

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 33

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte EBERHARD FUCHS,
PETER-JOHANN MELDER
WERNER SCHNURR
and
ROLF FISCHER

Appeal No. 2001-0936
Application No. 08/952,208

ON BRIEF

Before WINTERS, WILLIAM F. SMITH, and MOORE, *Administrative Patent Judges*.

MOORE, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the final rejection of claims 1, 3-6 and 10-16. Claims 2 and 7-8 have been canceled. Claim 9 never existed due to a numbering error in the amendment dated August 10, 1998. Thus, only claims 1, 3-6 and 10-16 are before us on this appeal.

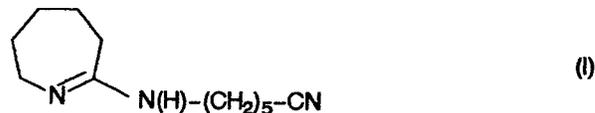
REPRESENTATIVE CLAIM

The appellants have indicated (Supplemental Appeal Brief, page 3, lines 10-14) that for the purposes of the Section 112

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issues on appeal, the claims will stand or fall together. For purposes of the Section 103 issue of this appeal, the appellants have urged that claims 13-16 should stand apart. Accordingly, for the Section 112 issues the claims will stand or fall together with claim 1. For the Section 103 issues, we select claim 1 as representative of claims 1, 3-6, and 10-12; and claim 13 as representative of claims 13-16, respectively. Note In re Dance, 160 F.3d 1339, 1340 n.2, 48 USPQ2d 1635, 1636 n.2 (Fed. Cir. 1998); In re King, 801 F.2d 1324, 1325, 231 USPQ 136, 137 (Fed. Cir. 1986); In re Sernaker, 702 F.2d 989, 991, 217 USPQ 1, 3 (Fed. Cir. 1983). They read as follows:

1. A process for the preparation of caprolactam by reacting 6-aminocapronitrile with water, which process comprises reacting a mixture of 6-aminocapronitrile and the tetrahydroazepin of the formula (I)



which mixture comprises at least 0.01% by weight of the tetrahydroazepine of the formula I, in the liquid phase in the presence of a heterogeneous catalyst.

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aminocapronitrile and 0.01% of a tetrahydroazepine with water in the liquid phase in the presence of a heterogeneous catalyst. The invention also relates to a process for the preparation of caprolactam which involves reacting a tetrahydroazepine with water in the liquid phase in the presence of a heterogeneous catalyst. (Claims 1 and 13).

DISPOSITION

I. The Rejection of Claims 1, 3-6 and 10-16 Under 35 U.S.C. § 112, first paragraph

The examiner has stated that the disclosure is not enabling. More specifically, the examiner has stated that the starting material which is critical or essential to the practice of the invention, but is not included in the claims, is not enabled by the disclosure. The examiner states that no sources of the tetrahydroazepine of formula I (THA-I) have been provided. The examples, it is said, show production of THA-I by heating aminocapronitrile, but as the claims include sources by any other means, enablement is lacking. (Examiner's Answer, page 3, lines 4-15).

The enablement requirement of 35 U.S.C. §112, first paragraph, requires that the patent specification enable "those skilled in the art to make and use the full scope of the claimed invention without 'undue experimentation'" Genentech, Inc. v.

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Novo Nordisk. A/S, 108 F.3d at 1365, 42 USPQ2d at 1004 (quoting In re Wright, 999 F.2d 1557, 1561, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993)). See also In re Fisher, 427 F.2d 833, 839, 166 USPQ 18, 24 (CCPA 1970) (the first paragraph of section 112 requires that the scope of protection sought in a claim bear a reasonable correlation to the scope of enablement provided by the specification). Nothing more than objective enablement is required, and therefore it is irrelevant whether this teaching is provided through broad terminology or illustrative examples. In re Marzocchi, 439 F.2d 220, 223, 169 USPQ 367, 269 (CCPA 1971).

