

United States District Court,
D. Delaware.

TULIP COMPUTERS,
INTERNATIONALI B.V. Plaintiff.

v.
DELL COMPUTER CORPORATION,
Defendant.

No. CIV.A.00-981

Dec. 9, 2002.

Owner of patent for computer motherboard sued computer manufacturer for infringement. Construing claims, the District Court, Thyng, United States Magistrate Judge, held that: (1) "personal computer" was computer for individual or home use, but did not include notebook computer; (2) connectors on riser card had to be able to accommodate expansion boards, but there was no requirement that expansion boards actually be inserted into those connectors; and (3) riser card could have only one combination connector.

Claims construed.

Court-Filed Expert Resumes

Although patent claims containing open transitional phrasing are not limited to covering only elements specifically recited in those claims, mere use of transitional phrasing does not eliminate self-imposed numerical limitation.

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MEMORANDUM OPINION

THYNGE, United States Magistrate Judge.

I. INTRODUCTION

This is a patent infringement case. On November 24, 2000, Tulip Computer International B.V. ("Tulip") FN1 filed its complaint (D.I.1) alleging infringement of its U.S. patent No. 5,594,621 ("the '621 patent") by specific systems in defendant Dell Computer Corporation's ("Dell") FN2 OptiPlex line of computers. On January 19, 2001, Dell filed its answer (D.I.6) denying Tulip's allegations and alleging that the '621 patent is invalid, unenforceable, and not infringed. On August 15, 2002, this court entered an amended scheduling

order (D.I.281) pursuant to which the parties filed a joint submission of disputed claim terms on September 20, 2002 (D.I.308). Simultaneous briefing on the parties' respective claim interpretations was completed on October 25, 2002. Case dispositive pretrial summary judgment motions were filed on October 11, 2002 FN3 and briefing on those motions was completed on November 1, 2002. Pursuant to *Markman v. Westview Instruments, Inc.* FN4 and local practice, oral argument was held November 7, 2002 on the parties' claim interpretations and motions for summary judgment. This opinion sets forth the court's construction of the disputed claim terms. The court's determination with regard to the parties' motions for summary judgment are presented in separate opinions.

FN1. Tulip is a Dutch corporation with its principal place of business in the Netherlands.

FN2. Dell is a Delaware corporation with its principal place of business in Texas.

FN3. Tulip's motion for partial summary judgment of validity under 35 U.S.C. s. 112 (D.I.336), Tulip's motion for partial summary judgment of literal infringement (D.I.338), Tulip's motion for partial summary judgment of no inequitable conduct (D.I.341), Dell's motion for partial summary judgment on failure to mark and noninfringement (D.I.344), Dell's motion for summary judgment of unenforceability due to inequitable conduct (D.I.347), and Dell's motion for summary judgment on invalidity (D.I.350).

FN4. 52 F.3d 967 (Fed.Cir.1995) (*en banc*), *aff'd*, 517 U.S. 370, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996).

II. BACKGROUND

Personal computers of the AT type (those based on the IBM PC AT), and computers compatible therewith, typically include a motherboard on which various components are located (*i.e.*, the processor, memory chips and various integrated circuits). Early personal computers also included connectors located on the motherboard into which expansion boards could be inserted. Expansion boards permit the functionality of the computer to be expanded and include video cards, audio cards, telefax cards, modem cards, and control cards for external components such as CD-ROM players or disk drives. Expansion boards typically consist of a printed circuit board having its functional components mounted on one side. These boards have contact strips by which the expansion boards are electronically connected to the motherboard via the expansion connectors. The expansion boards also have a mounting bracket at one end of the card by which the card may be secured to the computer chassis once the board has been inserted into an expansion connector. Because the expansion boards in early personal computers were mounted on the motherboard and extended perpendicularly to the plane of the motherboard, the computer's chassis had to be tall enough to accommodate height of the expansion boards. The Low Profile Extender ("LPX") form factor FN5 was developed to respond to consumer demand for shorter computer chassis. The LPX form factor consists of a connector for a so-called riser card. A riser card is a printed circuit board inserted perpendicularly into the motherboard in the same manner as an expansion boards. The riser card has expansion connectors on its face into which expansion boards can be inserted. When expansion boards are inserted into the connectors on the riser card, the expansion boards extend perpendicularly from the riser card and parallel to the plane of the motherboard. Since the riser card merely functions as a docking station for expansion boards, its surface need only contain the expansion connectors for expansion boards. Therefore, the height of the riser card is less than the height of the typical expansion board whose surface area contains the functional components of those boards. Consequently, less vertical space is required by computers utilizing the LPX form factor compared to computers whose expansion boards are inserted directly into the motherboard. The result is a lower profile computer case.

FN5. The term "form factor" refers to the shape and configuration of the components on a motherboard.

Early expansion boards were compatible with an Industry Standard Architecture ("ISA") bus that carried signals among the components on the mother board and to the riser card. An improved, faster, technology was the Peripheral Component Interconnect ("PCI") bus which processes high frequency signals (33 MHz). The contact strips of ISA and PCI expansion boards differed in design and, therefore, each required a specific expansion connector. As the computer industry transitioned from ISA to PCI type boards, there was a desire to provide users with computers capable of utilizing boards of both types. To this end riser cards were designed for use in computers utilizing the LPX form factor, that included both dedicated ISA expansion connectors and dedicated PCI expansion connectors. A further advancement was the development of a combination connector ("combi-connector"). A combi-connector occupies a single expansion position and has two expansion connectors, one that can receive an ISA type board and one that can receive a PCI type board. The two expansion connectors of the combi-connector are physically close together and are aligned with a single point of attachment for securing an expansion board's mounting bracket to the computer chassis. A user can insert either an ISA board or a PCI board into the combi-connector, but not both types of boards simultaneously. The '621 patent claims a riser card including expansion positions having dedicated ISA and PCI connector(s) and a combination connector.

Prior to Tulip's invention, riser cards were inserted into a connector centrally located on the motherboard. A riser card located in the middle of the motherboard created a physical barrier to the circulation of air from the computer's internal cooling fan. Because of this barrier, the area of the motherboard located on the side of the riser card farthest away from the computer's fan was not cooled as effectively as the area of the motherboard on the same side of the riser card as the fan. Tulip's advancement in the art was to move the riser card to the side of the motherboard. The repositioning of the riser card purportedly permits unimpeded airflow across the computer's internal components thereby improving the cooling efficiency of the computer's fan. Tulip also contends that additional advantages are achieved when the riser card is moved from a central to a side location on the motherboard.

In prior art teaching a centrally located riser card having connectors for both ISA and PCI type expansion boards, the dedicated ISA connectors are located in the lowest expansion connectors nearest to the motherboard and the side of the ISA expansion boards on which its components are located faces away from the motherboard. The dedicated PCI connectors are located at the highest expansion connectors farthest from the motherboard and the side of the PCI expansion boards on which its components are located faces toward the motherboard. The invention described by the '621 patent reverses the respective connector locations and component orientation. The result is an invention teaching a riser card on which the dedicated PCI connectors are located in the lowest expansion connectors and oriented such that the side of the PCI expansion boards on which its components are located face away from the motherboard. This has the purported advantage of shorter linking tracks to the PCI expansion boards. Shorter linking tracks are contended to be particularly desirable for the 33 MHz signals processed by PCI expansion boards. Additionally, having the components on the PCI expansion boards facing away from the motherboard allegedly provides more efficient cooling for those components.

Tulip states that a connector for a riser card having both ISA and PCI connectors requires a large number of terminals for electronic signals between the motherboard and expansion boards. Tulip contends when such a riser card connector is centrally located, the presence of the terminals associated with the riser card connector make it difficult to provide linking tracks which connect motherboard components on one side of the riser card connector to components on the motherboard on the other side of the riser card connector. Tulip maintains that placing the riser card connector on the side of the motherboard avoids this problem. Finally, Tulip maintains that moving the riser card connector to the side of the motherboard creates

additional space for the placement of larger components on the motherboard itself and that those components are also more efficiently cooled by the computer's fan.

A. The Patented Invention

The '621 patent, entitled "Motherboard for a Computer of the AT Type, and a Computer of the AT Type Comprising Such Motherboard," describes and claims a personal computer having a novel motherboard form factor. The invention concerns the placement of a riser card connector at a specific location on the motherboard and the arrangement of expansion board connectors on the riser card to achieve the purported benefits described above.

Claims 1 and 2 of the '621 patent are at issue. Claim 1 reads as follows (with the disputed claim terms in bold):

1. An assembly **for use in a personal computer**, said assembly comprising:

a motherboard;

a mating connector for a **riser card**, said mating connector situated on the motherboard and **adjacent** and **parallel** to a **peripheral side edge** thereof,

said mating connector having an opening adapted to receive a **riser card**,

said mating connector being oriented on the motherboard such that the opening extends in a direction perpendicularly upward from a horizontal surface of the motherboard; and

the **riser card** having a predetermined number of expansion positions thereon,

each of said positions having at least one expansion connector associated therewith so as to form a plurality of expansion connectors located on the **riser card** such that a plurality of expansion boards can be simultaneously mated through said expansion connectors to said **riser card**, said one expansion connector being either an ISA (industry standard architecture) or a PCI (peripheral connect interface) type connector so as to respectively accommodate an ISA or PCI type expansion board,

all of the expansion connectors being horizontally oriented and successively arranged in a **parallel** fashion one above another,

and said **riser card** being oriented with respect to the motherboard such that **each one of the plurality of expansion boards inserted into a corresponding one of said expansion connectors** is oriented in a direction substantially parallel to a horizontal plane of the motherboard and extends inward from a vicinity of the **side edge** towards a central portion of the motherboard;

wherein a predefined one of the positions on the riser card has both ISA type and PCI type expansion connectors associated therewith and situated one above another so as to accommodate either an ISA type or a PCI type expansion board in said predefined one position,

wherein said predefined one position is **located on the riser card below at least one of the positions having the ISA type expansion connector and above at least one of the positions having the PCI type expansion connector.**FN6

Claim 2 of the '621 patent reads as follows (with the disputed claim terms in bold):

2. A **personal computer** having:

a motherboard;

a mating connector for a **riser card**, said mating connector situated on the motherboard and **adjacent** and **parallel** to a **peripheral side edge** thereof,

said mating connector having an opening adapted to receive a riser card,

said mating connector being oriented on the motherboard such that the opening extends in a direction perpendicularly upward from a horizontal surface of the motherboard; and

the **riser card** having a predetermined number of expansion positions thereon,

each of said positions having at least one expansion connector associated therewith so as to form a plurality of expansion connectors located on the **riser card** such that a plurality of expansion boards can be simultaneously mated through said expansion connectors to said **riser card**, said one expansion connector being either an ISA (industry standard architecture) or a PCI (peripheral connect interface) type connector so as to respectively accommodate an ISA or PCI type expansion board,

all of the expansion connectors being horizontally oriented and successively arranged in a **parallel** fashion one above another,

and said **riser card** being oriented with respect to the motherboard such that **each one of the plurality of expansion boards inserted into a corresponding one of said expansion connectors** is oriented in a direction substantially **parallel** to a horizontal plan of the motherboard and extends inward from a vicinity of **the side edge** towards a central portion of the motherboard;

wherein a predefined one of the positions on the riser card has both ISA type and PCI type expansion connectors associated therewith and situated one above another so as to accommodate either an ISA type or a PCI type expansion board in said predefined one position,

wherein said predefined one position is **located on the riser card below at least one of the positions having the ISA type expansion connector and above at least one of the positions having the PCI type expansion connector.**^{FN7}

FN7. '621 at 6:35-7:7.

The parties have stipulated that the meaning of the following terms and phrases of the asserted claims are disputed:

1. "for use in a personal computer" (claim 1 only);
2. "personal computer" (claim 2 only);
3. "riser card";

4. "adjacent";
5. "parallel";
6. "side edge";
7. "peripheral side edge";
8. "such that each one of the plurality of expansion boards inserted into a corresponding one of said expansion connectors";
9. "wherein a predefined one of the positions on the riser card has both ISA type and PCI type expansion connectors associated therewith"; and
10. "located on the riser card below at least one of the positions having the ISA type expansion connector and above at least one of the positions having the PCI type expansion connector".

The court will construe each of these claim terms in turn.

