

THIS OPINION IS NOT BINDING PRECEDENT

The opinion in support of the decision being entered today is not binding precedent of the Board.

Paper 27

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte KHE C. NGUYEN

Appeal 97-1804
Application 08/329,042¹

Before: McKELVEY, Senior Administrative Patent Judge, and
SCHAFER and LEE, Administrative Patent Judges.

McKELVEY, Senior Administrative Patent Judge.

Decision on appeal under 35 U.S.C. § 134

The appeal is from a decision of the Primary Examiner rejecting claims 1, 8 and 11-12. We reverse.

¹ Application for patent filed 20 October 1994. The application is said to be a continuation of application 08/084,377, filed 29 June 1993. The real party in interest is Hewlett-Packard Company.

A. Findings of fact

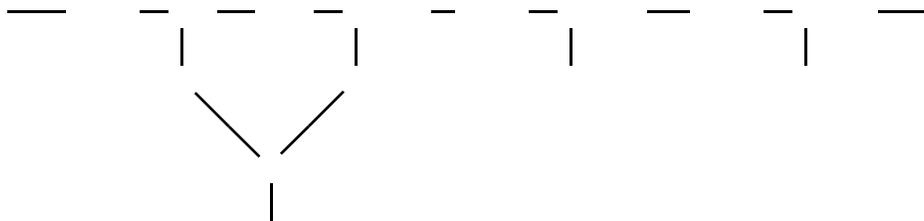
The record supports the following findings by a preponderance of the evidence.

Claimed invention

1. The claims stand or fall with claim 1.
2. Claim 1 reads (indentation and paragraph numbering added; limitations which are material to the appeal in **bold**):²

A **continuous, non-porous layer** of self-cross-linked polyvinyl butyral binder,

[1] made be [sic-by] reacting molecules of the following Formula (1):



- [2] where R = alkyl, allyl, [or] aryl groups, where
[a] 1 = 50 - 95 mol%

² We have reproduced claim 1 as presented in Amendment A (Paper 13) filed 4 April 1995); Amendment A is identified by the PTO as #E.

- [b] m = 0.5 - 15 mol%, and
- [c] n = 5 - 35 mol% and
- [3] the said reacting of the molecules of Formula (1) is done
 - [a] in the absence of a cross-linker
 - [b] in the absence of a cross-linkable copolymer not described by said Formula (1) and
 - [c] in the absence of a catalyst,
- [4] so that said **continuous, non-porous layer** of self-cross-linked polyvinyl butyral after said reacting is free of catalyst.

The invention described in the specification as filed

3. The invention relates generally to photoconductors for electrophotography (specification, page 1, lines 13-14).

4. In the electrophotography art, a "photoconductor surface" is used (specification, page 2, lines 3-5).

5. According to applicant, "recent progress in the electrophotography art with the photoconductor surface has been made with organic materials as organic photoconductors (OPC's)" (specification, page 2, lines 25-27).

6. Thus, in the electrophotography art, the acronym OPC means an organic photoconductor.

7. In the specification, as filed, the invention was originally described as "a self-cross-linked polyvinyl butyral (PVB) binder for OPC's" (specification, page 9, lines 3-4).

8. An object of applicant's invention is said to be (specification, page 7, lines 6-10):

A third object of this invention is to provide a cross-linked binder for an OPC without having to provide also, besides the binder material, a cross-linker material, or a cross-linkable copolymer material, or a cross-linking catalyst, which may affect the life of the OPC.

9. Figs. 1 and 2 of the drawings, set out below in Finding 12, are schematic, cross-sectional views of embodiments of the invention (specification, page 10, lines 29-30).

10. Fig. 1 depicts an OPC with a conductive substrate **1** and a photoconductor layer **2** (specification, page 11, lines 13-14).

11. Fig. 2 depicts a photoconductor layer **2** which contains a separate charge generation layer **2A** and a separate charge transport layer **2B** (specification, page 11, lines 14-16).

