

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* JOSHUA E. RABINOVICH

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Appeal 2008-2872  
Application 10/445,024  
Technology Center 1700

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Decided: June 25, 2008

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Before EDWARD C. KIMLIN, ROMULO H. DELMENDO, and  
MICHAEL P. COLAIANNI, *Administrative Patent Judges*.

COLAIANNI, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant appeals under 35 U.S.C. § 134 the final rejection of claims 1-16, 25-31, 33, and 34. We have jurisdiction over the appeal pursuant to 35 U.S.C. § 6(b).

We AFFIRM-IN-PART.

INTRODUCTION

Appellant claims a method for repairing a substrate comprising providing a V-shaped feedstock having a back and opposite inwardly sloped side walls; feeding the V-shaped feedstock into a substrate in need of repair;

heating the V-shaped feedstock to fuse the sloped sidewalls of the feedstock and sloped side walls in a substrate with the conducted energy (claim 1; Figure 2).

Claims 1, 25, and 31 are illustrative:

1. A repairing process for repairing a substrate comprising:

providing a V-shaped feedstock having a back and opposite inwardly sloped side walls,

feeding the V-shaped feedstock into a substrate in need of repair,

heating the V-shaped feedstock by directing energy to the back of the feedstock,

conducting energy through the feedstock, and

fusing the sloped side walls of the feedstock and sloped side walls in a substrate with the conducted energy.

25. A method of repairing large substrates, vehicles or building parts comprising:

providing a component with a surface hole,

providing a tapered-shaped plug conforming to the surface hole of the substrate,

inserting the tapered-shaped plug into the surface hole, and

applying heating energy and bonding the tapered-shaped plug in the substrate,

wherein the hole and the plug are non-semispherical in shape.

31. A method of repairing an opening in a substrate comprising providing an object having sloped side walls in the opening and heating,

softening and fusing the sloped side walls and contacting walls of the opening,

preparing walls of the opening as sloping walls matching the sloped walls of the object,

wherein the opening and the object are non-semispherical in shape.

The Examiner relies on the following prior art references as evidence of unpatentability:

Stuck	2,734,261	Feb. 14, 1956
Webster	4,874,136	Oct. 17, 1989
Galanes	5,348,212	Sep. 20, 1994
NEC Toyama (as translated) <sup>1</sup>	JP 11-121906	Apr. 30, 1999
Murphy	6,884,964 B2	Apr. 26, 2005

The rejections as presented by the Examiner are as follows:

1. Claims 25-31, 33, and 34 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.
2. Claims 1-4, 9-16, 31, 33, and 34 are rejected under 35 U.S.C. § 103 as being unpatentable over Murphy in view of Webster and NEC Toyama.
3. Claims 5-8 are rejected under 35 U.S.C. § 103 as being unpatentable over Murphy in view of Webster, NEC Toyama, Stuck, and Galanes.
4. Claims 25, 27, 28, 30, 31, 33, and 34 are rejected under 35 U.S.C. § 103 as being unpatentable over Murphy.

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<sup>1</sup> We rely on the Machine-Assisted Translation of JP 11-121906 provided by the Examiner, the accuracy of which has not been contested. We also refer to JP 11-121906 by the named applicant “NEC Toyama” rather than the first named inventor.

5. Claim 26 is rejected under 35 U.S.C. § 103 as being unpatentable over Murphy in view of Webster.
6. Claim 29 is rejected under 35 U.S.C. § 103 as being unpatentable over Murphy in view of Ely.
7. Claim 30 is rejected under 35 U.S.C. § 103 as being unpatentable over Murphy in view of Webster and NEC Toyama.

Appellant separately argues all the claims under individual subheadings with regard to the prior art rejections involving multiple claims. Accordingly, Appellant's arguments regarding the rejections over the prior art are addressed with regard to each argued claim.

Appellant argues claims 25 and 31 with regard to the § 112, first paragraph, rejection. Accordingly, Appellant's arguments regarding the propriety of the § 112 rejection will be addressed with regard to claims 25 and 31.

