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D E C I S I O N
of 25 July 1994

Case Number: T 0021/93 - 3.4.1

Application Number: 83112359.1

Publication Number: 0111317

IPC: G07B 17/02

Language of the proceedings: EN

Title of invention:
Methods and apparatus for modifying a firmware variable in an electronic postage meter

Patentee:
PITNEY BOWES INC.

Opponent:
Francotyp- Postalia GmbH

Headword:
-

Relevant legal provisions:
EPC Art. 56, 114(2)

Keyword:
"Analogous use of a generally known programming technique"
"Late-filed evidence for technical facts submitted in due time"
"Inventive step: no"

Decisions cited:
-

Catchword:
-

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Case Number: T 0021/93 - 3.4.1

D E C I S I O N
of the Technical Board of Appeal 3.4.1
of 25 July 1994

Appellant: (Opponent)
Francotyp- Postalia GmbH
Postfach 15 14 84
D-13362 Berlin (DE)

Representative:
Thoenes, Dieter, Dr.
Schaumburg, Thoenes & Thurn
Mauerkircherstrasse 31
D-81679 München (DE)

Respondent: (Proprietor of the patent)
PITNEY BOWES INC.
One Elmcroft
Stamford
Connecticut 06926-0790 (US)

Representative:
Avery, Stephen, John
Hoffmann, Eitle & Partner
Patentanwälte
Postfach 81 04 20
D-81904 München (DE)

Decision under appeal: **Decision of the Opposition Division of the European Patent Office dated 3 November 1992 rejecting the opposition filed against European patent No. 0 111 317 pursuant to Article 102(2) EPC.**

Composition of the Board:

Chairman: G. D. Paterson
Members: H. J. Reich
R. K. Shukla

Summary of Facts and Submissions

I. The Respondent is owner of European patent No. 0 111 317.

The independent granted claims read as follows:

"1. A method for modifying a firmware variable in an electronic postage meter comprising the steps of:

storing a program for operation of the electronic postage meter;

providing data in non-volatile memory external to the stored program which data is capable of modifying a variable in the program to change the action of the program; and

accessing such external data during operation of the electronic postage meter to change the action of the program in accordance with the presence of the external data.

5. A method for modifying a variable in firmware in an electronic postage meter comprising the steps of:

storing a program for operation of the electronic postage meter in at least one ROM;

setting data in non-volatile memory external to the stored program; and

modifying a variable in the firmware in accordance with the external data.

7. Apparatus for modifying a variable in firmware in an electronic postage meter comprising:

ROM means (14) for storing a program for the electronic postage meter;

non-volatile memory means (24);

data stored in said non-volatile memory means (24) for changing the actions of the firmware; and

means (10,12) interconnecting said ROM means (14) and said non-volatile memory means (24) for providing communication therebetween to access said data and change the actions of the firmware in accordance with the presence of said data in said non-volatile memory means (24)."

Claims 2 to 4 are dependent on Claim 1, Claim 6 depends on Claim 5 and Claims 8 to 15 are dependent on Claim 7.

II. This patent was opposed by the Appellant on the grounds of lack of novelty and inventive step having regard to prior art documents:

D1: GB-A-2 079 223
D2: "Regelungstechnik und Prozeßdatenverarbeitung", Vol. 21, 1973, No. 12, pages 377-383 and Vol. 22, 1974, No. 1, pages 25-29;
D3: "Elektronik" No. 10, 1973, pages 345-352, and
D4: DE-A-2 041 537.

III. The Opposition Division rejected the opposition on the following grounds: In document D1 there is no suggestion to provide data in a non-volatile memory external to the stored program which data is capable of modifying the action of the program. Also none of the cited documents discloses the principle of altering firmware variables depending on data stored in a non-volatile memory. The fact that documents cited during opposition proceedings and in the European Search Report do not disclose the advantageous variable modifying technique of the independent claims of the patent under appeal, adds weight to the Respondent's argument that at the priority data of the patent, programming technology was not nearly as widespread or well known as it is now.

