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**D E C I S I O N**  
**of 4 March 2004**

**Case Number:** T 0029/01 - 3.2.5

**Application Number:** 93310302.0

**Publication Number:** 0604160

**IPC:** B41J/325

**Language of the proceedings:** EN

**Title of invention:**

Thermal printing apparatus capable of variable speed printing

**Patentee:**

PITNEY BOWES, INC.

**Opponent:**

NEOPOST LTD

**Headword:**

-

**Relevant legal provisions:**

EPC Art. 56

**Keyword:**

"Inventive step - yes"

**Decisions cited:**

**Catchword:**

-



Case Number: T 0029/01 - 3.2.5

**D E C I S I O N**  
**of the Technical Board of Appeal 3.2.5**  
**of 4 March 2004**

**Appellant:** NEOPOST LTD  
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**Decision under appeal:** Interlocutory decision of the Opposition  
Division of the European Patent Office posted  
20 November 2000 concerning maintenance of  
European patent No. 0604160 in amended form.

**Composition of the Board:**

**Chairman:** W. Moser  
**Members:** H. M. Schram  
W. R. Zellhuber

## Summary of Facts and Submissions

- I. The appellant (opponent) lodged an appeal against the decision of the Opposition Division maintaining the European patent No. 0 604 160 in amended form.

The Opposition Division held that the grounds of opposition under Article 100(a) EPC (lack of novelty, Article 54 EPC, and lack of inventive step, Article 56 EPC) did not prejudice the maintenance of the patent in amended form.

- II. The following documents were *inter alia* referred to in the appeal proceedings:

D1: EP-A 0 434 340

D2: US-A 5 064 301

- III. Oral proceedings were held before the Board of Appeal on 4 March 2004.

- IV. The appellant (opponent) requested that the decision under appeal be set aside and that the patent be revoked in its entirety.

The respondent (patent proprietor) requested that the appeal be dismissed.

- V. Independent claim 1 of the main (sole) request (i.e. claim 1 as maintained by the Opposition Division) reads as follows:

"1. A thermal printing apparatus comprising a base (13) supporting a registration wall, said registration wall (17) removably supporting a thermal ribbon cassette (21), a print deck (15), a thermal print head (20) carried by the registration wall and extending over the deck to define a print station, a platen drive assembly (26) mounted in said base for biasing an envelope against the thermal print head and causing the envelope to traverse the thermal print head during a print cycle of the thermal printing apparatus, the latter having a drive motor (44) responsive to a micro controller, characterised by said micro controller being programmable and programmed to operate said drive motor of said platen assembly at a plurality of operating speeds, said micro controller being further programmed to synchronously actuate said thermal print head, and selection means (33, 35) responsive to the presence of a said thermal ribbon cassette (21) containing a wax ink formulation or a said thermal ribbon cassette (21) containing a polymer ink formulation to cause said micro controller to select one of a plurality of the print cycle speeds according to the ink formulation concerned."

VI. The appellant argued essentially as follows:

Document D2 represented the closest state of the art. This document disclosed a thermal printing apparatus with a ribbon cassette housing a polymer ink ribbon for printing in a hot release mode or a wax ink ribbon for printing in a cold release mode. Admittedly, this document did not disclose selecting a printing speed according to the ink formulation concerned. However, it was known in the art that printing quality and printing

speed were reciprocally related and that the optimal printing speeds in the hot and cold release modes were different. That document D2 did not propose selecting a different printing speed for each mode did not mean that it discouraged the skilled person to make this option available. It rather reflected that the person skilled in the art was faced with a conventional trade-off situation: making this option available in a thermal printing apparatus would be an improvement, which, however, would also require more resources. Making all efforts to improving the printing quality of a postal franking machine with a view to preventing fraud was imperative for an engineer working in this field. For achieving this goal this engineer would take all relevant parameters, such as print medium quality, ink formulation, printing speed and the trajectory of the ink ribbon with respect to the print medium, into account. The person skilled in the art would thus arrive at the invention without exercising inventive skills on the basis of document D2 alone. Document D1 taught that for achieving high resolution printing a slow print rate was beneficial. A combination of documents D2 and D1 also led to the subject-matter of claim 1 of the main request. Claim 1 of the main request was incomplete in the sense that it did not specify that the trajectory of the ink ribbon had to be adapted for each ink formulation in order to solve the problem posed.

