

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 12

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte STEPHEN A. PAYNE, CHRISTOPHER D. MARSHALL,
HOWARD T. POWELL, and WILLIAM F. KRUPKE

Appeal No. 1998-1661
Application No. 08/409,244

ON BRIEF

Before KRASS, FLEMING, and BARRY, Administrative Patent Judges.

KRASS, Administrative Patent Judge.

DECISION ON APPEAL

Appeal No. 1998-1661
Application No. 08/409,244

This is a decision on appeal from the final rejection of claims 1 through 15, all of the claims pending in the application.

The invention is directed to a hybrid solid state laser having a Neodymium-based Master Oscillator [MO] and a Ytterbium-based Power Amplifier [PA].

Representative independent claim 1 is reproduced as follows:

1. A MOPA laser system comprising:

a laser master oscillator (MO) pumped by a first pump source and having a Nd-doped gain medium for generating a MO beam with tailored beam properties; and

a power amplifier (PA) pumped by a second pump source and having an Yb-doped gain medium for amplifying the MO beam, the MO and PA being arranged to input the MO beam into the PA to pass the MO beam through the Yb-doped gain medium;

the Nd-doped gain medium and Yb-doped gain medium having a gain maximum at substantially the same wavelength, the Nd-doped gain medium having a higher gain cross section than the Yb-doped gain medium, the Yb-doped gain medium having a longer energy storage time than the Nd-doped gain medium.

The examiner relies on the following references:

O'Meara	5,126,876	Jun. 30, 1992
Krupke et al. (Krupke)	5,280,492	Jan. 18, 1994
Payne et al. (Payne)	5,341,389	Aug. 23, 1994

Appeal No. 1998-1661
Application No. 08/409,244

Claims 1 through 15 stand rejected under 35 U.S.C. § 112, second paragraph, as being vague and indefinite. Claims 1, 2 and 5 through 13 stand rejected under 35 U.S.C. § 103 as unpatentable over the combination of Krupke, Payne and O'Meara.

Reference is made to the brief and answer for the respective positions of appellants and the examiner.

OPINION

We turn first to the rejection under 35 U.S.C. § 112, second paragraph.

With regard to claim 1, the examiner contends that it is inaccurate to characterize a master oscillator as being "pumped by a first pump source" since it is the active or gain medium that is actually pumped. Similarly, the examiner contends that it is inaccurate to characterize a power amplifier as being pumped by a second pump source since it is the active or gain medium that is actually pumped.

Appeal No. 1998-1661
Application No. 08/409,244

While the examiner is correct in noting that it is the gain media that are actually pumped, rather than the MO or the PA which are pumped, we do not find that such a minor inaccuracy causes the claim to be of such indefiniteness, within the meaning of 35 U.S.C. 112, second paragraph, that the skilled artisan would not understand what constitutes the metes and bounds of the instant claimed invention. As explained by appellants, and we agree, the skilled artisan in the environment of laser technology would understand that the pumping of structure such as the MO or the PA would, in actuality, have no meaning and that the recitation of the MO being "pumped" and of the PA being "pumped" really is a recitation of the gain media within the MO or PA being "pumped." So, while the claim language is not as precise as it could be, in view of the artisan's knowledge, we cannot say that the instant claim language runs afoul of 35 U.S.C. § 112 in failing to particularly point out and distinctly claim what applicants consider to be their invention.

The examiner next complains that the "structure-plus-function" language on line 3 and on line 6 of claim 1 is "not in proper means-plus-function format." We are aware of no

Appeal No. 1998-1661
Application No. 08/409,244

such requirement and we agree with appellants that functional language may be employed in a claim without limitation to "means-plus-function." If the functional language serves to further define what a particular structure does and the language is not indefinite or ambiguous in any way, we find nothing wrong, within the meaning of 35 U.S.C. § 112, second paragraph, with the use of such functional language.

The examiner next contends that lines 3-4 of claim 1 recite a beam "with tailored beam properties" but that it is not clear how such a beam is produced, making the claim indefinite and incomplete. The claim need not recite all of the particulars as to how such a beam is produced. As long as there is enabling support within the specification for the recitation of such a beam¹, we find no problem with the cited claim language. While the mere recitation of a "beam with tailored beam properties" may be broadly claimed, breadth does not equate to indefiniteness.

¹The examiner appears to have no problem with support or enablement, within 35 U.S.C. § 112, paragraph 1, regarding a "beam with tailored beam properties."

Appeal No. 1998-1661
Application No. 08/409,244

The examiner also contends that it is not clear that simply passing the MO beam through the Yb-doped gain medium will produce the claimed MOPA system or that a Nd-doped gain medium and a Yb-doped medium inherently possess a gain maximum at substantially the same wavelength, or that the Nd-doped gain medium inherently has a gain cross section higher than the Yb-doped gain medium or that the Yb-doped gain medium inherently has a longer energy storage time than the Nd-doped gain medium. It is not clear to the examiner how these desired results are achieved.

We have some difficulty with the examiner's reasoning here. The claim does not say that the Nd-doped gain medium and the Yb-doped gain medium "inherently" possess a gain maximum at substantially the same wavelength or that the Nd-doped gain medium "inherently" possesses a gain cross section higher than the Yb-doped gain medium or that the Yb-doped gain medium "inherently" has a longer energy storage time than the Nd-doped gain medium. That is, the claim does not recite or imply that **all** Nd- or Yb-doped gain media have these properties. As appellants explain, at page 12 of the brief, the claim recites those embodiments, or combinations, of Nd-

Appeal No. 1998-1661
Application No. 08/409,244

and Yb-doped media that **do** have these properties and excludes those that don't. Clearly, claim 1, as well as claim 11, is definite with respect to which Nd- and Yb-doped gain media are to be used by the instant invention.

