

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(2) is not binding precedent of the Board.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. 13

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte LEONARD T. KING

Appeal No. 96-2501
Application 08/177,243¹

ON BRIEF

Before COHEN, ABRAMS and FRANKFORT, Administrative Patent Judges.
FRANKFORT, Administrative Patent Judge.

¹ Application for patent filed January 4, 1994. According to appellant, the application is a continuation-in-part of Application 08/049,977, filed April 19, 1993, abandoned.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 2 through 7, which are all of the claims remaining in this application. Claim 1 has been canceled.

Appellant's invention relates to a stationary material mixing apparatus (i.e., a static mixer) as seen in Figures 7 through 9 of the application drawings. As indicated on page 7 of the specification, the appellant's mixing apparatus comprises a conduit (31) in the form of a cylinder having a longitudinal axis (37). Within the cylinder there are provided a plurality of mixing elements (33-36). As appellant further points out on page 7 of the specification,

[t]hese elements are characterized as having no edges or surfaces perpendicular to longitudinal axis 37 and are sized so that no such elements are in contact with one another resulting in an open region of travel 96 for fluids passing through conduit 31 along its longitudinal axis ideally, each mixing element is seated within the conduit at an angle between approximately 30E to 45E to said longitudinal axis. Most importantly, however, the mixing elements are positioned within the conduit so that at least 75% of the conduit circumference in any plane is free of any mixing element. Obviously,

Appeal No. 96-2501
Application 08/177,243

various mixing elements are provided with no points of contact so that there are absolutely no "crotches" provided in the present

invention which would otherwise result in material hangup. In fact, it is a design objective of the present invention to enable debris having effective diameters of 75% or more of the conduit diameter to pass through the conduit without entrainment.

As is noted on page 4 of the specification, it was a design priority for appellant to enhance mixing efficiency by providing an increase in the effective roughness of the interior wall of the conduit, but to achieve such a result without major obstruction to the flow of large debris items entrained in a process or flow system. To that end appellant has sought to eliminate "dead zones" in the mixing apparatus where fluids, even in turbulent flow, accumulate and remain virtually unmixed and to eliminate "crotches" where fibrous material, etc. can gather and hang-up and encourage clogging or plugging of the mixer when fibers, clumps and particulates are contained within the fluids to be mixed.

Appeal No. 96-2501
Application 08/177,243

Claim 7, the only independent claim, is representative of the subject matter on appeal and reads as follows:

7. A stationary material mixing apparatus comprising a conduit having a length, a substantially circular circumference, a longitudinal axis through said length and being open at both ends thereof, said conduit housing a plurality of mixing elements, said mixing elements having no edges perpendicular to said longitudinal axis and are sized and positioned within said conduit such that at any plane passing perpendicularly to said longitudinal axis, at least 75% of the circumference of said conduit is free of any mixing element and no mixing elements are in contact with one another resulting in an open region of travel for fluids passing through said conduit along its longitudinal axis.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Doom	4,072,296	Feb. 7, 1978
Kao	4,258,782	Mar. 31, 1981
Schulz (Norwegian Patent) ²	24,309	Mar. 2, 1914

Claims 2, 3, 6 and 7 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Doom.

² Our understanding of this foreign language document is based upon a translation prepared for the U.S. Patent and Trademark Office. A copy of that translation accompanies this decision.

Appeal No. 96-2501
Application 08/177,243

Claims 2, 3, 4, 6 and 7 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Schulz.

Claims 2, 6 and 7 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Kao.

Claim 5 stands rejected under 35 U.S.C. § 103 as being unpatentable over Schulz.

Rather than reiterate the examiner's full statement of the above-noted rejections and the conflicting viewpoints advanced by appellant and the examiner regarding those rejections, we make reference to the examiner's answer (Paper No. 10, mailed January 24, 1996) for the examiner's full reasoning in support of the rejections, and to appellant's brief (Paper No. 9, filed October 19, 1995) for appellant's arguments thereagainst.³

OPINION

³ The reply brief filed February 23, 1996 (Paper No. 11) was refused entry by the examiner. See Paper No. 12, mailed March 26, 1996.

