Paper No. 18

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte ZBIGNIEW T. BRYNING,
BENJAMIN R. IRVIN,
HRAIR KIRAKOSSIAN,
and
EDWIN F. ULLMAN

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Appeal No. 1997-2569
Application No. 08/469,578

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ON BRIEF

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Before KIMLIN, HANLON, and KRATZ, Administrative Patent Judges.

HANLON, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134 from the final rejection of claims 3-5, 13, 23, 32-41 and 44. Claims 43 and 45-50 are also pending in the application but have been allowed by the examiner. The claims on appeal are

directed to a method and apparatus for mixing two or more

liquids using

electrostatic or acoustic energy. Claim 3 is illustrative and reads as follows:

> 3. A method of mixing two or more liquids, said method comprising the steps of:
>
> (a) forming a liquid droplet containing said two or more liquids on a substantially planar and substantially inelastic surface, said liquid droplet being in containerless containment on said surface, said surface being substantially impervious to and non-reactive with said liquid droplet and
>
> (b) applying electrostatic energy or acoustic energy to said droplets thereby mixing said liquids.

The references relied upon by the examiner are:

Gibbs et al. (Gibbs)	3,854,703	Dec. 17, 1974
Woodbridge, III (Woodbridge)	4,065,263	Dec. 27, 1977
Lee et al. (Lee)	4,250,257	Feb. 10, 1981
Shibuya et al. (Shibuya)	4,988,208	Jan. 29, 1991

Smith et al. (Smith) "An Innovative Technology for 'Random-Access' Sampling," 28 Clinical Chemistry, no. 9, 1867-72 (Tarrytown, NY, Technicon Instruments Corp., 1982).

The following rejections are at issue in this appeal:

(1) Claims 3, 4, 13, 23, 32, 33, 35-37, 39, 40 and 44 are rejected under 35 U.S.C. § 103 as being unpatentable over Gibbs and Lee and further in view of Woodbridge.

(2) Claims 5, 34, and 38 are rejected under 35 U.S.C.

§ 103 as being unpatentable over Gibbs, Lee and Woodbridge as applied to claims 3 and 32, and further in view of Smith.

(3) Claim 41 is rejected under 35 U.S.C. § 103 as being unpatentable over Gibbs and Lee as applied to claim 36, and further in view of Shibuya.

Grouping of claims

According to appellants, "Claims 3-5, 13, 23, 32-41 and 44 stand or fall together as to the rejections under 35 U.S.C. § 103" (Brief, p. 3). Therefore, for purposes of this appeal, claims 4, 5, 13, 23, 32-41 and 44 stand or fall with the patentability of claim 3. See 37 CFR § 1.192(c)(7) (1996).

Discussion

Claim 3 is directed to a method of mixing two or more liquids comprising the steps of (1) forming a liquid droplet containing the liquids on a surface which is impervious to and non-reactive with the liquid droplet whereby the droplet is in containerless containment on the surface and (2) applying electrostatic or acoustic energy to the droplet to mix the liquids contained therein.

Gibbs discloses a method of mixing a liquid specimen and a liquid reagent. Drops of these liquids are applied to a horizontal support which maintains the drops in "containerless containment." Thereafter, a jet of gaseous fluid, preferably

air, causes agitation of the liquids and effects a mixing thereof. Gibbs discloses several parameters such as tape speed and air flow which are said to achieve adequate mixing. See, e.g., col. 3, lines 46-57 and col. 4, lines 15-29. According to Gibbs, this method prevents cross-contamination between samples. See col. 1, lines 5-54; col. 2, lines 5-28.

Lee discloses a method for analyzing whole blood samples using a gel medium incorporated into a rigid support or applied as a coating on a tape. The whole blood sample is dropped onto the gel medium at an application station. Thereafter (col. 6, lines 11-15):

> A vibratory agitator 71 is disposed adjacent the tape 60 at the application station 62 to mix the sample and prevent sedimentation of red cells in the whole blood sample, while the plasma solutes are diffusing into the gels.

Woodbridge discloses an analytical test strip comprising a pocket for receiving small sample fluids. Vibration, including sonic and ultrasonic stimulation, may be used to mix fluids contained in the pocket. See col. 11, lines 3-9.

The examiner recognizes that both Gibbs and Lee fail to teach using electrostatic or acoustic energy to effect the mixing disclosed therein. Nevertheless, the examiner concludes (Answer, pp. 4-5):

> It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a vibratory agitator in place of the air-driven agitator in the device of Gibbs because vibratory agitators achieve mixing in droplets on moving test strips as taught by Lee.
>
> It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a sonic source as the vibratory agitator in the modified device of Gibbs and Lee because a sonic source is suitable for reagent mixing by vibration as taught by Woodbridge.

Appellants argue that the combination of Gibbs, Lee and Woodbridge proposed by the examiner amounts to a hindsight reconstruction of the claimed invention. First, appellants argue that there is no motivation to use vibratory agitation as in Lee to mix the droplets in Gibbs since Lee uses a gel which confines the droplets during mixing. Particularly, appellants argue (Brief, p. 6):

> The forces acting on the drop of whole blood in Lee are significantly greater than those found in Gibbs. The skilled artisan could reasonably conclude that vibratory mixing of the type used by Lee would not work for the drop of liquid in Gibbs.

Second, appellants argue that the teachings of Woodbridge do not overcome the deficiencies of Gibbs and Lee since Woodbridge uses vibration to mix a liquid which is fully contained in the test strip. See Brief, p. 7.

Appellants' arguments are not persuasive. It is of no moment that the support disclosed in Lee is not "substantially impervious to and non-reactive" with the sample deposited thereon. The examiner relies on Lee to establish that it would have been obvious to one having ordinary skill in the art to mix the droplets of Gibbs using alternative agitation means such as the vibratory agitator disclosed in Lee. See In re Keller, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981) (the test for obviousness is not what the individual references teach, but what the combined teachings of the references would have suggested to one having ordinary skill in the art). Furthermore, in view of the teachings in Gibbs that contamination among samples is not desirable, one having an ordinary level of skill in the art would have adjusted the intensity of the vibratory agitator in Lee to prevent cross-contamination.

Likewise, it is of no moment that the sample of Woodbridge is fully contained within the test strip. The examiner merely relies on Woodbridge to establish that sonic mixing is a form of the vibratory mixing disclosed in Lee. It is well settled that a rejection premised upon a proper combination of references cannot be overcome by attacking the references individually. As pointed out above, the test for obviousness is not what the individual references teach, but what the combined teachings of the references would have suggested to one having ordinary skill in the art. Keller, 642 F.2d at 425, 208 USPQ at 881.

For the reasons set forth above, the combined teachings of Gibbs, Lee and Woodbridge suggest the claimed invention and provide a reasonable expectation of success. Therefore, the decision of the examiner is affirmed.

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

AFFIRMED

EDWARD C. KIMLIN Administrative Patent Judge	)
ADRIENE LEPIANE HANLON Administrative Patent Judge	) BOARD OF PATENT) APPEALS AND) INTERFERENCES
PETER F. KRATZ Administrative Patent Judge	)

ALH:hh

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