

United States District Court,  
W.D. Wisconsin.

**BRIGGS & STRATTON CORP,**  
Plaintiff.

v.

**KOHLER CO,**  
Defendant.

No. 05-C-0025-C

**Nov. 3, 2005.**

**Background:** Owner of two patents for single-cylinder internal combustion engine sued competitor for infringement. Owner moved for summary judgment on issues of infringement and validity, and competitor for partial summary judgment on issue of damages.

**Holdings:** The District Court, Crabb, J., held that:

- (1) claim calling for rail-guided, reciprocating counterbalance weight was infringed;
- (2) claim calling for mass of counterbalance weight to be equally distributed on opposite sides of cylinder axis was not infringed;
- (3) fact issue existed as to whether accused engine's intake passageway had claimed "substantially uniform" cross-sectional area;
- (4) claim calling for rail-guided, reciprocating counterbalance weight was not anticipated;
- (5) fact issue existed as to whether claim calling for rail-guided, reciprocating counterbalance weight was invalid as obvious;
- (6) fact issue existed as to whether cylinder head assembly patent was anticipated or obvious; and
- (7) claimed anti-vibration "system" was subject to patent marking statute.

Owner's motion granted in part and denied in part; competitor's motion granted.

See also 2005 WL 1711154.

6,742,488, 6,974,458. Cited.

David L. Debruin, for Plaintiff.

David J. Harth, Heller Ehrman White & McAuliffe, Madison, WI, for Defendant.

**OPINION AND ORDER**

**CRABB, District Judge.**

In this civil action, plaintiff Briggs & Stratton Corp. accuses defendant Kohler Co. of manufacturing and selling a single-cylinder internal combustion engine that infringes claims 1-2, 4, 6-11 and 13 of plaintiff's United States Patent No. 6,382,166 (the '166 patent) and claims 1, 2-6, 8, 11-13 and 15-31 of United States Patent No. 6,460,502 (the '502 patent). Plaintiff seeks declaratory, injunctive and monetary relief under 35 U.S.C. s. 271. Defendant asserts six counterclaims, alleging non-infringement, patent invalidity and violations of 15 U.S.C. s.s. 1 & 2 of the Sherman Act, Wisconsin antitrust laws, Wis. Stat. s.s. 133.03, 133.04, 133.14 and 133.18 and the Wisconsin common law of unfair competition. The case is before the court on plaintiff's motions to strike and for summary judgment on the issues of literal infringement and validity and on defendant's motion for partial summary judgment limiting damages. Jurisdiction is present. 28 U.S.C. s.s. 1338(a) and 1331.

Before setting out the undisputed facts, I will address plaintiff's motion to strike portions of the brief and supporting declarations defendant filed in response to plaintiff's motion for summary judgment.

### **I. MOTION TO STRIKE**

On February 16, 2005, plaintiff served its first set of interrogatories and requests for production on defendant. Interrogatory # 1 asked defendant to

[e]xplain in detail, on a claim-by-claim and limitation-by-limitation basis, each of KOHLER'S contentions that any claim of the '166 PATENT or the '502 PATENT is invalid, void, and/or unenforceable under 35 U.S.C. s.s. 101, 102, 103, and 112, including an identification of documents that KOHLER contends support such contentions, the complete legal and factual bases for such contentions, including claim construction contentions, and each person having knowledge of any factual basis.

Aff. of Joseph T. Miotke, dkt. # 81, exh. # 2, at 1. Defendant responded on March 24, 2005. On May 26, 2005, and again on August 9, 2005, defendant supplemented its responses to plaintiff's first set of interrogatories and requests for production.

On July 15, 2005, defendant's expert, James Brogdon, filed an expert report that included Brogdon's claim constructions and opinions regarding the invalidity of the '166 and '502 patents. On August 4, 2005, defendant filed a second report by Brogdon in response to the report filed by plaintiff's expert, Marthinus van Schoor.