IV. The Appellant lodged an appeal against the decision of the Opposition Division, citing inter alia the following new documents:

D5: "Funkschau" 9 January 1981, pages 87 to 89;
D7: "Einführung in die Mikroprozessortechnik" Texas Instruments Deutschland GmbH, 1977, pages 195 to 214.

V. The Respondent filed on 5 July 1994 a new set of claims as a basis for an auxiliary request.

The independent claims of this auxiliary request read as follows:

"1. A method for modifying a firmware variable in an electronic postage meter comprising the steps of:

storing a program for operation of the electronic postage meter;

providing a non-volatile memory (24) for storing critical accounting data during said operation;

providing further data in said non-volatile memory external to the stored program which further data is capable of modifying a variable in the program to change the action of the program; and

accessing such external further data during operation of the electronic postage meter to change the action of the program in accordance with the presence of the external further data.

5. A method for modifying a variable in firmware in an electronic postage meter comprising the steps of:

storing a program for operation of the electronic postage meter in at least one ROM;

providing a non-volatile memory (24) for storing critical accounting data during said operation;

setting further data in said non-volatile memory external to the stored program; and

modifying a variable in the firmware in accordance with the external further data.

7. Apparatus for modifying a variable in firmware in an electronic postage meter comprising:

ROM means (14) for storing a program for the electronic postage meter;

non-volatile memory means (24) for storing critical account data;

further data stored in said non-volatile memory means (24) for changing the actions of the firmware; and means (10,12) interconnecting said ROM means (14) and said non-volatile memory means (24) for providing communication therebetween to access said further data and change the actions of the firmware in accordance with the presence of said further data in said non-volatile memory means (24)."

Claims 2 to 4 of the auxiliary request are dependent on Claim 1, Claim 6 depends on Claim 5 and Claims 8 to 15 are dependent on Claim 7.

VI. Oral proceedings were held on 25 July 1994, at the end of which the Appellant (Opponent) requested that the decision under appeal be set aside and the European patent No. 0 111 317 be revoked. The Respondent (Patentee) requested that the appeal be dismissed and that the patent be maintained as granted (main request), or on the basis of the auxiliary request filed on 5 July 1994.

VII. In support of his request, the Appellant made essentially the following submissions:

(a) In contrast to patent literature, the vast amount of literature published in the field of data processing is not classified according to its technical features, so that it is not possible to carry out a systematic search for a specific feature, and one has to leave it to chance to find a relevant document. For these reasons, documents D5 and D7 could only be filed after expiry of the opposition period.

(b) Storing a program for operation of an electronic postage meter in at least one ROM (first step) and providing respectively setting data in a non-volatile memory external to the stored program (second step) is disclosed in document D1. Hence, the subject-matter of all independent claims of the patent under appeal is distinguished over this nearest prior art in that the external data is capable of changing the action of the program during operation of the postage meter (third step).

(c) Postage meters started to be controlled by computers in 1973. Therefore, at the priority date of the patent under appeal an expert in the field of postage meters necessarily required knowledge in electronic data processing and must be expected to follow at least the basic developments in programming such as reported in document D5 which is intended to inform the interested non-professional. Document D5 (in particular page 89, left-hand column, paragraph 2) discloses all three claimed programming steps as such in a personal computer: storing a program for operation (user program), storing data (system parameters) in a

non-volatile memory (floppy disk) external to the program for operation, and accessing these data during operation to change the action of the program (such as line width, kind of cursor, etc.). The type of changed program action in document D5, (controlling line width), is directly comparable with those disclosed in the patent under appeal (setting phantom zeros and the decimal point position). A simple replacement of the personal computer by a postage meter leads to the subject-matter of all independent claims of the patent under appeal. Applying a popular method of programming such as disclosed in document D5 in a conventional postage meter as disclosed in document D1 needs no inventive skill.

(d) In customising a programme controlling an apparatus, the principle followed is to simplify the adaptation to diverging systems by a common standard software for all foreseeable uses of the program. This principle is also derivable from document D5, page 89, left-hand column, paragraphs 2 and 5. The integration of foreseeable actions of the program by a corresponding parameter file external to the program for operation is expanded in that document D5 specifies that a user's individual needs can be satisfied by an additional special parameter file on the floppy disk storing a personal parameter system which the user may enter himself via a particular generator program. These statements in document D5 would allow a skilled person to recognise that the programming method of document D5 allows to simplify the adaptation of a programmed electronic postage meter to the requirements of a variety of different postal systems according to the technical problem underlying the patent under appeal.

