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Datasheet for the decision of 16 July 2014

Case Number: T 2126/10 - 3.2.06

Application Number: 05023121.6

Publication Number: 1657337

IPC: D05C7/10

Language of the proceedings: EN

Title of invention:
Laser operated cutting and engraving device for materials of various kind for electronic control automatic embroidery machines, and working program to embroider materials of various kind for electronic computers to control such laser operated cutting and engraving device for materials

Patent Proprietor:
GMI s.r.l.

Opponents:
PROEL S.R.L.
SEIT Elettronica s.r.l.

Relevant legal provisions:
EPC Art. 54, 56, 83, 100(b), 114
RPBA Art. 12(2), 13(1)

Keyword:
Late-filed evidence - admitted (no)
Public prior use - proven (yes)
Novelty - (yes)
Inventive step - (yes)

Decisions cited:
G 0010/91

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Case Number: T 2126/10 - 3.2.06

D E C I S I O N
of Technical Board of Appeal 3.2.06
of 16 July 2014

Appellant: (Opponent 1)	PROEL S.R.L. Via Zorutti 117/2 33030 Campoformido (UD) (IT)
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Appellant: (Opponent 2)	SEIT Elettronica s.r.l. Via Prà Fontana 18 Zona Industriale Loc. Zecchei 31049 Valdobbiadene (TV) (IT)
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Respondent: (Patent Proprietor)	GMI s.r.l. Via Massimo d'Azeglio N. 28 31029 Vittorio Veneto TV (IT)
Representative:	Modiano, Micaela Nadia Modiano & Partners (IT) Via Meravigli, 16 20123 Milano (IT)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 24 August 2010 rejecting the opposition filed against European patent No. 1657337 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman	M. Harrison
Members:	G. Kadner
	K. Garnett

Summary of Facts and Submissions

I. The mention of grant of European patent No. 1 657 337, on the basis of European patent application No. 05023121.6 filed on 24 October 2005, was published on 17 October 2007.

Claim 1 of the patent as granted reads as follows (features numbered according to the decision under appeal):

"1. Laser operated cutting and engraving device for materials to embroider of various kind
2. for electronic control automatic embroidery machines,
2.1 adapted to perform cuts and engravings on pre-established positions and forms and sizes on to the materials,
2.2 each embroidery machine comprising substantially
2.2.1 a rectilinear lengthened and horizontal movable loom (12)
2.2.1.1 defining a horizontal cutting plane, on to which the various materials to be worked are arranged, and
2.2.1.2 supported by a suitable support structure, and
2.2.1.3 which can be driven by means of per se known control and transmission means with alternate movements in the longitudinal direction (X axis) and the transversal direction (Y axis),
2.2.2 each machine comprising also a set of stationary embroidery heads
2.2.2.1 identical to each other,
2.2.2.2 provided with embroidery needles and set to embroider the materials with threads of different kind and colour, and

2.2.2.3 supported by a horizontal rectilinear bar situated above said cutting plane and secured to said support structure, and

2.2.3 at least a laser operated cutting and engraving head

2.2.3.1 slidable alternately along a horizontal rectilinear bar supported by vertical stanchions,

2.2.3.2 on a position situated above and spaced away with respect to said embroidery heads,

2.2.3.3 said laser operated cutting and engraving head being provided with

2.2.3.3.1 means (24) to generate a laser beam,

2.2.3.3.2 at least two pairs (28, 29, 30, 31), each one with one or two lens, supported by support means in a position spaced away to each other and provided to widen the wideness of the laser beam generated by said generator means (24),

2.2.3.3.3 optical means with variable focal length interposed between said first and second pair and operated by motor means, and

2.2.3.3.4 at least a first and a second deflection mirror (26), operated by galvanometric motor means, arranged in the laser beam path and adapted respectively to focalize with variable focal lengths and to deflect the laser beam on to the material to be worked in the longitudinal direction (X axis) and transversal direction (Y axis), in a way that such laser beam be directed on to the material by forming points (or spots) having reduced diameter,

2.2.4 the machine being adapted to perform pre-established working programs, which can be set on and controlled by at least a personal

computer or similar computer means,
in which the various materials to embroider arranged on to said cutting plane are firstly sewn with the needles of said embroidery heads,

2.2.4.1 by driving said movable loom with alternate movements in the longitudinal and transversal directions, and

