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**Datasheet for the decision  
of 22 April 2009**

**Case Number:** T 1029/06 - 3.5.01

**Application Number:** 02258945.1

**Publication Number:** 1324251

**IPC:** G06F 17/60

**Language of the proceedings:** EN

**Title of invention:**

Environmental impact estimation method and apparatus

**Applicant:**

KABUSHIKI KAISHA TOSHIBA

**Opponent:**

-

**Headword:**

Environmental impact estimation/TOSHIBA

**Relevant legal provisions:**

EPC Art. 52(1)(2) and (3)

**Relevant legal provisions (EPC 1973):**

EPC Art. 56

**Keyword:**

"Environmental impact estimation steps - excluded from  
patentability (yes)"

"Displaying icons - inventive (no)"

**Decisions cited:**

T 0208/84, T 0953/94, T 0154/04, T 0388/04, T 0365/05,  
T 1147/05, T 1227/05

**Catchword:**

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Case Number: T 1029/06 - 3.5.01

**D E C I S I O N**  
of the Technical Board of Appeal 3.5.01  
of 22 April 2009

**Appellant:** KABUSHIKI KAISHA TOSHIBA  
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Minato-ku  
Tokyo 105-8001 (JP)

**Representative:** Midgley, Jonathan Lee  
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**Decision under appeal:** Decision of the Examining Division of the  
European Patent Office posted 9 December 2005  
refusing European patent application  
No. 02258945.1 pursuant to Article 97(1) EPC  
1973.

**Composition of the Board:**

**Chairman:** S. Steinbrener  
**Members:** W. Chandler  
P. Schmitz

## Summary of Facts and Submissions

- I. This appeal is against the decision of the examining division to refuse the European patent application on the ground that the subject-matter of claim 1 of the main request was not inventive (Article 56 EPC 1973) over US-A-5 652 708 (called D3 at point I.6 in the decision under appeal). In an "Obiter Dictum" at point IV, the examining division stated that the amendments to claims 1 and 7 of the first and second auxiliary requests did not introduce anything beyond what had been considered as not inventive. These requests were therefore refused under Rule 86(3) EPC 1973.
- II. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the main, first, or second auxiliary request before the examining division, or the third auxiliary request filed with the statement setting out the grounds of appeal. The appellant also made an auxiliary request for oral proceedings.
- III. In the communication accompanying the summons to oral proceedings, the Board summarised the issues to be discussed and expressed doubts about the clarity of the claims as well as whether they had technical character and/or involved an inventive step.
- IV. In a response, it was stated that the appellant would not be represented at the oral proceedings.

V. At the oral proceedings, which took place in the appellant's absence, the Board discussed the case and the Chairman announced the decision.

VI. Claim 1 of the main request reads as follows:

"An environmental impact estimation method comprising:  
storing information related to reuse objects and recycle objects in a memory unit (18);  
performing life cycle modeling to make a life cycle model, the life cycle modeling including reading the information related to the reuse objects and the recycle objects from the memory unit;  
predicting recovery distribution of products used as the reuse objects; and  
evaluating an environmental impact and a cost to bear in reuse or recycle based on prediction results obtained by the predicting; characterized in that  
the object information stored is related to reuse objects and recycle objects of previous generation products every production period thereof;  
in that the life cycle modeling is performed to determine some of the reuse objects and the recycle objects which enable to be diverted to a new product from the previous generation products using the read object information; and  
in that the predicting predicts a product recovery quantity at an arbitrary time point using a superposition distribution of two recovery quantity distributions defined by a recovery quantity and each of a product worth life and a product useful life."

Claim 1 of the first auxiliary request adds to the end of claim 1 of the main request "the product worth life

corresponding to a period during which the product maintains its value for a product user".

Claim 1 of the second auxiliary request adds to the end of claim 1 of the first auxiliary request "and the product useful life corresponding to a period during which a product maintains a failure rate smaller than a predetermined failure rate demanded for the product".

