

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 26

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte PETER ANTHONY FRANASZEK,
MICHEL HENRI THEODORE HACK,
CHARLES OTTO SCHULZ,
and THOMAS BASIL SMITH III

Appeal No. 2002-0058
Application 08/859,865

ON BRIEF

Before JERRY SMITH, GROSS, and BARRY, Administrative Patent Judges.

JERRY SMITH, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on the appeal under 35 U.S.C. § 134 from the examiner's rejection of claims 1-34, which constitute all the claims in the application.

The disclosed invention pertains to a method and apparatus for managing memory in a computer.

Representative claim 1 is reproduced as follows:

1. A method of managing main memory, comprising:

designating a subset of pages in main memory, wherein at least one page of said subset of pages includes one or more items which are compressed and which are freely accessible without moving said at least one page to another portion of said main memory, and wherein said at least one page of said subset of pages occupies an amount of physical space which varies due to compression of said one or more items of said at least one page; and

transferring an item, which has been referenced, into said subset, when said item is not a member of said subset.

The examiner relies on the following references:

Richter et al. (Richter)	5,598,553	Jan. 28, 1997 (Filed May 18, 1995)
Franaszek	5,761,536	Jun. 02, 1998 (Filed Aug. 21, 1996)

Claims 1-34 stand rejected under 35 U.S.C. § 103. As evidence of obviousness the examiner offers Richter in view of Franaszek.

Rather than repeat the arguments of appellants or the examiner, we make reference to the briefs and the answer for the respective details thereof.

OPINION

We have carefully considered the subject matter on appeal, the rejection advanced by the examiner and the evidence of obviousness relied upon by the examiner as support for the rejection. We have, likewise, reviewed and taken into consideration, in reaching our decision, the appellants' arguments set forth in the briefs along with the examiner's rationale in support of the rejection and arguments in rebuttal set forth in the examiner's answer.

It is our view, after consideration of the record before us, that the evidence relied upon and the level of skill in the particular art would have suggested to one of ordinary skill in the art the obviousness of the invention as set forth in claims 1, 4-9, 12, 15-20, 23, 25-28 and 31-33. We reach the opposite conclusion with respect to claims 2, 3, 10, 11, 13, 14, 21, 22, 24, 29, 30 and 34. Accordingly, we affirm-in-part.

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the examiner to establish a factual basis to support the legal conclusion of obviousness. See In re Fine, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the examiner is expected to make the factual determinations set forth in Graham v. John Deere

Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), and to provide a reason why one having ordinary skill in the pertinent art would have been led to modify the prior art or to combine prior art references to arrive at the claimed invention. Such reason must stem from some teaching, suggestion or implication in the prior art as a whole or knowledge generally available to one having ordinary skill in the art. Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir.), cert. denied, 488 U.S. 825 (1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017 (1986); ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). These showings by the examiner are an essential part of complying with the burden of presenting a prima facie case of obviousness. Note In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). If that burden is met, the burden then shifts to the applicant to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole and the relative persuasiveness of the arguments. See Id.; In re Hedges, 783 F.2d 1038, 1039, 228 USPQ 685, 686 (Fed. Cir. 1986); In re

Piasecki, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984); and In re Rinehart, 531 F.2d 1048, 1052, 189 USPQ 143, 147 (CCPA 1976). Only those arguments actually made by appellants have been considered in this decision. Arguments which appellants could have made but choose not to make in the brief have not been considered and are deemed to be waived by appellants [see 37 CFR § 1.192(a)].

Appellants argue claims 1, 4, 9, 12, 15, 20, 23 and 31-33 as a first group of claims [brief, page 4]. With respect to representative, independent claim 1, the examiner indicates how he reads the claimed invention on the disclosure of Richter. The rejection essentially finds that Richter teaches the claimed invention except that Richter does not teach that the items in memory are compressed. The examiner cites Franaszek as teaching the compression of a cache line before it is stored in main memory. The examiner finds that it would have been obvious to the artisan to compress the data in Richter before it is stored in order to reduce the amount of space required in memory which would require less page-outs to secondary storage [answer, pages 4-5].

