IN THE UNITED STATES DISTRICT COURT,
FOR THE WESTERN DISTRICT OF NORTH CAROLINA
CHARLOTTE DIVISION

AMERICAN EAGLE WHEEL CORPORATION, Plaintiff, v. LAWRENCE CAMPBELL SMYTH, Defendant.	)	Civil Action No. 3:04cv42 mcK

COMPLAINT

Plaintiff AMERICAN EAGLE WHEEL CORPORATION ("AEWC"), for its Complaint against Defendant LAWRENCE CAMPBELL SMYTH, alleges as follows:

The Parties

1. AEWC is a corporation organized and existing under the laws of the State of California having its principal place of business at 5780 Soestern Court, Chino, California.

2. Upon information and belief, Lawrence Campbell Smyth ("Smyth") is an individual residing at 16180 Riverpoint Drive, Charlotte, North Carolina.

Jurisdiction and Venue

3. These are claims for a declaration of patent invalidity, a declaration of patent unenforceability, conversion, unjust enrichment, and for request of correction of inventorship of a patent. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331, 1338(a), 1367(a) and 2201

4. The parties hereto are citizens of different states. The amount in controversy exceeds seventy five thousand ($75,000.00) dollars. This court has jurisdiction of this matter pursuant to 28 U.S.C. §1332.

5. Smyth is the owner of record of U.S. Patent No. 6,272,748 (the "'748 patent"), which issued on August 14, 2001, attached as Exhibit A hereto. The '748 patent claims a process for making wheels. Smyth has alleged that AEWC will infringe the '748 patent if AEWC practices the process. AEWC has the capability to immediately begin practicing the process, and has practiced the process in the past prior to issuance of the '748 patent. AEWC refrains from currently practicing the process because of the existence of the '748 patent and Smyth's allegations of infringement. Smyth has sued AEWC in South Carolina State Court on claims relating to the technology described in the '748 patent. An actual justiciable controversy therefore exists between the parties.

6. Venue is proper in this Judicial District under 28 U.S.C. §§ 1391(b).

Background

7. Smyth was hired by AEWC in 1998, and began working at the AEWC manufacturing facility in York, South Carolina, as the plant manager in or about August of 1998.

8. While employed by AEWC, Smyth supervised AEWC employees Paul Vezzetti and Bill Van de Nobelen, who were involved in the development of new processes to manufacture wheels. Specifically, one project involved the development of a method to produce cast wheel rims to be used in the production of two-piece wheels. At the time Smyth arrived at the York plant, this project was well underway. At that time, the facility was casting a five-spoke wheel, cutting the center out with a plasma torch, and machining the wheel rim.

9. During Smyth's tenure, this project, led by Paul Vezzetti advanced. The plant began using a solid center wheel rather than a five spoke wheel. The wheel was machined first and then the center was removed by machining it out rather than by cutting it out with a plasma torch.

10. AEWC made the necessary molds, supplied, or purchased and modified the necessary equipment for this process, and was successful in using this process prior to Smyth leaving AEWC's employ. AEWC employees kept this new process confidential for the benefit of AEWC. The new process represented a significant advance in the manufacture of cast aluminum wheel rims.

11. After Smyth left AEWC's employ, he filed an application for a United States patent on January 3, 2000. Smyth's patent application claimed the process for producing cast aluminum wheel rims, described above, which was developed by Paul Vezzetti. Smyth did not inform the United States Patent & Trademark Office ("PTO") of the involvement of AEWC's employees in inventing the process for machining wheels, and did not name the AEWC employees as inventors in the patent application. Instead, Smyth signed a declaration under oath, which was submitted to the PTO indicating that he was the sole inventor of the claimed subject matter. AEWC was unaware that Smyth filed the patent application, and AEWC never authorized Smyth to file the patent application.

12. Smyth's patent application was subsequently allowed, and on August 14, 2001, Smyth was awarded U.S. Patent No. 6,272,748, entitled "METHOD OF MANUFACTURING A WHEEL RIM FOR A TWO-PIECE WHEEL ASSEMBLY."

13. On November 2, 2001, Smyth filed suit against AEWC is South Carolina Court of Common Pleas for York County. In his deposition in that lawsuit, Smyth testified as follows: "Q. If American Eagle Wheel Corporation continues or produces, I should say, wheels using this

process, is it your position that they are infringing upon your patent? A. Absolutely. Q. And is that part of what this lawsuit is all about? A. Absolutely."

First Claim for Relief
Declaration of Invalidity of U.S. Patent No. 6,272,748

14. AEWC hereby incorporates by reference and re-alleges Paragraphs 1-10 as if restated herein.

15. The '748 patent is invalid under 35 U.S.C. § 101 et seq.

Second Claim for Relief
Declaration of Unenforceability of U.S. Patent No. 6,272,748

16. AEWC hereby incorporates by reference and re-alleges Paragraphs 1-12 as if restated herein.

17. Upon information and belief, Smyth failed to inform the PTO that AEWC employee Paul Vezzetti conceived of the invention claimed in the '748 patent with the intent to deceive the PTO into issuing the '748 patent solely in Smyth's name. Smyth made a material misrepresentation and omission to the PTO by representing he was the sole inventor, and by failing to disclose the true identity of the inventors of the invention claimed in the '748 patent.

