

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 22

UNITED STATES PATENT AND TRADEMARK OFFICE

MAILED

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

MAY 29 1996

Ex parte NORMAN B. RAINER

PAT & TM OFFICE
BOARD OF PATENT APPEALS
AND INTERFERENCES

Appeal No. 95-4395
Application 07/561,006¹

ON BRIEF

Before GARRIS, FRANKFORT and McQUADE, Administrative Patent Judges.

FRANKFORT, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1, 4, 5 and 7, all of the claims remaining in this application. Claims 2, 3 and 6 have been canceled.

¹ Application for patent filed July 31, 1990. According to appellant, the application is a continuation of copending application 07/395,535, filed August 18, 1989, issued as U.S. Patent No. 5,002,984 on March 26, 1991.

Appeal No. 95-4395
Application 07/561,006

Appellant's invention relates to an open-celled cellulosic sponge containing a water-insoluble polymer capable of selectively removing dissolved ions, particularly ions of heavy metals, from aqueous systems. Claim 1, the only independent claim on appeal, is representative of the claimed subject matter and a copy thereof, as it appears in the Appendix to appellant's brief, is attached to this decision.

The prior art references of record relied upon by the examiner in rejecting the appealed claims under 35 U.S.C. § 103 are:

Rainer	3,715,339	Feb. 6, 1973
Thill	4,332,916	Jun. 1, 1982

Claims 1, 4, 5 and 7 stand rejected under 35 U.S.C. § 103 as being unpatentable over "Rainer alone or in view of Thill."²

Reference is made to the examiner's answer (Paper No. 11, mailed March 10, 1992) and to the supplemental examiner's answers (Papers No. 19 and 21) for the examiner's complete

² The rejection of claims 1, 4, 5 and 7 under the judicially created doctrine of obviousness-type double patenting based on claims 1 and 2 of appellant's co-pending application Serial No. 07/395,535, filed August 18, 1989 (now U.S. Patent No. 5,002,984, granted March 26, 1991) in the final rejection, has been withdrawn by the examiner in light of the terminal disclaimer filed July 3, 1991. See the advisory action mailed July 24, 1991 (Paper No. 8).

Appeal No. 95-4395
Application 07/561,006

reasoning in support of the above-noted rejection. Appellant's arguments thereagainst are found in the brief (Paper No. 10, filed September 25, 1991) and in the reply brief (Paper No. 20, filed August 14, 1995).

OPINION

In reaching our conclusion on the obviousness issue raised in this appeal, we have carefully considered appellant's specification and claims, the applied references, and the respective viewpoints advanced by appellant and the examiner. As a consequence of our review, we have made the determination that the examiner's rejection of claims 1, 4, 5 and 7 under 35 U.S.C. § 103 cannot be sustained. Our reasons follow.

Appellant's specification (page 1) makes clear that the use of ion exchange resins for the absorption of dissolved ions is well known, and that such resins are generally manufactured in bead form for use in columns through which the liquids to be purged of dissolved ions are passed to interact with the polymer beads. Appellant further notes, on page 1, that U.S. Patent No. 4,332,961 (to Thill), now applied by the examiner, discloses an ion exchange resin attached to an open-celled cellulose sponge, wherein the resin is chemically bonded to the hydroxyl groups of the cellulose of the sponge by means of a cross linking agent.

Appeal No. 95-4395
Application 07/561,006

Appellant characterizes the sponge product of Thill as being "self-supporting and of potentially large size." In addition, on page 2 of the specification, appellant makes reference to a co-pending application Serial No. 07/395,535, filed August 18, 1989 (now U.S. Patent No. 5,002,984, granted March 26, 1991) which discloses an insolubilized polyethyleneimine (PEI) polymer deposited in situ within an open celled cellulosic sponge. Appellant notes however that it has been found that such treated sponges

generally have a high loading of polymer in the peripheral regions, but have little or no polymer in the center region of the sponge.

