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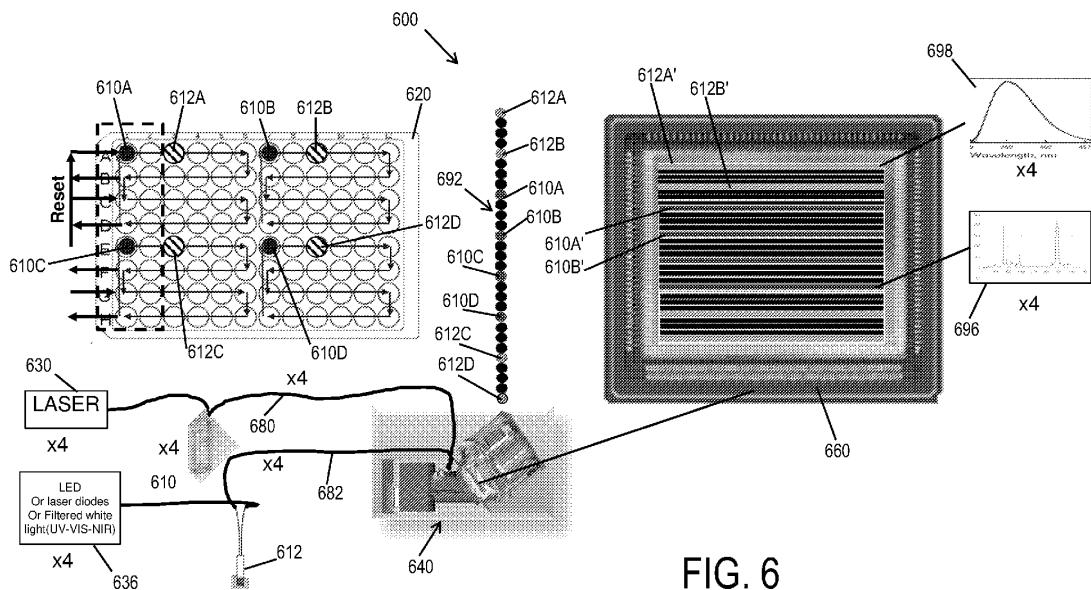
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(54) Title: MULTI-TRACK RAMAN WELL PLATE READER



(57) Abstract: A microplate reader simultaneously obtains Raman measurements from liquid samples contained in non-adjacent wells in a well plate (620). At least two Raman probes (610A, 610B, 610C, 610D) are positioned perpendicularly above or below the microplate (620) to simultaneously acquire Raman spectra data (696) of the non-adjacent liquid samples. Each probe (610A, 610B, 610C, 610D) is coupled to a laser (630) and a spectrometer (640) and includes a lens focusing laser light within the sample and collecting light from the sample for the spectrometer (640). The spectrometer (640) may include a 2D imaging sensor (660), e.g. a sCMOS or a CCD sensor, to image light from multiple probes (610A, 610B, 610C, 610D) simultaneously, spaced from one another to reduce crosstalk. A positioner moves the microplate (620) or probes (610A, 610B, 610C, 610D) to acquire data from a different subset of non-adjacent samples, and may also vary laser focus within wells during data acquisition. Multiple fluorescence probes (612A, 612B, 612C,

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612D) may simultaneously acquire fluorescence data (698) from the same samples, or non-adjacent samples. Raman and fluorescence probes (610A, 610B, 610C, 610D, 612A, 612B, 612C, 612D) may be fiber-coupled and positioned within a reaction chamber of a liquid handling system.