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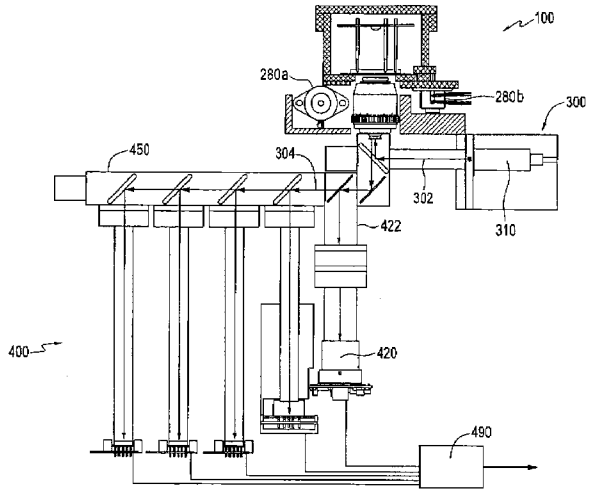
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[Continued on next page]

(54) Title: MICROFLUIDIC SYSTEM AND METHOD TO TEST FOR TARGET MOLECULES IN A BIOLOGICAL SAMPLE



(57) Abstract: A system and method to test for the presence of target molecules in a biological test sample includes test molecules, a microfluidic chip, and irradiating and detection devices. The test molecules include bio-recognition molecules conjugable with the target molecules, and the corresponding conjugates. The microfluidic chip includes sample channels and flow focusing channels adjoining the sample channels. A buffer exiting from the focusing channels directs a single-file stream of the test molecules through one of the sample channels. The irradiating device delivers radiation for absorption by the test molecules in the single-file stream. After absorption, the test molecules emit fluorescence of a distinct fluorescent spectrum for each of the conjugates. The detection device monitors identifies the presence of the conjugates by monitoring for the distinct fluorescent spectrum. Thus, the test system and method identifies the presence of the target molecules in the test sample.

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