

The opinion in support of the decision being entered today was **not** written for publication and is **not** binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte EDUARD KUGLER

Appeal No. 2004-2148
Application No. 09/362,397

ON BRIEF

Before GARRIS, WARREN and JEFFREY T. SMITH, *Administrative Patent Judges*.

JEFFREY T. SMITH, *Administrative Patent Judge*.

DECISION ON APPEAL

Applicants appeal the decision of the Primary Examiner finally rejecting claims 91 to 149. We have jurisdiction under 35 U.S.C. § 134.¹

BACKGROUND

¹ In rendering this decision, we have considered Appellant's arguments presented in the Brief filed November 12, 2003 and the Reply Brief filed May 10, 2004.

Appellant's invention is directed to a method for producing a information carrier comprising at least two solid material interfaces. The method comprises depositing a layer, which at least predominantly consists of Si_vN_w or $\text{Si}_v\text{N}_w\text{H}_u$, by means of a reactive vacuum coating process. According to Appellant, the claimed is particularly suited for producing the intermediate layer of the information carrier. Claims 91, 92 and 107, which are representative of the claimed invention, appear below:

91. A method for producing an information carrier comprising at least two solid material interfaces adapted to contain information and whereat the information is stored by local modulation of at least one solid material characteristic, from which characteristic reflection of electromagnetic radiation depends at said interface, further comprising at least one intermediate layer between said two solid material interfaces, said at least one intermediate layer transmitting said radiation, said information being readable from at least one of said solid material interfaces by means of radiation of predetermined wavelength, the method comprising the step of:

depositing in said intermediate layer at least one layer at least predominantly comprising Si_vN_w by means of a reactive vacuum coating process, comprising the step of freeing Si from a solid body into a process atmosphere with a reactive gas containing N.

92. A method for producing an information carrier comprising at least two solid material interfaces adapted to contain information and whereat the information is stored by local modulation of at least one solid material characteristic, from which characteristic reflection of electro-magnetic radiation

depends at said interface, further comprising at least one intermediate layer between said two solid material interfaces, said at least one intermediate layer transmitting said radiation, said information being readable from a least one of said solid material interfaces by means of radiation of predetermined wavelength, the method comprising the step of:

depositing in said intermediate layer at least one layer at least predominantly comprising $\text{Si}_v\text{N}_w\text{H}_u$ by means of a reactive vacuum coating process in a process atmosphere, an optimum of transmission of said layer and of a refractive index of the material of said layer being achieved by adjusting the concentration of a reactive gas in the process atmosphere, which reactive gas comprises N and H.

107. A method for producing an information carrier comprising at least two solid material interfaces adapted to contain information and whereat the information is stored by local modulation of at least one solid material characteristic, from which characteristic reflection of electromagnetic radiation depends at said interface, further comprising at least one intermediate layer between said two solid material interfaces, said at least one intermediate layer transmitting said radiation, said information being readable from a least one of said solid material interfaces by means of radiation of predetermined wavelength, the method comprising the step of:

depositing the intermediate layer to have a layer system with at least one dielectric layer and with an optical thickness which, at least in a first approximation, is $m \cdot \lambda_0 / 4$, wherein m is an integer of at least unity and is uneven and wherein λ_0 designates the wavelength of said radiation which is transmitted through said at least one dielectric layer and wherein, depending from said m being an integer, m being reduced by an amount of up to 0.6 or increased by an amount of up to 0.2.