#### OPINION

#### 35 U.S.C. § 112, FIRST PARAGRAPH, REJECTION: WRITTEN DESCRIPTION CLAIMS 25 and 31

The Examiner contends that the claim features “wherein the hole and the plug are non-semispherical in shape” (claim 25) and “wherein the opening and the object are non-semispherical in shape” (claim 31) lack written description in the originally filed Specification (Ans. 3). The Examiner explains that the original disclosure lacks written description for many more complex shapes, such as the broader term “non-semispherical” (Ans. 8).

Appellant argues that there is no requirement for literal support of the “non-semispherical” claim feature in the Specification (Br. 11). Appellant contends that Figures 5 and 9 clearly show a tapered-shaped, non-semispherical plug 31 and conforming hole such that the “non-semispherical” feature of claim 25 has written description support (Br. 12). Appellant also contends that the Specification provides support for the “non-semispherical” claim feature (Br. 12-13).

With regard to claim 31, Appellant additionally argues that the Specification discloses a V-shaped groove and a V-shaped wire feedstock, such that the V-shaped wire feedstock provides written descriptive support for the “non-semispherical” claim feature (Br. 13-14).

“[T]he examiner bears the initial burden, on review of the prior art or any other ground, of presenting a *prima facie* case of unpatentability.” *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992).

Whether claimed subject matter is described in an Applicant’s originally filed Specification so as to satisfy the written description requirement of 35 U.S.C. § 112, first paragraph, is a factual determination. *In re Wertheim*, 541 F.2d 257, 262 (CCPA 1976). The function of the written description requirement is to ensure that the inventor had possession, as of the filing date of the application relied upon, of the specific subject matter claimed. *Id.* It is not necessary that the application describe the claim features exactly, but only so clearly that persons of ordinary skill in the art will recognize from the disclosure that Applicant invented the subject matter claimed. *Id.* See also *In re Rasmussen*, 650 F.2d 1212, 1215 (CCPA 1981)(“[T]hat a claim may be broader than the specific embodiment disclosed in a specification is in itself no moment.”).

Thus, the Examiner must make factual findings establishing that a person skilled in the relevant art would not have recognized that Applicant invented the subject matter claimed. *Cf. In re Curtis*, 354 F.3d 1347 (Fed. Cir. 2004)(affirming the Board on the basis that dental floss claims reciting a genus of friction-enhancing coatings over PTFE floss lacked written description in the original disclosure, which was limited to the use of microcrystalline wax adhered to PTFE floss, where the art was found to be unpredictable); *Gentry Gallery, Inc. v. Berkline Corp.*, 134 F.3d 1473, 1479 (Fed. Cir. 1998)(holding that patent claims directed to a sectional sofa were invalid as lacking written description under 35 U.S.C. § 112, ¶1, because they did not limit the location of the reclining controls to the console area in direct conflict with the original disclosure, which identified the console as the only possible location of the controls); *Tronzo v. Biomet, Inc.*, 156 F.3d 1154, 1159 (Fed. Cir. 1998)(“[T]he only reference in the ‘589 patent’s specification to different shapes [for a cup in a prosthesis] is a recitation of the prior art...Instead of suggesting that the ‘589 patent encompasses additional shapes, the specification specifically distinguishes the prior art as inferior and touts the advantages of the conical shape of the ‘589 cup.”).

Based upon these principles, we find that the Examiner did not make the necessary factual findings to explain why the “non-semispherical” feature of claim 25 and the “non-semispherical” feature of claim 31 lack sufficient support in the originally filed Specification. As is clear from case law, the mere fact that the original Specification lacks in haec verba support is insufficient. Here, claim 25 recites “a tapered shaped-plug conforming to the surface hole of the substrate” and “wherein the hole and the plug are non-semispherical in shape.” As Appellant argues, Figure 5 clearly shows a

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plug 31 having tapered surfaces 39, 41 that conform to the surfaces of the hole 43, 45. The Examiner did not provide a reason why such tapered surface disclosures, which necessarily define non-semispherical shapes, fail to support the feature “wherein the hole and the plug are non-semispherical in shape” as recited in claim 25.

Claim 31 is broader than claim 25. In contrast to the “tapered” feature of claim 25, claim 31 broadly recites placing an object with sloped side walls in an opening having matching sloped walls. As the Examiner correctly finds, “non-semispherical” includes a multitude of “more complex shapes” (Ans. 8), which Appellant’s Specification and figures do not show he possessed at the time of filing the application, especially in the context that the Specification itself touts the invention as a “V-shaped feedstock that eliminates difficulties associated with flat feedstocks” (Spec. 2). *Tronzo*, 156 F.3d at 1159. As used in claim 31, we find that the “non-semispherical” feature lacks written description and, thus, fails to comply with the written description requirement of § 112, first paragraph.

