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(54) **Title:** METHOD AND APPARATUS FOR CYCLE SKIP AVOIDANCE IN FULL WAVEFORM INVERSION

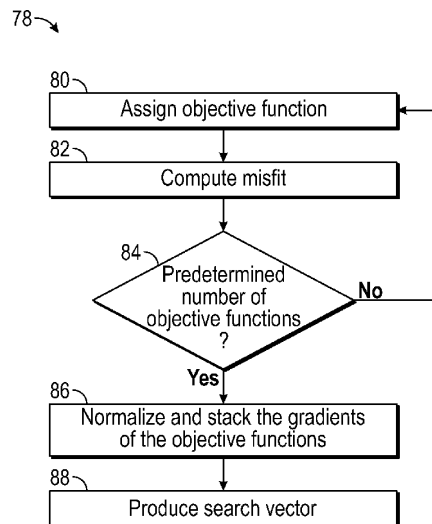


FIG. 5

(57) **Abstract:** Techniques to avoid a cycle skip in conjunction with a full waveform inversion are disclosed herein. A method includes selecting a first objective function of a full waveform inversion (FWI) from a set of objective functions, selecting a second objective function of the FWI from the set of objective functions, calculating a first misfit based upon the first objective function using modeled data with respect to observed data, calculating a first search direction based upon the first misfit between the modeled data and the observed data, calculating a second misfit based upon the second objective function using the modeled data with respect to the observed data, calculating a second search direction based upon the second misfit between the modeled data and the observed data, combining the first search direction with the second direction and computing an update to the modeled data based upon the first search direction and the second search direction combination.

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