CITED PRIOR ART

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As evidence of unpatentability, the Examiner relies on the following

reference:

Sproul et al. (Sproul)	4,428,811	Jan. 31, 1984
Kim	5,240,581	Aug. 31, 1993
Kugler	5,292,417	Mar. 8, 1994
Challener, IV	5,414,678	May 9, 1995
Takei et al. (Takei) (Japanese Patent Application)	59-73413	Apr. 25, 1984
Tawara (European Patent Application)	473,492	Mar. 4, 1992
Signer et al. (Signer) (European Patent Application)	564,789	Feb. 15, 1993
Imaino (European Patent Application)	658,885	Jun. 21, 1995

The Examiner, Answer pages 3 to 17, entered the following rejections:

- I. Claims 91, 98, 99 and 103 to 105 under 35 U.S.C. § 103(a) as unpatentable over the combined teachings of Challener and Kim.
- II. Claims 95 and 100 under 35 U.S.C. § 103(a) as unpatentable over the combined teachings of Challener and Kim as applied to claims 91, 98, 99 and 103 to 105, further combined with Kluger.

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III. Claims 96 and 97 under 35 U.S.C. § 103(a) as unpatentable over the combined teachings of Challener, Kim and Kluger as applied to claims 91, 95, 98, 99, 100 and 103 to 105, further combined with Signer.

IV. Claims 92, 93 and 106 under 35 U.S.C. § 103(a) as unpatentable over the combined teachings of Challener and Tawara.

V. Claims 94, 95 and 98 to 100 under 35 U.S.C. § 103(a) as unpatentable over the combined teachings of Challener and Tawara as applied to claims 92, 93 and 106 , further combined with Kluger.

VI. Claims 96 and 97 under 35 U.S.C. § 103(a) as unpatentable over the combined teachings of Challener, Tawara and Kluger as applied to claims 92, 93 and 106, further combined with Signer.

VII. Claims 107 to 118, 123 to 125, 130 to 135, 137 to 140 and 143 to 149 under 35 U.S.C. § 103(a) as unpatentable over Challener.

VIII. Claims 119, 120, 126 and 127 under 35 U.S.C. § 103(a) as unpatentable over Challener as applied to claims 107 to 118, 123 to 125, 130 to 135, 137 to 140 and 143 to 149, further combined with Imano.

IX. Claims 121 and 122 under 35 U.S.C. § 103(a) as unpatentable over Challener as applied to claims 107 to 118, 123 to 125, 130 to 135, 137 to 140 and 143 to 149, further combined with Sproul.

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X. Claims 128 and 129 under 35 U.S.C. § 103(a) as unpatentable over Challenger as applied to claims 107 to 118, 123 to 125, 130 to 135, 137 to 140 and 143 to 149, further combined with Kugler.

XI. Claims 136, 141 and 142 under 35 U.S.C. § 103(a) as unpatentable over Challenger as applied to claims 107 to 118, 123 to 125, 130 to 135, 137 to 140 and 143 to 149, further combined with Tawara.

DECISION

We have carefully reviewed the claims, specification and applied prior art, including all of the arguments advanced by both the Examiner and Appellant in support of their respective positions. We affirm the rejection under 35 U.S.C. § 103(a) of claims 91, 98, 99 and 103 to 105 over the combined teachings of Challenger and Kim; the rejection under 35 U.S.C. § 103(a) of claims 95 and 100 over the combined teachings of Challenger, Kim and Kluger; the rejection under 35 U.S.C. § 103(a) of claims 96 and 97 over the combined teachings of Challenger, Kim, Kluger and Signer; the rejection under 35 U.S.C. § 103(a) of claims 107 to 118, 123 to 125, 130 to 135, 137 to 140 and 143 to 149 over Challenger; the rejection under 35 U.S.C. § 103(a) of claims 119, 120, 126 and 127 over the combined teachings of Challenger and Imano; the rejection under 35 U.S.C. § 103(a)

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of claims 128 and 129 over the combined teachings of Challener and Kugler; and the rejection under 35 U.S.C. § 103(a) of claims 136, 141 and 142 over the combined teachings of Challener and Tawara. However, we reverse the rejection under 35 U.S.C. § 103(a) of 92, 93 and 106 under 35 U.S.C. § 103(a) as unpatentable over the combined teachings of Challener and Tawara; the rejection under 35 U.S.C. § 103(a) of claims 94, 95 and 98 to 100 under 35 U.S.C. § 103(a) as unpatentable over the combined teachings of Challener, Tawara and Kluger; the rejection under 35 U.S.C. § 103(a) of claims 96 and 97 over the combined teachings of Challener, Tawara, Kluger and Signer; and the rejection under 35 U.S.C. § 103(a) of claims 121 and 122 over the combined teachings of Challener and Sproul.