In the instant specification, it is taught how THA-1 may be produced (Specification, page 1, lines 8-10). Indeed, it appears that each of the reactants in the claimed step is and has been known. The examiner has not established that any of the reactants is unknown. We therefore find that the claimed subject matter may be practiced by one of ordinary skill in the art without undue experimentation. That the scope of the claims may include sources made by any other means is not germane to the determination of enablement.

We therefore reverse this rejection.

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II. The Rejection of Claims 1, 3-6 and 10-16 Under 35 U.S.C.

§ 112, second paragraph

The examiner has stated that claims 1, 3-6 and 10-16 are incomplete for omitting essential steps, such omission amounting to a gap between the steps. More specifically, the examiner states that the omitted step is the required heating of 6-aminocapronitrile to produce the tetrahydroazepine of formula (I) consistent with the disclosure. The examiner quotes the specification, page 4, lines 11-27 as stating that "the sole source of starting material is heating 6-aminocapronitrile" (Examiner's Answer, page 4, line 1).

Initially, we note that the specification, page 4, lines 11-27 does not appear to contain this alleged quotation. It states that the reaction mixture "is obtainable" by heating 6-aminocapronitrile (page 4, line 11) or distilling unconverted 6-aminocapronitrile (page 4, lines 25-27). We are unable to find this statement urged by the examiner.

Even were this not to be the case, the claim need not state the source of the material in the process. The appellants are claiming the step of reaction, not preparation. While any reactants for any reaction may need to be "prepared", it is not necessary to claim a step of preparation for known reactants.

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As set forth in Amgen Inc. v. Chugai Pharmaceutical Co., Ltd., 927 F.2d 1200, 1217, 18 USPQ2d 1016, 1030 (Fed. Cir. 1991) "The statute requires that 'the specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.' A decision as to whether a claim is invalid under this provision requires a determination whether those skilled in the art would understand what is claimed." See Shatterproof Glass Corp. v. Libbey-Owens Ford Co., 758 F.2d 613, 624, 225 USPQ 634, 641 (Fed. Cir. 1985) (Claims must "reasonably apprise those skilled in the art" as to their scope and be "as precise as the subject matter permits").

The claims recite a single-step reaction which one of ordinary skill in the art would understand. Even if certain additional preparatory work were needed to prepare reactants, they need not necessarily always be recited. Under the facts of the present case, we conclude there is no omitted essential step.

We therefore reverse this rejection.

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III. The rejection of claims 1, 3-6 and 10-16 under 35 U.S.C.
§ 103(a) as being unpatentable over Ritz.

(A) Claims 1, 3-6, and 10-12

The examiner has found that Ritz discloses the synthesis of caprolactam from aqueous 6-aminocapronitrile. The examiner has further found that the reference is silent on the purification of 6-aminocapronitrile starting material, and teaches the use of heterogeneous catalysts in the preparation of caprolactam. The examiner thus concludes that one of ordinary skill in the art would use 6-aminocapronitrile without purification to make caprolactam. (Examiner's Answer, page 5, lines 9-17). The examiner finally states the 6-aminocapronitrile inherently contains THA-1 (Final Rejection, page 3, lines 4-5) (formed when stored at room temperature).

The appellants admit that Ritz discloses the reaction of 6-aminocapronitrile with water in the liquid phase in the presence of a heterogeneous catalyst (Appeal Brief, page 6, lines 4-8). The appellants, however, urge in their Brief on Appeal that the 6-aminocapronitrile is pure. It is said to be routine expedient in the chemical art (and self evident under circumstances as present in the field of caprolactam and polycaprolactam manufacture) that each of the intermediate products are introduced into their reactions as pure materials. Otherwise,

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discolorations or imperfections could result in the loss of an entire batch. (Appeal Brief, page 6, lines 25-37).