2.2.4.2 then they are cut and engraved in the required positions and with the required forms and sizes by means of said laser operated cutting and engraving head,

the device being characterised in that

3. said optical means with variable focal length comprise

3.1 at least an optical lens (33)

3.1.1 operated by galvanometric motor means and

3.1.2 supported by a movable support structure (35),

3.1.3 operated by additional motor means (step-by-step motor 37), so as to be able to slide with a limited stroke of established wideness on to said support means (rectilinear bar 32), from one to another one of two adjustment positions (A, B) spaced away from each other,

3.1.4 said optical lens (33) being adapted to be displaced slowly by said movable support structure(35), before the cutting and engraving step, in the required adjustment position to be able to focalize the laser beam on to the materials of variable size, by changing from time to time the focal length of said lens (33) with respect to the same materials, and

3.1.5 being adapted to be displaced during the cutting and engraving step with extremely quickly movements, controlled by said

galvanometric motor means, in synchronism with the movements of said first and second deflection mirror (26, 27), to adjust accurately and instantaneously the laser beam focal length,

and characterised by

4. vertical orthogonal (44) or inclinated guide means(50), co-operating with control and transmission means (45, 46, 47), to provide for the alternate sliding

4.1 in either a vertical orthogonal direction or

4.2 an inclinated direction and in different adjustment positions of a system (43)

4.3 comprising said laser beam generator means (24), said first and second pair (28, 29, 30, 31), said central optical lens (33), said movable support structure (35) with said additional motor means (37) and said first and second deflection mirror (26, 27) with the relative galvanometric motor means,

and characterised also by

5. first and second electronic control means (56, 58) connected to said personal computer (55) or similar computer means, and

5.1 adapted to control and manage in synchronism to each other the movements respectively of said optical lens (33), said additional motor means (37) and said first and second deflection mirror (26, 27), as well as said system (43) along

5.2 either said vertical orthogonal guide means (44) or

5.3 said inclined guide means (50)

5.4 and along said rectilinear horizontal bar (18),

5.5 depending on each working program respectively set with said personal computer (55) or similar computer means."

Claim 6 defines an embroidery working program for materials of various kinds for an electronic computer, such as a personal computer, to control an embroidery automatic machine provided with laser operated cutting and engraving device according to claims 1 to 5. This claim was not attacked separately in the opposition.

II. Two notices of opposition, in which revocation of the patent on the grounds of Articles 100(a) (opponents 1 and 2) and 100(b) EPC (opponent 1) was requested, were filed against the granted patent.

Inter alia the following documents were filed by the opponents:

P1: Magazine "Laser Focus World", article "Post-objective mirrors allow for large fields", published April 2003, pages 89 to 93
P2: Operation manual of Proel Machines
E1: Declaration of Proel Srl of previous sales of their own machines
E2: Sales invoices and delivery papers, and respective declarations of the buyers

III. By way of its decision posted on 24 August 2010, the opposition division concluded that only the ground for opposition under Article 100(a) EPC was admitted and that the public availability of a machine according to P2 had been proven. Having considered inventive step based on the opponents' arguments in respect of the combination of P2 with P1, it rejected the oppositions.

IV. Notices of appeal were filed against this decision, and the respective appeal fees were paid, by appellant I (opponent 1) on 14 October 2010 and by appellant II (opponent 2) on 19 October 2010. Appellant I's grounds of appeal were included with the notice of appeal, and appellant II's grounds of appeal were filed on 22 December 2010. The appellants pursued their requests for revocation of the patent.

The following documents were filed with appellant II's appeal grounds:

T1: JP-A-62 064489
T2: EP-A-1 278 610
T3: WO-A-90/09141
CD showing a laser system
P2, pages 10, 19 and 20 (nb. P2 was filed already during opposition proceedings)
X: 3-Axis Scanhead User Manual, Nutfield Technology, Inc., 2002-2003, 91-0017 Rev. 1, cover pages and pages 1 to 31
Y: Declaration by Mr. Milkowski, 16 November 2010
M: Software Manual Focuscut III for P2 machine, dated 10.10.2004
F1 to F7: photographs of a P2-type machine

V. In a communication accompanying the summons to oral proceedings the Board stated that the admittance of the newly filed documents would have to be considered, and expressed its opinion that the public prior use of a machine in accordance with P2 appeared to be proven. Discussion of inventive step seemed to be necessary particularly with respect to P1 and P2.