Rather than reiterate the conflicting viewpoints advanced by the Examiner and the Appellant concerning the above-noted rejection, we refer to the Answer and the Briefs.

DISCUSSION

We have carefully reviewed the claims, specification and applied prior art, including all of the arguments advanced by both the Examiner and Appellant in support of their respective positions.

Our initial inquiry is directed to the scope of the claimed subject matter. During patent prosecution, claims are to be given their broadest

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reasonable interpretation consistent with the specification, and the claim language is to be read in view of the specification as it would be interpreted by one of ordinary skill in the art. *In re Morris*, 127 F.3d 1048, 1053-54, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997); *In re Zletz*, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989); *In re Sneed*, 710 F.2d 1544, 1548, 218 USPQ 385, 388 (Fed. Cir. 1983); *In re Okuzawa*, 537 F.2d 545, 548, 190 USPQ 464, 466 (CCPA 1976). We note that independent claims 91 and 92 materials identified by the formula Si_vN_w and $\text{Si}_v\text{N}_w\text{H}_u$ respectively. However, the balance of each claim fails to provide a definition of the variable contained in the formula.² For purposes of appeal, we will interpret the variables of the formula to be at least a positive integer. This interpretation appears to be consistent with the discussion of the silicon materials described in the specification beginning on page 11.

I.

The subject matter of claim 92 requires the depositing of an intermediate layer comprising predominantly $\text{Si}_v\text{N}_w\text{H}_u$ in a reactive gas comprising N and H.

² We note that other claims on appeal contain formula with similar defects.

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In rejecting the subject matter of claim 92, the Examiner relies on the teachings of Challenger and Tawara. Challenger discloses an information carrier comprising at least two solid material interfaces. Challenger does not disclose that silicon nitride hydrogen (SiNH) is a suitable material for the intermediate layer. Challenger also does not disclose the method of applying the intermediate layer. The Examiner relies on Tawara for teaching the application method of a SiNH material. (Answer, pp. 8-11). The Appellant argues, and we agree, that Tawara does not describe the process of the claimed invention. Tawara does not disclose the depositing of the SiNH material by means of a reactive vacuum coating process in a process atmosphere that comprises adjusting the concentration of a reactive gas that comprises N and H. (Brief, pp. 31-32). The Examiner has not cited support for assertion that the reactive gas of Tawara comprises N and H. The Examiner states, Answer pages 19 and 20, that "Appellant admits that there is an implication from Tawara to utilize reactive gases to achieve such compositions." Thus, it appears that the Examiner is asserting that the use of reactive gases comprising N and H is inherent in the teachings of Tawara. However, inherency cannot be established by implications, probabilities or possibilities. See *In re Oelrich*, 666 F.2d 578, 581, 212 USPQ 323, 326 (CCPA 1981). As stated in *In re Rijckaert*, 9 F.3d

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1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (quoting from *In re Spormann*, 363 F.2d 444, 448, 150 USPQ 449, 452 (CCPA 1966)), "That which may be inherent is not necessarily known. Obviousness cannot be predicated on what is unknown."

For the above reasons, and those presented in the Briefs, we cannot sustain the rejection of independent claim 92 and the subject matter of dependent claims 93 to 106.³

II.

The Examiner rejected claims 91, 98, 99 and 103 to 105 under 35 U.S.C. § 103(a) as unpatentable over the combined teachings of Challener and Kim. (Answer, pp. 3-5). We affirm.

Appellant argues that the subject matter of claims 91, 103 and 104 is patentable because Challener and Kim teach that achieving the required high refraction level is difficult. (Brief, pp. 30-31).

