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PROPULSION AND CONTROL PROPELLERS WITH THRUSTER NOZZLES PRIMARILY FOR AIRCRAFT APPLICATIONS

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16. Abstract The invention deals with a propulsion and control propeller with thruster nozzles, primarily for aircraft application. A Adjustability of rotor blades at the hub and pressurized gas expulsion combined with an air propeller increase power. The invention combines both characteristics in one simple device, and, furthermore, incorporates overall aircraft control so that mechanisms which govern lateral and horizontal movement become superfluous.

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PROPULSION AND CONTROL PROPELLERS WITH THRUSTER NOZZLES PRIMARILY FOR AIRCRAFT APPLICATIONS

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Patent Claims /1*

1. Propulsion and control propeller with thruster nozzle, primarily for aircraft whereby jet arms 2 branch out of a rotor hub 1 in which pressurized gas is stored. The jet arms are composed of S-shaped pipes, curved on at least two planes and fastened onto rotor hub 1 by their center axis C-D so that they turn.

2. Propulsion and control propeller of Claim 1 whereby one of two opposing jet arms 2 attached to rotor hub 1 is similarly curved but facing in the opposite direction.

3. Propulsion and control propeller of Claims 1 and 2 whereby the jet arms 2, aligned by rotor hub 1, uniformly taper inwardly and spread in a funnel shape at their jetstream ends 3.

4. Propulsion and control propeller of Claims 1 through 3 whereby jet arms 2 have fin-like flanges 4 along their axis. These flanges may be shaped to meet specifications.

5. Propulsion and control propeller of Claims 1 through 4 whereby jet arms 2 have small propellant holes 5 or slits along their axis.

6. Propulsion and control propeller of Claims 1 through 5 whereby an injection nozzle 9 for pressure-raising propellant is present in the intake area of the jet arms 2.

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*Numbers in the margin indicate pagination in the foreign text.

7. Propulsion and control propeller of Claims 1 through 6 whereby jet arm 2 is mounted on rotor hub 1 by round disk 7 securely attached angularly around the jet arm. This disk has hollowed out spaces which hold heat-curbing balls 8.

Propulsion and Control Propellers with Thruster Nozzles Primarily for Aircraft Applications /2

The invention deals with a propulsion and control propeller with thruster nozzles, primarily for aircraft application. It can, however, also be used for airboats and other watercraft.

It consists of a rotor hub in which pressurized gas is stored, jet arms which preferably taper and are constructed from S-shaped pipes which are curved on at least two planes and are attached to the rotor hub by their center axis so that they turn.

Rotor blades which turn on a hub are commonly used on helicopters, among other places. Adjusting them makes it easier to ascend to greater altitudes or to fly in certain directions. Rotor blades with thrust nozzles are also used today. They have slits running lengthwise in their trailing edge, with which propulsion can be controlled and headed in certain directions. Further, air propellers have been reported which have aerothermodynamic ducts on their blade ends in circumferential direction. There are also rotorcraft in which the rotor engines have additional arms extending from the hub and through which gas flows. They are fed by a jet selector device at the expense of the forward propulsion pipe.

Considered all together, the listed mechanisms make it clear that the adjustability of rotor blades at the hub and pressurized gas expulsion combined with an air propeller increase power.

It is the intention of this invention to combine both /3
characteristics in one simple device, and, furthermore, to incorporate overall aircraft control so that mechanisms which

govern lateral and horizontal movement become superfluous. The goal is a combined propulsion and control device which permits the aircraft to ascend vertically, both rapidly and smoothly, to stop momentarily in mid-air, to turn quickly while in that position, and to fly away from that position just as quickly. Today's helicopters are technically complicated and, for this reason, susceptible to breakdowns and expensive to maintain. As is well known, helicopters cannot attain the speed of jets; jets, on the other hand, lack maneuverability. Jets cannot start nor stop vertically.

The task at hand is completed by using a pressurized gas-feeding rotor hub designed, for example, as the head on the longitudinal axis of an aircraft. Instead of rotor blades, jet arms, formed by S-curved pipes, branch out from the rotor hub to which they are attached and around which they rotate. The jet arms are curved on at least two planes. This design adds turbine power, which increases according to settings, to the usual propeller power used on propeller aircraft today. Preferably, the jet arms taper uniformly from the rotor hub to their jetstream ends, where they widen again to a funnel.

