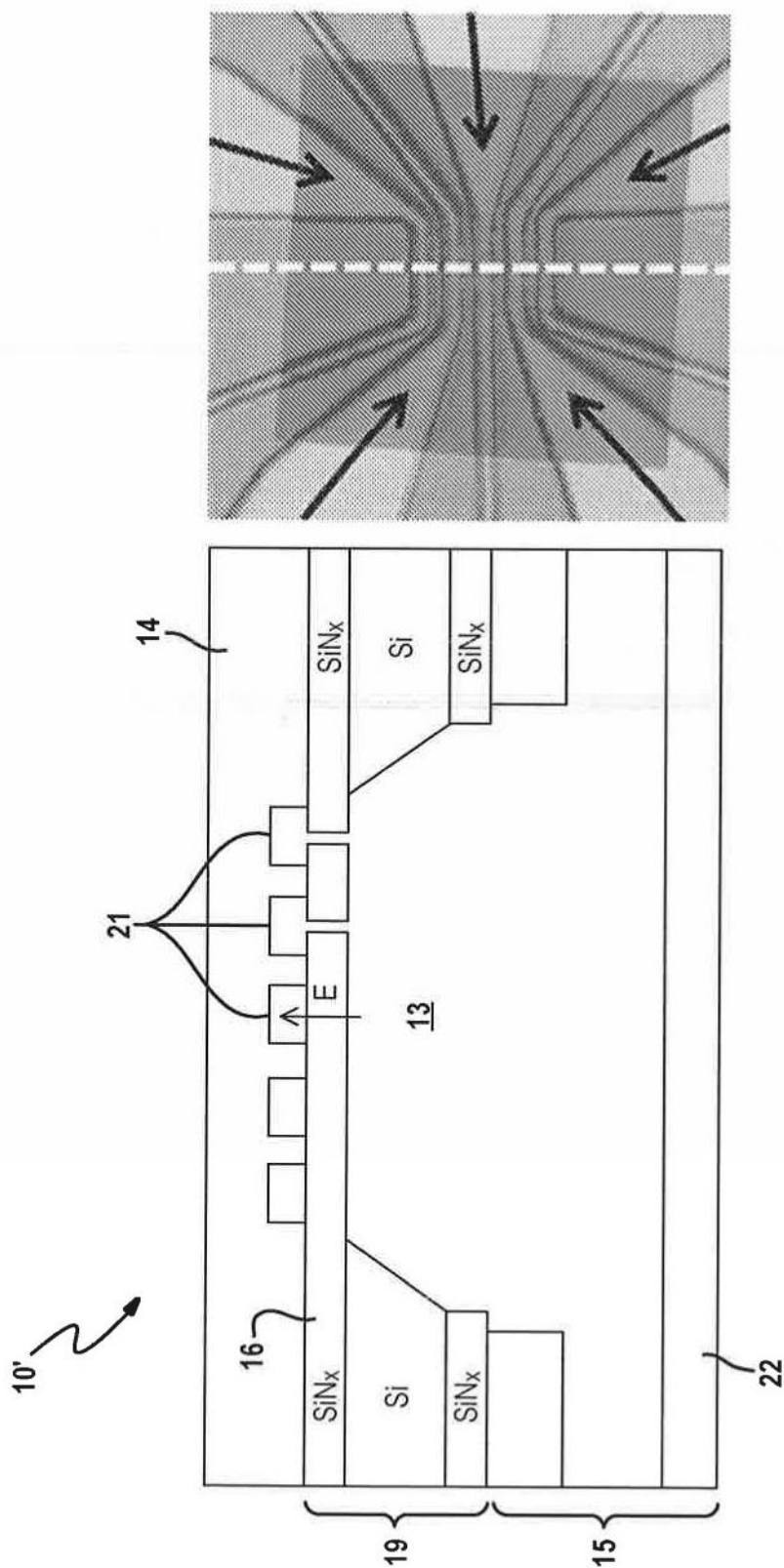
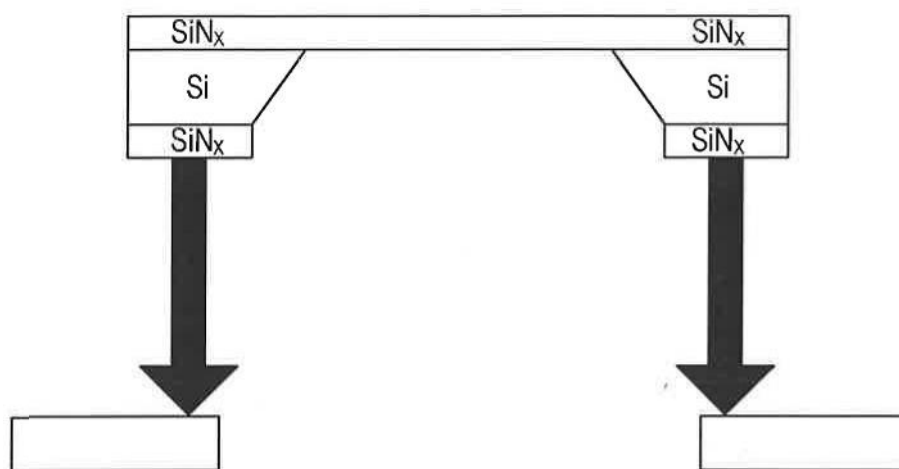
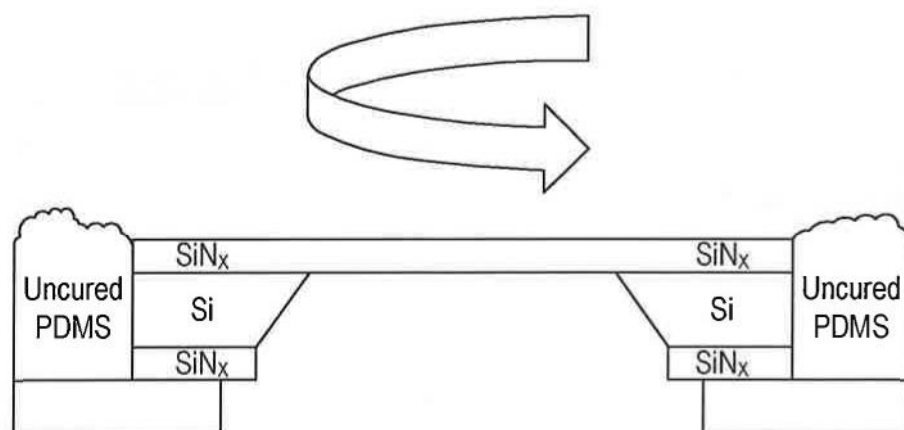
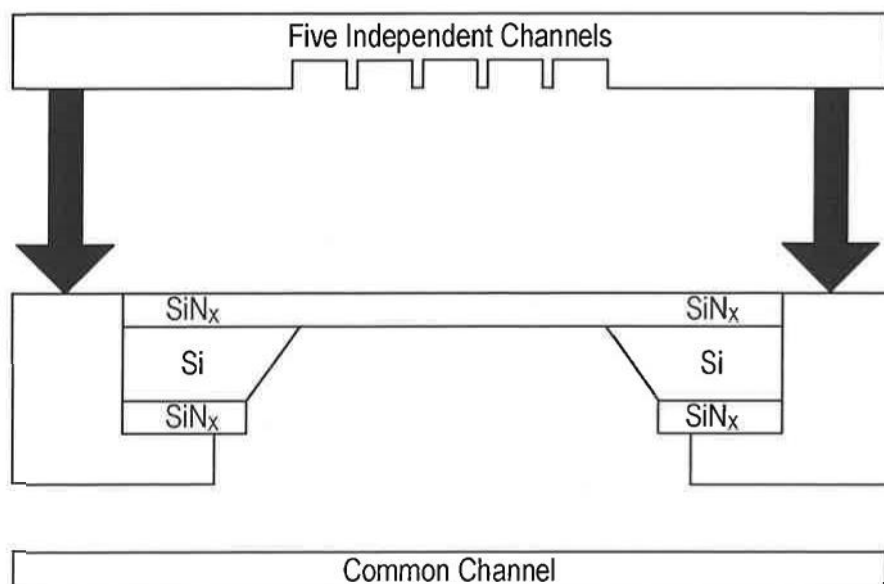