VII. The respondent argued essentially as follows:

Claim 1 of the main request was not about selecting different paper speeds for each ink formulation. Rather, it was about selecting different print cycle

speeds, i.e. it was about different frequencies of energisation of the print head (see column 7, lines 26 to 44, of the patent in suit as amended). Document D1 was teaching away from the invention, since this document required that the frequency of energisation of the elements of the print head, i.e. the print cycle time of the head, be maintained unchanged (see column 5, lines 52 to 55 and column 6, lines 23 to 29 of document D1). Document D2 could be considered to represent the closest state of the art. This document discussed the disadvantages of a conventional dual-mode thermal printer, whereby an operator was operating a switch to bring a release arm in one of two positions, one for a ribbon cassette containing a wax ink formulation and one for a ribbon cassette containing a polymer ink formulation (see column 2, line 31, to column 3, line 39, of document D2). In order to obviate these disadvantages, document D2 proposed equipping the printer with a ribbon cassette mounted on a carriage and movable toward and away from the printing surface. This document did not discuss changing the feed speed nor changing the printing cycle speed. The appellant had not proven that it was known in the art that each mode of operation had its own optimal print cycle speed. Moreover, the person skilled in the art would consider other possibilities to improve the printing quality, such as increasing the energisation of the print head, or reducing the feed rate of the print medium. Since none of the documents cited by the appellant disclosed selecting one of a plurality of print cycle speeds according to the ink formulation concerned, the subject-matter of claim 1 involved an inventive step. The embodiment of a thermal ribbon cassette shown in Figure 6 of the patent in suit, which

allowed an extended contact length between ribbon and print medium for wax-based ribbons, was a preferred embodiment (see column 8, line 56, to column 9, line 17, of the patent in suit as amended). There was no need to incorporate additional features of this preferred embodiment in claim 1 of the main request.

## **Reasons for the Decision**

### 1. *Interpretation of claim 1*

- 1.1 The expression "print cycle speed" employed in the characterizing part of claim 1 is not defined in the patent in suit. It may be inferred from the preamble of claim 1 that the duration of a "print cycle" corresponds to the time  $t$  [s] it takes for the envelope to traverse the thermal print head of the thermal printing apparatus. Assuming that the heater elements of the print head are formed in a single row and arranged perpendicular to the direction of travel of the envelope in conjunction with the thermal ribbon, and that during a print cycle the envelope advances a distance  $\delta$  [m], the printing speed corresponds to the feed rate of the print medium *during a printing cycle*, and takes the value  $\delta/t$  [m/s]. In the judgement of the Board, the expression "print cycle speed" thus seems to be synonymous with printing speed.

This interpretation is corroborated by the following facts. The expression "print(ing) cycle speed" is referred to in column 1, lines 15 to 29, of the patent in suit, where prior art is discussed. In document EP-A 0 165 601, which is cited in said passage, the printing

cycle is the machine cycle of the postage meter, i. e. the time it takes to print a postal value and other indicia on a tape (see page 4, lines 1 to 11, page 6, lines 7 to 9, in conjunction with page 7, lines 1 to 4, page 9, lines 1 to 6, and page 2, lines 1 to 5, of said document). The interpretation of the expression "print cycle speed" as given by the Board is in line with the meaning of the common understanding of said expression in the light of document EP-A 0 165 601.

In the embodiment described in column 7, line 4ff, of the patent in suit, the envelope is fed at a *uniform* rate (see column 7, lines 8 to 11). In column 1, lines 30 to 32, and in column 2, lines 28 to 34, of the patent in suit the term "printing speed" is employed (see also column 7, lines 31 to 40, and column 8, lines 6 to 11, of the patent in suit). Lowering the printing speed means that the duration of the printing operation, i.e. the print cycle, must be correspondingly longer, since the distance  $\delta$  for a given postage indicia is fixed and independent of the type of ribbon used.

The Board is thus led to presume that the expressions print cycle speed, printing speed and feed rate may be used interchangeably and do have the same connotation.

- 1.2 A totally different concept is the "print cycle" of a print head, which is expressed as the frequency of energising the elements of the print head, or as the time for a heating and cooling cycle of the elements, see e.g. document D1, column 5, lines 52 to 55. The "print cycle" of a print head is normally a hard-wired characteristic of the print head having a fixed value,



whereas the "print cycle" of a printing operation depends on what is to be printed. In column 7, lines 37 to 40, of the patent in suit, it is stated that the printing operation takes about 525 ms for a polymer based ink transfer ribbon formulation and about 425 ms for wax based ink transfer ribbon. By way of contrast, a typical print cycle time of a print head is in the order of a few milliseconds, see e.g. document D1, where the minimum print cycle time of the print head is said to be currently approximately 2 ms (see column 5, lines 55 to 57, and Figure 5).

The respondent has submitted during oral proceedings before the Board that the print head of the thermal printing apparatus according to the invention was capable of printing a postage indicia in a single print cycle of the print head, in other words, that the printing operation corresponded to one print cycle of the print head. The expression "print cycle speed" in claim 1 thus referred to the print cycle of the print head. This interpretation also held good in case a plurality of print cycles of the print head were needed for printing an indicia.

- 1.3 In the judgement of the Board, the interpretation of the expression "print cycle speed" by the respondent does not seem to be in line with the disclosure of the invention in the description, drawings and claims of the patent in suit, seen as a whole. The term "speed" seems to be inappropriate to denote the "print cycle frequency" of the print head, since the latter is normally expressed in number of cycles per (milli)seconds, whereas the former is expressed in units of length per unit of time. However, if the print

head is capable of printing a postage indicia in a single print cycle of the print head, as submitted by the respondent, there is no (feed) length involved, implying that the term "speed" could be equated with frequency. It would thus appear that the interpretation of the expression "print cycle speed" given by the respondent, although unlikely, cannot be completely ruled out.

