

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 38

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DIETER WOLTER-DOLL

Appeal No. 1996-4124
Application No. 08/307,088

ON BRIEF

Before THOMAS, FLEMING, and RUGGIERO, Administrative Patent Judges.

FLEMING, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 16 through 22 and 24 through 29.¹ Claims 1 through 15 and 23 were canceled.

The invention relates to a method and apparatus of detecting machining flaws caused by grinding machines. Appellant identifies on page 2 of the specification that the method allows for detection of machining flaws in a workpiece, while the workpiece is being machined. On page 3 of the

¹We note that on page 1 of the Examiner's answer the Examiner refers to an Examiner's amendment. Further, we note that Appellant approved the Examiner's amendment in a February 1, 1996 interview. Further, on page 2 of the Examiner's answer, the Examiner noted several minor errors in Appellant's appendix A. There is some confusion on the record because the claims in the appendix are different than the claims in the record. See papers, numbers 15 and 20. In view of this confusion, we must look to the record for the claims that are for our consideration. In doing so, we note the following: Claim 21, as amended by the August 22, 1994 amendment, contains limitations of a "tooth disc" and a "grinding disc." Claim 25, as submitted in the May, 9 1994 amendment and amended by the Examiner's Answer is dependent upon claim 29 and contains the limitations of a "grinding wheel." Claim 26 as amended by the August 22, 1994 amendment does not contain the minor typographical error, errant "m", which is present in Appellant's appendix A. We further note that, the terms "tooth disc" in claim 21 and "grinding wheel" in claim 25 appear to lack antecedent basis and we suggest that the Examiner review this matter.

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specification, Appellant identifies that the force applied to the workpiece by the machining process is monitored as an instantaneous value and

compared to a stored nominal value. On page 3 of the specification, Appellant identifies that the nominal value is determined by storing all actual values during the machining of a workpiece free of flaws. Appellant identifies on page 9 of the specification that the feed rate of the machining tool is controlled in accordance with the comparison of the measured force, such that the feed rate can be reduced before a flaw occurs. On page 7 of the specification, Appellant identifies that the workpiece is a gear box gear wheel. On page 4 of the specification, the Appellant states that the machining is performed by a grinding disc which can simultaneously grind two tooth flanks.

Independent claim 28 is representative of the invention:

28. A method of preventing machining flaws in a tooth wheel, which are caused by a grinding disc which simultaneously grinds two adjacent tooth flanks of adjacent teeth of the tooth wheel, when the grinding disc is applied against the two adjacent tooth flanks with excessive force during grinding, said method comprising the steps of:

determining nominal grinding forces applied by the grinding disc to a test tooth wheel produced without any machining flaws and storing nominal force values;

continuously measuring a grinding force which is applied by the grinding disc to the tooth wheel in two axes extending at

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an angle to each other during regular grinding of the tooth wheel;
comparing an instantaneous measurement value of the grinding force with a corresponding nominal grinding force value;
and
changing at least one of a feed and a rotational speed of the grinding disc in accordance with a comparison value, whereby the grinding force, applied by the grinding disc, is brought in accordance with the corresponding nominal force value.

The Examiner relies upon the following references:

Hahn 20, 1986	4,590,573	May
Hernandez et al. 1990 (Hernandez)	4,931,949	Jun. 5,
Loehrke 1992	5,136,522	Aug. 4,

Claims 20, 21, 26, 28 and 29 stand rejected under 35 U.S.C. § 103 as being unpatentable over Hahn and Loehrke.

Claims 16 through 19, 22, 24, 25 and 27 stand rejected under 35 U.S.C. § 103 as being unpatentable over Hahn, Loehrke and Hernandez.²

² The rejection of claims 19, 24 and 27, is a new grounds of rejection raised by the Examiner in the Examiner's answer. However, as stated on page 6 of the answer the rationale of the rejection is the same as the Examiner applies to claim 16.

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Rather than reiterate the arguments of Appellant and the Examiner, reference is made to the briefs³ and the answers⁴ for the respective details thereof.

OPINION

After careful review of the evidence before us we agree with the Examiner's rejection of claims 20, 21, 26, 28 and 29 under

35 U.S.C. § 103. However, we will not sustain the rejection of claims 16 through 19, 22, 25, and 27 under 35 U.S.C. § 103.

