

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JOHN J. KOTYK and KEVIN L. DEPPERMANN

Appeal 2007-1830
Application 09/739,871
Technology Center 3600

Decided: December 7, 2007

Before DONALD E. ADAMS, DEMETRA J. MILLS, and
LORA M. GREEN, *Administrative Patent Judges*.

GREEN, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the Examiner's final rejection of claims 1, 5-9, 13-21, 49-51, and 92-109. We have jurisdiction under 35 U.S.C. § 6(b). Claims 1 and 98 are representative of the claims on appeal, and read as follows:

1. A non-destructive method for determining whether a seed exhibits a trait, the method comprising:

providing a plurality of seeds in a sampling device, said sampling device comprising a plurality of stacked trays, each tray containing a plurality of wells, a plurality of the wells containing a seed to be imaged;

magnetic resonance imaging of the sampling device to generate at least one magnetic resonance image of said plurality of seeds within the sampling device;

analyzing said magnetic resonance image for information indicative of the presence of the trait; and,

determining whether each individual seed exhibits said trait based on said analysis.

98. A non-destructive method for seed trait analysis, the method comprising:

generating a single magnetic resonance image of a plurality of distinct seeds;

analyzing said single magnetic resonance image for information indicative of the presence of a certain trait of interest;

determining which one or ones of the plurality of distinct seeds possess the certain trait of interest based on said analysis; and

physically sorting the plurality of seeds based on the detected presence of the trait of interest.

The Examiner relies upon the following references:

Hanawa	US 5,051,699	Sep. 24, 1991
Rocklage	US 5,833,947	Nov. 10, 1998
McNertney	US 5,864,984	Feb. 2, 1999
Williames	US 6,237,286	May 29, 2001

Rubel et al., "Simultaneous Determination of Oil and Water Contents in Different Oilseeds by Pulsed Nuclear Magnetic Resonance," *JACCS*, Vol. 71, pp. 1057-1062 (1994)

We reverse.

DISCUSSION

Claims 98, 99, and 108 stand rejected under 35 U.S.C. § 102(b) as being anticipated to McNerty.

According to the Examiner:

McNertney discloses a non-destructive (the seeds are not destroyed or harmed) method for seed trait analysis comprising the steps of generating a single MRI of a plurality of distinct seeds (col. 5, line 29 and col. 5, lines 64-65, the MRI takes one image of one germination box 12 at a time and each box 12 contains a plurality of seeds); analyzing the single MRI for information indicative of the presence of a certain trait of interest (col. 3, lines 1-7); determining which one or ones of the plurality of distinct seeds possess the certain trait of interest based on analysis (col. 3, lines 45- 65); and sorting the seeds based on the detected trait (col. 3, lines 42-65).

(Final Rejection¹, p. 2.)

The burden is on the Examiner to set forth a prima facie case of unpatentability. *In re Glaug*, 283 F.3d 1335, 1338 (Fed. Cir. 2002). To anticipate, every element and limitation of the claimed invention must be found in a single prior art reference, arranged as in the claim. *Karsten Mfg. Corp. v. Cleveland Golf Co.*, 242 F.3d 1376, 1383 (Fed. Cir. 2001).

Appellants assert that McNerty teaches a method for measuring seedlot vigor, in which seeds are planted in a germination box, and successive images of the germinated seedling are analyzed to determine root growth (Br. 7). Appellants argue that the Examiner's assertion that the method of McNerty is non-destructive is incorrect, as McNerty requires the analysis of successive images of the germinated seedling (*id.* at 8). Thus,

¹ All references to the Final Rejection are to the Final Rejection mailed June 17, 2005.

according to Appellants, “the method described in McNertney is ‘destructive’ because the nature of the seed must be changed to determine the trait of interest.” (*Id.*)

We agree, and the rejection is reversed.

McNertny teaches:

The present invention provides a machine vision system for determining seedlot vigor comprising an imaging device oriented to acquire an image of a germinating seed and an image analyzer for analyzing successive images of a seed and determining growth rate for a root of the seed, to determine the vigor of a seedlot to which the seed belongs.

The present invention also provides a method for determining seedlot vigor comprising the steps of:

- (a) acquiring a first image of each seed;
- (b) acquiring one or more additional images of the root at times later than first image; and
- (c) measuring growth rate of each germinated seedling by electronic image analysis to determine seedlot vigor.

