

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. 12

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte J. YONG RYU

Appeal No. 2001-2490
Application No. 09/388,056

ON BRIEF

Before GARRIS, WALTZ, and KRATZ, Administrative Patent Judges.
WALTZ, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal from the examiner's final rejection of claims 12 through 14, which are the only claims remaining in this application. We have jurisdiction pursuant to 35 U.S.C. § 134.

According to appellant, the invention is directed to a process for the removal of carbonyl compounds, comprising at least aldehydes or ketones, from a hydrocarbon feedstream by contacting the feedstream with an acidic material at a temperature high enough to cause the reaction of the carbonyl compounds upon contact with

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the acidic material, with adsorption of at least some part of the reaction products on the acidic material (Brief, pages 2-3).

Illustrative independent claim 12 is reproduced below:

12. A process for the removal of carbonyl compounds from hydrocarbons comprising feeding a hydrocarbon stream containing less than 0.1 weight percent carbonyl compounds comprising at least aldehydes or ketones through a bed of particulate acidic material at a temperature in the range of 100 to 400°C under conditions of pressure and residence time to result in reaction of said carbonyl compounds to produce reaction products and the deposition of said reaction products on said acidic material.

The examiner has relied upon the following references as evidence to support the rejections on appeal:

Holiday	3,453,343	July 1, 1969
Hupp et al. (Hupp)	4,117,021	Sep. 26, 1978

The claims on appeal stand rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as unpatentable over Hupp (Answer, page 3). Claims 12 and 14 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Holiday (Answer, page 4). We reverse the examiner's rejections on appeal essentially for the reasons stated in the Brief and Reply Brief, as well as the reasons set forth below.

OPINION

A. The Rejections over Hupp

The examiner finds that Hupp discloses a process of removing carbonyl compounds, such as ketones and aldehydes, from a hydrocarbon mixture by contacting the mixture with a catalyst such as clays, alumina, and silica-alumina, under conditions such as to convert the carbonyl compounds into water (Answer, page 3). The examiner recognizes that Hupp is "silent" with regard to two limitations of claim 12 on appeal, namely the limitations that the carbonyl compounds are contacted with a bed of particulate acidic material and that the reaction products are deposited on said acidic material (*id.*). However, the examiner maintains that the catalysts of Hupp "would inherently be acidic materials" since appellant discloses that alumina, silica-alumina and clays are among the acidic catalysts useful in the claimed process (*id.*, citing the specification, page 4, ll. 4-13). Furthermore, it is the examiner's position that, since Hupp is silent as to the removal of water from the purification zone, water "would inherently be deposited on the catalyst." *Id.*

The examiner, when relying upon the theory of inherency, must provide a basis in fact and/or technical reasoning to reasonably support a determination that the allegedly inherent characteristic

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necessarily flows from the teachings of the prior art. "Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." *In re Oelrich*, 666 F.2d 578, 581, 212 USPQ 323, 326 (CCPA 1981). On this record, we determine that the examiner has not provided a basis in fact or technical reasoning to support a determination of inherency.

As correctly argued by appellant (Reply Brief, pages 1-2), the examiner has not established that there is an absolute certainty that the catalyst of Hupp is acidic. Hupp discloses that alumina, silica-alumina, and clays are useful as a carrier for certain specified catalysts (col. 2, ll. 56-68). The entire "supported metal oxide catalyst" functions as a purification agent by aiding in the removal of the carbonyl compounds (Hupp, col. 3, ll. 1-4). Accordingly, the examiner has not presented any convincing evidence or reasoning to support the position that all of the catalyst support materials taught by Hupp would have necessarily been acidic. Appellant's disclosure only relates to certain specific catalysts within the genus of alumina, silica-alumina and clays that are acidic (specification, page 4, ll. 4-13).

Again as correctly argued by appellant (Reply Brief, page 2), the examiner has not established with certainty that the water

produced during the purification would have been deposited on the acidic material. As a technical matter, appellant asserts that it would have been more likely that water produced would have boiled away at the temperatures of the purification (*id.*). Contrary to the examiner's position that Hupp is silent as to the presence of water in the purification zone effluent (Answer, page 3), Hupp specifically teaches that the "product leaving the purification reactor contains ... a small amount of water" (col. 4, ll. 7-11). Accordingly, we determine that the examiner has not presented any convincing evidence or reasoning to establish the inherency of water depositing on the acidic material during the purification.

