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(54) **BROADBAND TRANSFER FUNCTION SYNTHESIS USING ORTHONORMAL RATIONAL BASES**

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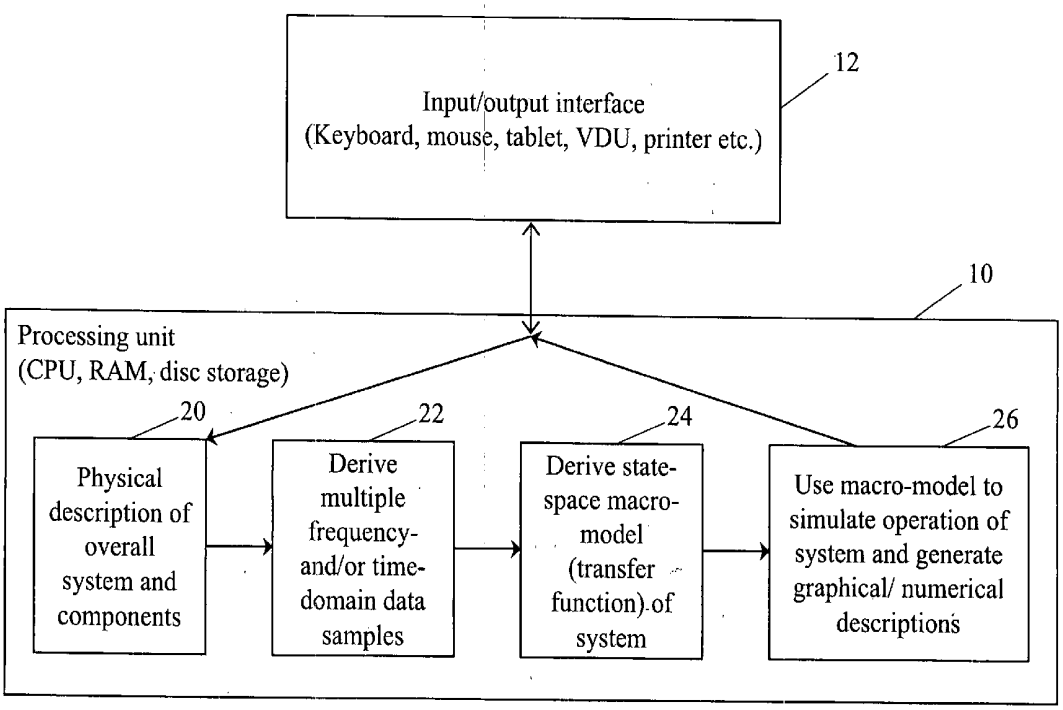
(57) **ABSTRACT**

In order to generate a broadband transfer function of complex characteristics of a linear time-invariant (LTI) system, data characterising properties of the system are acquired. A set of poles in the complex plane are defined to characterise the system, and then an iterative process is performed to: define a set of orthonormal rational basis functions incorporating the defined poles, use the orthonormal rational basis functions to estimate transfer function coefficients, and derive revised values for the complex poles, until a desired level of accuracy of the transfer function coefficients is attained. The revised complex poles are used to determine parameters of the broadband transfer function.