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**Datasheet for the decision
of 27 September 2016**

Case Number: T 2098/15 - 3.2.01

Application Number: 12705382.5

Publication Number: 2758304

IPC: B64B1/58, B64B1/60

Language of the proceedings: EN

Title of invention:

A MODIFICATION TO GAS ENVELOPES OF AIRSHIPS AND BALLOONS

Applicant:

Brindley, Charles Stuart

Headword:

Relevant legal provisions:

EPC Art. 54(1)

Keyword:

Novelty - (no)

Decisions cited:

Catchword:



Beschwerdekammern
Boards of Appeal
Chambres de recours

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Case Number: T 2098/15 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 27 September 2016

Appellant: Brindley, Charles Stuart
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Sawston, Cambridge CB22 3XE (GB)

Decision under appeal: Decision of the Examining Division of the
European Patent Office posted on 17 June 2015
refusing European patent application No.
12705382.5 pursuant to Article 97(2) EPC.

Composition of the Board:

Chairman G. Pricolo
Members: W. Marx
P. Guntz

Summary of Facts and Submissions

I. The appeal is against the decision of the examining division posted 17 June 2015 to refuse the European patent application 12705382.5. The notice of appeal was filed on 13 August 2015, and the appeal fee was paid simultaneously.

II. The international search report cited *inter alia* the following documents:

D1: WO 2011/042065 A1;

D3: WO 2006/137880 A2.

In its decision the examining division found that the subject-matter of claim 1 lacked novelty with respect to D1.

III. The board issued a communication pursuant to Rule 100(2) EPC and indicated its provisional opinion that the subject-matter of claim 1 on which the decision was based lacked novelty with respect to D3 and that the features under dispute with regard to D1 would not justify the presence of an inventive step.

IV. In a reply letter dated 4 March 2016, the appellant defended the claim on file but made no amendments to the claim. No request for oral proceedings has been filed.

V. Claim 1 according to the appellant's request reads:

"A modification within the gas envelopes of airships and balloons, being a flexible membrane impermeable to the passage of gases across it, attached around its

perimeter continuously to the inside of the gas envelope so as to seal the interior spaces of the gas envelope above and below it from each other hermetically;
the line of attachment of the flexible membrane to the gas envelope being horizontal when the airship or balloon is in level flight;
the shape of the membrane conforming to the shape of the portion of the gas envelope below the membrane's line of attachment to the gas envelope when fully inflated with lifting gas at minimum operating pressure, the lower surface of the membrane being then in contact over its whole area with the inner surface of the lower portion of the gas envelope below the line of attachment, all air having been exhausted from between the underside of the membrane and the inner surface of the lower portion of the gas envelope;
and when air is admitted between the lower portion of the gas envelope and the membrane, the membrane rises within the gas envelope, reducing the volume of the space above it, compressing the lifting gas."

VI. The appellant's arguments, insofar as they are relevant to the present decision, can be summarised as follows:

Document D3 referred to a composite invention consisting of an assembly of components which already existed across a variety of engineering applications in some form or another in present, or earlier airships, or balloons, relying upon a sufficient volume of 'lifting gas' within them, and of density sufficiently less than that of the surrounding air to be 'buoyant' in air. What made these systems unique was the manner in which these components were assembled and performed their intended functions. The claimed modification to lifting gas envelopes, essential components of all

'lighter than air' vehicles, was but one of the numerous potential modifications available, precisely defined to function in a very specific manner that was nowhere to be found in earlier writings, sketches, or drawings, nor in the realisation of any existing or previously existing 'lighter than air' vehicles.