18. Through such conduct, Smyth acted inequitably before the PTO, and the '748 patent is unenforceable.

19. This is an exceptional case under 35 U.S.C. § 285.

Third Claim for Relief
Conversion

20. AEWC hereby incorporates by reference and re-alleges Paragraphs 1-16 as if restated herein.

21. Smyth has wrongfully converted AEWC's proprietary information and trade secrets for Smyth's own benefit, depriving AEWC of its right to the immediate possession and value of the same.

22. As a direct and proximate result of such conversion, AEWC has been damaged. AEWC is entitled to exemplary damages due to the malicious, willful and wanton conduct of Smyth.

Fourth Claim for Relief
Unjust Enrichment

23. AEWC hereby incorporates by reference and re-alleges Paragraphs 1-19 as if restated herein.

24. By obtaining the '748 patent, Smyth has knowingly retained for his benefit the proprietary technology of AEWC, which is excluded from using such technology by the existence of the '748 patent.

25. Upon information and belief, Smyth has been enriched by obtaining the '748 patent and/or using the proprietary technology of AEWC, and has not paid AEWC for use of its technology.

26. AEWC is entitled to exemplary damages due to the malicious, willful and wanton conduct of Smyth.

Fifth Claim for Relief
Correction of Inventorship

27. AEWC hereby incorporates by reference and re-alleges Paragraphs 1-23 as if restated herein.

28. To the extent Smyth's failure to inform the PTO of the true inventors of the '748 patent was without deceptive intent, the inventorship of the '748 patent should be corrected to name Paul Vezzetti as the sole or joint inventor of the '748 patent pursuant to 35 U.S.C. § 256.

PRAYER FOR RELIEF

WHEREFORE, AEWC respectfully requests this Court enter judgment for AEWC against Smyth granting the following relief:

A. That the '748 patent is invalid and unenforceable;

B. That if the '748 patent is not invalid and unenforceable, an order issue pursuant to 35 U.S.C. § 256 that the inventorship of the '748 patent be corrected to name Paul Vezzetti as the sole or joint inventor of the '748 patent;

C. An accounting and an award of damages to compensate for AEWC for Smyth's conversion and unjust enrichment for patenting and/or using AEWC's proprietary technology;

D. An award of punitive and/or exemplary damages;

E. An assessment of prejudgment and postjudgment interest and costs against Smyth;

F. An award to AEWC of its attorneys fees and costs incurred in this lawsuit; and

G. An award of such other and further relief as this Court may deem just and proper.

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(12) **United States Patent**
Smyth

(10) **Patent No.: US 6,272,748 B1**
(45) **Date of Patent: Aug. 14, 2001**

(54) **METHOD OF MANUFACTURING A WHEEL RIM FOR A TWO-PIECE VEHICLE WHEEL ASSEMBLY**

(76) Inventor: **Larry C. Smyth**, 16108 River Point Dr., Charlotte, NC (US) 28278

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/476,697**

(22) Filed: **Jan. 3, 2000**

(51) **Int. Cl.**[7] **B23P 17/00**
(52) **U.S. Cl.** **29/894.322**; 29/894.35; 29/527.6; 29/418
(58) **Field of Search** 29/894.32, 894.322, 29/894.323, 894.35, 894.351, 894.353, 894.354, 418, 527.6

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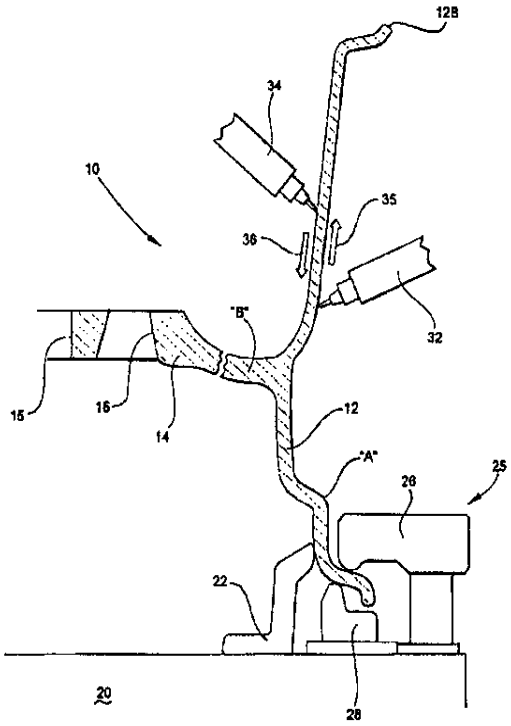
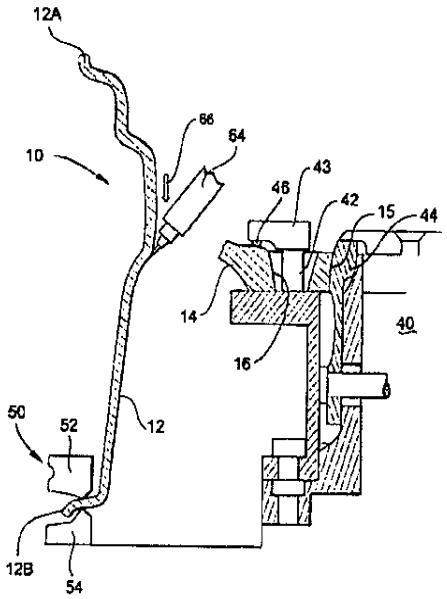
Primary Examiner—P. W. Echols
(74) *Attorney, Agent, or Firm*—Adams, Schwartz & Evans, P.A.

