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(54) Title: METHODS AND SYSTEMS FOR MECHANOPORATION-BASED PAYLOAD DELIVERY INTO BIOLOGICAL CELLS

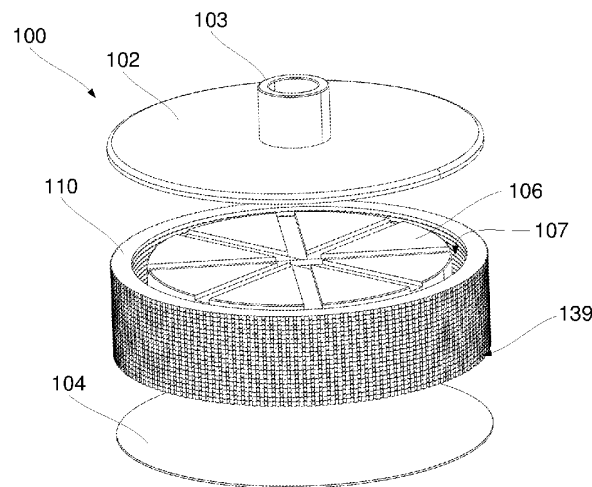


FIG. 1B

(57) Abstract: Described herein are methods and systems for mechanoporation-based high-throughput payload delivery into biological cells. For example, one system can process at least 1 billion cells per minute or at least 25 billion cells per minute, which is substantially greater than conventional methods. A cell processing apparatus comprises a processing assembly formed by stacking multiple processing components. Each processing component comprises channels, which may be used for filtration, mechanoporation, and/or separation of cells in the cell media. This functionality depends on the configuration of each channel. For example, each channel comprises one or more ridges such that each ridge forms a processing gap with an adjacent one of the processing components. The ridges may extend to the side walls or form a bypass gap with the wall. The processing gaps can be specially configured to compress cells as the cells pass through these gaps thereby initiating the mechanoporation process.

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