

**PATENT COURT
THE THIRD DEPARTMENT
DECISION**

Case No. 2006Heo3496 Scope Confirmation(Patent)

Plaintiff: SKC Co., Ltd.
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Defendant: Rohm and Haas Electronic Materials CMP Holdings, Inc.
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Closure of Hearing: May 18, 2007

Date of Decision: July 13, 2007

ORDER

1. Plaintiff's claim is dismissed.
2. The trial costs shall be borne by the Plaintiff.

Tenor of Claim

In regard to the Korean Intellectual Property Trial and Appeal Board's decision rendered on March 28, 2006 for Case No. 2005Dang616, Plaintiff requests cancellation of the portion relating to the Claims 1, 2, 4, 6, 11, 16, 18, 19 and 28 of Patent No. 195831.

REASONING

1. Backgrounds

A. The Contents of the Invention

1) Patented Invention

- a) Title: Improved Polishing Pad and Methods for Its Use
- b) Application Date/ Registration Date/ Registration Number: December 8, 1995 (priority claim: April 8, 1994) / February 18, 1999/ Patent No. 195831 (hereinafter the Patent)
- c) Patent Holder: Defendant
- d) Scope of the Patent and Drawing

Claim 1: An improved polishing pad having a surface texture or a pattern comprising both large and small flow channels which together permit the transport of polishing slurry containing particles across the surface of the polishing pad (hereafter referred to as Element 1), {said surface texture being produced solely by external means upon the surface of said solid uniform polymer sheet (hereafter referred to as Element 2)}, and comprising a solid uniform polymer sheet with no intrinsic ability to absorb or transport slurry particles (hereafter referred to as Element 3).

Rest of the Claims and Drawings: Provided in Appendix 1.

2) Prior Art: Provided in Appendix 2.

3) Invention to be Compared: Provided in Appendix 3.

B. Decision of the Korean Intellectual Property Trial and Appeal Board

The Plaintiff filed a negative scope trial at the Korean Intellectual Property Trial and Appeal Board (hereinafter the Board) on March

23rd, 2005, claiming that the Invention to be Compared does not fall under the scope of the Patent.

The Board reviewed the filing above under case no. 2005Dang617 and found that the Invention to be Compared falls under the scope of Claims 1, 2, 4, 6, 11, 16, 18 and 19 of the Patent, does not fall under the scope of Claims 3, 5, 7 through 10, 12 through 15, and 17 of the Patent, and is not specified enough to be decided whether it falls under the scope of Claims 20 through 28 of the Patent. Therefore, the Board dismissed plaintiff's arguments relating to Claims 1, 2, 4, 6, 11, 16, 18 and 19, accepted plaintiff's arguments relating to Claims 3, 5, 7 through 10, 12 through 15, and 17 and declined to rule on arguments relating to Claims 20 through 28.

[Evidence] Plaintiff's Exhibits 1 through 4, and all arguments, materials, pieces of evidence submitted to this court.

2. Issues in this case and the Summary of the Parties' Arguments

A. Issues

1) Whether the specification of the Patented Invention properly describes the Patented Invention;

2) Whether the Inventions in Claims 1, 2, 4, 6, 11, 16 and 18 have novelty;

3) Whether the working of the Invention to be Compared indirectly infringes upon Claims 1, 2, 4, 6, 11, 16, 18, 19 through 28, and thus, falls under the scope of each Claim

B. Summary of the Plaintiff's Arguments

1) Regarding Improper Description

Patented Invention cannot have a patented scope since the

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specification does not properly describe the Patented Invention. (However, the plaintiff did not provide specific ground of improper description.)

2) Regarding Novelty

Claim 1 has the technical means of solid uniform polymer sheet with no intrinsic ability to absorb or transport slurry particles as its characteristic, but this means merely reaffirms the evident fact that exclusion of bulk non-uniformity from the pre-existing pad decreases the polishing activity. Hence Claim 1 is technologically insignificant. Also, as the effect of improving the variability of polishing rate has been previously achieved by the use of Prior Art, namely, by continuously providing micro-channels and thereby continuing the consistent channeling of slurry particles, the exclusion of bulk non-uniformity from the pad, which gives a uniform effect over the entire polishing pad, does not particularly affect the variability of polishing rate. In particular, no data on the improvement of variability of polishing rate is provided in the specification of the Patented Invention. In short, the said technical means of Claim 1 is either technologically insignificant or does not improve the effect of the invention, and Claim 1 therefore lacks novelty and cannot have any patented scope.

In addition, Claims 2, 4, 6, 11, 16 and 18 of the Patented Invention lack Inventiveness as they are identical to the technical means stipulated in the Prior Art, have no technical significance, or are merely an addition of a technical means that has already been publicized. Therefore, the Claims above cannot have a patented scope.

3) Regarding whether the Invention to be Compared falls under the scope of the Patent

a) Claim 1

The Invention to be Compared is different from Claim 1 in that the Invention to be Compared includes micro-holes instead of the bulk non

-uniformity of the previously used polishing pad made out of non-uniform polymeric material and that it does not include the small flow channels of Claim 1.

The break-in procedure conducted prior to the use of polishing pad made by the Invention to be Compared (hereafter referred to as the Product at Trial)) and the conditioning procedure conducted concurrently with the use of the polishing pad form stripe indentations on the surface of the polishing pad. However, said conditioning procedure is intended to maintain a certain level of roughness on the surface of the polishing pad and not to form stripe indentations. Thus, the formation of stripe indentations is merely an unintentional event and the stripe indentations are neither uniformly formed over the entire surface of polishing pad nor is a controlling mechanism of polishing rate. Therefore, the use of the Product at Trial cannot be said to result in the small flow channels of Claim 1.

Moreover, the Invention to be Compared produces through the inclusion of micro-holes an advanced effect unattainable by Claim 1.

