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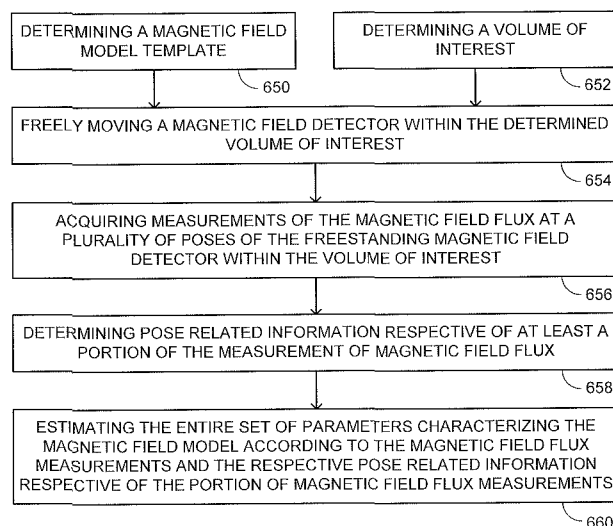


FIG. 10A

(57) Abstract: System for mapping a magnetic-field including a magnetic-field-transmitter, a freestanding magnetic-field-detector operative to freely move within a volume of interest and acquire measurements of the flux of the magnetic-field at a plurality of poses, a pose-information-acquisition-module for measuring information related to the pose of the magnetic-field-detector and a processor, coupled with the magnetic-field-detector and with said pose-information-acquisition-module and determines pose-related-information respective of each of at least a portion of the magnetic-flux-measurements, according to said information related to the pose of said magnetic-field-detector, the processor further estimating the entire set of parameters of a magnetic-field-model-template according to the magnetic-flux-measurements and the respective pose-related-information the magnetic flux measurements, the processor incorporates the entire set of parameters into said magnetic field model template, thereby determining said magnetic field model, the entire set of parameters includes the coefficients, the order, the number and location of the centers of expansion of the model.