

ABSTRACT

The invention relates to the field of aviation, in particular to the design of unmanned aerial vehicles for vertical take-off and landing. The apparatus is a polyhedral (for example, rectangular) body, with the cylinders 1 installed along its perimeter and capable of rotating. To supply air to the inside of the apparatus, the body has inlets 2 leading to the intake area and the gas supply area located within the body, where the centrifugal impellers 3 are installed at the top and at the bottom to create a forced flow of gas. At the outlet from the gas intake and supply area, as well as along the perimeter, there are flow channels located at the top and at the bottom, which have the form of cells 4 that extend into tunnel 5, which narrows at the outlet just before cylinder 1. The top and bottom flow channels are independent and not connected to each other. All rotating parts of the structure (impellers 3 and cylinders 1) are driven by engines 6 (electric engines, internal combustion engines (ICE)). There can be multiple impellers 3 on each side, at the top and at the bottom. The torque is compensated by the impellers 3 (those at the top compensate those at the bottom). The apparatus operates as follows: The gas enters into the body through the inlets 2. When the impellers 3 rotate, this causes the intake and supply of gas. The forced ram air created by the rotation of the centrifugal impellers 3 (shown with arrows on Fig. 2) passes through the cells 4 of the flow channel, which allows to split one continuous flow into several smaller ones and makes the air supply evenly distributed along the entire length of cylinders 1. After the cells, the flows pass through the tunnel 5 where they become narrower and get to the rotating cylinders 1. The narrowing of the gas flows increases their velocity, but reduces their impact on the cylinder area 1. The forced ram air that flows to the rotating cylinders 1 produces the Magnus effect on each cylinder 1. The torque of the upper impeller 3 is compensated by the torque of the lower impeller. 3 figures.