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[Continued on next page]

- (54) **Title:** PROCESSES FOR FORMING COMPOSITE STRUCTURES WITH A TWO-DIMENSIONAL MATERIAL USING A
POROUS, NON-SACRIFICIAL SUPPORTING LAYER

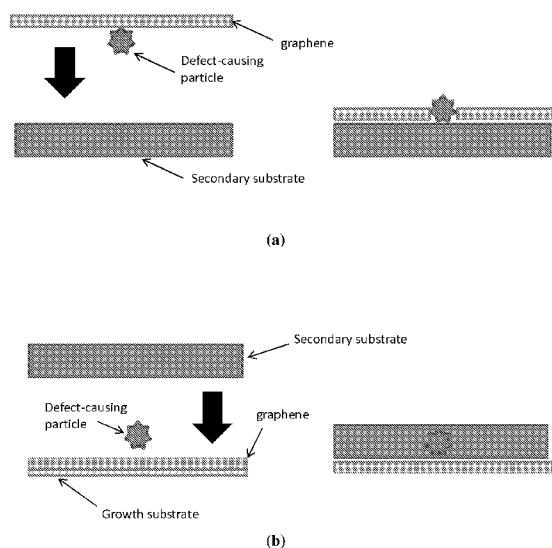


FIGURE 7

- (57) **Abstract:** It can be difficult to remove atomically thin films, such as graphene, graphene-based material and other two-dimensional materials, from a growth substrate and then to transfer the thin films to a secondary substrate. Tearing and conformality issues can arise during the removal and transfer processes. Processes for forming a composite structure by manipulating a two-dimensional material, such as graphene or graphene-base material, can include: providing a two-dimensional material adhered to a growth substrate; depositing a supporting layer on the two-dimensional material while the two-dimensional material is adhered to the growth substrate; and releasing the two-dimensional material from the growth substrate, the two-dimensional material remaining in contact with the supporting layer following release of the two-dimensional material from the growth substrate.



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