UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte LEICA MIKROSYSTEME GmbH

Appeal 2008-1973
Application 10/734,566
Technology Center 3700

Decided: October 21, 2008

Before JAMESON LEE, RICHARD TORCZON, and JAMES T. MOORE, *Administrative Patent Judges*.

LEE, *Administrative Patent Judge*.

DECISION ON APPEAL

A. Statement of the Case

This is a decision on appeal by the real party in interest, Leica Mikrosysteme GmbH (LMG), under 35 U.S.C. § 134(a) from a final rejection of claims 2-7 and 9. We have jurisdiction under 35 U.S.C. § 6(b).

References Relied Upon

Barrett	US 4,395,075	Jul. 26, 1983
Söderkvist	US 4,532,838	Aug. 6, 1985
Markgraf	US 4,603,848	Aug. 5, 1986
Mohr	US 5,488,886	Feb. 6, 1996
Niesporek	US 5,535,654	Jul. 16, 1996
Jakobi	US 5,761,977	Jun. 9, 1998
Nishimoto	US 5,787,776	Aug. 4, 1998
Walter	US 6,253,653	Jul. 3, 2001

The Rejections on Appeal

The Examiner rejected claims 2-7 and 9 under 35 U.S.C. § 103(a) as unpatentable over Niesporek, Walter, Markgraf, and Mohr.[1]

The Examiner rejected claims 2-7 and 9 under 35 U.S.C. § 103(a) as unpatentable over Söderkvist, Barrett, Jakobi, Nishimoto, Mohr and Niesporek.

The Invention

The invention relates to an apparatus for cutting into specimens where the spacing between a knife blade and the specimen is measured using a light barrier which does not require contact between the blade and specimen. (Spec. 3:¶¶ 6&7.)

B. Findings of Fact

1. Claim 9 is the independent claim and is reproduced below (Claims App'x 18:16-23):

9. An ultramicrotome comprising:

[1] The Examiner offered additional references as evidence of the general level of ordinary skill in the art. However, none is necessary for supporting the rejection.

> a knife, defining a knife edge,
>
> a knife holder for clamping the knife,
>
> a specimen holder for holding a specimen,
>
> a feed device for generating a relative linear motion between the knife and the specimen,
>
> a light barrier being arranged parallel to the knife edge and located between the knife and the specimen, the arrangement of the light barrier is such that the relative linear motion between the knife and the specimen penetrates the light barrier and thereby ascertains a spacing of a few micrometers between the knife and the specimen to prevent contact between the knife and specimen, and to facilitate the cutting of specimen sections that are 300 nanometers or less thick.

2. Niesporek discloses a microtome 2 that uses a delimiting device 20 which establishes the position of a sample 30 to be cut relative to a cutting knife 10. (Niesporek 2:25-28.)

3. In Niesporek, the delimiting device includes a lever arm 32 that contacts either the sample or the knife. (*Id*. at 4:17-22; Figure 1.)

4. Both the Examiner and LMG have characterized Niesporek's delimiting device as a contact sensor. (Ans. 4:8-9; App. Br. 5:15.)

5. Niesporak describes the use of a light barrier as a type of sensor known in the microtome art. (Niesporek 4:60-67.)

6. The Examiner found that contact sensors and light barriers are well known to a person of ordinary skill in the art as equivalents of one another. (Ans. 4:10-11.)

7. One of ordinary skill knew to use a light barrier to determine the position of an object holder 5 with respect to a cutting blade 4. (Walter 5:44-47.)

8. Markgraf discloses a device for separating sheets in a sheet feeder. (Markgraf Abstract.)

9. In Markgraf, the device includes a passage gap 16 that is adjusted based on the thickness of a sheet 23 that is to be separated from a stack. (*Id*. at 6:41-46.)

10. In Markgraf, the gap is measured through the use of a mechanical contact switch 52 that includes contact elements 44 and 45. (*Id*. at 7:25-37.)

11. Markgraf also provides that in place of the contact switch a light barrier may be used that includes a light source 76 and switching element 77. (*Id*. at 8:29-33.)

12. Markgraf teaches that the accuracy of measurements made using a contact switch may be unfavorably affected due to deformation of the switch's contacting surfaces. (*Id*. at 4:8-13.)

