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(54) Title: A HYBRID SERS SUBSTRATE AND METHOD OF FORMING THE SAME

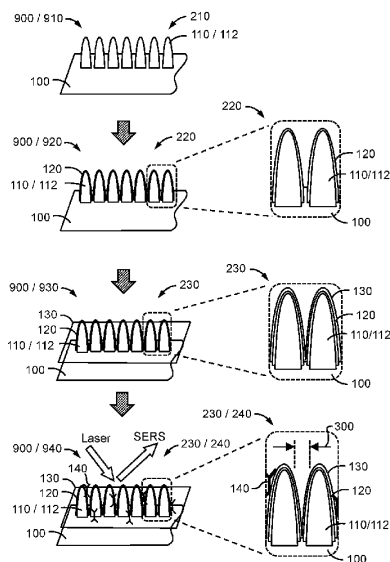


FIG. 1

(57) Abstract: A SERS substrate includes: a base, an array of nanostructures formed on the base, a first coating disposed on the array of nanostructures, and a second coating disposed on the first coating. The first coating includes a thin film formed of a noble metal. The second coating includes a metallic/semimetallic two-dimensional material. The metallic/semimetallic two-dimensional material may include one or more transition metal dichalcogenides. A method of making a SERS substrate include: plasma etching a base to form an array of nanostructures on the base; forming a first coating on the array of nanostructures, the first coating being a thin film formed of a noble metal; and forming a second coating on the first coating. The method may further include: forming a plurality of two-dimensional flakes using electrochemical exfoliation; and depositing the plurality of two-dimensional flakes after the first coating is formed.

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