1.4 When assessing inventive step under point 2 hereinafter, the Board will rely on the interpretation of the expression "print cycle speed" as given under point 1.1 above. The conclusions drawn will be valid, however, irrespective of whether "print cycle speed" refers to the printing speed (feed rate), or to the print cycle of the print head.

1.5 The appellant has also raised the objection that claim 1 did not specify the trajectories of the ribbon for each of the ink formulations. Without the incorporation of said trajectories in the claim, the printing apparatus according to claim 1 was not capable of obtaining an optimal print quality.

This cannot be accepted. Whilst it is true that a further improvement may be obtained if the trajectory of the ribbon is optimized for the type of ribbon used, the EPC does not require that the "best mode" of an invention is claimed. In the description of the patent in suit it is stated in column 2, line 8ff, that the one cassette post located just downstream of the thermal print head is positionable between a first and second position with a view of altering the angle assumed between the print head and the print post.

However, it is made clear in column 1, line 33, of the patent in suit that a preferred embodiment of the invention is described. The contact time between the ribbon and the print medium after printing should preferably be longer for a ribbon with a wax ink formulation than for a ribbon with a polymer ink formulation, allowing the wax to cool in order to release the ribbon. The wording "In a second position of the print post, the cassette construction is particularly suited for containing a polymer ink formulation ..." (cf. column 2, lines 18ff. of the patent in suit) confirms that the presence of a positionable post is merely optional. Moreover, all this is well known in the art, see e.g. document D2, column 2, lines 30 to 37.

2. *Inventive step*

- 2.1 The invention relates to a thermal printing apparatus for printing on envelopes and, more particularly, to a postage meter utilizing thermal printing of a postage indicia on envelopes.

The objective problem the present invention seeks to solve is to improve the print quality of a thermal printing apparatus, which allows selecting a thermal ribbon cassette containing a wax ink or a polymer ink formulation.

This problem is solved by the subject-matter of claim 1. In particular, the invention proposes that the thermal printing apparatus comprises selection means responsive to the presence of a thermal ribbon cassette containing either a wax ink formulation or a polymer

ink formulation, causing the micro controller to select one of a plurality of print cycle speeds according to the ink formulation concerned.

- 2.2 Document D2 represents the closest state of the art. This document discloses a thermal printer with sensing means for detecting the type of ribbon cassette mounted, and drive means responsive to said sensing means for moving said ribbon cassette toward and away from a printing surface according to the type of ribbon cassette mounted (see column 3, lines 42 to 65, column 5, line 44, to column 7, line 14). The ribbon contains a polymer or wax based ink solution, see column 1, line 60, to column 2, line 19.

There is no hint or suggestion in document D2 to select one of a plurality of print cycle speeds (processing speed of the paper stock) according to the type of ribbon cassette mounted.

Document D1 discloses a thermal printer for a franking machine which allows the user to select a high resolution slow printing rate, with a view of attaining a desired high quality of printing on an envelope having a rough surface (see column 6, lines 15 to 29, column 7, lines 15 to 40, and column 8, lines 15 to 32). The thermal printer known from document D1 comprises a single-strike or multi-strike thermal ink transfer ribbon (see column 6, line 32, to column 7, line 40). The print medium is fed past the print head in such a manner as to subject each area of the ink required to be transferred to heating in a succession of heating cycles. To this end feed rate is decreased, whereas the print cycle of the print head is maintained

unchanged. The result is that the area to be printed is overprinted several times, thus enhancing the print quality. There is no disclosure that the thermal ribbon is mounted in a cassette and that the thermal ribbon (cassette) contains a wax ink or a polymer ink formulation. Consequently, there can be no hint or suggestion in document D1 to select one of a plurality of print cycle speeds according to the type of ribbon cassette mounted.

- 2.3 The appellant has argued that the person skilled in the art was aware that the optimal printing speed for a wax ink formulation was different from the optimal printing speed for a polymer ink formulation. He or she would readily realize that the printing quality of the thermal printer known from document D2 could be improved by taking different optimal printing speeds into account.

In the judgement of the Board, this argument is not convincing for the following reasons. Even if the person skilled in the art were aware that ribbons containing a polymer ink formulation require more energy than wax ribbons, there would seem to be other possibilities than the one proposed by the invention to take this into account. For example, the degree of energisation of the print head could be adapted to the type of ribbon used.

- 2.4 It follows from the above that the person skilled in the art, starting from the thermal printer known from document D2, on the basis of his general technical knowledge alone, or in combination with the teaching of

document D1, would not have arrived at the subject-matter of claim 1 in an obvious manner.

Consequently, the subject-matter of claim 1 involves an inventive step.

The subject-matter of claims 2 to 4, which are appendent to the claim 1, similarly involves an inventive step.

## **Order**

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

The appeal is dismissed.

The Registrar:

The Chairman:

M. Dainese

W. Moser