12. Figs. 1 and 2 are:

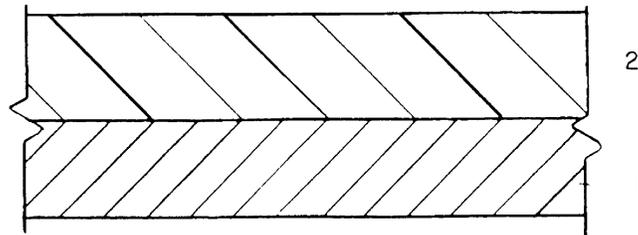


FIG. 1

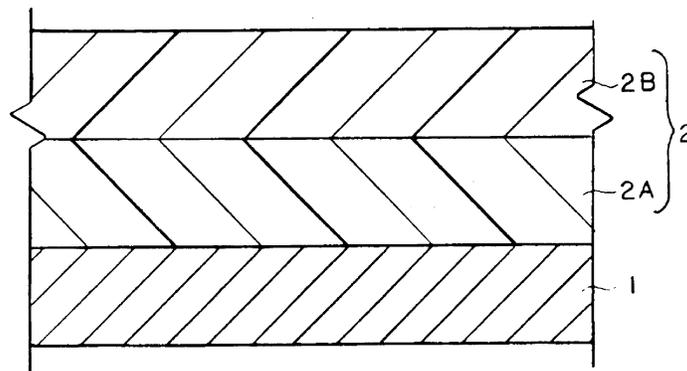


FIG. 2

13. The photoconductor **2** may be single-layered (Fig. 1) or dual-layered (Fig. 2) (specification, page 12, line 15).

14. When single-layered, the single layer performs both charge generation and charge transport functions; when dual-layered, one layer performs the charge generation function and the other layer performs the charge transport function (specification, page 12, lines 16-20).

15. The charge generation layer of the OPC's of the invention is a binder resin of self-cross-linked PVB having the formula set out in claim 1, reproduced supra in Finding 2 (specification, page 15, line 32 through page 16, line 17).

16. Cross-linking of the PVB is effected by heating it to between 150E - 300E C. (specification, page 16, lines 18-19) for about 2 hours (specification, page 9, lines 7-9).

17. Example 1 describes the preparation of an article by coating PVB on a substrate using a doctor blade (specification, page 18, line 28 through page 19, line 2).

Examiner's rejections

18. Two rejections are maintained in the Examiner's Answer.

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a. All the claims stand rejected under the first paragraph of 35 U.S.C. § 112 on the ground that the specification, as filed, does not provide support for language inserted therein during prosecution. See also 35 U.S.C. § 132, last sentence. The inserted language is "continuous, non-porous."

b. All the claims stand rejected under 35 U.S.C. § 102(e) as being anticipated by Hens, U.S. Patent 5,332,537 (1994).³

Prosecution history

19. There came a time during the prosecution when the examiner rejected the claims as being anticipated under 35 U.S.C. § 102(e) over Hens.

20. In due course, applicant filed a response (Amendment A--Paper 13).

21. In Amendment A, applicant inserted the language "continuous, non-porous" in various places in the specification and in the claims.

22. For example, the language

³ Hens is prior art vis-a-vis applicant under 35 U.S.C. § 102(e).

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a self-cross-linked polyvinyl butyral (PVB)
binder for OPC's

(page 9, line 3-4; see also Finding 7) was amended to read
(**bold** newly added material):

a **continuous, non-porous** self-cross-linked
polyvinyl butyral (PVB) binder for OPC's.

23. The language

The photoconductor **2** may be single- or dual-layered

(specification, page 12, line 15; see also Finding 13) was
amended to read (**bold** newly added material):

The **continuous, non-porous** photoconductor **2**
may be single- or dual-layered.

24. The language "continuous, non-porous" was also
added to claim 1.

25. Accompanying Amendment A was a first declaration
of the inventor, Dr. Nguyen (Amendment A, Exhibit C).

26. Dr. Nguyen has considerable experience in the
field of photoconductors (First Declaration, ¶¶ 3-6) and is

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qualified to give expert opinion in the field of photoconductors.

27. Dr. Nguyen states (First Declaration, ¶ 11):

I have physically examined binder layers for organic photoconductors made according to the methods disclosed in this application. These layers appear to be smooth, continuous films without pores.

28. Dr. Nguyen, responding to the examiner's rejection based on Hens, states (First Declaration, ¶ 13):

[A] necessary feature of an organic photoconductor layer is that it be non-porous because pores in the layer will adversely affect electrical charge acceptance and retention.

29. Basically, Dr. Nguyen is saying that the compact of Hens will not function as a OPC.

30. The examiner found that the addition of "continuous, non-porous" was "new matter" and rejected the claims on the ground that the claimed subject matter was not described in the application, as filed (Final Rejection, Paper 14, page 2).

31. The examiner also maintained the anticipation rejection based on Hens.

32. In response to the Final Rejection, applicant presented a second declaration of the inventor (Paper 20, Exhibit A).

33. The second declaration repeats much of what is said in the first declaration, but adds (Second Declaration, ¶ 8):

[W]hen OPC's are made by the doctor blade method as described in EXAMPLE 1 [of the specification], and by other conventional methods in the industry, the layer of self-cross-linked PVB binder which results in invariably continuous, non-porous, and of generally uniform thickness.

