ABSTRACT

A novel mechanism for reducing boundary layer friction and inhibiting the effects of uncontrolled fluid turbulence and turbulent layer separation, thus reducing the body drag, kinetic energy losses and lowering engine and pump fuel consumption is proposed. It steps on the type of turbulence observed in the so-called in fluid dynamics "drag crisis". Plurality of device shapes and plurality of devices producing the wanted pure form of even plurality of counter-rotating vortices extending into the flow, i.e. tubes, are presented and discussed in detail, contrasting with the prior art. Configurations of multiple devices for the purposes of drag and fuel reduction, including their simulations and experimental results are put forward. Additional embodiments of the resulting tubes disclose use on aircraft or vessel control surfaces as stall inhibitors, use in wind turbines as dynamic range extenders, as well as use in turbines in efficient cooling mechanisms. Additional embodiments focus on properly scaling the devices for the achievement of maximum effect on various bodies ranging from marine and water transport, air and land transportation.

The most illustrative drawing is Fig. 1A