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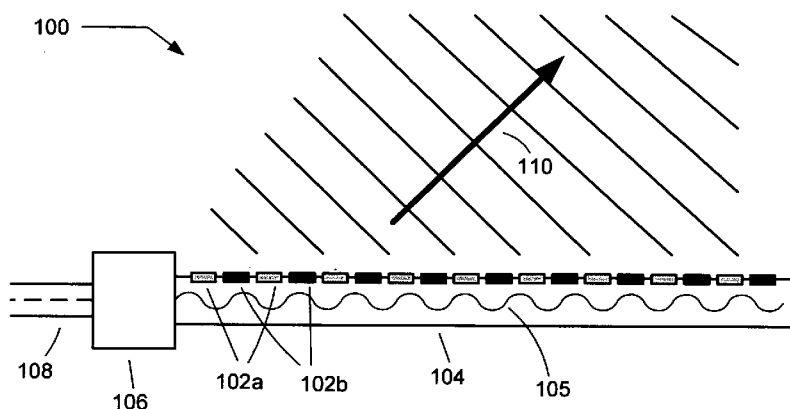
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FIG. 1



(57) Abstract: Surface scattering antennas provide adjustable radiation fields by adjustably coupling scattering elements along a wave-propagating structure. In some approaches, the scattering elements are complementary metamaterial elements. In some approaches, the scattering elements are made adjustable by disposing an electrically adjustable material, such as a liquid crystal, in proximity to the scattering elements. Methods and systems provide control and adjustment of surface scattering antennas for various applications.

