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 2 March 1998

Case Number: T 0511/95 - 3.2.4

Application Number: 90904622.9

Publication Number: 0466715

IPC: B26D 7/26

Language of the proceedings: EN

Title of invention:
Device for automatically setting up the multiple tool in hot-wire cutting machines

Patentee:
Ploderer, Michael

Opponent:
Wieser Maschinenbau Ges.m.b.H.

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Closest prior art"
"Internal state of the art"
"Inventive step - yes"

Decisions cited:
-

Catchword:
-

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0511/95 - 3.2.4

D E C I S I O N
of the Technical Board of Appeal 3.2.4
of 2 March 1998

Appellant: (Opponent)
Wieser Maschinenbau Ges.m.b.H.
Puchen 214
8992 Altaussee (AT)

Representative:
Hufnagel, Walter, Dipl.-Ing.
Dipl.-Wirtsch.-Ing.
Bad Brückenauer Strasse 6
90427 Nürnberg (DE)

Respondent: (Proprietor of the patent)
Ploderer, Michael
Marokkanergasse 21/11
1030 Wien (AT)

Representative:
Berngruber, Otto
Franziskanerstr. 38
81669 München (DE)

Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 19 June 1995 rejecting the opposition filed against European patent No. 0 466 715 pursuant to Article 102(2) EPC.**

Composition of the Board:

Chairman: C. A. J. Andries
Members: M. G. Hatherly
J. P. B. Seitz

Summary of Facts and Submissions

I. The decision of the opposition division to reject the opposition against European patent No. 0 466 715 was dispatched on 19 April 1995.

On 17 June 1995 the appellant (opponent) both filed an appeal against this decision and paid the appeal fee. The statement of grounds of appeal was received on 19 August 1995.

II. Claim 1 as granted reads as follows:

"A device for automatically setting up the multiple tool in hot-wire cutting machines, particularly for sheets and blocks of polystyrene and the like, comprising a bench (1) on which the material to be cut is rested, a pair of side walls (2) comprising a longitudinal bar (3) along which there are slidable a plurality of slides (8) cooperating with slides of another bar to keep stretched a plurality of electrically heated wires (4), and means for longitudinally and vertically moving said side walls (2) relative to said bench in such a manner that said wires hot-cut the material resting on said bench (1) into a predetermined pattern, characterised in that each side wall (2) comprises a carriage (7) provided with a member (9) for the engagement and disengagement with each slide (8) and driven under the control of an electronic control unit in order to position each slide along the respective longitudinal bars (3) in accordance with data acquired by said control unit."

III. The following documents were referred to during the appeal proceedings:

D2: EP-A-0 030 013,

D6: DE-A-3 047 976.

IV. Oral proceedings took place on 2 March 1998 in the presence of the parties.

In the written appeal proceedings the appellant argued that it would have been obvious to modify the plastic block cutting machine known from document D2 using the cutter positioning means known from document D6 and so arrive at the subject-matter of claim 1 of the patent. Although the patent stated that the problem to be solved by the invention included increasing the setting speed, the patent did not explain how this was to be done and permitted constructions which were slower than that of document D2 (Figure 4) in which all wires were moved simultaneously. The stated problem was also to reduce the space needed for the packed wires but the slides of the machine of the patent would also need to be wide enough not to tilt on the bars.

In the oral proceedings the appellant argued that it would have been obvious to arrive at the subject-matter of claim 1 by automating the machine according to the pre-characterising portion of claim 1 using the cutter positioning means known from document D6.

The respondent's representative stated that he did not know whether a machine according to the pre-characterising portion of claim 1 was part of the state of the art or whether it was merely internal state of

the art. However in either case it would not have been obvious to modify this machine or the machine according to document D2 along the lines set out in document D6 whose machine was so different in application and construction to that of wire cutting machines.

V. The appellant requested that the decision under appeal be set aside and the patent revoked.

The respondent requested the dismissal of the appeal.