(57) **ABSTRACT**

A method of manufacturing a wheel rim for a two-piece vehicle wheel assembly. The method includes the step of casting a one-piece alloy wheel form. The wheel form defines an integrally-formed annular rim blank and supporting center. The rim blank includes opposing first and second annular edge portions. The first annular edge portion of the rim blank is machined, and then the second annular edge portion of the rim blank is machined. After the machining steps, the one-piece wheel form is cut to separate the machined wheel rim from the supporting center.

18 Claims, 4 Drawing Sheets





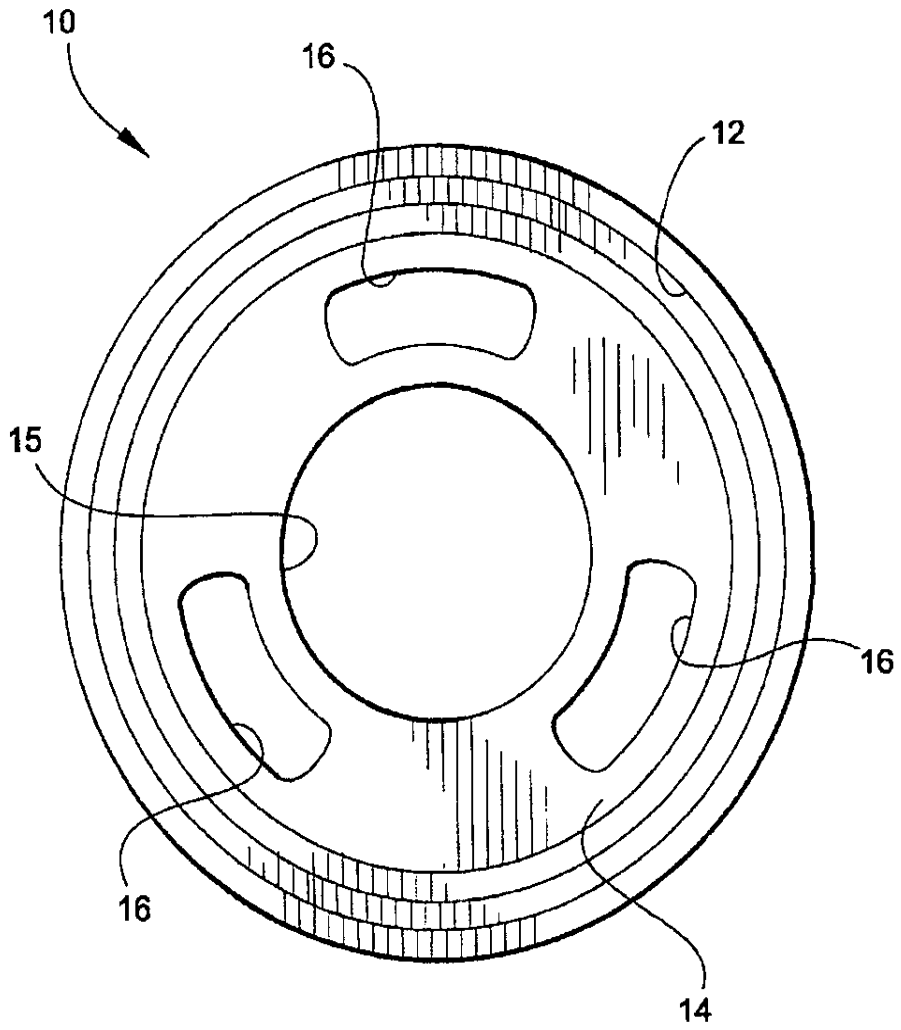


Fig. 1

