manufacture. Some of the persistent problems observed with prior art inhalers, include lack of ruggedness of device, propellants use to deliver the powder, consistency in dosing, inconvenience of the equipment, poor deagglomeration, and/or lack of patient compliance. Therefore, the inventors have identified the need to design and manufacture an inhaler with consistent powder delivery properties, easy to use without discomfort, and discrete inhaler configurations which would allow for better patient compliance.

SUMMARY

[0007a] According to an aspect of the present invention, there is provided a dry powder medicament cartridge for an inhaler, comprising: a) a cartridge top and b) a cartridge bottom defining an internal volume; wherein the cartridge top and the cartridge bottom are moveable relative to one another by a translational motion; and wherein the cartridge top has an undersurface that extends over the cartridge bottom; said undersurface configured to engage said cartridge bottom, and having an area to seal the internal volume and an area to expose the internal volume to ambient air.

[0008] The present disclosure is directed to dry powder inhalers, cartridges for dry powder inhalers and a system for rapid drug delivery to the pulmonary tract, including dry powders comprising active agents for the treatment of disease, including diabetes and obesity. The dry powder inhaler can be breath-powered, compact, reusable or disposable, has various shapes and sizes, and comprises a system of airflow conduit pathways for the effective and rapid delivery of powder medicament. In one embodiment, the inhaler can be a unit dose, reusable or disposable inhaler that can be used with or without a cartridge. By use without a cartridge we refer to systems in which cartridge-like structures are integral to the inhaler, as opposed systems in which a cartridge is installed for use by, for example, the user. In another embodiment, the inhaler can be a multidose inhaler, disposable or reusable that can be used with single unit dose cartridges installed in the inhaler or cartridge-like structures built-in or structurally configured as part of the inhaler.

[0009] The dry powder inhalation system comprises a dry powder inhalation device or inhaler with or without a cartridge, and a pharmaceutical formulation comprising an active ingredient for pulmonary delivery. In some embodiments delivery is to the deep lung (that is, to the alveolar region) and in some of these embodiments the active agents is absorbed into the pulmonary circulation for systemic delivery. The system can also comprise a dry powder inhaler with or without a unit dose cartridge, and a drug delivery formulation comprising, for example, diketopiperazine and an active ingredient such as peptides and proteins, including insulin and glucagon-like peptide 1.

[0010] In one embodiment, the dry powder inhaler comprises a housing, a moveable member, and a mouthpiece, wherein the moveable member is operably