Appeal No. 96-2501
Application 08/177,243

In reaching our decision in this appeal, we have given careful consideration to appellant's specification and claims, to the applied prior art references, and to the respective positions articulated by appellant and the examiner. As a consequence of our review, we make the determinations which follow.

Turning first to the examiner's rejection of claims 2, 3, 6 and 7 under 35 U.S.C. § 102(b) as being anticipated by Doom and that of claims 2, 6 and 7 as being anticipated by Kao, we observe that appellant has argued (brief, pages 6-8) that neither of these applied references has an arrangement of mixing elements whereby "no mixing elements are in contact with one another resulting in an open region of travel for fluids passing through said conduit along its longitudinal axis," as recited in independent claim 7 on appeal. The examiner has taken the position that Doom and Kao are responsive to these limitations in that the individual mixing elements of the references are not in physical contact with one another and create an open region of

Appeal No. 96-2501
Application 08/177,243

travel for fluids passing through the conduit along some arbitrary longitudinal axis. In this regard, the examiner notes that the language of claim 7 does not specify that the "longitudinal axis" set forth in the independent claim is the central longitudinal axis of the conduit and that such longitudinal axis thus "could be an axis near the wall of the conduit, offset from the center axis of the conduit, or any axis running lengthwise along the conduit" (answer, page 11).

It has been a long-standing maxim of patent law that, during examination, "claims in an application are to be given their broadest reasonable interpretation consistent with the specification" and, in addition, that the "claim language should be read in light of the specification as it would be interpreted by one of ordinary skill in the art" (emphasis added). In re Sneed, 710 F.2d 1544, 1548, 218 USPQ 385, 388 (Fed. Cir. 1983). Our Court of review has also informed us that the drawings included in the application may aid in the interpretation of claim limitations, in that the "drawings alone may be sufficient

Appeal No. 96-2501
Application 08/177,243

to provide the 'written description of the invention' required by § 112, first paragraph." Vas-Cath Inc. v. Mahurkar, 935 F.2d 1555, 1564, 19 USPQ2d 1111, 1117 (Fed. Cir. 1991). Thus, in those instances where a visual representation can flesh out words, as in the present application, drawings can and should be used like the written specification to provide evidence relevant to claim interpretation and used to interpret what the inventor intended by the claim terms. Applying these precepts to the present application, we find that, when the claim language under consideration is read in light of the present application disclosure as such would be interpreted by the hypothetical person possessing ordinary skill in the art, and particularly when this language is viewed in light of the invention as seen in Figures 7-9 of the application drawings, the claim language requiring that "no mixing elements are in contact with one another resulting in an open region of travel for fluids passing through said conduit along its longitudinal axis," as recited in appellant's independent claim 7 defines over the static mixing apparatus of either Doom or Kao.

Appeal No. 96-2501
Application 08/177,243

As is explained in the portion of page 7 of appellant's specification quoted above, it is critical to appellant's invention that the mixing elements are sized and positioned within the conduit such that "no such elements are in contact with one another resulting in an open region of travel 96 for fluids passing through conduit 31 along its longitudinal axis" and that the elements are further provided with no points of contact "so that there are absolutely no 'crotches' provided in the present invention which would otherwise result in material hangup." Thus, from our perspective, one of ordinary skill in the art would readily understand that appellant's independent claim 7 defines a mixing apparatus in the form of a conduit of substantially circular configuration (i.e., a cylinder) having a central

longitudinal axis (37) and a plurality of mixing elements mounted within the conduit such that the mixing elements a) have no edges perpendicular to said longitudinal axis, b) are sized and positioned within said conduit such that at any plane passing perpendicularly to said longitudinal axis, at least 75% of the circumference of said conduit is free of any mixing element and

Appeal No. 96-2501
Application 08/177,243

c) have no points of contact with one another and thereby provide an open region of travel (96) for fluids passing through the conduit 31 along its longitudinal axis and absolutely no "crotches" where fibrous material, etc. can gather and hang-up and encourage clogging or plugging of the mixer when fibers, clumps and particulates are contained within the fluids to be mixed, as essentially seen in Figures 7-9 of the application drawings. In this regard, we note that the examiner's interpretation of the limitation contained in the last two lines of claim 7 and of the term "longitudinal axis," in particular, is contrary to any reasonable understanding of appellant's claimed subject matter based on the application disclosure and the clear meaning of "longitudinal axis" as it would be understood by one of ordinary skill in the art.

