

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. 13

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte WARREN M. FARNWORTH

Appeal No. 2002-1223
Application 09/435,455

ON BRIEF

Before GARRIS, KRATZ, and DELMENDO, ***Administrative Patent Judges.***
GARRIS, ***Administrative Patent Judge.***

DECISION ON APPEAL

This is a decision on an appeal from the final rejection of claims 1-18, which are all of the claims in the application.

The subject matter on appeal relates to a method for generating a stream of liquid metal droplets for deposition on at least a portion of a stationary substrate. The method comprises producing a continuous stream of liquid metal droplets and selectively directing said stream of liquid metal droplets using a raster scanning process and catching at least some of the liquid metal droplets for preventing them from contacting the stationary substrate. This appealed subject matter is adequately illustrated by independent claims 1 and 10, which read as follows:

1. A method for generating a stream of liquid metal droplets for deposition on at least a portion of a stationary substrate comprising:

producing a continuous stream of liquid metal droplets; and

selectively directing said stream of liquid metal droplets in one dimension of a first dimension, a second dimension, and a combination of a first dimension and a second dimension using a raster scanning process comprising:

electrically charging said liquid metal droplets;

deflecting at least a portion of said electrically charged liquid metal droplets in said one dimension of a first dimension, a second dimension, and a combination of a first dimension and a second dimension; and

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catching at least some of said liquid metal droplets for preventing said at least some of said liquid metal droplets from contacting said stationary substrate.

10. A method for applying a stream of liquid metal droplets to portions of a stationary substrate comprising:

producing a continuous stream of liquid metal droplets; and

selectively directing said stream of liquid metal droplets in one of a first dimension, a second dimension, and a first dimension and a second dimension using a raster scanning process comprising:

electrically charging said liquid metal droplets;

deflecting at least a portion of said electrically charged liquid metal droplets in said one of a first dimension, a second dimension, and a first dimension and a second dimension for deposition on portions of said substrate; and

catching at least some of said liquid metal droplets for use as a continuous stream of liquid metal droplets for deposition on portions of said substrate.

The references relied upon by the examiner as evidence of obviousness are:

Oeftering	5,520,715	May 28, 1996
Sterett et al. (Sterett)	5,746,844	May 5, 1998
Smith et al. (Smith)	5,810,988	Sep. 22, 1998
Muntz et al. (Muntz)	5,938,102	Aug. 17, 1999

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Claims 1-18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over any of Oeftering, Sterett, Muntz or Smith.¹

We refer to the Brief and Reply Brief and to the Answer for a complete exposition of the opposing viewpoints expressed by the appellant and by the examiner concerning the above-noted rejections.

OPINION

For the reasons set forth below, we will sustain the § 103 rejections based on Muntz or Smith but not the § 103 rejections based on Oeftering or Sterett.

The rejections based on Oeftering or Sterett cannot be sustained because, with respect to these references, the examiner has failed to establish a **prima facie** case of unpatentability concerning the catching step of the here-claimed method.

With respect to this step, the examiner contends that "[t]he catching [step] as claimed would broadly include any

¹ On page 6 of the Brief, the appellant has grouped claims 1-9 separately from claims 10-18. Accordingly, we will focus on claims 1 and 10, which are the only independent claims on appeal, as respectively representing these claim groups. See 37 CFR § 1.192(c)(7) (2001).

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process under which at least some of the drops [i.e., liquid metal droplets] would not strike the substrate, including, for instance, prior art processes in which some of the drops strike on top of already solidified drops" (Answer, page 4). However, this contention lacks persuasive merit. It is well settled that, in proceedings before the Patent and Trademark Office, claims in an application are to be given their broadest reasonable interpretation consistent with the specification. ***In re Sneed***, 710 F.2d 1544, 1548, 218 USPQ 385, 388 (Fed. Cir. 1983). Here, the examiner has not even attempted to carry his burden of establishing that his claim interpretation regarding the appellant's catching step is reasonable and consistent with the specification. Moreover, our own study of the appellant's specification (e.g., see the second full paragraph on specification, page 7) persuades us that it would be unreasonable and inconsistent with this specification to construe, as the examiner has done, the here-claimed catching step as encompassing the step of depositing a liquid metal droplet on top of a previously deposited and solidified droplet.

Concerning this feature, the examiner also argues that it would have been obvious to provide the methods of Oeftering and Sterett with a catching step of the type under consideration. In this regard, the examiner proffers a number of reasons why an artisan would have been motivated to make such a provision. The fatal deficiency of this obviousness conclusion is the fact that the examiner has failed to advance any evidentiary support for it. Thus, when viewing Oeftering or Sterett alone in accordance with the examiner's stated rejection, no evidentiary basis exists for concluding that the artisan would have been even aware of this catching step much less would have been motivated to employ it in the respective methods of Oeftering or Sterett.