VI. Oral proceedings were held before the Board on 16 July 2014, during which the respondent withdrew its auxiliary

request which had been filed with its response to the respective grounds of appeal.

The appellants (opponent 1 and opponent 2) requested that the decision under appeal be set aside and the patent be revoked.

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

VII. The arguments of the appellants can be summarized as follows:

Both appellants argued that the opposition division's conclusion in respect of a public prior use of a machine according to P2 was correct. The documents provided as proof were sufficient, and in particular having regard to the serial number SN 023/50US-BR-D04 on e.g. the invoice dated 14.05.2004 (E2, page 10) for a "Laser Bridge"-machine and relating to the shipment document No. 175 (E2, page 11) and dated 26.04.2004, which date is also shown on the invoice.

All the additional pieces of evidence supplied with the grounds of appeal were highly relevant and should be admitted into the proceedings. As regards the documents filed for the first time in appeal, appellant II asserted that they should be allowed into the proceedings. Of these, T1 to T3 were highly relevant since they disclosed that the movement of a laser scan head in connection with focussing the laser beam during operation, also in relation to a synchronous system and in relation to the use of step motors, was well known. The further documents showed more details concerning the information already given by the documents filed during

opposition proceedings; document M was evidence showing that synchronisation of movements occurred in P2.

In respect of inventive step, appellant I put forward the line of attack that the combination of P2 with P1/X led the skilled person in an obvious manner to the subject-matter of claim 1. It was evident that the skilled person trying to automate the known device would also take a galvanometric motor for focussing the laser beam and synchronize the movements of the components using the drive means already available in P2. Only the alternative guide means, i.e. the inclined guide means defined in claim 1, was not known from the combination of the prior art and claim 1 should be restricted to this in order to be patentable. When the skilled person started from P2, he would of course use the information in P1 in relation to the lens focussing system with a variable working plane, and would retain all the other systems from P2 and therefore would retain the vertical movement means, which would thus be used as an automated means of adjusting the working field when applying the scan head of P1.

Appellant II asserted that P2 clearly disclosed that the Proel-machine was operable with a variable work field size. This fact was indicated by the expression "has a maximum work field of 300x300 mm" and further that the "distance between the scan-head and the cutting plane was adjustable (Z axis) using the Focuscut III software". Therefore, starting from P2, a combination with P1/X would lead to the subject-matter of claim 1 in an obvious manner.

When taking P1/X as the closest prior art, all the features of the claim defining the laser operated cutting and engraving device were known. According to P1

(page 90, left column) the three-axis scan head was suitable for cutting materials like textiles, and it allowed the user to change the working distance, field, and spot size with the scan head (e.g. page 92, right column). The problem to be solved was a mere application of these known teachings in automatic embroidery machines, where it was already known to use scan heads. According to the first features of claim 1 the device had only to be "suitable for" the application in electronic control embroidery machines, and when making it thus suitable, the skilled person would apply the features known from common embroidery machines like P2. When striving to raise the degree of automation he would replace the manually operated knob for focus and field size adjustment by additional motor means and, as a self-evident measure, would synchronize the motions of field size adjustment and focussing the laser beam. The alternative embodiment in which the system moved in an inclined direction along inclined guide means was generally obvious because this movement was simply the shortest connection between two positions, which also could be arrived at by vertical and horizontal movement of the system.

Thus, the subject-matter claimed lacked an inventive step.

Finally appellant II requested that the ground of opposition under Article 100(b) EPC, which already had been asserted before the opposition division, should be considered since the claimed invention could not be carried out by the skilled person. In particular the angle of inclination of guide 50 was not defined and it was not stated how "synchronism" was to be understood.

VIII. The respondent argued that as regards the documents provided in support of the alleged prior public use, although e.g. invoices and transport documents had been presented, it had not been proven that a machine according to P2 had indeed been delivered to a customer. No signed receipt or confirmation was available as evidence for the actual arrival of the product at a customer. Also, one of the documents related to the shipping of a dry cleaning machine such that it was not made clear what kind of machine really had been sold or delivered. Since all the evidence for the prior use was in the hands of the appellants, a proof "up to the hilt" was necessary, and this requirement was not met.

