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Methods and Apparatus for Delivering Aerosolized Medication

Abstract of the Disclosure

A metered dose inhaler (10) for use with a pressurized aerosol canister (18) includes a housing (12) defining a conduit (16) with a mouthpiece (56), and an actuator (26) with a nozzle discharge orifice (30) arranged to discharge aerosol into the conduit. An air tube (34) is arranged within the conduit with an inlet (38) of the air tube formed in the conduit wall (74) and an outlet (36) of the air tube in opposing relationship with the nozzle orifice. Inhalation through the mouthpiece causes air to be drawn into the inlet and flow out of the outlet of the air tube to form an air jet which impinges on an oppositely moving aerosol plume from the orifice. Auxiliary air inlets (46) in the closed end (24) of the conduit provide a boundary layer flow along the inner wall (44) of the conduit. Vortex generators (54) on the inner wall of the conduit add vorticity and turbulence to the boundary layer flow. Automatic actuation of the canister responsive to the patient's inhalation is achieved by a canister trigger (154) connected to a movable piston assembly (132) forming a wall of a variable-volume chamber (162) in fluid communication with a venturi (184) in the air tube. Air drawn through the venturi by the user's breath causes evacuation of air from the chamber, thereby moving the piston assembly and trigger to cause actuation of the canister.