At the outset, we note that Appellant states on pages 6 and 7 of the appeal brief (brief) that for the rejection based upon 35 U.S.C. § 103 based upon Hahn and Loehrke, claims 28 and 29 should be separately considered. 37 CFR § 1.192(c)(7) (July 1, 1995) as amended at 60 Fed. Reg. 14518

³Appellant filed an appeal brief on October 27, 1995. Appellant filed a reply brief in response to the Examiner's new grounds of rejection on April 15, 1996.

⁴The Examiner mailed an Examiner's answer on February 23, 1996. On July 12, 1996, the Examiner mailed a supplemental Examiner's answer addressing Appellant's arguments in the reply brief.

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(March 17, 1995), which was controlling at the time of Appellant's filing the brief, states:

For each ground of rejection which appellant contests and which applies to a group of two or more claims, the Board shall select a single claim from the group and shall decide the appeal as to the ground of rejection on the basis of that claim alone unless a statement is included that the claims of the group do not stand or fall together and, in the argument under paragraph (c)(8) of this section, appellant explains why the claims of the group are believed to be separately patentable. Merely pointing out differences in what the claims cover is not an argument as to why the claims are separately patentable.

On page 14 of the brief, Appellant states that claim 29 "contains features which [sic, are] substantially commensurate in scope with the corresponding features of claim 28." Thus, Appellant has not argued that claim 29 is separately patentable from claim 28. Accordingly, for the rejection under 35 U.S.C. § 103 based upon Hahn and Loehrke, we will group claims 20, 21, 26, 28 and 29 together, with claim 28 as the representative claim of the group.

Turning to the rejections based upon 35 U.S.C. § 103, it is the burden of the Examiner to establish why one having ordinary skill in the art would have been led to the claimed

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invention by the expressed teachings or suggestions found in the prior art or by the implication contained in such teachings or suggestions. In re Sernaker, 702 F.2d 989,995, 217 USPQ 1, 6 (Fed. Cir. 1983). "Additionally, when determining obviousness, the claimed invention should be considered as a whole; there is no legally recognizable 'heart' of the invention." Para-Ordinance Mfg. V SGS Importers Int'l Inc., 73 F.3d. 1085, 1087, 37 USPQ2d 1237, 1239 (Fed. Cir. 1995) (citing W. L. Gore & Assocs., Inc.v. Garlock Inc., 721 F.2d 1540, 1548, 220 USPQ 303, 309 (Fed. Cir. 1983), Cert. denied, 469 U.S. 851 (1984)).

As pointed out by our reviewing court, we must first determine the scope of the claim. "[T]he name of the game is the claim." In re Hiniker Co., 150 F.3d 1362, 1369, 47 USPQ2d 1523, 1529 (Fed. Cir. 1998). Claims will be given their broadest reasonable interpretation consistent with the specification, and limitations appearing in the specification are not to be read into the claims. In re Etter, 756 F.2d 852, 858, 225 USPQ 1, 5 (Fed. Cir. 1985).

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On page 6 of the Examiner's answer (answer), the Examiner asserts that the preamble of claim 28 is denied the effect of a limitation to the claim as "the portion of the claim following the preamble is a self contained description of the structure not depending for completeness upon the introductory clause." On pages 6 and 7 of the answer, the Examiner cites Kropa v. Robie, 187 F.2d 150, 88 USPQ 478 (CCPA 1951) as support for this assertion.

Appellant argues on page 9 of the appeal brief (brief) that the preamble of claim 28 constitutes a limitation of the claim. On page 10 of the brief, the Appellant asserts that the preamble is necessary to give meaning to the remainder of the claim.

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We agree with the Appellant. Our reviewing court has stated in Bell Communications Research, Inc. v. Vitalink Communications Corp., 55 F.3d 615, 620, 34 USPQ2d 1816, 1820 (Fed. Cir. 1995) that:

[A] claim preamble has the import that the claim as a whole suggests for it. In other words, when the claim drafter chooses to use both the preamble and the body to define the subject matter of the claimed invention, the invention is so defined.

