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 KUNIHIKO MITA, KAZUHIKO TOMARU,
YOSHITAKA AOKI and HIRONAO FUJIKI

Appeal No. 2006-1352
Application 10/250,683

HEARD: July 11, 2006

Before FRANKFORT, WARREN and BAHR, *Administrative Patent Judges*.

WARREN, *Administrative Patent Judge*.

Decision on Appeal

This is an appeal under 35 U.S.C. § 134 from the decision of the examiner finally rejecting claims 1 through 5 and 7 through 20, all of the claims in the application.

Claims 1 and 10 illustrate appellants' invention of a heat dissipating member, and are representative of the claims on appeal:

1. A heat dissipating member which is disposed between a heat generating electronic component which when operated generates heat and reaches a temperature higher than room temperature and a heat dissipating component, wherein the heat dissipating member is non-fluid in a room temperature state prior to operation of the electronic component and acquires a low viscosity, softens or melts under heat generation during operation of the electronic component to fluidize at least a surface thereof so as to fill between the electronic component and the heat dissipating component without leaving any substantial voids, and the heat dissipating member is formed of a composition comprising a silicone resin and a heat conductive filler, and

wherein the heat conductive filler is a mixture of a filler having an average particle size of 0.1 to 5 μm and a filler having an average particle size of 5 to 25 μm.

10. A heat dissipating member which is disposed between a heat generating electronic component which when operated generates heat and reaches a temperature higher than room temperature and a heat dissipating component, wherein the heat dissipating member is non-fluid in a room temperature state prior to operation of the electronic component and acquires a low viscosity, softens or melts under heat generation during operation of the electronic component to fluidize at least a surface thereof so as to fill between the electronic component and the heat dissipating component without leaving any substantial voids, and the heat dissipating member is formed of a composition comprising a silicone resin and a heat conductive filler, and

wherein said silicone resin contains, in the molecule, $RSiO_{3/2}$ units (T units) and $R_2SiO_{2/2}$ units (D units) wherein R is a substituted or unsubstituted monovalent hydrocarbon radical having 1 to 10 carbon atoms in a ratio of T units to D units being 20:80 to 80:20.

The references relied on by the examiner are:

Sato et al. (Sato)	3,974,122	Aug. 10, 1976
Hayase et al (Hayase)	5,998,509	Dec. 7, 1999
Mine et al. (Mine)	6,040,362	Mar. 21, 2000

The examiner has rejected claims 1 through 5 and 7 through 9 under 35 U.S.C. § 103(a) as being unpatentable over Mine in view of Hayase (answer, pages 3-5),[1] and claims 10 through 20 under 35 U.S.C. § 103(a) as being unpatentable over Mine in view of Sato (answer, pages 5-7).

Appellants argue independent claim 1 with respect to the first ground of rejection (brief, pages 11-14; reply brief, pages 8-10) and argue independent claims 10 and 15 as a group with respect to the second ground of rejection (brief, pages 11-14; reply brief, pages 8-10). Thus, we decide this appeal based on claims 1 and 10 as representative of the grounds of rejection and appellants' grouping of claims. 37 CFR § 41.37(c)(1)(vii) (September 2004).

We affirm.

We refer to the answer and to the brief and reply brief[2] for a complete exposition of the positions advanced by the examiner and appellants.

Opinion

---

[1] The examiner states the ground of rejection as involving "[c]laims 1-9" (answer, page 3) even though claim 6 was canceled in the amendment filed August 18, 2004.

[2] An appeal, whether on brief or heard, is decided on the record. 37 CFR § 41.37(c)(1)(vii) (September 2004) provides in pertinent part: "Any arguments or authorities not included in the brief or reply brief filed pursuant to § 41.41 will be refused consideration by the Board, unless good cause is shown." See also Manual of Patent Examining Procedure §§ 1205.02 and 1209 (8th ed., Rev. 3, August 2005; 1200-14 and 1200-48).