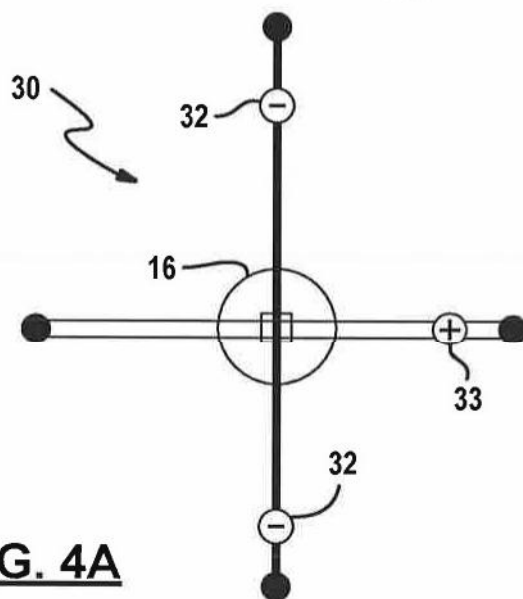
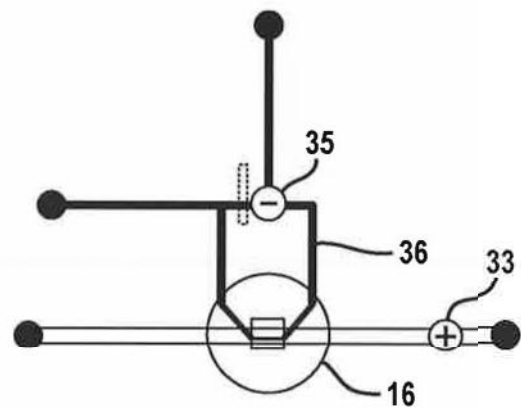
FIG. 2B

FIG. 2A

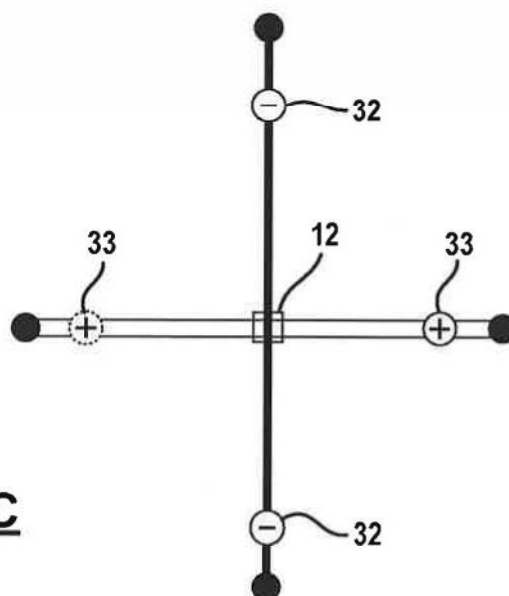
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**FIG. 3A****FIG. 3B****FIG. 3C**

- Fluidic Ports
- ⊖ Anode Electrode
- ⊕ Cathode Electrode
- Flow Channel
- ⋯ Control (Valve) Channel
- SiNx Membrane Window

**FIG. 4A****FIG. 4B**

- Fluidic Ports
- ⊖ Anode Electrode
- ⊕ Cathode Electrode
- Flow Channel
- ⋯ Control (Valve) Channel
- Free-Standing Silicon Nitride Membrane

**FIG. 4C**

10"