III. THE LAW OF PATENT CLAIM CONSTRUCTION

[1] [2] [3] [4] A patent's claims define the scope of the rights afforded to a patent owner under the patent and the interpretation and construction of those claims is a matter of law to be determined by the court. FN8 In making its determination of the proper construction of a claim, the court may consider "both intrinsic evidence (*e.g.*, the patent specification and file history) and extrinsic evidence (*e.g.*, expert testimony)," but should first examine "the intrinsic evidence of record, *i.e.*, the patent itself, including the claims, the specification and, if in evidence, the prosecution history." FN9 Intrinsic evidence should be examined in a particular order, however. FN10 The starting point for the court's examination of that evidence is the language of the disputed claim as the words of the claim, chosen by the inventor, delimitate the breadth of protection provided by the patent grant. FN11 The words of a claim are generally accorded their ordinary and accustomed meaning and if the claim includes a term of art, that term is given its ordinary and accustomed meaning to one of ordinary skill in the relevant art at the time of the invention. FN12 Although a patentee is permitted to be his own lexicographer, for the court to accept a suggested meaning that is contrary to the ordinary and accustomed meaning of a word, the intrinsic evidence must clearly set forth that novel meaning "so as to put one reasonably skilled in the art on notice that the patentee intended to so redefine the claim term." FN13

FN8. *Markman* 52 F.3d at 970-71.

FN9. *Vitronics Corp. v. Conceptor, Inc.*, 90 F.3d 1576, 1582 (Fed.Cir.1996). Normally, however, it will be unnecessary for the court to consider extrinsic evidence in interpreting claim language. *See Bell Atlantic Network Servs., Inc. v. Covad Communications Group, Inc.*, 262 F.3d 1258, 1269 (Fed.Cir.2001) (stating that it is only "in the rare circumstance that the court is unable to determine the meaning of the asserted claims after assessing the intrinsic evidence" that the court may consider extrinsic evidence).

FN10. *See Digital Biometrics, Inc. v. Identix, Inc.*, 149 F.3d 1335, 1344 (Fed.Cir.1998) (noting that "[e]ven within the intrinsic evidence ... there is a hierarchy of analytical tools").

FN11. *See* Phonometrics, Inc. v. Northern Telecom Inc., 133 F.3d 1459, 1464 (Fed.Cir.1998); Vitronics, 90 F.3d at 1582; Bell Communications Research Inc. v. Vitalink Communications Corp., 55 F.3d 615, 620 (Fed.Cir.1995).

FN12. Zelinski v. Brunswick Corp., 185 F.3d 1311, 1315 (Fed.Cir.1999); *see also* Johnson Worldwide Assoc., Inc. v. Zebco, Corp., 175 F.3d 985 (Fed.Cir.1999) (stating that there is a "heavy presumption in favor of the ordinary meaning of claim language").

FN13. Bell Atlantic Network Servs., Inc., 262 F.3d at 1268.

[5] To determine whether the patentee has used a term in a manner contrary to its accepted meaning, the court's next step is to review the patent's specification.FN14 Because the specification must include a written description which is sufficient to enable one of ordinary skill in the art to make and use the invention, "the specification is always relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term." FN15 Although the specification "provide[s] a context to illuminate the meaning of claim terms," FN16 the court should not interpret those claim terms "by adding limitations appearing only in the specification." FN17 Furthermore, the general rule is that unless the claims themselves so limit, "the claims of a patent are not limited to the preferred embodiment" set forth in the specification.FN18

FN14. Vitronics, 90 F.3d at 1582.

FN15. *Id.*

FN16. Abtox, Inc. v. Exitron Corp., 122 F.3d 1019, 1023 (Fed.Cir.1997).

FN17. Electro Medical Sys., S.A. v. Cooper Life Sciences, Inc., 34 F.3d 1048, 1054 (Fed.Cir.1994)

FN18. Karlin Technology, Inc. v. Surgical Dynamics, Inc., 177 F.3d 968, 973 (Fed.Cir.1999); *see also* Laitram Corp. v. NEC Corp., 163 F.3d 1342 (Fed.Cir.1998) (stating that "the mere repetition in the written description of a preferred aspect of a claimed invention does not limit the scope of an invention that is described in the claims in different and broader terms").

[6] Additionally, the court may consider a patent's prosecution history in determining the meaning of a claim term. The prosecution history "may contain contemporaneous exchanges between the patent applicant and the PTO about what the claims mean." FN19 Amendments to the patent and arguments made to the patent examiner may each be used to exclude an interpretation disclaimed during prosecution FN20 and each are given equal weight by the court in its interpretation.FN21 Only if there is still ambiguity as to the meaning of a claim after reviewing the intrinsic evidence should a court consider extrinsic evidence such as expert testimony or inventor testimony.FN22

FN19. Digital Biometrics, Inc. v. Identix, Inc., 149 F.3d 1335, 1344 (Fed.Cir.1998).

FN20. Southwall Technologies, Inc. v. Cardinal IG Co., 54 F.3d 1570, 1576 (Fed.Cir.1995).

FN21. Elkay Mfg. Co. v. Ebco Mfg. Co., 192 F.3d 973, 979 (Fed.Cir.1999).

FN22. Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1584 (Fed.Cir.1996).

[7] The Federal Circuit recently revisited the issue of a court's use of dictionaries when construing claim terms in *Texas Digital Sys., Inc. v. Telegenix, Inc.* FN23 Prior opinions had referred to dictionaries as a "special form of extrinsic evidence" which courts consulted during claim construction. FN24 In contrast to those earlier opinions, the *Texas Digital* court stated that "categorizing [dictionaries, encyclopedias and treatises available at the time a patent issued] as 'extrinsic evidence' or even a 'special form of extrinsic evidence' is misplaced and does not inform the analysis." FN25 In its extensive commentary on the use of dictionaries in claim construction, the *Texas Digital* court reiterated longstanding precedent that dictionaries are useful resources available to the court to determine the meanings of claim terms. FN26 The court noted that "[d]ictionaries ... publicly available at the time the patent issued, are objective resources that serve as reliable sources of information on the established meanings that would have been attributed to the terms of the claims by those of skill in the art." FN27 Since dictionary definitions recite the meanings of terms unbiased by motives of parties engaged in litigation, the outcome of which may depend on the court's construction of those terms, dictionaries (along with encyclopedias and treatises) "may be the most meaningful sources of information to aid judges in better understanding both the technology and the terminology used by those skilled in the art to describe the technology." FN28 That court's extensive comments on the use of these material sources in claim construction merits quotation at length. After noting the advantages of using dictionaries when construing claims, the court cautioned that:

FN23. 308 F.3d 1193 (Fed.Cir.2002).

FN24. *See, e.g., Intel Corp. v. Broadcom Corp.*, 172 F.Supp.2d 478, 486 (D.Del.2001) (stating that "[d]ictionaries, however, are a special form of extrinsic evidence that may be considered along with the intrinsic evidence in determining a claim's ordinary meaning") (citing *Interactive Gift Express, Inc. v. CompuServe Inc.*, 231 F.3d 859, 866 (Fed.Cir.2000)).

FN25. *Texas Digital* at 1203.

FN26. *Id.* at 1202.

FN27. *Id.* at 1202-03.

FN28. *Id.* at 1203.

[b]ecause words often have multiple dictionary definitions, some having no relation to the claimed

invention, the intrinsic record must always be consulted to identify which of the different possible dictionary meanings of the claim terms in issue is most consistent with the use of the words by the inventor. If more than one dictionary definition is consistent with the use of the words in the intrinsic record, the claim terms may be construed to encompass all such consistent meanings. The objective and contemporaneous record provided by the intrinsic evidence is the most reliable guide to help the court determine which of the possible meanings of the terms in question was intended by the inventor to particularly point out and distinctly claim the invention. Moreover, the intrinsic record also must be examined in every case to determine whether the presumption of ordinary and customary meaning is rebutted. Indeed, the intrinsic record may show that the specification uses the words in a manner clearly inconsistent with the ordinary meaning reflected, for example, in a dictionary definition. In such a case, the inconsistent dictionary definition must be rejected. In short, the presumption in favor of a dictionary definition will be overcome where the patentee, acting as his or her own lexicographer, has clearly set forth an explicit definition of the term different from its ordinary meaning. Further, the presumption also will be rebutted if the inventor has disavowed or disclaimed scope of coverage, by using words or expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope. FN29
FN29. *Id.* at 1203-04 (citations omitted).

The *Texas Digital* court suggests that when construing the words of a claim, the court should first determine the ordinary and accustomed meanings of disputed claim words through an examination of relevant dictionaries, encyclopedias, or treatises. This determination will reveal the broadest definition of those terms as understood by one of skill in the art. Having made that determination, the court must next examine the written description and prosecution history to determine whether the full scope of the definition of a disputed term is covered by the invention or whether that scope has necessarily been limited as a result of the patentee clearly setting forth an inconsistent definition of the disputed term or otherwise disavowing or disclaiming the full scope of the term's meaning. Following this procedure, the court construing claims may avoid improperly importing claim limitations to a single embodiment described in the specification as might occur if the court begins its analysis with an examination of the written description and prosecution history. FN30

FN30. *Id.* at 1204-05.

IV. THE COURT'S CLAIM CONSTRUCTION

A. For use in a personal computer (claim 1) and personal computer (claim 2)

1. Parties' positions on preamble limitation

[8] The disputed term, "personal computer," is recited in the preambles of both claim 1 and claim 2. The initial dispute concerning this term is whether or not it is to be construed as a claim limitation. Dell contends that neither "for use in a personal computer" (claim 1) nor "personal computer" (claim 2) should be construed as claim limitations because the preambles of each claim, which contain that term, merely state the intended use or purpose of the claimed invention. Dell urges the court to apply the general rule that a preamble which only states the intended use or purpose of the claimed invention is not part of the claim and does not limit the scope of that claim. FN31

FN31. *See Apple Computer, Inc. v. Articulate Sys., Inc.*, 234 F.3d 14, 22 (Fed.Cir.2000) (stating that "[l]anguage in a claim preamble ... acts as a claim limitation only when such language serves to 'give meaning to a claim and properly define the invention,' not when the preamble merely states a purpose or

intended use of the invention.' " (citing *In re Paulsen*, 30 F.3d 1475, 1479 (Fed.Cir.1994) (quoting *DeGeorge v. Bernier*, 768 F.2d 1318, 1322 n. 3 (Fed.Cir.1985))).

Tulip argues that the term "personal computer" should be construed as a claim limitation thereby restricting claims 1 and 2 to covering desktop or desktside computers, as distinguished from notebook computers. Tulip notes that language in the '621 patent specification distinguishes the claimed invention from prior art covering a notebook computer. The specification recites that "this [prior art, the Lam patent,] concerns a notebook computer and not a desktop computer as with the present invention." FN32 Tulip asserts that this language explicitly acknowledges that a notebook computer is beyond the scope of the invention claimed by the '621 patent. Tulip also references the prosecution history of the '621 patent where the inventor distinguished the prior art notebook computer by arguing to the patent examiner that the physical environment of a notebook computer could not accommodate the invention claimed in the '621 patent application and that the asserted benefits of its invention could not be achieved in such physical environment.

FN32. '621 at 2:54-56.

2. Court's finding on preamble limitation

[9] A court's determination of whether a preamble serves as a limitation upon a claim is "resolved only on review of the entirety of the patent to gain an understanding of what the inventors actually invented and intended to encompass by the claim." FN33 Generally, a preamble is not limiting if it "offers no distinct definition of any of the claimed invention's limitations, but rather merely states, ... the purpose or intended use of the invention." FN34 A preamble may be limiting, however, when there is "clear reliance on the preamble during prosecution to distinguish the claimed invention from the prior art." FN35 That reliance "transforms the preamble into a claim limitation because such reliance indicates use of the preamble to define, in part, the claimed invention." FN36

FN33. *Corning Glass Works v. Sumitomo Electric U.S.A., Inc.*, 868 F.2d 1251, 1257 (Fed.Cir.1989).

FN34. *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed.Cir.1999).

FN35. *Catalina Marketing Int'l v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed.Cir.2002) (citing *Bristol-Myers Squibb Co. v. Ben Venue Labs., Inc.*, 246 F.3d 1368, 1375 (Fed.Cir.2001)).