13. Markgraf teaches that a light barrier is preferable as it offers greater measurement accuracy and allows for operation without the deformation problem of a contact switch. (*Id*. at 3:65-68; 4:12-25.)

14. Mohr teaches a device for optimizing the process of cutting sheets of material. (Mohr Abstract.)

15. In Mohr, the device includes a holdfast beam 8 that contacts and maintains a sheet of material 1 in a position to be cut by cutting blade 7. (*Id*. at 5:56-59.)

16. Mohr discloses that the device includes a light barrier formed by light source 13 and photocell 14. (*Id*. at 6:14-18.)

17. As shown in Mohr's Figure 6, multiple light barriers are arranged parallel to cutting blade 7 such that the position of blade 7 with respect to the material 1 to be cut is determined when the blade penetrates the light barriers. (*Id*. at 7:12-38.)

18. Mohr supports the Examiner's finding that a person of ordinary skill in the art would have recognized that light barriers are well known to be positioned parallel to a knife blade in order to measure the positioning of the blade with respect to the material that it is to cut.

C. Analysis

LMG must show error in the Examiner's rejection of claims 2-7 and 9. The Examiner rejected all the claims over Niesporek, Walter, Markgraf, and Mohr. The Examiner alternatively rejected all the claims over Söderkvist, Barrett, Jakobi, Nishimoto, Mohr and Niesporek.

The Rejection Based on
Niesporek, Walter, Markgraf, and Mohr

Claims 2-7 are argued collectively with independent claim 9. We focus our analysis on the contested limitations.

The Examiner found that Niesporek discloses all the limitations of claim 9 with the exception of the use of a light barrier. According to the Examiner, rather than a light barrier, Niesporek discloses the use of a contact sensor 20 to determine the position of a sample relative to a cutting knife. The Examiner reasoned that a person of ordinary skill in the art would

recognize that contact sensors and light barriers are equivalents of one another. (Ans. 4:17-20.)

LMG does not dispute that Niesporek discloses all the limitations of claim 9 with the exception of a light barrier. What LMG does dispute is the Examiner's contention that light barriers and contact sensors are recognized equivalents in the microtome or ultramicrotome arts. According to LMG, the Examiner has not pointed to any evidence that suggests the use of a light barrier in a microtome to measure the gap between a knife and specimen to be cut.

Niesporek discloses a microtome 2 that uses a delimiting device 20 which establishes the position of a sample 30 to be cut relative to a cutting knife 10. (Niesporek 2:25-28.) The delimiting device is characterized by contact of a lever arm 32 with either the sample or the knife. (*Id*. at 4:17-22; Figure 1.) Both the Examiner and LMG have characterized Niesporek's delimiting device as a contact sensor. (Ans. 4:8-9; App. Br. 5:15.) The Examiner found that the contact sensor does not satisfy the limitation of a light barrier. However, the Examiner reasoned that a person of ordinary skill in the art would recognize that contact sensors and light barriers are both well known measuring devices. In support of that reasoning, the Examiner pointed to a portion of Niesporak that describes the use of a light barrier as a type of sensor known in the microtome art. (Niesporek 4:60-67.) The Examiner also cited to Walter, which provides evidence of the known use of a light barrier in a microtome for detecting the position of a sample holder with respect to a cutting blade. (Walter 5:44-47.)

The Examiner further pointed to Markgraf and Mohr as evidence of the one of ordinary skill's understanding of light barriers as devices for measuring spatial relationships.

Markgraf discloses a device for separating sheets in a sheet feeder. The device includes a passage gap 16 that is adjusted based on the thickness of a sheet 23 that is to be separated. (Markgraf 6:41-46.) The gap is measured through the use of a mechanical contact switch 52 that is formed by contact elements 44 and 45. (*Id*. at 7:25-37.) Markgraf also provides that as an alternative to the contact switch, a light barrier may be used that includes a light source 76 and switching element 77. (*Id*. at 8:29-33.) Markgraf teaches that a light barrier is preferable to a contact switch as the accuracy of measurements made using a contact switch may be unfavorably affected by deformation of the contacting surfaces. (*Id*. at 4:8-13). The light barrier offers greater measurement accuracy without the deformation problem (*id*. at 3:65-68; 4:12-25).