Therefore, the working of Invention to be Compared neither directly nor indirectly infringes upon Claim 1, and thus the Invention to be Compared cannot be deemed to fall under the scope of Claim 1.

b) Claims 2, 4, 6, 11 and 18

Claims 2, 4, 6, 11 and 18 are dependent claims of Claim 1, and thus, the Invention to be Compared does not fall under the scope of each of the Claims above as long as the Invention to be Compared does not fall under the scope of Claim 1.

c) Claims 19 through 21

Claims 19 through 21 are relating a layered polishing pad including the polishing pad of Claim 1, and Claims 22 through 28 are relating a polishing method using the polishing pad of Claim 1. Therefore, the Invention to be Compared does not fall under the scope of each of the Claims above, as long as the Invention to be Compared does not fall under the scope of Claim 1, which forms the technical characteristic of the Claims above.

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Further, with regard to a layered polishing pad wherein the non-surface layer or layers is substantially more(less) compliant than said surface layer of Claims 20 and 21, the technical element non-surface layer has not been described in Claim 19, which is an independent claim, and the compliance is described in imprecise term such as substantially more(less) compliant, making it unable to understand the technical characteristics. Invention to be Compared does not fall under the scope of a patent if a part of the scope of a patent is either abstract or unclear in such a way that it prevents specifying the technical scope. Therefore, the Board erred in dismissing plaintiff's claim on the grounds that the Invention to be Compared was not sufficiently specified.

3. Decision

A. Improper description of the Patented Invention

Plaintiff, at this court, argues that the specification of the Patented Invention does not properly describe the Patented Invention, but does not specify the ground for such argument. Therefore, this part of the plaintiff's claim shall be deemed groundless. During the proceeding at the Board, the plaintiff argued the following: (1) the description of intrinsic ability to absorb or transport slurry particles in Claims 1, 19 and 22 is ambiguous and not supported by the detailed description of the invention; (2) while the purpose of the Patented Invention is to decrease the variability of polishing pad, and thus the dispersion of the large and small flow channels plays an important role, this aspect is not described in the detailed description of the invention, nor is it specified in Claim 1; (3) in Claim 5, the description widths and depths of large flow channels coexist in various status is ambiguous and not supported by the detailed description; (5) in Claims 20 and 21, relative compliance of surface layer to non-surface layer is not supported by the invention's detailed description; and (6) [sic] in Claims 24 and 27,

the description produced with intervals is ambiguous. However, the Board rejected these claims, and thus, we shall review the Board's decision.

The matter of whether the specification of a patent constitutes an improper description pursuant to Article 42 Clause 4-1 of the Korean Patent Act is to be determined based on whether, with the standard being the level of the technology at the time of the patent application, each claimed scope and the detailed description of the invention corresponds to each other in such a way that a person having ordinary skill in the art in the technical field to which the patented invention belongs would be able to plainly understand the technical composition of the technical elements in the claims and effects of their combination or operation solely from the specification. On the other hand, the matter of whether the specification of a patent is improper under Article 42 Clause 4-2 of the Korean Patent Act is to be determined based on whether there is an element which ultimately makes the scope of the patent unclear, by way of including a term which makes the composition of the invention unclear or by including a use of term incongruous with its definition defined in the detailed description, for instance. Based on these considerations, Claims pointed out above by the plaintiff are neither unsupported by the detailed description nor ambiguous. Therefore, the decision of the Board is not unlawful.

B. Novelty of Claims 1, 2, 4, 6, 11, 16 and 18 Compared to Prior Art

1) Claim 1

a) Comparison in the Objective and Technical Field

Claim 1 aims to produce an improved polishing pad used to create a smooth, ultra-flat surface on items such as glass, semiconductors, dielectric/metal composites and integrated circuits (page 2 of Plaintiff's Exhibit No. 2), whereas Prior Art aims to produce a sheet polishing apparatus and a method that is stable and high in polishing rate regardless of the shape of the wafer.

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Therefore, the two inventions are identical in terms of their objective and technical field, in that they pertain to polishing a pad which levels the surface of items including semiconductor, etc.

b) Comparison in Elements

① Element 1

Element 1 of Claim 1 is having a surface texture or a pattern comprising both large and small flow channels which together permit the transport of polishing slurry containing particles across the surface of the polishing pad, which corresponds to the formation of macrogrooves (47) and microgrooves (50) and polishing pad (21) of the Prior Art.

However, based on the descriptions polishing pad can go under conditioning before polishing procedure by forming multiple cylinder-shaped macro-grooves (Column 5 of Plaintiff's Exhibit No. 4), pad conditioning assembly (30) is provided to form micro-channels(50) on the pad (21). Micro-channels (50) are formed during the planarization of wafers. (Column 4 of Plaintiff's Exhibit No. 4) in the specification of the Prior Art, it can be inferred that the macro-groove (47) and micro-groove (50) of the Prior Art can be retained during the use of the polishing pad as the surface texture moves the polishing slurry on the polishing pad. In such aspect, Element 1 of Claim 1 is identical to the corresponding composition of the Prior Art.

② Element 3

Element 3 of Claim 1 is a solid uniform polymer sheet with no intrinsic ability to absorb or transport slurry particles. Compared to this, specification of the Prior Art merely describes polishing pad (21) is relatively solid polyurethane or similar material which enables the transport of polishing particle including silica particle and its likes, and makes no mention of an intrinsic property of the polishing pad.

However, the background of the invention section of the detailed description of the Patented Invention, after mentioning the Prior Art as preceding reference, describes that the polishing pad notified to the inventors are composite materials or multiphase materials with an

intrinsic micro-texture due to their methods of production. Micro-texture on the surface is induced by carefully introducing bulk non-uniformities during the production of the pad. Aforementioned bulk texture becomes a surface micro-texture when it is exposed by way of cross-sectional cut, polishing or other means. Said micro-texture existing prior to use enables the absorption and transportation of slurry particles, and adds to the pad's polishing activity without the addition of extra micro-texture or macro-texture. (row 5 through 9 of page 3 of Plaintiff's Exhibit No. 2) Based on this description, the polishing pad described above in the Prior Art can be regarded as a non-uniform polymer material containing an intrinsic micro-texture which enables the absorption and transportation of slurry particles described as the preceding technology of the Patented Invention.