The hot pressurized gas moves from the rotor hub, which is designed as a pressure chamber, pressure channel, or ring channel, and then through the wide-spaced pipe section. The invention has shown that it is possible to inject an evaporating propellant into the hot gas entering from the hub. This further increases the dynamic pressure and thrusts the stream through the uniformly tapering pipe to its narrowest point, and finally, at the moment of highest density, out of the funnel-shaped thruster nozzles.

Since the heat generated as the gases pressurize is /4
directed mainly into the whirling jet arms, a natural air cooling source is created. This air cools the combustion power generator.

Generally, aircraft are pulled by the propulsion or control propeller to maneuver abrupt turns in flight. When adjusted accordingly, the double curved jet arms propel forward with turbine action while they simultaneously push from behind, both in air and in water. This provides optimum forward motion. According to the invention, every directional movement can be further optimized because the two opposing jet arms are similarly curved but face in opposite directions. Thus, the turbine power works on different planes in rapid succession.

Control at the hub takes place by means of counter-rotating position changes of the opposing jet arms, whereby the thrust nozzles, which are secured to the ends of the jet arms, can be turned in cirumferentially upward or downward direction. Flight speed can also be regulated in this way without the need to throttle gas pressure. This permits savings on technical expenses, such as brake assemblies and rudders for pitching and yawing, simplifies the pilot's activities, and increases flight stability.

The jet arm is attached to the rotor hub, preferably by an angled ring disk connected securely to the jet arm. This disk has hollowed out-spaces which hold heat-curbing balls.

The inside of the rotor hub and the jet arms are made of fireproof, non-oxidizing material.

The invention is schematically represented in the drawings. /5

Figure 1 shows a propulsion and control propeller in resting position with hub 1 and two cross-sectionally round jet arms which taper in flight and spread in a funnel-shape at their jetstream ends 3. The jet arms are S-shaped pipes, and in their second curve they are similarly curved but face in opposite directions. The jet arms are fastened onto rotor hub 1, from whose axis A-B they branch out at an angle or even an obtuse angle, so that they turn in the direction of the arrows.

The right jet arm has, for example, a fin-like flange 4, which provides pipe reinforcement and possible flow influence. The left jet arm has small propellant holes 5. Both of these variations can be applied concurrently. The lines for the injection nozzle for pressure-raising propellant are labeled 10.

Figure 2 shows an example of a cross section through rotor hub 1 with its axis A-B upon which a cross cylinder with axis C-D rests. Both axes form T-shaped channel 6, through which pressurized gas is directed into the opposing jet arms 2.

Each jet arm 2 has a shield-like ring disk 7 on its jetstream end. This disk is headed toward the hub and has hollowed-out spaces which hold balls 8. These balls serve as supports and to curb heat.

Injection nozzles 9 for pressure-raising propellant are secured, in this example, in T-shaped channel 6 of the rotor hub.