Our review of the examiner's application of prior art to claims 1 and 10 requires that we interpret the claims by giving the terms thereof the broadest reasonable interpretation in their ordinary usage in context as they would be understood by one of ordinary skill in the art in light of the written description in the specification unless another meaning is intended by appellants as established therein, and without reading into the claims any disclosed limitation or particular embodiment. *See, e.g., In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364, 70 USPQ2d 1827, 1830 (Fed. Cir. 2004); *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997); *In re Zletz*, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989).

The language of claim 1 specifies a "heat dissipating member" which is of any form that can be disposed in any manner between an electronic component that generates heat at any temperature higher than "room temperature" and a heat dissipating component. We interpret the language specifying the location in which the heat dissipating member is disposed as a statement of intended use. In this respect, the language specifies that the heat dissipating member must be susceptible to such disposition, and has the properties of being "non-fluid" at "room temperature" but "acquires a low viscosity, softens or melts" to any extent that will "fluidize at least a surface" of any area to any extent, at "a temperature higher than room temperature" when any manner of "electronic component" is in operation, and thus "fill between" the components "without leaving any substantial voids" at some point in time. These requirements must be given weight as limitations which characterize the claimed heat dissipating member in order to give meaning to the claim and properly define the invention. *See generally In re Fritch*, 972 F.2d 1260, 1262, 23 USPQ2d 1780, 1781 (Fed. Cir. 1992) (citing *Perkin-Elmer Corp. v. Computervision Corp.*, 732 F.2d 888, 896, 221 USPQ 669, 675 (Fed. Cir.), cert. denied, 469 U.S. 857[, 225 USPQ 792] (1984)); *Corning Glass Works v. Sumitomo Elec. U.S.A., Inc.*, 868 F.2d 1251, 1257, 9 USPQ2d 1962, 1966 (Fed. Cir. 1989), *In re Stencel*, 828 F.2d 751, 754-55, 4 USPQ2d 1071, 1073 (Fed. Cir. 1987).

In considering these limitations, we do not find the term "room temperature" defined in the specification, and thus consider this temperature to be generally in the range of 68°F to 75°F, which is 20°C to 23.9°C. There is also no definition or other disclosure which describes a "temperature higher than room temperature" at which the electronic component operates and thus, to which the heat dissipating member would be subjected when the unspecified "electronic

component" is in operation. Therefore, a heat dissipating member would be encompassed by the claims if it exhibits the specified properties in the presence of *any* "electronic component" which in operation provides "a temperature higher than room temperature" at which point the heat dissipating member would exhibit the specific characteristics.[3]

The language of claim 1 further specifies that the heat dissipating member is "formed" from a composition comprising at least any amount of any manner of silicone resin and any amount of any manner of heat conductive filler, "wherein the heat conductive filler is a mixture of a filler having an average particle size of 0.1 to 5 µm and a filler having an average particle size of 5 to 25 µm," to the extent that the composition provides the member with the properties specified in the claim as we found above. We find no basis in the language of claim 1 or in the written description in the specification (see, e.g., page 4, l. 36, to page 5, l. 9) on which to read any other limitation(s) on the composition and thus, the heat dissipating member, into the claim. Indeed, the specification discloses that the composition can contain, for example, silicone resins that are curable by any manner of reaction, heat conductive filler that can be surface treated, other silicone materials, such as silicone oils and gums, and other additive, such as silicone resins imparting flexibility and tack to attach the heat dissipating member to the components, and catalysts which facilitate the curing reactions, such as platinum catalysts (e.g., pages 6-8 and 9-10). The claim is open to compositions containing such additional ingredients by the use of the open-ended term "comprising." *See generally*, *Exxon Chem. Pats., Inc. v. Lubrizol Corp.*, 64 F.3d 1553, 1555, 35 USPQ2d 1801, 1802 (Fed. Cir. 1995) ("The claimed composition is defined as comprising - meaning containing at least - five specific ingredients."); *In re Baxter*, 656 F.2d 679, 686-87, 210 USPQ 795, 802-03 (CCPA 1981) ("As long as one of the monomers in the reaction is propylene, any other monomer may be present, because the term 'comprises' permits the *inclusion* of other steps, elements, or materials."). The limitation on the average particle size distribution of the heat conductive fillers is satisfied by a single filler, having one or several shapes and/or otherwise provides a bimodal distribution of particles sizes falling within