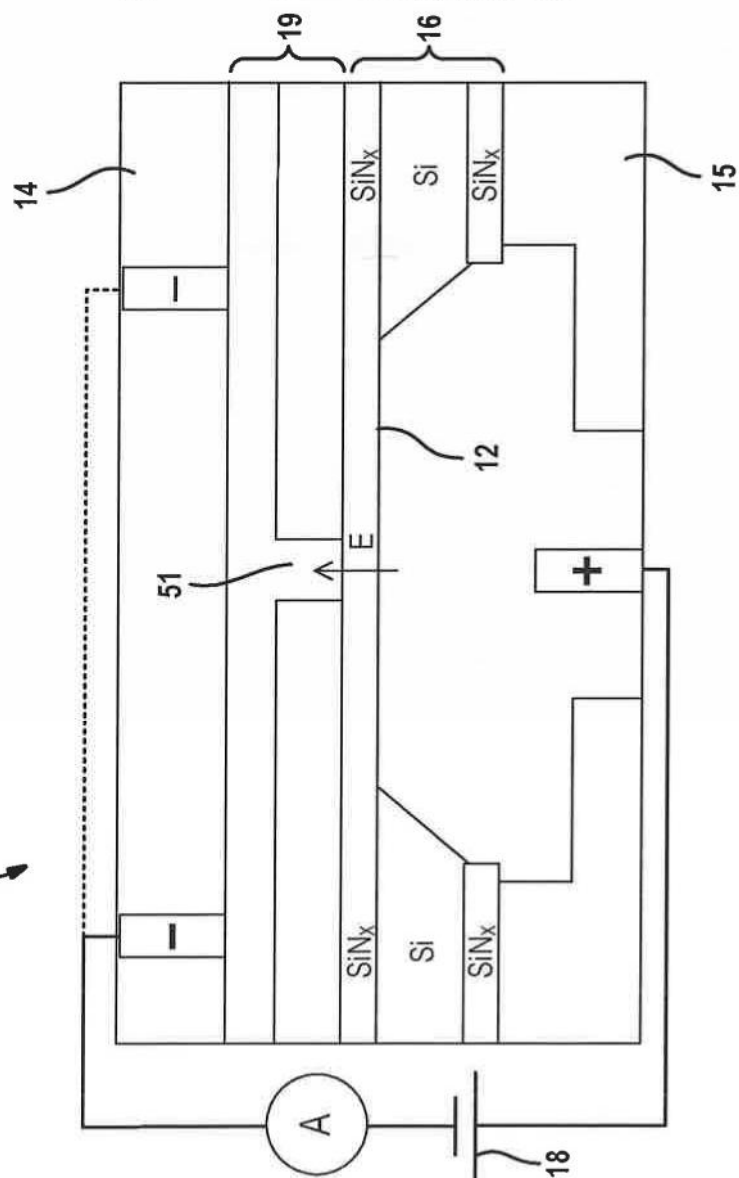


FIG. 5A

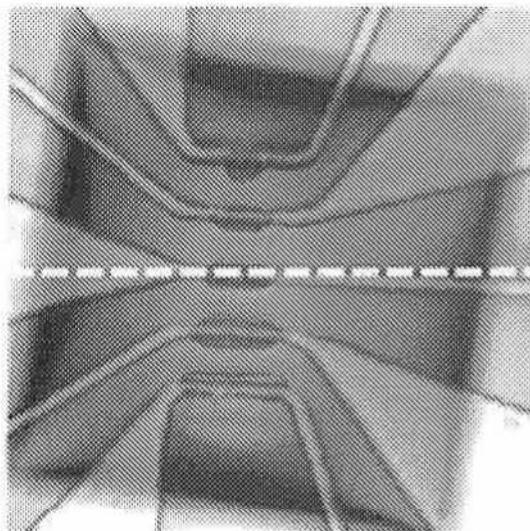
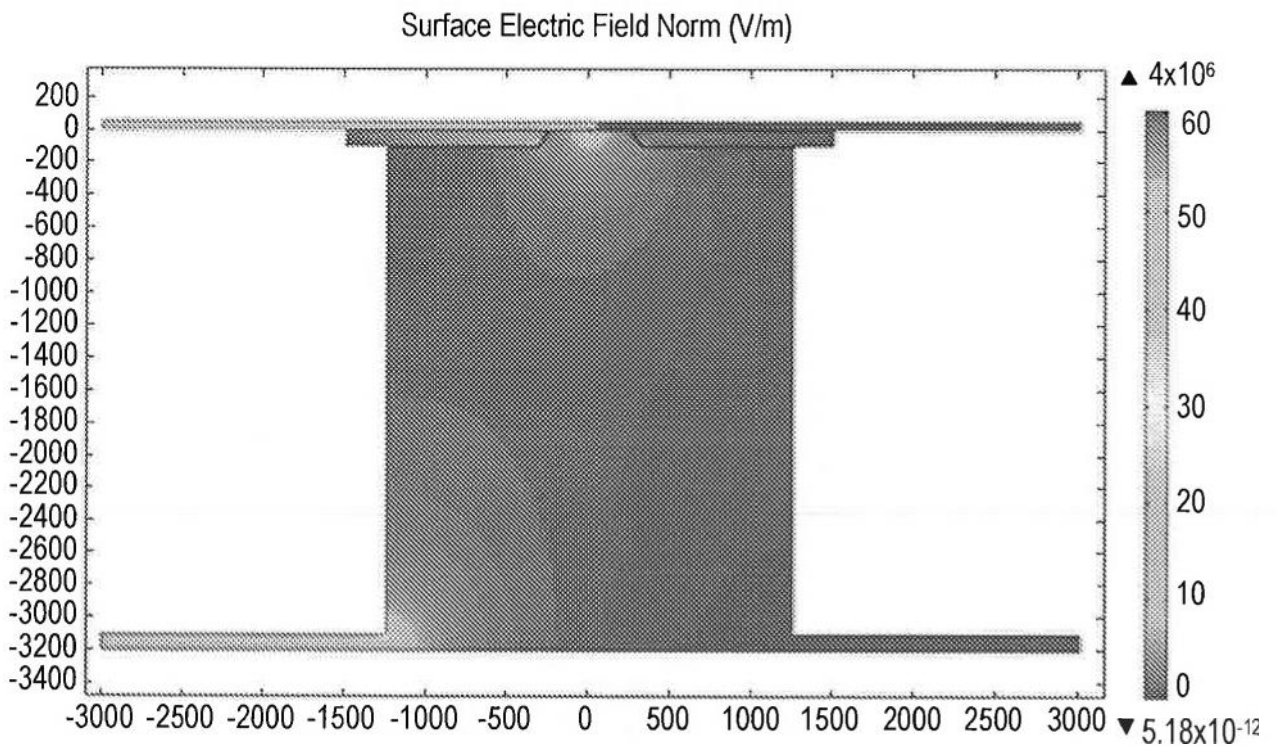