For the above reasons, we do not sustain the Examiner’s § 112, first paragraph, rejection of claims 25-30 as failing to comply with the written description requirement. We sustain, however, the Examiner’s § 112, first paragraph, rejection of claims 31, 33, and 34 as failing to comply with the written description requirement.

35 U.S.C. § 103 REJECTION OVER MURPHY IN VIEW OF WEBSTER  
AND NEC TOYAMA  
CLAIMS 1-3, 9, 13-16, 31, 33, AND 34

Appellant argues that Webster and NEC Toyama are not in the same field of endeavor and are not pertinent to the problem Appellant is trying to

solve (Br. 16-18). Appellant contends that the field of endeavor includes laser repair of land, sea, and air vehicles (Br. 16). Appellant contends that the problem to be solved concerns overcoming problems with existing repair processes that lack the ability to be used in-situ, are expensive or time-consuming, or may lead to excessive distortion or other flaws (Br. 16). Appellant also argues that NEC Toyama's repair of electrical connections on a circuit board is a unique field and has little in common with traditional welding or repair of mechanical parts and that preventing short circuits is a different problem than that addressed by Appellant (Br. 17).

With regard to claim 1, Appellant argues that Murphy, Webster and NEC Toyama fail to teach or suggest a V-shaped feedstock and its use in the claimed method (Br. 19-20). Appellant argues that none of the applied prior art references, absent hindsight, teach or suggest modifying Murphy to arrive at the claimed invention (Br. 21).

With regard to claims 2, 3, 9, and 13-16 Appellant argues that the Examiner has not cited art demonstrating that the subject matter of each of those claims would have been obvious (Br. 22-25).

With regard to independent claim 31, Appellant argues that using a non-semispherical shape would not have been merely an obvious change in shape because Murphy's plug and hole shape must be semispherical in shape (Br. 26).

With regard to claims 33 and 34 Appellant argues that the features of these claims are not recited by the references and the Examiner does not find otherwise (Br. 27).

We have considered all of Appellants' arguments and are unpersuaded for the reasons below.

When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1740 (2007). “[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.” *Id.* Any need or problem known in the field of endeavor at the time of invention and addressed by the prior art can provide a reason for combining the elements in the manner claimed. *KSR*, 127 S. Ct. at 1742.

Though the prior art need not necessarily be in the same field of endeavor to be analogous, we agree with Appellant that Webster’s pulp refining apparatus is not in the same field of endeavor as Appellant’s claimed process. Moreover, we determine that Webster’s pulp refining apparatus is not pertinent to any problem, be that Appellant’s specific problem or otherwise, known in the field of endeavor such that it would provide a reason for combining the elements in the manner claimed. Accordingly, we agree with Appellant that Webster is non-analogous art. However, our determination that Webster is non-analogous art is not dispositive, on this record, for concluding that the claims would have been non-obvious because we do not view Webster’s teachings as necessary for the viability of the present rejection or the other rejections of record that include Webster. Accordingly, in this Decision we focus our review of the rejections on the teachings of the references other than Webster. In the presently discussed rejection, we focus on NEC Toyama’s and Murphy’s teachings.

With regard to Appellant's non-analogous argument concerning the NEC Toyama reference, we do not agree with Appellant. Whether prior art is in the same field of endeavor is not dispositive to the question of whether a person having ordinary skill in the art would have combined the elements in the manner claimed. Even if these references are from different fields of endeavor, Appellant has failed to demonstrate that NEC Toyama's electronic substrate repair method using a tapered plug shape would *not* reasonably be expected to improve Murphy's welding repair method by facilitating the ease of repair. *KSR*, 127 S. Ct. at 1740.

Additionally, NEC Toyama is reasonably pertinent to Appellant's stated problem: providing an in-situ repair process without excessive distortion or other flaws (Br. 17-18). In fact, NEC Toyama uses a tapered-shaped plug piece to repair an electrical substrate (NEC Toyama, Figure 1 and 2d). Accordingly, we determine that NEC Toyama is analogous art.