D3 confined itself to systems for actively controlling the aerostatic lift of airships, housed within a hull (102), the hull configured to contain a first gas (helium) and serving as the bounding surface of all the systems shown in Figs 1 to 6B, such as a compartment located within the hull and configured to contain a second gas (air). The hull had to be construed as the envelope (102) of the 'gas envelope', and the space bounded by it - excluding the compartment(s) within it for containment of the second gas - the volume available to hold the lifting gas. The second compartments were elastically expandable beyond some unspecified minimum volume to accommodate a varying quantity of the second gas. No one of the 'compartments' within the gas envelopes illustrated in D3 (Figs 3A to 6B), and none of its elastically expandable part-envelope for separation of the variable volume of 'second' gas from the 'first', resembled in the slightest the flexible membrane as claimed, which lay passively wholly along some portion of the inner surface of the gas envelope until called into use.

The flexible membrane 610 (Figs 6A and B) was inside a tank, a composite pressure vessel, wholly within the hull, the gas envelope, where it performed the same function as claimed, but in a very different manner. It might be flexible, non-extensible and hemispherical in shape conforming to the inner surface of the pressure vessel, but neither the line of join, nor its position

and shape were shown or claimed. The claimed invention avoided the need to exchange some portion of the lifting gas to and from an internal pressure vessel.

As regards the board's consideration of D3, Figs 6A and B, the tank 601 represented an enclosed portion of the gas envelope 102 of airship 100 from and into which some portion of the lifting gas must necessarily be transferred. Moreover, there was no mention of airships and balloons in general anywhere in the relevant paragraphs, which were confined to the airship 100. Nowhere in D3 the flexible membrane was considered as a 'modification', but simply as one element of the tank within which component variation of lift was achieved. The divider 610 seemed to be attached around the inner circumference of the horizontal diameter of the spherical tank in which it was housed, but, while it was clearly flexible with no elastic stretching apparent in the illustrated intermediate states illustrated in Figs 6A and 6B, its actual unstretched shape and surface were matters for conjecture. The question had to be asked as to why the patentees of D3 did not simply abandon all the excesses of the "DCB system 600" and reverted to the simple modification to lifting gas envelopes as claimed.

Reasons for the Decision

1. The subject-matter of claim 1 is not new in view of the disclosure of document D3 (Article 54(1) and (2) EPC), as already indicated in the board's provisional opinion in its communication pursuant to Rule 100(2) EPC.

2. D3 discloses (see Figs 6A and 6B; and paragraphs [0049] to [0052]):

A modification within the gas envelopes (tank 601 represents a gas envelope of airship 100) of airships and balloons (100), being a flexible membrane (610; [0049]) impermeable to the passage of gases across it, attached around its perimeter continuously to the inside of the gas envelope (the membrane 601 is secured at the equator of the tank and may have the shape of a circle or a hemisphere with the same diameter than the diameter of the tank) so as to seal the interior spaces of the gas envelope above and below it from each other hermetically;

the line of attachment of the flexible membrane to the gas envelope being horizontal when the airship or balloon is in level flight (attached at the equator of the tank, see figures 6A and 6B in combination with figure 1);

the shape of the membrane conforming to the shape of the portion of the gas envelope below the membrane's line of attachment to the gas envelope when fully inflated with lifting gas at minimum operating pressure, the lower surface of the membrane being then in contact over its whole area with the inner surface of the lower portion of the gas envelope below the line of attachment (see [0051]; the divider 610 is pushed against the bottom half of the tank 601; this is in a condition where the pressure of the lifting gas 605 is at its minimum operating pressure because it occupies the bigger volume within the tank 601), all air having been exhausted from between the underside of the membrane and the inner surface of the lower portion of the gas envelope;

and when air is admitted between the lower portion of the gas envelope and the membrane, the membrane rises

within the gas envelope, reducing the volume of the space above it, compressing the lifting gas (see [0052]; outside air is pumped by the valves and pumps 606, 608, the membrane rises, reducing the space of the second section 614 and compressing the lifting gas within the second section).

3. The board does not find the appellant's counter-arguments persuasive.

3.1 As agreed by the appellant, D3 shows an airship (100) consisting of an assembly of components and comprising (see Figs 6A and 6B) a hull (102) and a compartment (tank 601) located within the hull, both of which configured to contain a lifting gas (605). Therefore, not only the hull but also the tank located within is considered to represent a gas envelope of the airship within the meaning of claim 1. In particular, the wording of claim 1 leaves open whether, when referring to a gas envelope, solely a component of an airship or the bounding surface of the complete system is meant.