Therefore, the Prior Art does not describe or suggest any uniform polymer pad besides the polishing pad as a non-uniform polymer material containing intrinsic micro-texture which enables the absorption and transportation of slurry particles, and thus Element 3 of Claim 1 is an element of composition which does not exist in the Prior Art..

③ Element 2

Element 2 of Claim 1 is that the surface texture being produced solely by external means upon the surface of the solid uniform polymer sheet.

Firstly, the Prior Art does not describe or suggest a uniform polymer sheet as noted above.

Next, a large flow channel and a small flow channel included in the surface texture of Claim 1 and the corresponding macro-grooves (47) and micro-grooves (50) in the Prior Art are same in that they are formed by external means, as stated above regarding Element 1. However, the non-uniform polymer pad disclosed in the Prior Art has an intrinsic micro-texture capable of transporting polishing particles, which means it contains micro-texture that does not rely on external means, and thus is different from Element 2 of Claim 1.

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c) Novelty

As discussed above, Claim 1 is not different from the Prior Art in that it contains large flow channel and small flow channel as the surface structure formed by external means during use of the polishing pad. However, whereas Claim 1 is a uniform polymer without an intrinsic ability to absorb and transport slurry particles, the Prior Art is a non-uniform polymer with such ability, containing an intrinsic micro-texture. Therefore, there is a difference in compositions.

However, the specification of the Patented Invention states the equivalence in polishing activity and notable decrease in the variability of the polishing rate as its effect, and there is no evidence supporting that applying a uniform polymer to the polishing pad is a well-known technology in the relevant technical field. Therefore, the difference in compositions noted above cannot be deemed a mere addition, variation or deletion of a well-known technology that is similarly effective. .

Therefore, the Prior Art does not deny the novelty of Claim 1.

2) Claims 2, 4, 6, 11, 16 and 18

Claims 2, 4, 6, 11, 16 and 18 are dependent claims of Claim 1 and they merely specify the elements of Claim 1 by either adding or limiting elements. Therefore, the inventive step of these dependent claims cannot be denied as long as the inventive step of Claim 1 cannot be denied.

C. Whether the Invention to be Compared is sufficiently Specified such that it may be compared with Claims 20 through 28

Before examining whether the Invention to be Compared falls under the scope of Claim 20 and Claim 28, we will examine whether the Invention to be Compared is sufficiently specified such that it may be compared with the inventions in Claims 20 through 28.

1) Claims 20 and 21

Claims 20 and 21 are both dependent claims of Claim 19. Claim 20 stipulates polishing pads wherein the non-surface layer or layers is substantially more compliant than the surface layer, and Claim 21 stipulates polishing pads wherein the non-surface layer or layers is practically less compliant than said surface layer.

Since there is no element in the Invention to be Compared that may be compared with the compositions of Claims 20 and 21 outlined above, the Invention to be Compared is not sufficiently specified to be compared with Claims 20 and 21.

2) Claims 22 through 28

Claims 22 through 28 pertain to the method of polishing a product's surface using a polishing pad. The Invention to be Compared does not include any element to be compared with the following elements of Claims 22 through 28: wherein polishing slurry containing particles is present on polishing pad and there is relative lateral motion between the article and the pad and including pressing the article.

Therefore, the Invention to be Compared is not sufficiently specified to be compared with Claims 22 through 28.

D. Whether working of Invention to be Compared indirectly infringes upon Claims 1, 2, 4, 6, 11, 16, 18 and 19

1) Indirect Infringement of Claim 1

a) Criteria for Determining Indirect Infringement of a Patent Right

Article 127 item 1 of the Korean Patent Act states that when patent is an invention of a product, making, assigning, leasing, importing or offering for assignment or lease of an article which is used exclusively for the production of the patented product as a matter of business is regarded as an infringement of patent right or an exclusive license (hereafter referred to only as patent right). In principle, making or assigning a product that does not fulfill the requirements of a patented

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invention does not infringe the patent right. However, when it is highly probable that the use of the said article will lead to fulfillment of the requirements of the patented invention and thus infringement of the patent right, the provision regards the said acts of making, assigning, etc., which occur at the stage prior to the infringement, as an infringement of the patent right and treat them as the same as direct infringement, to the extent that the patent right is not unduly expanded, in order to increase the effectiveness of remedying the infringement of patent rights.

Therefore, in the provision above, the *production* of the patented product should be construed as all conscious activity by a person who received an article which does not fulfill the requirements of patented invention to use this article to produce a product which fulfills the requirements of patented invention. Thus, the production of the patented product includes not only industrial production, but also fabrication, assembly and repair of such product.

On the other hand, as an article the making or assignment of which constitutes indirect infringement of patent right must be the one used exclusively for the production of patented invention, the use of said article must always result in the production of patented product. If the said article has a usage other than production of the patented product, the act of making the said article does not constitute indirect infringement. In light of the purpose of the provision, the said other usage must be commonly accepted or approved as having a commercial or economically practicality, and a mere possibility of being used in theory or experimentally or temporarily does not qualify as other usage that can refute the indirect infringement.

- b) Whether the article of the Invention to be Compared is used for the production of the product disclosed in Claim 1

① Comparison of Compositions

Compositions of Claim 1 include having a surface texture or a pattern comprising both large and small flow channels which together permit the transport of polishing slurry containing particles across the

surface of the polishing pad and solid uniform polymer sheet with no intrinsic ability to absorb or transport slurry particles.

As opposed to this, the Invention to be Compared is a polishing pad used in CMP procedure including micro-holes (15) in the form of an oval indentation with an open upper end, on the surface of bulk sheet (11) made of uniform polyurethane and grooves (13, 13') arranged in the form of channels which evenly transport polishing slurry over the entire surface of polishing pad, and thus, contains a bulk sheet with a uniform texture (11), micro-holes (15), and grooves (13, 13') as its elements.

Comparing the compositions of the two inventions, grooves (13, 13') of the Invention to be Compared is identical to the large flow channels of Claim 1 in that said grooves transport polishing slurry over the entire surface of polishing pad and consistently contain the polishing slurry over the use of polishing pad, and in that polishing slurry is formed by external means instead of by an intrinsic property of the sheet of polishing pad. Further, the two inventions are identical in that the sheet of the polishing pad in both inventions is a uniform solid polymer without an intrinsic ability to absorb or transport slurry particles. On the other hand, small flow channels of Claim 1 is not included in the Invention to be Compared.

