

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 36

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JOHN M. BIRMINGHAM

Appeal No. 94-0786
Application 07/861,332¹

ON BRIEF

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

JOHN D. SMITH, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal pursuant to 35 USC § 134 from the final rejection of claims 10 through 13.

Claim 10 and claim 13 are representative and are reproduced below:

10. In a method for cracking dicyclopentadiene to produce cyclopentadiene monomer, wherein molten dicyclopentadiene

¹ Application for patent filed March 25, 1992. According to appellant, the application is a continuation of Application 07/569,657, filed August 20, 1990, now abandoned.

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is combined with a body of heat transfer fluid maintained within a reaction vessel at a temperature effective to convert dicyclopentadiene to cyclopentadiene monomer vapor, the improvement which comprises:

(i) agitating said body of heat transfer fluid maintained in said reaction vessel;

(ii) introducing monomer and heat transfer fluid free molten dicyclopentadiene into said agitated body of heat transfer fluid,

wherein said introduction is made sufficiently below the surface of said heat transfer fluid to provide substantially complete conversion of said introduced dicyclopentadiene to cyclopentadiene monomer vapor, and

wherein said agitation of said body of heat transfer fluid facilitates said substantially complete conversion and the escape of said monomer vapor from the surface of said agitated body of heat transfer fluid;

(iii) rapidly removing said monomeric cyclopentadiene vapor from the surface of said agitated body of heat transfer fluid; and

(iv) directly condensing said removed monomeric cyclopentadiene vapor to provide liquid cyclopentadiene monomer

wherein 98% to 100% of said molten dicyclopentadiene introduced into said agitated body of heat transfer fluid in step (ii) is converted into liquid cyclopentadiene monomer of 97% to 100% purity in step (iv), and

wherein negligible formation of high cyclopentadiene polymers occur in said reaction vessel.

13. A system for converting 98% to 100% of a molten dicyclopentadiene feed to liquid cyclopentadiene monomer of 97% to 100% purity, which comprises:

(i) a reaction vessel to contain a body of heat

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transfer fluid therewithin;

(ii) means for establishing and maintaining a body of heat transfer fluid contained within said reaction vessel at a temperature effective to convert dicyclopentadiene to monomeric cyclopentadiene monomer vapor;

(iii) means for agitating a body of heat transfer fluid contained within said vessel;

(iv) means for introducing a monomer free molten dicyclopentadiene feed below the surface of an agitated body of heat transfer fluid contained in said reaction vessel;

(v) means for preheating dicyclopentadiene feed prior to introduction thereof into said heat transfer fluid contained in said reaction vessel;

(vi) means for rapidly removing monomeric cyclopentadiene vapor from the surface of an agitated body of heat transfer fluid contained in said reaction vessel; and

(vii) means for condensing monomeric cyclopentadiene vapor removed from said reaction vessel to provide liquid monomeric cyclopentadiene of 97% to 100% purity.

The references of record relied upon by the examiner are:

Kreps	2,831,904	Apr. 22, 1958
Robota	3,590,089	Jun. 29, 1971
Staff (Canadian Patent)	457,038	May 31, 1949
Oga et al. (Oga) (Japanese Kokai Patent)	56-59719	May 23, 1981

References of record relied upon by appellant are:

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Staff	2,453,044	Nov. 2, 1948
Robota	3,544,644	Dec. 1, 1970

The appealed claims stand rejected under 35 USC § 103 as unpatentable over Kreps in view of Staff²; Robota '089 in view of Staff; or Oga in view of Staff.

We reverse the rejections as applied to appealed method claims 10 through 12. We affirm the rejections as applied against appealed *system* claim 13.

This is the second appeal of claimed subject matter which is directed to a method and a *system* for cracking dicyclopentadiene to produce cyclopentadiene monomer. In comparison with the claims previously considered by the Board in the decision entered January 22, 1996 (Paper No. 20), the appealed method claims now require, *inter alia*, the introduction into a body of heat transfer fluid of *monomer and heat transfer fluid free* molten dicyclopentadiene. This claim limitation, as argued by appellant, further distinguishes the claimed process from the specific systems such as the Kreps Figure 1 embodiment wherein

² The examiner relies on the Canadian patent to Staff.

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dicyclopentadiene is combined with an auxiliary liquid (i.e., a heat transfer fluid) prior to introduction into a reaction vessel and Robota's Example 1 embodiment wherein a 10:1 dicyclopentadiene/oil mixture is utilized.

Additionally, as stressed by appellant, the now claimed process recites the step of ?directly condensing? removed monomeric cyclopentadiene vapor to provide liquid monomer, which claim language excludes the partial condensing step essential to Robota's process. See Robota at column 3, lines 32 through 45 and column 3, line 42 and line 65 through 71.

Finally, the now claimed process is further limited by ?wherein? clauses indicating that 98% to 100% of introduced molten dicyclopentadiene is converted to monomer of 97 to 100% purity with negligible formation of high cyclopentadiene polymer in the reaction vessel. It is not apparent that the Oga process is capable of meeting these claimed requirements. See for example the data reported in Table 2 of Oga in the translation at page 11.

In light of the above, we cannot sustain the examiner's rejections of appealed process claims 10 through 12. On the

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other hand, we will sustain the rejections of appealed ?system?
claim 13. With respect to this claim, appellant acknowledges
(Brief, page 27) that

The method limitations, including steps (ii)
and (iv) of claim 10 a fortiori are not
affirmatively recited in the system claim 13.

For the reasons advanced in the Answer and the factual findings
cited in support thereof (particularly see the Answer at page 6),
we affirm the examiner's rejections of ?system? claim 13.

In summary, the stated rejections against appealed process
claims 10 through 12 are reversed. The stated rejections against
appealed claim 13 are affirmed. The decision of the examiner,
accordingly, is affirmed-in-part.

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

AFFIRMED-IN-PART

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JOHN D. SMITH
Administrative Patent Judge

CHUNG K. PAK
Administrative Patent Judge

CHARLES F. WARREN
Administrative Patent Judge

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