Plaintiff contends that these filings were incomplete and that defendant has included in its brief in response to the motion for summary judgment expert opinions and legal arguments that were not disclosed previously to plaintiff, in violation of Fed.R.Civ.P. 26(e)(1). Plaintiff objects to (A) defendant's new non-infringement argument based on its assertion that the Courage balance system used in defendant's allegedly infringing engine does not have a counterbalance weight disposed on the second side of the crankshaft; (B) the allegedly new proposed constructions of the terms "counterbalance weight," "rail," "adapter," "runner filler," "selectable," and "substantially uniform"; and (C) numerous statements and documentary evidence offered by defendant's expert, James Grondin, and by defendant's Rule 30(b)(6) witness, Terrence Rotter. This evidence includes new claims regarding the obviousness of the '166 patent, allegedly contradictory testimony regarding the design of the Courage engine, testimony discussing "types" of runner fillers, two allegedly inaccurate summary charts and new references to prior art. Plaintiff asks that all arguments and materials not previously disclosed by defendant be stricken under Fed. Rule Civ. P. 37(c)(1) or under the "sham affidavit doctrine."

Rule 26(e) of the Federal Rules of Civil Procedure places upon litigants a duty to supplement "the information contained in [an expert witness's] report" and "information provided through deposition of the

expert" if the party learns that the information previously disclosed was incomplete or incorrect in any material respect. Rule 26(e)(1). Rule 26(e)(2) requires litigants to "seasonably amend" prior responses to interrogatories when a party learns that its earlier responses were incomplete or incorrect in any material respect.

A party who fails to disclose information required by Rule 26(e)(1) or to amend a prior response to discovery as required by Rule 26(e)(2) is not permitted to use the undisclosed evidence at trial, at a hearing or on a motion unless the failure is harmless or substantially justified. Fed.R.Civ.P. 37(c)(1). "The determination of whether a Rule 26(a) violation is justified or harmless is entrusted to the broad discretion of the district court." *Mid-America Tablewares, Inc. v. Mogi Trading Co., Ltd.*, 100 F.3d 1353, 1363 (7th Cir.1996).

#### ***A. Defendant's Non-Infringement Argument Regarding the '166 Patent***

[1] Relying on the declaration of its expert, James Brogdon, defendant argues that its Courage series engine does not utilize a counterbalance weight disposed on the second side of the engine's crankshaft. Defendant asserts that its new position is the logical response to the opinion expressed by plaintiff's expert, Marthinus van Schoor, in his August 5, 2005 invalidity report that the Menen (U.S. Patent No. 4,407,169) counterbalance weight is not disposed on the second side of the crankshaft. The Menen counterbalance weight is "virtually identical" to the Courage counterbalance weight; therefore, defendant argues, if Menen does not have a counterbalance weight disposed on a second side of the crankshaft, neither does the Courage series engine. Although this may be a logical position, it was not disclosed prior to the filing of defendant's response to plaintiff's motion for summary judgment. Defendant argues that the non-disclosure was justified because it did not have "an opportunity to respond" to van Schoor's report before filing its response to plaintiff's motion for summary judgment and it had no way of knowing from van Schoor's July 13, 2005 report on infringement that van Schoor viewed the Menen patent in this way.

Defendant's argument is dubious in two respects. First, Magistrate Judge Crocker advised the parties on March 7, 2005, to:

... undertake discovery in a manner that allows them to make or respond to dispositive motions within the scheduled deadlines. The fact that the general discovery cutoff ... occurs after the deadlines for filing and briefing dispositive motions is not a ground for requesting an extension of the motion and briefing deadlines.

Order dated Mar. 7, 2005, dkt. # 10, at 3. Despite that admonition, defendant did not schedule a deposition of van Schoor, plaintiff's expert, until September 1, 2005, two weeks after the court's *extended* summary judgment deadline and seven weeks after defendant had received van Schoor's report on infringement, in which van Schoor gave his opinion that the Courage balance system was disposed on a second side of the crankshaft.

Second, although defendant argues that after it learned on August 5, 2005, of van Schoor's position on the Menen patent, it had no opportunity to amend its infringement position, the facts show otherwise. Defendant supplemented its response to interrogatories on August 9, 2005, four days after receiving the report from van Schoor with specific reference to the Menen patent and six days before the deadline for summary judgment. Defendant's supplemental answers does not include its new position that the '166 patent did not infringe claim 1 because it does not have a counterbalance weight disposed on a second side of the crankshaft.