34. The examiner declined to give the first and second declarations much weight:

a. With respect to Dr. Nguyen's opinions based on his observation of OPC's (Finding 25), the examiner notes that Dr. Nguyen does not state the underlying basis upon which he made any observation ("Whether the examination was by naked eye or with an electron microscope would have a great bearing on whether the layer appeared non-porous" (Examiner's Answer, page 6)).

b. With respect to Dr. Nguyen's opinion that OPC's made in accordance with Example 1 would invariably be continuous, non-porous (Finding 30), the examiner notes the lack of "objective evidence to support *** [Dr. Nguyen's] conclusion" (Examiner's Answer, page 7).

c. With respect to Dr. Nguyen's opinion that a necessary feature of an organic photoconductor layer is that it be non-porous because pores in the layer will adversely affect electrical charged acceptance and retention (Finding 28), the examiner noted that applicant "is claiming a layer not a photoconductor" (Examiner's Answer, page 9).

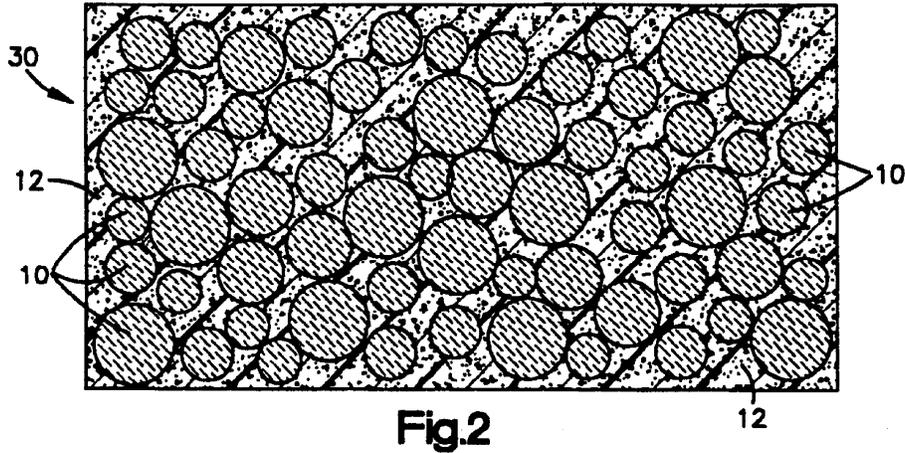
Hens

35. Hens describes an invention which relates to a method and binder for use in the fabrication of metal, ceramic, or intermetallic articles from powder particles (col. 1, lines 6-8).

36. Specifically, Hens describes a new and improved binder (col. 1, lines 32-33).

37. The binder is mixed with powder and is thereafter molded to form a compact (col. 1, lines 43-44).

38. A compact is illustrated in Fig. 2:



39. As shown, compact 30 contains binder 12 and powder 10.

40. Binder 12 includes a water soluble component and a water insoluble component (col. 2, lines 36-38).

41. The water insoluble component of the binder is a PVB resin (col. 7, lines 52-57).

42. The water soluble component of the binder is a polyethylene glycol having a molecular weight under 10,000 (col. 2, lines 52-54; col. 7, lines 50-52).

43. There comes a time when the PVB resin is cross-linked.

44. According to Hens, cross-linking can occur (1) through use of a catalyst (col. 5, line 39), (2) by a thermosetting reaction at a temperature not so high was to remove the water soluble component (col. 5, lines 42-48) or (3) by ultraviolet radiation (col. 6, lines 25-39). See also col. 8, lines 52-57.

45. Cross-linking can take place before or after removal of the water soluble component (col. 6, lines 6-9), although according to Hens it is preferred to effect cross-linking before "partially debinding the compact by removing the water soluble component **16** of the binder" (col. 6, lines 9-12).

46. Apparently, cross-linking before debinding results in increased strength (col. 6, lines 18-21).

47. After the PVB is cross-linked, Hens says that the PVB formed an "exoskeleton which strengthened the compact" (col. 8, lines 63).⁴

⁴ We have not been able to locate a definition of the word "exoskeleton" as applied to the art to which Hens is related. According to Webster's New International Dictionary, page 895 (1954), exoskeleton means a hard supporting or protective structure developed on or secreted by the outside of the body, as the shell of a crustacean--opposed to endoskeleton. Apparently the teeth of vertebrates are exoskeletal parts.

