

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 21

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ROBERT W. ALLINGTON,
DANIEL G. JAMESON,
ROBIN R. WINTER, and
DALE L. CLAY

Appeal No. 1997-1734
Application No. 08/215,259

HEARD¹: November 16, 2000

Before JOHN D. SMITH, WARREN, and DELMENDO, Administrative Patent Judges.

DELMENDO, Administrative Patent Judge.

¹ A telephonic hearing was conducted on the date noted. The participants consisted of the appellants' attorney, Mr. Vincent L. Carney, and all three members of this panel.

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 7 through 37, which are all the claims pending in the subject application.

Claims 7 and 29 are illustrative of the claims on appeal and are reproduced below:²

7. Apparatus comprising:
a plurality of openable sample containers each having a corresponding fluid inlet passageway, a corresponding space for insertion of a sample and a corresponding fluid outlet passageway;
at least some of said plurality of sample containers being adapted to hold a different one of a corresponding plurality of samples;
a first transport means;
said first transport means being adapted to carry said plurality of sample containers;
a second transport means;
programming means for causing said first transport means to move a selected sample container and sample to the location of said second transport means;
a supercritical extractor;
said programming means including means for causing said second transport means to move said selected container and sample from the said first transport means to a supercritical extraction means;
means for heating sample container at the place of extraction;

² Claim 7 as it appears in the appendix to the appeal brief is not identical to claim 7 as recited in the "Amendment" filed July 17, 1995. We have reproduced claim 7 as recited in the "Amendment."

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means for passing fluid at said supercritical condition through the said selected sample container and sample, thereby extracting an analyte from the sample;

said means for heating including a recess in which the said cartridge means is placed during the said extraction;

the cartridge means being substantially enclosed as a result of its said placement in the said recess; and

receiving means for receiving extractant from the sample.

29. Apparatus for automatic high-temperature high-pressure extraction processing of a sample with an extraction fluid comprising:

a plurality of sample containers;

more than two samples, each sample being in a corresponding individual sealable sample container located in a first transport means;

said sample containers insertable and removable from the said first transport means;

said sample containers having a first flow port and a second flow port, and the said sample disposed between the said flow ports;

programming means for causing first transport means to move a selected one of the said more than two sample containers with its contained sample to a location corresponding to a place of extraction;

means for heating the said selected sample container and extraction fluid to a set temperature;

said means for heating including a recess in which the said cartridge means is placed during the said extraction;

the cartridge means being substantially enclosed as a result of its said placement in the said recess;

receiving means for receiving extractant from the sample;

means for pressurizing said process of extraction within a pressure vessel means;

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extraction fluid flow means producing an extraction fluid flow;

a first connecting means disposed to conduct fluid from the said extraction fluid flow means to the first flow port of the selected sample container;

said extraction fluid flow means forcing extraction fluid through said first fluid flow connecting means and through the first fluid flow port of said selected sample container containing said sample wherein said extraction fluid contacting said sample at said heated and pressurized conditions produce an extract from the sample;

said means for receiving including a plurality of collection containers located in a second transport means;

said programming means causing the selection of a collection container in the said second transport means in correspondence with the said selection of a sample container in the said first transport means;

said second fluid flow connecting means being disposed to conduct said extract from the said second flow port of the said selected sample container containing sample to the said selected collection container to receive said extract, wherein means are provided for forcing flow of extraction fluid with extract from the said selected sample container to the said selected collection container;

said selected collection container receiving extract from only one selected sample container; and

said second transport means moving the said selected sample container after the said container has received extract.

The subject matter on appeal relates to a supercritical extraction apparatus (specification, page 4). According to the appellants, the claimed invention permits equalization of

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pressure on the inside and outside of the sample cartridge without contamination from impurities outside the cartridge but inside the pressure vessel (appeal brief, page 5). The appellants further submit that the claimed invention allows a plurality of extractions to be performed on a plurality of different preloaded samples without the need for manually loading samples or initiating the flow of the supercritical fluid for each individual sample (appeal brief, page 6). Additionally, the appellants state that "the critical temperature of the supercritical fluid is maintained in the pressure vessel because of the preheated pressure vessel to provide more efficient extraction of analyte" (id.).