Regarding claims 1 and 31, we find that Murphy discloses a method for weld repairing metal alloys (Murphy, col. 1, ll. 9-11). Murphy's method employs a filler insert whose size and shape are predetermined so that the welding operation can be carried out to completely melt the insert while minimizing the melting of the surrounding metal alloy component (Murphy, col. 1, ll. 61-64). Murphy discloses that a defect in a metal surface is machined to remove the defect and form a cavity in the surface having a width, depth and shape substantially the same as a melt pool width, depth and shape (Murphy, col. 2, ll. 8-12). Murphy discloses tests are run to determine the proper shape of the melt pool, which is used to form multiple filler inserts (i.e., plugs) having the desired widths, depths and shapes (Murphy, col. 2, ll. 40-51). Murphy discloses using different shapes for the

filler insert and cavity (Murphy, col. 2, ll. 48-51; col. 5, ll. 41-55). Murphy further discloses that the melt front and melt pool “may” have a semispherical shape, though a greater aspect ratio (depth vs. width) will typically be preferred for repairing many surface defects (Murphy, col. 3, ll. 51-58).

NEC Toyama discloses an open circuit repair method using a wire rod 1 shaped like a tapered plug to fill a cavity in a substrate (NEC Toyama, ¶¶ [0014] and [0015]; Figure 2d).

From these disclosures and contrary to Appellant’s arguments regarding claims 1 and 31, we conclude that it would have been obvious to modify the insert filler (i.e., plug) shape in Murphy’s method of repairing substrates to be a V-shaped feedstock (claim 1) or a non-semispherical shaped object and side walls (claim 31) as shown in NEC Toyama because Murphy indicates that a multitude of shapes may be used for the filler inserts. In other words, Murphy’s disclosure to use various shaped filler inserts would have suggested using any shaped insert filler including the claimed V-shaped feedstock or non-semispherical shaped object. Appellant has not proffered any evidence that using the particular V-shaped feedstock or non-semispherical shaped object produces unexpected results.

Appellant’s argument that the Examiner relied on impermissible hindsight is not persuasive because, as noted above, Murphy plainly suggests that many different shapes may be used for the insert filler and hole combination. Moreover, Murphy’s disclosure is not limited to a semispherical shape as argued by Appellant. Rather, Murphy discloses that the melt front “may” have a semispherical shape. Such disclosure does not indicate that the shape is only limited to semispherical shapes.

Contrary to Appellant's arguments regarding claims 2, 3, and 34, preparing sloping side walls in the substrate (claim 2) or in a crack (claim 3), or wherein the object is a plug having sloped side walls (claim 34), would have been obvious from Murphy's disclosure to machine the defect to form a cavity that closely matches the shape of the filler insert (i.e., plug) (Murphy, col. 2, ll. 8-15, 47-57; col. 4, ll. 19-33, 34-41) and NEC Toyama's disclosure to form inwardly sloping side walls in the defect that match the shape of the wire rod (i.e., plug) (NEC Toyama ¶¶ [0014]- [0015]; Figure 1D).

Claim 9 recites that the process further comprises "providing, feeding, heating, conducting and fusing a double V-shaped or diamond shaped feedstock." As noted above, Murphy discloses that a multitude of shapes may be used for the insert filler-hole combination. Accordingly, it would have been obvious to modify Murphy's method of repairing substrates to have double V-shaped or diamond feedstock because Murphy indicates that a multitude of shapes may be used for the filler inserts. In other words, Murphy's disclosure to use various shaped filler inserts would have suggested using the claimed double V-shaped or diamond feedstock. Appellant has not proffered any evidence that using the double V-shaped or diamond feedstock produces unexpected results.

Regarding claims 13-16, we find that Murphy teaches or suggests the features of these claims. Specifically, Murphy discloses applying energy to the insert filler to soften and fuse the contacting surfaces of the insert filler to the substrate (Murphy, col. 1, ll. 61-64) as recited in claim 13. Regarding claim 14, Murphy discloses that the insert filler closely matches the shape of the cavity (Murphy, col. 2, ll. 8-15; col. 4, ll. 34-41). Regarding claim 15,

Murphy discloses that the heating of the contacting surfaces of the insert filler minimizes the melting of the surrounding metal alloy components (Murphy, col. 1, ll. 61-64). Regarding claim 16, Murphy discloses that the method may be used to repair cracks and that the size of the insert filler is determined based upon the size of the defect, which would have included a thin substrate (Murphy, col. 2, ll. 50-59).