It is not disputed that Challener discloses an information carrier comprising at least two solid material interfaces. However, Challener does not disclose the method for producing the intermediate silicon nitride layer. It is also not disputed that Kim describes an information carrier and a

³ Claims 93 to 106 are linking claims that depend directly or indirectly on claim 92. Thus, we reverse the rejection(s) of these claims that depends on claim 92 for patentability.

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method for applying silicon nitride as a protective layer. We agree with the Examiner, Answer page 18, that a person of ordinary skill in the art would have recognized the suitable methods for applying a silicon nitride layer in an information carrier, including the method disclosed in Kim. We note that Appellant, Reply Brief page 3, asserts that refractive index is a characteristic of the layer material and not the layer thickness. There is no dispute that both Challenger and Kim disclose SiN materials that fall within the scope of the claimed invention. Consequently, Appellant's argument regarding the degree of refraction for the intermediate layer of an information carrier is not persuasive. Furthermore, the Appellant has not directed us to evidence that the method of applying the SiN layer produces unexpected results.

Appellant argues that Challenger differs from the present invention in that silicon nitride must be selected from a list of other possible candidates for the intermediate layer. (Reply Brief, p. 2; Brief, p. 22). Appellant's argument is not persuasive. The person of ordinary skill in the art would have recognized that each of the materials disclosed in Challenger would have been suitable for the intermediate layer including silicon nitride.

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The subject matter of claims 98 and 99 further describes the subject matter of claim 91 by describing the reactive vacuum coating as sputtering (claim 98) or magnetron sputtering (claim 99).

Regarding claims 98 and 99, Appellant argues that because of the critical nature of the intermediate layer between information layers, it is not seen how the skilled artisan would reach these claims in an obvious manner from the combination of Challenger and Kim. (Brief, p. 34).

We do not agree. Appellant admits that the Kim reference teaches sputtering processes. (Brief, p. 34). However, Appellant asserts that Kim does not teach doping of the silicon target. This argument is not persuasive because the claimed subject matter does not require the doping of the silicon target.

The subject matter of claim 105 describes a method for producing an information carrier comprising at least two solid material interfaces. The claim specifies that the intermediate layer is deposited to have at least one dielectric layer with a particular optical thickness specified in the claim.

Appellant asserts that the subject matter of claim 105 is unobvious and patentable over the combination of Challenger and Kim. Specifically, on page 36 of the Brief, Appellant states:

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This claim, rejected as obvious from Challener in view of Kim, called for the method of claim[s] 91 [or 92], with a dielectric layer system of at least one layer, where this layer system has an optical thickness which, at least in a first approximation, is $m\lambda_0/4$, where m is an uneven integer of at least unity and where λ_0 is the wavelength of the radiation which is transmitted through the dielectric layer. Here, the thickness of a critical pad (or all) of the intermediate layer is set in terms of the wavelength of the reading or writing radiation (light) for at least the inner information layer. Neither Challener nor Kim suggest this requirement so that their combination can not supply the missing feature in any obvious way.

(Brief, p. 35).

Challener discloses an information carrier comprising at least two solid material interfaces and an intermediate layer that can comprise a silicon nitride material. Challener discloses the intermediate layer can have a thickness of 10 to 150nm. (Col. 4, ll. 67-68). However, Challener does not describe the characteristics of the layer specified by the claimed invention and the method of producing the intermediate layer.

A person of ordinary skill in the art preforming the invention of Challener, i.e., forming an information carrier comprising an intermediate layer with a thickness in the disclosed range of 10-150nm would have been practicing the claimed invention. *Cf. Mehl/Biophille Int'l Corp. v. Milgraum*, 192 F.3d 1362, 1366, 52 USPQ2d 1303, 1307 (Fed. Cir. 1999) ("Where, as here, the result is a necessary consequence of what was deliberately intended, it

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is of no import that the article's authors did not appreciate the results."); *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990) ("It is a general rule that merely discovering and claiming a new benefit of an old process cannot render the process again patentable."); *accord In re Spada*, 911 F.2d 705, 708, 15 USPQ2d 1655, 1657 (Fed. Cir. 1990). Appellant has not established that the intermediate layer of the information carrier of Challenger does not possess the characteristics described in the claims.