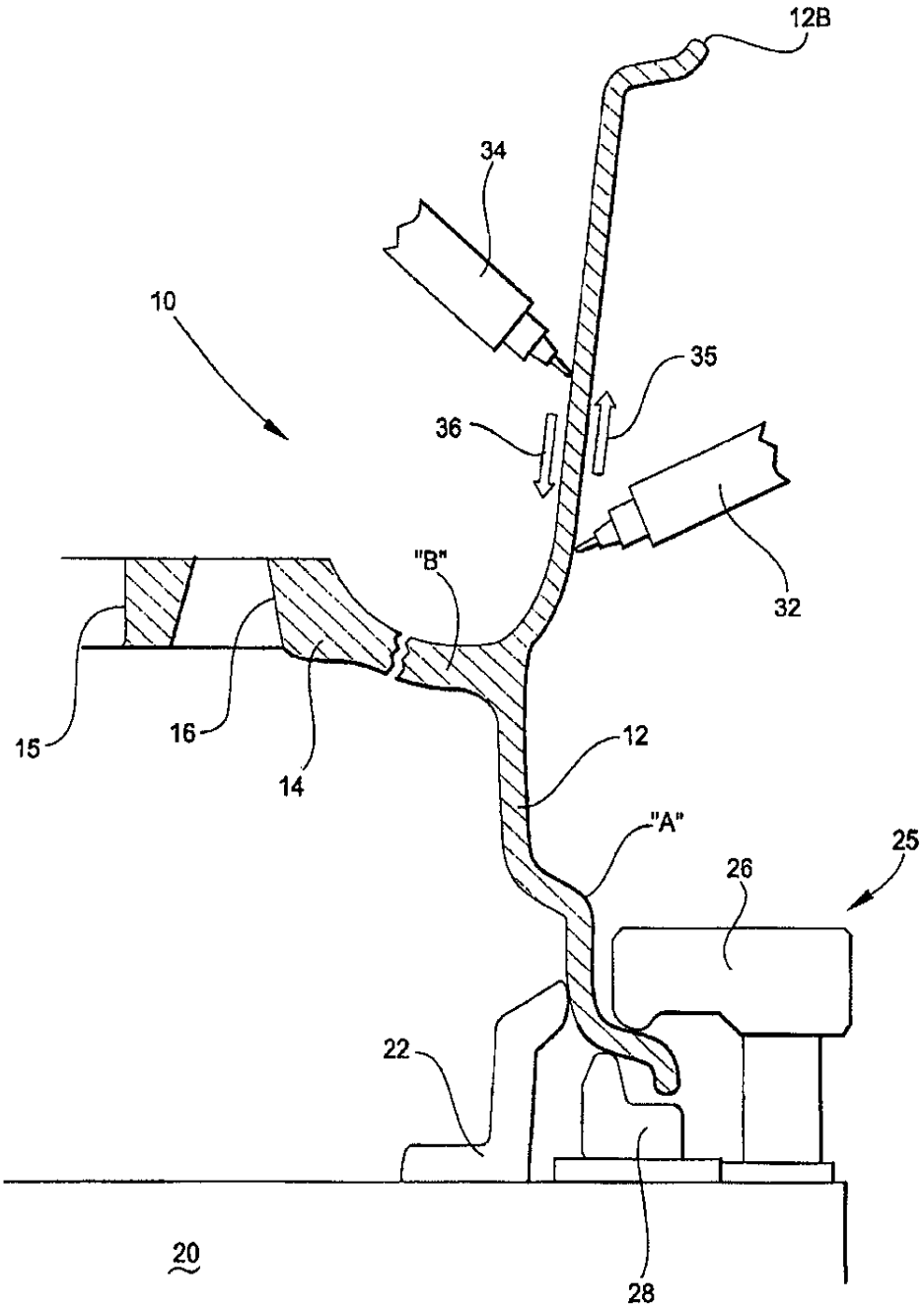


Fig. 2

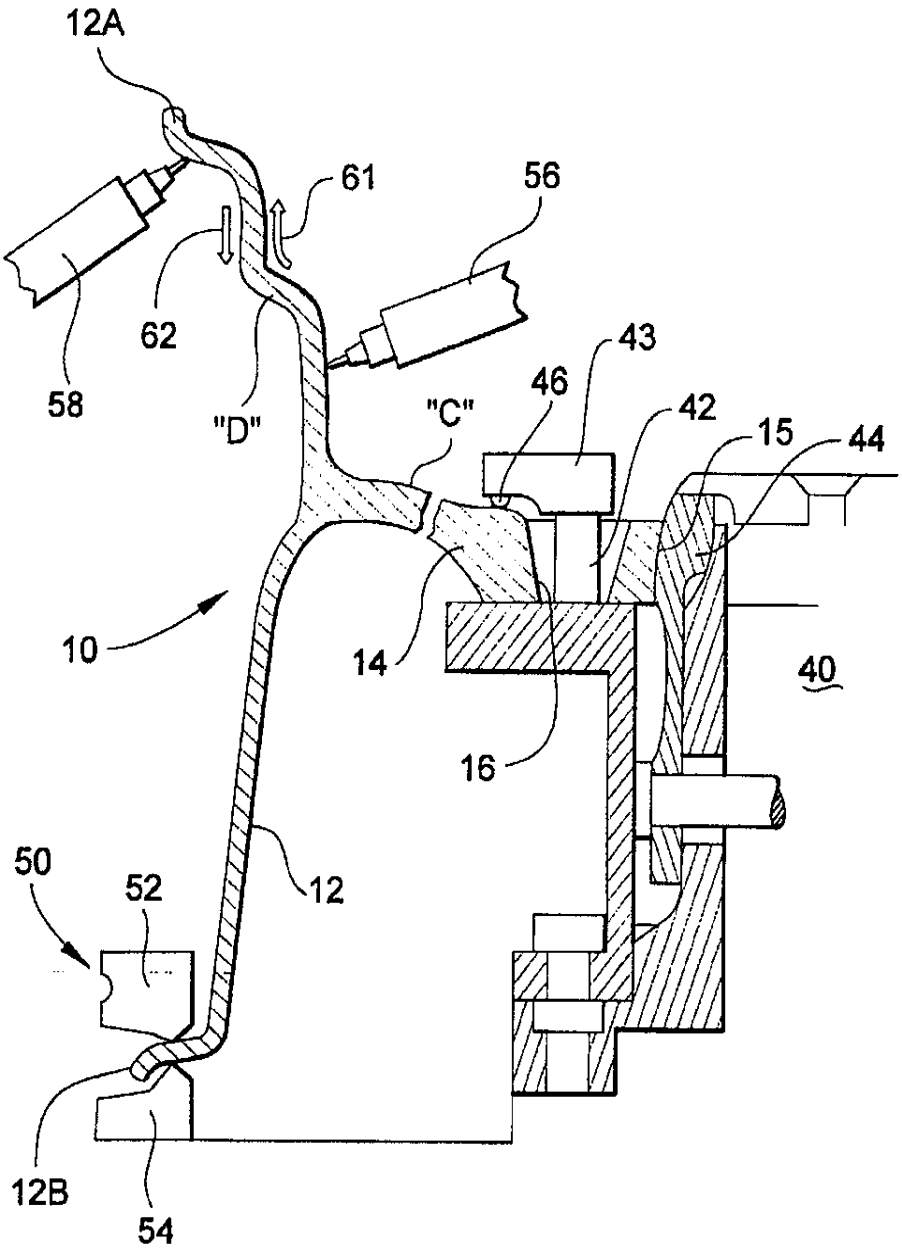


Fig. 3

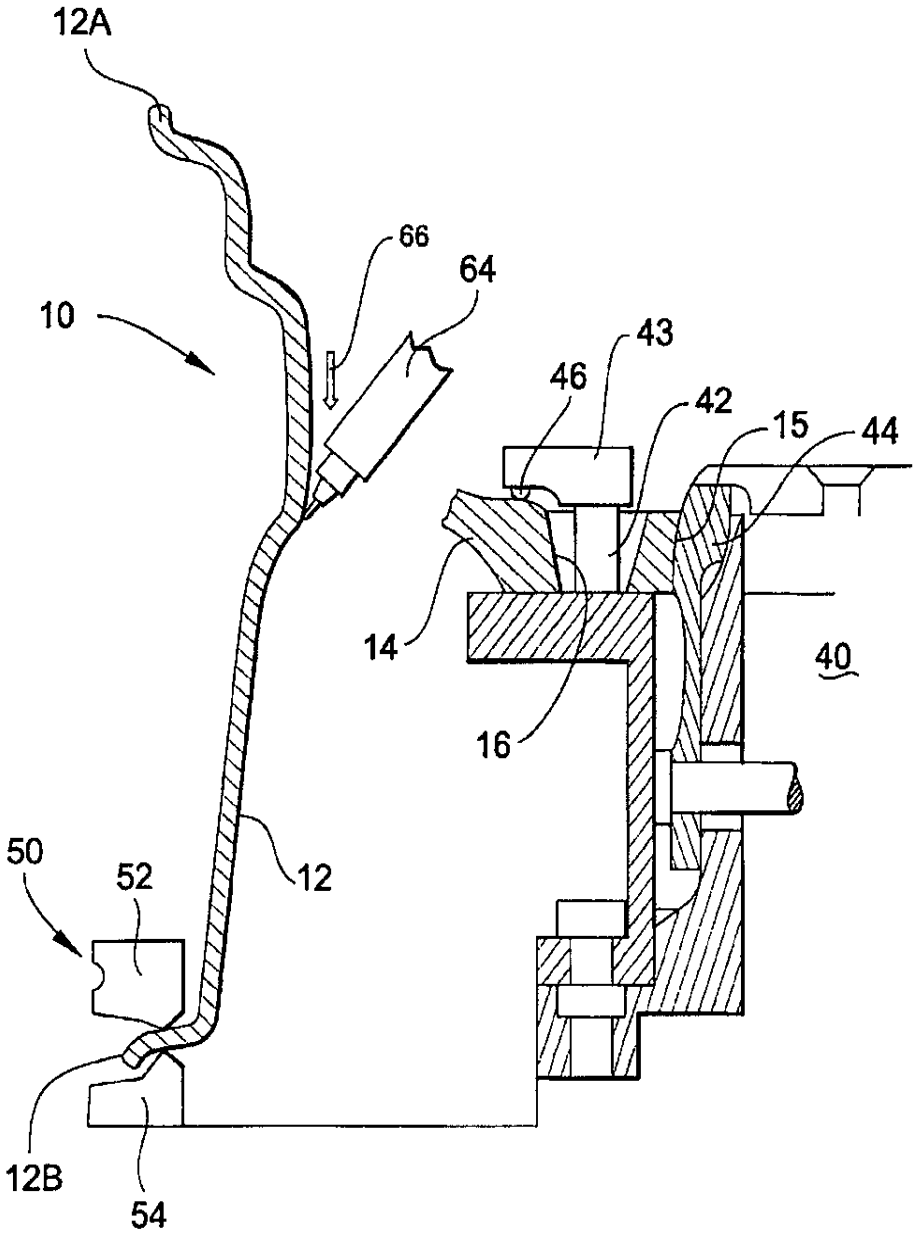


Fig. 4

METHOD OF MANUFACTURING A WHEEL RIM FOR A TWO-PIECE VEHICLE WHEEL ASSEMBLY

TECHNICAL FIELD AND BACKGROUND OF INVENTION

This invention relates to a method of manufacturing a wheel rim for a two-piece vehicle wheel assembly. The invention is especially applicable to the automobile parts industry.

One of the largest aftermarket niches in the automobile industry is the manufacture and sale of upgraded alloy wheels. Wheels are a major styling feature which can quickly freshen the appearance of older vehicles, or customize the appearance of new vehicles still at the dealership. Traditionally, aluminum alloy wheels have been cast in one-piece with integrally-formed rim and center sections.

The one-piece wheel was first introduced in the industry as an aftermarket product about 40 years ago. While this wheel was and still is largely successful, problems in manufacturing make it difficult to obtain a high quality casting and finished wheel on a consistent basis. Various manufacturing techniques have been tried in an effort to make a better product, including making the rim section thicker to keep it from leaking, and to increase its overall strength and toughness.