The newly filed documents should not be admitted into the proceedings since they were late filed and not sufficiently relevant. They did not disclose more information than the documents on file. The knowledge of the movement of a scan head along an X-axis, a Y-axis and a Z-axis as such was anyway not contested. In particular, document X did not disclose more than P1. M was dated after the alleged sale of the P2 machines, so it was not proven that the software disclosed in M was available in those machines.

The closest prior art was P2 as this was a system used for embroidery machines, and this machine was operated with a fixed distance between the scan head and the working plane. Raising and lowering of the scan head was performed to adapt the position of the scan head to differing heights of the working plane, and to position the protective hood at its maximum distance from the working plane. As described on page 68, the machine according to P2 was unsuitable for high or thick materials, due to the fixed working distance. To the skilled reader it was made clear that there was a

maximum work field, not a variable working field. When a different work field was desired, the f-theta lens had to be changed manually. The fact that cutting operations could be carried out in a smaller working field than the maximum was not disputed, albeit that the quality of the spot was not adapted ideally to the working field.

When starting from P2, the problem to be solved was therefore to provide a flexible and faster working device which allowed the change of the work field between different sizes while maintaining the focus of the laser beam optimally. There was no indication towards the solution as claimed which could be derived from P2 itself without the exercise of an inventive step, since this machine was intended for a special use without any problems arising during its operation. P1 disclosed merely a general purpose laser device allowing variation of parameters. The reference to cutting and drilling, and the general applicability to a variety of materials such as textiles, did not provide any incentive to adapt the machine for use in the field claimed and, even if it were to be applied in that field, there was no indication as to how it should be combined with any of the elements from P2. Although the appellants argued that mere automation was the problem to be solved, this was not correct; such an approach relied on pick-and-mix combination of elements from P1/X and P2 without there being any indication towards such a combination. Thus, only hindsight of the invention would lead a skilled person to the solution claimed when starting from P2 or P1/X.

As to the ground of opposition under Article 100(b) raised by appellant II, this ground should not be admitted into the proceedings since it had been brought forward at an extremely late stage of proceedings,

namely during the oral proceedings before the Board and involved an entirely new factual argument. Further, it related merely to an alleged lack of sufficiency for which no supporting evidence had been provided, and which *prima facie* lacked merit.

Reasons for the Decision

1. The appeals are admissible.

2. *Admittance of newly filed documents (Article 114 EPC)*

2.1 Together with its grounds of appeal, appellant II filed new documents. Most of these documents were not admitted into the proceedings by the Board for the reason that they were not more relevant than the documents on file, as explained below, and thus it was not highly probable that such documents would prejudice maintenance of the patent.

2.2 T1 (JP-A-62 064489) and T2 (EP-A-1 278 610) disclose laser cutting systems wherein a vertical laser beam is focussed or adjusted by a lens movable along a vertical axis. No control relating to the use of mirrors is present. It is thus irrelevant that T1 discloses a stepping motor and that T2 for example shows that the adjustment of the distance of a laser head from a cutting plane is known together with a telescopic means of autofocus, since this is a different type of system. T3 (WO-A-90/09141) deals with a method and apparatus for precision laser surgery which is a quite different technical field of laser application than in the textile field. Merely because synchronisation of movements may be known does not by itself add anything to the reasoning of why a skilled person considering the

combination of P2 and P1/X would arrive at the invention in claim 1 without involving an inventive step.

2.3 The supplied CD contains a video demonstrating a laser cutting system. However, no evidence has been provided of the date when the video was recorded. More importantly, it cannot be established from the evidence before the Board whether what is shown in the video relates to a device which was available before the priority date in the particular state in which it is shown operating.

2.4 Document M (Software Manual Focuscut III for P2 machine) bears the date 18.10.2004 (18 October 2004) which albeit some days before the priority date is more than half a year after the delivery date of the Proel-machines according to P2 and also the date of the P2 instruction manual (which bears a date of 5 March 2004). Since this document was not available when the P2 instruction manual was drafted or when the P2 machines were supplied, it cannot serve as reliable evidence that the Proel-machines worked according to the software of document M.

2.5 F1 to F7 (photographs of a P2-type machine) do not bear a date on which they were taken, albeit that F1 appears to be a picture of a machine identification plate bearing the date 2004 and the serial-number of a Proel-machine which corresponds to part of the documentation relating to the P2 public prior use evidence in E2. Photographs F1 to F7 thus add nothing of relevance to the present proceedings.