Mohr discloses a device for optimizing the process of cutting sheets of material. The device includes a holdfast beam 8 that contacts and maintains a sheet of material 1 in a position to be cut by cutting blade 7. Mohr also discloses that the device includes a light barrier formed by light source 13 and photocell 14. As shown in Mohr's Figure 6, multiple light barriers are arranged parallel to cutting blade 7 such that the position of blade 7 with respect to the material 1 to be cut is determined when the blade penetrates the light barriers. (Mohr 7:12-38.)

A combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results. *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1739 (2007). If a technique

has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. *Id.* at 1740. Furthermore, a basis to combine teachings need not be expressly stated in any prior art reference. *In re Kahn*, 441 F.3d 977, 989 (Fed. Cir. 2006). There need only be an articulated reasoning with rational underpinnings to support a motivation to combine teachings. *Id.* at 988.

As is evident from both Niesporek and Walter, it was well known that light barriers are a type of sensing device used in the microtome art. As is evident from Markgraf, it was well known that a light barrier sensor is preferable to a contact sensor as the light barrier provides higher accuracy measurements. As is evident from Mohr, it was well known that light barriers are positioned parallel to a knife blade in order to measure the positioning of the blade with respect to a material that it is to be cut.

In light of what was well known to a person of ordinary skill in the art, the Examiner concluded that an ultramicrotome having all the limitations of LMG's claim 9, including the required light barrier, would have been obvious. That conclusion is credible as it reasonably takes into account the knowledge and ability of a person of ordinary skill in the microtome art in choosing between known sensor types. In choosing between a contact sensor and a light barrier to measure the distance between a knife blade and sample, a person of ordinary skill would reasonably select a light barrier in order to take advantage of its known greater measurement accuracy.

We first reject LMG's argument that the Examiner has not offered any evidence to support the position that contact sensors and light barriers are recognized equivalents in the microtome or ultramicrotome arts. (App. Br.

9:15-17.) As discussed above, Niesporek teaches both the use of a contact sensor 20 and a light barrier 58 as sensors for measuring the spacing between two components of a microtome. Walter teaches that a microtome is known to use a light barrier to determine the position of an object holder 5 with respect to a cutting blade 4.

Prior art references must be considered for everything they teach by way of technology and are not limited to the particular invention they are describing and attempting to protect. *EWP Corp. v. Reliance Universal Inc.*, 755 F.2d 898, 907 (Fed. Cir. 1985). One with ordinary skill in the art is presumed to have knowledge apart from what the prior art references explicitly say. *See KSR Int'l Co*, 127 S.Ct. at 1740-41. Additionally, a person of ordinary skill in the art is also a person of ordinary creativity, not an automaton. *Id*. at 1742.

While neither Niesporek nor Walter are explicit in their teaching of the interchangeability of measurement sensors, a person of ordinary skill and creativity would have understood from those teachings that a contact sensor and a light barrier are available as alternatives when selecting sensors for measuring the positioning of microtome components. Because each was known in the microtome art to provide those positioning measurements, it follows that a person of ordinary skill in the art would have reasonably recognized that those sensors are equivalents of one another.

We next reject LMG's argument that the references cited by the Examiner that are not related to microtomes, such as Markgraf and Mohr, are non-analogous art and not available as evidence of the obviousness of LMG's claim 9. (App. Br. 9:23-11:6.) A reference is analogous art when it is either in the field of an applicant's endeavor or if it is pertinent to the

particular problem with which the inventor was concerned. *In re Oetiker*, 977 F.2d 1443, 1447 (Fed. Cir. 1986). Furthermore, common sense applies in deciding which fields a person of ordinary skill in the art would look to for a solution to the problem facing the inventor. *Id*.

Here, it is clear from LMG's own specification that the field of endeavor of LMG's invention is generally cutting apparatuses where microtomes and ultramicrotomes are but merely exemplary types of such cutting apparatuses. From LMG's specification (Spec. 1:9-16):

FIELD OF THE INVENTION

> The invention concerns an **apparatus for cutting into specimens**, in particular a microtome or ultramicrotome….
>
> In the operation of **cutting apparatuses**, in particular a microtome or ultramicrotome, it is routinely necessary to position the specimen exactly with respect to the knife in accurately positioned and rapid fashion. (Emphasis added).

Mohr is directed to a device that cuts material. A person of ordinary skill in the art would understand that Mohr is within the field of "cutting apparatuses" to which LMG's invention is directed and is analogous art.