Regarding the above, the plaintiff argues that while the internal structure such as air bubbles unevenly dispersed on a polishing pad made of non-uniform polymeric material, is the cause of variability in polishing rate in the Invention to be Compared, it is included as a method of attributing any polishing rate at all, by functioning as a means to store, allocate and provide the polishing slurry. As the Invention to be Compared maintains the internal structure's necessary function for the activation of polishing rate by including micro-holes, it shares a technical idea with the polishing pad made of non-uniform polymer substance, but has a technical idea completely different from the Patented Invention, in that the Patented Invention has merely eliminated the irregular internal structure from a non-uniform polymer

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material.

However, the uniformity of a polishing pad is determined by whether its material has an intrinsic ability to absorb and transport the slurry particle, both in the Patented Invention and the Invention to be Compared. When micro-holes are added by external means to a polymer pad uniform by itself, it cannot be regarded that the polymer pad has non-uniformity. Therefore, the plaintiff's argument that Invention to be Compared and the Patented Invention disclosed in Claim 1 are different in terms of uniformity of polymer pad is groundless.

② Whether the use of the article of the Invention to be Compared forms the small flow channels in Claim 1

As noted above, the Invention to be Compared is identical as Claim 1 in that it includes the elements of a *uniform polymer pad* and large flow channels of Claim 1 and does not contain the element of small flow channels of Claim 1. However, it falls under the *production* of the product disclosed in the Patented Invention as stipulated in Article 127 Clause 1 of the Korean Patent Act if the use of the article as in the Invention to be Compared forms the element of small flow channel of Claim 1.

Therefore, whether the use of the article of the Invention to be Compared forms small flow channels as described in Claim 1 is to be examined.

A) Facts found from evidence

Putting together Plaintiff's Exhibits 11, 12, 17, and 18 and Defendant's Exhibits 1 through 5, 7, 8, and 10 and the impressions from the entire proceeding at the court, each of the following facts is found.

- (a) The product which the plaintiff produced by using the Invention to be Compared (model name: SURESKC) is designed in such a way that it undergoes a break-in process prior to use, and conducts a conditioning process consistently during use. Break-in and conditioning

processes consist of pressing the surface of polishing pad with a conditioner, which functions to (1) maintain the roughness of the surface by scraping off the transformed surface, (2) remove foreign material and residues created in the CMP procedure, and (3) promote the allocation of slurry. The only type of conditioner currently in use is one on which innumerable fine diamond particles are attached.

- (b) Said product produced by the plaintiff has been used exclusively by Samsung Electronics Co., Ltd (hereafter referred to as Samsung Electronics). Samsung Electronics is currently conducting break-in and conditioning processes by using a conditioner to which approximately 150,000 diamond particles are attached, which simultaneously self-rotates at the speed of tens of times per minute and oscillates between the center and periphery of the polishing pad. Break-in process takes 10 to 20 minutes on average.
- (c) Before Samsung Electronics used the said product, there were only grooves and micro-holes on the surface of the polishing pad and no other indentation prior to conditioning, and miniscule stripe indentations appeared on the surface only after conditioning. When observed under an electron microscope, said stripe indentations were close to straight lines, and 40 randomly selected stripes of indentation were of various lengths, from 40m to 960m, and of various widths, from 1m to 4.5m. In terms of depth, they were deeper than 2.5m after break-in, and deeper than 6m after use-up. For each of the polishing pad after break-in, after 10 hours of use, after 20 hours of use and after use-up, there were one to three stripe indentations between two rows of three micro-holes. Amount or size of the stripe indentations did not vary

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regardless of its distance from center, measured at 3, 6 and 9. Therefore, it was estimated that approximately 600,000 to 1,800,000 stripe indentations would be observed in the entire polishing pad with the area of 202,580mm.

More stripe indentations were observed when observed under an optical microscope than were observed under an electron microscope.

(d) Average size of a slurry particle most commonly used domestically ranges from 0.12m to 0.16m.

B) Property of the small flow channels of Claim 1

According to the language of the claim, small flow channels of Claim 1 is a type of surface texture or pattern, with an ability to transport polishing slurry with particle over the entire surface of polishing pad, and are formed by external means, but as the technical composition is not evident from the language of the claim above, it shall be supplemented by detailed description and drawings.

The detailed description of the specification of the Patented Invention reads, among others: the smallest dimension of macro-groove intervals is 0.5mm; although micro-textures of the invention are small-sized, they comprise of structures of even smaller sets on the projected surface on macro-textures, which also function as a channel for the undisturbed flow of slurry; By definition, micro-grooves are notably smaller than macro-grooves. Therefore, the actual largest dimension of the size of micro-grooves is either 0.25mm or more than half of the least interval between the protrusions of macro-grooves, which is half of the projected surface. The lower bound of micro-grooves is more than ten times the average diameter of slurry particle used in polishing; and as in the case of macro-grooves, a random micro-groove pattern can be used as long as the entire projected surface goes through covering, such

that it is uniform and the micro-groove pattern is within the said range in size. A preferable micro-groove pattern is either an array of irregularly arranged straight lines or indentations with an irregular variety of width and depth. The effect of this irregularity is to provide a specifically intended, uniform polishing rate over the entire surface of the pad.

Therefore, for small flow channel of Claim 1 to be sufficiently effective, its width and depth should be limited to the upper bound of 0.25mm, a number corresponding to half of the smallest protrusion between large flow channels, and limited to the lower bound of ten times the average diameter of slurry particle.