[3] To the extent that the cited claim language is intended by appellants as a "method or process of use" limitation, such a limitation has no place in a product claim. *See In re Wiggins*, 397 F.2d 356, 359 n.4, 158 USPQ 199, 201-02 n.4 (CCPA 1968).

the specified ranges, as well as by different fillers, regardless of shape. We note that the two average particles size ranges overlap at the upper and lower ends, respectively, that is, at 5 µm.

The language of the first clause of claim 10 is the same as that of the first clause of claim 1. Claim 10 limits the "silicone resin" by specifying that it "contains" at least some amount of $RSiO_{3/2}$ units (T units) and $R_2SiO_{2/2}$ units (D units), with the ratio of units as stated. We interpret the term "contains" as open-ended in the same manner as "comprising," thus permitting the presence of other any other unit in any amount in the "silicone resin" in the same manner as the term "comprising" used to describe such silicone resins which contain additional units in the specification (page 5, l. 18). *See In re Panagrossi*, 277 F.2d 181, 185, 125 USPQ 410, 413 (CCPA 1960) (interpretation of phrase with term "containing"); *cf. Exxon Chem. Pats.*, 64 F.3d at 1555, 35 USPQ2d at 1802. The "R" group of the specified units can be hydrocarbon radicals "substituted" with any manner of substituent including reactive substituents and linkages to other polymeric moieties.

We have carefully reviewed the record on this appeal and based thereon find ourselves in agreement with the supported position advanced by the examiner that, *prima facie*, the claimed heat dissipating member encompassed by claim 1 and by claim 10 would have been obvious over the combined teachings of Mine and Hayase and of Mine and Sato, respectively, to one of ordinary skill in this art at the time the claimed invention was made. Accordingly, since a *prima facie* case of obviousness has been established by the examiner, we again evaluate all of the evidence of obviousness and nonobviousness based on the record as a whole, giving due consideration to the weight of appellants' arguments in the brief and reply brief. *See generally*, *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992); *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984).

We find that appellants acknowledge in the written description in the specification that it was known in this art to use a flexible heat conductive sheet, which can be made of heat conductive silicone rubber, and heat conductive grease between a heat generating electronic component and a heat sink for efficient transfer of heat between the two (page 2, ll. 17-29).[4] We

[4] *See In re Nomiya*, 509 F.2d 566, 570-71, 571 n.5, 184 USPQ 607, 611, 611 n.4 (CCPA 1975) ("We see no reason why appellants' representations in their application should not be accepted at face value as admissions that Figs. 1 and 2 may be considered "prior art" for any purpose,

find that Mine would have disclosed to one of ordinary skill in this art that silicone polymers, such as silicone oils and silicone resins, are used in compositions containing heat conducting metal powders which can be used in the form of a heat conducting sheet or grease between a heat generating electronic component and a heat sink component to connect the two components for efficient heat dissipation, as well as for the sealing or filling of such components (e.g., col. 1, ll. 50-63, and col. 8, ll. 21-41). Mine specifically would have taught curable silicone polymers which can be cured by different reactions, and discloses compositions containing different organopolysiloxane resins which contain at least two alkenyl hydrocarbon radicals and at least two hydrogen atoms bonded to silicon atoms, respectively, and a hydrosilyation reaction catalyst, the composition cured by the hydrosilyation reaction "at relatively low temperatures" (e.g., col. 2, l. 64, to col. 3, l. 12).