Appellants argue that Richter is non-analogous art and memory management is too broad a field on which to base the

application of art. Appellants also argue that the items in Franaszek are not freely accessible as claimed. Finally, appellants argue that the teachings of Franaszek are directed away from paging as recited in claim 1 [brief, pages 4-8].

The examiner responds that Richter, Franaszek and the claimed invention are all directed to the field of memory management. The examiner also responds that Richter, rather than Franaszek, is relied on for the teaching of items being freely accessible. Finally, the examiner notes that although Richter teaches use of segmentation, that does not negate the fact that the reference teaches storing pages in the main memory of the system [answer, pages 7-9].

Appellants respond that the field of endeavor of claim 1, taken as a whole, is different from the field of endeavor of Richter. Appellants also respond that there is no teaching or suggestion in Richter regarding the need or desirability for data compression [reply brief, pages 2-3].

We will sustain the rejection of the first group of claims because none of appellants' arguments are persuasive of error in the rejection. On the first point, we agree with the examiner that the field of endeavor of the invention of claim 1 and the disclosure of Richter is the field of memory management. Based on the scope of claim 1,

we find that the field of memory management is the appropriate field for determining whether prior art is analogous, and that Richter is clearly from this field of endeavor. On the second point, we agree with the examiner that Franaszek is not relied on for the teaching of data being freely accessible. The data in Richter is freely accessible for reasons indicated by the examiner in the answer. On the third point, we also agree with the examiner that Richter teaches that a main memory can be managed using a paging technique.

It is important to note the manner in which the examiner has read the elements of claim 1 on the disclosure of Richter [answer, pages 4-5]. Based on this reading, the only feature missing from the claimed invention is the concept of storing compressed data. The examiner notes that Franaszek teaches compressing data before it is stored, and the examiner notes that such compression would have been useful in Richter because it would have permitted more data to be stored in the memory which would have required less page-outs to secondary storage. We agree with this finding of the examiner. Although appellants argue that there is no indication that Richter would benefit from data compression, we can find no logical reason on this record why the system

of Richter would not benefit from data compression for the reason noted by the examiner.

In summary, we find that the examiner has established a prima facie case of the obviousness of claim 1. We have considered each of appellants' arguments with respect to claim 1, but we are not persuaded by any of these arguments that the examiner's rejection is in error. Therefore, we sustain the rejection of claims 1, 4, 9, 12, 15, 20, 23 and 31-33.

Appellants argue claims 2, 10, 11, 13, 21, 22, 24, 29, 30 and 34 as a second group of claims [brief, page 4]. With respect to representative claim 2, the examiner acknowledges that the combination of Richter and Franaszek does not teach determining if there is enough free space in the memory to add a new entry. The examiner asserts that making this determination was well known in the art and that it would have been obvious to the artisan to make this determination [answer, page 5].

Appellants argue that since claim 1 recites compressed data, the estimate of free space is non-trivial to obtain. Thus, appellants assert that this estimate is not a simple check of unallocated free space [brief, page 8]. The examiner responds that appellants' arguments do not show how

the claim language supports their assertions [answer, page 9]. Appellants respond that the main memory of claim 1 contains compressed items so that the estimate of free space is not as simple as checking for free space in memory without compression [reply brief, page 3].

We will not sustain the examiner's rejection of this group of claims. We agree with appellants that there is no teaching or suggestion within the applied prior art for estimating the free space in a main memory which contains pages of compressed items. Since the amount of compression varies when storing data, we agree with appellants that determining an estimate of free space is not trivial. The examiner also has not explained why the availability of space would even be a concern in the system of Richter, even if Richter was storing compressed data as argued in the rejection.

Appellants argue claims 3 and 14 as a third group of claims [brief, page 4]. Since claims 3 and 14 respectively depend from claims 2 and 13, and since we have not sustained the rejection of claims 2 and 13, we also do not sustain the rejection of claims 3 and 14.