Claim 33 recites that the object of claim 31 is an elongated V-shaped triangular wire feedstock having the sloped side walls. NEC Toyama discloses that a “wire rod” (e.g., repair insert that is longer than it is wide as implied by the use of term “wire rod”) is formed with sloping side walls to repair the substrate (NEC Toyama, ¶¶ [0014]-[0015]; Figure 1D). Murphy discloses a method for repairing cracks or defects in a component using an insert filler having various shapes (Murphy, col. 2, ll. 50-59). From these disclosures, it would have been obvious to combine NEC Toyama’s “wire rod” feature with Murphy’s method of repairing a crack or defect because Murphy discloses that the size of the insert filler is determined based on the size of the defect or crack to be repaired. Accordingly, when a crack with a high aspect ratio needs repair (i.e., a crack longer than it is wide), Murphy in view of NEC Toyama would have suggested using a longer insert filler (i.e., wire) that is shaped to correspond to the cavity formed (e.g., a V-shaped wire rod).

For the above reasons, we sustain the Examiner’s § 103 rejection of claims 1, 2, 3, 9, 13-16, 31, 33, and 34 over Murphy in view of NEC Toyama.

#### CLAIM 4

Claim 4 recites, in relevant part, “placing a plug in the opening, inserting a V-shaped feedstock between the plug and sloping walls of the opening, and heating and fusing the side walls of the V-shaped feedstock with the sloped side walls of the plug and the sloping side walls of the opening.”

The Examiner finds that Murphy discloses a plug and Webster discloses a wire such that using the plug and the wire together would have been obvious depending upon the substrate groove in need of repair because two repair processes instead of a single repair process does not impart patentability to the claims (Ans. 4-5).

Appellant argues that the subject matter of claim 4 is not taught or suggested by Murphy, Webster or NEC Toyama. We agree.

Claim 4 recites that a V-shaped feedstock is placed between a plug and the side walls of the opening, which is not taught or suggested by any of the applied prior art references. Accordingly, because every claim feature is not taught or suggested by the prior art, we do not sustain the Examiner’s § 103 rejection of claim 4 over Murphy in view of NEC Toyama.

#### CLAIMS 10-12

Claim 10 recites, in relevant part, “feeding the V-shaped feedstock with a feedstock feeding and energy directing rotatable head.” Claims 11 and 12 depend upon claim 10.

The Examiner finds that automation of a joining process with a moveable head for applying energy is well known as robotic welding (Ans.

5). The Examiner concludes that it would have been obvious to use robotic welding because the robot speeds and automates the process (Ans. 5).

Appellant argues the applied prior art fails to teach or suggest the subject matter of claims 10-12 (Br. 23-24). We agree.

Neither Murphy nor NEC Toyama discloses using a rotatable head to apply V-shaped feedstock. Because the Examiner has not established that the prior art teaches or suggests all the claim features, we do not sustain the Examiner's § 103 rejection of claims 10-12 over Murphy in view of NEC Toyama.

### 35 U.S.C. § 103 REJECTION OVER MURPHY IN VIEW OF WEBSTER, NEC TOYAMA, STUCK AND GALANES

Appellant argues that Stuck or Galanes fail to disclose the subject matter of claims 5-8 (Br. 28). Appellant contends that there is no motivation in the applied prior art to modify Murphy to arrive at the invention of claims 5-8 (Br. 28). With regard to claim 5, Appellant argues that the V-shaped feedstock and inversion of the feedstock are not taught or suggested by the prior art (Br. 29). We agree.

Claim 5 recites "placing a second inverted V-shaped feedstock in the substrate in contact with the first V-shaped feedstock and fusing at least one wall of the second V-shaped feedstock to a wall of the first feedstock."

Galanes discloses a welding method for repairing rotatable shafts (Galanes, col. 1, ll. 11-13). Galanes discloses forming a groove in the rotatable shaft welding the shaft pieces together by inserting the tips of a filler metal wire and a tungsten electrode into the groove to perform the weld (Galanes, col. 7, ll. 25-38).