C) Forming a small flow channel

The stripe indentations formed in break-in and conditioning process while using the article of the Invention to be Compared have width and depth mostly falling within the upper and lower bounds of those of the product disclosed in Claim 1, and number of the strip indentations, on average, range from one to three between micro-holes, adding up to a total of 600,000 to 1,800,000 stripe indentations over the entire surface of polishing pad (with a strong possibility that there exist more than the estimate as more indentations are observed under an optical telescope). Also, conditioning is intended to maintain the roughness of surface on the polishing pad and to promote the allocation of slurry, besides eliminating polishing residue from the polishing pad. When polishing pad is rubbed with diamond conditioner, it necessarily forms many indentations of various shapes, which form the roughness of surface on the polishing pad, function as a pass way for slurry particles, and thereby contribute to the mechanical and chemical polishing activity of the polishing pad. Based on these considerations, said stripe indentations are the same as small flow channels of Claim 1

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in that they are formed by external means, and that they have the function of transporting particle-containing slurry over the whole surface of polishing pad, and said stripe indentations cannot be deemed an inadvertent incidence from the conditioning process. (Plaintiff argues that whereas commonly used conditioning or conditioning used in the Invention to be Compared functions to eliminate the residue on the surface and form and maintain the roughness of the surface of the polishing pad, conditioning from the Patented Invention is designed to form small flow channels as the pass way for slurry, and is hence different from the aforementioned types of conditioning. However, since the Patented Invention also describes a diamond pad conditioner (RPC1) in its embodiment, the conditioning process as in the Patented Invention is not fundamentally different from that of the Invention to be Compared. Therefore, plaintiff's argument above is groundless.)

Thus, at the time the decision of the Board was made, when the article as in the Invention to be Compared is used as it would be, the small flow channels of Claim 1 are necessarily formed, which fulfills the requirement of Claim 1. Therefore, Invention to be Compared is deemed as production of the product disclosed in Claim 1.

c) Whether the article of the Invention to be Compared is used exclusively for the production of the product disclosed in Claim 1

As it is noted above that the article of the Invention to be Compared is used for the production of the product disclosed in Claim 1, it is to be examined whether the use of the article of the Invention to be Compared has a usage other than the production of the product disclosed in Claim 1.

Polishing pad produced by the plaintiff based on the Invention to be Compared has been used only by Samsung Electronics. In this case, the use necessarily involves break-in and conditioning processes by a

diamond conditioner. It is also recognized that, based on Plaintiff's Exhibit No. 17 and all the submissions of arguments, materials and evidence during this proceeding, in CMP procedure, while break-in process has decreased in importance, it is still acknowledged as needed, and that after diamond conditioning was developed, its superiority was noted to such extent that all CMP procedure started using the said conditioner from the mid-90's. Based on these finding of the facts, there does not seem to be a practical way, commonly accepted or approved, of using the article of the Invention to be Compared, without forming small flow channels of Claim 1, such as using the article without a diamond conditioner or conditioning process.

With regard to this, the plaintiff responded that conditioning's effect to the surface of the polishing pad, and the existence and extent of its effect rely on various factors, such as the type of conditioner, hardness of the pad, type of slurry used, type of particles in the slurry and the degree of pressure conditioning poses on the pad, and therefore it cannot be concluded that small flow channels are formed under every different condition under which different semiconductor producers use the article of the Invention to be Compared. However, the use of the article of the Invention to be Compared in a specific condition whereby small flow channels do not form is a mere possibility, which cannot be deemed to be commonly accepted or approved as commercially or economically practical. Therefore, plaintiff's argument above is groundless.

Therefore, we find that the article of the Invention to be Compared is used exclusively for the production of the product disclosed in Claim 1.

d) Summary

Making the article of the Invention to be Compared constitutes making of an article that is used exclusively for the production of the product disclosed in Claim 1. The plaintiff clearly made the article as a matter of business, because he made the polishing pads and sold

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them in exchange for consideration. Therefore, making of the article of the Invention to be Compared constitutes an indirect infringement of Claim 1. (The plaintiff also asserts that the Invention to be compared has an advanced effect through the technological means of the micro-holes, which is unattainable by Claim 1, and therefore cannot be an indirect infringement of Claim 1. However, although the Invention to be Compared has an element not included in Claim 1 and this element has an advanced effect, if the use of the article of the Invention to be Compared meets all of the elements in Claim 1, the Invention to be Compared and the invention disclosed in Claim 1 are in the relationship where the former makes use of the latter, and the indirect infringement of Claim 1 may not be denied on this ground. Therefore, the plaintiff's argument above is groundless.

2) Indirect Infringement of Claim 2

Claim 2 is a dependent claim of Claim 1. The technical characteristic of Claim 2 is to limit Claim 1 by specifying the dimensions of the protruded surface between the large flow channels to the range of 0.5 mm to 5 mm in largest lateral dimension. The lateral dimension of grooves in the Invention to be Compared, 1.076 mm, falls within the range specified in Claim 2.

Therefore, making the article of the Invention to be Compared constitutes an indirect infringement of Claim 2.

3) Indirect Infringement of Claim 4

Claim 4 is a dependent claim of Claim 1. The technical characteristic of Claim 4 is to limit Claim 1 by specifying that the large flow channels have a greater depth than width and its depth not to exceed 90% of the overall thickness of the pad. Said composition of Claim 4 is identical to that of the Invention to be Compared, which specifies that grooves' depth be greater than width and not to exceed 90% of the overall thickness of the pad.

Therefore, making the article of the Invention to be Compared

constitutes an indirect infringement of Claim 4.

4) Indirect Infringement of Claim 6

Claim 6 is a dependent claim of Claim 1. The technical characteristic of Claim 6 is to limit Claim 1 by specifying that the solid uniform polymer sheet is a pad made of polyurethane. Said composition of Claim 6 is identical to that of the Invention to be Compared which specifies polyurethane.

Therefore, making of the article of the Invention to be Compared constitutes an indirect infringement of Claim 6.

5) Indirect Infringement of Claim 11

Claim 11 is a dependent claim of Claim 1 through Claim 5. The technical characteristic of Claim 11 is to add elements to or limit the Claims by specifying that the large flow channels in the pad are arranged in a concentric annular fashion. Said composition of Claim 11 is identical to the grooves of the Invention to be Compared having a wave form (that is, the concentric annular form).

Therefore, making of the article of the Invention to be Compared constitutes an indirect infringement of Claim 11.

