of the latter.

According to a first aspect, the present disclosure refers to an inhaler for powdered medicaments consisting of a substantially smoking pipe-shaped hollow body that has a first portion, for housing a cartridge of powdered medicament and including a support base for said cartridge, and a second portion connected substantially perpendicularly to said first portion for delivering the medicament by means of a primary airstream that carries the powder from an inner drop region, located at the bottom of said first portion, along a delivery duct whose end is suitable to be placed in a patient's mouth, said delivery duct being divided horizontally by a dividing baffle into an upper duct that delivers said primary airstream and a lower duct that delivers a powderless secondary airstream, the intake of the air forming the primary airstream being achieved through at least three air intakes formed in the first portion that are preferably arranged symmetrically with respect to the longitudinal midplane of the inhaler, the intake of the air forming the secondary airstream being achieved through an air intake formed at the distal end of said lower duct, the inhaler being characterized in that said support base for the cartridge includes a plurality of horizontal support surfaces projecting inside the first portion, oriented flow channels being formed in the support base which extend between said at least three air intakes and the inner powder drop region.

A first important advantage of the present inhaler is given by the presence of the oriented flow channels that during inhalation by the patient, even in low suction conditions, help the formation of vortices which intersect in the drop region of the medicinal powder originating a turbulence that would result in a very high velocity of flow which promotes the dispersion of the inhalable drug particles, thus increasing the inhalability rate of the drug.

A second significant advantage of this inhaler consists in the easy mounting of the auto-perforation cartridge and in the great stability of the latter guaranteed by the support base, so that the cartridge may be pre-mounted on the inhaler at the factory whereby even patients with difficulties in handling and opening the cartridge do not risk to spread the medicinal powder outside the designated drop region.

Still another advantage of said inhaler derives from the fact that the shortened

dividing baffle of the delivery duct ensures that the secondary airstream is always delivered because it will start its work of supporting the primary airstream even before arriving at the end of the delivery duct placed in the patient's mouth. Moreover, the multiple zones of air entrance to the lower duct ensure a secondary airstream with an adequate flow rate and a minimum resistance for a smooth sliding of the air inside the lower duct.

Yet another advantage of this inhaler resides in the greater safety and ease of use guaranteed by the external flange of the delivery duct that defines a precise depth of introduction of the inhaler in the patient’s mouth, so as to achieve an optimal drug delivery and to prevent the risk of ingestion.

According to a second aspect, the present disclosure refers to a disposable monodose device for the inhalation of powdered medicaments, characterized in that it includes an inhaler according to the first aspect and an auto-perforation cartridge of powdered medicament blocked on the support base of said inhaler, said cartridge having a longitudinally symmetrical plan shape substantially corresponding to the shape of said support base and a region designed to receive a patient's finger pressure to open the cartridge, said region being centered on the plane of longitudinal symmetry of the cartridge.

Further advantages and characteristics of the inhaler according to the present invention will be clear to those skilled in the art from the following detailed description of an embodiment thereof, with reference to the annexed drawings wherein:

Fig.1 is a top perspective view of the inhaler seen from its distal end;

Fig.2 is a bottom perspective view of the inhaler seen from its distal end;

Fig.3 is a front perspective view of the inhaler seen from its proximal end;

Fig.4 is a top plan view of the inhaler;

Fig.5 is a view similar to the preceding one with the cartridge mounted on the

CLAIMS

1. Inhaler for powdered medicaments consisting of a substantially smoking pipe-shaped hollow body that has a first portion, for housing a cartridge of powdered medicament and including a support base for said cartridge, and a second portion connected substantially perpendicularly to said first portion for delivering the medicament by means of a primary airstream that carries the powder from an inner drop region, located at the bottom of said first portion, along a delivery duct whose end is suitable to be placed in a patient's mouth, said delivery duct being divided horizontally by a dividing baffle into an upper duct that delivers said primary airstream and a lower duct that delivers a powderless secondary airstream, the intake of the air forming the primary airstream being achieved through at least three air intakes formed in the first portion that are preferably arranged symmetrically with respect to the longitudinal midplane of the inhaler, the intake of the air forming the secondary airstream being achieved through an air intake formed at the distal end of said lower duct, the inhaler being characterized in that said support base for the cartridge includes a plurality of horizontal support surfaces projecting inside the first portion, oriented flow channels being formed in the support base which extend between said at least three air intakes and the inner powder drop region.