Stuck discloses a process of repairing Jordan plugs (Stuck, col. 1, ll. 38-46). Stuck discloses welding a cone section C and forming slots 47 in the cone C into which bars 48 and wedges 49 are inserted (Stuck, col. 2, ll. 55-62). Stuck does not disclose heating the wedges 49 to fuse them to the bar 48.

Murphy discloses matching an insert filler (i.e., a single insert) with the shape of the cavity to repair a defect or crack in a metal alloy (Murphy, col. 2, ll. 40-59; col. 5, ll. 41-59; Figures 3-5). Murphy does not disclose using multiple filler inserts to fill the cavity.

Based on these disclosures, we do not find that the applied prior art teaches or suggests the subject matter of claims 5-8. Though Galanes does disclose welding together wire to form a weld, Galanes does not teach or suggest placing a second inverted V-shaped feedstock in the substrate in contact with the first V-shaped feedstock and fusing the first and second feedstocks together. Moreover, Murphy, the primary reference, discloses using a single insert filler, not multiple insert fillers. Accordingly, we do not find the subject matter of claim 5 and, claims 6-8 that depend on claim 5, to be taught or suggested by the applied prior art.

Therefore, we do not sustain the Examiner's § 103 rejection of claims 5-8 over Murphy in view of NEC Toyama, Stuck, and Galanes.

### 35 U.S.C. § 103 REJECTION OVER MURPHY CLAIMS 25, 27, 28, 31, 33, AND 34

With regard to claims 25 and 31, Appellant argues that Murphy fails to teach or suggest tapered or sloped matching sidewalls of both the opening and the plug, wherein the plug and the opening are not semispherical in

shape (Br. 31). Appellant contends that Murphy requires that the insert filler and cavity shape be semispherical in shape (Br. 31-32).

With regard to claims 27, 28, 33, and 34 Appellant argues that the claim features of the particular claims are not taught or suggested by the prior art (Br. 32-33).

We have considered Appellant's arguments and are unpersuaded for the reasons below.

Contrary to Appellant's argument, Murphy does not require the insert filler (i.e., plug) and cavity receiving the plug to be semispherical in shape. Rather, as noted above, Murphy discloses that the insert filler and cavity may have multiple shapes and the melt front "may" have a semispherical shape (Murphy, col. 2, ll. 5-15, 40-59; col. 3, ll. 51-59; col. 5, ll. 41-59). In other words, Murphy indicates that the shape of the insert filler and cavity need not be semispherical.

Based on our above findings and those findings regarding Murphy in the § 103 rejection over Murphy in view of Webster and NEC Toyama section of this decision, we conclude that it would have been obvious to modify Murphy's method of repairing substrates to have a non-semispherical shaped plug/object and hole/side walls (claims 25 or 31) because Murphy indicates that a multitude of shapes may be used for the filler inserts. In other words, Murphy's disclosure to use various shaped filler inserts would have suggested using the claimed non-semispherical shaped object/plug with a complementary shaped cavity. Appellant has not proffered any evidence that using the particular non-semispherical shaped object/plug produces unexpected results.

With regard to claims 27 and 28, we find that Murphy teaches or suggests the subject matter of these claims. Specifically, Murphy teaches that the insert filler (i.e., plug) is shaped to allow for a slight diametrical clearance with the cavity to aid with inserting the plug into the cavity such that the subject matter of claim 27 is taught or suggested (Murphy, col. 4, ll. 34-41). Murphy further teaches that the insert filler (i.e., plug) sinks into the surface hole as recited in claim 28 (Murphy, col. 4, ll. 34-41; Figure 3).

With regard to claims 33 and 34, Murphy discloses that the insert filler used in the process is sized to fill the particular cavity of the removed defect (Murphy, col. 5, ll. 41-53). Accordingly, forming the insert filler into a V-shaped wire feedstock (claim 33) or a plug with sloped walls (claim 34) would have been obvious from Murphy's disclosure to form the insert filler into various shapes to fit the particular cavity. Appellant has not proffered any evidence that the particular shape is critical to achieve unexpected results.

For the above reasons, we sustain the Examiner's § 103 rejection of claims 25, 27, 28, 31, 33, and 34 over Murphy.