In more recent years, the two-piece alloy wheel has become a viable alternative to one-piece wheels. The two-piece wheel includes an annular wheel rim or "hoop", and a center. The center is cast and machined as before, and then welded to the separately formed rim. The rim is generally formed using a non-heat treatable aluminum alloy sheet which is cut in a strip by shearing to the desired length and width. The strip is passed through a three-roll bender to form a hoop. The butted ends of the hoop are then flattened out and clamped together in a massive electric-resistance upset butt welder. The upset flash at the weld is broached off, and the joint finely sanded to make it non-prominent. The hoop is then flared along each side edge, and is loaded into either a rim rolling or rim spinning line. Rolling basically bends the edge of the rim axially around a mandrel keeping the thickness generally constant. Spinning, on the other hand, pushes the rim axially on the mandrel causing cross-sectional variation. The latter technique reduces the weight and improves the concentricity and strength of the rim. Finally, the wheel assembly is formed by attaching the finished rim to a selected wheel center.

This conventional approach using alloy sheet strips produces quality rims and, as the wheel center is a simple casting which is not required to seal-in air, the two-piece wheel quickly found a market in the industry. Sheet rims are generally made in large quantities for cost effectiveness, and are used with different style wheel centers and with various offsets to allow wide variation in wheel design. Despite this growing market, the one-piece cast wheel community persisted and continued to focus on improving difficult wheel casting methods. There was little incentive at this time to look into casting and machining rims as an alternative to sheet-formed rims in a two-piece wheel assembly. However, because sheet rims are made from sheet, the rims are only 2½ D (dimensional) shapes, i.e., they do not have the 3D shape capability that cast wheels possess in the rim area. Due in part to this limitation, there grew a demand in the industry for cast wheel rims.

Around 1996, the industry experimented with a process for casting and machining wheel rims with a rounded street side flange. The two-piece all-cast wheels made using this process did not sell well, and because they were more expensive to make than either a traditional two-piece or similar looking one-piece wheel, these earlier cast and machined alloy rims were discontinued. They did however suggest an approach for combining the advantages of both one-piece and two-piece wheels.

In the process of developing a cast wheel rim, it was determined that a 100% cast and machined rim was dimensionally truer than conventional sheet rims used in two-piece wheel assemblies, thereby resulting in a smoother vehicle ride. The key was to develop a more cost efficient process for manufacturing the cast wheel rim.

One manufacturer's current approach is to cast and heat treat a one-piece wheel form as normal, followed by cutting out the spoked center with a plasma torch, followed by conventional wheel machining. While the casting is designed with a functional "center", its only purpose is to deliver the molten metal to the rim, and not to carry loads. The plasma cutting results in a cast rim shape, i.e., a convoluted hoop, which must then be machined completely to form the rim. Machining typically consists of two operations. In the first operation, the cast front side of the rim is centered and clamped by a dedicated first operation chuck, after which the back side of the rim and wheel is machined to final dimension. In the second operation, the machined inner portion of the wheel rim and center is used to precisely locate and clamp the rim in a separate chuck so that the front side of the wheel can be finish machined to blend perfectly to the first operation machined rim diameters.

Although this process produces high quality rims, it is problematic in several respects. Because the rim casting is essentially a large diameter thin walled hoop, it is very difficult to adjust the machining lathe so as to avoid excessive chatter marks (vibration induced surface irregularities) on the machined surfaces. Other drawbacks to this process include excessive scrap, machining cycles running at twice the rate as those for one-piece wheels, excessive technician set-up time, low cutting insert life, and an extra sanding step required to smooth out the course machining and/or chatter marks in the subsequent rim polishing process. Generally, although various remedies have been explored and minor improvements made, this process is only half as efficient as normal casting and machining for one-piece wheels. Nonetheless, this process is still being used today.

To overcome these and other limitations of the prior art, Applicant determined that a higher quality wheel rim could be produced by leaving the cast center and rim sections of the wheel form in one integrally-formed piece during the entire machining process. The first operation machining of the wheel form and turning was performed in a conventional manner—a well known and essentially trouble free operation. Then, once the first operation machining was complete, a second operation machining was performed on the opposite side of the wheel form, this again being done in a conventional manner. After machining both sides, the center of the wheel form was parted-off using a trepanning tool and then recycled. The key technical point observed was that the center makes the rim rigid and supports it in a rigid condition during the entire machining process. The resulting wheel rim displayed all of the advantages of prior art cast rims in one-piece wheels, and included substantially fewer chatter marks, less machining time, fewer scraps, less technician set-up, and a fine machined surface which requires less polishing.

SUMMARY OF THE INVENTION

Therefore, it is an object of the invention to provide a method of forming a separate wheel rim from a one-piece cast wheel form.

It is another object of the invention to provide a method of forming a cast wheel rim which produces substantially fewer chatter marks and a finer surface after machining.

It is another object of the invention to provide a method of forming a cast wheel rim which reduces vibration of the rim blank during machining.

It is another object of the invention to provide a method of forming a cast wheel rim which requires less machining time.

It is another object of the invention to provide a method of forming a cast wheel rim which results in fewer scraps.

It is another object of the invention to provide a method of forming a cast wheel rim which requires less technician set-up time.

It is another object of the invention to provide a method of forming a cast wheel rim which requires less rim polishing.