FN36. *Id.*

Dell argues that the preambles of claims 1 and 2 merely describe an intended use for the claimed combination ("[a]n assembly for use in a personal computer," '621 at 5:62-63 (claim 1)) or a statement for the intended environment for the claimed combination ("[a] personal computer having," '621 at 6:36 (claim 2)). Because the bodies of claims 1 and 2 never refer back to any term in the preamble, and therefore the preambles do not provide antecedents for ensuing claim terms, Dell contends that this court should find that "personal computer" is not a limitation on the claims.FN37

FN37. *See C.R. Bard, Inc. v. M3 Sys., Inc.*, 157 F.3d 1340, 1350 (Fed.Cir.1998) (stating that a preamble that

"simply states the intended use or purpose of the invention ... usually does not limit the scope of the claim unless the preamble provides antecedents for ensuing claim terms and limits the claim accordingly" (citation omitted)).

Tulip does not argue that the bodies of claims 1 and 2 refer back to the "personal computer" described in the preambles to those claims. Tulip contends, however, that the preambles of the claims in issue are one of the "rare instances" described by the Federal Circuit where statements of intended use in the preamble do limit the claims because, here, "the applicant clearly and unmistakably relied on those uses or benefits to distinguish prior art." FN38 Tulip maintains that the specification and prosecution history of the '621 patent each demonstrate an acknowledgment by the patentee that the "personal computer" claimed is not a notebook computer.

FN38. *Catalina Marketing*, 289 F.3d at 809.

The specification of the '621 patent distinguishes prior U.S. Patent No. 5,121,295 (the "Lam patent") as "concern[ing] a notebook computer and not a desktop computer as with the present invention." FN39 The same distinction with respect to the Lam patent was made during the prosecution of the '621 patent application. In response to the examiner's initial rejection of claims 1 and 2 as originally filed as obvious, Tulip emphasized the differences between the notebook computer claimed by the Lam patent and the personal computer claimed in the '621 patent application. Tulip pointed out that, unlike its invention which teaches a riser card capable of accommodating a plurality of expansion boards, the Lam patent teaches a riser card that can accommodate a single expansion board in a notebook computer. FN40 Furthermore, Tulip explained to the examiner that the physical environment of contemporary notebook computers was incapable of housing a riser card with a plurality of expansion connectors located thereon. FN41 Finally, Tulip noted that because a notebook computer does not contain a cooling fan, "the problem of impeding directed air flow simply does not exist there." FN42

FN39. '621 at 2:53-55.

FN40. D.I. 368, Ex. B at 20 (Amendment to '621 patent application dated July 10, 1996).

FN41. *Id.*

FN42. *Id.*

The invention described in the '621 patent could not be practiced in notebook computers existing at the time of Tulip's invention because the relatively short height of the case for those notebook computers precluded use of a riser card with a plurality of connectors. This distinguishing characteristic was specifically referenced in both the specification and prosecution history. Other characteristics of notebook computers (*i.e.*, the lack of a cooling fan) nullify the advantage of more efficient air flow within the computer that is purportedly achieved by repositioning the riser card to the side edge of the motherboard. The differences between Tulip's claimed invention and those of a notebook computer were expressly relied upon by Tulip to distinguish its invention from the prior art disclosed by the Lam patent. Such clear acknowledgment in the specification and prosecution history that Tulip's claimed invention does not cover a notebook computer leads the court to conclude the term "personal computer" recited in the preambles of claims 1 and 2 limits

the scope of those claims to the extent that a notebook computer is excluded from the meaning of that term.FN43

FN43. *See e.g.*, *SciMed Life Sys., Inc. v. Adv. Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1341 (Fed.Cir.2001) ("Where the specification makes clear that the invention does not include a particular feature, that feature is deemed to be outside the reach of the claims of the patent, even though the language of the claims, read without reference to the specification, might be considered broad enough to encompass the feature in question."); *Elkay Mfg. Co. v. Ebco Mfg. Co.*, 192 F.3d 973 (Fed.Cir.1999) (concluding that argument distinguishing prior art during prosecution resulted in the disavowal of a potential claim interpretation encompassing the distinguished characteristic of that prior art); *Southwall Techs., Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1576 (Fed.Cir.1995) ("The prosecution history limits the interpretation of claim terms so as to exclude any interpretation that was disclaimed during prosecution."). In briefing and at oral argument Dell contended that this court's reasoning in *Ade Corp. v. KLA-Tencor Corp.*, 220 F.Supp.2d 303 (D.Del.2002), supports its argument that the preambles of claims 1 and 2 are not limiting. In *Ade Corp.*, this court concluded that a disputed preamble term merely recited an intended use of the claimed invention and, therefore, was not limiting. In that case, however, there is no indication that the patentee distinguished its invention from prior art in a way that necessitated reading that preamble as limiting. Indeed, this court stated that the preamble in question "[was] not necessary to understand ... the scope of the invention encompassed thereby." *Id.* at 310. Here, Tulip distinguished its invention from the Lam patent and, thereby, limited the scope of the "personal computer" referenced in the preambles of claims 1 and 2. It is through the limitation placed on the term "personal computer" by this court's construction of that term that the scope of Tulip's invention is understood. Similarly, in *STX, LLC v. Brine, Inc.*, 211 F.3d 588 (Fed.Cir.2000), also cited by Dell, when affirming the trial court's determination that a preamble was not limiting, the Federal Circuit noted that the prosecution history suggested that "the phrase was not essential in distinguishing [the claimed invention] over the prior art, and was not decisive in securing allowance of the claim during prosecution." *Id.* at 591. Again, the facts of *STX, LLC* are inconsistent with those of this case.

3. Parties' positions on claim construction

Each of the parties assert that their construction of the term "personal computer" gives that term its ordinary and accustomed meaning. Tulip proposes the term be construed as meaning a personal computer of the AT type, and specifically desktop and desktside computers. Dell argues that, even if the court determines that the preambles of claims 1 and 2 are found to be relevant claim limitations, Tulip's proposed construction is not consistent with the ordinary and accustomed meaning of "personal computer." Dell states that, at the time of Tulip's '621 patent application, the ordinary and accustomed meaning of "personal computer" meant a computer for individual or home use. FN44 During the same time period, Dell notes that a portable computer was defined as a "personal computer that is designed and configured to permit transportation as a piece of handled luggage." FN45 Based on these definitions, Dell argues, the ordinary and accustomed meaning of "personal computer" at the time of Tulip's '621 application included a portable, or notebook, computer.

FN44. D.I. 323 at 13 (citing MCGRAW-HILL DICTIONARY OF SCIENTIFIC AND TECHNICAL TERMS 1840 (5th ed.1994)).

FN45. *Id.* at 13 (citing NEW IEEE STANDARD DICTIONARY OF ELECTRICAL AND ELECTRONIC TERMS 975 (5th ED.1993)).

Tulip contends that the term "personal computer" should be defined according to its ordinary and

accustomed meaning and consistent with the manner in which the applicant used that term to define the invention and describe its preferred embodiments. Tulip asserts that the term "personal computer" should be construed as limited to a desktop or deskside personal computer and not including a notebook computer.

Dell contends that there is nothing in the specification or prosecution history that clearly indicates an intention to define "personal computer" in a manner contrary to the ordinary and accustomed meaning of that term. The specification describes the invention as "[a] (personal) computer of the AT type or a computer which is compatible therewith." FN46 Dell maintains that by including the term "compatible," Tulip signaled its assertion that the '621 patent covered later-developed generations of the personal computers described in the specification and, therefore, was not altering the definition of the term "personal computer" from its ordinary meaning.

FN46. '621 at 1:19-20.

Dell asserts that Tulip's construction improperly limits the scope of the invention claimed by the '621 patent. The patent's written description states that:

[a]lthough the motherboard according to the invention is applicable in various type [sic] of housings for personal computers of the AT type, in which there is a need for a riser card with at least two but preferably more positions for expansioncards, the motherboard has the most advantages when used in a computer of the desktop type.FN47

FN47. '621 at 5:32-37.

Dell contends that this language recites a preferred embodiment of the claimed invention and not that the scope of the invention was limited to only desktop computers. Dell suggests that its proposed construction is the most appropriate as it does not improperly limit the scope of the claims to the preferred embodiment of a desktop computer.FN48

FN48. *See* *Ekchian v. The Home Depot, Inc.*, 104 F.3d 1299, 1303 (Fed.Cir.1997) ("While examples disclosed in the preferred embodiment may aid in the proper interpretation of a claim term, the scope of a claim is not necessarily limited by such examples."); *see also* *Laitram Corp. v. Cambridge Wire Cloth Co.*, 863 F.2d 855, 865 (Fed.Cir.1988) ("References to a preferred embodiment, such as those often present in a specification, are not claim limitations.").

Dell states that other claims of the '621 patent support its contention that the ordinary and accustomed meaning of the "personal computer" of claims 1 and 2 included a portable, or notebook, computer when the '621 patent was filed. Dell notes that claim 3 of the patent, from which claim 2 depends, claims "[t]he personal computer of claim 2 wherein the computer is a desktop computer." FN49 According to Dell, claim 3 is directed at a subset (*e.g.*, desktop computers) of the general set of personal computers covered by claims 1 and 2. Any other interpretation, Dell contends would render the words "desktop type" in claim 3 redundant.

FN49. '621 at 7:8-9.

Dell points to the prosecution history of the '621 patent as further support for this argument. Dell notes that the language of claims 1 and 2, as originally filed, contained the phrase "a computer of the AT type" and

that original claim 3 depended from original claim 2 and limited original claim 3 to "[a] computer according to claim 2, characterized in that the computer is of the desktop type." FN50 Dell argues that this is additional evidence indicating that Tulip intended to claim all personal computers, in original claims 1 and 2, and a subset of all personal computers, a desktop computer, in original claim 3.

FN50. D.I. 324, Ex. 2 at TLP2 117060-61.

Tulip responds that, in view of its unequivocal disavowal of a notebook computer, the claim 3 reference to a "desktop type" computer having a housing as described in that claim distinguishes the invention of claim 3 from a mini tower computer, not a notebook computer, particularly in light of the stated applicability of the claimed invention "in various type[s] of housings for personal computers of the AT type." FN51 Tulip also notes that claim 3 includes additional limitations, like a box housing, that differentiate it from claim 2, thereby making it unnecessary that the phrase "desktop type" differentiate the claims.

FN51. '621 at 5:32-33.

4. Court's construction

[10] The court accepts the as the ordinary and accustomed meaning of "personal computer," cited by Dell, as a computer for individual or home use. That definition, however, must be limited by the acknowledgment, evident from the '621 patent specification and its prosecution history, that the computer for individual or home use claimed does not include a portable, or notebook, computer.FN52 Such a construction does not apply a meaning contrary to the ordinary and accustomed meaning of "personal computer," as that term was understood by one of ordinary skill in the art at the time Tulip applied for its '621 patent. That construction accepts the ordinary and accustomed meaning of the term as limited by the intrinsic evidence read as a whole.FN53

FN52. *See Specialty Composites v. Cabot Corp.*, 845 F.2d 981, 987 (Fed.Cir.1988) (stating that once the ordinary and accustomed meaning of a term is found, the court "must then determine whether the term acquired a more restricted meaning in the claims of the ... patent by intent or *during prosecution*."). (emphasis added).

FN53. *See Standard Oil Co. v. American Cyanamid Co.*, 774 F.2d 448, 452 (Fed.Cir.1985) ("[T]he prosecution history (or file wrapper) limits the interpretation of claims so as to exclude any interpretation that may have been disclaimed or disavowed during prosecution in order to obtain claim allowance.").

At oral argument, Dell contended that the citations to the specification and prosecution history relied upon by Tulip pertained to an obviousness argument about the combinability of prior art references, not a definition of personal computer. The representations Tulip made with regard to the obviousness of its invention, however, resulted in a clear disclaimer of notebook computers from the scope of its claimed invention. The scope of the claims being thus narrowed, can not be re-broadened by this court's construction of the term "personal computer" to include the very type of computer disclaimed.FN54

FN54. *Elekta Instrument S.A. v. O.U.R. Scientific Int'l, Inc.*, 214 F.3d 1302, 1308 (Fed.Cir.2000) ("Claims that have been narrowed in order to obtain issuance over the prior art cannot later be interpreted to cover that which was previously disclaimed during prosecution.").