When Rule 26 is violated, exclusion of any non-disclosed information is "automatic and mandatory unless the sanctioned party can show that its violation of Rule 26 was either justified or harmless." *David v.*

Caterpillar, Inc., 324 F.3d 851, 857 (7th Cir.2003). It is difficult to imagine how non-disclosure of an infringement defense in a patent infringement case could be harmless or how the non-disclosure could be justified under the circumstances of this case. Therefore, I will grant plaintiff's request and will disregard any reference to defendant's claim that the Courage series engine's counterbalance weight is not disposed on the second side of the crankshaft.

### ***B. Changes in Proposed Claim Construction***

[2] The table below shows defendant's new proposed constructions for six terms at issue in the '166 and '502 patents.

Table I		
Term	Construction asserted as of August 9, 2005	Proposed construction for summary judgment
counterbalance weight	a weight that counters forces associated with movement of a piston	a weight that counters forces associated with movement of a piston that is not integral or rigidly fixed to the crankshaft
rail	a bar with at least two substantially perpendicular surfaces that is fixed to one structure extending longitudinally upon which another structure is slidable and which serves to direct the motion of that structure along the axis of the bar	a bar with at least two substantially perpendicular surfaces that is fixed to one structure extending longitudinally upon which another structure is slidable and which serves to direct the motion of that structure along the axis of the bar
adapter	a device that permits the cylinder head's intake position to be altered	a device used to connect different pieces of apparatus
runner filler	a component that is positioned within, and fully defines at least part of, the intake passageway	a part of the adapter that is disposed within the intake runner that at least partially forms the intake passageway
selectable	capable of being altered	capable of being chosen or picked out
substantially uniform	varying only slightly from uniformity	largely or approximately uniform

Plaintiff reads defendant's brief as implying that defendant construes the term rail to include a requirement that the counterbalance weight "interface with corresponding slots or recesses" on the rail. Although in his declaration Brogdon states that the '166 patent requires interfacing, the construction of "rail" proposed in defendant's response brief is identical to the construction previously disclosed to plaintiff. I will not read defendant's proposed claim construction any more narrowly than it is framed in the response brief. For that reason, the propriety of the non-existent "change" in construction need not be addressed.

Similarly, defendant's changed construction of "substantially uniform" is insignificant. I see no difference in meaning between defendant's originally proposed construction of the term "substantially uniform" as "varying only slightly from uniformity" and its new construction, "largely or approximately uniform." If an object varies slightly from uniformity, then it is largely uniform.

The remaining changes in defendant's claim constructions are substantial. Defendant excuses the late changes in two ways. First, it asserts that its new construction of the term "adapter" was simply a response to *plaintiff's* new construction of the term in its brief in support of its motion for summary judgment. Although plaintiff denies this contention, the record supports defendant.

In a responsive report filed on August 15, 2005, plaintiff's expert, Dr. van Schoor, wrote that "one of ordinary skill in the art would construe the term 'adapter' to be a component that is used to effect operative compatibility between different parts of a system." Am'd Rep. of Dr. van Schoor, dkt. # 53, exh. # 26, at 11.

Plaintiff contends in its summary judgment brief that an "adapter" is "a device that permits the cylinder head's intake position to be altered." Plt.'s Brief in Supp. of M. for Summ. J. on '502 patent, dkt. # 50, at 14. Despite plaintiff's arguments to the contrary, this is a new construction of the term adapter.

It would be unreasonable to permit plaintiff to introduce a new claim construction in its motion for summary judgment and then prohibit defendant from responding with a new construction of its own. Therefore, I will consider both parties' proposed constructions for the term "adapter" as defined in their summary judgment briefs.

Second, defendant argues that its remaining changes in the construction of the terms "counterbalance weight," "runner filler" and "selectable" are excusable because they were made in response to van Schoor's amended expert report, filed by plaintiff on August 15, 2005. Defendant does not explain why it waited to disclose these new claim constructions to plaintiff in its response brief instead of including them in its amended replies to interrogatories, which it filed four days after receiving van Schoor's amended report. Because defendant has provided no justifiable excuse for its failure to provide plaintiff with notice of its new claim constructions prior to responding to plaintiff's motion for summary judgment, I will not consider the new constructions proposed in defendant's response brief. Rather, I will rely on the claim constructions disclosed to plaintiff as of August 9, 2005, as shown in Table 1, above.