For the foregoing reasons and those stated in the Brief and Reply Brief, we determine that the examiner has failed to establish a *prima facie* case of anticipation or obviousness in view of the reference evidence. Therefore we reverse the rejection of claims 12-14 under 35 U.S.C. § 102(b)/35 U.S.C. § 103(a) over Hupp.

B. The Rejection over Holiday

The examiner finds that Holiday discloses a process of removing aldehydes contained in a hydrocarbon stream by contacting the mixture with a spent alumina-silica catalyst under conditions where the aldehyde will be converted into water and carbon, which carbon is deposited on the catalyst (Answer, page 4). The examiner

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recognizes that the "only difference" between the disclosure of Holiday and the claimed process is the operating temperature, namely Holiday operates at 50-150 °F. while the claimed operating temperature is 100 to 400 °C. (212 to 752 °F.). *Id.* The examiner states that "it is well-known that the temperature of chemical reaction process must be selected to optimize the process." *Id.* The examiner cites several cases for the holding that "where the general conditions of the claimed [invention] are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *Id.*

As correctly argued by appellant (Reply Brief, pages 3-4), the cases and holding cited by the examiner are restricted to the obviousness of finding optimum ranges within general ranges known in the prior art. The examiner admits this from the quote above, namely that "where the general conditions of the claimed [invention] are disclosed in the prior art...." On this record, the only condition disclosed by the prior art of Holiday is an operating temperature of 50 to 150 °F. (col. 2, ll. 41-42). The claimed operating temperature is not close to this range of Holiday (212 to 752 °F.). Therefore the examiner has not established, by convincing evidence or reasoning, why it would have been obvious to

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use operating temperatures so much outside the range taught by Holiday.

Furthermore, the examiner acknowledges that Holiday is "silent" about the acidity of the alumina-silica catalyst but argues that it "would inherently be an acidic material" since appellant discloses such materials as acidic (Answer, page 5, citing the specification, page 4, ll. 4-13). Holiday teaches that the purification zone catalyst is a deactivated or "spent" catalyst, i.e., a catalyst rendered inactive for the polymerization of butene-1 or isobutene (col. 1, ll. 40-49; col. 1, l. 64-col. 2, l. 2). The examiner states that appellant has not demonstrated by evidence that the inactive catalyst of Holiday would not be acidic (Answer, page 6). However, the initial burden of establishing that the spent catalyst of Holiday would have necessarily been acidic rests with the examiner. See *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992); *In re Oelrich*, *supra*. As discussed above, reference to appellant's specification does not provide sufficient evidence that all aluminas, silica-aluminas, and clays are acidic, much less any evidence regarding the inactive or spent catalysts of Holiday.

For the foregoing reasons and those stated in the Brief and Reply Brief, we determine that the examiner has failed to establish

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a *prima facie* case of obviousness in view of the reference evidence.¹ Therefore we reverse the examiner's rejection of claims 12 and 14 under 35 U.S.C. § 103(a) over Holiday.

C. Summary

The rejections of claims 12-14 under 35 U.S.C. § 102(b) / § 103(a) over Hupp are reversed. The rejection of claims 12 and 14 under 35 U.S.C. § 103(a) over Holiday is reversed.

¹Since we determine that no *prima facie* case of obviousness exists on this record, we need not consider appellant's rebuttal evidence (U.S. Patent No. 5,043,523, issued Aug. 27, 1991, cited on page 7 of the Brief). See *In re Geiger*, 815 F.2d 686, 688, 2 USPQ2d 1276, 1278 (Fed. Cir. 1987).

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The decision of the examiner is reversed.

REVERSED

BRADLEY R. GARRIS)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
THOMAS A. WALTZ)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
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)	
)	
PETER F. KRATZ)	
Administrative Patent Judge)	

TAW/jrg

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