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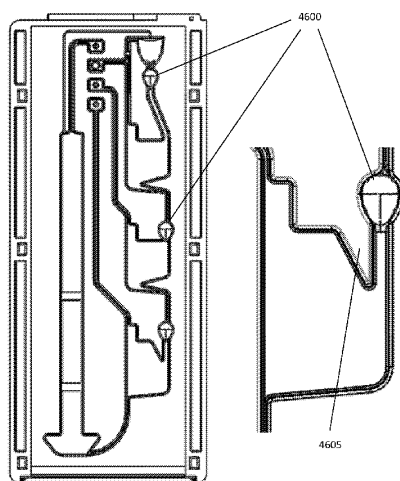


FIG. 46A

FIG. 46B

(57) Abstract: A disposable cassette for detecting nucleic acids or performing other assays. The cassette can be inserted into a base station during use. The cassette has numerous features to ensure correct operation of the device under gravity, such as vent pockets for enabling the flow of sample fluid from one chamber to the next when the vent pocket is unsealed. The vent pockets have protrusions to help prevent accidental resealing. The cassette also can have a gasket to ensure free air movement between open vent pockets. A flexible circuit with patterned metallic electrical components disposed on a heat stable material can be in direct contact with fluid in the chambers and has resistive heating elements aligned with the vent pockets and the chambers. Recesses in the cassette channels or chambers can have structures such as ridges or grooves to direct fluid flow to enhance rehydration of lyophilized reagents disposed in the recess. Flow diverters in the chambers can reduce the flow velocity of the sample fluid and increase the effective fluid flow path length, enabling more accurate control of fluid flow in the cassette. The roof of each chamber can have a projection that prevents capillary fluid flow across the top of the chamber, thus reducing or preventing sequestration of newly resuspended reagent from the bulk of the reaction solution volume.

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