Under these circumstances, it is apparent that we cannot sustain the examiner's § 103 rejections of all appealed claims as being unpatentable over Oeftering or Sterett.

As for the rejections based on Muntz or Smith, the appellant with commendable candor has conceded, in effect, that the here-claimed catching step is disclosed by each of Muntz or Smith (e.g., see the sentence bridging pages 3 and 4 of the Reply Brief as well as the first full sentence on page 7 of the Reply

Brief). Nevertheless, the appellant argues that the rejections based on these references are improper because "Smith and Muntz clearly do not teach or suggest a method or apparatus for preferentially deflecting a portion of the generated droplets in two dimensions or a raster scanning as presently claimed" (Reply Brief, page 7). This argument is unconvincing for a number of reasons.

First, contrary to the appellant's apparent belief, the independent claims on appeal do not require that the liquid metal droplets be deflected in two different directions. Rather, appealed claim 1 simply requires that a portion of the droplets be deflected in a first "dimension," a second "dimension" and a combination thereof. Thus, while this claim may require droplet deflection in plural dimensions, the claim language permits all of these plural dimensions to be in the same direction. As an example, claim 1 encompasses an embodiment wherein plural droplets are deflected at different distances or dimensions but in only one direction. The language of appealed independent claim 10 is similar but even more broad since it recites deflecting the metal droplets in "one of a first dimension, a

second dimension, and a first dimension and second dimension" (emphasis added). It follows that claim 10 encompasses an embodiment wherein plural droplets are deflected in only one direction and only one dimension or distance.

As previously indicated, application claims are to be given their broadest reasonable interpretation consistent with the specification. *Sneed*, 710 F.2d at 1548, 218 USPQ at 388. The above-discussed interpretations of appealed independent claims 1 and 10 are indeed reasonable and consistent with the appellant's specification. This is because the appellant's specification expressly discloses that the droplets "are deflected in either the horizontal X-direction or the vertical² Y-direction, or both" (Specification, page 6; emphasis added). It is apparent from this disclosure that the appellant's method

² The subject specification is not a model of clarity with respect to the directions in which droplets are deflected viewed from the perspective shown in figure 1 of the appellant's drawing. From this perspective, it is particularly unclear what is meant by reference to "the vertical Y-direction." Specifically, it is unclear how the apparatus and method shown in appellant's figure 1 would somehow cause droplets to be deflected in a direction vertical to substrate 12 of figure 1. The appellant and the examiner should address this matter in any further prosecution that may occur.

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encompasses the step of deflecting droplets in only one direction.

With this claim interpretation in mind, we observe that both Smith (e.g., see figure 1 and the written disclosure with respect thereto) and Muntz (e.g., see figure 1 and the written disclosure with respect thereto) practice the step of deflecting plural droplets in a single direction at differing distances or dimensions. Indeed, the appellant seems to agree that, at least, Muntz discloses such a deflection step (e.g., see the paragraph bridging pages 7 and 8 and the first full paragraph on page 11 of the Reply Brief).

In summary, neither of the independent claims on appeal distinguishes over Muntz or Smith in the manner argued by the appellant. For this reason alone, it is appropriate to sustain the § 103 rejections based on these references.

Alternatively, even if the appealed claims were interpreted in the manner argued by the appellant, they still would not be patentable over the applied prior art. As the appellant seems to appreciate, Muntz discloses deflecting his droplets along a "fan axis" which is perpendicular to patentee's

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plates 16, 18 and transverse to the X-axis (e.g., see lines 39-44 in column 3). The particular direction of droplet deflection along this "fan axis" can be changed by rotating the deflection plates 16, 18 (e.g., see lines 26-33 in column 4). Significantly, this reference further discloses that the "fan axis" can be rotated continuously by rotating plates 16, 18 "while droplets are deflected along the fan axis to deposit a pattern of droplets" (see lines 31-34 in column 7). This disclosed embodiment wherein the fan axis and plates are rotated continuously "while droplets are deflected along the fan axis" would necessarily result in the deflection of droplets in a plurality of directions along this fan axis.

It follows that the independent claims on appeal do not distinguish over Muntz even when these claims are interpreted, as urged by the appellant, to require that the droplets be deflected in plural directions.

In light of the foregoing, we will sustain the examiner's § 103 rejections of all appealed claims as being unpatentable over Muntz or Smith.

The decision of the examiner is affirmed.

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

AFFIRMED

BRADLEY R. GARRIS)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
PETER F. KRATZ)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
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ROMULO H. DELMENDO)	
Administrative Patent Judge)	

BRG:psb

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