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13/781,927	03/01/2013	Eric Frank Schulte	SETN-12	2587
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Robert O. Groover P.O. Box 520 Wills Point, TX 75169			PATEL, DEVANG R	
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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* ERIC FRANK SCHULTE

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Appeal 2019-002735  
Application 13/781,927  
Technology Center 1700

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Before ADRIENE LEPIANE HANLON, JAMES C. HOUSEL, and  
GEORGE C. BEST, *Administrative Patent Judges*.

BEST, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant<sup>1</sup> appeals from the Examiner's decision to reject claims 257, 259–265, 268–272, 275, and 276 of Application 13/781,927. Final Act. (May 26, 2016).<sup>2</sup> We have jurisdiction under 35 U.S.C. § 6.

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<sup>1</sup> We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies SET North America, LLC as the real party in interest. Appeal Br. 3.

<sup>2</sup> On November 28, 2016, Appellant filed a notice of appeal. The Appeal Brief and the Examiner's Answer were filed in due course. Appellant did not file a Reply Brief. On December 11, 2017, the appeal was dismissed for failure to pay the appeal forwarding fee. On February 7, 2018, the '927 Application was deemed abandoned due to Appellant's failure to respond to

For the reasons set forth below, we *reverse*.

## I. BACKGROUND

The '927 Application describes methods for 3D interconnect bonding of multiple chips without solder reflow. Spec. ¶ 3. Claim 257 is representative of the '927 Application's claims and is reproduced below from the Claims Appendix of the Appeal Brief.

257. A method for bonding microelectronic elements, comprising the steps of:
- a) flowing a nitrogen-containing reducing gas through a glow discharge at atmospheric pressure to produce a temporary radical-enriched condition, and flowing the gas, while still in its temporary radical-enriched condition, over first and second substrates having respective contacting metallizations, thereby reducing native oxides and also simultaneously passivating substantially all of the contacting metallizations;
  - b) compressing the substrates together, *without any conductive liquid phase material*, to mechanically bond the substrates together by deforming at least some of their passivated contacting metallizations; wherein at least one of the substrates has contacting metallizations on both sides of the substrate; and
  - c) repeating step b), using additional substrates which have been subjected to step a), to bond additional substrates to a stack of substrates which includes the first and second substrates.

Appeal Br., Claims App. 1 (emphasis added).

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communications from the Office. On March 8, 2018, Appellant petitioned to revive the '927 Application. The petition was granted on July 31, 2018, and the appeal was docketed on February 26, 2019.

## II. REJECTIONS

On appeal, the Examiner maintains<sup>3</sup> the following rejections:

1. Claims 257, 259, 265, and 268–272 are rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Uner '860<sup>4</sup> and Ko.<sup>5</sup> Final Act. 7.
2. Claims 260 and 275 are rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Uner '860, Ko, and D'Asaro.<sup>6</sup> Final Act. 12.
3. Claims 261 and 276 are rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Uner '860, Ko, and Tong.<sup>7</sup> Final Act. 13.

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<sup>3</sup> After entry of the Final Action, Appellant canceled claim 274 without prejudice. Amendment with Notice of Appeal (November 28, 2016). The amendment was entered on January 11, 2017. Cancellation of claim 274 mooted rejections of this claim.

<sup>4</sup> US 6,551,860 B2, issued April 22, 2003.

<sup>5</sup> Cheng-Ta Ko & Kuan-Neng Chen, *Wafer-level bonding/stacking technology for 3-D integration*, 50 *Microelectronics Reliability* 481 (2010). Both the Examiner and Appellant refer to this reference as “Chen.” We follow our normal practice of referring to the reference by the last name of its first author.

<sup>6</sup> US 5,918,794, issued July 6, 1999.

<sup>7</sup> US 2007/0232023 A1, published October 4, 2007.

4. Claims 262 and 263 are rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Uner '860, Ko, and Kang.<sup>8</sup> Final Act. 14.
5. Claim 264 is rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Uner '860, Ko, and Uner NPL.<sup>9</sup> Final Act. 14.

### III. DISCUSSION

Appellant argues that each claim on appeal should be considered separately. Appeal Br. 10, 21–22. Appellant, however, only presents substantive argument for reversal of the rejection of independent claims 257 and 272. *See id.* at 10–21. Under the rules governing this appeal, Appellant has not done enough to merit separate consideration of each of the claims on appeal. 37 C.F.R. § 41.37(c)(1)(iv). We, therefore, limit our discussion to claims 257 and 272. Each of the remaining claims will stand or fall with its parent independent claim. *Id.*

*A. Rejection of claims 257, 259, 265, and 268–272 as unpatentable over the combination of Uner '860 and Ko*

*1. Claim 257*

The Examiner rejected independent claim 257 as unpatentable over the combination of Uner '860 and Ko. Final Act. 7–9.

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<sup>8</sup> Sung K. Kang, *Thermal Compression Bonding of Aluminum Bumps in TAB Applications*, 1998 IEEE Electronic Components and Technology Conference 1305 (1998).

<sup>9</sup> Jason R. Uner et al., *The Application of Atmospheric Pressure Plasma to various steps in IC Packaging*, SEMICON West B-1 (2000).