In claim 1 of the third auxiliary request, the words "and recycle objects" have been deleted from the first feature. The characterising part has been replaced by:

" the object information stored is related to reuse objects and recycle objects of previous generation products manufactured in every production period;

in that the life cycle model represents which reuse objects of the previous generation products should be diverted to which next generation product based on the information read out from the memory, the life cycle modelling including displaying icons representing the reuse objects and the next generation product on a display device and designating which reuse object is diverted to which of the next generation products by referring to displayed icons; and

in that the recovery distribution prediction comprises predicting a product recovery quantity using a superposition distribution of two recovery quantity distributions defined by a recovery quantity and each of a product worth life and a product useful life, the product worth life corresponding to a period during which the product maintains its value for a product user; and by

calculating a time-dependent balance between the supply of reuse products and the demand for new products, based on the result of the life cycle modelling and the product recovery quantity."

VII. The appellant argued essentially as follows:

The invention contained an inventive step in a field which was not excluded from patentability. With the present invention, a product recovery quantity at an arbitrary time point was predicted using a superposition distribution of two recovery quantity distributions defined by a recovery quantity and each of a product worth life and a product useful life. As a result of this, a truer recovery quantity prediction could be obtained. Whilst the invention used mathematical modelling, the quantities being processed represented real life objects and processes, and the result of the prediction was used in the overall manufacturing process. Further, it was implicit from the claim that there had to be some form of user interface and interaction.

It would be out of line with the progression of case law from VICOM onwards, to refuse these claims. Physical processes controlled by mathematical methods were normally allowable, as for example in decision T 953/94. The Board of Appeal in that case found allowable a method of controlling a physical process based on analysing a functional relationship between two parameters of the physical process. Various sets of lines were displayed on the screen of a VDU, and then control signals for adjusting a parameter were generated, as a result of studying the various sets of

lines. There seemed to be a sufficiently close correspondence of the facts of that case with the facts of the present case to be able to draw a useful analogy. Both were involved in manufacturing processes, and both involved user interaction.

The claims of the first and second auxiliary requests defined the product worth life and product useful life more clearly.

The independent claims of the third auxiliary request specified that the life cycle model represented which reuse objects of the previous generation products should be diverted to which next generation product, based on the information read out from memory. It further specified using icons to represent the reuse objects and the next generation products, and to designate which reuse object was diverted to which next generation product. It further specified at the end of each claim the calculation of a time-dependent balance between supply and demand, based on the result of the life-cycle modelling and the product recovery quantity. These features were not disclosed in the available prior art and made an additional inventive technical contribution.

With the benefit of this invention, an operator, using the display, could designate visually which reuse object was to be diverted to which next generation product, and the operator could determine the supply-demand balance. Accordingly, the invention included the machine-operator interface which was inherent in the manufacturing process.

## Reasons for the Decision

### The invention

1. The application concerns aiding planning, development, design and estimation of an environmentally conscious product (see paragraph [0001] of the application). In particular, a method of estimating the impact on the environment and the cost of developing multi-generation products (e.g. a computer or a display - products B and C in Figure 3) that reuse and recycle objects from products of previous generations (e.g. the 14-inch display or the "main body" from product A).
2. According to Figure 2, the method has the following basic steps:
  - (a) Producing a life cycle model (Figure 3) that determines which parts of the previous generation product can be reused/recycled in the next generation (see paragraphs [0037],[0038],[0059]).
  - (b) Predicting the number of products to be manufactured and the number of reused and recycled parts (paragraphs [0039] to [0041],[0060]).
  - (c) Evaluating the environmental impact, e.g. of CO<sub>2</sub> emissions, and cost of manufacturing the products and reusing/recycling old parts (paragraphs [0042] to [0045],[0061],[0062]).
  - (d) Displaying the total cost and CO<sub>2</sub> emissions (Figure 7 and paragraphs [0046],[0063]).
3. The Board understands the main aspects of the invention to be the idea that the life cycle model must be applied to multi-generation products in order to take



into account the effect of reuse and recycling of previous products (paragraph [0017]), and the specific approximation used to predict the number of products available for reuse and recycling ("recovery quantity distribution" - grounds of appeal, page 2, paragraph 1). The latter is approximated to be a superposition of two distributions with peaks at the product worth life and the product useful life, respectively, measured from the time of peak production (Figure 6b). The product worth life corresponds to a period during which the product maintains its value for a product user. The product useful life corresponds to a period during which a product maintains a failure rate smaller than a failure rate that is demanded. The product useful life and product worth life are determined for each product by a user of this system (the person designing and developing the product to be evaluated) based on real conditions and experience (paragraph [0053]).

