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(54) **Title**: MICRONEEDLE DEVICES AND METHODS

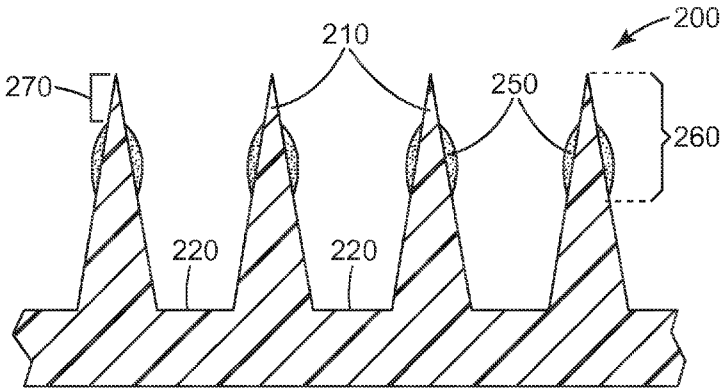


Fig. 3

(57) **Abstract**: A medical device, comprising: an array of microneedles, and a coating disposed on the microneedles, wherein the coating comprises: a local anesthetic selected from the group consisting of lidocaine, prilocaine, and a combination thereof; and a local anesthetic dose-extending component selected from the group consisting of alpha 1 adrenergic agonists, alpha 2 adrenergic agonists, and a combination thereof; wherein the local anesthetic is present in an amount of at least 1 wt-% based upon total weight of solids in the coating, and wherein the dose-extending component/local anesthetic weight ratio is at least 0.0001; a medical device, comprising an array of dissolvable microneedles, the microneedles comprising: a dissolvable matrix material; at least 1 wt-% of a local anesthetic selected from the group consisting of lidocaine, prilocaine, and a combination thereof; and a local anesthetic dose-extending component selected from the group consisting of alpha 1 adrenergic agonists, alpha 2 adrenergic agonists, and a combination thereof; wherein the dose-extending component/local anesthetic weight ratio is at least 0.0001, and wherein wt-% is based upon total weight of solids in all portions of the dissolvable microneedles which contain the local anesthetic; a method of extending a topically delivered local anesthetic dose in mammalian tissue using the devices; and methods of making the devices are provided.

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