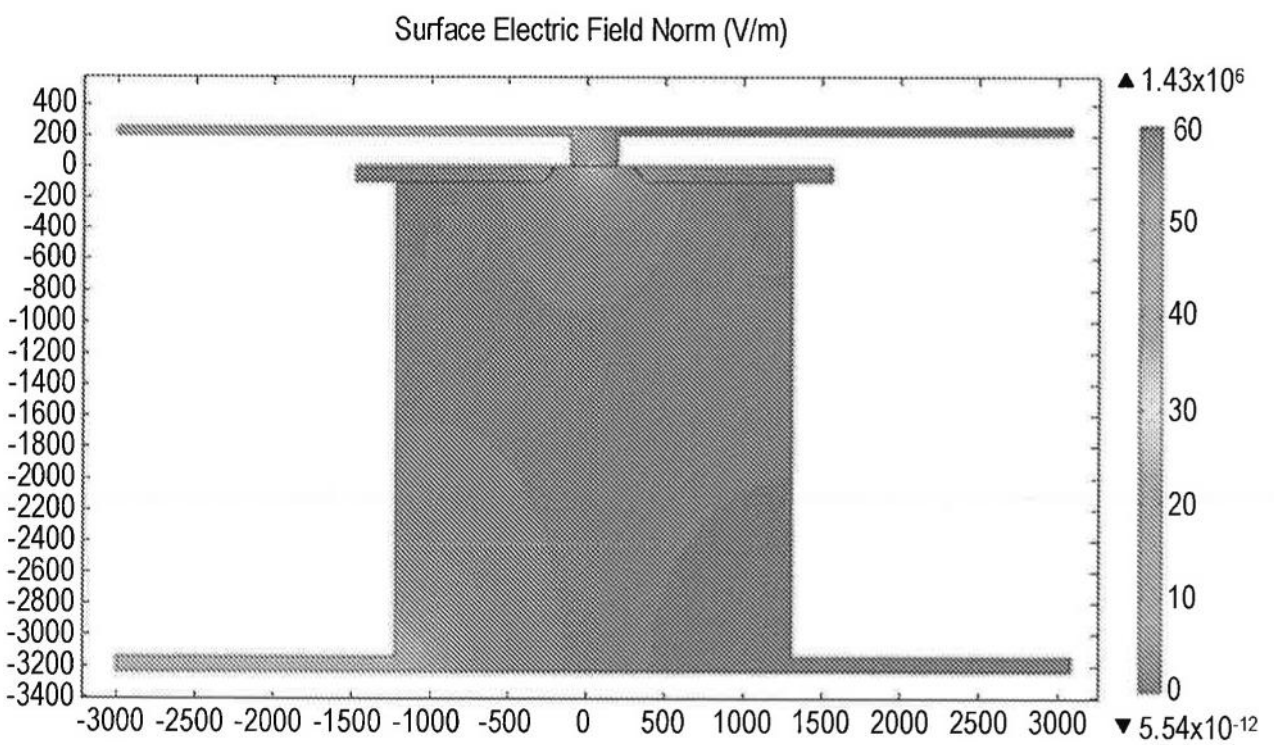
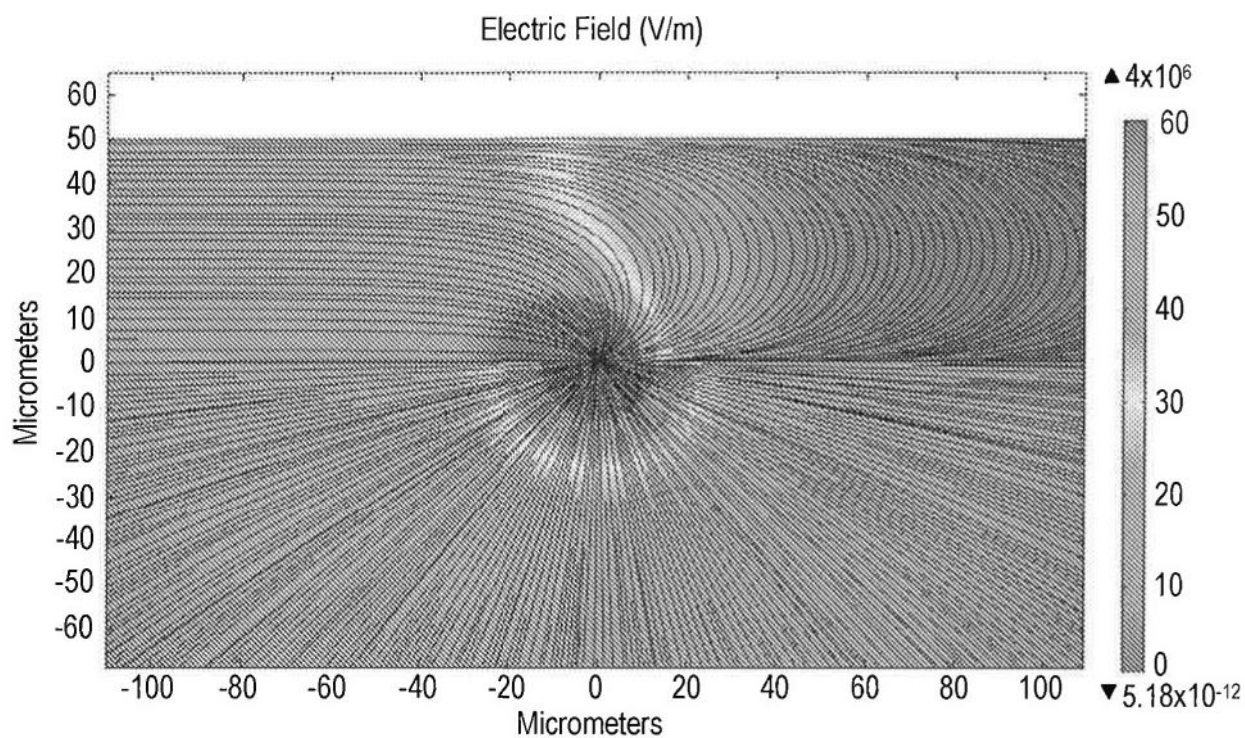
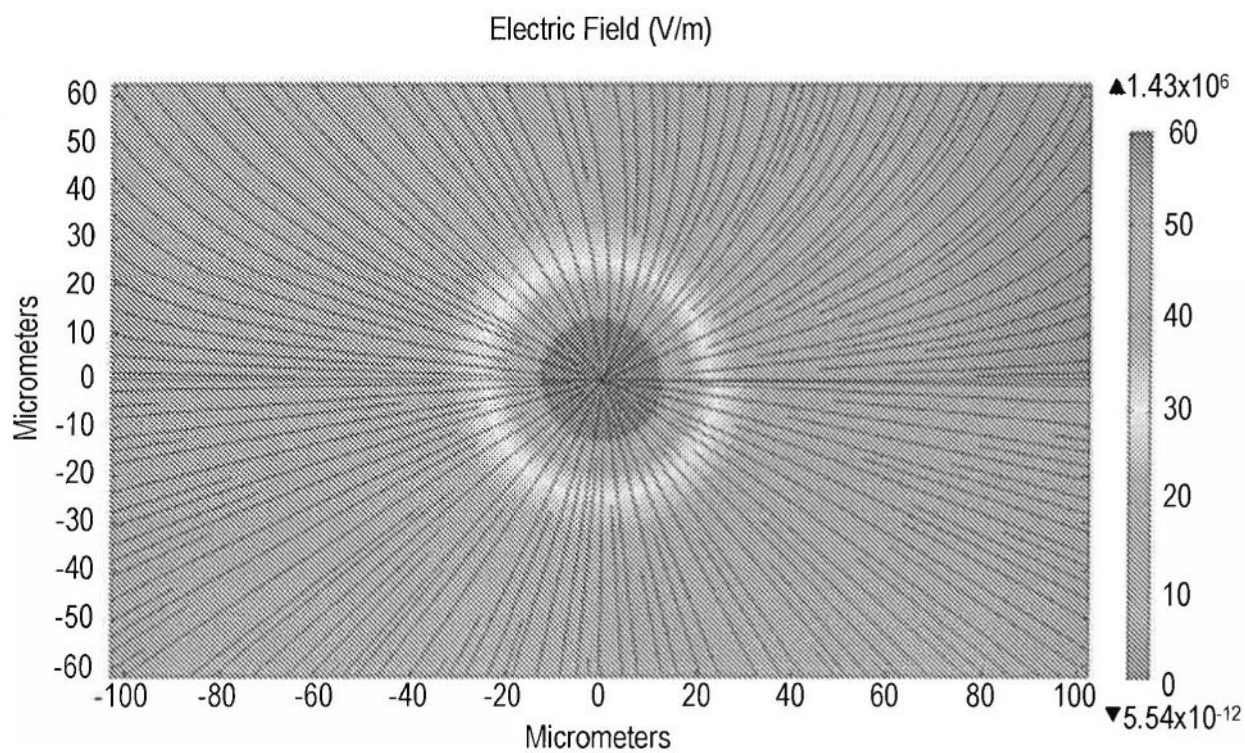