6) Indirect Infringement of Claim 16

Claim 16 is a dependent claim of Claim 1 through 5. The technical characteristic of Claim 16 is to add elements to or limit the Claims by specifying that the small flow channels are of a multiplicity of widths and depths ranging from 0.25mm to no less than 10 times the average size of the particles in the polishing slurry. Said composition of Claim 16 is identical to the stripe indentations formed during use of the Invention to be Compared, ranging from 0.25 to no less than 10 times the average size of slurry particles.

Therefore, making of the article of the Invention to be Compared constitutes an indirect infringement of Claim 16.

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7) Indirect Infringement of Claim 18

Claim 18 is a dependent claim of Claim 16. The technical characteristic of Claim 18 is to add elements to or limit Claim 16 by specifying that small flow channels are straight and are randomly oriented with respect to each other. Said composition of Claim 18 is identical to the stripe indentations formed during the use of the Accused Invention Product that are straight and randomly oriented with respect to each other.

Therefore, making of the article of the Invention to be Compared constitutes an indirect infringement of Claim 18.

8) Indirect Infringement of Claim 19

Claim 19 is an independent claim which relates to a layered polishing pad which includes all elements of Claim 1 and more than two layers of polymeric materials. The Invention to be Compared also obviously anticipates a layered structure wherein a non-surface layer other than the surface of polishing pad exists.

Therefore, making of the article of the Invention to be Compared constitutes an indirect infringement of Claim 19.

E. Sub-conclusion

Therefore, the Patented Invention cannot be deemed as not having the scope of a patent right on the grounds of improper description or lack of novelty, and the Invention to be Compared is not sufficiently specified to be compared with Claims 20 through 28 in terms of its compositions, and making of the article of the Invention to be Compared constitutes an indirect infringement of Claims 1, 2, 4, 6, 11, 16, 18 and 19. The Invention to be Compared thus falls under the scope of each of the said Claims. As the decision of the Board conforms with the decision of this court, it shall be deemed lawful.

4. Conclusion

Thus, the plaintiff's claim is groundless, and thus, is dismissed.

Presiding Judge Kimoon SUNG
Judge Dongsoo HAN
Judge Minsup KWAK

[Attachment 1]

Claims and Drawings of the Patented Invention

1. Scope of the Patent (Claims 2 to 28)

Claim 2: A pad according to Claim 1 wherein the projecting surfaces between said large flow channels are of dimensions ranging from 0.5mm to 5mm in largest lateral dimension.

Claim 3: A pad according to claim 1 wherein the width and depth of said large flow channels are equal and do not exceed more than half of the largest lateral dimension of projecting surfaces between said large flow.

Claim 4: A pad according to claim 1 wherein said large flow channels have a depth greater than width, said depth not to exceed 90% of the overall thickness of said pad.

Claim 5: A pad according to claim 1 wherein said large flow channels are of several widths and depths present together.

Claim 6: A pad according to claim 1 wherein said solid uniform polymer sheet is a polyurethane.

Claim 7: A pad according to claim 1 wherein said solid uniform polymer sheet is a polycarbonate.

Claim 8: A pad according to claim 1 wherein said solid uniform polymer sheet is a nylon.

Claim 9: A pad according to claim 1 wherein said solid uniform polymer sheet is an acrylic polymer.

Claim 10: A pad according to claim 1 wherein said solid uniform polymer sheet is a polyester.

Claim 11: A pad according to claim 1, 2, 3, 4 or 5 wherein said large flow channels are arranged in a concentric annular fashion.

Claim 12: A pad according to claim 1, 2, 3, 4 or 5 wherein said large flow channels are arranged in a regular square grid pattern to

produce projecting surface features of substantially rectangular outline.

Claim 13: A pad according to claim 1, 2, 3, 4 or 5 wherein said large flow channels are arranged in a regular grid pattern to produce projecting surface features of substantially triangular outline.

Claim 14: A pad according to claim 1, 2, 3, 4 or 5 wherein said large flow channels are straight and are randomly oriented with respect to each other.

Claim 15: A pad according to claim 1, 2, 3, 4 or 5 wherein the width of said small flow channels is constant and is of a dimension ranging from 0.25 mm to no less than 10 times the average size of the particles in the polishing slurry.

Claim 16: A pad according to claim 1, 2, 3, 4 or 5 wherein said small flow channels are of a multiplicity of widths and depths ranging from 0.25 mm to no less than 10 times the average size of the particles in the polishing slurry.

Claim 17: A pad according to claim 15 wherein said small flow channels are straight and are randomly oriented with respect to each other.

Claim 18: A pad according to claim 16 wherein said small flow channels are straight and are randomly oriented with respect to each other.

Claim 19: A layered polishing pad comprising two or more layers of polymeric materials wherein the surface layer is comprised of a solid uniform polymer sheet with no intrinsic ability to absorb or transport slurry particles, with said sheet in use having a surface texture or pattern comprising both large and small flow channels which together permit the transport of polishing slurry containing particles across the surface of the polishing pad. Said surface texture is produced solely by external means upon the surface of said solid uniform polymer sheet.

Claim 20: A layered polishing pad according to claim 19 wherein the non-surface layer or layers is substantially more compliant than said surface layer.

Claim 21: A layered polishing pad according to claim 19 wherein

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the non-surface layer or layers is substantially less compliant than said surface layer.

Claim 22: A method for polishing the surface of an article which includes: pressing said article against a polishing pad while polishing slurry containing particles is present on said pad with relative lateral motion between said article and said pad, in which said polishing pad is comprised of a solid uniform polymer sheet with no intrinsic ability to absorb or transport slurry particles. Said sheet in use has a surface texture or pattern comprising both large and small flow channels which together permit the transport of said polishing slurry containing particles across the surface of said polishing pad, and said surface texture is produced solely by external means upon the surface of said solid uniform polymer sheet.

Claim 23: A method according to claim 22 wherein said large flow channels are produced prior to use.

Claim 24: A method according to claim 22 wherein said large flow channels are produced at intervals during the polishing process.