It is another object of the invention to provide a method of forming a cast wheel rim wherein the rim has a substantially greater yield strength than conventional aluminum sheet rims.

It is another object of the invention to provide a method of forming a cast wheel rim wherein the rim resists deformation resulting from an impact force.

It is another object of the invention to provide a method of forming a cast wheel rim wherein the rim provides a smooth vehicle ride.

These and other objects of the present invention are achieved in the preferred embodiments disclosed below by providing a method of manufacturing a wheel rim for a two-piece vehicle wheel assembly. The method includes the step of casting a one-piece alloy wheel form. The wheel form defines an integrally-formed annular rim blank and supporting center. The rim blank includes opposing first and second annular edge portions. The first annular edge portion of the rim blank is machined, and then the second annular edge portion of the rim blank is machined. After the machining steps, the one-piece wheel form is cut to separate the machined wheel rim from the supporting center.

According to another preferred embodiment of the invention, wherein the step of cutting the one-piece wheel form includes using a trepanning tool to sever the machined wheel rim from the supporting center.

According to yet another preferred embodiment of the invention, the method includes the step of clamping the second annular edge portion of the rim blank to secure the rim blank while machining the first annular edge portion.

According to yet another preferred embodiment of the invention, the method includes the step of clamping the first annular edge portion of the rim blank to secure the rim blank while machining the second annular edge portion.

According to yet another preferred embodiment of the invention, the method includes the step of centering the wheel form prior to machining the second annular edge portion.

According to yet another preferred embodiment of the invention, the method includes the step of finishing and polishing the machined wheel rim after the wheel rim is separated from the wheel form.

According to yet another preferred embodiment of the invention, the method includes the step of turning the wheel form over after machining the first annular edge portion to expose the second annular edge portion for machining.

According to yet another preferred embodiment of the invention, the method includes the step of finishing and smoothing the cut made to separate the machined wheel rim from the supporting center of the wheel form.

According to yet another preferred embodiment of the invention, the method includes the step of recycling the supporting center after separating the machined wheel rim.

In yet another embodiment, the method of manufacturing a wheel rim for a two-piece vehicle wheel assembly includes the steps of casting a one-piece alloy wheel form defining an integrally-formed annular rim blank and supporting center. The rim blank includes opposing first and second annular edge portions. At least one of the first and second annular edge portions of the rim blank is then machined. After the machining step, the one-piece wheel form is cut to separate the machined wheel rim from the supporting center.

BRIEF DESCRIPTION OF THE DRAWINGS

Some of the objects of the invention have been set forth above. Other objects and advantages of the invention will appear as the description proceeds when taken in conjunction with the following drawings, in which:

FIG. 1 is a plan view of a vehicle wheel form to be processed according to a method of the present invention;

FIG. 2 is fragmentary, cross-sectional view of the wheel form mounted in a wheel chuck and showing cutter tools for machining the inside and outside surfaces of the rim blank;

FIG. 3 is fragmentary, cross-sectional view of the wheel form turned over and mounted in a second wheel chuck, and showing cutter tools for machining the remaining surfaces of the rim blank; and

FIG. 4 is fragmentary, cross-sectional view of the wheel form mounted in the second wheel chuck, and showing a cutter tool for separating the machined wheel rim from the supporting center.

DESCRIPTION OF THE PREFFERED EMBODIMENT AND BEST MODE

Referring now specifically to the drawings, a cast alloy wheel form is illustrated in FIG. 1 and shown generally at reference numeral **10**. The wheel form **10** is processed according to a method of the present invention to form a 3-dimensional, cast alloy wheel rim adapted for use in a two-piece vehicle wheel assembly. The wheel form **10** includes an integrally-formed rim blank **12** and supporting center **14**. The center **14** has a machined pilot bore **15** and several cast windows **16** for receiving wheel alignment and clamping members described below.

Referring to FIG. **2**, after casting, the alloy wheel form **10** is mounted on a wheel chuck **20** in a vertical lathe. The wheel chuck **20** has a spring-loaded centering device **22** and clamping assembly **25** for engaging and holding an annular edge portion **12A** of the rim blank **12**. The clamping assembly **25** includes a vertically adjustable flange clamp **26** which bears against an outside surface of the rim edge, and a stationary rest pad **28** which bears against the inside surface of the rim edge. The clamping assembly **25** holds the wheel form **10** in a stable, fixed position during a first operation machining process. Conventional lathe cutting tools **32** and **34** machine the inside and outside surfaces of the cast rim blank **10** beginning from a point located approximately at "A" and traveling, for example, in the direction indicated by arrows **35** and **36** around the opposing annular edge portion **12B** of the rim blank **12** to a point located approximately at "B".

After the first operation machining process, the wheel form **10** is turned over and mounted on a collet chuck **40**

shown in FIG. 3. This chuck **40** includes three drive dogs **42** (only one shown) each having a retention head **43** (rotated 90 degrees and shown in phantom for clarity) for being received through respective windows **16** of the wheel center **14**, and an expanding collet **44** which engages an inside surface of the pilot hole **15** to properly center the wheel form **10** for further processing. The retention head **43** of the drive dog **42** has a spring-loaded detent **46** which engages the wheel center **15**. The drive dogs **42** and expanding collet **44** cooperate to hold the wheel form **10** in a stable, fixed position during a second operation machining process. Preferably, a second clamping assembly **50** including a vertically adjustable clamp finger **52** and stationary rest pad **54** is used to hold the rim edge.

