

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 20

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte ALVIN J. SANDERS, WILLIAM E. DEEDS  
and MARK E. RUPRIGHT

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Appeal No. 97-1119  
Application 08/285,219<sup>1</sup>

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ON BRIEF

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Before CALVERT, ABRAMS and FRANKFORT, Administrative Patent Judges.

CALVERT, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 16 to 22, all of the claims remaining in the application.

The subject matter in issue concerns a method for using solar radiation to stabilize an orbital space-based platform.

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<sup>1</sup>Application for patent filed August 3, 1994. According to appellant, this application is a divisional of application 07/912,903, filed July 13, 1992.

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The claims on appeal (except claim 22) are reproduced in the appendix to appellants' brief<sup>2</sup>.

The reference on which the rejection is based is:

Piening                                    4,262,867                                    Apr. 21, 1981

Claims 16 to 22 stand finally rejected as unpatentable over Piening, under 35 USC § 103.

Rejection under 37 CFR 1.196(b)

Pursuant to 37 CFR 1.196(b), claims 16 to 22 are rejected for failure to comply with the second paragraph of 35 USC § 112.

The purpose of § 112, second paragraph, is

to provide those who would endeavor, in future enterprise, to approach the area circumscribed by the claims of a patent, with the adequate notice demanded by due process of law, so that they may more readily and accurately determine the boundaries of protection involved and evaluate the possibility of infringement and dominance.

In re Hammack, 427 F.2d 1378, 1382, 166 USPQ 204, 208 (CCPA 1970). The test for compliance is

whether the claim language, when read by a person of ordinary skill in the art in light of the specification, describes the subject matter with sufficient precision that the bounds of the claimed subject matter are distinct.

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<sup>2</sup>In reviewing the application, we note an apparent discrepancy between Fig. 3B and the specification. On page 22, lines 6 to 13, appellants indicate that the platform is oriented to give a net forward thrust, but in Fig. 3B the "net thrust" vector is shown as being in the opposite direction to the platform's direction of travel. Also, the convex end cap recited in claim 21 is not shown in the drawings. 37 CFR 1.83(a).

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In re Merat, 519 F.2d 1390, 1396, 186 USPQ 471, 476 (CCPA 1975).

The problem in the present case arises from the recitation "in the absence of solar sails which would substantially increase the surface area of the platform" in independent claim 16. In particular, if the recited method were performed by a platform having solar sails, could one of ordinary skill, reading the claim in light of the specification, readily and accurately determine whether those sails were sails which "would substantially increase the surface area of the platform", as recited in the claim.

The use of a word of degree such as "substantially" in a claim does not render the claim indefinite if the specification provides some standard for measuring that degree. Seattle Box Co., Inc. v. Industrial Crating & Packing, Inc., 731 F.2d 818, 826, 221 USPQ 568, 573-74 (Fed. Cir. 1984). See also In re Mattison, 509 F.2d 563, 564, 184 USPQ 484, 486 (CCPA 1975). In the present case, appellants disclose the use of "small solar sails" by which "is meant that the solar sails do not substantially increase the surface area of the platform" (page 19, lines 1 to 3), and "small movable vanes or sails (that is, small vanes that do not substantially increase the surface area of the platform)" (page 21, lines 17 and 18). Having thus defined

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sails which would not substantially increase the surface area of the platform as "small sails", appellants then state on page 24, lines 2 to 12 (emphasis added);

In the context of our invention, "small" moveable vanes or "sails" refers to the relationship between the area(s) of the vane(s) or sail(s) and the total area of the orbital platform. The total area available for photon momentum transfer is the exterior of the platform and the area(s) of the vane(s) or sail(s). In the present invention, the addition of the surface area of the vane(s) or sail(s) does not appreciably increase the amount of area available for capturing photon momentum. Rather, the addition of the surface area of the vane(s) or sail(s) is useful in channeling the photon momentum transfer in such a manner as to produce a non-zero vector component in the desired direction.

We do not regard the above-quoted disclosure as sufficient to provide a standard for measuring whether a solar sail would substantially increase the platform's surface area. One could not experiment to determine the limits of the claims (cf. Seattle Box, 731 F.2d at 826, 221 USPQ at 574) because the disclosure that the small sails do not "appreciably increase" the amount of area available is no more definite than the "substantially increase" language of claim 16. Nor do we find in the specification any numerical examples from which the bounds of "substantially increase" might be inferred (cf. In re Mattison, id.). Accordingly, claim 16, and claims 17 to 22 dependent

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thereon, do not comply with the second paragraph of § 112.