Construing "personal computer" to mean a computer for individual or home use, but not including a notebook computer, is also consistent with the language of the specification cited by Dell describing "[a] (personal) computer of the AT type or a computer which is compatible therewith" FN55 as it protects what Dell characterized as Tulip's assertion that the '621 patent covers later-developed generations of personal computers described by the claims. The court's construction also avoids Dell's concern over the improper importation of a preferred embodiment limitation from the specification. As Dell correctly notes, the language of the written description stating that "the motherboard has the most advantages when used in a computer of the desktop type" FN56 does not limit the scope of the invention to only desktop computers. Despite that fact, the language of the written description immediately preceding the just-quoted language, describing a personal computer "in which there is a need for a riser card with *at least two* but preferably more positions for expansion cards," FN57 and the language of claims 1 and 2, calling for a "riser card [in which] ... *a plurality of expansion boards* can be simultaneously mated," FN58 does preclude the invention from covering a notebook computer. As explained above, at the time of Tulip's '621 patent application, notebook computers could not accommodate a riser card with more than one expansion board.FN59 The court's construction, therefore, avoids both limiting the claims to a preferred embodiment and broadening the scope of those claims to cover a notebook computer.

FN55. '621 at 1:19-20.

FN56. *Id.* at 5:36-37.

FN57. *Id.* at 5:34-36 (emphasis added).

FN58. *Id.* at 6: 11-12 (claim 1); *Id.* at 6:51-52 (claim 2) (emphasis added).

FN59. *See* D.I. 368, Ex. B at 19-20 (stating that "prior to the Lam patent [notebook computers] could not accommodate even one industry standard expansion board" and that the "Lam [patent] teaches ... how to incorporate just *one* expansion board into a notebook computer" (emphasis added)).

The court disagrees with Dell's assertion that the language of claim 3, claiming "[t]he personal computer of claim 2 wherein the computer is a desktop type," FN60 would be rendered redundant if notebook computers are determined to be outside of the scope of the term "personal computer." The "desktop type" computer of claim 3 may properly be directed to a subset of the "various types of housings for personal computers" FN61 to which the specification states the invention is applicable. Moreover, the limitation of dependent claim 3 is directed not only to a desktop type computer but also to the housing for the computer described in that claim. These additional areas of claim coverage are consistent with Dell's assertion that claim 3 contains a definition of personal computer that claims a subspecies of the personal computer of claim 2, notwithstanding the court's determination that it is clear, as demonstrated above, that notebook computers are excluded from the term "personal computer." Therefore, the court finds that the disputed term "personal computer" means a computer for individual or home use, but not including a notebook computer.

FN60. '621 at 7:8-9.

FN61. *Id.* at 5:33-34.

B. Riser card

1. Parties' positions

[11] The parties are in substantial agreement as to the meaning of the disputed term "riser card." Tulip has suggested a number meanings for the term, proposing in its final *Markman* brief the definition: "[a] printed circuit board that provides electrical connectors for expansion boards and plugs into a mating connector on the motherboard." FN62 Dell contends that "[t]he term requires a printed circuit board extending perpendicular to a motherboard, the printed circuit board including at least one expansion board connector mounted thereon, and wherein the printed circuit board is electrically connected to the motherboard." FN63

FN62. D.I. 368 at 5. In the parties' joint submission of disputed terms, Tulip suggested "riser card" be defined as: "[a] printed circuit board that is mounted on the motherboard planar and provides electrical connections for expansion boards." D.I. 308 at 5. In its initial *Markman* brief, Tulip defines "riser card" as: "[a] printed circuit board that is mounted on the motherboard and that provides electrical connectors for expansion boards." D.I. 326 at 11.

FN63. D.I. 308 at 10.

Both parties cite the definition of riser board contained in the specification of the '621 patent. The specification states, "[t]he motherboard then comprises a connector for a plug-on or so-called riser card. This is a printed board with printed circuitry on which, in a row parallel above each other, a number of connectors are arranged." FN64 Additionally, Dell notes that the claims also call for "a mating connector for [the] riser card." FN65 The mating connector is claimed as having "an opening adapted to receive a riser card, said mating connector being oriented on the motherboard such that the opening extends in a direction perpendicularly upward from a horizontal surface of the motherboard." FN66 From this, Dell argues the term "riser card" must include the requirement that the riser card extend perpendicularly from the motherboard.

FN64. '621 at 1:56-59.

FN65. *Id.* at 5:66.

FN66. *Id.* at 6:2-6.

2. Court's construction

The parties agree that the term "riser card" concerns a printed circuit board with connectors into which a plurality of expansion boards may be inserted. FN67 At oral argument, Tulip agreed that the mating connector described in the claims at issue necessarily results in the riser card extending perpendicularly from the motherboard when the riser card is inserted into the mating connector. Likewise, Dell acknowledged at oral argument that the "electrical connectors," which Tulip described as "contact strips" (*i.e.*, metal fingers on the edge of the riser card) that mate with the "connector on the motherboard," FN68 would satisfy Dell's proposed construction that the riser card be "electronically connected to the motherboard." Therefore, the court construes "riser card" to mean a printed circuit board extending

perpendicularly from, and being electronically connected to, the motherboard and having a plurality of expansion connectors into which expansion boards may be inserted.

FN67. Although the proposed construction suggested by Dell in the joint submission on disputed claim terms includes a requirement that at least one expansion board be inserted into the riser card, neither party addressed that requirement in their *Markman* briefing or at oral argument with respect to the definition of riser card. Because that purported requirement is separately addressed, below, whether or not the riser card has at least one expansion board inserted is not considered in the court's construction of the term "riser card."

FN68. D.I. 368 at 5.

C. Adjacent

[12] The term "adjacent" pertains to the location of the mating connector into which the riser card is inserted: "a mating connector for a riser card, said mating connector situated on the motherboard and **adjacent** and parallel to a peripheral side edge thereof." FN69

FN69. '621 at 5:66-6:1 (claim 1); *Id.* at 6:38-40 (claim 2).

1. Parties' positions

Tulip proposes "adjacent" be given its ordinary and accustomed meaning, "lying near or close to." FN70 Dell contends that the term should *not* be given its ordinary and accustomed meaning, "nearby but not touching," FN71 because the term is clearly redefined in the written description. Dell asserts that the term requires the mating connector to be located along the side of the motherboard. Dell contends that Figure 2 (reproduced below) shows the mating connector 22 located on the edge of the motherboard 21. Dell contends that Figure 4 also shows the riser card and mating connector along the side of the motherboard.

FN70. WEBSTER'S NEW TWENTIETH CENTURY DICTIONARY 24, Unabridged Second Edition (1970).

FN71. WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY 26 (1993).

Tulip argues that Figure 2 illustrates a preferred embodiment. Tulip contends that reference to a preferred embodiment is insufficient to overcome the presumption that a claim term carries its ordinary and accustomed meaning. FN72 Furthermore, Tulip points out that Figure 2 shows the riser card connector 22 is near, but *not* touching, the outermost side edge of the motherboard. Tulip contends Dell's construction improperly limits the claims, without intrinsic support for that limitation, by suggesting a definition that would preclude traces or other components between the riser card connector and the far edge of the motherboard.

FN72. *See CCS Fitness, Inc. v. Brunswick Corp.* 288 F.3d 1359, 1366 (Fed.Cir.2002) ("An accused infringer may overcome [the] 'heavy presumption' [that a claim term carries its ordinary and customary meaning] and narrow a claim term's ordinary meaning, but he cannot do so simply by pointing to the preferred embodiment or other structures or steps disclosed in the specification or prosecution history.").

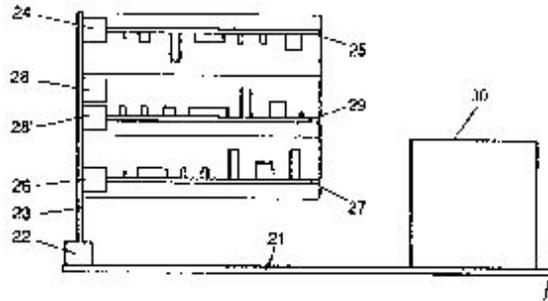


FIG. 2

2. Court's construction

The parties' disagreement over the meaning of the term "adjacent" concerns whether the term should be defined with reference to the side edge of the motherboard and whether the connector must be flush with the side edge of the motherboard. The court accepts the dictionary definition cited by Dell, "nearby but not touching," as the ordinary and accustomed meaning of "adjacent" but disagrees with Dell that "adjacent" is clearly redefined in the written description. To the extent Dell suggests that "adjacent" means that the mating connector must be flush with the side edge of the motherboard, there is nothing in the claims or specification supporting that meaning. Notwithstanding the fact that the figures cited by Dell merely represent preferred embodiments of the claimed invention, they do not show the mating connector flush with the side of the motherboard. Figure 2 shows mating connector 22 nearby, but not touching, the edge of motherboard 21. The perspective shown in Figure 4 does not illustrate either the mating connector or side edge of the motherboard where the mating locator is located and, therefore, Figure 4 is of no aid to the court's construction of the disputed term.

To the extent there is any dispute over whether the term "adjacent" must be defined with respect to the side edge of the motherboard, the claims in issue make that requirement clear. Claims 1 and 2 recite that the mating connector is "situated on the motherboard and adjacent ... to a peripheral side edge thereof." FN73 Consequently, the court construes "adjacent" as meaning that the mating connector is located nearby but not touching the side edge (as defined below) of the motherboard.

FN73. '621 at 5:67-6:1 (claim 1); *Id.* at 6:39-40 (claim 2) (emphasis added).

D. Parallel

[13] The term "parallel" is directed to the orientation of the mating connector with respect to the edge of the motherboard ("a mating connector for a riser card, said mating connector situated on the motherboard and adjacent and **parallel** to a peripheral side edge thereof"); FN74 the orientation of the expansion connectors on the riser card with respect to each other ("all of the expansion connectors being horizontally oriented and successively arranged in a **parallel** fashion one above another"); FN75 and the orientation of the expansion boards, when inserted into the riser card, with respect to the motherboard ("said riser card being oriented with respect to the motherboard such that each one of the plurality of expansion boards inserted into a corresponding one of said expansion connectors is oriented in a direction *substantially parallel* to a horizontal plane of the motherboard"). FN76

FN74. *Id.* at 5:66-6:1 (claim 1); *Id.* at 6:38-40 (claim 2).

FN75. *Id.* at 6:17-19 (claim 1); *Id.* at 6:56-58 (claim 2).

FN76. *Id.* at 6:20-25 (claim 1), *Id.* at 6:59-64 (claim 2) (emphasis added).

1. Parties' positions

Tulip proposes that "parallel" be given its ordinary and accustomed meaning, "extending in the same direction." FN77 Dell's proposes that "parallel" be construed according to its ordinary meaning, "extending in the same direction ... everywhere equidistant ... and not meeting," FN78 but that the phrase "substantially parallel" must be given a different meaning than when "parallel" is used without that modifier.

FN77. WEBSTER'S NEW TWENTIETH CENTURY DICTIONARY 1299, Unabridged Second Edition (1970).

FN78. WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY 1637 (1993).

Dell notes that Claims 1 and 2, as originally filed, contained the phrase "substantially parallel" in reference both to the location of the mating connector on the motherboard and to the orientation of expansion boards to the motherboard when inserted into the riser card.FN79 After those claims were rejected by the examiner, the substituted claims removed the modifier "substantially" from before "parallel" in reference to the location of the mating connector on the motherboard, but "substantially" was not removed from before "parallel" in reference to the expansion boards being "substantially parallel" to the motherboard. Dell cites *Jeneric/Pentron, Inc. v. Dillon Co., Inc.* for the proposition that when flexible language ("about" in that case) is included in a claim, the court must strictly construe terms without flexible language.FN80 Dell argues that by removing the word "substantially" during prosecution, Tulip surrendered an interpretation of the claims that would allow the mating connector to be anything but exactly "parallel" to "a peripheral side edge." Therefore, Dell insists that the court apply its proposed construction, "extending in the same direction, everywhere equidistant and not meeting," with mathematical precision.

FN79. Claims 1 and 2 as filed on June 13, 1996 in the original patent application recited: "said riser card having a predetermined number of positions for expansion cards and comprising a number of connectors, substantially arranged in a row *parallel* above each other, for such expansion cards, while the plane of an expansion card, when it is arranged in a connector of the riser card, extends *substantially parallel* to the plane of the motherboard, characterized in that the connector for the riser card is arranged adjacent a side edge of the motherboard and *substantially parallel* thereto." D.I. 324, Ex. 2 at TLP2 117060-61 (emphasis added).

FN80. *See* 205 F.3d 1377, 1381 (Fed.Cir.2000).