Once mounted and secured on the collet chuck **40**, conventional lathe cutting tools **56** and **58** machine the inside and outside surfaces of the rim blank **10** beginning from approximately point "C" and traveling, for example, in the direction indicated by arrows **61** and **62** around the edge portion **12A** of the rim blank **10** to approximately point "D". The integrally formed wheel center **14** stabilizes the rim blank **12** during the entire machining processes, thereby resulting in reduced vibration and the occurrence of substantially fewer chatter marks.

As shown in FIG. **4**, after the second operation machining and while the wheel form **10** is still secured in the second chuck **40** at both the center **14** and edge of the rim portion **12B**, a conventional trepanning tool **64** cuts the wheel form **10** in the direction indicated by arrow **66** at the junction of the rim blank **12** and center **14** to separate the machined wheel rim. The supporting center **14** is scrapped and recycled. A final finishing, smoothing, and polishing process completes the cast wheel rim and readies it for incorporation into a two-piece wheel assembly. The finished wheel rim is attached to the selected wheel center using any suitable means, such as by welding or riveting.

The wheel form **10** is preferably cast of a standard aluminum alloy. In addition, a number of conventional wheel chucks may be utilized for securing the wheel form **10** during processing. One such wheel chuck is described in U.S. Pat. No. 5,820,137. The complete disclosure of this patent is incorporated herein by reference.

A method of manufacturing a vehicle wheel rim is described above. Various details of the invention may be changed without departing from its scope. Furthermore, the foregoing description of the preferred embodiment of the invention and the best mode for practicing the invention are provided for the purpose of illustration only and not for the purpose of limitation-the invention being defined by the claims.

I claim:

1. A method of manufacturing a wheel rim for a two-piece vehicle wheel assembly, comprising the steps of:

(a) casting a one-piece alloy wheel form defining an integrally-formed annular rim blank and supporting center, the rim blank including opposing first and second annular edge portions;

(b) machining at least one of the first and second annular edge portions of the rim blank; and

(c) after the machining step of (b), cutting the one-piece wheel form to separate the machined wheel rim from the supporting center.

2. A method according to claim **1**, wherein the step of cutting the one-piece wheel form includes using a trepanning tool to sever the machined wheel rim from the supporting center.

3. A method according to claim **1**, and comprising the step of polishing the machined wheel rim after the wheel rim is separated from the wheel form.

4. A method according to claim **1**, and comprising the step of finishing and smoothing the cut made to separate the machined wheel rim from the supporting center of the wheel form.

5. A method according to claim **1**, and comprising the step of recycling the supporting center after separating the machined wheel rim.

6. A method according to claim **1**, and comprising the step of attaching the machined wheel rim to a separately manufactured wheel center to form a two-piece vehicle wheel assembly.

7. A method of manufacturing a wheel rim for a two-piece vehicle wheel assembly, comprising the steps of:

(a) casting a one-piece alloy wheel form defining an integrally-formed annular rim blank and supporting center, the rim blank including opposing first and second annular edge portions;

(b) machining the first annular edge portion of the rim blank;

(c) machining the second annular edge portion of the rim blank; and

(d) after the machining steps of (b) and (c), cutting the one-piece wheel form to separate the machined wheel rim from the supporting center.

8. A method according to claim **7**, wherein the step of cutting the one-piece wheel form includes using a trepanning tool to sever the machined wheel rim from the supporting center.

9. A method according to claim **7**, and comprising the step of clamping the second annular edge portion of the rim blank to secure the rim blank while machining the first annular edge portion.

10. A method according to claim **7**, and comprising the step of clamping the first annular edge portion of the rim blank to secure the rim blank while machining the second annular edge portion.

11. A method according to claim **7**, and comprising the step of centering the wheel form prior to machining the second annular edge portion.

12. A method according to claim **7**, and comprising the step of polishing the machined wheel rim after the wheel rim is separated from the wheel form.

13. A method according to claim **7**, and comprising the step of turning the wheel form over after machining the first annular edge portion to expose the second annular edge portion for machining.

14. A method according to claim **7**, and comprising the step of finishing and smoothing the cut made to separate the machined wheel rim from the supporting center of the wheel form.

15. A method according to claim **7**, and comprising the step of recycling the supporting center after separating the machined wheel rim.

16. A method according to claim **7**, and comprising the step of attaching the machined wheel rim to a separately manufactured wheel center to form a two-piece vehicle wheel assembly.

17. A method of manufacturing a wheel rim for a two-piece vehicle wheel assembly, comprising the steps of:

(a) casting a one-piece alloy wheel form defining an integrally-formed annular rim blank and supporting center, the rim blank including opposing first and second annular edge portions;

(b) clamping the second annular edge portion of the rim blank to secure the rim blank in position while exposing the first annular edge portion;

(c) machining the first annular edge portion of the rim blank;

(d) turning the wheel form over after machining the first annular edge portion of the rim blank to expose the second annular edge portion for machining;

(e) clamping the first annular edge portion of the rim blank to secure the rim blank in position;

(f) machining the second annular edge portion of the rim blank; and

(g) after the machining step of (f), cutting the one-piece wheel form to separate the machined wheel rim from the supporting center.

18. A method according to claim 17, and comprising the step of attaching the machined wheel rim to a separately manufactured wheel center to form a two-piece vehicle wheel assembly.

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