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**Datasheet for the decision
of 1 March 2011**

Case Number: T 1466/06 - 3.4.03

Application Number: 01125989.2

Publication Number: 1203910

IPC: F16T 1/48

Language of the proceedings: EN

Title of invention:

Method of supporting sales and maintenance of steam traps and aggregating system for use in the method

Applicant:

TLV CO. LTD.

Opponent:

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Headword:

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Relevant legal provisions:

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Relevant legal provisions (EPC 1973):

EPC Art. 56

Keyword:

"Inventive step (no)"

Decisions cited:

T 0641/00

Catchword:

-



Case Number: T 1466/06 - 3.4.03

D E C I S I O N
of the Technical Board of Appeal 3.4.03
of 1 March 2011

Appellant:

TLV CO. LTD.
881, Nagasuna
Noguchi-cho
Kakogawa-shi
Hyogo-ken (JP)

Representative:

Lemcke, Brommer & Partner
Patentanwälte
Bismarckstraße 16
D-76133 Karlsruhe (DE)

Decision under appeal:

Decision of the Examining Division of the
European Patent Office posted 2 May 2006
refusing European patent application
No. 01125989.2 pursuant to Article 97(1) EPC
1973.

Composition of the Board:

Chairman: G. Eliasson
Members: E. Wolff
T. Bokor

Summary of Facts and Submissions

I. The examining division refused European patent application No. 01125989 for lack of an inventive step.

II. The examining division cited in its decision *inter alia* the following prior art document:

D1: US 4 788 849 A (YONEMURA MASAO FT AL)
6 December 1988 (1988-12-06)

III. At oral proceedings before the board, the appellant requested that the decision of the examining division be set aside and a patent be granted on the basis of the claims filed with the statement setting out the grounds of appeal.

IV. Independent claims 1 and 4 of the appellant's request are worded as follows:

"1. A method of supporting sales and maintenance of steam traps, the method utilizes an aggregating system (7) which effects the steps of:

inputting stored diagnostic result data on steam leakage amounts due to malfunction of some of a plurality of existing steam traps (2a) and model confirmation result data from a diagnostic device (3) which has diagnosed a working condition of each of some of the plurality of existing steam traps (2a) installed in a customer's plant (1);

calculating an estimated value of a first total steam loss amount (Qa) due to malfunction of steam traps, the first total steam loss amount comprising aggregation of steam leak amounts (qa) of all the

existing steam traps (2) in the customer's plant (1), based on the diagnostic result data and also on a trap number ratio comprising a ratio between the number of said some steam traps (2a) diagnosed and the total number of the existing steam traps (2);

calculating an estimated value of a second total steam loss amount (Qb) due to model difference, the second total steam loss amount comprising aggregation of differences (qb) between inherent steam leak amounts of the existing steam traps (2) under their normal working conditions and inherent steam leak amounts of recommended steam traps of a model different from the existing steam traps under their normal working conditions, based on said model confirmation result data and also on said trap number ratio

calculating a monetary conversion value (A) of an integrated value of a sum of the estimated value of the first total steam loss amount (Qa) and the estimated value of the second total steam loss amount (Qb) integrated for a predetermined period;

generating comparison data (9) allowing comparison between said monetary conversion value (A) and a replacement cost (B) required for lump-sum replacement of all the existing steam traps (2) by the recommended steam traps; and

outputting said comparison data (9) for presentation to the customer in sales and/or maintenance activities of the recommended steam traps."

"4. An aggregating system (7) for use in a method of supporting sales and maintenance of steam traps, the system comprising;

inputting means (16) for inputting stored diagnostic result data on steam leakage amounts due to

malfunction of some of a plurality of existing steam traps (2a) and model confirmation result data from a diagnostic device (3) which has diagnosed a working condition of each of some of the plurality of existing steam traps (2a) installed in a customer's plant;

first calculating means (11) for calculating an estimated value of a first total steam loss amount (Qa) due to malfunction of steam traps, the first total steam loss amount comprising aggregation of steam leak amounts (qa) of all the existing steam traps (2) in the customer's plant (1), based on the diagnostic result data inputted to the inputting means (16) and also on a trap number ratio comprising a ratio between the number of said some steam traps diagnosed and the total number of the existing steam traps;

