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(54) Title: **BALANCED PHOTONIC ARCHITECTURES FOR MATRIX COMPUTATIONS**

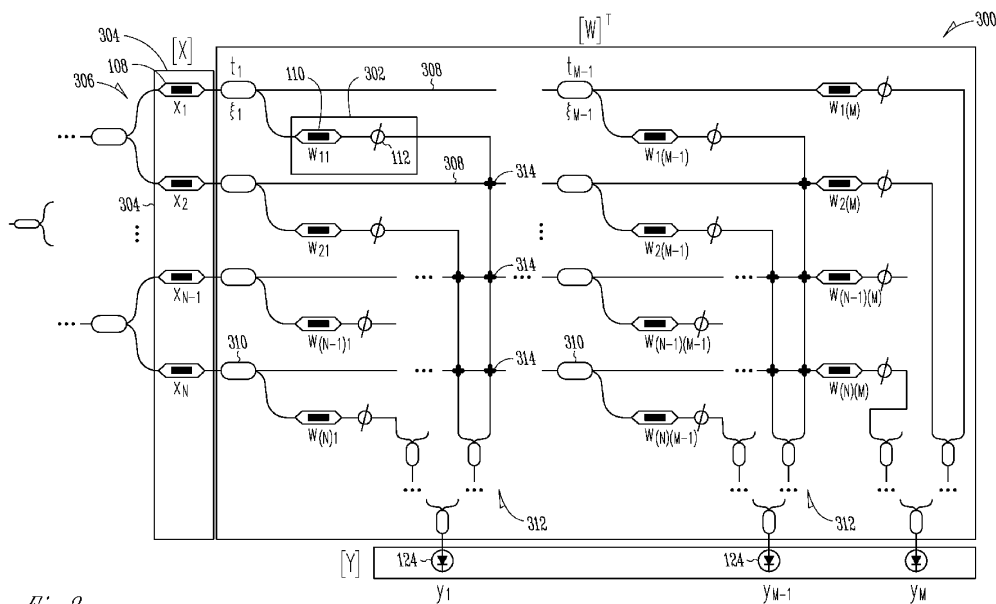


Fig. 3

(57) **Abstract:** Vector and matrix multiplications can be accomplished in photonic circuitry by coherently combining light that has been optically modulated, in amplitude and/or phase, in accordance with the vector and matrix components. Disclosed are various beneficial photonic circuit layouts characterized by loss- and delay-balanced optical paths. In various embodiments, loss balancing across paths is achieved with suitable optical coupling ratios and balanced numbers of waveguide crossings (using dummy crossings where needed) across the paths. Delays are balanced in some embodiments with geometrically delay-matched optical paths.

[Continued on next page]

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