As evidence of unpatentability, the examiner relies upon the following prior art references:

Gilford 1977	4,058,367	Nov. 15,
Holt 6, 1985	4,533,641	Aug.
Frank et al. (Frank) 1992	5,133,859	Jul. 28,

(filed Mar. 2, 1990)

Claims 7 through 37 stand rejected under 35 U.S.C. § 103 as unpatentable over the combined teachings of Frank, Holt, and Gilford (examiner's answer, pages 3-4).

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We have carefully reviewed the entire record, including all of the arguments and evidence advanced by both the examiner and the appellants in support of their respective positions. This review leads us to conclude that the examiner's rejection is not well founded. Accordingly, we reverse. The reasons for our determination follow.

The examiner states:

Frank shows a similar extraction device using supercritical carbon dioxide.

The claims differ from Frank in some specific details which are not specifically referred to by Frank, but are suggested by Frank. For instance, claims 7 recites a first and second transport means, and dependent claims add a third transport means.

Frank shows chamber 210 actuated between two positions(col.9, first and second paragraphs). Frank adds(col.12, fourth paragraph) that an automated apparatus can be provided for placing the extraction containers in the extraction chamber and for removing extraction containers from the chamber. [Underscoring added; examiner's answer, p. 3.]

The examiner then concludes:

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to use a well known carousel for the first transport means and to provide a piston or plunger to push the sample into chamber 210(see the piston in Holt if necessary). The third transport means would involve the second positioning of chamber 210(referred to above) to provide the automatic seals and to put the heater in place. At col.9, line 8, Frank suggests thermal signals. Obviously

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the sample container flow connections and sample container lid could be designed in the same horizontal plane, so that downward movement of the chamber would seal all three openings. Well known automatic clamps could be provided for locking the parts in place. [Examiner's answer, pp. 3-4.]

The appellants, on the other hand, summarize their arguments as follows:

The principal reference, Frank, et al., does not disclose the nature of his sample vessels, collection system or programming system but does indicate they exist. On the other hand, all of the claims in this application recite sealable or closeable sample cartridges with inlet and outlet passageways and means for heating them in the pressure chamber. It would not be obvious to a person of ordinary skill in the art to construct these features which are not disclosed in Frank, et al nor in the two references combined with it nor is there any reason why a person of ordinary skill in the art would combine them along the line of the invention to obtain the benefits achieved with the claimed invention. Similarly, there is no teaching of a heated variable restrictor or of the rotary carousels for transport paths or of any mechanism for locking the sample cartridges in place. None of these features would have been obvious to a person of ordinary skill in the art from the cited references. [Appeal brief, pp. 12-13.]

Specifically, the appellants contend:

The Examiner has given no reason why a person of ordinary skill in the art would modify the thimbles disclosed in Frank, et al. to provide openable or sealable cartridges with their separate inlet and outlet passageways for use in an automatic supercritical extraction system. The problems of

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contamination and isolation or efficiency of moving the extracted material are not even discussed in any of these references. Thus, no motivation is disclosed for modifying the references or combining the references in any way. [Appeal brief, p. 15.]

The appellants further argue:

Even assuming arguendo that a person of ordinary skill in the art would know of all of the components, that is not enough for a prima facie case. There must be a rationale or logic that would cause a person of ordinary skill in the art to make such a combination. [Appeal brief, p. 18.]

