BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS

BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

Internal distribution code:
(A) [ ] Publication in OJ
(B) [ ] To Chairmen and Members
(C) [X] To Chairmen

D E C I S I O N
of 12 January 1999

Case Number: T 0861/96 - 3.2.5

Application Number: 88201929.2

Publication Number: 0357841

IPC: B29C 53/06

Language of the proceedings: EN

Title of invention:
A method of providing score lines in packaging material

Patentee:
Leeuwarder Papierwarenfabriek B.V.

Opponents:
(01) Pechiney, S.A., Courbevoie
(02) SIG Combibloc GmbH

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step (no)"

Decisions cited:
-

Catchword:
-

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0861/96 - 3.2.5

D E C I S I O N
of the Technical Board of Appeal 3.2.5
of 12 January 1999

Appellant: Leeuwarder Papierwarenfabriek B.V.
(Proprietor of the patent) Harlingertrekweg 45
8913 HR Leeuwarden (NL)

Representative: Smulders, Theodorus A.H.J., Ir.
Vereenigde Octrooibureaux
Nieuwe Parklaan 97
2587 BN 's-Gravenhage (NL)

Respondent: Pechiney, S.A., Courbevoie
(Opponent 01) 28 Rue de Bonnel
69433 Lyon Cedex 03 (FR)

Representative: -

(Opponent 02) SIG Combibloc GmbH
Rurstr. 58
52441 Linnich (DE)

Representative: Thielmann, Andreas
Cohausz & Florack
Patentanwälte
Postfach 33 02 29
40435 Düsseldorf (DE)

Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 16 July 1996 revoking European patent No. 0 357 841 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: A. Burkhart
Members: C. G. F. Biggio
V. Di Cerbo

Summary of Facts and Submissions

I. The appellant (proprietor of the patent) lodged an appeal against the decision of the Opposition Division revoking the patent No. 0 357 841.

Opposition was filed against the patent as a whole and based on Article 100(a) EPC (lack of novelty and inventive step).

The Opposition Division held that the grounds of opposition mentioned in Article 100(a) in connection with Article 56 EPC prejudiced the maintenance of the patent having regard to the following prior art:

- a prior use invoked by opponent 02 in its statement of grounds of opposition of 1 December 1994, referring to documents D10 (annexes 1 to 3, filed on 1 December 1994),

- D13: "Packaging Technology", March/April 1987, pages 8 and 9,

- D3: US-A-3 909 582, and

- US-A-4 049 945.

II. During the appeal proceedings the respondent/opponent 02 cited for the first time document

D14: "Laser beam scanning" edited by Gerald F. Marshall, Marcel Dekker Inc., New York - Basel, 1985, pages 193 to 239.

III. Oral proceedings were held before the Board of Appeal on 12 January 1999.

(i) The appellant requested that the decision under appeal be set aside and the patent be maintained as granted (main request) or in amended form on the basis of the auxiliary claim presented during the oral proceedings (auxiliary request).

(ii) The respondents requested that the appeal be dismissed.

(iii) Claim 1 as granted (main request) reads as follows:

"1. A method of providing score lines in single or multilayered packaging material through local evaporation of a portion of said material, using a controllable laser beam, which is movable relative to said packaging material in two mutually perpendicular directions from a fixed point in response to control signals, which define the path of the score line to be provided on the packaging material,
characterised by
- advancing a web of packaging material at a substantially uniform, adjustable speed in a web path past a first laser beam, directed onto a first side of said web so as to locally evaporate material from said first side, thereby forming score lines thereon, said web having a

recurring pattern of printed images appearing on one side thereof

- moving said first laser beam in response to pattern dependent control signals, said signals defining a path of said score lines to be provided in registration with said pattern and being responsive to the speed of the web
- adjusting the focal length of said laser beam so that the focus of the first laser beam is maintained on the first side of the web, while said score lines are being formed thereon
- monitoring positional irregularities in the recurring pattern of printed images on said one side of the web and
- adjusting in response to said monitoring, the pattern dependent control signals so as to maintain said score lines in registration with said pattern."

The auxiliary claim 1, the subject-matter of which is identical with that of claim 1 as granted, reads as follows:

a. A method of providing score lines in single or multilayered packaging material, using a drivable scoring tool, which is movable relative to said packaging material in at least one direction in response to drive signals, the scoring tool defining the path of the score line to be provided on the packaging material
comprising the steps of

b. advancing a web of packaging material at a substantially uniform, adjustable speed in a web path past a scoring tool directed on the first side of said web so as to locally remove material from said first side, thereby forming score lines thereon, said web having a recurring pattern of printed images appearing on one side thereof,

c. moving said scoring tool in response to drive signals with a speed related to the speed of the web,

d. monitoring positional irregularities in the recurring pattern of printed images on said first side of the web and

e. adjusting in response to said monitoring the drive signals for the scoring tool so as to change the relative position of said scoring tool with respect to the moving web in order to maintain said score lines in registration with said pattern

characterised in that

f. the drivable scoring tool is a controllable first laser beam, which for local evaporation of a portion of said material is moved relative to said packaging material in two mutually perpendicular directions from a fixed point in response to pattern dependent control signals, which define the path of the score lines to be provided on the packaging material,

g. the focal length of said laser beam is adjusted so that the focus of the laser beam is maintained on the first side of the web while said score lines are

being formed thereon,

h. the adjusting in response to said monitoring the pattern dependent control signals so as to maintain said score lines in registration with said pattern."