Reasons for the Decision

1. The appeal is admissible.

2. *Novelty*

The combination of features specified in claim 1 is not disclosed by any of the prior art documents available to the board. For example document D6 cuts by means of knives not wires and while the embodiment of Figure 4 of document D2 features cutting wires these are not electrically heated. Novelty moreover has not been disputed in these appeal proceedings.

Therefore the subject-matter of claim 1 is considered novel within the meaning of Article 54 EPC.

3. *Document D2*

3.1 The most relevant embodiment of document D2 is that shown in Figure 4 and described in the paragraph bridging pages 7 and 8. One end of each cutting wire (numbered 1 on Figure 1) is carried in a bearing unit 7 which is movable along guide 11 by lead screw 13 to set the vertical position of the wire. This arrangement is repeated at the other end of the wire (see Figure 1 and

claims 14 and 15). Each wire is rotated about its axis and is heated by the friction with the material, see page 2, fourth paragraph, lines 1 to 8.

The plastic block is moved horizontally through the array of rotating wires arranged one above the other (see Figure 4 and page 7, lines 16 to 27 "Diese Lagereinheiten 7 sind ... in Führungen 11 vertikal zur Bewegungsrichtung des zu schneidenden Kunststoffblockes verschiebbar gelagert ... eine Verstellung der Lagereinheiten 7 in vertikaler Richtung").

3.2 In document D2 the wires are not electrically heated but are rotated in order to avoid electric heating (compare the present claim 1, page 3, line 54) and it seems more likely that the material to be cut is carried on a movable carrier (such as a conveyor belt) than on a bench. Moreover the board cannot identify in document D2 a pair of side walls and means for longitudinally and vertically moving the side walls relative to the bench on which the material rests. Thus there are considerable differences between the pre-characterising portion of the claim and the disclosure of document D2, due to the machines being conceptually totally different.

4 *The prior art acknowledged in the patent specification*

4.1 Lines 5 to 28 of page 2 of the patent specification describe hot-wire cutting machines which appear to have all the features of the machine specified in the pre-characterising portion of claim 1, including a bench on which the material to be cut is rested and side walls between which electrically heated wires are stretched. The relative movement of the wires to the material can be achieved by moving the side walls vertically and horizontally. These machines are set up manually so of course it is only the machine of the

pre-characterising portion of claim 1 which is acknowledged to be known and not the "**device** for **automatically** setting up" referred to at the start of the claim.

4.2 Once it became clear during the oral proceedings that the appellant was now starting from a machine in accordance with the pre-characterising portion of claim 1, the respondent's representative stated that he did not know whether such a machine was really part of the state of the art or whether it was merely internal state of the art.

4.3 The cited passage in the patent specification gives the impression that such machines were in common use prior to the present invention being made. This information was moreover present in the published patent application, indeed even in the priority document. Further, lines 11 to 17 of page 2 of the proprietor's letter of 29 December 1994 state that the invention is a modification of "a **traditional** hot-wire cutting machine". The board therefore sees no concrete reason to doubt that these machines, which have consistently been presented as being part of the state of the art, are in fact state of the art. The respondent's representative did not say that these machines are not part of the state of the art, he merely said that he did not know if they were or not, and he gave no actual reason for doubt. It will be seen in sections 7 and 8 below that the board's final decision would not change depending on whether these machines are part of the state of the art. For these reasons and because of the late stage of the proceedings at which the point arose, the board takes the machines according to the pre-characterising portion of claim 1 as belonging to the state of the art at the priority date.

5. *Closest prior art*

5.1 The main reason for the relevance of the machine of document D2 is that its wires are set not manually but electro-mechanically, by rotating the lead screw 13 and controlling the clutch units 7 by a central control unit 10 (see page 7, lines 23 to 27). However, it is clear from the above section 3 that the document discloses very few of the other features of the pre-characterising portion of claim 1 and indeed discloses a basic construction very different to that of the claimed machine.

5.2 On the other hand, the manually set machine, acknowledged in the opening part of the description of the present patent as being known, has the same basic construction as that of the invention and is apparently the machine from which the inventor started. Since this prior art machine is used for dividing claim 1 there is naturally a close correspondence between their features.

