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(54) **Title:** PERFORATING TWO-DIMENSIONAL MATERIALS USING BROAD ION FIELD

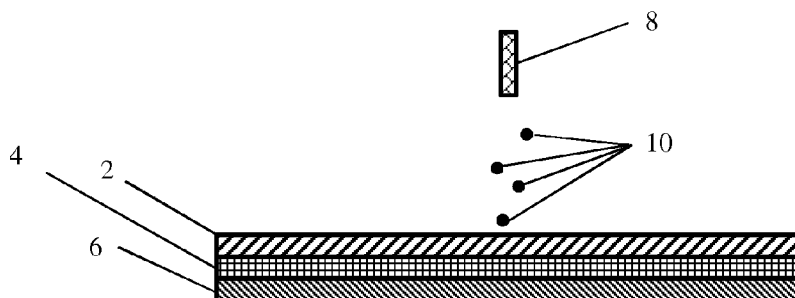


FIGURE 2

(57) **Abstract:** Perforating graphene and other two-dimensional materials with holes inclusively having a desired size range, a narrow size distribution, and a high hole density can be difficult to achieve. A layer in continuous contact with graphene, graphene-based materials and other two-dimensional materials can help promote hole formation. Processes for perforating a two-dimensional material can include exposing to an ion source a two-dimensional material in continuous contact with at least one layer, and interacting a plurality of ions from the ion source with the two-dimensional material and with the at least one layer. The ion source may be a broad ion beam.