It is a primary objective of appellant's present invention to provide a water treating metal ion absorbing product in the form of an open celled cellulosic sponge wherein the insolubilized PEI polymer is "substantially uniformly distributed throughout the sponge" (specification, page 3) and wherein the content of the polymer in the sponge is at least 15% and preferably between 15% and 60% by weight of the product. Also of importance to appellant is controlling the thermal gradient between the surface of the sponge and its interior during heating of the sponge at the curing temperature of the polymer and minimizing breakage of the dry, brittle, impregnated sponges while they are agitated to promote uniform thermal curing. In attaining the above-noted objectives, appellant has determined

Appeal No. 95-4395
Application 07/561,006

that the configuration and size of the treated sponges is "of critical importance" (specification, page 6). In particular, appellant indicates, in the paragraph spanning pages 3-4 of the specification, and recites in claim 1 on appeal, that the sponge has

a cuboid configuration comprised of a primary pair of parallel flat surfaces spaced apart by a distance representing an X axis having a length between 10 and 35 mm, and joined by a sidewall perimeter comprised of four sides orthogonally disposed to said primary flat surfaces and causing said sponge to have at least one plane of symmetry perpendicular to said primary surfaces and including the X axis, the shortest straight line distance spanning said perimeter while perpendicularly intersecting said X axis being considered to be a Y axis, and the longest straight line distance spanning said perimeter while perpendicularly intersecting said X axis being considered to be a Z axis, the sum of the X and Y axes being in the range of 20-50 mm, said Z axis being between one and eight times the X axis and less than 119 mm.

Test results found in Examples 1, 2 and 3 on pages 7 through 11 of appellant's specification appear to demonstrate that configuration and size as disclosed and claimed by appellant are important factors in attaining the objectives noted above and set out in the specification.

Turning to the examiner's rejection of the appealed claims under 35 U.S.C. § 103 based on Rainer alone, or Rainer in view of Thill, we note that while appellant's prior patent discloses that a water-insoluble ion exchange polymer of the type

Appeal No. 95-4395
Application 07/561,006

used in appellant's present application may be incorporated within a permeable matrix such as an "open sponge" (column 6, lines 64-66), there is no disclosure in appellant's prior patent of such sponge being a cellulosic sponge, as required in the claims on appeal. There is also no disclosure in the Rainer patent concerning the configuration or sizing of the sponge. The examiner, recognizing these deficiencies in the Rainer patent, urges that it would have been obvious to one of ordinary skill in the art to provide a sponge made of cellulose material in Rainer "because the composition and function of the product are known and cellulose is a species of the genus called for" (answer, page 4). Alternatively, the examiner relies upon the teachings of Thill and urges that it would have been prima facie obvious "to couple Rainer and Thill to obtain the claimed invention."

After reviewing the combined teachings of the applied Rainer and Thill references, we must agree with the examiner that it would have been prima facie obvious to one of ordinary skill in the art to use a cellulosic sponge as the "open sponge" in Rainer so as to attain the advantage of increased ion exchange capacity per unit weight of substrate as taught in Thill.

With regard to the particular configuration and size of the sponge product set forth in appellant's claims on appeal, the examiner has taken the position that "optimization of the product in terms of shape and/or dimension is deemed obvious within the

discretion of a skilled practitioner" (answer, page 5). The examiner reaches this conclusion on the basis that

the dimensions are recognized as art comprised of result oriented variables which one of ordinary skill would determine according to a specific result. Thus it would be [sic, have been] obvious to determine the dimensions to meet a given requirement... (answer, page 6).

The examiner points to the statement in Thill (column 2, lines 27-31) concerning sizing of the sponge as further support for this conclusion. The referenced statement in Thill indicates that

[i]n adding the crosslinkable polymer to the sponge, a piece of sponge of most any convenient size preselected to hold enough sample solution for the problem at hand is used.