2. Inhaler according to claim 1, characterized in that the longitudinal axes of the channels that extend from lateral air intakes form an angle of 55°±20% with the midplane.

3. Inhaler according to any of the preceding claims, characterized in that the horizontal support surfaces projecting inside the first portion are formed on a plane corresponding to the top of the upper duct such that also a distal portion of the latter makes part of the support base.

4. Inhaler according to any of the preceding claims, characterized in that the connection between the inner powder drop region and the upper duct is achieved through a grid.

5. Inhaler according to the preceding claim, characterized in that it further includes three vertical baffles that extend along the full height of the grid and divide it

into four air entrance zones, said vertical baffles being preferably arranged such that said entrance zones have the same width.

6. Inhaler according to any of the preceding claims, characterized in that the dividing baffle is shorter than the delivery duct, preferably by a distance comprised between 4 and 7 mm.

7. Inhaler according to any of the preceding claims, characterized in that the first portion includes a peripheral wall that extends above the support base and is provided with coupling means for blocking the cartridge on the inhaler.

8. Inhaler according to the preceding claim, characterized in that, in correspondence with each support surface, the peripheral wall has an elastic region of reduced thickness with a central triangular tooth projecting on the inside, said tooth being formed with an inclined surface that extends from the top of the wall towards the support base and with a horizontal bottom base so as to achieve a taper for the insertion from above of the cartridge and an undercut for the blocking thereof on the support base.

9. Inhaler according to any of the preceding claims, characterized in that the air intake of the lower duct is divided into a plurality of air entrance zones, preferably having the same width, by one or more elongated baffles, preferably not more than seven, that extend under the powder drop region.

10. Inhaler according to any of the preceding claims, characterized in that the minimum passage cross-section of the upper duct is 25,6 mm2±20%, the minimum passage cross-section of the lower duct is 14,3 mm2±20%, and the ratio between said sections may vary in the range from 1:1 to 9:1.

11. Inhaler according to any of the preceding claims, characterized in that the air intakes for the primary airstream are obtained in projecting portions, preferably of semi-circular shape, formed in the lower wall of the first portion below the support base.

12. Inhaler according to any of the preceding claims, characterized in that it further includes an external flange on the delivery duct, said external flange being sized to prevent the ingestion of the inhaler by the patient.

13. Inhaler according to the preceding claim, characterized in that it the external flange is made as an integral part of the inhaler or is a separate element that is mounted

on the inhaler through coupling means formed on the delivery duct.

14. Disposable monodose device for the inhalation of powdered medicaments, characterized in that it includes an inhaler according to any of claims 7 to 13 and an auto-perforation cartridge of powdered medicament blocked on the support base of said inhaler, said cartridge having a longitudinally symmetrical plan shape substantially corresponding to the shape of said support base and a region designed to receive a patient's finger pressure to open the cartridge, said region being centered on the plane of longitudinal symmetry of the cartridge.

15. Disposable monodose device according to claim 14, characterized in that the inhaler has three air intakes and the longitudinal axes of the channels converge in a point of the drop region substantially in correspondence with the position where is located the region of the cartridge on which the patient applies his finger pressure to open the cartridge.

16. Disposable monodose device according to claim 14, characterized in that the inhaler has more than three air intakes formed symmetrical with respect to the midplane and at such positions that the region of the cartridge on which the patient applies his finger pressure to open the cartridge is comprised between the intersections of the longitudinal axes of the channels.