Among the required organopolysiloxanes containing two alkenyl hydrocarbon radicals, which can be vinyl radicals, are such organosiloxanes containing, among other units, $RSiO_{3/2}$ units and/or $R_2SiO_{2/2}$ units, wherein the R group is a substituted or unsubstituted monovalent hydrocarbon group (e.g., col. 3, ll. 10-28). The hydrosilylation catalyst can be a platinum catalyst (e.g., col. 4, ll. 44-58). The compositions can contain additional components, such as adhesion promoting silicone resins, curing inhibitors, organic fillers (e.g., col. 5, l. 10, to col. 6, l. 63). The heat conducting metal particles can be, for example, aluminum and copper as well as the oxides and nitrides thereof which can be of any shape; can be surface treated; can be used in a mixture of two or more different metals; can be used in a mixture of two or more different shapes of the same metal; and can have a mean particle size in the range of 0.1 to 50 µm, with mean particle sizes of 5 µm and 10 µm exemplified (e.g., col. 6, l. 64, to col. 8, l. 20, Reference Examples 1-4). We find that the mean particle size would have been considered by one of ordinary skill in this art to indicate the average particle size of the heat conducting filler particles.

---

including use as evidence of obviousness under § 103. [Citations omitted.] By filing an application containing Figs. 1 and 2, labeled prior art, *ipsissimis verbis*, and statements explanatory thereof, appellants have conceded what is to be considered as prior art in determining obviousness of their improvement.").

A rubber-form cured heat-conducting silicone polymer which can be used as a heat dissipating member prepared from such a heat-conducting silicone polymer composition is illustrated in Mine Practical Examples 1-3 (particularly col. 10, ll. 38-43 and 53-8, col. 11, ll. 58-66, and Table 2). The composition of Mine Practical Example 3 contains a mixture of flake-form aluminum particles with a mean particle size of 10 µm (Reference Example 2) and substantially spherical aluminum powder with a mean particle size of 5 µm (Reference Example 3). This mixture of heat conducting filler particles which would have been recognized by one of ordinary skill in this art as providing a bimodal distribution of mean particle sizes and thus average particles sizes (col. 11, ll. 20-22). Indeed, the average particles sizes of the different shaped aluminum particles fall within the claimed bimodal ranges.[5]

We find that Mine thus provides substantial evidence supporting the examiner's finding that Mine would have expressly disclosed to one of ordinary skill in this art all of the limitations of the heat dissipating member and composition specified in appealed claim 1 except for the specified bimodal distribution average particle size ranges of the heat conductive filler (answer, page 4), and all of the limitations of the heat dissipating member and composition specified in claim 10 expect for the ratio of $RSiO_{3/2}$ units (T units) to $R_2SiO_{2/2}$ units (D units) (answer, page 6). With respect to claim 1, the examiner submits that, *prima facie*, Hayase would have taught this person to use particle sizes for the heat conductive filler within the teachings of Mine which provide efficient heat conduction (answer, page 5). We found above that Mine would have disclosed that the average size of the heat conductive filler particles can fall within the claimed ranges using a mixture of such particles or a mixture of different shapes of a single such particle, resulting in a bimodal distribution. We find that Hayase would have disclosed to one of ordinary skill in this art a resin composition for encapsulating a semiconductor device which contains an epoxy resin, a polysiloxane resin curing agent therefor, and an organic filler which can be aluminum oxide and aluminum nitride (e.g., col. 2, l. 22, to col. 17, l. 37). Hayase would have taught that in the encapsulation of a chip mounted on a substrate, the space between the

[5] We affirm the examiner's grounds of rejection under 35 U.S.C. § 103(a) and thus do not reach the issue of whether Mine Practical Example 3 constitutes an anticipation of at least claim 1 within the meaning of 35 U.S.C. § 102(b). This issue should be addressed upon any further

semiconductor element and the substrate can be filled by determining a workable or optimum maximum particle size and average particle size for the organic filler based on the height of the space, which is generally in the range of 50 µm to 150 µm, and on the viscosity of the composition to reasonably fill the space, disclosing a maximum particle size of 30 µm or less and an average particle size range of 0.5 µm to 50 µm for this purpose (e.g., col. 17, l. 49, to col. 18, l. 10, and col. 28, ll. 44-66; see also col. 24, ll. 30-36, col. 28, l. 66, to col. 29, l. 3, col. 30, l. 55, to col. 31, l. 10).