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Fig.1

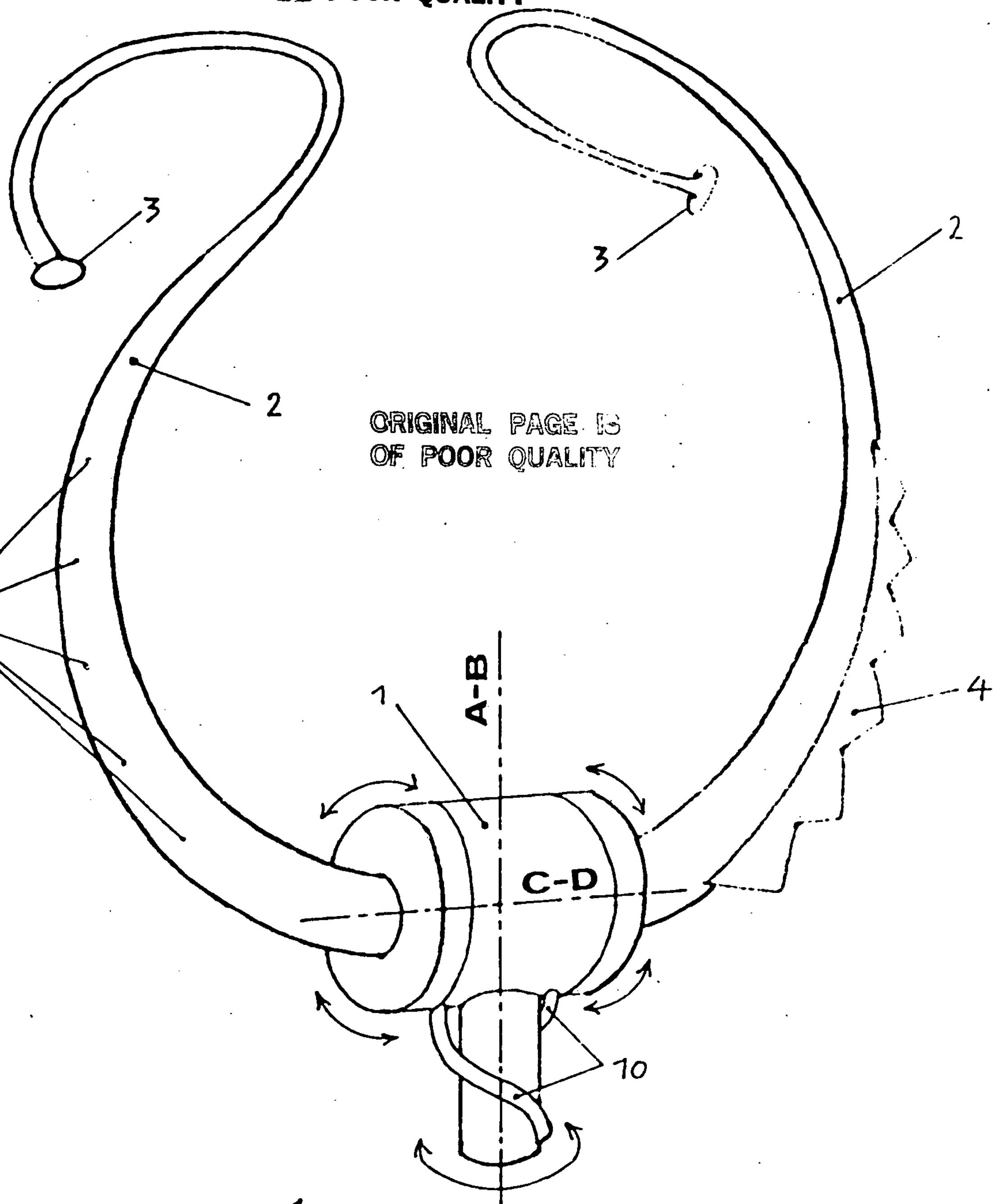

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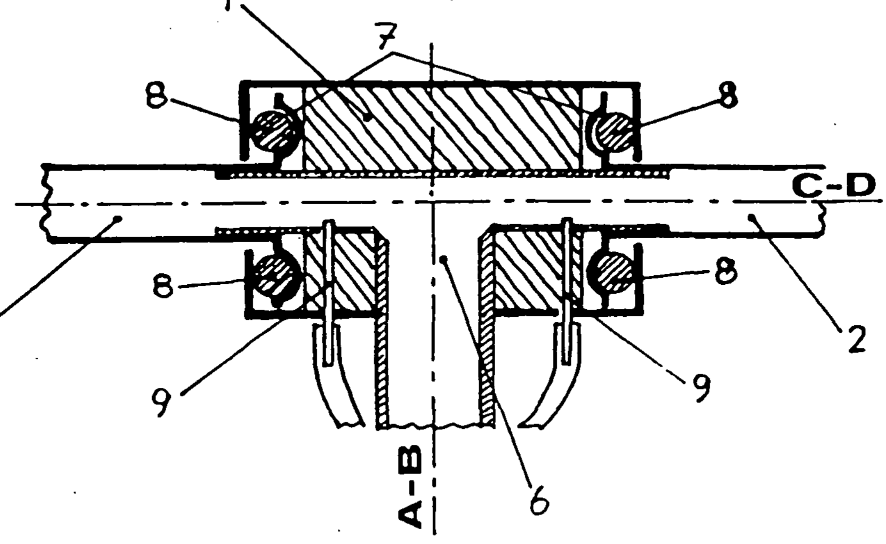
Fig.2



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