2.6 Y (Mr. Milkowski's declaration) and X (3-Axis Scanhead User Manual, Nutfield Technology, Inc.) relate to

article P1, and in P1 (page 89) the author is named as a Vice President at Nutfield Technology.

2.7 Therefore only document X, containing more detailed information than in P1, which was available before the priority date, was admitted into the proceedings by the Board.

3. *Public prior use of a Proel-machine according to P2*

3.1 In its decision, the opposition division concluded that the public prior use of a machine according to P2 had been proven beyond reasonable doubt (page 11, second paragraph). The respondent asserted that it had not been proven "up to the hilt" that such machine had in fact been delivered to a customer, e.g. by production of a written receipt, something which was necessary since all evidence was in the hands of the opponents. The Board concludes, first, that the evidence was not solely in the hands of the opponents, since the machine and the operation manual had been distributed to customers and thus had become publicly available. The patent proprietor could also have obtained information of its own accord; at least it was not shown that this was not feasible. Second, coming to the evidence as such, the invoices and shipping documents of E1 and E2 bear dates more than a half year before the priority date and include identifiable serial numbers of the machines. The invoices, at least partly, are final invoices, which, in the normal course of business, are generally issued after the complete machine has been delivered. Importantly, in several cases independent third parties (who supplied copies of their ID cards or passports) confirm (a) receipt of machines (of the P2-type) and (b) the date of the invoices in relation thereto, which dates tie up in the majority of cases with the machinery

shipping notes related thereto. Thus, even though none of the pieces of evidence specifically states the date on which the P2-type machines were received, it is not realistic given the dates in the available evidence to suspect that the machines were not delivered well before the priority date. Therefore the Board confirms the opposition division's conclusion that a machine according to P2 has been publicly made available.

3.2 The respondent also argued that certain aspects of receipts or shipping notes provided insufficient evidence of public prior use (such as page 4 of E2, seemingly relating to a machine for dry cleaning). However, the totality of the evidence supplied to support the prior use of machines according to P2, including the instruction manuals and brochures, is considered by the Board to outweigh any discrepancies or e.g. lack of signatures on certain documents. This remains the case even though certain pieces of evidence may be individually criticised as not being complete when regarded as isolated pieces of evidence.

4. *Novelty (Article 54 EPC)*

Novelty of the subject-matter of claim 1 was not contested. The Board also sees no reason to find otherwise based on the evidence before it.

5. *Inventive step (Article 56 EPC)*

5.1 Appellant II presented an attack starting from P1 and X, regarded as one document P1/X, which discloses the features relating to a laser operated cutting and engraving device for materials of various kind to be embroidered, i.e. features (see I. above) 1., 2.2.3, 2.2.3.3, 2.2.3.3.1, 2.2.3.3.2, 2.2.3.3.3, 2.2.3.3.4,

2.2.4 (in part), 3., 3.1, 3.1.1, 3.1.2, 3.1.5, 5., 5.1 (in part) and 5.5.

5.2 P1/X discloses (using the terminology in claim 1) a laser operated cutting and engraving device suitable for working materials to embroider of various kind (P1: page 90, middle column, "textiles") comprising a laser operated cutting and engraving head which is provided with means to generate a laser beam, a laser beam input and an objective lens supported by support means in a position away to each other, optical means (linear lens translator) with variable focal length interposed between the laser beam input and the objective lens and operated by motor means, and a first and a second deflection mirror (y scanner, x scanner), operated by galvanometric motor means, arranged in the laser beam path and adapted respectively to focalize with variable focal lengths and to deflect the laser beam on to the material to be worked in the longitudinal direction (X axis) and transversal direction (Y axis), in a way that such laser beam be directed on to the material by forming points (or spots) having reduced diameter (P1: Fig.1; Fig. 2).

5.3 The device is adapted to perform pre-established working programs, which can be set on and controlled by at least a personal computer or similar computer means (X: page 24, 2nd Par.; page 25 5th par.).

5.4 The optical means (linear lens translator) with variable focal length comprise an optical lens (expander lens) operated by galvanometric motor means and supported by a movable support structure (arrangement of linear lens translator); the optical lens (expander lens) is adapted to be displaced slowly by a spindle driven by a hand knob (focus & field size adjustment), before the cutting

and engraving step, in the required adjustment position to be able to focalize the laser beam on to the materials of variable size, by changing from time to time the focal length of the expander lens with respect to the same materials, and being adapted to be displaced during the cutting and engraving step with extremely quick movements, controlled by galvanometric motor means, in synchronism with the movements of said first and second deflection mirror (y scanner, x scanner), to adjust accurately and instantaneously the laser beam focal length (P1 page 90, right col., third par.).

