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**Datasheet for the decision  
of 3 February 2021**

**Case Number:** T 0982/18 - 3.2.04

**Application Number:** 11843714.4

**Publication Number:** 2643573

**IPC:** F02B71/00

**Language of the proceedings:** EN

**Title of invention:**

HIGH-EFFICIENCY LINEAR COMBUSTION ENGINE

**Applicant:**

Mainspring Energy, Inc.

**Headword:**

**Relevant legal provisions:**

EPC Art. 109(1), 111(1)

RPBA Art. 11

**Keyword:**

Interlocutory revision - department of first instance should  
have rectified decision (yes)

Remittal to the department of first instance

**Decisions cited:**

T 0336/03, T 0139/87, T 1060/13

**Catchword:**



**Beschwerdekammern**  
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Case Number: T 0982/18 - 3.2.04

**D E C I S I O N**  
**of Technical Board of Appeal 3.2.04**  
**of 3 February 2021**

**Appellant:** Mainspring Energy, Inc.  
(Applicant) 186 Constitution Drive  
Menlo Park, CA 94025 (US)

**Representative:** Haley Guiliano International LLP  
26-28 Bedford Row  
London WC1R 4HE (GB)

**Decision under appeal:** **Decision of the Examining Division of the  
European Patent Office posted on 7 November 2017  
refusing European patent application No.  
11843714.4 pursuant to Article 97(2) EPC.**

**Composition of the Board:**

**Chairman** S. Oechsner de Coninck  
**Members:** J. Wright  
W. Van der Eijk

## **Summary of Facts and Submissions**

- I. The appellant (applicant) lodged an appeal, received on 11 January 2018, against the decision of the examining division, dated 7 November 2017, refusing the European patent application No. 11843714.4. The appeal fee was also paid on the same day. The statement setting out the grounds of appeal was received on 19 March 2018.
- II. The examining division's refusal was based on added matter, Art. 123(2) EPC (main request, first, second auxiliary requests), novelty, Art. 54 EPC and/or inventive step, Art. 56 EPC (all requests).
- III. The appellant requests that the decision be set aside and a patent be granted on the basis of an amended main request filed together with his statement of grounds. As an auxiliary measure the appellant requests remittal of the case for interlocutory revision.
- IV. Claim 1 of the main request reads as follows:
- "A linear combustion engine comprising:  
a main cylinder (105) comprising a combustion section (130);  
an outer cylinder (705), separate from the main cylinder (105), comprising a driver section (710) configured to provide at least some compression work during a compression stroke of the linear combustion engine, the driver section (710) comprising a gas spring, wherein the main cylinder (105) and the outer cylinder (705) are configured such that blow-by gas from the combustion section (130) does not flow into the driver section (710);  
a gas bearing (740);

a piston assembly (120) configured to travel linearly, the piston assembly (120) comprising:  
a first piston within the main cylinder between a top dead center position and a bottom dead center position, a second piston within the outer cylinder, and a piston rod (145) coupled to the first piston and to the second piston, and configured to move along the gas bearing (740);  
a translator (220) configured to move with the piston assembly; and  
a stator (210) configured to:  
convert kinetic energy of the piston assembly (120) into electrical energy based on relative motion of the translator (210), and  
convert electrical energy into kinetic energy of the piston assembly, wherein the linear combustion engine is configured to operate using compression ignition."

- V. The appellant argues as follows:
- The reinstatement of the wording "at least some compression work" overcomes the objection of added subject-matter as also acknowledged by the examining division in paragraph 15 of their decision.
  - In addition to a gas spring, absent from D4, the subject-matter of claim 1 of the main request now further defines a gas bearing, and is thus novel.
  - Starting from either D2 or D4 the skilled person would not arrive at the subject-matter of claim 1 using D1, D5 or its own general knowledge.

## Reasons for the Decision

1. The appeal is admissible.
2. Main request - Interlocutory revision Art. 109(1) EPC
  - 2.1 Claim 1 according to the main request adds to claim 1 according to the fourth auxiliary request of 17 October 2017 that the linear combustion engine further comprises a gas bearing (740) and that the piston rod is configured to move along the gas bearing (740).
  - 2.2 The fourth auxiliary request was considered not to infringe Article 123(2) EPC (decision paragraph 15, last sentence), but was objected to in a broad and unspecific manner together with auxiliary requests 2, 3 and 5 in paragraphs 17 to 19 for lack of novelty with respect to D4 or lack of an inventive step should the gas spring be regarded as novel in paragraph 20.
  - 2.3 The above mentioned features concern the additional provision of a particular bearing in form of a gas bearing and its function along which the piston rod (coupling the first piston to the second piston) moves.
  - 2.4 D4 was found to be novelty destroying for claim 1 according to auxiliary request 4. D4 relates to engine starting devices in particular for use with an engine having a pair of floating pistons 19, that carry armature 20 extending through electromagnetic assemblies 21 to electromagnetically synchronize their movement (col 3, lines 25-40). Each piston 19 includes an outer portion 2 extending into high pressure chambers 4 filled with hydraulic liquid (referred to as "bounce chambers" by the examining division).