The Examiner rejected the subject matter of claims 95 and 100 under 35 U.S.C. § 103(a) as unpatentable over the combined teachings of Challenger, Kim and Kluger. We affirm.

According to Appellant, Kugler teaches the DC with superimposed AC powering of carrier and electrode. Kugler also teaches the applicability of its teaching in general optical devices. (Brief, p. 33).

Appellant argues that in view of the unpredictability of the various techniques to produce layers the person of ordinary skill in this art would not find the subject matter of claim 95 obvious from the combination of Challenger, Kim and Kluger. (Brief, p. 33).

A person of ordinary skill in the art would have recognized the suitable methods for forming layer in an information carrier. A person of ordinary skill in the art would have reasonably expected that the process of

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forming an optical layer disclosed by Kluger would have been suitable for forming a layer in the information carrier of Challenger.

Appellant argues that Kugler does teach doping of the silicon target (Claim 100) as well as sputtering but not ion plating. Appellant argues that because of the critical nature of the intermediate layer between information layers, it is not seen how the skilled artisan would reach these claims in an obvious manner from the combination of Challenger, Kim and Kluger. (Brief, p. 34).

We do not agree. Appellant admits that the Kluger reference teaches doping of the silicon target and sputtering processes. (Brief, p. 34). Appellant's argument is not persuasive because the claimed subject matter discloses ion plating is an alternative to sputtering and magnetron sputtering.

The Examiner rejected claims 96 and 97 under 35 U.S.C. § 103(a) as unpatentable over the combined teachings of Challenger, Kim, Kluger and Signer. We affirm.

Claims 96 and 97 further limit Claim 95 by calling for the pulsing or intermittent interrupting of power. This process is taught by Signer. Appellant argues that Signer seems to have wide application in general but only mentions its usefulness for making optical layers and does not

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mention the more critical requirements of an intermediate layer of an information carrier. Thus, claims 96 and 97 are not believed to be obvious from the combined teachings of Challener, Kim, Kluger and Signer. (Brief, p. 34).

A person of ordinary skill in the art would have recognized the suitable methods for forming layer in an information carrier. A person of ordinary skill in the art would have reasonably expected that the process of forming an optical layer disclosed by Kluger and Signer would have been suitable for forming a layer in the information carrier of Challener.

III.

The Examiner rejected claims 107 to 118, 123 to 125, 130 to 135, 137 to 140 and 143 to 149 under 35 U.S.C. § 103(a) as unpatentable over Challener. We affirm.

The subject matter of claim 107 describes a method for producing an information carrier comprising at least two solid material interfaces. The claim specifies that the intermediate layer is deposited to have at least one dielectric layer with a particular optical thickness specified in the claim.

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Appellant asserts that the subject matter of claim 107 is unobvious and patentable over Challenger. Specifically, on page 36 of the Brief, Appellant states:

Claim 107 is believed to be clearly unobvious and patentable over Challenger because, except for calling for the intermediate layer to contain dielectric material, Challenger is missing the entire novel combination of features claimed, namely: 'depositing the intermediate Layer to have a Layer system with at least one dielectric Layer and with an optical thickness which, at least in a first approximation, is $m \cdot \lambda_0 / 4$, wherein m is an integer of at least unity and is uneven and wherein λ_0 designates the wavelength of said radiation which is transmitted through said at least one dielectric layer and wherein, depending from said m being an integer, m being reduced by an amount of up to 0.6 or increased by an amount of up to 0.2.'

Neither the calculation for the layer thickness is taught by Challenger, nor the expanded tolerance for "m" which makes the method of the claimed invention easier to perform while still producing functional information carriers.

Appellant also presents similar arguments regarding the subject matter of the dependent claims 108 to 118, 123 to 125, 130 to 135, 137 to 140 and 143 to 149 which describe more characteristics of the intermediate layer. (Brief, pp. 36 to 40).