5.5 Electronic control means (X: page 25, 5th par. "Corcalc") are connected to a computer means, and adapted to control and manage in synchronism to each other the movements respectively of expander lens the galvanometric motor means and the first and second deflection mirror depending on each working program respectively set with the computer means.

5.6 Since according to feature 2., the laser operated device of feature 1. needs only be suitable for use with electronic control automatic embroidery machines (due to the word "for" in feature 1), the three-axis laser scan head disclosed in P1/X is found to meet this requirement.

5.7 The objective problem to be solved arising from the difference between the features disclosed in P1/X and the subject-matter of claim 1 is considered to be the application of the laser scan head in a (normal) embroidery machine.

5.8 When attempting to solve this problem, the skilled person would combine the laser scan head e.g. with a machine as known from P2, since in P1 on page 89, right column, the

advantages of using three-axis head compared to a two-axis head are explained.

5.9 The electronic control automatic embroidery machine described in the Operation Manual P2 discloses features 2.1, 2.2, 2.2.1, 2.2.1.1, 2.2.1.2, 2.2.1.3, 2.2.2, 2.2.2.1, 2.2.2.2, 2.2.2.3, 2.2.3, 2.2.3.1, 2.2.3.2, 2.2.4 (in part), 2.2.4.1, 2.2.4.2.

5.10 This machine of P2 comprises (again according to the terminology used in claim 1) substantially a rectilinear lengthened and horizontal movable loom defining a horizontal cutting plane, on to which the various materials to be worked are arranged, and supported by a suitable support structure, and which can be driven by means of per se known control and transmission means with alternate movements in the longitudinal direction (X axis) and the transversal direction (Y axis), each machine comprising also a set of stationary embroidery heads identical to each other, provided with embroidery needles and set to embroider the materials with threads of different kind and colour, and supported by a horizontal rectilinear bar situated above the cutting plane and secured to said support structure, and a laser operated cutting and engraving head slidable alternately along a horizontal rectilinear bar supported by vertical stanchions, on a position situated above and spaced away with respect to said embroidery heads, the laser operated cutting and engraving head being provided with means to generate a laser beam (P2: title page, page 10, e.g. 1st par.).

5.11 The machine of the P2-type is adapted to perform pre-established working programs, which can be set on and controlled by a computer means (P2: page 10, 3rd par. "Focuscut II software"), in which the various materials

to be embroidered which are arranged on the cutting plane are firstly sewn with the needles of the embroidery heads, by driving the movable loom with alternate movements in the longitudinal and transversal directions, and then the materials are cut and engraved in the required positions and with the required forms and sizes by means of a laser operated cutting and engraving head.

5.12 Even combining the disclosures of P1/X with those of P2 however does not lead to a disclosure including the following combination of features:

2.2.3.3.2: at least two pairs (28, 29, 30, 31) (of lens means used for adapting the generated laser beam), each one with one or two lens, supported by support means in a position away to each other and provided to widen the wideness of the laser beam generated by said generator means (24),

3.1.3 (the optical means "expander lens") operated by additional motor means (step-by-step motor 37), so as to be able to slide with a limited stroke of established wideness on said support means (rectilinear bar 32), from one to another one of two adjustment positions (A, B) spaced away from each other,

4. vertical orthogonal (44) or inclined guide means(50), co-operating with control and transmission means (45, 46, 47), to provide for the alternate sliding of a system (43)

4.1 in either a vertical orthogonal direction or

4.2 an inclined direction and in different adjustment positions of a system (43)

4.3 comprising said laser beam generator means (24), said first and second pair (28, 29, 30, 31), said central optical lens (33), said movable support structure (35) with said additional motor means (37) and

said first and second deflection mirror (26, 27) with the relative galvanometric motor means,
and
5. first and second electronic control means (56, 58) connected to said personal computer (55) or similar computer means, and
5.1 adapted to control and manage in synchronism to each other the movements respectively of said optical lens (33), said motor means (37) and said first and second deflection mirror (26, 27), as well as said system along
5.2 either said vertical orthogonal guide means (44) or
5.3 said inclined guide means (50)
5.4 and along said rectilinear horizontal bar (18),
5.5 depending on each working program respectively set with said personal computer (55) or similar computer means.