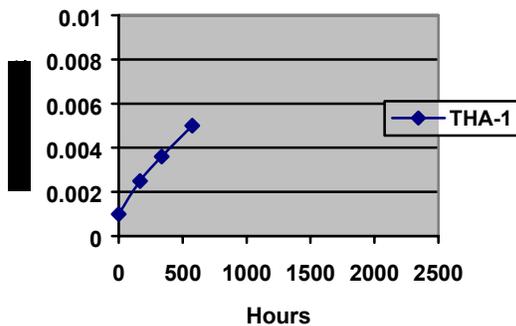
The appellants further contend that Ritz itself teaches away from the claimed 0.01% THA-1 in that at column 8, lines 22-29 teaches that some impurities in concentrations of 10 ppm or less can "make it impossible to adhere to characteristics."

Additionally, the declaration of Melder (Paper #13, page 5, first full paragraph) states that purification of 6-aminocapronitrile in Ritz must have occurred upon its manufacture, based upon the three cited references in Ritz. The appellants urge that these three references either state or imply that the resulting 6-ACN is distilled off (Id., page 4, lines 17-37) and is therefore "pure" in the sense of free from THA-1. The appellants have also stated that this is so because in the appropriate work-up to distill off the 6-CAN, THA-1 would be left in the residue unless the distillation were continued. (Id., page 3, last two paragraphs).

Furthermore, the appellants have asserted that in the art of manufacturing caprolactam or polycaprolactam for manufacture into, e.g. nylon 6, it is generally known to use pure materials to avoid wasting a batch of product. (Appeal Brief, page 6, second paragraph).

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The aforementioned declaration also provides data which is relied upon by the appellants to establish that, even upon storage, the amount of THA-I is too low to meet the claim limitation. We have reproduced the data on the graph which follows, focusing on THA-I formation.



*The data point at zero hours is $<.001$. The appellants, in their calculations of equilibrium, consider this as zero. We do not agree with that approximation. The appellants, when relying on declaration evidence, carry the burden of proof. As they have not established how much less than 0.001 THA-I is present at zero hours, and in view of the nearly linear other data points, we find that the data supports a figure of 0.001.

The declarant has drawn, from these data points, the conclusion that the THA-I formed during storage is "by far lower than required in the process according to our invention." Id., page 7, lines 2-3). The appellants further have provided calculations which state that 58.8 ppm is the equilibrium concentration of THA when $t=\infty$. (Paper #18, pages 2-3).

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We note that the examiner has not addressed the declaration evidence in the Examiner's Answer, or taken a position to refute the appellants' contentions regarding the purity of materials used in manufacture of caprolactam and polycaprolactam in the Examiner's Answer. In a previous Action (Paper #17, page 2, lines 10-14), the examiner did note that the appellants did not show what factors drove the reaction or whether it was at equilibrium.

Our review of Ritz indicates that the 6-aminonitrile of interest is manufactured by hydrogenating adiponitrile. Three examples are given, a reaction scheme described in DE-A-836 938, DE-A 848 645, and US 5,151,543. (Ritz, column 2, lines 61-64). We find that Ritz's silence on the workup of the produced 6-ACN does not indicate that it has not been purified. In their unrefuted declaration, the appellants note that the 6-ACN distills out of the reaction mix first, to be followed by the unreacted adiponitrile, then the THA-I. However, in standard practice the distillation is stopped before recovering the THA-I. (Paper #13, paragraph bridging pages 3-4).

We therefore agree with the position advanced by the appellants that, and find that, on balance, the evidence supports the position that one of ordinary skill in the art would understand that the material of Ritz is purified by distillation.

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We next turn to the examiner's contention that THA-I would be inherently present upon storage. We find that the curve plotted above clearly has a diminishing inflection, but as to whether it will diminish completely before it reaches the lowest claim limitation plotted, 0.01 is still unclear to us. Indeed, the last three data points look nearly linear to our view, and the description of the first data point is "less than 0.01", not zero. We therefore question the conclusions drawn from this data.

Further, the appellants specification states that storage at room temperature will bring about the formation of THA-I (Page 1, lines 8-10). It is, therefore, reasonable to find that some THA-1 is formed upon storage.