(e) The method of programming applied in the patent in suit would be derivable also from the three level memory organisation of the cash register disclosed in document D7, in particular pages 206 and 207. It provides constructionally separable memory units for storing the program for operation and for the data (value added tax percentages) which change the action of the program. Hence, in the event that the wording of the claims under consideration is construed to mean storing the program for operation and the data which change its action in separate constructional units, such apparatus feature is known from document D7.

(f) Only the independent claims of the auxiliary request contain implicitly the feature that the data which change the action of the program are not accessible to the user of the postage meter. Such a feature - when interpreted as defining the person who is entitled to change these data - is not a technical feature, and - when interpreted as defining a measure for securing data, for example a security housing or a code - is generally known. Therefore the subject-matter added to the independent claims of the auxiliary request does not constitute an inventive step in the subject-matter of these claims.

VIII. The above submissions were contested by the Respondent who argued essentially as follows:

(a) Even on the basis of hindsight, it took 9 years until documents D5 and D7 were found so that the invention cannot be obvious. Moreover both late-filed documents are not relevant and should be disregarded under Article 114(2) EPC.

(b) Conventional postage meters such as disclosed in document D1 use a non-volatile memory in order to avoid the loss of critical accounting data in the event of energy failure. The present invention makes use of this non-volatile memory in a new way by storing therein data which change the action of the program in order to adapt - via one standard program - the operation of the postage meter to the requirements of the postal systems of different countries, saving thereby manufacturing costs and increasing the security of the meter.

(c) The method of programming disclosed in document D5 would not be relevant to that of the present invention, since the user program and the parametric data are both stored on the same floppy disk and are both loaded into the working memory when the computer is switched on; see D5, page 87, right-hand column, paragraphs 2 and 3. Hence, document D5 would give no hint to separate the program for operation from data which change the action of the program. In the present invention it is essential that whilst the program is stored in ROM, the data which changes the action of the program is stored in a non-volatile memory, i.e. in a different memory from the program whose action is to be changed.

(d) Furthermore, there would be a significant distinction between changing the position of the decimal point according to an embodiment of the invention on the one hand and changing the choice of line width or cursor type as disclosed in document D5. In the invention the action of the program is changed, in the prior art disclosed in document D5 only the parametric data is changed without change of the program itself. The change of

the parameter system in document D5 by means of a generator program has no effect on the action of the program.

(e) The change of the numerical value of the value-added tax percentage in the cash register disclosed in document D7 has the effect that the program carries out the same action, only in a different way. Therefore, both late-filed documents do not hint to a skilled person to provide data which cause the program to do something different.

(f) The feature added into the claims of the auxiliary request that the non-volatile memory stores the critical accounting data is disclosed in the description of the patent under appeal column 5, line 52; column 4, line 4 and column 3, line 38. This fact implies to the skilled person that the non-volatile memory is provided in a secure housing. The final step in customising is effected before sealing the secure housing, so that the data changing the action of the program are not available to the user. In the method of programming disclosed in document D5 the program for operation, the generator program and the parameter system are all stored on the floppy disk which is accessible to the public. Giving thus no hint how to secure data, a skilled person would not take into account the teaching of document D5.

IX. At the conclusion of the oral proceedings, the decision was announced that the decision of the Opposition Division is set aside and that the European patent is revoked.

Reasons for the Decision

1. *Admissibility of document D5*

The Appellant contended in the Notice of Opposition, pages 2 and 3, that the only difference from the nearest prior art disclosed in document D1 was the capability of the data stored in the non-volatile memory to change the action of the program of operation, i.e. a particular programming technique which had been generally known for some time. In the appeal proceedings the Appellant based his main ground of opposition - lack of inventive step - on the same framework of technical facts as set out in the Notice of Opposition, and additionally cited document D5 in support of such ground. This document lies within the framework of the Notice of Opposition and does not change the nature of the Appellant's case. In the Board's view this document is sufficiently relevant to be admitted into the appeal proceedings.

