



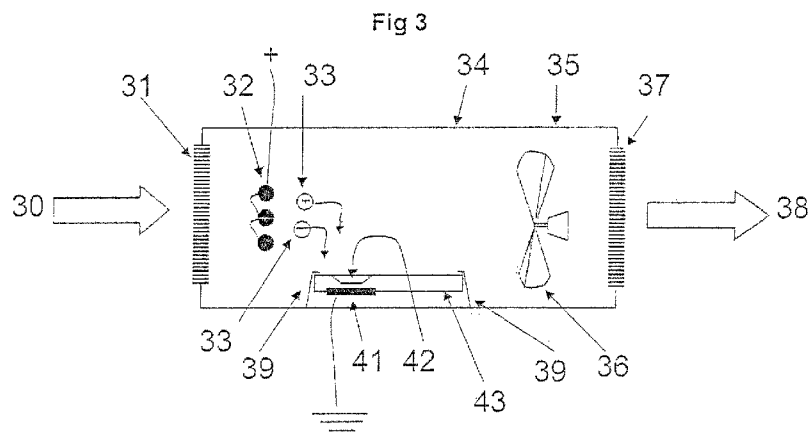
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(54) **Title:** ELECTROKINETIC DEVICE FOR CAPTURING ASSAYABLE AGENTS IN A DIELECTRIC FLUID

(57) **Abstract:** Electrokinetic devices and methods are described with the purpose of collecting assayable agents from a dielectric fluid medium. Electrokinetic flow may be induced by the use of plasma generation at high voltage electrodes and consequent transport of charged particles in an electric voltage gradient. In one embodiment, the agents are directed electrokinetically to the sample collection assay device with no intermediate transfer steps. The agents are directed by creation of an electrokinetic potential well, which will effect their capture on to an assay device. Environmental agents such as biowarfare agents, pathogens, allergens or pollutants are collected autonomously on to the assay device, without any human intervention. The dielectric fluid medium, such as air, is sampled by electrokinetic propulsion with no moving parts or optionally, by transporting the dielectric fluid by a fan, pump or by breath. A further embodiment for collection of pathogen samples entails breathing into a tube where the sample is exposed to an electric plasma in the neighborhood of a high voltage electrode or electrodes, further transported by the breath through a potential well created at a sample collection device, where charge particles are electroprecipitated. The dielectric fluid medium may further include non-conductive liquids, such as oils. Oils may be sampled for the presence of contaminants, contaminating organisms or biodegrading organisms.