FIG. 5B

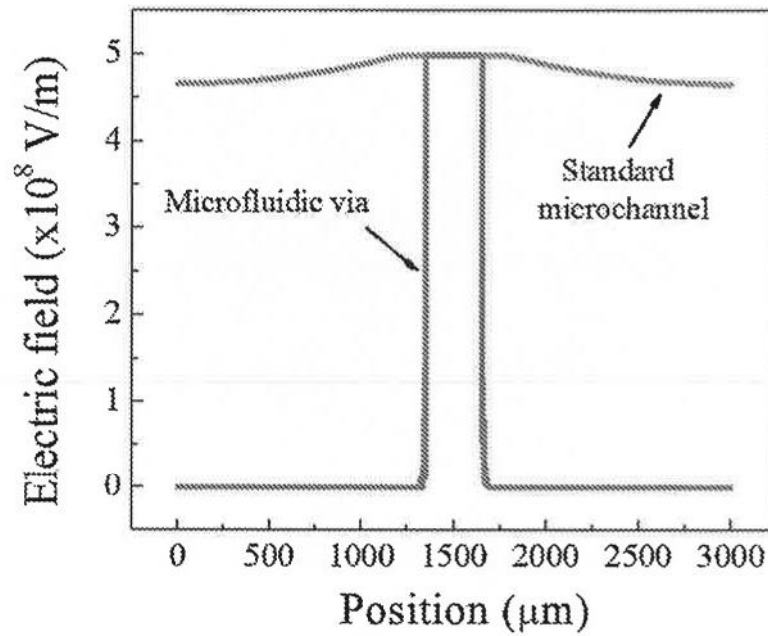
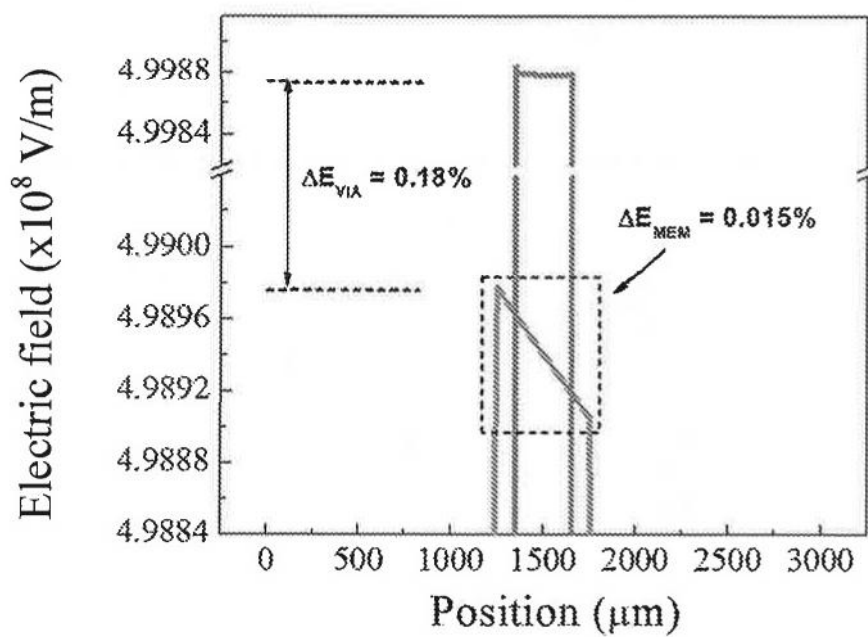
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**FIG. 6A****FIG. 6B**