Further, the court has stated that in those cases where the introductory phrase is essential to point out the invention defined by the claim, the preamble is given the effect of a limitation. Id. (Citing Kropa v. Robie, 187 F.2d 150, 152, 88 USPQ 478, 480-481 (CCPA 1951)). We find that the preamble of claim 28 is necessary to define the limitations of the remainder of the claim. Specifically, the body of claim 28 contains the limitation of "the grinding disc" and we find that this limitation refers to the preamble description of "a grinding disc which simultaneously grinds two adjacent tooth flanks of adjacent teeth of the tooth wheel." Thus, we find that the scope of claim 28 includes a specific grinding disc

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which grinds two adjacent tooth flanks of adjacent teeth of a tooth wheel.

Further, claim 28 contains the limitation of "continuously measuring a grinding force which is applied by the grinding disc." In determining the scope of this limitation, we note that the specification does not define "continuously measuring a grinding force . . . during regular grinding of the tooth wheel." On page 8 of the specification, Appellant identifies that each sensor monitoring the grinding force has an associated analog to digital (A/D) converter which provides the sensed value to a CPU. Thus, the measured data is digital, and thereby is a periodic sampling. On page 3 of the specification, Appellant identifies that the force value is measured during the course of the machining process. Thus, we find that the scope of the limitation "continuously measuring a grinding force" limitation includes that the grinding force is continuously sampled throughout the grinding of the toothed wheel.

In summary, we find that the scope of independent method claim 28 includes a specific grinding disc which grinds two adjacent tooth flanks of adjacent teeth of a tooth wheel,

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where the grinding force is continuously sampled throughout the grinding of the toothed wheel.

On page 3 of the answer, the Examiner identifies that Hahn is relied upon for teaching that the feed rates are adjusted to maintain force levels. The Examiner notes on pages 4 and 7 of the answer that Loehrke is relied upon for teaching grinding of teeth in a gear.

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A) Analogous art:

Appellant argues that on page 7 of the brief that Hahn does not disclose grinding adjacent flanks with a grinding disc. On page 8 of the brief, Appellant states that the problem solved by the claimed device is different than Hahn's device. On page 10 of the brief, Appellant argues that Hahn relates to cylindrical grinding which is a different surface of the tooth wheel than the tooth flanks. Further, Appellant states on page 11 of the brief that Loehrke's method of grinding tooth flanks solves a different problem than that claimed.

In determining whether a claim would have been obvious at the time of the invention, the Examiner must first determine the scope and content of the prior art. Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966). "Although § 103 does not, by its terms, define the 'art to which [the] subject matter [sought to be patented] pertains,' this determination is frequently couched in terms of whether the art is analogous or not, i.e., whether the art is 'too remote to be treated as prior art.'" In re Clay, 966 F.2d 656, 658,

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23 USPQ2d 1058, 1060 (Fed. Cir. 1992) citing In re Sovish, 769 F.2d 738, 741, 226 USPQ 771, 773 (Fed. Cir. 1985).

In making this determination, it must first be determined if the prior art is from the same field of endeavor, regardless of the problem addressed. If the prior art is not in the same field of endeavor, it must then be determined if the prior art is particularly pertinent to the particular problem with which the inventor is involved. In re Clay, supra, 966 F.2d at 658-659, 23 USPQ2d at 1060.

We find that the field of endeavor for claim 28 is that of a grinding machine which grinds flanks in the teeth of tooth wheels. We find both Hahn and Loehrke to be analogous prior art as they are in the same field of endeavor as Appellant's claim 28.

Hahn teaches controlling a grinding machine such that the feed of the grinding machine is adjusted based upon measured grinding force. See column 7, lines 46 through 65. Further, Hahn states that the multipurpose grinding machine of figure 15 can be used to produce "sector-shaped parts." See column 14, lines 14 through 17. We find that Hahn's teaching of

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using the grinding machine to manufacture sector-shaped parts is a suggestion to use the grinding machine to grind tooth flanks in toothed wheels. Thus, we find that Hahn is in the same field of endeavor as claim 28.