We note that when an examiner relies upon a theory of inherency, "the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." Ex parte Levy, 17 USPQ2d 1461, 1464 (BPAI 1990). Inherency "may not be established by a probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." Ex parte Skinner, 2 USPQ2d 1788, 1789 (BPAI 1986). Also, the examiner has the initial burden of providing such

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evidence or technical reasoning. See In re Spada, 911 F.2d 705, 708, 15 USPQ2d 1655, 1657 (Fed. Cir. 1990); In re King, 801 F.2d 1324, 1327, 231 USPQ 136, 138-39 (Fed. Cir. 1986).

This, the examiner has not done. Undoubtedly, some THA-I is present in 6-ACN. However, we note that the evidence supports a conclusion that (I) pure reactants are generally preferred in this field, (II) the methods of preparation of 6-ACN indicate some isolation or separation of the product, (III) at best it would take at least about 48 days (2 x 576 hours) to reach the claimed lower limit. Waiting a month and a half to use reactants to reach a minimum threshold in the claim (and then not necessarily) does not meet the stringent standard for inherency.

Thus, we are not convinced that a prepared or stored 6-ACN will necessarily and inevitably contain the threshold amount of THA-I claimed in claim 1. We therefore reverse this rejection as it applies to claims 1, 3-6, and 10-12.

B. Claims 13-16

Although no separate discussion is made by either the examiner or the appellant in their briefs or answers, we note that claim 13, which is representative of this grouping, contains no lower limit on the THA-1, and is written in "comprising" language which allows for the inclusion of the 6-ACN of Ritz.

We incorporate by reference the discussion in section A

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above. We reiterate that the examiner has established, by sufficient technical reasoning, that some THA-I is necessarily present in the 6-ACN of Ritz. Indeed, we additionally find that the process of Ritz (liquid phase, 140°C to 320°C, 1-120 minutes) fall within the temperatures and times required to manufacture the THA-I from 6-ACN recited in the instant specification. (Ritz, col. 3, lines 1-15; specification, page 4, lines 11-27). Finally, the instant specification admits that THA-I is formed from simply storing 6-ACN. (Specification, page 1, lines 8-10).

As stated in In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-4 (CCPA 1977):

Where . . . the claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes, the PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product. Whether the rejection is based on "inherency" under 35 U.S.C. § 102, on "prima facie obviousness" under 35 U.S.C. § 103, jointly or alternatively, the burden of proof is the same, and its fairness is evidenced by the PTO's inability to manufacture products or to obtain and compare prior art products.

Thus, we agree the examiner has established that the subject matter of claim 13 reasonably appears to be identical or substantially identical to the prior art, and consequently a prima facie case of obviousness.

Turning to the declaration evidence, it only illustrates that <10 ppm (<0.001) is present in the 6-ACN at day zero and it

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increases from there. The remaining arguments relating to equilibrium level do not apply to claim 13, as no lower limit is specified. On balance, then, we agree that the process of Ritz includes THA-1 in sufficient measure to meet the claim limitations. The burden of showing otherwise has shifted to the appellants, and the evidence of record does not refute the prima facie case of obviousness.

Accordingly, we shall affirm this rejection as it applies to claims 13-16.

Summary of Decision

The rejection of claims 1, 3-6 and 10-16 under 35 U.S.C. §112, first paragraph, is reversed.

The rejection of claims 1, 3-6 and 10-16 under 35 U.S.C. §112, second paragraph, is reversed.

The rejection of claims 1, 3-6 and 10-16 under 35 U.S.C. § 103(a) is reversed as to claims 1, 3-6 and 10-12.

The rejection of claims 1, 3-6 and 10-16 under 35 U.S.C. § 103(a) is sustained as to claims 13-16.

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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

SHERMAN D. WINTERS)	
Administrative Patent Judge)	
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)	
)	BOARD OF PATENT
WILLIAM F. SMITH)	
Administrative Patent Judge)	APPEALS AND
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