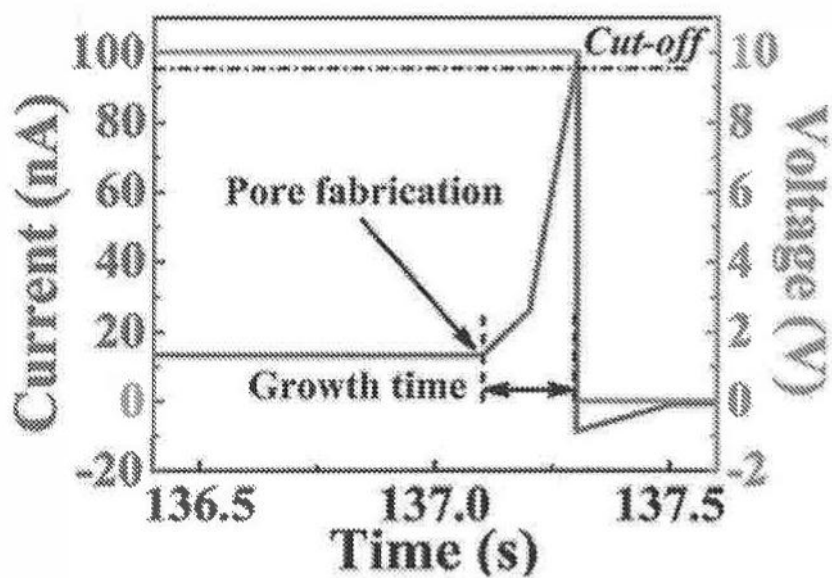
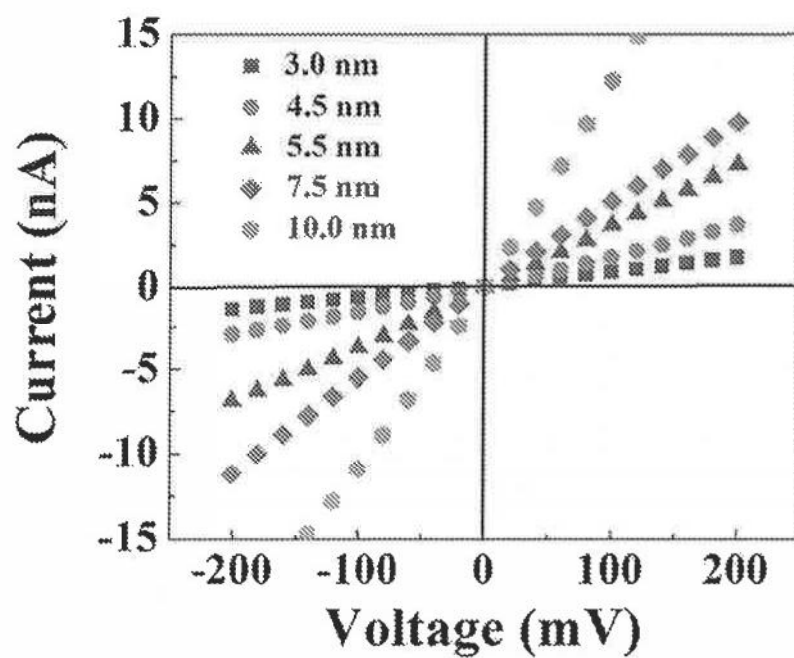
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**FIG. 6C****FIG. 6D**

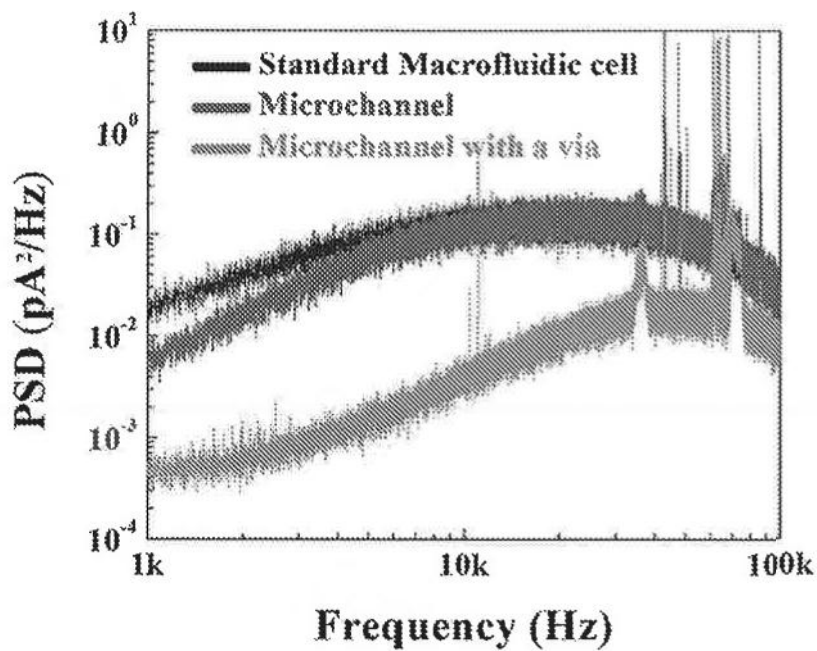
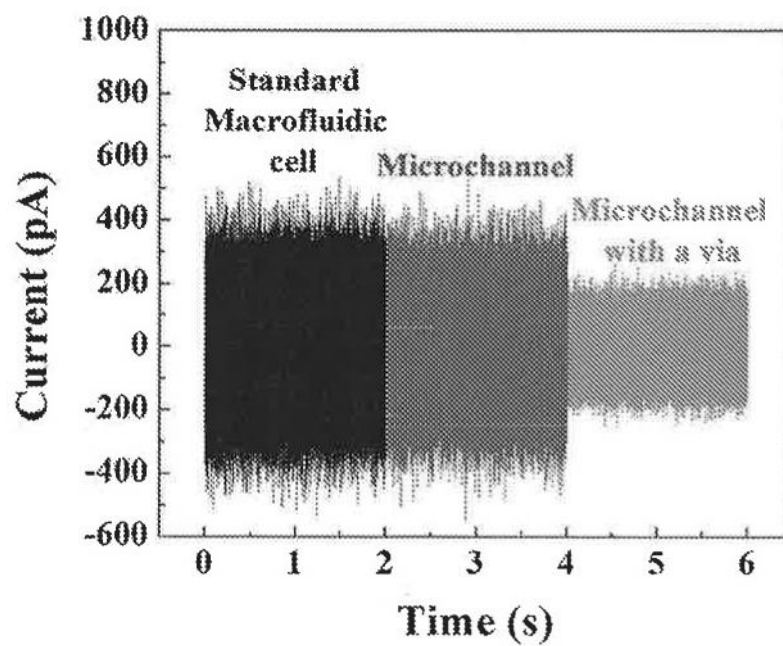
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**FIG. 6E****FIG. 6F**

