

Space aircraft

The present invention relates to a space aircraft, that is an aircraft capable of taking off from the ground in the usual manner, of reaching an altitude of at least a hundred kilometres, flying at a transonic or even supersonic speed, then of also landing in the usual manner of an aircraft.

Single-storey space aircraft of this kind, capable of flying at speeds of greater than 0.9 mach, comprise both anaerobic propulsion means such as rocket motors, and aerobic propulsion means such as turboshaft engines.

During the flight of a space aircraft of this kind, is possible for just the anaerobic propulsion means to be operating, the aerobic propulsion means then being inactive or switched off. In such a stage of flight, the air entry of the aerobic propulsion means thus causes significant drag, braking the flight of the space aircraft.

The object of the present invention is to remedy this drawback.

For this purpose, according to the invention, the single-storey space aircraft, which is capable of flying at speeds of greater than 0.9 mach and which comprises:

- anaerobic propulsion means and
- aerobic propulsion means, which are provided with at least one air entry,

is distinctive in that it comprises at least one movable flap which is mounted on the framework of the space aircraft, in front of said air entry, and which can move, in both directions, between a first position for which said movable flap clears said air entry and is applied against the fuselage of said space aircraft, and a second position for which said movable flap covers said air entry from the aerodynamic flow around said space aircraft, preventing air from penetrating into said air entry.

Thus, by means of a movable flap of this kind, said air entry can be isolated from the airflow around the aircraft, such that the drag thereof can be reduced, when the aerobic propulsion means are not operating. It will be noted in addition that, by means of said movable flap, said aerobic propulsion means are thus protected from excessive gas speeds and the resulting heating.

Although said movable flap arrangement may move in different ways, it is advantageous for it to rotate between said first and second positions.

Preferably, said single flap is domed to allow it to fit the shape of said fuselage when it occupies said first retracted position. Moreover, the single flap is preferably rounded opposite said air entry so as to further reduce the drag of the assembly of said flap and said air entry in said second extended position.

The accompanying drawings make it possible to understand how the invention can be represented. In said drawings, identical reference numerals denote like elements.

Fig. 1 is a perspective view of a space aircraft according to the present invention, equipped with flaps for covering the air entry, which flaps are in the retracted position, clearing the air entries of the turboshaft engine.

Fig. 2 is a further perspective view of the space aircraft from Fig. 1, with said flaps in the extended position, covering the air entries of the turboshaft engines.

Fig. 3 and 4 show the operating mechanism of a covering flap of the space aircraft from Fig. 1 and 2.

The space aircraft 1 according to the present invention and shown in Fig. 1 and 2 comprises just one storey, having a fuselage 2, and is capable of transonic and/or supersonic flight.

Said space aircraft 1 comprises at least one rocket motor 3 and two turboshaft engines 4, each comprising an air entry 5. The turboshaft engines are laterally arranged at the rear of the fuselage 2, such that one of the turboshaft engines 4 is on the left and the other of said turboshaft engines 4 is on the right of the fuselage 2.

5 When the space aircraft is in transonic or supersonic flight and the turboshaft engines 4 are not operating, the air entries 5 are the source of significant aerodynamic drag.

Thus, in order to remedy this drawback, the space aircraft 1 from Fig. 1 and 2 comprises, in front of each of the two air entries 5, a rotating flap 6, which is articulated about an axis X-X of the framework of said space aircraft. Each flap 6 can move, in 10 both directions, between a retracted position (see Fig. 1) for which it is applied against the fuselage 2 and clears the corresponding air entry 5, and an extended position (see Fig. 2) for which it covers said air entry 5 from the aerodynamic flow around said space aircraft.

15 Thus, when the space aircraft 1 is at high speed and the turboshaft engines 4 are not operating, the air entries 5 of said engines can be covered by the flaps 6 so as to reduce the aerodynamic drag of the air entries 5.

In order to actuate the flaps 6 between the retracted position thereof and the extended position thereof, and vice versa, the system shown schematically in Fig. 3 and 4, comprising actuators 7, can be used. The rod 8 of each actuator 7 is connected 20 to the corresponding flap 6 by means of a connecting rod 9 articulated, on one side, to said flap 6 by means of a hinged joint 10 and, on the other side, to said actuator rod 8 by means of a swing joint 11.

Each flap 6 is domed so as to be able to fit the shape of the fuselage 2 in the 25 retracted position (Fig. 1). Moreover, in order to reduce the drag which said flap may cause in the extended position (Fig. 2), the end 12 thereof which is opposite the corresponding air entry 5 is rounded.

CLAIMS

1. Single-storey space aircraft (1), which is capable of flying at speeds of greater than 0.9 mach, and which comprises:

- anaerobic propulsion means (3) and
- aerobic propulsion means (4), which are provided with at least one air entry (5),

characterised in that it comprises at least one movable flap (6) which is mounted on the framework of the space aircraft, in front of said air entry, and which can move, in both directions, between a first position for which said movable flap (6) clears said air entry (5) and is applied against the fuselage (2) of said space aircraft, and a second position for which said movable flap (6) covers said air entry (5) from the aerodynamic flow around said space aircraft (1), preventing air from penetrating into said air entry (5).

2. Aircraft according to claim 1,

characterised in that said movable flap (6) rotates between said first and second positions.

3. Aircraft according to either claim 1 or claim 2,

characterised in that said movable flap (6) is domed to allow it to fit the shape of said fuselage (2) when it occupies said first position.

4. Aircraft according to any of claims 1 to 3,

characterised in that said movable flap (6) is rounded opposite said air entry (5).