We agree with the appellants (appeal brief, page 19) that the examiner has not made out a prima facie case of obviousness within the meaning of 35 U.S.C. § 103. A claimed invention is unpatentable if the differences between it and the prior art "are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art" (emphasis added). 35 U.S.C. § 103(a)(1995); Graham v. John Deere Co., 383 U.S. 1, 14, 148 USPQ 459, 465 (1966). The analysis of whether the claimed subject matter as a whole would have been obvious to a person having ordinary skill in the art over the prior art rests on several factual inquiries including: (1) the scope and content of the prior art; (2) the differences between the

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prior art and the claims; (3) the level of ordinary skill in the art at the time of invention; and (4) objective evidence of nonobviousness. Graham, 383 U.S. at 17-18, 148 USPQ at 467.

As a preliminary matter, we note that the examiner does not explain the scope and content of the prior art to any reasonable degree of specificity. In addition, we find that the examiner does not identify all of the differences between the prior art and the claimed subject matter. Instead, the examiner states that "[t]he claims differ from Frank in some specific details..." In our opinion, the examiner's analysis in this case falls short of the standards set forth in Graham.

Turning to the merits, Frank describes a sample preparation device which extracts sample components from complex matrices using supercritical carbon dioxide as the principal extracting solvent and presents the resulting extract in a user-chosen sample collection vessel (autosampler vial, bulk vessel, cuvette, etc.) with the autosampler vial being directly compatible with automatic injection systems of other analytical instruments (column 4, lines 48-56). In one embodiment, Frank teaches an apparatus comprising a gas

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cylinder **100**, a pump **102**, a regulator **104**, an extraction section **106**, a nozzle **108**, a pressure transducer **112**, a flow transducer **118**, and a control loop **116** (figure 1; column 7, lines 17-39). In another embodiment, Frank teaches the use of a heat exchanger **204** and preheater **211** to control the temperature of the fluid upstream of the extraction chamber (figure 3; column 8, lines 40-50 and 61-63). According to Frank, the extraction chamber is preferably actuated between two positions and that this actuation permits the chamber to be automated (column 8, line 66 to column 9, line 1). Frank further teaches that an "apparatus for automatically creating the high pressure seals necessary between chamber **210** and the vessel containing the sample" can be included (column 9, lines 1-4). Frank states that the vessel containing the sample is a "thimble," which is preferably "a common vessel in an automated bench, permitting the same vessel to serve as a sample transport vessel, as part of a filtering apparatus" (column 9, lines 18-21). Also, Frank teaches that, in a preferred embodiment, the apparatus additionally comprises a queue which can collect multiple fractions in sample

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collection containers such as the autosampler vials which are typically used in gas and liquid chromatographs (column 11, lines 19-25) and that an automated apparatus can be provided for placing the extraction containers in the extraction chamber, removing the extraction containers from the chamber, and replacing the extraction containers in a queue/storage area (column 12, lines 35-39).

As pointed out by the appellants, Frank does not specifically describe the nature of the sample vessels ("thimbles"), collection system, or programming system. In particular, Frank does not teach the claim elements of openable sample containers having a fluid inlet passageway and a fluid outlet passageway (appealed claim 7) and a sealable sample container having a first flow port and a second flow port (appealed claim 29). In response to the appellants argument that these claims elements are not disclosed in the prior art, the examiner refers to Frank's teaching of "high pressure seals" between the extraction chamber and the vessel containing the sample (examiner's answer, page 4). However, the examiner has not explained on this record how the presence of the "high pressure seals" satisfies the claim elements in

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question or how these claim elements would have been obvious to one of ordinary skill in the art over the applied prior art. Holt and Gilford, which the examiner characterizes as being cumulative (examiner's answer, page 3), have apparently been cited to show the obviousness of using a piston (examiner's answer, pages 3-4), but these prior art references do not remedy the deficiencies of Frank with respect to the claim elements concerning the sample containers.

For these reasons, we reverse the examiner's rejection of claims 7 through 37 under 35 U.S.C. § 103 as unpatentable over the combined teachings of Frank, Holt, and Gilford.

The decision of the examiner is reversed.

REVERSED

JOHN D. SMITH)
Administrative Patent Judge)
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) BOARD OF PATENT
CHARLES F. WARREN) APPEALS

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Administrative Patent Judge) AND
) INTERFERENCES
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