Compressed hydraulic liquid provides spring energy to return the pistons toward each other (col 3, lines 45-56). The Board notes however that D4 does not mention any bearing along which the piston rod moves, let alone a gas bearing. Nor can any bearing be seen in the figures, less so their location on the gas actuated piston 19 side or on the piston side 2 exposed to hydraulic fluid in the above "bounce" chambers 4 that explicitly use hydraulic liquid instead of gas (column 3, lines 49-56). Figure 1 shows the piston rod but it is only schematic (see column 3, lines 19 to 21). Thus, it is clearly recognisable that claim 1 of the main request adds features not disclosed in D4, cited against novelty, and therefore overcomes the novelty objection. Moreover, these added features introduce further distinguishing features other than the gas spring considered by the examining division to be commonly known in linear piston arrangements and thus obvious (chapter 20 of the decision).

Thus the reasons given in the decision for finding claim 1 not allowable under the provisions of articles 54 or 56 EPC are clearly overcome.

- 2.5 Under Article 109(1) EPC, if the department whose decision is contested considers the appeal to be admissible and well founded, it shall rectify its decision.
  
- 2.6 It is established case law of the Boards of Appeal that an appeal is to be considered "well-founded" if at least the main request submitted with the appeal includes amendments which clearly meet the objections on which the decision relies, such that the department of the first instance could reasonably be expected to recognise this and thus rectify its decision. That there are other objections which have not been removed

but which were not the subject of the contested decision cannot preclude the application of Art. 109(1) EPC (T 139/87, point 4; T 1060/13, point 4.1). Thus, even if the amendments raise new objections not previously discussed, interlocutory revision must be allowed since an applicant should in such circumstances have the right to examination in two instances (CLBA, 9th edition 2019, V.A.2.9.2).

2.7 As identified above, the further limitation which has been added manifestly overcomes the objections raised against auxiliary request 4 in the impugned decision. This situation corresponds to the situation explained in the guidelines for examination E-XIII 7.4.2(f) where several features from the description are added that were not discussed in the decision and where the line of argumentation has to be revised. Applying this approach to the present case, the examining division should have granted interlocutory revision irrespective of the question as to whether the amended claim might be unallowable for other reasons not treated in the decision or otherwise considered during examination so far (See for example T0336/03, in particular points 2 and 3).

2.8 Since the Board finds that the only grounds for the refusal with respect to the former auxiliary request 4 were based on lack of novelty with respect to D4, and an indication that foreseeing a gas spring in D4's arrangement would be obvious, are remedied by the present main request, the Board finds the appeal to be allowable. Consequently the decision must be set aside.



3. Request for grant of a patent

3.1 In the present case where the examining division has not granted interlocutory revision although it should have done so, the Board would have to resume examination of the application at the appeal stage, possibly involving an additional search concerning gas bearings used in linear engines. Therefore the Board is unable to accede the appellant's main request to grant the patent based on the sole set of claims on file.

4. Auxiliary request for remittal

4.1 As the appellant's main request to grant a patent cannot be allowed, remittal for further prosecution in accordance with the auxiliary measure requested by the appellant is appropriate.

4.2 According to Article 11 RPBA 2020 second sentence, fundamental deficiencies apparent in the proceedings constitute special reasons for remittal. In the present case where the examining division did not rectify its decision although it should have done so pursuant Article 109(1) EPC constitutes such a fundamental deficiency justifying remittal.

4.3 In view of the above, the board decided to exercise its discretion under Article 111(1) EPC and to remit the case to the examining division for further prosecution on the basis of the main request.

5. Since the appellant's request for remittal is granted, the Boards need not consider the appellant's lower ranking request for oral proceedings.

## Order

**For these reasons it is decided that:**

1. The decision is set aside.
2. The case is remitted to the first instance for further prosecution on the basis of the main request submitted with the statement of grounds of appeal.

The Registrar:

The Chairman:



G. Magouliotis

S.Oechsner de Coninck

Decision electronically authenticated