second calculating means (12) calculating an estimated value of a second total steam loss amount (Qb) due to model difference, the second total steam loss amount comprising aggregation of differences (qb) between inherent steam leak amounts of the existing steam traps (2) under their normal working conditions and inherent steam leak amounts of recommended steam traps of a model different from the existing steam traps under their normal working conditions, based on said model confirmation result data inputted to the inputting means (16) and also on said trap number ratio;

third calculating means (13) for calculating a monetary conversion value (A) of an integrated value of a sum of the estimated value of the first total steam loss amount (Qa) and the estimated value of the second total steam loss amount (Qb) integrated for a predetermined period;

comparison data generating means (15) for generating comparison data (9) allowing comparison

between said monetary conversion value (A) and replacement costs (B) required for lump-sum replacement of all the existing steam traps (2) by the recommended steam traps and

outputting means (17) for outputting said comparison data (9) in a predetermined display format."

- V. The arguments presented by the appellant can be summarised as follows:

The invention is concerned with evaluating opportunities for energy saving and to this end the total steam loss from steam traps is assessed.

Accepting that document D1 constituted the closest prior art, there were four features of the invention claimed in the system claim 4 which were not known from document D1, of which three were technical in nature. The only difference which was economic and non-technical concerned the comparison between the monetary conversion value (A) and replacement costs (B) to aid in the decision whether a complete replacement of all steam traps would pay off or not.

Specifically, the features which distinguished the claimed invention from the disclosure in document D1 were that the invention required monitoring of only a sample, with the total steam loss being the result of a calculation. This difference was clearly technical in nature. Compared to the system according to document D1 where all steam traps were monitored, a reduction in the number of measuring instruments could be achieved.

Secondly, according to the invention the calculation of the total steam loss was based not merely on actual measurements performed on the steam traps. Instead, a combination was used of the measured amounts of steam leakage (the first total steam loss amount (Qa) of all the existing steam traps) and a second calculated steam loss obtained (Qb) from a comparison of the data sheets of the existing steam traps and another model. Use of the relevant data from the data sheets of the steam traps constituted another technical difference between the claimed invention and the cited prior art. It significantly simplified the comparison between the steam loss of the existing steam traps and those that were considered to be a suitable replacement.

Thirdly, the claimed invention provided for the energy loss as a result of leakage in the steam traps to be converted into monetary terms, integrated over a predetermined period, thereby allowing an immediate assessment of the costs incurred as a result of the steam loss.

The same comments applied also to the method steps in independent claim 1, which was a claim for a method of supporting sales and maintenance of steam traps.

In summary, the differences between the invention were not only technical in nature but were not disclosed in or even hinted at in the cited prior art document D1, and hence the subject matter of independent claims 1 and 4 was an invention which, moreover, involved an inventive step.

Reasons for the decision

1. Admissibility

The appeal is admissible.

2. Patentability

2.1 The board is satisfied that what is claimed in independent claims 1 and 4 of the application does not fall within the exclusions from patentability under Article 52 EPC.

3. Inventive step

3.1 Independent claim 4 relates to an aggregating system for use in a method of supporting sales and maintenance of steam traps.

3.2 The problem-solution approach to assess inventive step requires that the claimed invention be compared with the nearest prior art. In the present case, this is document D1.

3.3 Document D1 relates to the monitoring of steam traps. It discloses apparatus enabling automatic totalisation and analysis of check-up data and prediction of a repair or replacement period (col.1 line 67 to column 2, line 2). In operation, each steam trap is monitored, steam leakage is measured and the corresponding data are stored by a steam leakage detector. The stored data are then transmitted to a host computer (col.2 lines 3 to 14).