Tulip asserts that Dell's proposed construction, which includes the limitation of being "everywhere equidistant," is impracticable as it is beyond the ordinary tolerances of circuit board manufacturing and,

therefore, that definition could not be consistent with the ordinary and accustomed meaning of "parallel" to one of ordinary skill in the art. Tulip argues that *Jeneric/Pentron* is inapplicable here as that case concerned precise numeric limitations in chemical composition claims where the precise numeric limitations were required to distinguish over the prior art, circumstances different from those of this case. Finally, Tulip contends that the '621 patent specification supports its proposed construction which explicitly discloses a riser connector that is substantially parallel to a side edge of the motherboard.FN81

FN81. See '621 at 2:65-3:1 ("To that end, the invention provides a motherboard of the above-mentioned type, characterized in that the connector for the riser card is arranged adjacent to a side edge of the motherboard and substantially parallel thereto,...."); Id. at 4:1-4 ("characterized in that the connector for the riser card is arranged adjacent a side edge of the motherboard and substantially parallel thereto,....").

2. Court's construction

Although Tulip suggests defining "parallel" according to its ordinary and accustomed meaning, Tulip only cites part of the definition put forth to define that term. The dictionary Tulip cites as reciting the ordinary and accustomed meaning of "parallel" defines that term as: "extending in the same direction and at the same distance apart at every point, so as never to meet," FN82 a definition no different than that recited by Dell as the ordinary and accustomed meaning of "parallel."

FN82. WEBSTER'S NEW TWENTIETH CENTURY DICTIONARY 1299, Unabridged Second Edition (1970).

Tulip is correct, however, in arguing that the facts of *Jeneric/Pentron* are distinguishable from those presented in this case. The patent at issue in *Jeneric/Pentron* was directed to a porcelain composition used in dental restoration products. Within one of the claims at issue in that case, the patent recited both precise ranges for chemical components of its claimed composition and imprecise language, "about," to qualify the values of other elements of that claim.FN83 The *Jeneric/Pentron* court also noted that those precise ranges had to be written narrowly to avoid being found anticipated or obvious in light of a prior art patent incorporated by reference into the patent at issue in that case.FN84 Based on those facts, the Federal Circuit agreed with the trial court's determination that the scope of the asserted claim was limited to the precise ranges recited stating, "Jeneric may not rely on the precise ranges of the claims to distinguish itself from prior art during prosecution and then later construe the ranges more broadly during an infringement action." FN85

FN83. *Jeneric/Pentron*, 205 F.3d at 1381.

FN84. Id. at 1382.

FN85. Id.

In this case, Tulip amended the '621 patent application to avoid the examiner's initial determination of obviousness in light of two prior art references. Tulip did not, however, rely on its substitution of a claims reciting that the mating connector was "parallel" to the side edge of the motherboard for cancelled original claim which recited a mating connector that was "substantially parallel" in order to avoid a prior art reference. Instead, Tulip argued that the two references cited by the examiner would not have made its

claimed invention obvious to one of ordinary skill in the relevant art. The Harwer patent (U.S. Patent No. 5,440,755) teaches a riser card with a plurality of expansion connectors. The Harwer patent teaches form factor wherein the riser card is centrally located on the motherboard with expansion connectors for PCI boards at the top of the riser card and expansion connectors for ISA boards on the lower part of the riser card. The Lam patent teaches, in the context of a notebook computer, placing a riser card on the edge of the motherboard with only one expansion connector thereon. As discussed in the section concerning the term "personal computer," Tulip argued that the physical environment of a notebook computer would not accommodate its claimed invention and, therefore, no one in skilled in the art would have looked to the Lam patent to remedy the disadvantages of a centrally located riser board having a plurality of expansion connectors. This court determined, above, that these representations narrowed the scope of Tulip's invention so as not to encompass notebook computers. Tulip's successful attempts to distinguish the prior art referenced by the examiner did not, however, depend on, or even mention, whether the claimed mating connector was "parallel" or "substantially parallel" to the side edge of the motherboard. The fact remains, though, that Tulip did delete the word "substantially" from before "parallel" in describing the orientation of the mating connector to the side edge of the motherboard and may have, inadvertently or not, narrowed the scope of the claims in suit.

Perhaps in realization of this fact, Tulip seems to contradictorily argue that the term "parallel" should be given its ordinary and accustomed meaning but proposing a truncated version of the definition contained in its cited dictionary because the full definition would purportedly be impracticable as beyond standard circuit board manufacturing tolerances. Such manufacturing tolerances are extrinsic evidence not necessary to the court's understanding of the commonly understood term "parallel." That extrinsic evidence might be relevant to the finder of fact at a later stage of this litigation should the issue of infringement, either literal or by the doctrine of equivalence, depend on whether a mating connector is "parallel" or "substantially parallel" to the side edge of the motherboard. For the purposes of construing the word "parallel," however, the court need look no further than the intrinsic record.

Nothing in the claims, specification, or prosecution history leads this court to accept the truncated definition of "parallel" suggested by Tulip. Based on each party's assertion that "parallel" be given its ordinary and accustomed meaning, and finding no need to examine extrinsic evidence, the court construes the term "parallel" to mean extending in the same direction with every point the same distance apart and never meeting.FN86

FN86. The parties have not submitted "substantially" as a disputed term this court needs to construe. As the definition of parallel is to the same each time it is recited in the claims, "substantially" parallel provides deviation from the precise meaning of "parallel" to the extent a future finder of fact may determine. Although the court need not address Dell's contention that the definition be applied with "mathematical precision," it is noted that the relevant reference for a determination of whether the mating connector is parallel is no greater than the length of the side edge of the motherboard adjacent to which the connector is mounted and would not be determined by an infinite extension of imaginary lines coextensive with the mating connector and the side edge of the motherboard.

E. The side edge and peripheral side edge

[14] The terms "peripheral side edge" and "the side edge" refer to the position on the motherboard of the mating connector for the riser card ("a mating connector for a riser card, said mating connector situated on the motherboard and adjacent and parallel to a **peripheral side edge** thereof") FN87 and the location and orientation of the riser card and any attached expansion boards when the riser card is plugged into the mating connector ("said riser card being oriented with respect to the motherboard such that each one of the plurality of expansion boards inserted into a corresponding one of said expansion connectors is oriented in a

direction substantially parallel to a horizontal plane of the motherboard and extends inward from a vicinity of **the side edge** towards a central portion of the motherboard").FN88

FN87. '621 at 5:66-6:1 (claim 1); Id. at 6:38-40 (claim 2).

FN88. Id. at 6:20-26 (claim 1); Id. at 6:59-65 (claim 2).

1. Parties' positions

As with the disputed term "riser card," Tulip has offered several definitions for the term "peripheral side edge." In its final *Markman* brief, Tulip proposes giving the words of the phrase "peripheral side edge" their ordinary and accustomed meanings and construing the disputed phrase to mean "an edge on a side at the periphery of the motherboard, as contrasted to an edge on the front or back of the motherboard." FN89 Dell contends that the phrase has no clear meaning and is indefinite. If any meaning can be ascribed to the phrase, Dell suggests that, "edge" means a line where the motherboard ends, "side edge" means a long edge, rather than a short edge or end, of a rectangular motherboard, and "peripheral side edge" means a side edge on the periphery of the motherboard.

FN89. D.I. 368 at 14. In the parties' joint submission of disputed terms, Tulip suggested "peripheral side edge" be defined as: "a side on the periphery of the motherboard." D.I. 308 at 6. In its initial *Markman* brief, Tulip defines "peripheral side edge" as: "one of the sides at the periphery of the motherboard, as contrasted to the front or back edge of the motherboard." D.I. 326 at 13.

Tulip contends that "peripheral" has an ordinary and accustomed meaning of "pertaining to, constituting, or of the nature of a periphery." FN90 Tulip suggests the ordinary and accustomed meaning of "side" is "(a) any of the lines or surfaces that bound or limit something; as, a square has four *sides*, a cube six; (b) any bounding line or surface of an object other than the ends or top and bottom; (c) either of the two bounding surfaces of an object that are distinguished from the front, back, top, and bottom." FN91 Tulip states that the ordinary meaning of "edge," is "the abrupt border or margin of anything; the brink, as the *edge* of the table; the *edge* of a precipice." FN92 These ordinary meanings, Tulip contends, support a construction of the phrase "peripheral side edge" as a border on the periphery of a motherboard which is not the front, back, top, or bottom. Tulip argues further that its use of the indefinite article "a" ("a peripheral side edge thereof"), indicates that the claimed peripheral side edge of a motherboard is not limited to a single peripheral side edge running the entire length of the motherboard but also encompasses a side edge on the periphery of the motherboard that may extend across a portion of that length if, for example, a motherboard was not rectangular or had an irregular side edge. Tulip contends that its proposed construction is consistent with the disclosure of a preferred embodiment recited in the '621 patent's specification reciting, "FIG. 2 shows how, in accordance with the invention, by moving the connector 22 for the riser card 23 to the side of the motherboard 21, the above-outlined problems are obviated and additional advantages are obtained." FN93

FN90. WEBSTER'S NEW TWENTIETH CENTURY DICTIONARY 1334, Unabridged Second Edition (1970).

FN91. Id. at 1685 (emphasis in original).

FN92. Id. at 576 (emphasis in original).

FN93. '621 at 5:5-8.

Tulip suggests that the phrase "the side edge" be construed to mean the "peripheral side edge" (according to Tulip's proposed construction) of the motherboard adjacent to the connector for the riser card. Tulip argues that the antecedent basis for "the side edge" is "a peripheral side edge," introduced earlier in the claims. Tulip also points out that there is no language in the specification which refers to the relative lengths of the sides of the motherboard, as is included in Dell's proposed construction.

Dell contends that the meaning of the term "the side edge" is clear from the language of the claims. Dell states that the term "edge" should be given its ordinary meaning of a line where the motherboard ends and that "side edge" should be construed to mean the longer edge, rather than a shorter edge or end, of a rectangular motherboard. Dell insists that the terms "side" and "edge" must be given different meanings or those terms would be redundant. Dell argues that its construction is also consistent with the specifications of the '621 patent and points to Figure 4 where the motherboard 41 includes four edges: two sides (or longer edges) and two ends (or shorter edges). The riser card 43 is located along one of the two sides or longer edges. Dell also directs the court's attention to Figure 2 which shows that the expansion boards inserted into the riser card 23 extend inwardly from one of the two side edges toward a central portion of the motherboard 21.

Dell argues that because the phrase "peripheral side edge" is not clearly defined within the language of claims 1 and 2, and since "peripheral side edge" is not referenced in the written description or prosecution history, this court should determine that the phrase is indefinite. Dell contends that if the court disagrees with its argument that the term is indefinite, since "peripheral" is qualified by the term "thereof," the only proper reference point is the motherboard and the phrase must be construed to mean either of the side edges on the periphery of the rectangular motherboard. Although Dell argues this construction is proper, it contends that the word "periphery" in this construction is surplusage.

Dell maintains that Tulip improperly suggests a construction where "the side edge" and "peripheral side edge" be given the same meaning. Such a construction, Dell argues, is contrary to the principal of claim construction that different terms used in a claim should be construed differently. Dell also urges the court to reject Tulip's antecedent basis argument for construing the two phrases identically. Dell points out that the phrase "a peripheral side edge" is properly the antecedent "the *peripheral* side edge" not "the side edge." Dell notes that original claims 1 and 2 referred had a single reference to a "side edge" but did not include the word "peripheral." FN94 Claims 1 and 2 of the '621 patent as issued contain the two references to "side edge" contained in the disputed phrases. The word "peripheral" precedes the first reference to "side edge" but not the second reference to "side edge." Dell argues that if Tulip intended the phrase "a peripheral side edge" to serve as the antecedent for the phrase "the side edge," the word "peripheral" would have been included before both references to "side edge."

FN94. Original claims 1 and 2 only referred to "side edge" in the following phrase: "characterized in that the connector for the riser card is arranged adjacent to a side edge of the motherboard and substantially parallel thereto." D.I. 333, Ex. 2 at TLP2 117060-61.

2. Court's construction

The parties agree that "peripheral side edge" and "side edge" refer to the motherboard. The parties' proposed definitions of "edge" are consistent with the definition of that word as "the line or point where a material

object or area begins or ends: BORDER." FN95 The parties disagree as to how "side" is to be defined so as to give that word a different meaning from "edge." The court disagrees with Dell's suggestion that "side" means the long, as opposed to the short, edges of a rectangular motherboard. There is no claim element referencing the relative lengths of the edges of the motherboard. In fact, there is no evidence in the specification or prosecution history that necessitates narrowing the scope of Tulip's invention to a rectangular motherboard. That being the case, the '621 patent could cover a square motherboard whose edges are, by definition, all the same length; a shape to which Dell's proposed construction could not be applied. The court also disagrees with Dell's argument that Figures 2 and 4, showing a rectangular motherboard having the mating connector for the riser card along one of the longer edges of that motherboard, support its proposed construction. Accepting Dell's argument would improperly narrow the claims at issue to a preferred embodiment illustrated by those figures.