4. The recovery quantity distribution is used to predict the number of parts that will be available for reuse and recycling in future products. This information, together with the costs of production, reuse and recycling, is used to estimate the overall cost of the product. The same applies to the estimation of the overall impact of the product on the environment (paragraphs [0061],[0062]). Figure 7 shows that the reuse leads to an approximate 10% saving in cost and CO<sub>2</sub> emissions (paragraph [0063]).
  
5. The third auxiliary request introduces the concepts of allowing a visual designation of reuse objects and associated next generation products and of obtaining an accurate prediction of reuse/recycling of old products

to enable a "time-dependent balance" between the parts/materials obtained and the demand in new products of the next generation (paragraphs [0013],[0019] to [0021], and grounds of appeal, end).

**Main request**

6. The Board first notes that it is not particularly clear what the object of method claim 1 is, nor how this is achieved. Firstly, claim 1 is for an "environmental impact estimation method", but the fourth step introduces the idea of estimating the cost. Secondly, the method only mentions the environmental impact/cost of the reuse/recycling, but not the manufacturing of the product itself, which appears to be an important parameter in the overall process. Finally, the wording of the critical feature of the prediction of the recovery quantity distribution is also not clear.
  
7. However, even if one were to interpret the claims in the light of the overall disclosure of the application given above, the majority of the steps (life cycle modelling, predicting, evaluating) are typical tools of operational research that normally have not been considered technical in the established jurisprudence, in particular if only information is processed for the purpose of management decisions with no clear technical application. In decision T 1147/05 - Environmental impact information/RICOH (not published in OJ EPO), the Board held at point 3.3 that:

"The Board accepts that a reduction of the environmental impact may in certain circumstances constitute a technical effect. One example might

be an invention concerning a less energy-intensive process for the manufacture of a product. On the other hand, as a further example, if an invention is a proposal to abandon - rather than to improve - an energy-intensive process, there is no technical effect but, at most, a physical consequence. A technical effect should not depend solely on the intervention of the human mind. In the present case the invention is not a proposal for a technically superior process but a way of selecting, from a given set of improved processes, the most cost-effective ones. Whether or not the processes are actually implemented, ie whether there is any effect at all, even physical, is not part of the claim. This will be a later decision to be taken by a manager.

"Thus, the potential reductions in environmental impact that the invention serves to determine cannot be regarded as a technical effect."

8. The present Board considers that these statements apply equally to the environmental impact *estimation* method in the present case. The Board does not consider that the remaining feature of the "memory unit" implies any computer implementation that would limit the claim to involve necessarily technical means (see e.g. T 388/04 - Undeliverable mail/PITNEY BOWES, OJ EPO 2007, 16 at point 3).
  
9. Concerning the jurisprudence, the appellant relies on T 208/84 - Computer-related invention/VICOM (OJ EPO 1987, 14) and T 953/94 (not published in OJ EPO). In VICOM, the distinction was drawn at point 5 between a

mathematical method and a technical process. The former is carried out on numbers and the latter is carried out on a physical entity (which may be a material object but equally an image stored as an electric signal) by some technical means implementing the method and provides as its result a certain change in that entity. In T 953/94, the Board found allowable at point 6 a method of controlling a "physical" process using a mathematical model, although a reference to an unspecified "physical process" might, according to more recent jurisprudence, be rejected as a "meta-specification" (see e.g. T 1227/05 - Circuit simulation I/INFINEON TECHNOLOGIES, OJ EPO 2007, 574 at point 3.1.1). However, the present case differs from these cases in that there is apparently no resultant change to or control over any physical entity or process, but merely a processing of information. The Board in T 1147/05 (supra) reached the same conclusion at point 3.4 in respect of VICOM for the environmental impact information system.