3.4 The purpose of the prior art system is to simplify maintenance control of steam traps. In document D1 the host computer analyses the data supplied to it by the steam trap monitors, generates the sum-total of steam leakage of all the steam traps in terms either of monetary cost or of rejection rate, and monitors for each steam trap the change of leakage with time (column 2, lines 8 to 14 and column 3, lines 1 to 6). By recording and displaying how leakage in each steam trap changes with time, and by summing and analysing the total leakage of all steam traps, the time at which a steam trap should be repaired or replaced can be determined automatically. Identifying and repairing or replacing defective parts at an early stage avoids wasting energy and contributes to lower production costs (col. 3, lines 7 to 14 and lines 21 to 24).

3.5 The invention as claimed in claim 4 provides for two calculating means (first calculating means (11), second calculating means (12)) and a comparison data generating means (15). Calculating and comparing are basic functions of a general purpose computer. There is nothing in the application to suggest that the claimed first and second calculating means (11, 12) and the comparison data generating means (15) must be something other than a general purpose computer.

3.6 The differences identified by the board between the aggregating system of claim 4 and the apparatus disclosed in document D1 are:

- (a) as claimed, a first total steam loss (Qa) arising from all the malfunctioning traps is arrived at by

extrapolating to all steam traps the steam loss established on the basis of the fraction of malfunctioning steam traps in a subset of steam traps. In document D1, the total steam loss of all the steam traps is calculated on the basis of the data collected from all the steam traps.

- (b) as claimed, a second calculation involves deriving a second total steam loss (Qb) from a comparison between the theoretical total steam loss of the existing model and the theoretical total steam loss were the steam traps replaced with a different model. The difference in steam loss between existing traps, both properly functioning ones and malfunctioning ones, and potential replacement traps is then arrived at by combining the two total steam losses (Qa) and (Qb) to determine whether replacement of the steam traps would be economically advantageous. The data for this comparison are obtained from the respective data sheets.

3.7 The object of the invention derived from these differences between closest prior art and the claimed invention is the provision of improved manner of identifying whether and when it is advantageous to replace steam traps.

3.8 The difference labelled a) replaces individual measurements of all steam traps by sampling and extrapolating the result to the whole population. Sampling is a standard technique and is unquestionably used in a wide variety of technical fields to reduce

the effort that would be involved in carrying out individual measurement on each and every item.

- 3.9 The application contains no indication that any special measures would be needed to enable sampling to be performed. The application also contains no hint that the extrapolated value for the total steam loss would be obtained by anything other than straight-forward statistical extrapolation using the ratio of sampled traps to total traps in respect of both faulty steam traps and normally functioning ones.
- 3.10 In these circumstances, no inventive activity can be attributed to replacing the individual measurement carried out on each steam trap in document D1 with sampling techniques on a subset of steam traps as claimed in claim 4.
- 3.11 Difference b) above lies in the choice of the data on which the comparison of steam traps is based, in order to decide whether or not to upgrade to a newer type of steam trap. The decision to upgrade is purely a business decision and the board cannot see that this feature produces any technical effect. Hence, this difference cannot enter into the assessment of inventive step (T641/00).
- 3.12 A further alleged difference turns out not to be a difference at all. Unlike document D1, so the appellant argued, the invention took into account steam losses of both well functioning and faulty steam traps. However, the same is also true of the apparatus of document D1 which provides (column 2, lines 11-12) "*summation and analysis of total leakage at **all** traps ...*" [emphasis

added], there being no evident exclusion from that summation of steam losses for steam traps that are operating normally.

- 3.13 The appellant has also argued for yet another technical difference. It relates to the presentation of the steam loss in terms of monetary cost. Notwithstanding the question whether or not this feature contributes to the technical character of the invention, the host computer in D1 also displays the result of its steam loss calculations not just in term of rejection rate but in terms of monetary cost (document D1, column 2, lines 55 to 59).
- 3.14 What applies to the system claimed in claim 4 applies equally to the method claimed in claim 1, which additionally lacks the sparse apparatus features of claim 4.
4. For the foregoing reasons, the board concludes that the invention as claimed does not involve an inventive step, contrary to the requirements of Art. 56 EPC 1973.

Order

For these reasons it is decided that:

The appeal is dismissed.

Registrar

Chair

S. Sánchez Chiquero

G. Eliasson