5.3 Thus the board finds that the closest prior art or starting point for the invention is the manually set machine acknowledged in the opening part of the description of the present patent as being known. The general principle will also be remembered that the closest prior art for the determination of inventive step is the prior art from which it is possible to mount the best inventive step attack. As will be seen in section 8 below, the best attack could not start from document D2.

6. *Problem and solution*

6.1 As explained in lines 21 to 28 of page 2 of the patent specification, the disadvantage of the closest prior art, i.e. the manually set machine, is the need for two persons, one on each side of the machine, to set the position of what can be a considerable number of wires and thus will take quite a time. Moreover when the job is changed the positions of wires need to be changed, again manually.

6.2 The solution to the problem is specified in the characterising portion of claim 1, namely to provide each side wall of the existing machine with a carriage provided with a member for selectively engaging each slide. The carriage is driven to position each slide along the longitudinal bar under the control of an electronic control unit in accordance with data acquired by said control unit. Thus setting of the machine is achieved automatically without the need for two persons and it can be expected that the setting will be quicker and more reliable. It is irrelevant whether constructions are permitted which are slower than that of document D2 since the problem is defined using the closest prior art which is not the machine of document D2. Similarly the problem set out in page 2, line 35 of the patent of reducing the space needed for the packed wires is strictly speaking a problem formulated relative to document D2. Nevertheless, since there is one carriage for a number of wire ends, the wires can be spaced closely together, either out of the way at the end of the machine or when cutting thin slices of the material.

6.3 Thus the board is satisfied that the features of claim 1, in particular the features of its characterising portion, solve the problem arising from the machine of the closest prior art.

7. *Inventive step starting from the closest prior art*

7.1 The appellant argues that the skilled person would immediately be aware of the disadvantages of the prior art manually set machine and would seek a way to automate it. He would analyse the actions which the operators carry out manually when setting the wires of the prior art machine and he would consider how these actions could be carried out automatically. The skilled person would systematically work his way down the categories of the International Patent Classification until he came to B 26 D 7/26 which concerns means for mounting or adjusting the cutting member. A search in this category would reveal document D6 since this bears this classification. The board can agree with the appellant up to this point.

7.2 It can be seen in the Figure of document D6 that a pair of mating knives 7 and 11 can be moved in a direction perpendicular to the running direction of a paper web 1 which is to be slit lengthwise. A setting carriage 13 moves along slides 14 and its pin 15' enters a hole 17 on a carriage 5 to slide this carriage 5 and its knife 7 along slides 3 and 4 across the paper web. Similarly a pin 16' of the same setting carriage 13 enters a hole 18 on a carriage 10 to move the latter and its knife 11 along slides 8 and 9. There can be a plurality of knife pairs, see lines 32 and 33 of page 5 (the printed page numbers and not the handwritten ones will be used from now on) and lines 22 to 25 of page 6. The setting carriage 13 can be moved manually using a handwheel 23 or by a motor 24 (see page 8, lines 12 to 14 and 19 to 22). The knife pairs can be set automatically using a memory to store set positions and a processor, see page 11, lines 3 to 20.

7.3 Thus document D6 obviously concerns automatically setting the positions of a plurality of knife pairs across a web which is to be slit lengthwise. It remains to be seen whether the skilled person starting from the manually set hot-wire cutting machine would seriously consider document D6, whether he would see that it was relevant to his problem of automating the machine, and whether by using it to solve his problem he would arrive the subject-matter of claim 1 in an obvious manner.

