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File Number: T 670/90 - 3.4.1

Application No.: 83 301 510.0

Publication No.: 0 089 824

Title of invention: Method for dismantling and disposing of fuel assemblies

Classification: G21C 19/36

D E C I S I O N
of 30 March 1992

Proprietor of the patent: Westinghouse Electric Corporation

Opponent: Siemens AG

Headword:

EPC Article 56

Keyword: "Inventive step (yes, after cancellation of apparatus claims)"

Headnote



Case Number : T 670/90 - 3.4.1

D E C I S I O N
of the Technical Board of Appeal 3.4.1
of 30 March 1992

Appellant :
(Opponent)

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Respondent :
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Decision under appeal :

Interlocutory decision of the Opposition Division
of the European Patent Office dated 11 July 1990
concerning maintenance of European patent
No. 0 089 824 in amended form.

Composition of the Board :

Chairman : G.D. Paterson
Members : Y. van Henden
H. Reich

Summary of Facts and Submissions

I. European patent No. 0 089 824 incorporating method Claims 1 to 6 and apparatus Claims 7 to 11 was granted to the Respondent.

II. This patent was opposed by the Appellant on the grounds mentioned in Article 100(a) EPC, referring to the prior art document

D: FR-A-2 324 094.

III. By an interlocutory decision within the meaning of Article 106(3) EPC, the Opposition Division decided on the amended form in which the European patent could be maintained.

IV. The Appellant lodged an appeal against the interlocutory decision.

V. In a communication pursuant to Article 11(2) of the RPBA, the Board took the provisional view that the disclosure of document (D) prejudiced the allowability of the apparatus Claim 7, whereas Claim 1 as amended during the procedure before the Opposition Division could be rendered allowable by performing a further amendment.

VI. With reply dated 24 July 1991, the Appellant introduced into the proceedings the additional documents:

E: EP-A-0 033 074,

F: DE-A-2 635 501,

and explained that, combined with those of document (D), the teachings therein disclosed rendered the subject-matter of the independent Claims 1 and 7 obvious.

- VII. By telefax of 2 August 1991, the Respondent informed the Board that the Appellant had agreed to a proposal he had made, namely to delete the apparatus claims and to amend Claim 1 as requested in the Board's communication, and that he would consequently not attend the oral proceedings scheduled for 13 August 1991.
- VIII. By telefax of 5 August 1991, the Appellant confirmed his agreement to the Respondent's proposal and withdrew his request for oral proceedings.
- IX. The Respondent filed on 4 February 1992 new pages of description numbered 1 to 8 and new claims numbered 1 to 6. He requested the European patent to be maintained in its amended form, in accordance with the new description and claims.
- X. Claim 1 reads as follows:

"A method for remotely dismantling, compacting and shearing a spent fuel assembly frame skeleton (10), wherein, after the top nozzle (8) and the fuel rods (6) have been removed from the fuel assembly in a spent fuel pit (14), the assembly skeleton (10) comprising the bottom nozzle (34), thimble tubes (44) and grids (42) is moved from the spent fuel pit (14) and placed into a bottom nozzle removal fixture (22) of a skeleton conveyor (20), in which removal fixture the bottom nozzle (34) is removed from the assembly skeleton (10), the assembly skeleton (10) is then conveyed from the bottom nozzle removal fixture to a compactor (24) separate from the bottom nozzle removal fixture (22), wherein the remainder of the assembly skeleton (10) is compacted in a direction normal to the longitudinal axis of the skeleton, and the compacted skeleton (10) is conveyed from the compactor to

a skeleton shear (26) separate from the compactor, in which the compacted assembly skeleton (10) is cut into individual pieces so as to reduce the length of the compacted skeleton."

Claims 2 to 6 are dependent on Claim 1.

XI. With letter dated 25 February 1992, the Appellant informed the Board that he renounced to comment on the amended documents forming the basis of the Respondent's request.

Reasons for the Decision

1. The Board is satisfied that the description and claims were neither amended in such a way that the European patent contains subject-matter which extends beyond the content of the application as filed, nor in such a way as to extend the protection conferred - Article 123(2) and (3) EPC.
2. Novelty
 - 2.1 Document (D) pertains inter alia to a method for remotely dismantling, compacting and shearing a spent fuel assembly, wherein the assembly comprising the bottom nozzle - cf. "embout de pied (52)" - the thimble tubes - cf. "faisceau de tubes (22)" - and the grids - cf. "entretoises" - is moved from a spent fuel swimming pool (2) and placed into a guide (20); an end section of the assembly is compacted in said guide (20) in a direction normal to the longitudinal axis of the assembly by means of clamp chucks (26, 28); the compacted end section of the assembly is cut by a shear (16) into an individual piece so as to reduce the length of the assembly, and the whole sequence is recommenced until the whole assembly has been

cut into compacted individual pieces - see: Figures 1 and 3a to 3f; page 1, lines 18 to 26 and 33 to 39; from page 6, line 37 to page 7, line 38. Document (D) furthermore mentions the possibility of removing at least one of the bottom and top nozzles - i.e. bottom spigot (52) and top spigot (58) - before placing the remainder of the assembly into the compacting and shearing device - see Claim 1. Finally, the clamp chucks (26, 28) and the blade (30) act as a "bottom nozzle removal fixture" - see Figure 3a and page 7, lines 33 to 38.