Similarly, we find that Loehrke is in the same field of endeavor as Appellant's claim 28. We find that Loehrke teaches a grinding machine with a grinding disc that cuts two tooth flanks. See grinding disc item 16, of Loehrke's figure 1 and the description on column 9, lines 45 to 55.

B) Limitation of continuous monitoring

On page 11 of the brief, Appellant asserts that Hahn does not teach "continuous measuring of the grinding force as recited in claim 28". Instead, Appellant asserts that Hahn periodically monitors grinding force.

As we identified above, the scope of the "continuous measuring of the grinding force" limitation of claim 28 is that the grinding force is continuously sampled throughout the grinding of the toothed wheel. Hahn teaches in column 14, lines 17 through 20, that the grinding force is periodically monitored. In column 13, lines 35 through 38, Hahn teaches that the force is monitored throughout the grinding process.

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Thus, we find that Hahn teaches that throughout the grinding process the grinding force is continuously sampled.

Accordingly, we find that Hahn's teaching of monitoring grinding force is commensurate with the scope of the claim 28 limitation of "continuous measuring of the grinding force."

C) Suggestion to Combine Hahn and Loehrke

On pages 11 and 12 of the brief, Appellant asserts that there is no motivation to combine Hahn and Loehrke. Appellant states "no disclosure or suggestion in any of the references can be found which would lead one of ordinary skill in the art to combine their various features. That separate features of different references may not be properly combined in the absence

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of some specific teachings that they should or could be combined, is such a well-settled law that it hardly needs to be repeated here."

We find that Hahn suggests modification to use his grinding method to grind tooth flanks in toothed wheels. Hahn states that the multipurpose grinding machine of Figure 15 can be used to produce "sector-shaped parts." See column 14, lines

14 through 17. We find the disclosure of grinding sector shaped parts suggests that the grinding machine can be used to grind teeth in a tooth wheel. Further, we find that Loehrke teaches a grinding disc which cuts two tooth flanks. See grinding disc item 16 of Loehrke's Figure 1 and the description on column 9, lines 45 to 55. Thus, we find that one of ordinary skill in the art would recognize that Loehrke's grinding disc shown in Figure 1 could be used in the grinding machine depicted in Hahn's Figure 15 to grind tooth flanks.

Further, we find Loehrke provides suggestion to use test tooth wheel measurements in lieu of theoretical calculations.

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We find that Hahn teaches that the dimensions of the workpiece are entered from a part print. See column 17, lines 13 through 15. We find that Loehrke teaches, in column 3, lines 32 to 37, that the dimensions of a work piece can be theoretically determined or that they can be measured from a master gear and stored in memory. We find that Loehrke's master gear meets the

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limitation of a test tooth wheel. Thus, we find Loehrke provides suggestion to modify devices such as Hahn to obtain the workpiece dimensions from measurements of a test tooth wheel. We further note, that Hahn teaches that when the program is given the part dimensions it will calculate all grinding parameters, column 17, lines 15 through 17. Hahn also teaches that the program calculates the grinding forces to be applied and that these calculations include consideration of the size of the cut to be made. See column 22, lines 8 to 18 and column 21 lines 16 through 21. Accordingly, we find that given the part dimensions, measured from a test tooth wheel, Hahn will determine the forces applied in grinding the test tooth wheel and store the values.

D) Limit of Review

We note, Appellant has chosen not to argue any other specific limitations of claims 20, 21, 26, 28 and 29 as a basis for patentability. We are not required to raise and/or consider such issues. As stated by our reviewing court in In re Baxter Travenol Labs., 952 F.2d 388, 391, 21 USPQ2d 1281, 1285 (Fed. Cir. 1991), "[i]t is not the function of this court

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to examine the claims in greater detail than argued by an
appellant, looking for nonobvious distinctions over the prior
art."

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37 CFR § 1.192(a) as amended at 60 FR § 14518 (March 17, 1995), which was controlling at the time of Appellant filing the brief, states as follows:

The brief ... must set forth the authorities and arguments on which the appellant will rely to maintain the appeal. Any arguments or authorities not included in the brief may be refused consideration by the Board of Patent Appeals and Interferences.