48. Ultimately, however, removal of the water soluble component opens pores in the compact (col. 4, lines 4-5).

49. Specifically, heating the compact is said to vaporize the water insoluble component and resulting gases escape from the compact through pores formed by removal of the water soluble component (col. 4, lines 41-45).

Applicant's argument with respect to Hens

50. Applicant maintains that Hens does not describe a "layer" within the meaning of claim 1.

51. According to applicant, a "layer" is "[a] single thickness, coating, or stratum spread out or covering a surface." The American Heritage Dictionary of the English Language (1969) (attached as Exhibit A to the Appeal Brief).

52. Applicant points to the drawings to support his argument that the invention relates to a "layer" (see Figs. 1 and 2, supra Finding 12).

53. Accordingly, applicant reasons that Hens does not describe a continuous, non-porous, self-cross-linked OPC layer of PVB (Appeal Brief, page 6).

B. Discussion

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1. Meaning of "layer" in claim 1

What does the word "layer" in claim 1 mean?

Construction of the meaning of a word in a claim is an issue of law to be resolved based on the facts of each case. Markman v. Westview Instruments, Inc., 517 U.S. 370, 391, 116 S.Ct. 1384, 1396 (1996) (interpretation of the word "inventory" [in a patent claim] in this case is an issue for the judge, not the jury ***.); Ethicon Endo-Surgery, Inc. v. U.S. Surgical Corp., 93 F.3d 1572, 1577, 40 USPQ2d 1019, 1022 (Fed. Cir. 1996) (significance to be given a limitation in a patent claim is a question of law which is resolved based on particular facts).

The meaning of words in a claim is ascertained from language of claims, the specification, and prosecution history. Also relevant are other claims and expert testimony. Claims should be construed as one skilled in the art would construe them. Smithkline Diagnostics, Inc. v. Helena Laboratories Corp., 859 F.2d 878, 882, 8 USPQ2d 1468, 1471 (Fed. Cir. 1988). To determine the meaning of "layer" we have looked to the specification. Compare Digital Biometrics Inc. v. Identix Inc., 149 F.3d 1335, 1344, 47 USPQ2d 1418, 1424

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(Fed. Cir. 1998). Paraphrasing Judge Plager's opinion for the court the following becomes apparent. To determine the proper meaning of claims, one first considers the so-called intrinsic evidence, i.e., the claims, the written description, and, if in evidence, the prosecution history. Within the intrinsic evidence, however, there is a hierarchy of analytical tools. The actual words of the claims are the controlling focus. The written description is considered, in particular to determine if the patentee acted as its own lexicographer, and ascribed a certain meaning to terms in the claims. If not, the ordinary meaning as understood by one having ordinary skill in the art controls. See also Pitney Bowes, Inc. v. Hewlett-Packard Co., 182 F.3d 1298, 1309, 51 USPQ2d 1161, 1169 (Fed. Cir. 1999) (to ascertain the meaning of claims, we consider three sources: the claims, the written description, and the prosecution history).

Claims undergoing examination are given their broadest reasonable construction consistent with the specification. Burlington Industries v. Quigg, 822 F.2d 1581, 1583, 3 USPQ2d 1436, 1438 (Fed. Cir. 1987); In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-51 (CCPA 1969).

The title of the invention is "Cross-linked polyvinyl butyral binder for organic photoconductor." Applicant describes both single- and dual-layered OPC's. The drawings depict OPC layers. Nothing in the specification would suggest to one skilled in the art that applicant's "layer" is anything but a layer in an OPC. It is manifest, from a consideration of the specification as a whole, that applicant did not set out to solve any problem other than an OPC problem. OPC's have layers. Hence, in our view the broadest reasonable construction of the word "layer" in claim 1, consistent with the specification, is a "OPC layer." Hence, "layer" in claim 1 should be construed to mean "OPC layer" and not broadly a layer for any purpose.

2. Section 112 rejection

We agree with applicant that the § 112 (and any new matter rejection under 35 U.S.C. § 132) is resolved in the basis of whether the specification, as filed, expressed a concept of an OPC layer which is a continuous, non-porous, self-cross-linked layer of PVB. In re Anderson, 471 F.2d 1237, 1244, 176 USPQ 331, 336 (CCPA 1973).

a.

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The language "continuous, non-porous" was inserted into the specification and claims to overcome the examiner's citation of Hens. It is true that the specification, as filed, does not explicitly describe applicant's layers **2** and **2A** as being continuous and non-porous. Likewise, the specification does not define or discuss the meaning of "continuous" or "non-porous."