**35 U.S.C. § 103 REJECTION OF CLAIM 30 OVER MURPHY & 35  
U.S.C. § 103 REJECTION OF CLAIM 30 OVER MURPHY IN VIEW OF  
WEBSTER AND NEC TOYAMA**

Appellant argues that none of the applied prior art references disclose inserting a V-shaped feedstock between the hole and the plug, heating the feedstock and softening and fusing contacting walls of the feedstock, hole and plug wherein no gap filler material is required as recited in claim 30 (Br. 32, 35). We agree.

We find that none of the applied prior art teaches placing a V-shaped feedstock between a plug and the side walls of the opening. Accordingly, because every claim feature is not taught or suggested by the prior art, we do not sustain the Examiner's § 103 rejection of claim 30 over Murphy, or over Murphy in view of NEC Toyama.

### 35 U.S.C. § 103 REJECTION OVER MURPHY IN VIEW OF WEBSTER

Appellant argues that Murphy and Webster fail to teach applying energy in directions along interface walls of the tapered-shaped plug and hole and softening and fusing contacting surfaces of the plug and hole and eliminating porosity by fusing as recited in claim 26 (Br. 34).

At the outset, we find that Webster's disclosures are not necessary to satisfy the subject matter of claim 26. Accordingly, we focus solely on Murphy's disclosures.

Murphy discloses the interface between the insert filler and cavity are heated such that the insert filler melts and melting of the cavity portion is minimized so as to fuse the insert filler and the substrate together (Murphy, col. 1, ll. 61-66). Murphy further discloses that controlling the interface melting (i.e., the amount of cavity melting and insert filler melting) reduces the risk of cracking following the welding operation (Murphy, col. 1, ll. 64-67). Murphy discloses that the insert filler is formed such that its shape is approximately the same as the cavity into which it is placed (Murphy, col. 2, ll. 12-15).

These disclosures indicate that, like Appellant's claim 26, the heating and fusing are occurring along the interface walls between the insert filler and the substrate. Moreover, Murphy's disclosures to reduce the risk of

cracking by controlling melting along the interface and that the insert filler's shape is complementary to the cavity suggest that the porosity of the joint between the insert filler and the substrate is eliminated.

Accordingly, we sustain the Examiner's § 103 rejection of claim 26 over Murphy.

### 35 U.S.C. § 103 REJECTION OVER MURPHY IN VIEW OF ELY CLAIM 29

Claim 29 recites that the tapered-shaped plug protrudes higher than nominal and removing the protruding material after fusing.

Appellant argues that Ely has nothing to do with weld repair such that there is no motivation for modifying Murphy's weld repairing method according to the teaching of Ely (Br. 34).

We find that Murphy discloses that the insert filler (i.e., plug) material may extend above the surface of the substrate and the protruding material may be removed (Murphy, col. 5, ll. 35-40). Accordingly, in view of this factual finding, we find Ely's disclosures to be merely cumulative to that disclosed by Murphy. Therefore, because Murphy discloses the feature of claim 29, we sustain the Examiner's § 103 rejection of claim 29 over Murphy.

### DECISION

We sustain the Examiner's §112, first paragraph, rejection of claims 31, 33, and 34 as failing to comply with the written description requirement.

We do not sustain the Examiner's § 112, first paragraph, rejection of claims 25-30 as failing to comply with the written description requirement.

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We sustain the Examiner's § 103 rejection of claims 1-3, 9, 13-16, 31, 33, and 34 over Murphy in view NEC Toyama.

We do not sustain the Examiner's § 103 rejection of claims 4 and 10-12 over Murphy in view of NEC Toyama.

We do not sustain the Examiner's § 103 rejection of claims 5-8 over Murphy in view of NEC Toyama, Stuck, and Galanes.

We sustain the Examiner's § 103 rejection of claims 25, 27, 28, 31, 33, and 34 over Murphy.

We do not sustain the Examiner's § 103 rejection of claim 30 over Murphy.

We sustain the Examiner's § 103 rejection of claim 26 over Murphy.

We sustain the Examiner's § 103 rejection of claim 29 over Murphy.

We do not sustain the Examiner's § 103 rejection of claim 30 over Murphy in view of NEC Toyama.

The Examiner's decision is affirmed-in-part.

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

AFFIRMED-IN-PART

PL Initial:  
sld

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James C. Wray  
Suite 300  
1493 Chain Bridge Road  
McLean, VA 22101