We find substantial evidence in the combined teachings of Mine and Hayase supporting the examiner's determination. Indeed, one of ordinary skill in this art would have recognized from the description and illustration of the heat conductive filler particles, including the bimodal distribution of particle sizes, in Mine that different mean or average particle sizes can be used in the same silicone resin containing compositions taught by the reference. This person would have further been taught by Hayase that the average particle size of such fillers can be varied based on the height of the space between electronic components to be filled by a composition and the desired viscosity of such a composition used for similar purpose disclosed by this reference. Thus, *prima facie*, the combined teachings of the reference would have taught this person that the optimum or workable range of particle sizes, whether characterized as mean or average, for the silicone resin containing compositions of Mine can be determined by routine experimentation as evinced by Mine and Hayase. Accordingly, one of ordinary skill in this art would have reasonably arrived at the claimed invention encompassed by appealed claim 1 without recourse to appellants' specification. *See In re Aller*, 220 F.2d 454, 456-58, 105 USPQ 233, 235-37 (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.").

With respect to claim 10, the examiner submits that, *prima facie*, Sato would have taught one of ordinary skill in the art to employ a ratio of $RSiO_{3/2}$ units (T units) and $R_2SiO_{2/2}$ units (D units) that falls within the claimed range (answer, pages 6-7). Mine would have specifically disclosed "organopolysiloxanes having $R_2SiO_{2/2}$ units and $RSiO_{3/2}$ units, [and] organopolysiloxanes having $R_2SiO_{2/2}$ units and $RSiO_{3/2}$ units and $SiO_{4/2}$ units," which must

---

prosecution of the appealed claims before the examiner subsequent to the disposition of this

contain alkenyl groups, such as vinyl groups, (col. 3, ll. 10-14, 20-22 and 26-28). These silicone resins are used in compositions which are cured via the hydrosilylation reaction using a platinum catalyst with heat. The compositions would be encompassed by claim 10 if the $RSiO_{3/2}$ units (T units) and $R_2SiO_{2/2}$ units (D units) are used in the claimed ratio range. We find that Sato would have disclosed to one of ordinary skill in this art heat curable resin molding compositions containing two organosiloxanes each having $R^1SiO_{1.5}$ units and $R_2{}^1SiO$ units corresponding to the claimed T and D units, respectively, as well as vinyl groups (e.g., col. 2, ll. 38-43 and 50-54). These units are used in certain molar fractions of 0.5 to 0.95 T units and 0.05 to 0.35 D units in the first organosiloxane and 0.0 to 0.6 T units and 0.07 to 0.998 D units in the second organosiloxane, from which it appears that the T units form the preponderance of the first organosiloxanes and the D units form the preponderance of the second organosiloxanes (e.g., col. 2, ll. 43-46 and 56-58). Sato uses the organosiloxanes in compositions containing a platinum catalyst and optionally containing additives including alumina (e.g., col. 7, ll. 46-68). Sato would have taught curing such compositions (e.g., col. 8, ll. 60-66) in the same and similar manner to the compositions and curing reaction taught therefor by Mine. Sato would have disclosed that the moldings obtained have dimensional stability or small thermal expansion coefficients (e.g., col. 1, ll. 10-13).