### ***C. Statements and Opinions of Defendant's Experts***

#### ***1. Opinions related to obviousness of the '166 patent***

[3] Plaintiff's third objection to defendant's summary judgment arguments focuses on defendant's submission of a chart created by its expert, Brogdon, that compares each claim of the '166 patent to numerous pieces of prior art. *See* Brogdon Decl., dkt. # 65, exh. E. According to plaintiff, Brogdon's readings of prior art as reflected in Exhibit E differ from his reading of the prior art as disclosed in his expert report.

Although plaintiff is correct in stating that Brogdon's positions in his expert report differ slightly from positions taken in the summary chart attached to his declaration in support of defendant's response brief, all but one of the changes are minor. In Exhibit E, Brogdon withdraws his contention that Van Ligten and Menen each contain a counterbalance weight disposed on a second side of the crankshaft, and amends his prior contention that use of a rail interconnected with the counterbalance weight or crankcase housing as described in claim 1 is rendered obvious by Kollock, Ricardo, Murata, Shirai and Ljunstrom under defendant's construction and asserts that the use of a rail is obvious under both parties' constructions. None of these changes prejudice plaintiff in any way and may in fact bolster its case. Plaintiff concedes this, stating that defendant's changed readings of Kollock, Ricardo, Murata, Shirai and Ljunstrom "constitute an admission by Kohler that these five references cannot anticipate claim 1 under either party's construction." Accordingly, I will deny plaintiff's request to strike these minor changes.

However, one difference between Brogdon's expert report and the summary chart merits further attention. In the summary chart, defendant contends for the first time that claims 7 and 8 are rendered obvious by Ljunstrom under both parties' proposed constructions. This reading of Ljunstrom is entirely new and was not disclosed to plaintiff. Therefore, I will not consider it.

#### ***2. "New" opinions related to the '502 patent***

Plaintiff objects to defendant's submission of a second chart created by Brogdon that compares each claim of the '502 patent to numerous pieces of prior art. Brogdon Decl., dkt. # 70, exh. B. According to plaintiff, defendant has changed its reading of prior art pieces from the reading Brogdon provided in his expert report. In addition, plaintiff objects to the inclusion of "new opinions" in para. para. 7, 9, 11, 12, 14-17, 21-28, 30-32 and 34 of Brogdon's declaration in support of defendant's response brief.

### **a. Summary chart**

Although plaintiff contends that the table attached to Brogdon's declaration in support of defendant's response brief as Exhibit B contains "literally dozens of new opinions," Plt.'s Br. on M. to Strike, dkt. # 80, at 18, plaintiff limits its attack to three examples: (1) a new reference to the Howarth engineering text; (2) a claim that Watanabe anticipates claim 22 instead of rendering it obvious; and (3) "new combinations of references render obvious many of the claims." *Id.* Rather than sorting through which of the many alleged discrepancies between Brogdon's report and his chart are legitimate and which are not, I will not consult Exhibit B in deciding plaintiff's motion, but will rely instead on Brogdon's affidavit, declaration and expert report to support defendant's proposed findings of fact regarding prior art relating to the '502 patent. I will deny plaintiff's motion as moot with respect to the exhibit.

### **b. Motivation to combine**

Plaintiff objects to "new" references to inventors' motivation to combine prior art references found in defendant's response brief and in Brogdon's declaration in support of defendant's response brief. Plaintiff does not contend that the prior art references upon which defendant relies were undisclosed, but rather that defendant did not disclose its argument that inventors would have been motivated to combine the references, thereby rendering obvious the '502 patent. Defendant offers no explanation for its failure to disclose its "motivation to combine" arguments to plaintiff at an earlier date.

Generally, failure to disclose amended expert opinions is sufficient reason to strike new arguments. However, as the moving party, plaintiff bears the burden of showing which of defendant's arguments are new and which were disclosed prior to summary judgment. Plaintiff has not provided this information. Defendant has made over 200 arguments regarding the invalidity of the '502 patent. The parties do not suggest that *all* of these arguments were undisclosed. Therefore, absent specific information indicating which arguments ought to be stricken and which should stand, I will deny plaintiff's motion to strike *any* of defendant's arguments regarding inventors' motivation to combine prior art.

### **c. Statements regarding the structure of the Courage series engine**

At his deposition, Rotter declared that the counterbalance weight used in the Courage engine was designed as "one piece." Rotter Dep., dkt. # 41, at 153, ln. 25. When questioned about the portion of the piece that plaintiff contends is a link arm, Rotter testified that its purpose was to "connect ... the crankshaft to the mass you want to move." *Id.* at 154, ln. 10-11. In his declaration in support of defendant's response brief, Rotter states that "the counterbalance weight of the Courage engine fits over the crankshaft and does not utilize link arms." Rotter Decl., dkt. # 71, at para. 14.

