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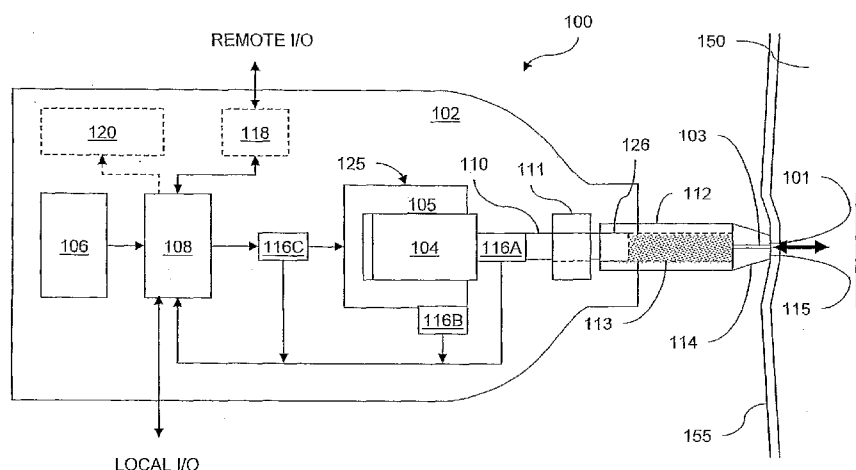
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(54) Title: NEEDLE-FREE TRANSDERMAL TRANSPORT DEVICE



(57) Abstract: A needle-free transdermal transport device (100) for transferring a substance across a surface (155) of a biological body (150) includes a reservoir (113) for storing the substance, a nozzle (114) in fluid communication with the reservoir and a controllable electromagnetic actuator (125) in communication with the reservoir. The actuator, referred to as a Lorentz force actuator, includes a stationary magnet assembly (105) and a moving coil assembly (104). The coil assembly moves a piston (126) having an end portion positioned within the reservoir. The actuator receives an electrical input and generates in response a corresponding force acting on the piston and causing a needle-free transfer of the substance between the reservoir and the biological body. The magnitude, direction and duration of the force are dynamically controlled (e.g., servo-controlled) by the electrical input and can be altered during the course of an actuation cycle. Beneficially, the actuator can be moved in different directions according to the electrical input.

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