2. *Inventive step - Main Request*

2.1 From the nearest prior art according to document D1, it is known:

(a) in the wording of **Claim 1** of the main request: "A method comprising the steps of storing a program for operation of an electronic postage meter (see D1, Q5 in Fig. 11; page 4, lines 25 and 26); providing data in non-volatile memory external to the stored program (Q2 in Fig. 11, page 7, lines 16 to 18 and page 11, lines 11 to 14)",

(b) in the wording of **Claim 5** of the main request: "A method comprising the steps of storing a program for operation of the electronic postage meter in at

least one ROM (D1, page 4, line 25), setting data in non-volatile memory external to the stored program (page 10, lines 51 to 54)";

(c) in the wording of **Claim 7** of the main request: "Apparatus comprising ROM-means for storing a program for the electronic postage meter (D1, Q5, page 4, lines 25 and 26), non-volatile memory means (Q2, page 7, lines 7 to 16); data stored in said non-volatile memory means; and means interconnecting said ROM means and said non-volatile memory means for providing communication therebetween (D1, page 7, lines 23 to 39)".

2.2 The object of the present invention is to provide a firmware controlled electronic postage meter with a general program in which the actions of the firmware may be changed for satisfying the requirements of a variety of different postal systems by means of the same firmware, so that programming costs are minimised; see the patent under appeal, column 1, line 54 to column 2, line 6. Starting from the nearest prior art according to document D1, the objective problem underlying the patent in suit is to rationalise the customising of a conventional postage meter. In the Board's opinion, simplifying the manufacture of a product which is sold to customers with diverging technical needs belongs to a skilled person's normal activities. Hence, the formulation of the above objective technical problem does not contribute to an inventive step in the subject-matter of Claims 1, 5 or 7 of the main request.

2.3 The above objective problem is solved in that:

(a) according to the remaining wording of **Claim 1** of the main request:

the data stored external to the operation program "is capable of modifying a variable in the program to change the action of the program", so that the claimed method is one "for modifying a firmware variable" and comprises the step of "accessing such external data during operation of the electronic postage meter to change the action of the program in accordance with the presence of the external data",

(b) according to the remaining wording of **Claim 5** of the main request:
the method comprises the step of "modifying a variable in the firmware in accordance with the external data", so that the claimed method is one "for modifying a variable in firmware in an electronic postage meter",

(c) according to the remaining wording of **Claim 7** of the main request:
the data stored is "for changing the firmware" and the communication between program ROM and non-volatile memory means is "to access said data and change the actions of the firmware in accordance with the presence of said non-volatile memory means".

The three solutions according to the wording of Claims 1, 5 and 7 as specified above are technically identical in that a skilled person arrives at the specific subject-matter of all three claims when he additionally stores in the conventional non-volatile memory Q2 of the postage meter disclosed in D1 data which during the operation of the postage meter change the action of the program for operation stored in ROM Q5. Therefore, it has to be examined whether it was obvious to a person skilled in the art to provide in a

postage meter **external** to its operational program data which, when accessed, change the **action** of the operational program.

2.4 The effect of the external data: "changing the action of the program" is quite general and needs interpretation as to what is meant by the term "action". The embodiment of the claimed "action" disclosed in the patent in suit concerns the particular way of generating a decimal point and phantom zeros, which way depends on the particular external data accessed. Hence, the term "action" clearly comprises a particular way of presenting information. One effect produced by the system parameters disclosed in document D5 is the generation of a particular printer line width; see D5, page 89, left-hand column, line 14. The conventional effect thus also represents a particular way of presenting information. The program action derivable from document D5 and that disclosed in the patent in suit both generate the same category of firmware properties. Therefore, the conventional program action, in the Board's view, allows the skilled person to recognise that the conventional method of programming according to document D5 achieves the desired firmware properties for customising. There is no subject-matter disclosed in the patent in suit which permits to give the term "action" a technical interpretation narrowing the term "action" in such a way that the prior art disclosed in document D5 lies outside the claimed term "action". For the above reasons, the Board does not accept the Respondent's submission set out in paragraph VIII (d) and (e) above.

