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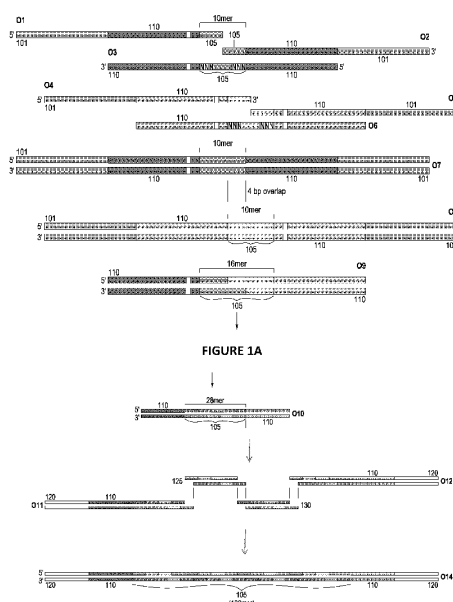


FIGURE 1B

(57) Abstract: The invention provides methods for synthesizing a product DNA molecule of any possible DNA sequence from a universal library of overlapping oligonucleotides. The method involves combining a plurality of the overlapping oligonucleotides in a reaction pool, where the sequences of the plurality of oligonucleotides comprise at least a sub-sequence of the product DNA molecule. The method also involves annealing the plurality of oligonucleotides, performing a ligation step, and performing an amplification step to thereby synthesize a sub-sequence of the product DNA molecule. The invention can be used to synthesize a DNA molecule of any possible sequence from the universal library, which can be accomplished through a hierarchical assembly scheme. In one embodiment the universal library comprises fewer than 10,000 pre-manufactured oligonucleotides that can be synthesized into the any possible DNA sequence. In any embodiment the product DNA molecule has an error rate of less than 1 error per 2,000 nucleotides.

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