7.4 It cannot be denied that the manually set hot-wire cutting machine and the machine of document D6 are very different. The cutters are electrically heated stationary wires and rotating knives respectively. It is the ends of each wire which are to be positioned and these are far apart whereas the holes 17 and 18 by whose means the knife positions are set are very close together. This is because the material cut by the hot-wire cutting machine is three-dimensional and is cut across its considerable width while the material cut by the D6 machine is essentially two-dimensional and is cut only through its much lesser thickness. Prior to cutting, the wires of the hot-wire cutting machine are located above the block and so can be set with the block already in place. However in the machine of document D6 the advanced pin 15' must cross the path of the web 1 and so the position of the upper knife carriage 5 must be set prior to threading the web. The movement of the setting carriage 13 in document D6 is **across** the length of product to be cut whereas in the manually set hot-wire cutting machine the ends of the wires are moved **along** the product. While on closer reflection it becomes clear that the setting carriage 13 of document D6 can be located at one side of the web during cutting, the first impression given by the

Figure is that the whole cutting and setting arrangement is only possible because the two-dimensionality and flexibility of the material allows it to be bent to avoid the various components whereas this would not be possible with a three-dimensional block.

7.5 For the above reasons the board is of the opinion that the skilled person seeking an answer to his automation problem would not give more than a cursory glance to document D6. Similarities on a general theoretical level between what is disclosed and what is needed (automatic setting of a plurality of cutters without using a carriage for each) only become apparent with hindsight, after seeing the present invention.

7.6 However, the board will continue by considering document D6 further. The upper and lower knives of each pair cooperate, so it must be ensured that the upper knife has a fixed position relative to the lower knife wherever they are located across the web. This is achieved by the single setting carriage 13 with its two pins 15' and 16' engaging the upper knife carriage 5 and the lower knife carriage 10 respectively. It is possible to use this single setting carriage, which is highly advantageous in the machine of document D6, because the holes 17 and 18 used for setting the knife carriages 5 and 10 not only have a fixed relative position **across** the web but also are adjacent in the direction **perpendicular** to the paper web allowing the bar between pins 15' and 16' to be short.

7.7 These fixed relative and adjacent position conditions are however not present in the manually set hot-wire cutting machine. The wire ends are far apart in the direction perpendicular to the longitudinal bars 3 carrying the slides 8. Thus the bar between the setting pins for the wire end carriages would need to be very

long to bridge the width of the machine. Moreover it must be possible to vary the position of one slide 8 along its longitudinal bar 3 relative to the position of the other slide 8 of the pair along the other longitudinal bar 3, otherwise slanting cuts could not be made. This might be achieved by first setting one slide and then the other using a single carriage but this would slow down the speed of setting up the machine.

7.8 Thus even if the skilled person did carefully consider document D6, there would still be some difficulty in applying its teachings to the manually set hot-wire cutting machine. For the skilled person both to carefully examine the document D6 and to realise that in fact he needed **two** mechanically unconnected setting carriages instead of the one essential in document D6, is considered by the board to constitute an inventive activity.

7.9 This said, other points discussed in the appeal proceedings such as the greater width of the knife carriages of the document D6 compared with the wire ends of the manually set hot-wire cutting machine, the number of wires being greater than the number of knife pairs, that any driving means including those known from documents D2 and D6 can be used in the invention, and the sideways support by the longitudinal bar of the slides at the ends of the wires are not decisive and need not be discussed in this decision.

8. *Inventive step starting from document D2*

Although forming the basis of the opponent's obviousness attack on claim 1 in the opposition proceedings and the written appeal proceedings prior to the oral proceedings, the opponent did not rely on document D2 in the oral proceedings. Starting from

document D2 would not change the board's view given in the above sections 7.5 and 7.8 that the skilled person would not give more than a cursory glance to document D6 and that even if he did it would not be obvious to apply it in the necessary way. Moreover as stated in the above section 3, document D2 does not disclose some of the features of the pre-characterising portion of claim 1. It is clear from the above section 7.2 that document D6 is concerned only with the characterising portion of the claim. Thus a combination of the documents D2 and D6, even if it were obvious to make the combination, could not yield the subject-matter of the claim, e.g. the electrical wire heating which is avoided in document D2.

9. The subject-matter of claim 1 as granted is thus not obvious and therefore is patentable as required by Article 52 EPC. The patent may therefore be maintained with this independent claim and claims 2 to 10 which are dependent thereon.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

N. Maslin C. Andries