2.5 Contrary to the Respondent's opinion in paragraph VIII (c) above, the loading of the user program and of the parameter system from the floppy disk into the working memory of the personal computer does not change the fact

that the parameter system of document D5 represents and is recognisable as data which is stored **external** to the program for operation and which is complete with regard to all needed program actions that are foreseeable by the producer of the personal computer. Therefore, in the Board's view the competent skilled person producing firmware will easily recognise that the programming method disclosed in document D5 allows to change a variable in the **same** given firmware by means of **one** general program in order to satisfy **all** foreseeable needs of the user. The Board regards such a skilled person as able to verify that the list of foreseeable user needs such as represented by the conventional parameter system of document D5 - without generator program for entering individually added user needs - corresponds to the list of foreseeable requirements of a variety of different postal systems. Hence, a skilled person would derive from the disclosure in document D5 that the method for programming disclosed in document D5 is capable of solving the objective problem indicated in paragraph 2.2 above under the required generic limit indicated in paragraph 2.3 above, so that he **would** make use of it in the postage meter disclosed in document D1 without hindsight (see paragraph VIII (a) above).

2.6 When implementing the method of programming disclosed in document D5 into the postage meter disclosed in document D1, the skilled person would realise that in the firmware of document D1, the program for operation is already stored in a ROM (see paragraph 2.1(b) above), and that there are additionally a variety of detached memories (see for instance Q2 or Q4 in Figure 11 of D1); i.e. there is sufficient hardware capacity to provide storage of the firmware variable changing data **external** to the stored program for operation. The skilled person's decision to store the firmware variable changing data away from the program ROM in the existing

non-volatile part of the conventional memory hardware, in the Board's view, has no unforeseeable technical effects but is an easily realisable adaptation to the generally known user requirement of storage security. Though being "essential" (see paragraph VIII (c)), the separate storage of data and program is an element of the conventional method for programming applied and the advantages of storing the data in a non-volatile way are known in practice. Hence, contrary to the Respondent's submission in paragraph VIII (b), in the Board's view the new use of the non-volatile memory means of document D1 for storing firmware variable changing data was obvious to the skilled person.

2.7 For the reasons set out in paragraphs 2.1 to 2.6 above, in the Board's judgment, Claims 1, 5 and 7 of the main request lack an inventive step within the meaning of Article 56 EPC.

3. *Inventive step - Auxiliary Request*

3.1 Claims 1, 5 and 7 of the auxiliary request add to the subject-matter of Claims 1, 5 and 7 of the main request the feature that the non-volatile memory is

"for storing critical accounting data during said operation", so that the firmware variable changing data are for reasons of clarity amended into "further" data stored in the non-volatile memory."

3.2 This additional feature is disclosed in document D1; see page 10, lines 51 to 55.

3.3 With reference to the Respondent's submission as set out in paragraph VIII (f) above that this additional claim feature implies a storage of the firmware changing data within a secure housing, it follows automatically that

the non-volatile memory in the technical starting point of the present invention must also be located within a secure housing. Hence, the reasoning in paragraphs 2.2 to 2.6 above is equally applicable to the subject-matter of the independent claims of the auxiliary request.

3.4 Moreover, contrary to the submission set out in paragraph VIII (f) above, when the skilled person starts to improve the customising of the postage meter disclosed in document D1, he would know of the social need to make firmware changing data inaccessible to the public, and would thus store such data within the secure housing and thus in a non-volatile memory.

3.5 For the above reasons, in the Board's judgment, the subject-matter of Claims 1, 5 and 7 of the auxiliary request, lacks an inventive step within the meaning of Article 56 EPC.

4. Claims 2 to 4, 6 and 8 to 15 of the main and auxiliary requests fall because of their dependency on unallowable independent claims.

Order

For these reasons it is decided that:

1. The decision of the Opposition Division is set aside.

2. The European patent is revoked.

The Registrar: The Chairman:

M. Beer G. D. Paterson