5.13 Appellant II asserted that the skilled person recognizing the possibilities of improved automation would self-evidently replace the manual knob (for adjusting the laser scan head of P1/X to different working distances and field sizes) by an additional motor means. When including such motor means, it was then allegedly also obvious to control the other elements, i.e. the motion in vertical orthogonal or in inclined direction along the guide means of the whole system including the laser beam generator means, the first and second pair of lenses, the central optical lens, the movable support structure with the additional motor means and the first and second deflection mirror with the relative galvanometric motor means (i.e. those means defined in claim 1) in synchronism with each other by suitable control means.

5.14 The Board however does not accept this argument, since the skilled person would have to overcome several hurdles, something which would not be possible, unless hindsight were used, without the exercise of inventive skill.

5.15 Considering the adaptation of the laser scan head according to P1/X for incorporation in a P2-type machine, the skilled person would recognize that the P2-type machine is designed for working only in one plane. This follows *inter alia* from page 68 ("3.4 Contraindications"), according to which high thick materials are unsuitable for cutting/engraving.

5.16 Appellant II argued that page 10, fifth paragraph of P2 (which indicates a "maximum work field of 300x300 mm") disclosed that vertical adjustment to create different working fields was provided by P2, in particular because, in the same paragraph, it was also indicated that the distance between the scan-head and the cutting plane could be adjusted (Z-axis) using the Focuscut III software. However, such a disclosure is not unambiguously present in P2 since the maximum work field can be seen, at least in as far as this can unambiguously be understood, as merely defining the maximum limits of the field in which laser cutting can occur (i.e. smaller and larger fields are possible and can be defined within the 300x300 mm field, but there is no indication that such field size adjustment occurs by height adjustment of the scanner head from the working plane). The height adjustment is required to set the protective hood working height "d" (see e.g. page 32 of P2). Indeed the use of a so-called F-theta lens (as mentioned for example in P1, page 89, right hand column, first complete paragraph - in relation to two-axis scan heads) appears to confirm that this is the case.

5.17 Although appellant II offered (see pages 3 and 4 of the appeal grounds) to demonstrate by means of inspection (Article 117 EPC) that a Proel machine of the P2-type altered the work field size by raising and lowering the head, a fact which is not *per se* doubted (albeit that an f-theta type lens is present), such an inspection would have served no purpose in the present case since it has not been shown, nor is it evident why, such a machine necessarily still corresponds to the machine supplied at the time at which the accepted prior use was made. An inspection would thus not have got over the lack of evidence in this respect.

5.18 Therefore the skilled person would recognize that the raising and lowering movement of the scan head together with the protective hood, by means of the motor already present in P2 which causes raising and lowering of the scan head, is intended for bringing the scan head into either the "Home" position or the operating position, since the distance "d" between the hood and the cutting plane must be as small as possible (P2: page 32). Therefore, if the skilled person were to try to widen the work field of the P2-machine, measures would have to be taken to adapt the protective hood, possibly by some form of a telescopic device or by manually changing it with one of different size as required in a particular case. Under these circumstances, since this modification would be rather complex and time-consuming, any advantage in automating the manual adjustment by the hand knob would be rather insignificant in the context of saving setting-up time for a different application. Thus, attempting to solve a problem of time-saving in relation to work field size adaptation by mere automation would not lead a skilled person to the solution in claim 1. In this regard it may also be noted

that even P1 uses a manual adjustment of the field size. Essentially, what the appellant is arguing in this particular respect appears to be that the skilled person would recognise the advantages of the P1/X system and incorporate this system into P2 to provide adjustable field size, whereby the manual adjustment of focus and field-size in P1 by means of the manual knob would be replaced by the drive motor and spindle in P2 which alters the protective hood height. However, there is no incentive in the prior art to do what the appellants suggest; the arguments thus relate simply to what a skilled person could do to arrive at something within the scope of the claim. Although the appellants also argue that adjustment of the height of the scan head by the motor drive system in P2 would alter the working field, and indeed the Board does not doubt that an alteration of the field would then occur, the appellants have not demonstrated that the P2-type machine and its instruction manual give an indication that the adjustment of the height is directed to this purpose and that this would be extracted from the disclosure relating to the adjustment of the height for reasons of protective hood distance control.