Plaintiff asserts two grounds for striking the statements found in Rotter's declaration. First, the statements disclose information that bolsters defendant's previously undisclosed non-infringement argument that the Courage engine's counterbalance weight is not disposed on a second side of the crankshaft and second, they contradict Brogdon and Rotter's deposition testimony and are therefore "sham affidavits."

I have already indicated that I will not consider defendant's previously undisclosed argument that the Courage engine's counterbalance weight is not disposed on a second side of the crankshaft. It is unnecessary to strike Rotter's statements on the ground that they might support his now-stricken argument.

[4] Plaintiff argues in the alternative that the statements should be stricken under the "sham affidavit doctrine." The Court of Appeals for the Seventh Circuit has long held that parties cannot thwart the purposes of Rule 56 by creating "sham" issues of fact with affidavits that contradict prior deposition testimony. *Bank of Illinois v. Allied Signal Safety Restraint Systems*, 75 F.3d 1162, 1168 (7th Cir.1996). It is settled law that

if a party submits affidavits or declarations after a deposition that recant or modify deposition testimony, the court can ignore the affidavits in the absence of a convincing explanation for the change in testimony, such as a failure to understand the question completely or the discovery of new evidence. *Id.* at 1170. However, the court will not exclude post-deposition evidence unless the statements are inherently inconsistent and any contradiction is not the result of an honest discrepancy or newly discovered evidence. *Id.* Although plaintiff argues that the declaration of Rotter is a "sham affidavit" that conflicts with his prior deposition testimony, I conclude that the declarations are not inherently inconsistent.

At his deposition, Rotter was asked about the function of the top and bottom portions of the one-piece counterbalance weight used in the Courage engine. In the context of that question, Rotter made a distinction between the "mass" and the connecting pieces. However, by admitting that the weight contained connectors, Rotter was not necessarily admitting the weight had link arms, as he understood the term. If Rotter believed link arms were connectors formed separately from the counterbalance weight itself (as defendant implies throughout its response brief), he might reasonably deny that the one-piece weight used in the Courage engine has link arms. The potential discrepancies between Rotter's deposition testimony and declaration may provide fodder for later impeachment, but they are not inherently contradictory. Therefore, I will deny plaintiff's motion to strike the declaration.

#### **d. Types of runner fillers**

In defendant's brief in response to plaintiff's motion for summary judgment, it discusses "runner fillers" and describes them as coming in two varieties: open and closed. Plaintiff objects to this characterization, contending that it is a "new opinion" previously undisclosed by defendant that must be stricken. The assertion that runner fillers can be open (meaning not fully enclosed) or closed is not an expert opinion, but rather a factual observation. Moreover, as defendant emphasizes, it is a fact that plaintiff does not contest. Because defendant did not violate Rule 26 by failing to "disclose" its classification of runner fillers, I will deny plaintiff's motion with respect to this request.

#### **e. Reference to Howarth engineering text**

Plaintiff objects to all references to the Howarth engineering text made by Brogdon in his declaration in support of defendant's response brief. Plaintiff alleges that this text was not clearly disclosed and that Brogdon's opinions regarding the text are new and unanticipated.

In his declaration supporting defendant's response brief, Brogdon states for the first time that the Howarth engineering textbook shows a "closed runner filler" similar to the runner filler taught by the '502 patent. Defendant says that plaintiff was on notice that Brogdon would rely on Howarth because it provided plaintiff a copy of portions of the text prior to Brogdon's deposition. However, nowhere in his report or in his deposition testimony did Brogdon refer to Howarth or state that it contained a "closed runner filler" similar to the runner filler taught by the '502 patent.

It was not enough for defendant to provide plaintiff a copy of portions of the textbook in advance of Brogdon's deposition if Brogdon was not relying explicitly on the textbook in his expert report and deposition testimony. Howarth purportedly shows a "closed runner filler" similar to the one taught by the '502 patent. If anything, the fact that defendant's expert reviewed the patent and made no comment on it in his report or deposition would have reasonably led plaintiff to conclude that Howarth did not call into question the validity of the '502 patent. Therefore, because defendant failed to make a timely disclosure of Brogdon's opinion that Howarth invalidates the '502 patent, I will grant plaintiff's motion and will disregard any reference to the Howarth text.