IV. The appellant argued essentially as follows:

Document D10 disclosed a method using a mechanical system of providing score lines in a moving web of packaging material, which method comprised the steps according to paragraphs (a) to (e) of the preamble of the auxiliary claim.

The features according to paragraphs (f), (g), (h) of the characterising portion of the auxiliary claim were not present in the method of D10 and were not suggested by D13.

It was admitted that D13 gave an incentive to replace in packaging applications mechanical equipment by a controllable laser beam, which was able to be deflected over a surface into two mutually perpendicular directions. However, D13 did not disclose or suggest the feature "making score lines on a moving web" nor the features (g) and (h) of the auxiliary claim.

Dynamic focussing used in feature (g) was per se known in the prior art, however there was no hint in the prior art to apply dynamic focussing in accordance with feature (g) in a method for providing score lines on a moving web. Moreover, the choice of feature (g) was not a necessity or the only possibility for obtaining a constant depth of the score lines during deflection of

the laser beam but was a specific choice out of several other possibilities being at the disposal of the person skilled in the art.

An indication that it was not obvious for a person skilled in the art to modify the mechanical system according to D10 by the features (f), (g) and (h) according to the auxiliary claim could be seen in the fact that the application of lasers in the packaging field had been known already for about 20 years before the priority date of the patent in suit, and that none of the giant competitor companies of the patentee had been able to arrive within this long time period at the subject-matter of the patent in suit, which provided a very useful solution to the long existing problem of forming score lines of any given configuration in a moving web having a recurring pattern of printed images appearing on one side thereof, the score lines being provided in registration with said pattern.

Therefore, the method according to the auxiliary claim as well as that of claim 1 of the patent as granted, which were identical as to their substance, involved an inventive step.

V. The respondents argued essentially as follows:

Document D10 disclosed not only the features (a) to (e) of the preamble of the auxiliary claim but also feature (h) of the characterising portion of the auxiliary claim. The latter feature was present in the method of D10, because the control unit received signals from the detector F scanning register marks on the web and, upon detecting positional irregularities

in the recurring pattern of printed images adjusted the scoring tool (roller 2) so as to maintain the score lines in registration with the pattern.

By the teaching of document D13 the person skilled in the art was guided to replace in the method of D10 the mechanical scoring equipment by a laser system. Moreover, document D13 gave a clear hint to feature (f) of the characterising portion of the auxiliary claim and, furthermore, pointed to the advantage of easy adjustment of the focal length of the laser beam to any desired spot size. Maintaining the focus of the laser beam on the first side, while the score lines are formed thereon, was a matter of course for the person skilled in the art because otherwise a constant depth of the score lines on the web could not be maintained. Moreover, dynamic focussing of a laser beam belonged to the basis knowledge of the person skilled in the art, as could be seen, for instance, from document D14, pages 227 and 228 and Figure 17.

Therefore, the subject-matter of the main and auxiliary request did not involve an inventive step.

Reasons for the Decision

1. *Late filed prior art document*

The late-filed document D14 is a text-book representing the general knowledge of a person skilled in the art of laser beam scanning.

Since this text book contains useful background

information, the Board considers it under Article 114(1) EPC.

2. *Novelty*

The subject-matter of the patent in suit must be regarded as being novel, since none of the prior art documents discloses a method for providing score lines in a packaging method according to claim 1 as granted or to the auxiliary claim.

Novelty, in fact, has no longer been in dispute.

3. *Inventive step*

3.1 Closest prior art

The closest prior art is represented by the public prior use invoked by the respondent/opponent 02.

This public prior use, which was not contested by the appellant, discloses a method of providing score lines in single or multi-layered packaging material using a drivable scoring tool, which is movable relative to said packaging material in response to drive signals, the scoring tool defining the path of the score line to be provided on the packaging material, comprising the steps of

- advancing a web of packaging material at a substantially uniform, adjustable speed in a web path past a scoring tool directed on the first side of said web, thereby forming score lines thereon, said web having a recurring pattern of

printed images appearing on one side thereof,

- moving said scoring tool in response to drive signals with a speed related to the speed of the web.

In this method a control unit ST receives signals from a detector F scanning pattern register marks on the web, and, upon detecting positional irregularities in the recurring pattern of printed images on the web, the control unit ST adjusts in response to the monitored irregularities the drive signals for the scoring tool so as to change the relative position of the scoring tool with respect to the moving web in order to maintain the score lines in registration with the pattern.