Claim 19 (and its dependent claim 20) are also not in compliance with § 112, second paragraph, in that the recitation in claim 19 that the space-based platform has a large aspect ratio is a double recitation of a limitation already specified in claim 16 (line 3), which is the parent of claim 19's parent claim, claim 18. Since 35 USC § 112, fourth paragraph, requires that a dependent claim "specify a further limitation of the subject matter claimed", claim 19's failure to recite any limitation not already included in parent claim 18 renders it indefinite.

#### Rejection Under 35 USC § 103

Although in some circumstances claims which do not comply with 35 USC § 112, second paragraph, should not be rejected under § 103, see In re Steele, 305 F.2d 859, 862, 134 USPQ 292, 295 (CCPA 1962), we believe that in the present case the indefiniteness of claims 16 to 22 is not such that the rejection under § 103 may not still be considered on its merits. Cf. Ex parte Saceman, 27 USPQ2d 1472, 1474 (BPAI 1993).

The examiner states the basis for the rejection as (answer, pages 3 to 4):

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Piening in col. 4, lines 26-42 notes that the basis for his finding comes from observing spacecraft in general being moved by solar pressure. Consequently it would appear clear to one of ordinary skill in the art that the use of solar sails is only a more efficient use of the solar pressure and the principles expressed by Piening can be applied to any spacecraft surface whether it is a solar sail or merely a cylindrical surface of a satellite. The principles are very fundamental and are merely the application of vectored forces which Piening has observed and therefore It [sic] would have been obvious to one having ordinary skill in the art at the time the invention was made to apply the principles expressed by Piening to any shaped satellite including cylindrical. Consequently the moving of the surface of the satellite in numerous directions to take advantage of the solar pressure like that of the wind on a sailboat or an aircraft are obvious steps. Piening teaches moving his solar surfaces in any direction to take advantage of the solar pressure to take advantage of [sic] thereof and to consequently reorient the satellite.

We do not consider this rejection to be well taken. While Piening recognizes, in the part of col. 4 cited by the examiner, that solar radiation pressure can "disturb the orbit" of spacecraft, particularly of balloon satellites, Piening does not disclose using this pressure on the spacecraft per se to produce thrust, but discloses the use of movable panels and vanes upon which the solar radiation can exert a force to rotate the satellite about its axes. The reference does not teach, nor do we consider that it would suggest to one of ordinary skill in the

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art, that the spacecraft itself be oriented to obtain the desired thrust from the solar radiation; instead, in Piening, it is the panels and vanes on the spacecraft which are oriented. Moreover, claim 16 requires a space-based platform "having a large aspect ratio", which is not disclosed or taught by Piening; this limitation is not addressed by the examiner, although referred to in appellants' brief.

Accordingly, the rejection of claims 16 to 22 under 35 USC § 103 will not be sustained.

#### Conclusion

The examiner's decision to reject claims 16 to 22 is reversed. Claims 16-22 are are rejected pursuant to 37 CFR 1.196(b).

This decision contains a new ground of rejection pursuant to 37 CFR § 1.196(b)(amended effective Dec. 1, 1997, by final rule notice, 62 Fed. Reg. 53,131, 53,197 (Oct. 10, 1997), 1203 Off. Gaz. Pat. & Trademark Office 63, 122 (Oct. 21, 1997)). 37 CFR § 1.196(b) provides that, "A new ground of rejection shall not be considered final for purposes of judicial review."

37 CFR § 1.196(b) also provides that the appellant, WITHIN

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TWO MONTHS FROM THE DATE OF THE DECISION must exercise one of

the following two options with respect to the new ground of rejection to avoid termination of proceedings (§ 1.197(c)) as to the rejected claims:

(1) Submit an appropriate amendment of the claims so rejected or a showing of facts relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the application will be remanded to the examiner. . . .

(2) Request that the application be reheard under § 1.197(b) by the Board of Patent Appeals and Interferences upon the same record. . . .

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

Reversed  
37 CFR 1.196(b)

IAN A. CALVERT )  
Administrative Patent Judge )  
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CHARLES E. FRANKFORT	)	
Administrative Patent Judge	)	

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