10. Furthermore, there are a number of more recent decisions that support the view that the quantities in the present case do not have technical character. For example, T 154/04 - Estimating sales activity/DUNS LICENSING ASSOCIATES (OJ EPO 2008, 46) points out at point 20 that it is not necessarily sufficient to convey technical character that the quantities being processed represent physical parameters. T 365/05 - Bovine herd management/CORNELL RESEARCH FOUNDATION (not published in OJ EPO) comes to similar conclusions at point 5.10, also in consideration of VICOM (supra).

11. Summarising, the Board judges that claim 1 of the main request has no overall technical character, but is merely a mixture of subject-matter excluded as such under Article 52(2) and (3) EPC, specifically mathematical methods, methods for performing mental acts or doing business and presentations of information. Accordingly, the subject-matter of the claim is not an invention in the sense of Article 52(1) EPC.

**First and second auxiliary requests**

12. Claim 1 of the first and second auxiliary requests defines the product worth life and the product useful life, i.e. parameters in the model. However, such definitions, whilst improving the clarity of the claim, still relate to the non-technical quantities mentioned above and cannot contribute to the technical character (Article 52(1) and (2) EPC).

**Third auxiliary request**

13. In the third auxiliary request, there are further unclear features. The recycle objects in the second feature of claim 1 are not mentioned in the first feature. Although the appellant states that the third request is based on the second auxiliary request, neither claim 1 (nor claim 7) define the product useful life. Furthermore, the Board does not consider the amendment of calculating the "time-dependent balance" to be clearly supported. Firstly, the support suggested by the appellant (equivalent to paragraphs [0038] and [0059] of the published application) appears to refer only to the feature of displaying the icons. In fact, although the application mentions "balance" in

paragraphs [0007], [0011], [0012], [0018] and [0020] and "demand balance" in paragraph [0043], all apparently meaning the difference between the number of required and available reuse parts, there is no mention of "time-dependent balance".

14. Again, notwithstanding the above objections, claim 1 could be considered to add the features of displaying icons to represent the reuse objects in the life cycle model and calculating a "time-dependent balance". Although more detailed, this does not change the fact that the method basically processes and displays information (whether about objects or products or properties of products does not matter) that may be useful for business decisions in any production environment. For such decisions all economic factors have to be evaluated, e.g. production cost or, in more recent times, also environmental impact. These factors have to be calculated or estimated. The additional concept of calculating a balance (whatever it may be) is such a calculation. In the Board's view, a technical effect would only arise if the method were specifically used for producing a concrete product. In the present case, an implementation in this sense is left open, and the result of the method is only data, e.g. presented in a report or used in a presentation that may serve any purpose.

15. Thus in the Board's view, the only technical feature in claim 1 is the above-mentioned feature of displaying icons representing the reuse objects (e.g. as in Figure 3) on a display device. However, displaying parameters in a computer information processing system

using icons is notorious and cannot contribute to inventive step.

16. Accordingly, claim 1 of the third auxiliary request does not involve an inventive step (Article 56 EPC 1973).

**Examining division's arguments**

17. The examining division refused the application with the COMVIK line of argumentation that the difference over D3 was merely the specific mathematical model used for the recovery distribution, namely the two peak approximation, which did not have technical character, in this particular context of environmental impact estimation.
18. This argument must also be correct because the Board's arguments, which apply to all the features of the claim, apply *ad maiore ad minus* to the more limited number of features representing the differences between the claimed subject-matter and the prior art considered by the examining division.
19. There being no further requests, it follows that the appeal must be dismissed.

**Order**

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

The appeal is dismissed.

The Registrar:

The Chairman:

T. Buschek

S. Steinbrener