In light of the foregoing considerations, it is clear to us that neither Doom nor Kao teaches or suggests a mixing apparatus which anticipates that defined in appellant's claim 7

Appeal No. 96-2501
Application 08/177,243

on appeal. Both of these references include numerous "crotches" where fibrous material, etc. can gather and hang-up and encourage clogging or plugging of the mixer when fibers, clumps and particulates are contained within the fluids to be mixed, and both of these references have structures which obstruct the area along the longitudinal axis of the mixing conduits therein. Thus, both of these references have mixing elements which are "in contact" as that terminology would be understood from appellant's disclosure, and also fail to define "an open region of travel for fluids passing through said conduit along its longitudinal axis" (emphasis added), as recited in independent claim 7 on appeal. Accordingly, the examiner's rejection of claims 2, 3, 6 and 7 under 35 U.S.C. § 102(b) as being anticipated by Doom and that of claims 2, 6 and 7 as being anticipated by Kao must be reversed.

Next for our consideration are the examiner's rejections of claims 2, 3, 4, 6 and 7 under 35 U.S.C. § 102(b) based on Schulz and of claim 5 under 35 U.S.C. § 103 based on Schulz.

Appeal No. 96-2501
Application 08/177,243

For essentially the same reasons as expressed above with regard to the rejections based on Doom and Kao, we find that the rejections relying on Schulz must also be reversed. That is, while

Schulz may disclose an open region of travel for fluids passing through the conduit along its central longitudinal axis (e.g., in Figs. 1 and 1b), when the limitation set forth in the last two lines of appellant's independent claim 7 is given the interpretation we have expressed above, it is clear that Schulz has mixing elements which are "in contact with one another," as that terminology would be understood by one of ordinary skill in the art from appellant's disclosure, in that Schulz clearly has numerous "crotches" where fibrous material, etc. can gather and hang-up and encourage clogging or plugging of the mixer when fibers, clumps and particulates are contained within the fluids to be mixed.

In addition, with regard to the examiner's treatment of dependent claim 6 in each of the § 102(b) rejections on appeal, we must point out that as explained in the Manual of Patent

Appeal No. 96-2501
Application 08/177,243

Examining Procedure (Rev. 2, July 1996) at § 2173.05(g), there is nothing inherently wrong with defining some part of the invention in functional terms, and such functional limitations must be evaluated just like any other limitation of the claim. As for the examiner's position concerning what might be "conceivable . . . under some circumstances and/or operating conditions" (answer, page 12), we must point out that inherency cannot be established by possibilities or probabilities, but instead, the disclosure relied upon must be sufficient to show that the natural result flowing from the teachings of the applied reference would result in the claimed subject matter. See In re Oelrich, 666 F.2d 578, 581, 212 USPQ 323, 326 (CCPA 1981) and Hansgirg v. Kemmer, 102 F.2d 212, 214, 40 USPQ 665, 667 (CCPA 1939), cited therein. We find nothing in the disclosure of Schulz, Doom or Kao which would provide any reasonable expectation that any mixing apparatus therein has the capability of passing therethrough solid matter having a diameter of at least 75% of the diameter of said conduit, as required in appellant's claim 6 on appeal.

Appeal No. 96-2501
Application 08/177,243

To summarize:

The decisions of the examiner rejecting claims 2, 3, 6 and 7 under 35 U.S.C. § 102(b) based on Doom, claims 2, 6 and 7 under 35 U.S.C. § 102(b) based on Kao, and claims 2, 3, 4, 6 and 7 under 35 U.S.C. § 102(b) based on Schulz are reversed. In addition, the decision of the examiner rejecting claim 5 under 35 U.S.C. § 103 based on Schulz is also reversed.

REVERSED

IRWIN CHARLES COHEN)	
Administrative Patent Judge)	
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NEAL E. ABRAMS)	BOARD OF PATENT
Administrative Patent Judge)	APPEALS AND
)	INTERFERENCES
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Appeal No. 96-2501
Application 08/177,243

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