The Examiner asserts that the claims are unpatentable over Challenger. (Answer, pp. 12-13). Challenger discloses an information carrier comprising at least two solid material interfaces and an intermediate layer

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that can comprise a silicon nitride material. Challenger discloses the intermediate layer can have a thickness of 10 to 150nm. (Col. 4, ll. 67-68). However, Challenger does not describe the characteristics of the layer specified by the claimed invention and the method of producing the intermediate layer.

A person of ordinary skill in the art performing the invention of Challenger, i.e., forming an information carrier comprising an intermediate layer with a thickness in the disclosed range of 10-150nm would have been practicing the claimed invention. *Cf. Mehl/Biophile Int'l Corp. v. Milgram*, 192 F.3d 1362, 1366, 52 USPQ2d 1303, 1307 (Fed. Cir. 1999) ("Where, as here, the result is a necessary consequence of what was deliberately intended, it is of no import that the article's authors did not appreciate the results."); *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990) ("It is a general rule that merely discovering and claiming a new benefit of an old process cannot render the process again patentable."); *accord In re Spada*, 911 F.2d 705, 708, 15 USPQ2d 1655, 1657 (Fed. Cir. 1990). Appellant has not established that the intermediate layer of the information carrier of Challenger does not possess the characteristics described in the claims.

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The Examiner rejected claims 119, 120, 126 and 127 under 35 U.S.C. § 103(a) as unpatentable over the combination of Challenger and Imaino.

We affirm.

The claims further define the subject matter of claim 107 by specifying that the intermediate layer comprises a spacer layer that can be made of glue or laquer. The Examiner relies on the Imaino reference for describing an optically transparent cement spacer layer. According to the Examiner, the cement spacer layer would aid in holding the information carrier together. (Answer, pp. 12-15).

Appellant argues that the subject matter of claims 119 and 120 is patentable because neither Challenger nor Imaino discusses the criterion for the intermediate layer thickness as a function of wavelength. This argument is the same as presented for claim 107. This argument is not persuasive for the reasons discussed above.

Appellant argues that the subject matter of claims 126 and 127 is patentable because while Imaino teaches the usefulness of cement spacer layers even in the critical intermediate layer between information layers, Imaino does not suggest the combination of reflective layers and Challenger only uses its reflective Layer behind the full thickness of both its information layers.

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Appellant's argument is not persuasive. Appellants have not addressed the motivation presented by the Examiner. A person of ordinary skill in the art would have reasonably expected that the optical cement spacer layers disclosed in the information carrier of Imaino could also have been used in the information carrier of Challenger. "For obviousness under § 103, all that is required is a reasonable expectation of success." *In re O'Farrell*, 853 F.2d 894, 904, 7 USPQ2d 1673, 1681 (Fed. Cir. 1988). Claims 123-127 are therefore also believed to be unobvious from the cited reference or reference combination.

The Examiner rejected claims 121 and 122 under 35 U.S.C. § 103(a) as unpatentable over combination of Challenger and Sproul. We reverse.

Claims 121 and 122 further define the subject matter of claim 107 by specifying that the intermediate layer comprises ZrN, HfN or TiN (claim 121) or ZrN (claim 122). The Examiner relies on the Sproul reference for describing a layer comprises ZrN. According to the Examiner, Sproul discloses depositing ZrN in an nitrogen atmosphere to provide a protective hardness layer. (Answer, p. 16). We agree with Appellant that Sproul teaches ZrN, HfN or TiN, column 8, as suitable for hard layers of metal cutting tools and that no optical properties are discussed or contemplated by Sproul. (Brief, p. 23). Moreover, the Examiner has not explained why

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having hardness properties in an intermediate layer of an optical carrier would have been beneficial. In evaluating the references, the Examiner may not pick and choose from anyone reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such a reference fairly suggests to one of ordinary skill in the art. *See In re Kamm*, 452 F.2d 1052, 1056-57, 172 USPQ 298, 301-02 (CCPA 1972).