There is a dictionary definition of "porous" in the record.⁵ But, the dictionary (Webster's II, New Riverside University Dictionary) does not purport to be a technical dictionary, let alone a dictionary in the photoconducting art. In this respect, we believe that the observation about dictionaries in Anderson v. International Engineering and Manufacturing Inc., 160 F.3d 1345, 1348, 48 USPQ2d 1631, 1634 (Fed. Cir. 1998) is applicable. The Federal Circuit noted that definitions in dictionaries all reflect common usages of "away" and reinforce the observation that dictionary definitions of ordinary words are rarely dispositive of their

⁵ The definition is: "Having or full of pores." Pore is defined as "A minute orifice, as one in the skin of an animal, serving as an outlet for perspiration, or in a plant stem or leaf, serving as a means of absorption and transpiration" and "A minute surface opening or passageway, as in a rock."

meaning in a technological context; a word describing patented technology takes its definition from the context in which it was used by the inventor.

b.

Dr. Nguyen testified in his declaration that a necessary feature of an OPC is that it be non-porous because pores in the layer will adversely affect electrical charged acceptance and retention. Finding 28. Almost every material has pores albeit some may be microscopic in size. In accordance with Dr. Nguyen's testimony, which we find credible, it becomes apparent that OPC layers are non-porous to the extent that any microscopic pores which might exist do not adversely affect electrical charged acceptance and retention. Accordingly, we find the added limitation of applicant's OPC's as being non-porous to be nothing more than a statement of a characteristic of an OPC. In other words, one skilled in the art would have understood that the OPC's described by applicant in the specification had to be non-porous in the sense in which Dr. Nguyen says an OPC must be non-porous.

The examiner declined to give much weight to Dr. Nguyen's declarations. See Finding 34. The examiner found that

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Dr. Nguyen did not state the basis upon which he had observed the absence of pores. Finding 34(a). The examiner also found that Dr. Nguyen did not provide objective evidence to support a conclusion that the OPC layer made in accordance with Example 1 would invariably be continuous and non-porous. Finding 34(b).

As a general proposition we agree with the examiner that an expert may be called upon to state the underlying basis for an opinion. Cf. Fed. R. Evid. 705. We also agree that Dr. Nguyen did not state the underlying basis for his opinion that OPC's he had observed were continuous and non-porous. We also agree with the examiner that generally nothing requires the fact finder to credit the unsupported assertions of an expert witness. Cf. Rohm and Haas Co. v. Brotech Corp., 127 F.3d 1089, 1092, 44 USPQ2d 1459, 1462 (Fed. Cir. 1997). On the other hand, the absence of an underlying basis and the absence of technical support for an opinion does not mean the expert opinion must be rejected. In this case, Dr. Nguyen also has told us that:

a necessary feature of an organic photoconductor layer is that it be non-porous because pores in the

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layer will adversely affect electrical charged acceptance and retention.

Finding 28. When Dr. Nguyen's testimony is considered, as a whole, we are inclined, under the unique facts of this case, to give it more weight than we might give an opinion made without a statement of the underlying basis or technical support to back it up. When Dr. Nguyen's testimony is given some weight, it becomes apparent that the language "continuous, non-porous" added to the specification and claims becomes nothing more than an explicit statement of a known characteristic of an OPC layer as it would have been understood by one skilled in the art. Accordingly, addition of "continuous, non-porous" is not new matter within the meaning of 35 U.S.C. § 132, last sentence.

c.

For the reasons given, the examiner's rejection of all the claims under the first paragraph of 35 U.S.C. § 112,

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alternatively under the last sentence of 35 U.S.C. § 132, must be reversed.⁶

3. Section 102 rejection

Our construction of the meaning of "layer" in claim 1 also disposes of the examiner's anticipation rejection based on Hens. Hens does not describe a "layer" which is an OPC layer. Hence, Hens does not describe a "layer" within the meaning of claim 1 on appeal. Accordingly, the examiner's rejection based on Hens must be reversed.

C. Decision

The examiner's rejections based on the first paragraph of 35 U.S.C. § 112 and 35 U.S.C. § 102(e) are reversed.

REVERSED.

⁶ While we do not think it likely, applicant may disagree with our interpretation of "layer" to be limited to an "OPC layer." We are aware of In re Priest, 582 F.2d 33, 199 USPQ 11 (CCPA 1978), where the CCPA held that it was error for board to add "inferential limitations" to applicant's claims. We place on the record our view that if "layer" does not mean "OPC layer," then we would have affirmed the examiner's rejection under the first paragraph 35 U.S.C. § 112.

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