3.2 Within the inner gas envelope (tank 601) of D3, a divider (610) is secured at the equator of the tank. As explicitly stated in D3, in one embodiment the divider is a flexible membrane, which is also explicitly said to have the shape of a hemisphere with the same diameter as the diameter of the tank (paragraph [0049]) which has also a circular cross section in a vertical plane (see Figs 6A, 6B). Moreover, when describing its function, the divider is said to be pushed against the bottom half of the tank as the tank is filled with lifting gas (see paragraph [0051]). From this it can be concluded that the flexible membrane lies passively wholly along some portion of the inner surface of the gas envelope, contrary to the appellant's assertion.

Therefore, the flexible membrane of the embodiment according to Figs 6A and 6B in D3 represents a "modification within the gas envelopes of airships, being a flexible membrane ... the shape of the membrane conforming to the shape of the portion of the gas envelope below the membrane's line of attachment to the gas envelope when fully inflated with lifting gas at minimum operating pressure" as claimed.

- 3.3 The appellant acknowledges that the flexible membrane inside the tank known from D3 performs the same function as claimed and might be hemispherical in shape conforming to the inner surface, but contested that neither the line of join, nor its position and shape were shown. However, as explicitly stated in D3 (paragraph [0049]), the flexible membrane (divider 610) may be secured at the equator of the tank and may have the shape of a hemisphere with the same diameter as the diameter of the tank. Both the terms "secured at the equator" and "hemisphere with the same diameter" define exactly the line and position of attachment of the flexible membrane to the tank in D3, i.e. at the great circle of the tank surface which divides the tank into two symmetrical parts. Moreover, as can be derived from Figs 6A and 6B in combination with Figure 1, the line of attachment is horizontal when the airship is in level flight, which was not contested by the appellant. As regards the shape of the flexible membrane, the appellant has admitted himself previously that the flexible membrane might be hemispherical in shape conforming to the inner surface, as explicitly stated in D3 (paragraph [0049]). Therefore, also the appellant's allegation that the unstretched shape and surface of the flexible membrane of D3 were a matter for conjecture does not hold.

- 3.4 The claimed invention might avoid the need to exchange some portion of the lifting gas to and from an internal pressure vessel. However, D3 also shows that "the lifting gas 605 may be compressed within the second section 614 of the tank 601 rather than released into the hull 102 through the one or more valves and/or pumps 616" (see paragraph [0052]). Therefore, the board cannot follow the appellant in that the tank in D3 represented a gas envelope, or an enclosed portion of the gas envelope 102 of the airship (as already argued above), from and into which some portion of the lifting gas must necessarily be transferred.
- 3.5 The appellant's argument that D3 did not mention airships and balloons in general, but only referred to an airship 100, is irrelevant for the assessment of novelty of the claimed subject-matter ("a modification within the gas envelopes of airships and balloons"), since neither the airship nor a balloon necessarily forms part of the invention as claimed. The term "gas envelopes of airships and balloons" only requires a gas envelope to be suitable to be used in airships and balloons, which is true for the tank known from D3. Moreover, it is clear that a gas envelope installed in an airship cannot be used at the same time in a balloon, although it might be suitable for being used in a balloon.
- 3.6 The fact that D3 does not consider the flexible membrane as a 'modification' is irrelevant because this term does not *per se* imply any features providing structural or functional limitations, the claimed subject-matter being defined by the subsequent features recited in the claim ("within the gas envelopes of airships and balloons, being a flexible

membrane ..."), which, as explained above, are known from D3 in combination.

- 3.7 As a consequence, the subject-matter of claim 1 is considered new in view of D3.
4. Since no request for oral proceedings was filed by the appellant, the present decision can be taken in written proceedings.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



A. Vottner

G. Pricolo

Decision electronically authenticated