Appellants argue claims 5-7, 16-18 and 25-27 as a fourth group of claims [brief, page 4]. With respect to

representative claim 5, the examiner acknowledges that the combination of Richter and Franaszek does not teach removing an item from the main memory and updating the status information concerning that item. The examiner asserts that making room in memory was well known in the art and that it would have been obvious to the artisan to remove an item from memory in Richter and update status information [answer, page 6].

Appellants argue that the removing step of their invention is different from a "garden variety" page-out [brief, page 9]. The examiner responds that appellants' arguments do not show how the claim language distinguishes from "garden variety" page-outs [answer, pages 9-10].

During patent examination, the claims are given the broadest reasonable interpretation consistent with the specification. See In re Morris, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997). Claim 5 merely recites that one item is removed from memory when transferring another item into memory. The claim does not incorporate any special meaning for the term "removing." We agree with the examiner that it was well known in this art that an item in main memory may have to be removed in order to make room for a new item to be stored in memory. As noted by the

examiner, a conventional page-out involves removing the least-used page or a page no longer needed from main memory and returning the page to secondary storage [answer, page 6].

Appellants did not dispute the examiner's assertion regarding page-outs. Instead, appellants argued that the removal step of claim 5 differs from a "garden-variety" page-out in changing the subset designation and deleting the page from the TLB, noting page 15 of the specification [brief, page 9].

The scope and breadth of the language of claim 5 does not preclude the examiner's interpretation which we find reasonable. Indeed, if we were to accept appellants' construction of claim 5, we would be impermissibly importing subject matter from the specification into the claim. Although claims are read in light of the specification, it is improper to read limitations appearing in the specification into a claim if such limitations are not recited in the claim. See In re Paulsen, 30 F.3d 1475, 1480, 31 USPQ2d 1671, 1674 (Fed. Cir. 1994); Intervet America Inc. v. Kee-Vet Lab. Inc., 887 F.2d 1050, 1053, 12 USPQ2d 1474, 1476 (Fed. Cir. 1989); In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-51 (CCPA 1969) ("[R]eading a

claim in the light of the specification, to thereby interpret limitations explicitly recited in the claim, is a quite different thing from reading limitations of the specification into a claim, to thereby narrow the scope of the claim by implicitly adding disclosed limitations which have no express basis in the claim." (internal quotation marks omitted)). Here, appellants' arguments relying on page 15 of the specification are not commensurate with the scope and breadth of the claim language. Therefore, appellants' argument with respect to this group of claims is not persuasive of error in the rejection. Accordingly, we will sustain the examiner's rejection of this group of claims.

Appellants argue claims 8, 19 and 28 as a fifth group of claims [brief, page 4]. With respect to representative claim 8, the examiner asserts that in Richter it is necessary to perform the operation of changing from a read-only state to a writable state in order to overcome a page fault situation and continue with the accessing of data [answer, page 7]. Appellants argue that the rejection does not give the proper meaning to the phrase "forward progress of a computer system" [brief, page 10]. The examiner responds that the phrase "forward progress of a computer

system" includes forward progress of an application as taught by Richter [answer, page 10]. Appellants respond that the claimed phrase must be interpreted in light of the specification [reply brief, pages 3-4].

We will sustain the examiner's rejection of this group of claims. Claims are given their broadest reasonable interpretation during prosecution. See Morris, supra, at 1055. We agree with the examiner that the phrase "forward progress of a computer system" is broad enough to include forward progress of a computer application as indicated by the examiner. Appellants could easily amend the language of claim 8 to limit its scope to that which is argued.

In summary, we have sustained the examiner's rejection with respect to claims 1, 4-9, 12, 15-20, 23, 25-28 and 31-33, but we have not sustained the rejection with respect to claims 2, 3, 10, 11, 13, 14, 21, 22, 24, 29, 30 and 34. Therefore the decision of the examiner rejecting claims 1-34 is affirmed-in-part.

Appeal No. 2002-0058
Application No. 08/859,865

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

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Administrative Patent Judge)	
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ANITA PELLMAN GROSS)	BOARD OF PATENT
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