In one embodiment of the present invention a rotating rack system containing a plurality of germination boxes (in one embodiment, 198 germination boxes are used) is placed inside an environmentally-controlled growth chamber. An imaging device such as a digital camera is positioned using a camera positioning system so that it can obtain a image of one germination box at a time.

(McNertny, col. 2, l. 62-col. 3, l. 14.)

Thus, in the invention of McNertny, it is the growth of the roots of the emerging seedling that are measured. Once the seedling has emerged, the seed *per se* is destroyed.

The Examiner asserts that there is “no support in the specification that the seeds are not to be germinated or have roots in order to meet this ‘nondestructive’ definition. Instead, the Examiner finds in Appellant[s’]

[sic]specification teaching[s] of seeds, roots, plant tissue or plant parts to be studied under MRI, which roots and plant are destructive form of the seeds, meaning the seeds have germinated into full plant.” (Answer 6.)

The interpretation of terms in a claim is a matter of law. *In re American Academy of Science Tech Center*, 367 F.3d 1359, 1363 (Fed. Cir. 2004). During prosecution before the Office, claims are to be given their broadest reasonable interpretation consistent with the Specification as it would be interpreted by one of ordinary skill in the art. *Id.* at 1364.

We initially note that the Specification at no place specifically defined the term seed. We thus give the term seed its broadest reasonable interpretation consistent with the Specification, as it would be interpreted by the ordinary artisan reading the Specification.

The Specification teaches that the invention

provides devices and methods for rapid, non-destructive analysis of the physical and chemical characteristics of one or more seeds or plant tissues and for using this analysis to selectively breed plants with one or more desired characteristics. The analysis is carried out on a sample of one or more seeds using MRI to measure one or more characteristics of the sample. Seeds exhibiting the desired characteristics can be selected to be grown from among many seeds analyzed. The invention is further useful for observing insect or fungal infestation, shapes of seeds, and damage to seeds.

(Specification, p. 8.)

Moreover, according to the Specification,

Other plant tissues or agricultural samples can be substituted for seeds. As used herein, plant tissues include, but are not limited to, any plant part such as leaf, flower, root, and petal. As used herein, agricultural samples include, but are not

limited to, plant tissues such as seeds, but also include non-plant based material such as non-organic matter or non-plant based matter that occur in an agricultural context.

(*Id.* at 29)

Thus, the Specification teaches that plant tissues other than seed may be analyzed using the method taught by the instant invention. Another plant tissue that may be substituted for seeds is the root. Thus, the Specification teaches that a plant tissue such as a root is not part of the seed. Thus, seed as used in the Specification excludes allowing the seed to produce the germinated seedling in order to measure root growth as taught by McNertney. Thus, McNertney does not teach the invention as required by claims 98, 99, and 108, and we are compelled to reverse the rejection.

Claims 1, 5, 6, 9, 13, 49, and 94-97 stand rejected under 35 U.S.C. § 103(a) as being obvious over the combination of McNertney and Williames.

Claims 7, 8, 14, 15, 17-21, 100-102, 105, and 107 stand rejected under 35 U.S.C. § 103(a) as being obvious over the combination of McNertney and Rubel.

Claims 16, 92, and 93 stand rejected under 35 U.S.C. § 103(a) as being obvious over the combination of McNertney and Rubel, as further combined with Williames.

Claim 50 stand rejected under 35 U.S.C. § 103(a) as being obvious over the combination of McNertney and Williames, as further combined with Rubel.

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Claim 51 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of McNertney and Williames, as further combined with Rocklage.

Claims 103, 104, and 109 stand rejected under 35 U.S.C. § 103(a) as being obvious over McNertney as applied under 35 U.S.C. § 102(b).

Claim 106 stand rejected under 35 U.S.C. § 103(a) as being obvious over the combination of McNertney and Hanawa.

As none of the additional references cited by the Examiner, nor the argument provided under § 103(a) overcome the deficiencies of McNertney as applied under § 102(b), all of the above rejection are reversed for the reasons set forth above with respect to the rejection of claims 98, 99, and 108 under 35 U.S.C. § 102(b).

CONCLUSION

In summary, because the Examiner has failed to set forth a prima facie case of unpatentability, all of the appealed rejections are reversed.

REVERSED

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