Paper No. 18

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ANGEL SY

Appeal No. 2002-1530
Application No. 09/138,217

ON BRIEF

Before WARREN, TIMM, and MOORE, *Administrative Patent Judges*.

TIMM, *Administrative Patent Judge*.

DECISION ON APPEAL

This appeal involves claim 15, the only claim pending in the application. We have jurisdiction under 35 U.S.C. § 134.

THE CLAIMED SUBJECT MATTER

Claim 15 is directed to an apparatus and reads as follows:

15. An apparatus for carrying out an integrated process for the alkylation of organic aromatic compounds, comprising:

(a) a distillation column reactor containing a bed of alkylation catalyst in the form of a catalytic distillation structure and having an organic aromatic compound inlet above said bed of alkylation catalyst and an olefin inlet below said bed of alkylation catalyst;

(b) a first overheads outlet connected to the top of said distillation column reactor to remove unreacted organic compound and unreacted olefin;

(c) a first bottoms outlet connected to the bottom of said distillation column reactor to remove alkylated product;

(d) a distillation column for separating mono substituted alkylated product from poly substituted alkylated product having an alkylated product inlet in fluid communication with said first bottoms outlet, a second overheads outlet to remove mono substituted alkylated product and a second bottoms outlet to remove poly substituted alkylated product; and

(e) a transalkylator comprising:

(i) a vessel containing a plurality of transalkylation catalyst beds in series, the effluent from each of said plurality of beds flowing to the next bed in series;

(ii) a plurality of poly substituted benzene inlets, one each of said poly substituted benzene inlets being disposed upstream of each of said plurality of transalkylation catalyst beds;

(iii) a head connecting each of said poly substituted inlets to said second bottoms outlet;

(iv) valves in each of said plurality of poly substituted benzene inlets, said valves being for directing poly substituted benzene to only so many of said plurality of transalkylation beds as is required to obtain the optimum conversion of poly substituted benzenes to mono substituted benzenes; and

(v) a separate benzene inlet to said first of said plurality of transalkylation catalyst beds such that benzene may be fed to said first bed and subsequent beds independently of feeding poly substituted benzenes to said first and subsequent beds.

THE EVIDENCE

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

Gilmore	2,548,966	Apr. 17, 1951
Smith, Jr. et al. (Smith)	5,055,627	Oct. 8, 1991
Innes et al. (Innes)	5,081,323	Jan. 14, 1992
Cosyns et al. (Cosyns)	5,306,852	Apr. 26, 1994

THE REJECTION

Claim 15 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Smith and further in view of Innes, Gilmore, and Cosyns (Answer at 3-5). We reverse for the following reasons.

OPINION

"A critical step in analyzing the patentability of claims pursuant to section 103(a) is casting the mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, guided only by the prior art references and the then-accepted wisdom in the field." *In re Kotzab*, 217 F.3d 1365, 1369-70, 55 USPQ2d 1313, 1316-17 (Fed. Cir. 2000). When we

consider the rejection in this light, we find the evidence inadequate to support the rejection as advanced by the Examiner.

The apparatus of claim 15 includes a transalkylator with a plurality of catalyst beds and a plurality of inlets, one inlet being disposed upstream of each bed. The Examiner acknowledges that Smith does not describe a transalkylator with multiple inlets as claimed. The only specific transalkylator disclosed by Smith has a single inlet for feeding a blend of polyalkylate (poly substituted benzene) and benzene to the transalkylator. Therefore, the Examiner turns to Innes for a teaching of the required multiple inlets. The Examiner concludes that it would have been an obvious matter of design choice to substitute the transalkylation reactor of Smith with the reactors taught by Innes since such a modification would have involved a mere substitution of known equivalent structures (Answer at 4).

The problem is that Innes does not teach what the Examiner states it to teach. Namely, Innes does not teach "that the reactants/feedstock (which would be the poly substituted benzene for the transalkylation reactor) can be added between the beds" (Answer at 3). Innes only discusses adding olefin and benzene between beds for alkylation. Nowhere does Innes include a broader statement that such interstage addition is desirable in general much less any specific statement regarding interstage addition in the transalkylation apparatus.

The portions of Innes relied upon by the Examiner do not support a broader interpretation of Innes with regard to interstage addition. The Examiner relies upon column 6, lines 4-19 of Innes, but this portion of Innes speaks of only interstage addition of olefin and benzene for

alkylation. The Examiner further relies upon the statement in Innes that "[w]hen conducting either alkylation or transalkylation, various types of reactors can be used" (Innes at col. 5, ll. 50-52). However, this statement simply conveys that various reactors such as batch reactors, fixed bed reactors or moving bed reactors with single or multiple beds can be used in either alkylation or transalkylation, it does not enlarge the later teaching of interstage addition in alkylation to a teaching encompassing transalkylation. This is especially evident from the later discussion in Innes which focuses on transalkylation (Innes at col. 6, ll. 49-65). When Innes discusses using a separate transalkylator to perform the step of transalkylating, Innes states that it is preferred to blend the bottoms from the distillation of monoalkylated product with the aromatic feed (Innes at col. 6, ll. 53-57). Such blending is what is taught by Smith (Smith at col. 2, ll. 60-62; col. 9, ll. 2-8; shown at Figs. 1 and 2 at 34 and 48) and Innes describes no other method of adding the feedstocks to the transalkylator. Innes as well as Smith suggests using a transalkylator with one inlet.

As Smith and Innes only provide evidence that it was known to add benzene to the poly substituted benzene and provide one inlet into the transalkylator, there is no reason, suggestion, or motivation, based upon evidence found within the prior art, for modifying the apparatus of Smith to include a plurality of poly substituted benzene inlets disposed as claimed and with valves and a header. While Gilmore and Cosyns provide evidence that such structures were known and used in other processes, they do not provide any reason for using these structures in

the transalkylator of Smith. Therefore, the evidence does not support the reference combination as made by the Examiner.

We conclude that the Examiner has failed to establish a *prima facie* case of obviousness with respect to the subject matter of claim 15.

CONCLUSION

To summarize, the decision of the Examiner to reject claim 15 under 35 U.S.C. § 103 is reversed.

REVERSED

CHARLES F. WARREN Administrative Patent Judge	)))))) BOARD OF PATENT
CATHERINE TIMM Administrative Patent Judge	) APPEALS) AND) INTERFERENCES
JAMES T. MOORE Administrative Patent Judge	))

CT/tdl

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