We find substantial evidence in the combined teachings of Mine and Sato supporting the examiner's determination with respect to claim 10. Indeed, Sato would have reasonably suggested to one of ordinary skill in this art that the ratio of T units to D units affects the properties of the cured resin composition. We find that the ratio of T units to D units disclosed by Sato overlaps the claimed ratio of T units to D units. On this record, we determine that, *prima facie*, the combined teachings of Mine and Sato would have reasonably suggested to one of ordinary skill in this art to use organosiloxanes having different molar fraction ratios of T and D units in the compositions of Mine as suggested by Sato in the reasonably expectation of obtaining desired properties in the heat conductive sheets of Mine by routine experimentation. Thus, one of ordinary skill in this art routinely following the combined teachings of the references would have reasonably arrived at the claimed invention encompassed by appealed

---

appeal.

claim 10 without recourse to appellants' specification. *See, e.g., In re Boesch*, 617 F.2d 272, 273-75, 205 USPQ 215, 216-18 (CCPA 1980) ("[T]he prior art would have suggested 'the kind of experimentation necessary to achieve the claimed composition, including the proportional balancing [of ingredients] described by appellants Nv equation.' This accords with the rule that discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. [Citations omitted.]").

We are not convinced that appellants have rebutted the *prima facie* case of obviousness with respect to either ground of rejection. Appellants submit that the combination of Mine with Hayase or with Sato, even if made by one of ordinary skill in the art, would not have described or suggested the limitations of the heat dissipating member which we recognized in the first clause of claims 1 and 10 (*see above* pp. 3-4 and 5). In this respect, appellants allege that Mine would not have disclosed "that their polymer composition is placed between a heat source and heat sink or fill a void or space therebetween," and that the reference discloses only that the disclosed compositions are "useful as a heat-conducting insulating bonding agent for . . . electrical and electronic applications" (reply brief, page 7). Appellants further submit that even if combined, the teachings of Mine and Hayase and of Mine and Sato would not have suggested the modifications to Mine that would result in the heat dissipation member encompassed by claims 1 and 10.

The difficulty that we have with appellants' position is that as we found above, Mine in fact would have disclosed to one of ordinary skill in this art a heat dissipating member in the form of a heat conducting sheet for disposition between an electronic component which would generate heat at a temperature above room temperature and a heat sink in order to transfer heat therebetween, and would have illustrated this disclosure in Mine Practical Examples 1-3, of which Practical Example 3 reasonably appears to fall within at least claim 1. Thus, it would have reasonably appeared to this person that the sheet would be "non-fluid in a room temperature state." It would also have reasonably appeared to this person that that the heat conducting sheet disclosed by Mine would have at least softened at some point above room temperature, and in any event would have expanded at the elevated temperature. This person would have further recognized that whether the sheets would have done so in a particular electronic device would depend on the temperature generated by the electronic component of

that device. That the sheet may not "acquires a low viscosity, softens or melts . . . to fluidize at least a surface . . . to fill between the electronic component and the heat dissipating component without leaving any substantial voids" at some point in time in said particular device is not dispositive of the issue of whether the sheet meets this limitation of claims 1 and 10 as we interpreted these claims above. We are reinforced in our view by the disclosure in Mine of the same or similar organosiloxanes having the same or similar units that are used in the same or similar compositions containing the same or similar heat conductive filler particles and other components, such as catalysts, to prepare the same or similar heat conducting sheets for disposing between components of an electronic device as disclosed in the written description in appellants' specification.

Furthermore, we find that one of ordinary skill in this art would have reasonably combined Mine with each of Hayase and Sato in view of the related disclosures in each combination of references that we found above. *See generally*, *In re Kahn*, 441 F.3d 977, 985-88, 78 USPQ2d 1329, 1334-37 (Fed. Cir. 2006). Indeed, the difference between the claimed heat conductive sheets encompassed by claims 1 and 10 and the heat conductive sheets of Mine is in the overlapping ranges of the average particle sizes of the heat conductive filler and in the ratio range of certain units in organosiloxane resins which can be present in the compositions from which the sheets are derived.