## **II. PLAINTIFF'S MOTION FOR SUMMARY JUDGMENT**

Turning next to plaintiff's motion for summary judgment, I note that large portions of defendant's submissions regarding the '166 patent do not comply with this court's procedures regarding summary judgment. Those procedures required the party responding to the motion for summary judgment to answer each of the movant's proposed findings of fact, supporting disputed facts with citations to admissible evidence. *Procedures to be Followed on Motions for Summary Judgment* I.C.1. To support a proposed fact, parties may rely upon depositions, answers to interrogatories, admissions pursuant to Fed.R.Civ.P. 36, other admissions, affidavits and authenticated documents. *Procedures* I.C.1.a-f. In its response to plaintiff's proposed findings, defendant consistently omitted citations or cited broadly to its brief, which is not an admissible source of evidence. *Id.* Where defendant has failed to comply with the court's procedures, its disputes have been disregarded. *Procedures* II.C. ("Unless the party opposing the motion puts into dispute a fact proposed by the moving party, the court will conclude that the fact is undisputed."). *See also* Metropolitan Life Ins. Co. v. Johnson, 297 F.3d 558, 562 (7th Cir.2002) (court of appeals has "consistently and repeatedly upheld a district court's discretion to require strict compliance with its local rules governing summary judgment").

In addition, defendant has attempted to supplement its proposed findings with broad references to exhibits and reports, under the apparent assumption that the court will consider all facts alleged in those exhibits and reports to be proposed facts. The court's procedures require that each fact be proposed in a separate paragraph in the proposed findings of fact. *Procedures I.B.1.* Where defendant has cited exhibits as "facts" (see, for example, DPF0F for the '502 patent, dkt. # 88, para. 35), its proposals have been disregarded. Propositions contained in briefs that were not the subject of proposed findings of fact have not been considered. *Procedures I.B.4.*

From the parties' proposed findings of fact, I find the following facts to be undisputed.

### ***A. Undisputed Facts***

#### ***1. Parties***

Plaintiff Briggs & Stratton Corporation is incorporated under the laws of the state of Wisconsin and has its primary place of business in Wauwatosa, Wisconsin. Defendant Kohler Company is incorporated under the laws of the state of Wisconsin and has its primary place of business in Kohler, Wisconsin. Defendant does substantial business in the state of Wisconsin.

Both plaintiff and defendant manufacture internal combustion engines. These engines are commonly used in outdoor power equipment, such as lawn mowers and lawn tractors. Plaintiff has had success in the marketplace with its engines, such as the Intek with Anti-Vibration System (an embodiment of plaintiff's '166 patent).

#### ***2. The '166 patent***

##### ***a. Counterweights and counterbalance weights***

Most internal combustion engines produce mechanical power by converting the up and down motion of a piston into rotary motion. The piston is attached to a crankshaft by means of a rod. As the piston moves, the crankshaft rotates. The rotary motion of the crankshaft can be harnessed for a wide variety of uses.

In all piston engines, as the piston moves up and down in a cylinder bore, it accelerates and decelerates. These accelerations and decelerations produce an equal and opposite force. The motion of the piston generates inertia forces that can be modeled as forces having various frequencies. The most significant of these forces are referred to as primary and secondary force components. The primary force component is at the same frequency as the crankshaft rotation. The secondary component is at twice the rotation frequency.



As a piston engine operates, the forces reacting to the piston's acceleration forces are transmitted to the engine main bearings and from the bearings to the structure of the engine. In a simple cylinder engine, these forces are transmitted to the equipment on which the engine is mounted and are felt as vibrations. Vibrations are undesirable because they can be unpleasant to operators of machinery and because they can cause damage to the engine and to attached equipment. For more than a century, engineers have been designing mechanisms for reducing these undesirable vibrations.

One early method of reducing transmission vibrations involved the use of a counterweight, which can balance linear (primary) acceleration forces on the axis of a piston, when attached to the engine crankshaft and rotating with it. However, because counterweights rotate with the crankshaft, they cannot reduce secondary inertia forces. Counterweights introduce unwanted side-to-side vibrations and therefore can only partially balance forces associated with piston movement. They are unable to provide dynamic balance and they reduce vibrations caused by piston reciprocation by only 50-60%.