Also, 37 CFR § 1.192(c)(8)(iv) states:

For each rejection under 35 U.S.C. § 103, the argument shall specify the errors in the rejection and, if appropriate, the specific limitations in the rejected claims which are not described in the prior art relied on in the rejection, and shall explain how such limitations render the claimed subject matter unobvious over the prior art. If the rejection is based upon a combination of references, the argument shall explain why the references, taken as a whole, do not suggest the claimed subject matter, and shall include, as may be appropriate, an explanation of why features disclosed in one reference may not properly be combined with features disclosed in another reference. A general argument that all the limitations are not described in a single reference does not satisfy the requirements of this paragraph.

Thus, 37 CFR § 1.192 provides that just as the court is not under any burden to raise and/or consider such issues, this board is also not under any greater burden. For the forging

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reasons we sustain the Examiner's rejection of claims 20, 21, 26, 28 and 29 under 35 U.S.C. § 103 as being unpatentable over Hahn and Loehrke.

We next consider the rejection of claims 16 through 19, 22, 24, 25 and 27 under 35 U.S.C. § 103 as being unpatentable over Hahn, Loehrke and Hernandez. On pages 4 and 6 of the answer, the Examiner states it would have been obvious to use an accelerometer as a load or force sensor to measure force, as Hernandez teaches accelerometers provide more detailed and accurate results.

Appellant argues on page 13 of the brief that Hernandez does not teach measuring the displacement of a toothed wheel supporting means which is caused by a grinding force on a tooth as is claimed in claim 16. On page 3 of the reply brief, Appellant makes similar arguments concerning the application of Hernandez to claim 19.

We note that claim 27 also contains the limitation of measuring the displacement of a toothed wheel supporting means which is caused by a grinding force on a tooth as is claimed and claim 17 is dependent upon claim 16.

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We find that Hernandez teaches a force sensor, accelerometer item 16, for measuring displacement of a tooth wheel support, gearbox item 12. However, we find that this teaching is not related to measuring forces caused by grinding flanks of the gear teeth. Further, we find that neither Hahn nor Loehrke teaches or suggests the use of force sensors on the work

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piece support to measure grinding forces. Therefore, we will not sustain the rejection of claims 16, 17, 19 and 27 under 35 U.S.C. § 103.

Claims 18 and 25 contain limitations that the force sensors are accelerometers. As stated above we find that the teachings of Hernandez cannot be combined with Hahn and Loehrke in the manner set forth in the Examiner's rejection. Further, we find that neither Hahn nor Loehrke teaches or suggests the use of are accelerometers as force sensore. Therefore, we will not sustain the rejection of claims 18 and 25 under 35 U.S.C. § 103.

Claim 22⁵ contains limitations that the measured force values are printed out. As stated above we find that the teachings of Hernandez cannot be combined with Hahn and Loehrke in the manner set forth in the Examiner's rejection. Further, we find that neither Hahn nor Loehrke teaches or

⁵It is noted that the language of claim 22 which states "including the step of printed out measurement values" is awkward. This claim was interpreted to mean "including the step of printing out measurement values."

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suggests printing out the measured values. Therefore, we will not sustain the rejection of claim 22 under 35 U.S.C. § 103.

On page 24 of the reply brief, Appellant argues that Hernandez does not teach using high resolution inductive pickups for measuring grinding forces applied when grinding tooth

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flanks on a toothed wheel. We agree. As stated above we find that Hernandez cannot be combined with Hahn and Loehrke in the manner set forth in the Examiner's rejection. We find that Hahn teaches use of non-contacting displacement sensors to measure grinding force. See column 14, lines 3 through 9. However, we find that neither Hahn nor Loehrke teaches or suggests that the force sensors on the work piece comprise two high resolution inductive path pick ups as is claimed in claim 24. Therefore, we will not sustain the rejection of claim 24 under 35 U.S.C. § 103.

For the foregoing reasons we affirm the Examiner's rejection of claims 20, 21, 26, 28 and 29 under 35 U.S.C. § 103. We reverse the Examiner's rejection of claims 16 through 19, 22, 24, 25 and 27 under 35 U.S.C. § 103.

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

AFFIRMED-IN-PART

JAMES D. THOMAS)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
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)	INTERFERENCES
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AFFIRMED-IN-PART

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