- 2.2 According to the patent in suit, the skeleton conveyor (20) carrying out the claimed method is located in a transfer canal (12) connected to the spent fuel pit (14) by a fuel handling slot (18) - see column 3, lines 39 to 46. When the skeleton conveyor is positioned in the transfer canal (12), water is contained therein and maintained to a level of about 203 mm below the curb (31) of said transfer canal - see column 5, lines 38 to 42.

Although the height of fuel handling slot (18) is not disclosed in the European patent, obvious reasons of security - in particular the necessity to keep spent fuel assemblies under water while moving them towards the skeleton conveyor - make it necessary to use a height greater than 203 mm, so that the spent fuel pit (14) too is filled with water when the skeleton conveyor is positioned in the transfer canal (12). With regard thereto, however, it may not be denied that the spent fuel swimming pool (2) mentioned in document (D1) is a "spent fuel pit" within the meaning of said European patent.

- 2.3 The subject-matter of Claim 1 is thus distinguished over the prior art disclosed in document (D) in that

- the fuel rods (6) are removed from the spent fuel assembly before compacting and shearing said assembly;
- top nozzle (8) and fuel rods are removed from the fuel assembly in the spent fuel pit (14);
- after removal of the bottom nozzle (34), the assembly skeleton is conveyed from the removal fixture (22) to a compactor (24) separate from said removal fixture;
- the remainder of the assembly skeleton is compacted over its whole length before being cut into individual pieces, and in that
- the compacted skeleton is conveyed from the compactor to a skeleton shear (26) separate from said compactor.

2.4 None of the documents taken into consideration during the opposition proceedings comes closer to the claimed subject-matter than does document (D). This applies in particular to the late-cited documents (F) and (E), which are respectively concerned with a method of repairing partly spent fuel elements and with an apparatus therefor, and in which no arrangement suitable for dismantling, compacting and shearing skeleton assemblies is described.

2.5 The subject-matter of Claim 1 is novel. Moreover, in the Board's judgment, the one-part formulation of this claim is preferable for the sake of conciseness.

3. Inventive step

Removing the fuel rods from the assembly skeleton before compacting and shearing it is not suggested in document

(D) - see the main claim, relating to a method for shearing a bundle of thimble tubes containing nuclear fuels. The latter, however, are generally in the form of ceramic pellets made of mixtures of uranium and plutonium oxides and placed in thin walled stainless steel tubes, thereby forming fuel rods. Said fuel rods are maintained by structures made of metals having small neutron capture cross sections, in particular light metals such as magnesium. It is therefore evident that, in spent fuel elements, the degree of radioactivity of the various constituent parts varies within the limits of a broad interval, the fuel material being highly radioactive, whereas the metals of which the support structure is made are less contaminated than the fuel rod sheaths.

With regard thereto, a first advantage of the claimed method is that the amount of radioactive dust produced by the shearing device is strongly reduced, as well as the radioactivity level of said dust. A further advantage of the method is that a separate chemical processing of the materials forming the remainder of the assembly skeleton can be carried out, whereas the fuel rods can be saved or, if necessary, undergo any suitable physical or chemical treatment.

None of the documents taken into consideration during the opposition proceedings, however, gives to the skilled person an incentive to operate as proposed in the European patent. As a matter of fact, document (D) even points away from the invention, since it is stated there that introducing the whole assembly - i.e. the assembly including both spigots or "nozzles" (52, 58) and, consequently, the fuel rods - simplifies the process - see: page 1, lines 27 to 32; sentence bridging pages 2 and 3.

In the Board's judgment, therefore, the subject-matter of Claim 1 involves an inventive step.

4. Hence it follows that amended Claim 1 is allowable.

Dependent Claims 2 to 6 concern particular variants of the method according to Claim 1 and are therefore likewise allowable.

Order

For these reasons, it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the first instance with the order to maintain the patent in amended form on the basis of the following documents:

Claims: 1 to 6 received on 4 February 1992;

Description: pages 1 to 8 received on 4 February 1992;

Drawings: Figures 1 to 11 according to EP-B1-0 089 824.

The Registrar:

The Chairman:

M. Beer

G.D. Paterson