Thus, the burden has shifted to appellants to establish by affective argument and/or objective evidence to patentably distinguish the claimed heat dissipating members encompassed by claims 1 and 10 over the heat dissipating members disclosed by Mine even though Mine does not expressly state the limitations in the first clause of each of the claims, and the basis for the grounds of rejection is § 103(a). *See, e.g.*, *In re Best*, 562 F.2d 1252, 1255-56, 195 USPQ 430, 433-34 (CCPA 1977) ("Where, as here, the claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes, the PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product. See *In re Ludtke*, [441 F.2d 660, 169 USPQ 563 (CCPA 1971)]. Whether the rejection is based on 'inherency' under 35 USC 102, on 'prima facie obviousness' under 35 USC 103, jointly or alternatively, the burden of proof is the same, and its fairness is evidenced by the PTO's inability to manufacture products or to obtain and

compare prior art products. [Footnote and citation omitted.]"); *In re Skoner*, 517 F.2d 947, 950-51, 186 USPQ 80, 82-83 (CCPA 1975) ("Appellants have chosen to describe their invention in terms of certain physical characteristics . . . . Merely choosing to describe their invention in this manner does not render patentable their method which is clearly obvious in view of [the reference]. [Citation omitted.]"); *cf. In re Spada*, 911 F.2d 705, 708-09, 15 USPQ2d 1655, 1657-58 (Fed. Cir. 1990) ("The Board held that the compositions claimed by Spada 'appear to be identical' to those described by Smith. While Spada criticizes the usage of the word 'appear', we think that it was reasonable for the PTO to infer that the polymerization by both Smith and Spada of identical monomers, employing the same or similar polymerization techniques, would produce polymers having the identical composition.").

Furthermore, appellants also have the burden of establishing the criticality of the claimed ranges specified in each of claims 1 and 10 over the ranges taught in the prior art such as by a showing of unexpected results. *See In re Woodruff*, 919 F.2d 1575, 1577-78, 16 USPQ2d 1934, 1936-37 (Fed. Cir. 1990) ("The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims. [Citations omitted.] These cases have consistently held that in such a situation, the applicant must show that the particular range is *critical*, generally by showing that the claimed range achieves unexpected results relative to the prior art range. [Citations omitted.]"); *Boesch*, 617 F.2d at 276, 205 USPQ 215, 219; *Aller*, 220 F.2d at 456, 105 USPQ at 235.

Appellants have not relied on any evidence in the brief or reply brief which addresses either burden. Appellants make the bare allegations that the Mine Examples do not use resins which result in the properties specified in the first clause of claims 1 and 10 (brief, e.g., page 6; reply brief, e.g., page 6-7). Such unsupported allegations are entitled to little, if any, weight. *See In re Payne*, 606 F.2d 303, 315, 203 USPQ 245, 256 (CCPA 1979); *In re Lindner*, 457 F.2d 506, 508, 173 USPQ 356, 358 (CCPA 1972). In any event, we found above that the Mine Practical Examples make clear that the silicone resins used therein result in a "rubber-form" heat conducive sheet, and indeed, appellants have not shown that the specific resins are outside of the scope of the appealed claims.

Accordingly, based on our consideration of the totality of the record before us, we have weighed the evidence of obviousness found in the combined teachings of Mine and Hayase and

of Mine and Sato with appellants' countervailing evidence of and argument for nonobviousness and conclude that the claimed invention encompassed by appealed claims 1 through 5 and 7 through 20 would have been obvious as a matter of law under 35 U.S.C. § 103(a).

The examiner's decision is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv) (2005).

AFFIRMED

CHARLES E. FRANKFORT Administrative Patent Judge	)	
CHARLES F. WARREN Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
JENNIFER D. BAHR Administrative Patent Judge	)	

Oblon, Spivak, McClelland, Maier & Neustadt, P.C.
1940 Duke Street
Alexandria, VA 22314