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(54) **QUANTUM CONVEYOR AND METHODS OF  
PRODUCING A QUANTUM CONVEYOR**

(57) **ABSTRACT**

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A method of producing a quantum conveyor includes: forming a pair of screening gate electrodes in or on a semiconductor substrate and that extend between a first stationary quantum dot and a second stationary quantum dot, the pair of screening gate electrodes configured to delimit a channel of moveable quantum dots between the first stationary quantum dot and the second stationary quantum dot; forming, via a lithography process, a plurality of first planar transfer electrodes above the semiconductor substrate and that extend transverse to the channel of moveable quantum dots; and forming, via a self-aligned damascene process, a plurality of second planar transfer electrodes laterally interleaved with the first planar transfer electrodes, wherein the first planar transfer electrodes and the second planar transfer electrodes are configured to transfer quantum information between the first stationary quantum dot and the second stationary quantum dot through the channel of moveable quantum dots.

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