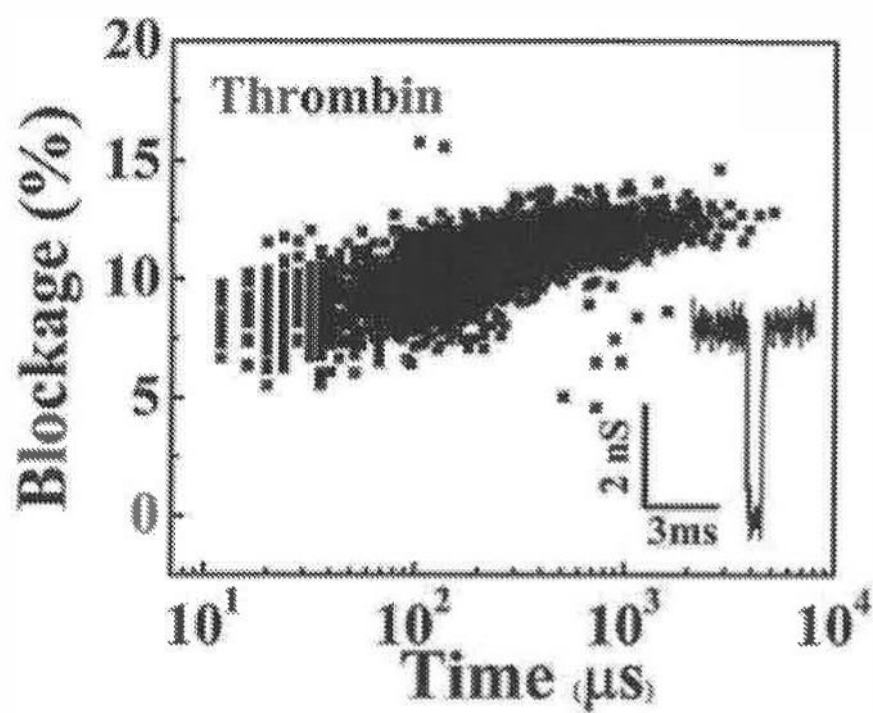
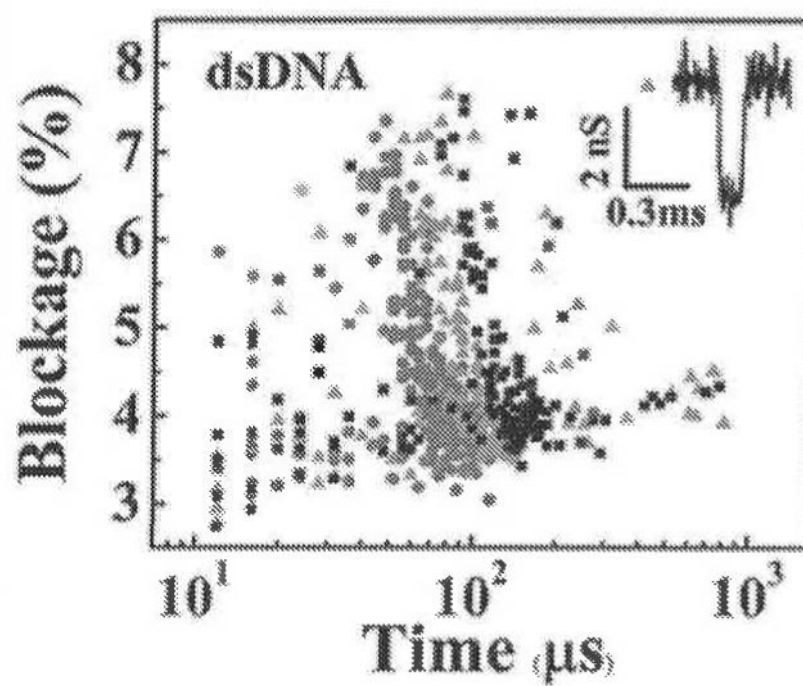
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FIG. 7AFIG. 7B

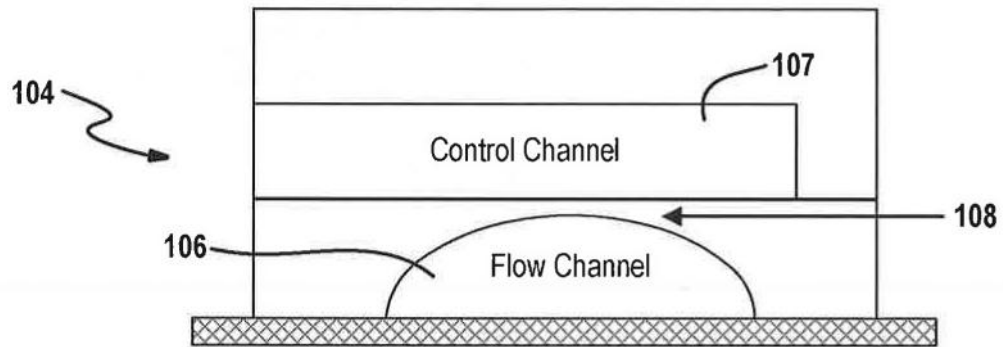
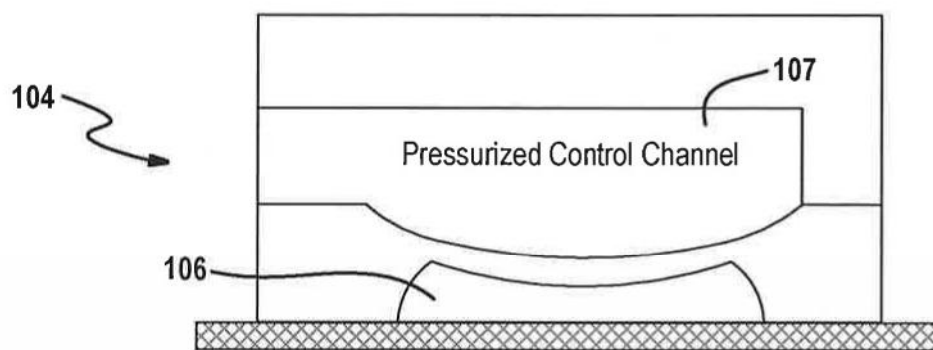
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**FIG. 8A****FIG. 8B**

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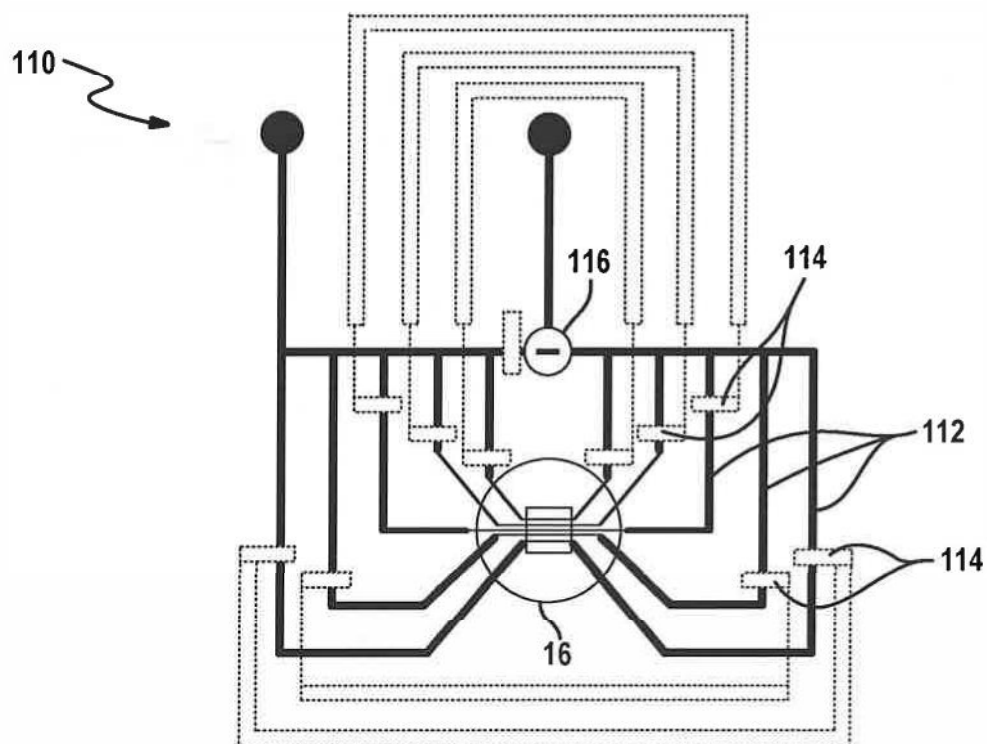
FIG. 9AFIG. 9B