A more effective solution to engine vibration is the counterbalance weight, which is a mass equal to the piston mechanism's reciprocating mass. The center of gravity of a counterbalance weight moves the same distance and along the same line of motion as the piston mechanism's center of gravity, but in a direction opposite that of the piston with which it is aligned. Counterbalance weights provide an equal and opposite force to the piston mechanism's acceleration that cancels the acceleration-induced forces of the piston. Typically, counterbalance weights do not rotate.

A counterbalance weight can cancel both the primary forces and a significant portion of the secondary forces associated with piston reciprocation. As a result, counterbalance weights are able to provide engines with significant dynamic balance that counterweights cannot provide; counterbalance weights can cancel 80-90% of the forces created by a reciprocating piston.

Counterbalance weights and reciprocating counterbalance weights were used in engine manufacturing long before the invention claimed in the '166 patent was conceived. In 1876, Nicolaus Otto invented the first practical gasoline internal combustion engine. His engine balanced piston acceleration by using a mass that moved in linear opposition to the piston. In May 1924, a magazine titled *The Motor* featured an article describing a counterbalance mechanism in which a "single crank... carries an eccentric at each side of the throw." The article explained, "These eccentrics cause weights to move up and down in opposition to the pistons, the weights being guided upon steel pegs which are fixed to the sump of the engine." (The parties have not explained the meaning of the term "eccentric." The *New Oxford American Dictionary* defines it as "a disc or wheel mounted eccentrically on a revolving shaft in order to transform rotation into backward-and-forward motion." *New Oxford American Dictionary* 538 (2001).)

Many other ways of counterbalancing piston inertia forces have been employed. One of the simplest of these is balancing one piston with another. In a horizontally opposed configuration, a second cylinder is deployed opposite the first cylinder and the crankshaft is arranged to move the pistons in opposition to one another. In the most economical of these horizontally opposed configurations, the two cylinders are not directly in line but are close enough to one another that the large shaking force of a single cylinder is reduced to a small turning torque. In horizontally opposed engines with six cylinders, even this small turning torque can be eliminated.

Another form of balancing one piston with another is seen in the common automotive engine configurations of four and six cylinders. In a four cylinder engine, the inertia forces that shake the engine are completely balanced by having two pistons going up while two others are going down. In a six cylinder engine, the balancing of up and down forces is not as evident but the balance is complete.

## **b. Prosecution of the '166 patent**

On May 7, 2002, United States Patent No. 6,382,166 (the '166 patent) was issued to Daniel L. Klika and John H. Thiermann for an invention entitled "Balancing System Using Reciprocating Counterbalance Weight." By virtue of assignment, Briggs & Stratton has acquired and continues to maintain all rights, title and interests in and to the '166 patent.

Claim 1 of the '166 patent reads as follows:

1. A balancing system for an internal combustion engine having a crankcase housing and a cylinder bore defining a cylinder axis, the system comprising:

a crankshaft substantially within the crankcase housing, wherein the cylinder bore is disposed on a first side of the crankshaft;

a piston disposed in the cylinder bore for reciprocal movement generally along the cylinder axis in response to rotation of the crankshaft;

a counterbalance weight disposed on a second side of the crankshaft that is generally opposite the first side, said counterbalance weight reciprocating in response to rotation of the crankshaft; and

a rail interconnected with at least one of said counterbalance weight and said crankcase housing such that said rail guides said counterbalance weight during reciprocation of said counterbalance weight.

'166 patent, col. 4., lns. 6-24.

Claims 2, 4, 6-11 and 13 depend from claim 1. They read as follows:

2. The system of claim 1, further comprising a link arm coupling the counterbalance weight to the crankshaft.

4. The system of claim 2, further comprising an eccentric portion of the crankshaft, wherein the link arm engages the eccentric portion.

6. The system of claim 1, further comprising two spaced link arms coupling the counterbalance weight to the crankshaft.

7. The system of claim 1, further comprising a second rail interconnected with at least one of the counterbalance weight and the crankcase housing that guides said counterbalance weight.

8. The system of claim 7, further comprising a third rail interconnected with at least one of the counterbalance weight and the crankcase housing that guides said counterbalance weight.

