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(57) Abstract: Methods and systems for designing large sets of barcodes that ensure robust and efficient error correction capabilities are described. Also described are methods for assigning barcodes to target analytes that minimize optical crowding in *in situ* detection applications. Furthermore, methods for performing barcode error correction and for performing barcode-assisted image registration and alignment are also described.

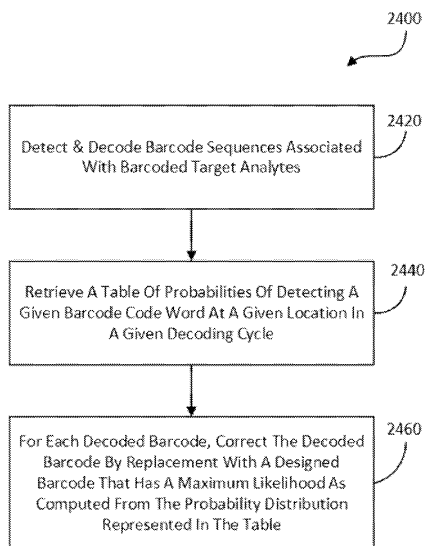


FIG. 24

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