In conclusion, the method according to the public prior use comprises the features (a) to (e) and (h) of the auxiliary claim.

In this known method the scoring tool is a mechanical equipment comprising rollers carrying perforation or cutting means for producing the score lines on the web.

3.2 Problem underlying the invention

Since the said prior art method uses a mechanical scoring tool equipment, it has drawbacks as to versatility, limited process speed, tool wear and breakage.

Therefore, the problem to be solved by the invention of the patent in suit consists in providing a method by

which the drawbacks of the mechanical system used in the prior art method are overcome and by which score lines of any given configuration can be formed at a high production rate and low maintenance expenses.

3.3 Solution

The said problem is solved, according to both the granted claim 1 and the auxiliary claim by the following features

(i) the mechanical scoring tool used in the prior art method is replaced by a laser beam equipment, which evaporates a portion of the packaging material,

(ii) which is moved relative to said packaging material in two mutually perpendicular directions from a fixed point in response to pattern dependent control signals, which define the path of the score lines to be provided on the packaging material,

(iii) whereby the focal length of the laser beam is adjusted so that the focus of the laser beam is maintained on the first side of the web while the score lines are being formed thereon.

3.4 This solution is obvious for the following reasons.

Already the headline of the article according to document D13 "Low-cost laser systems can replace mechanical equipment in packaging applications: sealing, cutting, perforating and marking by laser are

all feasible" gives a clear incentive for the person skilled in the art to replace the mechanical scoring tool used in the prior art method by a laser beam equipment. Moreover, in numerous passages of D13 - see for instance: page 8, left column, paragraphs 3 and 4, middle column, paragraphs 3 and 4, right column, paragraphs 2 and 4 - it is pointed to the advantages of laser beams over mechanical tool, as higher versatility, higher process speed and lower maintenance expenses.

The fact that document D13 does not expressis verbis mention the use of a laser beam in combination with a moving web does not prevent the person skilled in the art from considering this document for obtaining suggestions how to improve the publicly used prior art method which was concerned with the processing of a moving web.

Document D13 teaches further that the laser output can be modulated to produce perforation, that, when used with galvanometers (or scanners), the modulated laser beam can be deflected over materials for two-dimensional marking or engraving (see page 8, middle column, paragraph 2) and that paper or any thin material can also be perforated by modulating the laser's output with control electronics, whereby altering perforation specifications is a simple matter of changing the modulation rate (see page 9, middle column, paragraph 4).

The afore-mentioned teaching of document D13 guides the person skilled in the art towards modifying the prior art method in the sense of the above-mentioned

features (i) and (ii) of the granted or auxiliary claim, respectively.

As to the above-mentioned feature (iii) it is to be noted that in the originally filed application documents nothing is said about the significance of this feature. The only location of the originally filed application documents, namely column 2, lines 42 to 52 of EP-A1-0 357 841, from which the said feature is derived, is silent about the significance or any advantageous result to be achieved by the feature describing dynamic focussing of the deflected laser beam. This fact indicates that the patentee himself considered the now claimed feature of dynamic focussing as a customary measure within the realisation of the step according to feature (ii).

Since document D13 already addresses the advantage of easy focus adjustment of a laser beam (see page 8, middle column, paragraph 2, and page 9, middle column, paragraph 2) and since dynamic focussing belongs to the general knowledge of the person skilled in the art of laser beam scanning (see for instance document D14, pages 227 and 228 and Figure 17), the person skilled in the art would use dynamic focussing when realising step (ii) of the invention, in order to maintain the energy intensity of the laser on the web surface - and hence the depth of the score lines - constant, while the laser beam is two-dimensionally deflected over the web surface.

The Board shares the view of the respondents that the person skilled in the art would consider dynamic focussing as a first choice as compared with other

thinkable possibilities for energy adjustment, like energy modulation, using a parallel beam or adjusting the writing speed of the laser, which other possibilities he would consider to be more complicated and expensive.

Therefore, the application of the measures according to feature (iii) is also obvious for the person skilled in the art.

The fact that the application of lasers in the packaging field has been known about 20 years before the priority date of the patent in suit and that the patentee was the first to develop a useful solution for the long existing problem underlying the invention, cannot establish the presence of an inventive step in the present case.

This fact might be considered as a secondary indication of the presence of an inventive step but is no substitute for the assessment of the invention vis-à-vis the prior art pursuant to Article 56 EPC with respect to the public prior use and to document D13.

The public prior use and document D13 were made known to the public only two and one years, respectively, before the priority date of the patent in suit and were, therefore, at the disposal of the person skilled in the art only a very short time before the priority date of the invention as examples for or incentives to the solution of the alleged long existing problem underlying the invention.

3.5 For the above reasons, the method according to claim 1

as granted does not involve an inventive step within the meaning of Article 56 EPC.

The same applies to the method of the auxiliary claim, the subject-matter of which is identical with the subject-matter of claim 1 as granted.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

A. Townend A. Burkhart