

Dear Examinee -

An inventor presents his invention to you and requests that you draft a patent application to protect the invention.

The invention as presented by the inventor

An inventor presents to you his invention: he noticed that in airplanes and space shuttles (commonly called vehicles) there are anti-icing heating systems that are configured to heat certain surfaces of the vehicle by heating elements when the temperature at these surfaces or close to them is below certain threshold, in order to cause accumulating ice to melt or otherwise be removed. Heating elements in the vehicle are usually controlled by so-called Ice Protection Control Units (IPCUs). In this process, each heating element is assigned to one or more temperature sensors which provide temperature measurement data for the area surrounding the heating elements, this data in turn being used to control and adjust the heating elements. The heating elements and the temperature sensors are controlled by the IPCUs as remote components, their power is provided to the heating element via power lines (solid line) and their control signals are transmitted via corresponding control cables (dashed lines), as depicted in **Figure 1**.

The inventor says he has developed a new anti-icing system which saves in cabling (i.e. less weight, less costs in materials and labor), as shown in **Figures 2, 3 and 4**, in which:

100- deployment of the heating system on a vehicle

10 - heating system

5 - control device, comprising:

5a, 5b - power line data transmission transceiver / Power Line Communication (PLC)
transceiver / PowerLAN

6 - sensor controller

7 - heating controller

8a, 8b – connecting cables

1 - remote component (positioned at separate locations, physically separated from the control device controlling the components, in order to perform locally sensor data acquisition or providing locally restricted heating output), comprising:

1a, 1b - cable connections

4- sensor element

2 - heating element

3 - evaluation circuit adapted to evaluate temperature measurement values (optional)

20 - schematic representation of a method of operation of the system, in which

- 21 - supplied power to first remote component 1 by a control device 5 via a first connecting cable 8a
- 22 – exchange control signals between the control device 5 and a sensor element 4 of the first remote component 1 via the first connecting cable 8a
- 23 – supply power by control element 5 to a second remote component 1, which comprises a heating element 2, via a second connecting cable 8b (optional)
- 24 - exchange control signals between the control device 5 and a sensor element 4 of the second remote component 1 via the second connecting cable 8b (optional).

The inventor indicated that the core of his invention may also be used to save in cabling in other on-board systems of the vehicle, such as steering controls (flaps, rudder, ailerons), engine power control, etc.

----- End of the Disclosure of the Invention -----

Your tasks:

General direction: You are requested to exercise your professional background in order to indicate embodiment issues (if any) and engineering difficulties (if any).

(score)

1. Draft patent application based on the description of the inventor **(25%)**
If you find that certain details are missing – indicate what are these details and what aspects of the description you expect them to complete. If you find these details essential for the drafting – assume what the details are (explain your assumption) and proceed based on these assumed details.
2. Draft at least 7 device/system/apparatus claims and at least 4 method claims in US style **(40%)**
3. How will you modify your claims to fit to the EP style of claims? If re-drafting is needed explain why and re-draft at least 3 of the device/system/apparatus claims and at least 3 of the method claims. If not needed – explain why.
(15%)

4. After the application and claims were drafted and before the application was filed the inventor found and presented to you a British patent **GB 2410481** titled “Modular Aircraft Control System and Method”. See some drawings and some text from that patent at the bottom of the document.

In view of this patent–will you change the description of the invention? Or the claims? Why?
(10%)

5. Explain what defines the broadest scope of coverage of the patent? And what are dependent claims for?

(5%)

6. Why it is recommended to draft device/system claims and method claims?

(5%)

100%

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Drawings of the invention:

