

Title (en)  
NUTATING FLUID DELIVERY APPARATUS

Title (de)  
TAUMELNDE AUSTRAGVORRICHTUNG FÜR FLUIDE

Title (fr)  
DISPOSITIF OSCILLANT POUR LA DISTRIBUTION DE FLUIDE

Publication  
**EP 1104332 B1 20060125 (EN)**

Application  
**EP 99934049 A 19990714**

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- US 9915985 W 19990714
- US 11536298 A 19980714
- US 15048098 A 19980909
- US 10862798 P 19981116
- US 11235798 P 19981215
- US 14151199 P 19990628

Abstract (en)

[origin: WO0003810A2] The present invention provides an apparatus comprising: a body having a fluid inlet; a wobble turbine disposed downstream of the fluid inlet, the wobble turbine being configured to rotate when struck by a stream emitted from the fluid inlet; and a fluid redirecting means, such as a moving or stationary shroud or a chamber, disposed downstream of the wobble turbine to redirect the stream. While the wobble turbine may be placed downstream of the fluid inlet in various ways, it is preferred that the wobble turbine is disposed in an axially spaced relationship to the fluid inlet, such as by coupling the wobble turbine to the body in a loose, post and sleeve relationship. The preferred wobble turbine includes a convex conical upper surface with angular momentum inducing members formed therein/thereon, wherein the angular momentum inducing members are selected from grooves, vanes, blades and combinations thereof. The apparatus may further comprise a wobble limiting member, such as a stator ring, engaging the wobble turbine.

[origin: WO0003810A2] The present invention provides an apparatus comprising: a body having a fluid inlet (550); a wobble turbine (554) disposed downstream of the fluid inlet, the wobble turbine being configured to rotate when struck by a stream emitted from the fluid inlet; and a fluid redirecting means (567), such as a moving or stationary shroud or a chamber, disposed downstream of the wobble turbine to redirect the stream. While the wobble turbine may be placed downstream of the fluid inlet in various ways, it is preferred that the wobble turbine is disposed in an axially spaced relationship to the fluid inlet, such as by coupling the wobble turbine to the body in a loose, post and sleeve relationship. The preferred wobble turbine includes a convex conical upper surface (558), with angular momentum inducing members formed therein/thereon, wherein the angular momentum inducing members are selected from grooves, vanes, blades (560) and combinations thereof. The apparatus may further comprise a wobble limiting member, such as a stator ring, engaging the wobble turbine.

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