The Examiner found that Uner '860 describes or suggests steps (a) and (b) of claim 257. *Id.* at 7–8. The Examiner also found that it would have been obvious to a person of ordinary skill in the art to repeat step (b) as recited in step (c). *Id.* at 8 (citing *Perfect Web Techs., Inc. v. InfoUSA, Inc.*, 587 F.3d 1324, 1330–31 (Fed. Cir. 2009)). In the alternative, the Examiner found that Ko describes or suggests bonding multiple wafers by repeating the bonding procedure. *Id.* at 8–9.

Appellant argues that this rejection should be reversed because the Examiner erred by finding that the prior art describes or suggests each of steps (a) through (c) recited in claim 257. Appeal Br. 19. Appellant also argues that the Examiner improperly ignored the inventor's Rule 132 Declaration (the "Schulte Declaration"). *Id.* at 15–18.

Because we reverse, we need only address Appellant's arguments and the Examiner's findings regarding step (a) of claim 257.

Appellant argues that neither Uner '860 nor Ko describe or suggest "passivating substantially all of the contacting metallizations" as recited in claim 257's step (a). *Id.* at 13.

In rejecting claim 257, the Examiner found that Uner '860 describes passivating the contacting metallizations to prevent re-oxidation. Final Act. 7 (citing Uner '860, Figs. 5, 6, 10, 15; 2:6–25, 14:25–56). The portions of Uner '860 cited by the Examiner do not mention or describe passivation of the contacting metallizations. Indeed, we are unaware of any mention of passivation in Uner '860. Nor did the Examiner find that Uner '860's process inherently passivates substantially all of the contacting metallizations as required by claim 257.

For this reason, the Examiner's finding regarding passivation is not supported by evidence. Thus, the rejection of claim 257 must be reversed.

Because we have reversed the rejection of claim 257, we also reverse the rejection of claims 259, 265, and 268–271, which ultimately depend from claim 257.

2. *Claim 272*

The Examiner also rejected independent claim 272 as unpatentable over the combination of Uner '860 and Ko. Final Act. 10–12.

Appellant's arguments for reversal of the rejection of claim 272 are substantively the same as those Appellant presented in arguing for reversal of the rejection of claim 257. For the reasons set forth above, we have reversed the rejection of claim 257. We, therefore, also reverse the rejection of claim 272.

*B. Rejection of claims 260 and 275 as unpatentable over the combination of Uner '860, Ko, and D'Asaro*

The Examiner rejected claims 260 and 275 as unpatentable over the combination of Uner '860, Ko, and D'Asaro. Final Act. 12–13.

Appellant does not present substantive argument for reversal of this rejection. *See* Appeal Br. 10–23. We, therefore, assume that Appellant is arguing that claims 260 and 275 are patentable based upon the alleged patentability of their parent independent claims.

Because we have reversed the rejection of claims 257 and 272, we also reverse the rejection of claims 260 and 275.

*C. Rejection of claims 261 and 276 as unpatentable over the combination of Uner '860, Ko, and Tong*

The Examiner rejected claims 261 and 276 as unpatentable over the combination of Uner '860, Ko, and Tong. Final Act. 13.

Appellant does not present substantive argument for reversal of this rejection. *See* Appeal Br. 10–23. We, therefore, assume that Appellant is arguing that claims 261 and 276 are patentable based upon the alleged patentability of their parent independent claims.

Because we have reversed the rejection of claims 257 and 272, we also reverse the rejection of claims 261 and 276.

*D. Rejection of claims 262 and 263 as unpatentable over the combination of Uner '860, Ko, and Kang*

The Examiner rejected claims 262 263 as unpatentable over the combination of Uner '860, Ko, and Kang. Final Act. 14.

Appellant does not present substantive argument for reversal of this rejection. *See* Appeal Br. 10–23. We, therefore, assume that Appellant is arguing that claims 262 and 263 are patentable based upon the alleged patentability of their parent independent claim 257.

Because we have reversed the rejection of claim 257, we also reverse the rejection of claims 262 and 263.

*E. Rejection of claim 264 as unpatentable over the combination of Uner '860, Ko, and Uner NPL*

The Examiner rejected claim 264 as unpatentable over the combination of Uner '860, Ko, and Uner NPL. Final Act. 14–15.

Appellant does not present substantive argument for reversal of this rejection. *See* Appeal Br. 10–23. We, therefore, assume that Appellant is arguing that claim 264 are patentable based upon the alleged patentability of its parent independent claim.

Because we have reversed the rejection of claim 257, we also reverse the rejection of claim 264.



IV. CONCLUSION

In summary:

<b>Claims Rejected</b>	<b>35 U.S.C. §</b>	<b>Reference(s)/Basis</b>	<b>Reversed</b>	<b>Reversed</b>
257, 259, 265, 268-272	103(a)	Uner '860, Ko		257, 259, 265, 268-272
260, 275	103(a)	Uner '860, Ko, D'Asaro		260, 275
261, 276	103(a)	Uner '860, Ko, Tong		261, 276
262, 263	103(a)	Uner '860, Ko, Kang		262, 263
264	103(a)	Uner '860, Ko, UnerNPL		264
<b>Overall Outcome</b>				<b>257, 259-265, 268-272, 275, 276</b>

REVERSED