5.19 Further, considering the interrelation of the various adjustment means, the automation of the adjustment of the optical means with variable focal length (e.g. in P1/X) in synchronism with all the other components would also not provide a substantial advantage since the "slow displacement" of the optical lens could be arrived at by slowly turning of the hand knob, before the cutting and engraving step, in the required adjustment position to be able to focus the laser beam onto the materials of variable size, by changing from time to time the focal length of the lens with respect to these materials. Hence even the replacement of the spindle operating hand

knob by motor means and providing synchronism of movements (i.e. coordinated movements between the various motorised parts) is not obvious nor indeed solves the problem of providing greater flexibility in the machine.

5.20 The same considerations apply whether starting from P1/X as the closest prior art and combining this with the teaching of P2 or vice versa. In any case, there remain a number of features which are not disclosed in either P1/X or P2 and which cannot be considered as being merely obvious in the mind of the skilled person since in their combination they effect additional advantages which cannot directly have been expected.

5.21 The further feature of "at least two pairs" (of lens means involved in the adaptation of the laser beam), each one with one or two lens spaced away from each other, with the optical means with variable focal length in-between, is also not at derivable from either P1/X or P2. In particular, the laser beam in the scan head according to P1/X enters directly into the linear lens translator (expander lens) (see e.g. Fig. 1). Widening the incoming laser beam before it enters the optical means with variable focal length allows, for example, a more exact focussing of the beam, resulting in a more precise laser point at the working position of the spot, something which is also not made obvious by P1/X when starting from P2 or when starting from P1/X as the closest prior art.

5.22 There is therefore no indication in the prior art towards the combination of these co-acting features in connection with the synchronized movements of the system components as defined in the claim. Therefore the

subject-matter of claim 1 is considered as involving an inventive step.

5.23 The subject-matter of independent claim 6 was not separately attacked and the Board finds no reason of its own not to find this claim allowable.

6. *Non-admittance of appellant II's objection under Article 100(b) EPC*

6.1 An objection under Article 100(b) EPC had been raised in appellant I's grounds of opposition but was held by the opposition division not to have been substantiated (point 4.1 of the Reasons). An application by appellant I during the oral proceedings before the opposition division (appellant II was not present) to introduce Article 100(b) as a ground of opposition was refused, being late-filed and not prima-facie relevant (point 4.2 of the Reasons). At a late stage of the oral proceedings before the Board, appellant II requested that the Board consider an objection under Article 100(b) / Article 83 EPC. The respondent objected to this ground of opposition as late filed and being merely an unsupported allegation

6.2 According to Article 12(2) of the Rules of Procedure of the Boards of Appeal (RPBA), the grounds of appeal shall contain a party's complete case. The objection under Article 83 EPC was thus to be treated as an amendment to appellant II's case. Admittance of the objection would have required, at a minimum, that the Board exercise its discretion positively in this regard (Article 13(1) RPBA). However, since the Board and the respondent were faced with an entirely new objection this would, if admitted, have required hearing detailed arguments on the matter for the first time during those oral

proceedings. Further, in the oral proceedings, nothing had been presented by the appellant beyond a mere allegation that an insufficiency of disclosure was present concerning a missing angle of inclination of the guide means and that "synchronism" as used in the claim was not further defined. Since the objection had not been substantiated by any supporting facts or evidence, admitting the objection would have required the Board and the respondent to deal with entirely fresh arguments for the first time during oral proceedings, without any substantiated basis upon which to draw conclusions, let alone provide the respondent with a possibility to gather and provide any of its own evidence which might be required. Moreover, the appellant's request to admit the objection and the brief argument made as to why the requirements of Article 83 were not fulfilled, did not *prima facie* provide the Board with any doubt that maintenance of the patent would have been prejudiced thereby. Further, given the conclusions reached in G 10/91 (see e.g. item 18 of the Reasons), the further issue would have arisen as to whether the ground of opposition could anyway have been introduced without the respondent's permission. The Board thus exercised its discretion not to admit this change of case (Article 13(1) RPBA).

Order

For these reasons it is decided that:

The appeals are dismissed.

The Registrar: The Chairman:

M. H. A. Patin M. Harrison

Decision electronically authenticated