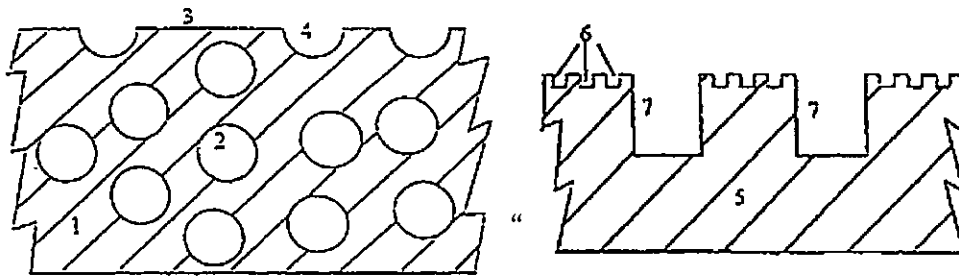
Claim 25: A method according to claim 22 wherein said large flow channels are produced continuously during the polishing process.

Claim 26: A method according to claim 23, 24 or 25 wherein said small flow channels are produced prior to use.

Claim 27: A method according to claim 23, 24 or 25 wherein said small flow channels are produced at intervals during the polishing process.

Claim 28: A method according to claim 23, 24 or 25 wherein small flow channels are produced continuously during the polishing process.

2. Figures



Prior Art

<FIG. 1>

<FIG. 2>

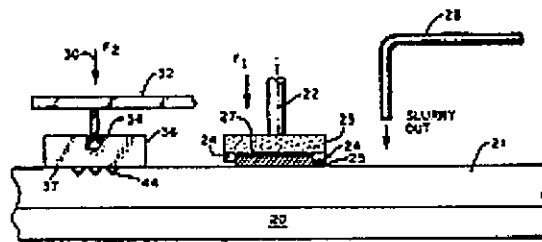
[Attachment 2]

The Prior Art

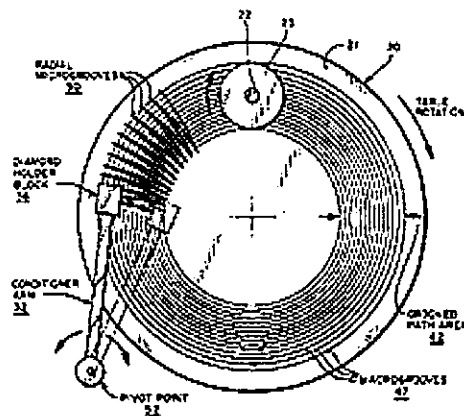
1. Summary of technology

The Prior Art (Plaintiff's Exhibit No. 4, United States Patent, Number 5,216,843, Date 1993. 6. 8), as a polishing pad conditioning apparatus for wafer planarization process includes, as noted in the specification and figures, the following summary of technology, according to the present invention, a polishing pad (21) comprises a relatively hard polyurethane, or similar material, capable of transporting abrasive particulate matter such as silica particles (Column 4, lines 22-25). Additionally, a polishing pad conditioning assembly (30) is provided for generating micro-channels (50) in the polishing pad (21). The micro-channels (50) are generated while wafers are being planarized (Column 4, lines 47-50). In the preferred embodiment of the present invention the polishing pad (21) is initially conditioned prior to polishing by impregnating the surface with a plurality of circumferential macro-grooves (47) (Column 5 lines 2-6). There are approximately 2-32 macro-grooves per radial inch (Column 5, lines 10-11). (In FIG. 6) The micro-grooves (50) generated by the diamond tips (44) of shanks (38) during wafer planarization are shown having a triangular shape with a depth of about 40 microns and a spacing of approximately 0.15 inches. Although the micro-grooves (50) are generated radially in the preferred embodiment, it is to be appreciated that other directions may also be used (Column 6, lines 61-68).

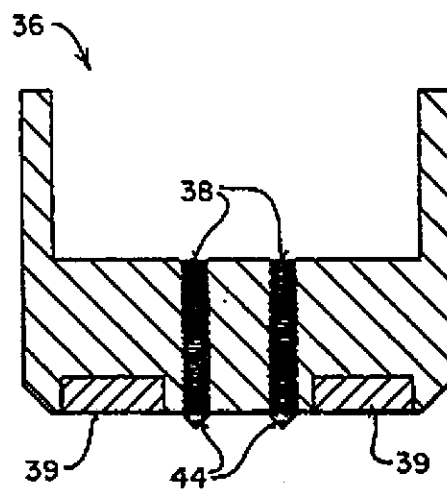
2. Figures



<FIG. 3>

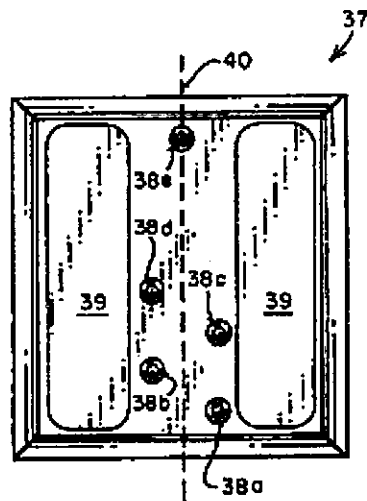


<FIG. 4>

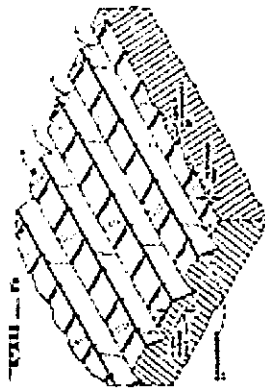


<FIG. 5a>

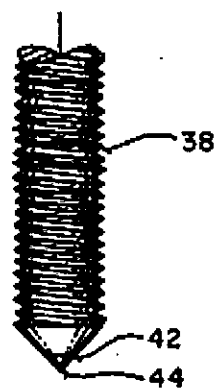
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<FIG. 5b>



<FIG. 5c>



<FIG. 6>

[Attachment 3]