FN95. WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY 722 (1993).

The court agrees with Tulip's suggestion that the "side" the motherboard referred to in the disputed term is an edge of the motherboard which is not a front edge or a rear edge of the motherboard.FN96 This construction gives a different meaning to the words "side" and "edge" and can be applied to motherboards of differing shapes (whether rectangular, square, or as Tulip posits, having an irregular shape). Therefore, the court construes "side edge" to be the border of the motherboard which is not the front or rear of the motherboard.

FN96. *See* WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY 2111 (1993) (defining "side" as "one of the surfaces or surface parts of an object which are distinguished ... from the front or back as being more or less perpendicular to the observer").

The addition of the modifier "peripheral" to "side edge" is somewhat perplexing. Peripheral is an adjective referring to the periphery of something, here a "side edge." Periphery is defined as "the outward bonds of something as distinguished from its internal regions or center." FN97 Periphery and edge (when referring to a border, as here) are synonyms FN98 so it is unclear what, if anything, the word "peripheral" adds to the phrase "side edge." Tulip's proposed construction of the phrase "peripheral side edge" ("an edge on a side at the periphery of the motherboard, as contrasted to an edge on the front or back of the motherboard") attempts to define the disputed phrase using "periphery" without suggesting how "periphery" adds meaning to the phrase. Indeed at oral argument, Tulip appeared to concede that the word "peripheral" does not add additional meaning to the phrase "side edge." When asked to distinguish "peripheral side edge" from "side edge" Tulip responded that "peripheral side edge and side edge are mutually reinforcing terms. They're saying the same thing. They are not trying to define different terms." FN99 Like Tulip's proposed construction, Dell's definition of "peripheral side edge" as "a side edge on the periphery of the motherboard" is no different in scope than the court's construction of the phrase "side edge." For the reasons that follow, the court determines that the word "peripheral" and "edge" are redundant and construes the disputed phrase "peripheral side edge" to have the same meaning as the disputed phrase "side edge."

FN97. *Id.* at 1681.

FN98. *See* WEBSTER'S COLLEGIATE THESAURUS 272 (edge), 595 (periphery) (1976).

FN99. D.I. 396 at 37 (Transcript of *Markman* hearing).

There is no evidence, and neither party argues, that the disputed phrases are referring to different locations on the motherboard or that "peripheral side edge" is intended to refer to a more limited area than "side edge." FN100 As Dell points out, the single reference to a "side edge" was not modified by the word "peripheral" in claims 1 and 2 as originally filed. During prosecution, original claims 1 and 2 were cancelled and the claims that ultimately issued as claims 1 and 2 in the '621 patent were added by amendment and included two references to the phrase "side edge," the first of which included the modifier "peripheral." As explained above, however, the cancellation of original claims 1 and 2 was in response to an obviousness rejection which had nothing to do with the definition of the phrase "side edge." The modifier "peripheral" was not added to avoid the referenced prior art and the applicant's comments with regard to the claims in the amendment did not discuss the phrase.FN101

FN100. Tulip did argue that, in order to give some meaning to the word "peripheral," the court could construe the disputed phrase "to refer to the side edge of the motherboard that is closest to an outer side wall (*i.e.*, a periphery) of the computer housing." D.I. 383 at 9. This would not be a reasonable construction as ascribing such meaning to the term requires reference to the computer housing. A computer housing is not mentioned in either claim 1 or 2. Additionally, the claim language recites, "said mating connector situated on the motherboard and adjacent and parallel to a peripheral side edge *thereof*." '621 at 5:66-6:1 (claim 1); Id. at 6:38-40 (claim 2) (emphasis added). That language unambiguously refers to the peripheral side edge of the motherboard. Moreover, the parties are in agreement that the disputed term is directed to a location on the motherboard. The court will not adopt Tulip's tortured alternative construction by interpreting two words of the disputed phrase, "side" and "edge," as referencing the motherboard and the third word, the adjective "peripheral," as referring to a structure not mentioned in either claim at issue, the computer's housing.

FN101. The fact that "peripheral" was not added during prosecution to narrow the scope of coverage of "side edge" distinguishes this case from *CAE Screenplates Inc. v. Heinrich Fiedler GmbH & Co. K.G.*, 224 F.3d 1308 (Fed.Cir.2000), which Dell cites for the uncontroversial proposition that different claim terms should be construed differently. There, the court determined from the language of substituted claims, and the applicant's arguments to the examiner contained in the prosecution history, that the applicant had narrowed the scope of its claim to avoid prior art referenced in an anticipation rejection. Id. at 1317-18. Significantly, and contrary to the facts of this case, the changes that further defined and narrowed the applicant's claims in *CAE Screenplates* were made to the claim term whose meaning was in dispute. Similarly in *Jack Guttman, Inc. v. Kopykake Enterprises, Inc.*, 302 F.3d 1352 (Fed.Cir.2002), the court determined, when construing the term "tortuous bend" that the dictionary definition of "tortuous," ("marked by repeated twists, bends, or turn") could not be used to define the disputed phrase "because [that definition] simply makes the phrase 'tortuous bend' redundant, without providing any insight into the *crucial issue* of how curved a bend may be before it becomes tortuous within the meaning of claim 11." Id. at 1357 (emphasis added). There, the construction of the disputed phrase "tortuous bend" was crucial to the court's determination of whether the plaintiff in that case had a reasonable likelihood of success on its infringement claim. Here, the plaintiff is not basing its infringement allegations on a distinction between the phrase "peripheral side edge" and "side edge" and the defendant is not proposing a more narrow definition of the phrase "peripheral side edge" which would avoid its products alleged infringement of the '621 patent. In fact, Dell responded to the court's question at oral argument, "is there any example of edge that's not also in the periphery?" by stating, "no. I think they're redundant with each other." D.I. 396 at 78. The effect, if any, of that redundancy will be addressed in this court's opinion on Tulip's motion for summary judgment of validity under 35 U.S.C. s. 112 (D.I.336) in which Tulip challenges Dell's argument that the phrase "peripheral side edge" is so ambiguous so as to make the '621 patent invalid.

Next, this is not a case where considerations of claim differentiation come into play. Both claims 1 and 2

have identical bodies, each reciting both disputed phrases. Neither claim is rendered surplusage if the court construes "peripheral side edge" and "side edge" to have the same meaning. Furthermore, none of the other claims of the '621 patent, those not at issue in this case, are rendered surplusage by that determination.

Finally, Tulip suggests that "a peripheral side edge" provides the antecedent basis for "the side edge" and contends that this further supports its position that both phrases refer to the same area of the motherboard. Although Dell is correct in pointing out that according to standard claim drafting "a peripheral side edge" is the proper antecedent for "the *peripheral* side edge," there is no other antecedent basis in the claims for the phrase "the side edge" other than the disputed phrase "a peripheral side edge." A review of the intrinsic record convinces the court that, despite an apparent sloppiness in claim drafting, the two references to "side edge" are do have the same meaning.

Nothing in the intrinsic evidence has been cited to, or discovered by, the court which indicates that the adjective "peripheral" changes, or adds to, the meaning of the phrase "side edge." FN102 Because the court finds that word "peripheral" is synonymous with the word "edge" as a reference to the border of the motherboard, the court construes "peripheral side edge" as having the same meaning as "side edge," the border of the motherboard which is not the front or rear of the motherboard.

FN102. The extrinsic record before the court also fails to suggest a meaning for the phrase "peripheral side edge" that is different from the meaning of the phrase "side edge." During his deposition, Tulip's expert Ronald S. Bader, was asked, "[i]n 1994 or prior thereto, had you personally ever used the term peripheral side edge in connection with your work as an engineer?" Bader answered, "[n]o. I have not. That's an interesting term." D.I. 370, Ex. 14 at 197. Nevertheless, Bader stated in his expert report that a person of ordinary skill in the art would understand the phrase "peripheral side edge" to have an ordinary and accustomed meaning of "border or margin." D.I. 326, Ex. D at 8. That meaning is merely a definition of the word "edge" and fails to give the words "peripheral" and "side" any effect at all.

F. Such that each one of the plurality of expansion boards inserted into a corresponding one of said expansion connectors

1. Parties' positions

[15] The parties dispute whether this phrase requires that there actually be expansion boards inserted into the expansion connectors. Tulip contends that this phrase should be interpreted as meaning that "connectors on the riser card can accommodate expansion cards and not that there must be expansion cards inserted into the expansion connectors." FN103 Dell argues that "the phrase requires the presence of two or more expansion boards inserted into corresponding expansion connectors on the riser card." FN104

FN103. D.I. 308 at 6-7.

FN104. Id. at 11.

The complete element of the '621 claims in which this phrase appears reads:

The riser card having a predetermined number of expansion positions thereon, each of said positions having at least one expansion connector associated therewith so as to form a plurality of expansion connectors located on the riser card such that a plurality of expansion boards can be simultaneously mated through said expansion connectors to said riser card, said one expansion connector being either an ISA (industry standard

architecture) or a PCI (peripheral connect interface) type connector so as to respectively accommodate an ISA or PCI type expansion board, all of the expansion connectors being horizontally oriented and successively arranged in a parallel fashion one above another, and said riser card being oriented with respect to the motherboard such that each one of the plurality of expansion boards inserted into a corresponding one of said expansion connectors is oriented in a direction substantially parallel to a horizontal plane of the motherboard and extends inward from a vicinity of the side edge towards a central portion of the motherboard.FN105

FN105. '621 at 6:7-26 (claim 1); Id. at 6:46-65 (claim 2).

Tulip argues the disputed phrase describes how expansion boards must be oriented when they are inserted into the riser card, not that there must be at least two expansion boards inserted into the riser card for there to be infringement. Tulip contends the statement that "expansion connectors located on the riser card such that a plurality of expansion boards *can be* simultaneously mated through said expansion connectors to said riser card" FN106 makes it clear that the addition of the expansion card is discretionary with the manufacturer or user. Tulip argues that the portion of the claims containing the disputed language also supports its construction; "said riser card being oriented with respect to the motherboard *such that* each one of the plurality of expansion boards inserted into a corresponding one of said expansion connectors is oriented in a direction substantially parallel to a horizontal plain on the motherboard" FN107 Tulip asserts that the use of "such that" describes the effect of the riser card orientation with respect to the motherboard. When a computer is configured in accordance with the claimed invention, an expansion board will extend toward the center of the motherboard and be oriented parallel to the motherboard. Tulip argues that the claims do not recite a requirement that expansion boards be inserted into the riser card, but merely that expansion boards may be inserted and if they are, they extend inward over the motherboard. Tulip maintains that the specification, drawings, and prosecution history also support its proposed construction.

FN106. Id. at 6:10-13 (claim 1); Id. at 6:49-52 (claim 2).

FN107. Id. at 6:20-25 (claim 1); Id. at 6:59-64 (claim 2) (emphasis added).

Tulip's invention is described in the '621 patent as:

relat[ing] to a motherboard for a computer of the AT type, comprising a connector for a [riser] card to be arranged vertically on the plane of the motherboard and a riser card arranged in that connector, said *riser card having a predetermined number of positions for expansion cards* and comprising a number of connectors, substantially arranged in a row parallel above each other, for such expansion cards, while the plane of an expansion card, *when it is arranged in a connector of the [riser] card*, extends substantially parallel to the plane of the motherboard.FN108

FN108. Id. at 1:9-18 (emphasis added).

Tulip notes that the italicized language does not indicate a requirement that expansion boards be inserted in the riser card. Tulip also points to specification language referencing removal of expansion cards to support its position that the invention does not require the presence of expansion cards. The specification recites that "when arranging and removing expansion cards, a relatively large force must be exerted." FN109 Tulip characterizes Figure 4 of the '621 patent as showing a preferred embodiment of the invention which illustrates a computer with a riser card inserted into the motherboard with no expansion boards inserted into

the riser card. Tulip maintains that it is rarely proper to construe claims to exclude a preferred embodiment of the invention being claimed.FN110 Finally, Tulip maintains that the prosecution history supports its proposed construction. When addressing the examiner's reference to the Lam patent, Tulip notes that it did not distinguish its invention by arguing that its invention had at least two expansion boards inserted into a riser card. Tulip argued that its invention was distinguishable from Lam because the Lam patent taught a riser card with only one expansion connector and Tulip's invention taught a riser card having a plurality of expansion connectors.