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**FIG. 10A****FIG. 10B**

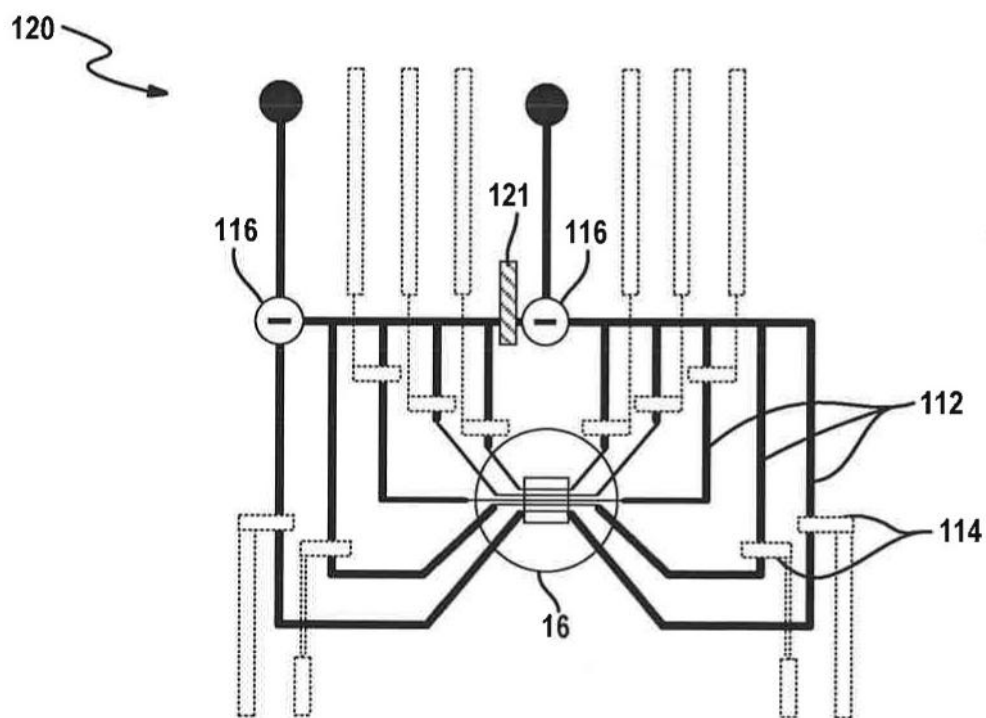
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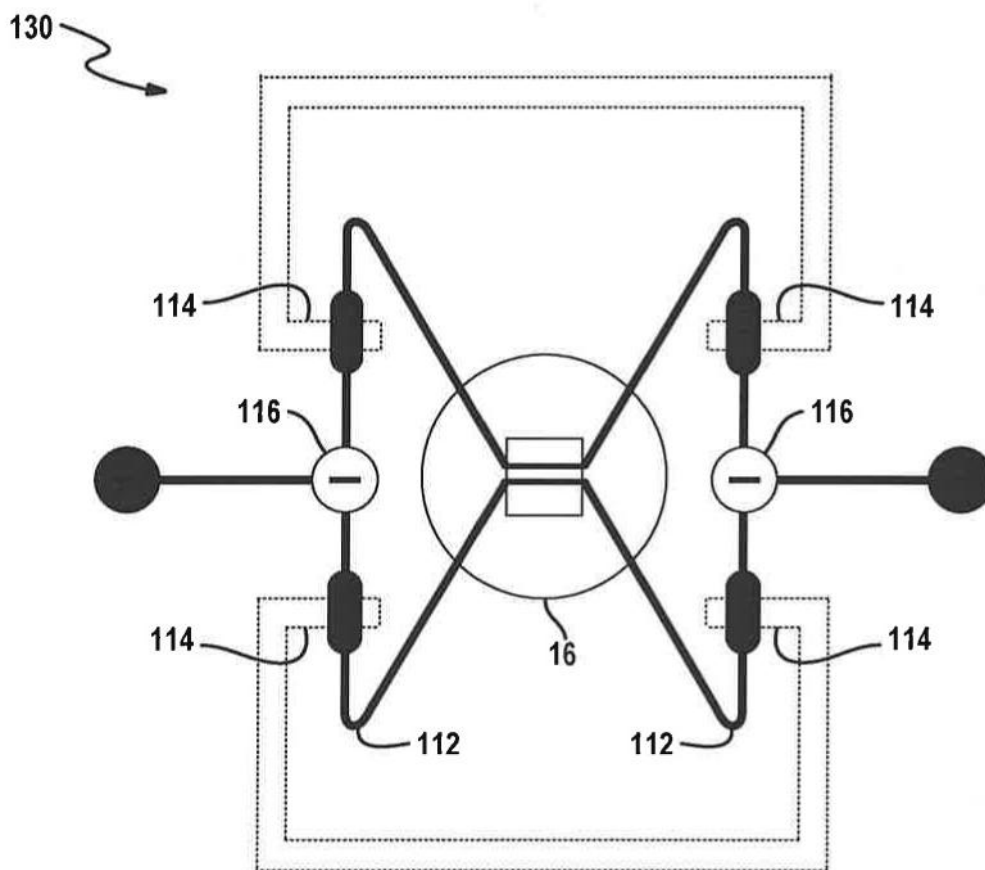
- Inlet And Outlet Ports
- ⊖ One Electrodes Feeding The Whole Top Channels
- Microfluidic Channels
- - - Pneumatic Valves
- ⊠ Silicon Nitride Membrane Window

**FIG. 11**

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- Inlet And Outlet Ports
- ⊖ One Electrodes Feeding The Whole Top Channels
- Microfluidic Channels
- ⋯ Pneumatic Valves
- ▨ Routing Valve
- ⊠ Silicon Nitride Membrane Window

**FIG. 12**

**FIG. 13**