The Invention to be Compared

1. Description

1) Title of the Accused Invention

Polishing pad for CMP

2) Brief Description of the Accused Invention Figures

FIG. 1 is a side view of the Accused Invention

FIG. 2 is a plane surface view of the Accused Invention

FIG. 3 is an enlarged view of a portion (micro-hole) of FIG.2

<Key Marks in the Figures>

10: Polishing pad

11: Bulk sheet

13, 13': Groove

15: Micro-hole

a: Standard Length b: Largest lateral dimension of projecting surface between grooves

c, c': Width of groove

d, d': Depth of groove

3) Detailed Description of the Accused Invention

The Accused Invention relates to a polishing pad used during the Chemical Mechanical Polishing (CMP) process to planarize the surface of semiconductor devices such as wafers during the production of semiconductors. As can be seen from FIG. 1, 2 and 3, the Accused Invention's polishing pad (10) has circular shaped micro-holes (15) and channel shaped grooves (13, 13') on the polyurethane bulk sheet (11). Said groove (13, 13') is channel-shaped, and permits the transport of polishing slurry across the whole surface of the polishing pad. The polishing slurry is included in said micro-hole (15) (micro-hole (15) is not of a channel structure and does neither transport nor flow the polishing slurry), and has the role of evenly supplying the polishing

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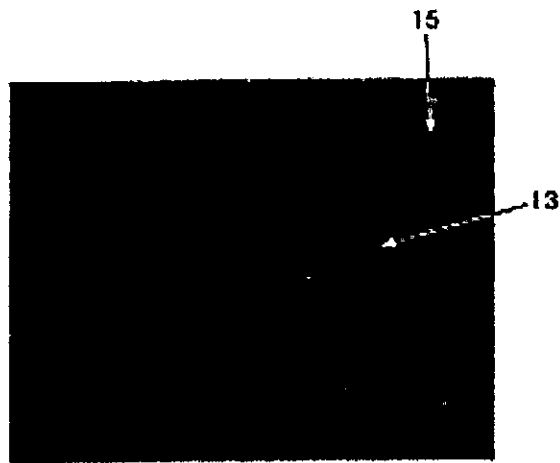
slurry to those parts not supplied by the groove (13, 13').

As can be seen from FIG. 1, the projecting surface between the groove of the Accused Invention (13, 13') is $1076\mu\text{m}$ (1.076mm) at the largest lateral dimension (b), the width (c, c') of the groove (13, 13') is $293\mu\text{m}$ (0.293mm), the depth (d, d') is $391\mu\text{m}$ (0.391mm). Said width (c, c') and depth (d, d') are different from each other, not exceeding of the largest lateral dimension of said projecting surface. Further, the depth (d, d') of said groove (13, 13') is larger than the width (c, c'), with depth (d, d') not to exceed 90% of the overall thickness of the pad. A groove's (13) width (c) and depth (d) of the said groove (13, 13') is almost identical to the width (c') and depth (d') of a different groove (13').

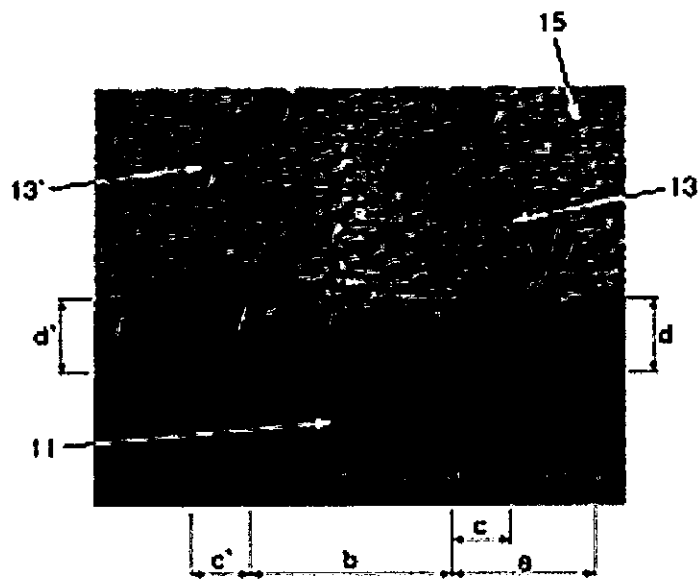
As can be seen from FIG. 1 and FIG. 2, the groove (13, 13') of the Accused Invention is in a wave form.

As can be seen from the description above and with reference to FIG. 1 and 2, the Accused Invention is a polishing pad used during the CMP process to planarize the surface of semiconductor devices. The pad generates the micro-hole (15) and groove (13, 13') on the surface of the bulk sheet, and a polishing slurry is transported across the whole surface of the polishing pad by the groove (13, 13'). The micro-hole functions to evenly supply the polishing slurry to those areas not supplied by the groove (13, 13').

2. Figures

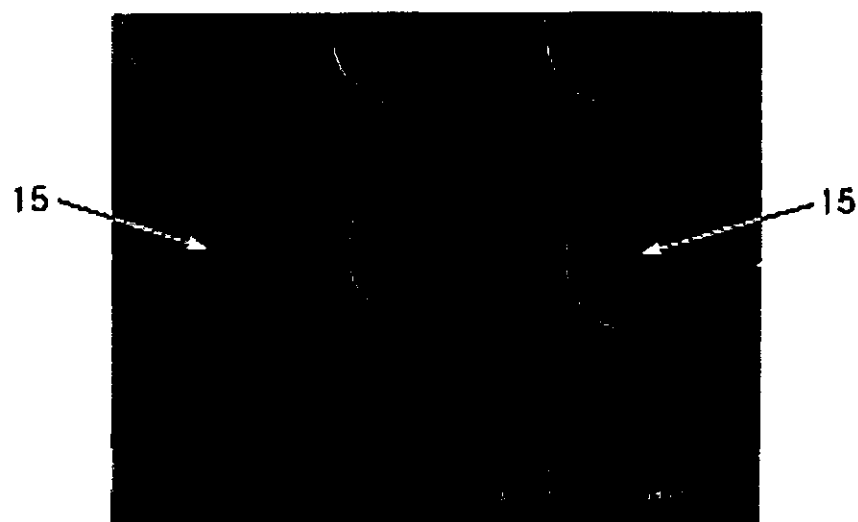


<FIG. 1>



<FIG. 2>

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<FIG. 3>