FN109. Id. at 5:58-59.

FN110. *See Interactive Gift Express, Inc. v. Compuserve, Inc.*, 256 F.3d 1323, 1343 (Fed.Cir.2001) (stating that a proposed construction in that case "would not read on the preferred embodiment, and therefore would 'rarely, if ever [be] correct and would require highly persuasive evidentiary support.' ") (quoting *Vitronics*, 90 F.3d at 1583; *Modine Mfg. Co. v. United States Int'l Trade Comm'n*, 75 F.3d 1545, 1550 (Fed.Cir.1996) ("[A] claim interpretation that would exclude the inventor's device is rarely the correct interpretation; such an interpretation requires highly persuasive evidentiary support")).

Dell argues that the plain language of claims 1 and 2 require the insertion of two or more expansion boards in corresponding expansion connectors on the riser card; "each one of the *plurality* of expansion boards *inserted* into a corresponding one of said expansion connectors ... extends inward" FN111 Dell contends that the specification also supports its proposed construction as it describes impeded air flow over expansion boards resulting from riser cards in earlier computers being located in the middle of the motherboard as a problem addressed by Tulip's invention. The '621 patent purportedly solved this problem by placing the riser card on the side edge of the motherboard so that air "can flow freely over the motherboard and between the expansion cards." FN112 According to Dell, Tulip's proposed construction would not achieve one of the described advantages of the '621 patent and, therefore, is incorrect.

FN111. '621 at 6:21-25 (claim 1); Id. at 6:60-64 (claim 2) (emphasis added).

FN112. Id. at 23-24.

Dell also points to characterizations made by Tulip during prosecution describing its solution for the cooling problem where, in distinguishing its claimed invention over the Harwer patent, Tulip described its invention as "teach[ing] that the riser card should be located along an edge of the motherboard with expansion boards connected to the card" FN113 as distinguished from the Harwer patent teaching a form factor that suffered from "rather impeded air circulation caused by a centrally located riser card, [and] the proximity of the components from both cards increases the heat build-up between these [expansion] cards, which ultimately reduces their reliability." FN114 Dell contends that these statements demonstrate an affirmative characterization of Tulip's claimed invention as requiring two or more expansion boards inserted into corresponding expansion connectors on the riser card.

FN113. D.I. 324, Ex. 2 at TLP2 117285.

FN114. Id., Ex. 2 at TLP2 117282-83.

Dell also argues that Figure 4 does not support Tulip's proposed construction. The purpose of that figure, Dell contends, is to illustrate the computer case for the claimed motherboard. The description of Figure 4 states that it "shows a perspective view of a case for a personal desktop computer of the AT type with a motherboard according to the invention." FN115 Dell maintains that Figure 4's illustration of a computer case is directed towards claims 3 and 6, not at issue here, and does not include all of the elements of the claimed invention of claims 1 and 2. Dell contends that the description of Figure 3 also supports its proposed construction. Figure 3 is described as "show[ing] a perspective view of a riser card or which connectors and expansion cards are arranged *in the manner of the invention*." FN116

FN115. '621 at 4:32-34.

FN116. *Id.* at 4:29-31 (emphasis added).

The court should reject Tulip's proposed construction because, Dell contends, the requirement that a plurality of expansion boards be inserted into the riser card is described as part of the invention in the specification, included in the claim language, and asserted as a basis for several advantages purportedly achieved by the invention,

2. Court's construction

The claim language supports Tulip's contention that the insertion of expansion boards is permissive, not required, to practice the inventions recited in claims 1 and 2 of the '621 patent. The elements of those claims are: a motherboard, a mating connector for a riser card, a riser card having expansion connectors, and a particular configuration of those expansion connectors on the riser card. Focusing on the riser card, that card must have expansion connectors arranged thereon to fall within the scope of the claims. The claim language does not indicate, however, that expansion boards must be inserted into those expansion connectors to practice the invention.

The claim element which refers to expansion boards uses permissive language with regard to the presence of expansion boards and provides the antecedent basis for the final reference in that element to expansion boards. It recites, "expansion connectors [are] located on the riser card such that a plurality of expansion boards *can be* simultaneously mated through said expansion connectors to said riser card." FN117 That claim element continues with a description of the types of expansion connectors that are to be on the riser card (ISA or PCI connectors) and the orientation of those connectors relative to the riser card and each other. The claim element concludes by describing the orientation of expansion boards inserted into the riser card relative to the motherboard, "said riser card being oriented with respect to the motherboard such that each one of the plurality of expansion boards inserted into a corresponding one of said expansion connectors is oriented in a direction substantially parallel to a horizontal plane of the motherboard." FN118 Dell would have the court consider the last quotation in isolation and construe that language as a requirement that expansion boards be inserted. The court will not take such a myopic view of the language of the claims. The antecedent basis for " *the* plurality of expansion boards inserted ..." contains permissive language, " *a* plurality of expansion boards *can be* simultaneously mated" Reading the claim element as a whole, one of ordinary skill would understand that expansion boards *can be* inserted into the expansion connectors located on the riser card and, if they are, the language on which Dell focuses describes the orientation of those inserted expansion boards relative to the motherboard. Accepting Dell's proposed construction would effectively rewrite the claim language to read "a plurality of expansion boards *are* simultaneously mated through said expansion connectors to said riser card." The court will not accept the invitation to so limit the claims at issue absent some clear intrinsic evidence supporting such limitation. An examination of the specification and drawings of the '621 patent, however, does not contradict the

unambiguous meaning of the claim language.

FN117. Id. at 6:10-13 (claim 1); Id. at 6:49-52 (claim 2) (emphasis added).

FN118. Id. at 6:20-25 (claim 1); Id. at 6:59-64 (claim 2).

The specification begins by describing the invention as relating to:

a motherboard for a computer ... comprising a connector for a [riser] card ... and a riser card arranged in that connector ... having ... expansion positions for expansion cards and comprising a number of connectors ... for such expansion cards, while the plane of an expansion card, when it is arranged in a connector ... extends substantially parallel to the plane of the motherboard.FN119

FN119. Id. at 1:9-18.

The court agrees with Tulip that this language does not indicate a requirement that expansion cards be inserted into the riser card. The specification reference to "arranging and removing expansion cards" FN120 is also supports Tulip's position. That language contemplates practicing Tulip's invention without expansion boards (the inventor chose to refer to "removing," not "replacing," expansion boards) and indicates the discretionary nature of inserting expansion boards in the claimed invention.

FN120. Id. at 5:58.

Dell is correct that one of the asserted benefits of the claimed invention (unimpeded airflow across expansion boards) would not be achieved if the disputed phrase is interpreted as not requiring that two or more expansion cards be inserted into the riser card. That fact, however, does not mandate acceptance of Dell's proposed construction. The specification notes that other benefits are obtained when the riser card connector and riser card are moved from a central location to a side location. These benefits include: an increased area on the motherboard permitting larger components to be mounted on the motherboard, increased ease of connecting components on the motherboard when the obstruction to linking tracks from the terminals associated with a centrally located riser card connector are removed, and unimpeded airflow across the entire motherboard and its associated components. All of these benefits are still achieved while still permitting the manufacturer or user of the invention the option of achieving the additional benefits described in the specification if the decision is made to insert expansion boards into the riser card.

The '621 patent's drawings do not require that expansion boards be inserted into the riser card. Figure 4 is described as "show[ing] a perspective view of a case for a personal desktop computer of the AT type with a motherboard according to the invention." FN121 That figure (reproduced below) shows the motherboard 41 and the riser card 43 with no expansion boards inserted. Even if Dell is correct and this figure pertains to the computer case to which dependent claims 3 and 6 claims (not at issue in this case) are directed, the figure is described as depicting a computer case "with a motherboard *according to the invention*." Claim 3 depends from claim 2 and, therefore, includes all of the limitations of claim 2. Claim 6 depends from claim 4 and includes all of the limitations of claim 4. Claim 4 recites the same disputed phrase and has the same permissive antecedent phrase, "a plurality of expansion boards *can be* simultaneously mated," as is

FN121. Id. at 4:32-34.

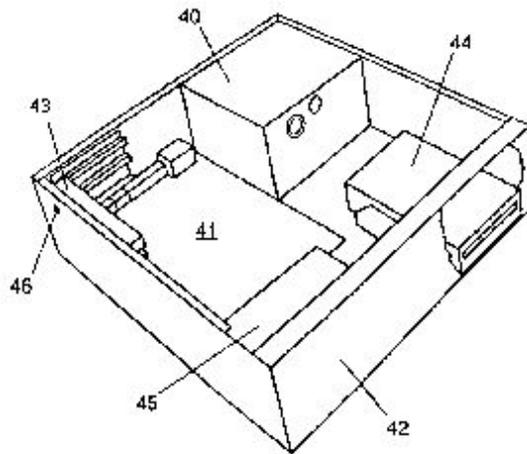


FIG. 4

recited in claims 1 and 2. Furthermore, inclusion of expansion boards inserted into the riser card in Figure 4 would not have obstructed the view of the claimed computer case. Even if the court were to accept Dell's contention that Figure 4 is only representative of the computer case covered by claims 3 and 6, neither the drawing nor description of Figure 3 (reproduced below), cited by Dell, compel the court to ignore the unambiguous claim language and accept Dell's proposed construction.

As Dell notes, the brief description of the drawings describes Figure 3 as "show[ing] a perspective view of a riser card on which connectors and expansion boards are arranged in the manner of the invention." FN122 The detailed description of that figure includes permissive language when describing Figure 3 as "show[ing] a perspective view which shows in what way an ISA expansion card 35 and a PCI expansion card 37 *can be* placed in their respective connectors 34 and 36." FN123 The figure itself shows how the expansion boards can be inserted into the riser card, it does not show those boards already inserted. This is apparent from the arrows on each board showing the direction of insertion of expansion boards should it be determined by a manufacturer or user that their specific needs require expansion boards to be inserted. It is also clear that the expansion boards

FN122. Id. at 4:29-31.

FN123. Id. at 5:39-42.

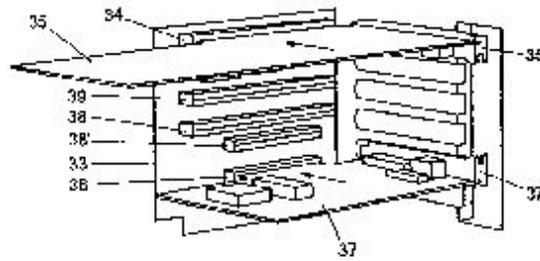


FIG. 3

depicted in Figure 3 have not yet been inserted by observing that the tops of the mounting brackets on the ends of the expansion boards are not flush with the edge of the computer chassis and that the bottom of the lower expansion card's mounting bracket has not closed off the opening of the expansion slot in the computer chassis as would be the case after the boards are inserted in the riser card. Nothing in the specification language or the drawings, therefore, requires the court to accept the limitation suggested by Dell. Finally, the prosecution history does not establish that Tulip distinguished its invention from prior art based on the presence of two or more expansion boards inserted into the riser card.

The examiner rejected Tulip's claims as obvious over Harwer in view of Lam. As previously discussed, Harwer teaches a personal computer with a centrally located riser card having a plurality of expansion connectors. Lam teaches a notebook computer with a riser card located on the side of the motherboard having a single expansion connector. In its argument to the examiner, Tulip emphasized the disadvantages of the centrally located riser card taught by Harwer and that no one skilled in the art would be motivated to look the Lam patent to remedy those disadvantages. Tulip never supported that position by arguing that its invention required a riser card with two or more expansion boards inserted as a way to narrow its claims and avoid the prior art references. Tulip argued that because a notebook computer could not physically accommodate a riser card having a plurality of expansion connectors, the Lam patent would not have provided an obvious solution to the problems inherent in the Harwer invention. This court has determined that Tulip's arguments during prosecution served to limit the personal computer covered by the patent to personal computers other than notebook computers. Because Tulip did not seek to avoid the obviousness rejection by arguing that its claims required that expansion boards be inserted into the riser card, it would not be proper for this court impose that limitation.