After reviewing the totality of the evidence before us, we must agree with appellant that the critical configuration and size of the sponge as set forth in appellant's claim 1 on appeal are not taught or suggested by the applied prior art references and, contrary to the view expressed by the examiner, these aspects of appellant's claimed invention would not have been recognized by one of ordinary skill in the art as being result effective variables with regard to the particular problems addressed and solved by appellant, i.e., providing for substantially uniform distribution of polymer throughout the sponge, controlling the thermal gradient between the surface of

Appeal No. 95-4395
Application 07/561,006

the sponge and its interior during heating of the sponge at the curing temperature of the polymer and for minimizing the breakage of the dry, brittle, impregnated sponges while they are agitated to promote uniform thermal curing.

The examiner's reliance on the passage in Thill, at column 2 lines 27-31, to support the obviousness position taken, in our opinion, is unavailing. This is particularly true when the passage in question is considered in the context of the totality of the teachings of the Thill patent. In our view, this portion of the Thill patent merely recognizes that a sponge of a preselected size "to hold enough sample solution for the problem at hand" is necessary and does nothing to suggest that sizing for any other purpose is of importance. As further noted by appellant, the only specific indication in Thill of a size for the sponges therein is found in Example 4 (column 4, lines 28-29), wherein the sponge is stated to be 6"x4"x1.5", a size well outside the range set forth in appellant's claim 1 on appeal.

There being no evidence of record upon which we can conclude that the configuration and size of the ion exchange sponges in the prior art would have been recognized by one of ordinary skill in the art as being result effective variables with regard to the particular problems addressed and solved by appellant, we must conclude that it is only by using appellant's own teachings and relying upon impermissible hindsight that one

Appeal No. 95-4395
Application 07/561,006

versed in the art would have been led to modify the sponges of the Rainer patent in the manner urged by the examiner so as to arrive at the particular ion exchange sponges now claimed by appellant. A rejection based on § 103 must rest on a factual basis, with the facts being interpreted without hindsight reconstruction of the invention from the prior art. In making this evaluation, the examiner has the initial duty of supplying the factual basis for the rejection he advances. He may not, because he doubts that the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in the factual basis. See In re Warner, 379 F.2d 1011, 1017, 154 USPQ 173, 178 (CCPA 1967). In the present case, since we perceive no factual basis in the references relied upon which fairly supports the examiner's position, we will not sustain the stated rejection of the appealed claims under 35 U.S.C. § 103.

The decision of the examiner rejecting appealed claims 1, 4, 5 and 7 under 35 U.S.C. § 103 based on Rainer alone or in view of Thill is therefore reversed.

Appeal No. 95-4395
Application 07/561,006

REVERSED

Bradley R. Garris
BRADLEY R. GARRIS)
Administrative Patent Judge)

Charles E. Frankfort
CHARLES E. FRANKFORT)
Administrative Patent Judge)

John P. McQuade
JOHN P. McQUADE)
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BOARD OF PATENT
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Appeal No. 95-4395
Application 07/561,006

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APPENDIX

- 1) A product comprised of an open celled sponge comprised of continuously interconnected cellulosic material having durably associated therewith between 15% and 60% by weight of said product of thermally insolubilized polyethyleneimine (PEI) derived from the interaction of PEI with a polycarboxylic acid, said sponge having a cuboid configuration comprised of a primary pair of parallel flat surfaces spaced apart by a distance representing an X axis having a length between 10 and 35 mm, and joined by a sidewall perimeter comprised of four sides orthogonally disposed to said primary flat surfaces and causing said sponge to have at least one plane of symmetry perpendicular to said primary surfaces and including the X axis, the shortest straight line distance spanning said perimeter while perpendicularly intersecting said X axis being considered to be a Y axis, and the longest straight line distance spanning said perimeter while perpendicularly intersecting said X axis being considered to be a Z axis, the sum of the X and Y axes being in the range of 20-50 mm, said Z axis being between one and eight times the X axis and less than 119 mm.