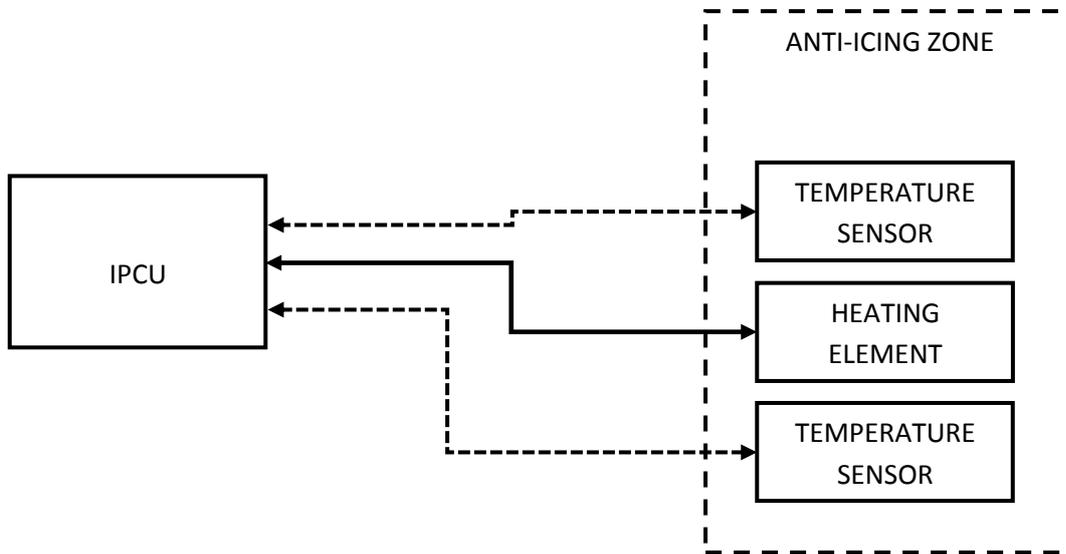


Figure 1

PRIOR ART

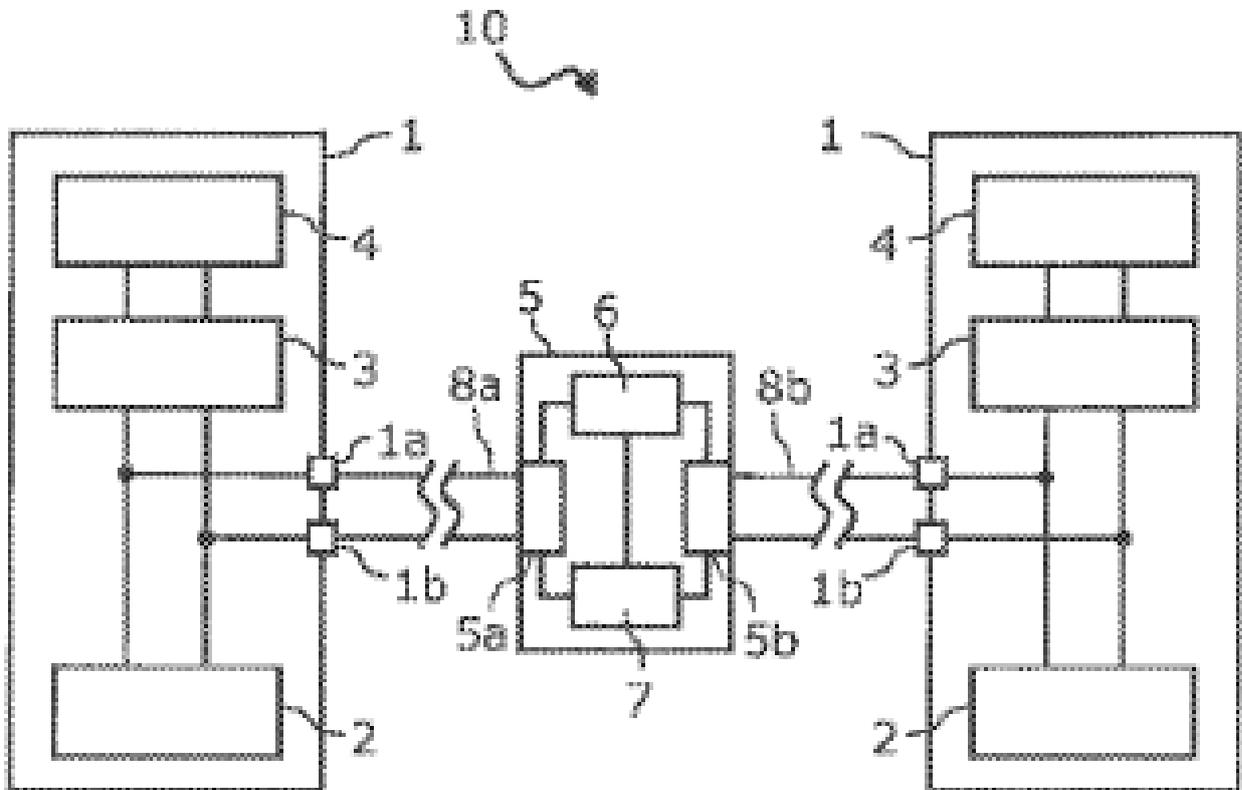


Figure 2

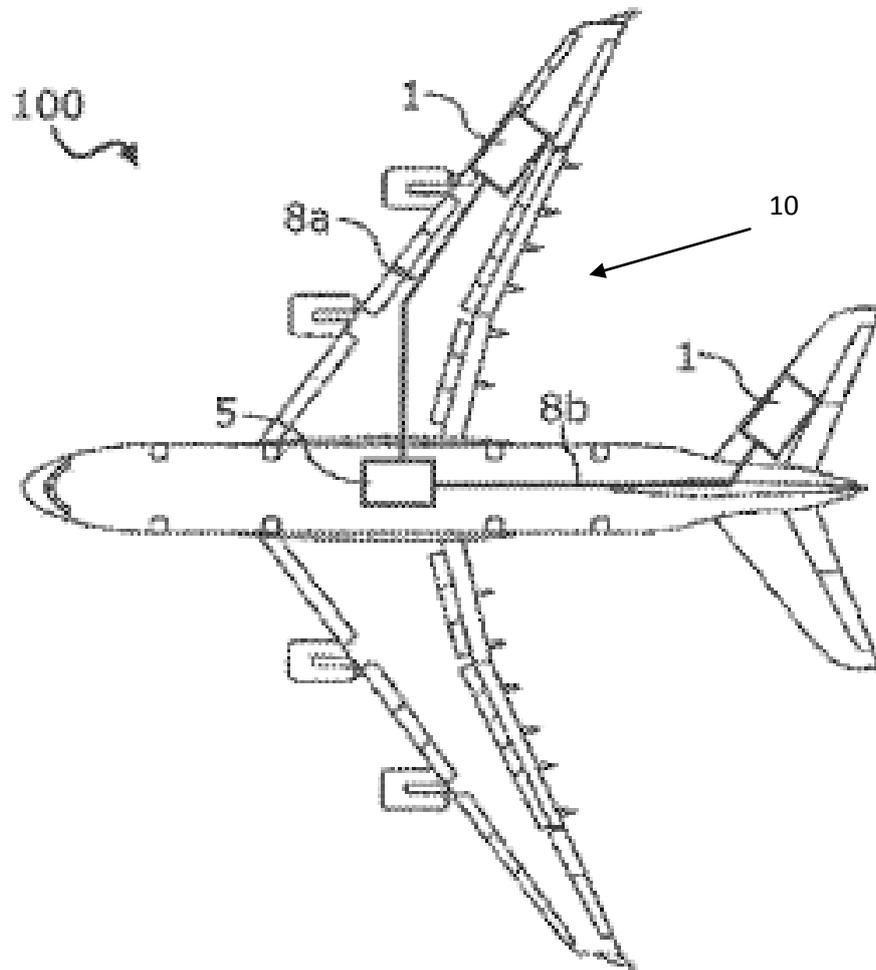


Figure 3

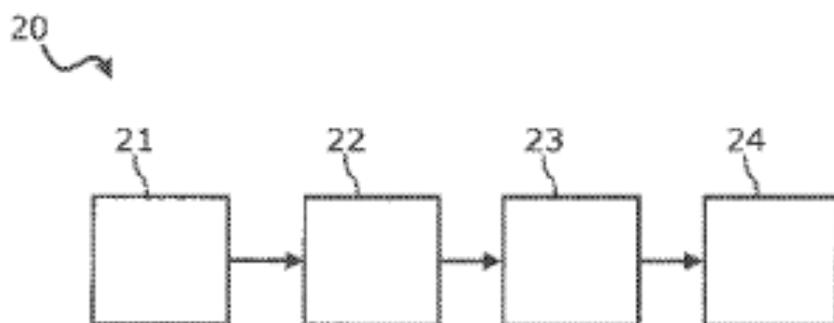


Figure 4

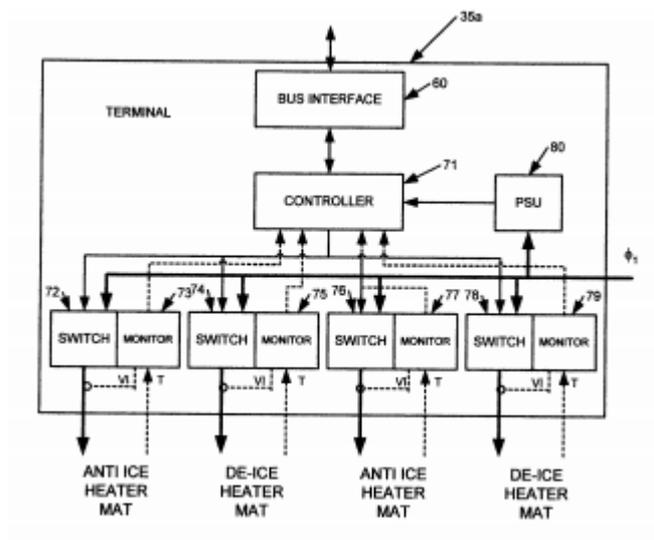
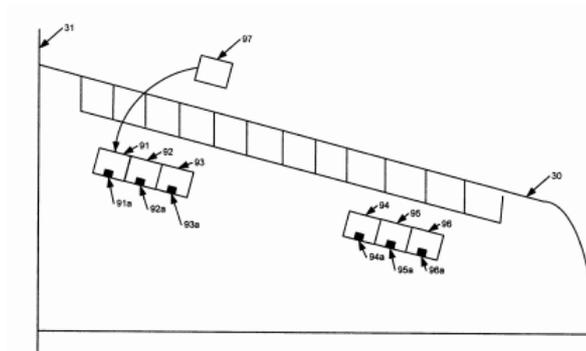
Prior art found after the application was drafted

(12) UK Patent (19) GB (11) 2 410 481 (13) B

(45) Date of publication: 04.06.2008

(54) Title of the invention: Modular aircraft control system and method

(51) INT CL: B64D 15/12 (2006.01) B60L 1/02 (2006.01) B64D 15/00 (2006.01) B64D 15/22 (2006.01)
G05B 15/02 (2006.01) H04B 3/54 (2006.01)



CLAIMS:

1. An aircraft system for control of the application of high power from an aircraft generator system to a plurality of devices in the aircraft, the system comprising:
 - a plurality of local controllers, each local controller for placement in the aircraft locally to a group of at least one said device and for controlling the application of said high power to said group of at least one device;
 - a low power line for providing power to each said local controller; and
 - a central control unit for applying power to said low power line and for communicating with and controlling said local controllers.