Since it is clear that the claim language does not require that expansion boards be inserted into the riser card, and because the specification and prosecution history does not compel a contrary determination, the court construes "such that each one of the plurality of expansion boards inserted into a corresponding one of said expansion connectors" to mean that connectors on the riser card can accommodate expansion boards but there is no requirement that expansion boards be inserted into those connectors.

G. Wherein a predefined one of the positions on the riser card has both ISA type and PCI type expansion connectors associated therewith

1. Parties' positions

[16] The parties dispute whether this phrase limits the number of combi-connectors to one, and only one, or whether it is merely a requirement that there be at least one combi-connector. Tulip's proposed construction is that the disputed phrase means that "at least one position on the riser card is a combination slot (or combi-connector) that has both an ISA type connector and a PCI type connector." FN124 Dell argues that "the phrase requires one and only one expansion position on the riser card that includes a combination of both an ISA type and a PCI type expansion connector." FN125

FN124. D.I. 308 at 8.

FN125. Id. at 12.

Tulip suggests that the disputed phrase requires that there be a combi-connector on the riser card but does not limit the invention to including only one combi-connector. Tulip contends that Dell's proposed construction has the effect of adding the words "and only one" to the claims. Tulip argues Dell's construction reads an improper unstated limitation into the language of the claims. Furthermore, Tulip insists that adding Dell's proposed limitation is inconsistent with its use of the transitional phrases "comprising" in claim 1 and "having" in claim 2. Such open transitional language, Tulip notes, does not exclude additional elements. Tulip contends that maintaining the effect of the applicant's open transitional language is particularly appropriate here, as Tulip never amended its claims to limit the invention to having a single combination connector and there is no prior art in the prosecution history having multiple combination connectors on a riser card that a limitation to a single combi-connector would avoid.

Dell states the clear meaning of the word "one" limits the meaning of the disputed phrase to "one and only one," FN126 and therefore, the disputed phrase limits the claimed invention to one and only one combi-connector. Dell disputes Tulip's assertion that the prosecution history does not distinguish the '621 invention from prior art based on the number of combination connectors on the riser card. During prosecution, Tulip stated that "[i]ndependent claim 4 [claim 1 of the '621 patent as issued] ... contains suitable recitations directed to the distinguishing aspects of the present invention-with those recitations being shown in bolded type." FN127 The phrase "wherein a predefined one of the positions" was among the bolded type.FN128 Dell contends this shows that Tulip considered "a predefined one" combi-connection to be one of its invention's distinguishing characteristics. Dell also notes that the claims at issue demonstrate that when Tulip contemplated more than one slot of a particular type on the riser card it drafted language to so provide. Both claims 1 and 2 include the language:

FN126. *See* WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY 1575 (1993) (defining "one" as "a single unit or entire ... thing and no more.").

FN127. D.I. 324, Ex. 2 at TLP2 117286.

FN128. Id., Ex. 2 at TLP2 117287.

wherein a predefined *one* of the positions on the riser card has both ISA type and PCI type expansion connectors associated therewith and situated one above another so as to accommodate either an ISA type or a PCI type expansionboard in said predefined *one* position, wherein said predefined *one* position is located on the riser card below *at least one* of the positions having the ISA type expansion connector and above *at least one* of the positions having the PCI type expansion connector.FN129

FN129. '621 at 6:27-35 (claim 1); Id. at 6: (emphasis added).

Dell contends that Tulip is now attempting to broaden its claim by effectively adding the words "at least" before its reference to the "predefined one" combination connector. Dell also disagrees with Tulip's statement of the affect of the open transitional phrases in the claims at issue. Dell argues that Tulip's use of

restrictive claim language with respect to one combi-connector trumps the transitional phrases "comprising" and "having."

2. *Court's construction*

The parties are in agreement that the disputed phrase refers to a combi-connector. They disagree over whether the phrase limits the invention to a single combi-connector. The claim elements unambiguously make a distinction between the "predefined one" combi-connector position and "at least one" position for ISA and PCI connectors located above and below the "predetermined one" combi-connector position. The word "one" is an adjective describing "a single unit." FN130 A "predefined one of the positions on the riser card having both ISA type and PCI expansion connectors [a combi-connector]" would ordinarily be understood to mean a single combi-connector. This understanding is reinforced by claim language describing the location of ISA connectors and PCI connectors relative to the combi-connector which makes it absolutely clear that the invention is not limited to a single dedicated ISA connector and a single dedicated PCI connector. After the "predefined one" combi-connector position is defined as "ha[ving] both ISA type and PCI type expansion connectors associated therewith and situated one above another so as to accommodate either an ISA type or a PCI type expansion board", that "predefined *one* position" is described as being located "below *at least one* of the positions having the ISA type expansion connector and above *at least one* of the positions having the PCI type expansion connector."

FN130. WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY 1575 (1993).

Tulip's proposed construction would broaden the claims to read " *at least one* predefined" position would have a combi-connector. Unlike the court's earlier determination that the phrases "peripheral side edge" and "side edge" have the same meaning because they clearly reference the same area on the motherboard, here, the "predefined one" combi-connector position and "at least one" position having an ISA connector and "at least one" position having a PCI connector all refer to different areas on the riser card. It would be inappropriate, therefore, for the court to construe "one" to mean the same thing as "at least one." Contrary to Tulip's assertion, Dell's proposed construction, that "a predefined one" combi-connector position means "one *and only one* " combi-connector position, is not improperly imposing an unstated limitation on the claims at issue.FN131 Dell's proposed construction merely applies the ordinary and accustomed meaning to the phrase. One means a single unit. One means one.

FN131. *See* Northern Telecom Ltd. v. Samsung Electronics Corp., 215 F.3d 1281, 1290 (Fed.Cir.2000) ("This court has repeatedly and clearly held that it will not read unstated limitations into claim language."); *Kemco Sales, Inc. v. Control Papers Co., Inc.*, 208 F.3d 1352, 1362 (Fed.Cir.2000) ("We are fully cognizant of the need to avoid reading limitations into a claim from the specification.").

[17] Tulip nevertheless argues that because the claims contain open transitional phrasing ("comprising" and "having"), it would be improper to construe the disputed phrase so as to limit the invention to having a single combi-connector. It is true that claims containing open transitional phrasing are not limited to covering only the elements specifically recited in those claims.FN132 Acknowledging that Tulip's patent may cover products having additional elements not recited in its claims is different than agreeing that its claims cover more than the specific number of combi-connector positions claimed, *i.e.*, one.FN133 The court does not agree with Tulip's assertion of the effect of open transitional language (that "a predefined one" combi-connector means "at least one" combi-connector) because such interpretation means the words "at least" have no separate meaning when the claims refer to "at least one" ISA connector and "at least one" PCI connector. Having determined that the ordinary and accustomed meaning of the word "one" is a single unit, and that the use of transitional phrasing does not eliminate a self-imposed numerical limitation, the

court must consider whether the specification or prosecution history eliminate this limitation.

FN132. *See* *Crystal Semiconductor Corp. v. TriTech Microelectronics International, Inc.*, 246 F.3d 1336, 1348 (Fed.Cir.2001) ("When a patent claim uses the word 'comprising' as its transitional phrase, the use of 'comprising' creates a presumption that the body of the claim is open. In the parlance of patent law, the transition 'comprising' creates a presumption that the recited elements are only a part of the device, that the claim does not exclude additional, unrecited elements. The transition 'having' can also make a claim open.") (citations omitted).

FN133. *Innovad Inc. v. Microsoft Corp.*, 260 F.3d 1326, 1333 (Fed.Cir.2001) (finding that "the term 'single,' ... precludes the use of multiple switches to perform [a specifically recited function]" even where the preamble recited the transitional phrase "comprising"); *see also* *Novo Nordisk A/S v. Eli Lilly & Co.*, No. Civ. A. 98-643 MMS, 1999 WL 1094213, at *12-13 (D.Del. Nov. 18, 1999) (The *Novo Nordisk* court construed a claim reciting two zinc ions to be limited to two and only two even with transitional phrase "comprising." The court noted that within the same claim the words "at least" preceded "three phenolics" and that "[t]he expression of a limitation in one element of a claim implies the exclusion of that term in other elements of the claim.... In order to give meaning to the choice to use the term 'at least' to modify only 'three phenolics,' claim 1 must mean that a hexamer complex can contain more than three phenolics but not more than two zinc ions per hexamer.").

The language of the specification repeats the same limitation on the number of combi-connectors to "one position" and consistently recites that there is "at least one" ISA connector above "that one position" for a combi-connector and/or "at least one" PCI connector below "that one position" for a combi-connector.FN134 The language of the specification reinforces the plain language of the claims and provides no basis to broaden the scope of those claims. Likewise, nothing in the prosecution history indicates that the court should construe the "predefined one" combi-connector position to mean "at least one" combi-connector position.

FN134. *See* '621 at 3:3-13 ("the riser card has one position where either an expansion card of the ISA type or an expansion card of the PCI type can be arranged in that, at that position, a connector of the ISA type and a connector of the PCI type are arranged above each other and parallel to each other; and the riser card comprises above *that one position at least one* position for an expansion card of the ISA type, at which position a connector of the ISA type is arranged, and/or under *that one position at least one position* for an expansion card of the PCI type, at which position a connector of the PCI type is arranged"); *Id.* at 4:6-16 (same).

Tulip notes that it did not attempt to avoid an obviousness rejection by distinguishing its invention from prior art with an argument that its invention taught a riser card having only a single combi-connector. Although the court agrees it did not make that argument, that fact is irrelevant.FN135 The fact that Tulip did not make that argument means that the court would not otherwise limit the '621 patent's coverage to single combi-connector riser cards had the claim language itself not so limited the patent's scope of coverage. The opposite does not follow. Just because Tulip did not need to distinguish its invention based on a particular claim element does not mean that its patent claims are entitled to broader coverage than the limitations clearly recited in those claims.

FN135. Dell's contention that the prosecution history reveals that Tulip did limit its claims to a riser card with a single combi-connector position because "a predefined one of the positions" was among bolded type used by Tulip to designate the distinguishing aspects of its invention is misleading. The entirety of the

disputed phrase is bolded. That phrase is not otherwise defined in the prosecution history and the task of determining the meaning of the phrase now rests with this court.

The ordinary and accustomed meaning of the word "one" is a single unit. Nothing in the specification or prosecution history contradict this ordinary meaning. Consequently, the court construes the phrase "wherein a predefined one of the positions on the riser card has both ISA type and PCI type expansion connectors associated therewith" to mean that the riser card has a single expansion position having a single combi-connector.

H. Located on the riser card below at least one of the positions having the ISA type expansion connector and above at least one of the positions having the PCI type expansion connector

Because of the court's construction of the disputed phrase concerning the number of combi-connector positions, the parties arguments concerning the construction of this phrase (which relate to the parties' respective positions had the court accepted Tulip's proposed construction of that phrase) need not be set forth. In light of the court's determination that the claims at issue cover only a riser card having a single combi-connector position, there is no dispute over the meaning of this phrase. For the sake of completeness, however, the court construes "located on the riser card below at least one of the positions having the ISA type expansion connector and above at least one of the positions having the PCI type expansion connector" to mean that there is at least one dedicated ISA type expansion connector above the single combi-connector and at least one dedicated PCI type expansion connector below the single combi-connector.

V. CONCLUSION

The court has above construed the following claim terms as follows:

	<i>Claim Language</i>	<i>Court's Construction</i>
	"personal computer"	the phrase limits claims 1 and 2 to a computer for individual or home use, but not including a notebook computer.
	"riser card"	a printed circuit board extending perpendicularly from, and being electronically connected to, the motherboard and having a plurality of expansion connectors into which expansion boards may be inserted.
	"adjacent"	the mating connector is located nearby but not touching the side edge of the motherboard
	"parallel"	extending in the same direction with every point the same distance apart and never meeting.
	"side edge"	the border of the motherboard which is not the front or rear of the motherboard
	"peripheral side edge"	the border of the motherboard which is not the front or rear of the motherboard
	"such that each one of the plurality of expansion boards inserted into a corresponding one of said expansion connectors"	connectors on the riser card can accommodate expansion boards but there is no requirement that expansion boards be inserted into those connectors
	"wherein a predefined one of the positions on the riser card has both ISA type and PCI type expansion connectors associated therewith"	riser card has a single expansion position having a single combi-connector
	"Located on the riser card below at least one of the	there is at least one dedicated ISA type expansion

positions having the ISA type expansion connector
and above at least one of the positions having the PCI
type expansion connector"

connector above the single combi-connector and at
least one dedicated PCI type expansion connector
below the single combi-connector

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