Also, the problem that LMG's invention addresses is that of accurately measuring the distance between a knife and a sample to be cut using a light barrier. (Spec. ¶¶ 6 & 7.) Both Mohr and Markgraf involve the use of a light barrier to measure the distance between a material and a component that acts on the material. Mohr teaches a cutting device that includes light barrier 14 which measures the distance between knife blade 7 and material 1. Markgraf teaches a sheet separator in which light barrier 78 measures the thickness of sheet passage gap 16 so that only a single sheet of material 23 is advanced a between cylinder 5 and retaining member 6.

Common sense would lead a person of ordinary skill in the art seeking to measure spacing in a microtome to look to areas where sensors are used for reliably measuring a gap between components. Mohr and Markgraf both provide guidance in deriving a solution to the problem of measuring the spacing between two components using a light barrier. Accordingly, Mohr and Markgraf are pertinent to the problem with which LMG is concerned and are correctly considered analogous art.

We also reject LMG's argument that Niesporek cannot be combined with any teaching of a light barrier because the inventor in Niesporek did not recognize the benefits of a light barrier in specifically measuring the gap between his microtome knife and sample. (App. Br. 6:14-21.) That argument is misplaced. What the inventor of a single prior art reference would understand from his invention is not the relevant inquiry to determine the obviousness of LMG's claims. Pursuant to the statutory language of 35 U.S.C. § 103(a), the relevant inquiry is whether the subject matter of the claims would have been obvious to person having ordinary skill in the art at the time LMG's invention was made. The Examiner determined that at the time LMG's invention was made, a person of ordinary skill in the art would understand LMG's claim 9 as being obvious. As set forth above, that determination is reasonably supported by the evidence of record and is not undermined by LMG's argument.

Finally, we reject LMG's contention that substituting a light barrier for Niesporek's contact sensor 20 as proposed by the Examiner would require such substantial modification of Niesporek as to change its principles of operation. (App. Br. 11:7-24.) Niesporek discloses a sensor for measuring the relative positions of a sample to be cut and a cutting knife.

The Examiner's proposed substitution of one type of known prior art sensor, i.e. a light barrier, for the contact sensor of Niespork results in a microtome that still provides the same positioning measurement. The evidence also reveals that the measurement is improved when a light barrier is used by virtue of its higher measurement accuracy. Thus, the incorporation of a light barrier not only maintains the measurement function disclosed in Niesporek but improves upon that function. The principle of operation of Niesporek's invention is not altered by substituting an improved sensor for a lesser sensor to more accurately make the same measurement.

Moreover, it is not even necessary that the inventions of the references be immediately combinable, without modification, to render obvious the invention under review. *See In re Sneed*, 710 F.2d 1544, 1550 (Fed. Cir. 1983). Here, the substitution of a light barrier for Niesporek's contact sensor 20 without any modification is not required. As discussed above, the Examiner correctly determined how a person of ordinary skill in the art would view the collective teachings of the prior art in modifying Niesporek to incorporate a light barrier. The Examiner correctly took into account the knowledge of one of ordinary skill in the art in determining that LMG's claim 9 is obvious.

For all the foregoing reasons, we sustain the rejection of claims 2-7 and 9 as unpatentable under 35 U.S.C. § 103(a) based on Niesporek.

The Rejection Based on
Söderkvist, Barrett, Jakobi, Nishimoto, Mohr and Niesporek

For the reasons discussed above, the Examiner correctly determined that LMG's claims 2-7 and 9 are unpatentable under 35 U.S.C. § 103(a) over Niesporek, Walter, Markgraf, and Mohr. We need not and do not reach the

Examiner's alternative rejection of claims 2-7 and 9 under 35 U.S.C. § 103(a) over Söderkvist, Barrett, Jakobi, Nishimoto, Mohr and Niesporek.

D. Conclusion

The rejection of claims 2-7 and 9 as unpatentable under 35 U.S.C. § 103(a) over Niesporek, Walter, Markgraf, and Mohr is **affirmed**.

We do not reach the merits of the rejection of claims 2-7 and 9 as unpatentable under 35 U.S.C. § 103(a) over Söderkvist, Barrett, Jakobi, Nishimoto, Mohr, and Niesporek.

AFFIRMED

ack

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