With regard to the examiner not being clear as to whether the simple passing of the MO beam through the Yb-doped gain medium will produce the claimed MOPA system, that is appellants' claimed invention, i.e., a MOPA laser wherein the MO beam is passed through the Yb-doped gain medium, wherein the Nd-doped gain medium and the Yb-doped gain medium have certain specific properties.

The examiner further explains that claims 9 and 11 are indefinite and incomplete because if the MO is to generate a laser beam, it must be pumped and the recitation of "for generating a MO beam" is a recitation of a function but it is not in a "proper means-plus-function format." The examiner applies similar reasoning for objecting to the "for amplifying the MO beam" language on line 5 of claims 9 and 11. As explained supra, there is no requirement that functional language must be employed in a claim in a "means-plus-function" format. If the functional language serves to

Appeal No. 1998-1661
Application No. 08/409,244

further define what a particular structure does and the language is not indefinite or ambiguous in any way, we find nothing wrong, within the meaning of 35 U.S.C. § 112, second paragraph, with the use of such functional language.

Finally, the examiner contends that it is not clear, in lines 6 and 7 of claim 9 and in lines 10 and 11 of claim 11 "that passing the MO beam through the Yb-doped crystal gain medium has any effect whatsoever on the Yb-doped crystal gain medium" [page 3-final rejection]. Any "effect" need not be spelled out in the claim. The invention claimed is a MOPA laser which passes a MO beam through a Yb-doped crystal gain medium. While the recitation may be a bit broader than the examiner would like, the way to attack breadth is to cite a prior art reference which evidences the broad scope of the claim. A broad claim is not necessarily an indefinite claim.

We find nothing indefinite, within the meaning of the second paragraph of 35 U.S.C. § 112, in the instant claims. Accordingly, we will not sustain the rejection of claims 1 through 15 under 35 U.S.C. § 112, second paragraph.

Appeal No. 1998-1661
Application No. 08/409,244

We now turn to the rejection of claims 1, 2 and 5 through 13 under 35 U.S.C. § 103.

We will not sustain this rejection either as, in our view, the examiner has failed to establish a prima facie case of obviousness.

The examiner applies O'Meara for the teaching of a MOPA laser system and relies on Payne for a teaching of Yb- and Nd-doped laser crystals. Krupke is relied on for certain Yb-doped crystals. The examiner concludes that since it is well known that the only necessary and sufficient condition for pumping an active medium is that the active medium be optically matched to the pump, it would have been obvious from the structures and teachings of the references to pump each of the crystals and that "one desiring to negate the spatial thermal differences of the solid gain amplifier medium would clearly use the Nd-doped crystal combinations of Payne...to pass the MO beam to the Yb-doped gain medium of Krupke...in a device built around the teachings of O'Meara" [final rejection page-5]. The examiner also appears to rely on a reference to Abrams but this reference forms no part of the instant grounds for rejection and so we will not consider Abrams. See In re

Appeal No. 1998-1661
Application No. 08/409,244

Hoch, 428 F.2d 1341, 1342 n.3, 166 USPQ 406, 407 n.3 (CCPA 1970).

It appears to us that the examiner's rationale can only be based on impermissible hindsight gleaned from a knowledge of appellants' invention. The three independent claims 1, 9 and 11 each require, at least, a MOPA laser system wherein a MO having a Nd-doped gain medium which generates a MO beam with certain properties and that that MO beam then be input into the PA of an MOPA laser in order to pass the MO beam through a Yb-doped gain medium of the PA.

Neither Payne nor Krupke is directed to a MOPA laser and this is not disputed by the examiner. Of the applied references, only O'Meara is directed to a MOPA laser and O'Meara fails to teach an MO with a Nd-doped gain medium wherein the MO beam is then input into the PA in order to pass the MO beam through a Yb-doped gain medium of the PA. Merely because one could, i.e., obvious to try, make the gain medium of O'Meara's MO Nd-doped and one could make the gain medium of O'Meara's PA Yb-doped, the examiner has not pointed, persuasively, to anything in the prior art which would have prompted the skilled artisan to do so. Krupke's Yb-doped

Appeal No. 1998-1661
Application No. 08/409,244

crystals and Payne's Nd- and Yb-doped crystals, per se, offer no suggestion to the artisan to modify O'Meara in such a manner that the MO had a Nd-doped gain medium while the PA had a Yb-doped gain medium and that the MO beam be passed through the Yb-doped medium of the PA. Only appellants' disclosure suggests this. If the examiner is suggesting that it would have been obvious to try different combinations of materials resulting in appellants' claimed invention, there would appear to have been no reasonable expectation of success in achieving appellants' result.

Accordingly, we will not sustain the rejection of claims 1, 2 and 5 through 13 under 35 U.S.C. § 103.

The examiner's decision is reversed.

REVERSED

Appeal No. 1998-1661
Application No. 08/409,244

ERROL A. KRASS)	
Administrative Patent Judge)	
)	
)	
)	
)	
MICHAEL R. FLEMING)	BOARD OF PATENT
Administrative Patent Judge)	APPEALS AND
)	INTERFERENCES
)	
)	
LANCE LEONARD BARRY)	
Administrative Patent Judge)	

ek/rwk

HENRY P. SARTORIO
DEPUTY LABORATORY COUNSEL FOR PATENTS
LAWRENCE LIVERMORE NATIONAL LABORATORY
P O BOX 808 L 703
LIVERMORE CA 94551

Appeal No. 1998-1661
Application No. 08/409,244