Claims 128 and 129 under 35 U.S.C. § 103(a) as unpatentable over combination of Challenger and Kugler. We affirm.

Claims 128 and 129 further define the subject matter of claim 107 by specifying that the intermediate layer comprises a doping material. The Examiner relies on the Kugler reference for describing a silicon material doped to increase conductivity. According to the Examiner a phosphorus doping material leads to a lower tendency of arcing and splashing at the poisoned target. (Answer, pp. 5-6).

The Appellant acknowledges that Kugler teaches phosphorous as a doping material. (Brief, p. 40). However, Appellant asserts that Kugler does not contemplate the rigors of an intermediate layer between two information layers.

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Appellant's position is not persuasive because Appellant has not addressed the motivation presented by the Examiner for combining the cited references. Obviousness cannot be rebutted by attacking references individually where the rejection is based upon the teachings of a combination of references. A reference must be read, not in isolation, but for what it fairly teaches in combination with the prior art as a whole. *In re Merck & Co.*, 800 F.2d 1091, 1097, 231 USPQ 375, 380 (Fed. Cir. 1986).

The Examiner rejected claims 136, 141 and 142 under 35 U.S.C. §103(a) as unpatentable over combination of Challener and Tawara. We affirm.

Claims 136, 141 and 142 further define the subject matter of claim 107 by specifying the amount of Si, C and H components employed in the invention. The Examiner relies on the Tawara reference for describing a silicon carbide containing hydrogen material. (Answer, p. 17). The Examiner acknowledges that Challener and Tawara do not teach specific formulations of the SiCH material. However, the Examiner asserts that the references suggest the use of other formulations. Thus, the Examiner determined that the subject matter of appealed claims would have been *prima facie* obvious to a person having ordinary skill in the art. (Answer, p. 23). We agree.

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It is our judgment that, *prima facie*, one of ordinary skill in the art would have determined through mere routine experimentation the optimum or workable values for the ratio of the Si, C and H components thus arriving at a method encompassed by appealed claims 136, 141 and 142. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) (“ [W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.”).

OTHER ISSUES

Prior to further prosecution or disposition of the present application, the Examiner should ensure that the claims, including 91 and 92, contain the appropriate values for the variables contained therein.

CONCLUSION

We affirm the rejection under 35 U.S.C. § 103(a) of claims 91, 98, 99 and 103 to 105 over the combined teachings of Challener and Kim; the rejection under 35 U.S.C. § 103(a) of claims 95 and 100 over the combined teachings of Challener, Kim and Kluger; the rejection under 35 U.S.C. § 103(a) of claims 96 and 97 over the combined teachings of Challener, Kim, Kluger and Signer; the rejection under 35 U.S.C. § 103(a) of claims 107 to 118, 123 to 125, 130 to 135, 137 to 140 and 143 to 149 over Challener; the

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rejection under 35 U.S.C. § 103(a) of claims 119, 120, 126 and 127 over the combined teachings of Challener and Imaino; the rejection under 35 U.S.C. § 103(a) of claims 128 and 129 over the combined teachings of Challener and Kugler; and the rejection under 35 U.S.C. § 103(a) of claims 136, 141 and 142 over the combined teachings of Challener and Tawara.

We reverse the rejection under 35 U.S.C. § 103(a) of 92, 93 and 106 under 35 U.S.C. § 103(a) as unpatentable over the combined teachings of Challener and Tawara; the rejection under 35 U.S.C. § 103(a) of claims 94, 95 and 98 to 100 under 35 U.S.C. § 103(a) as unpatentable over the combined teachings of Challener, Tawara and Kluger; the rejection under 35 U.S.C. § 103(a) of claims 96 and 97 over the combined teachings of Challener, Tawara, Kluger and Signer; and the rejection under 35 U.S.C. § 103(a) of claims 121 and 122 over the combined teachings of Challener and Sproul.

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