9. The system of claim 1, wherein the rail is substantially parallel to the cylinder axis.

10. The system of claim 1, wherein the other of said counterbalance weight and said crankcase housing has a slot that receives said rail.

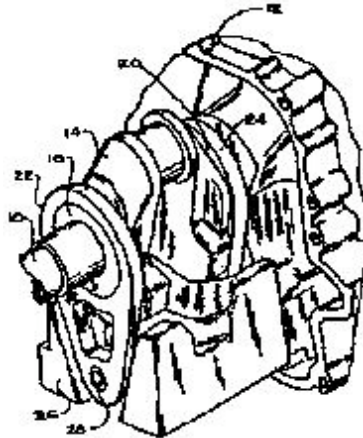
11. The system of claim 1, further comprising a guide surface that engages said counterbalance weight.

13. The system of claim 1, wherein the mass of said counterbalance weight is equally distributed on opposite

sides of said cylinder axis.

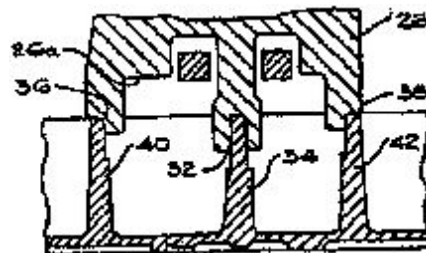
Id. at col. 4, lns. 25-26, 30-32, 36-53, 56-58.

The '166 patent discloses a counterbalance weight system that reciprocates in response to piston movement to reduce vibration. The figure shown below corresponds to Figure 1 of the '166 patent and shows one embodiment of the balancing system.



The interior of the single cylinder engine has a crankshaft (10) located in a crankcase housing (12). The counterbalance weight (26) is disposed on one side of the crankshaft and is connected to the crankshaft (10) using two link arms (22 and 24). The piston (not shown) is located on the other side of the crankshaft and the counterbalance weight reciprocates in opposition to the piston's reciprocation. The motion of the counterbalance weight is directed by one or more rails interconnected with either the crankcase housing or the counterbalance weight.

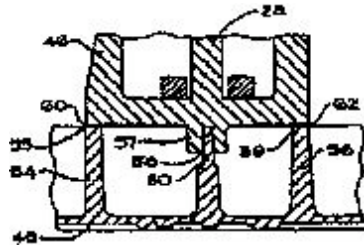
The rails between the counterbalance weight and the crankcase housing can be seen in the figure below (Figure 4 of the '166 patent). It provides a cross-sectional view of the counterbalance weight (26), showing three rails (40, 34 and 42) interconnected with the crankcase housing (not numbered).



In this particular embodiment of the '166 patent, the rail (34) is inserted into a slot (32) positioned on the side of the counterbalance weight. Other embodiments may either eliminate the centrally disposed rail (34), leaving rails (40 & 42) to direct the counterbalance weight's motion, or use a single rail (34) with a

corresponding slot.

The '166 patent discloses using a combination of rails and guides. The difference between a rail and a guide is illustrated in the figure above and the figure shown below (Figure 9 of the '166 patent).



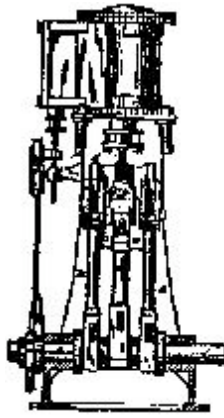
The figure above is a cross-sectional view showing a centrally disposed rail (50) and two guides (54 and 56) interconnected with the crankcase housing (48). The rail is inserted into a slot (58) positioned on the side of the counterbalance weight (46) and directs the motion of the counterbalance weight. The guides have flat upper surfaces that prevent the counterbalance weight from rocking to either side during reciprocation.

If the center slot on the counterbalance weight in the figure above is removed, the counterbalance weight is free to move left or right because the guides restrict only downward motion. The guides are unable to direct the counterbalance weight along the guides' axes. By contrast, the center rail (50) guides the counterbalance weight along the plane defined by the rail's two side surfaces.

The application for the '166 patent disclosed a number of patents to the United States Patent and Trademark Office, including United States Patent No. 350,068 (the Louque patent), United States Patent No. 4,407,169 (the Menen patent), United States Patent No. 4,656,981 (the Murata patent) and United States Patent No. 5,927,242 (the Kollock patent). Initially, the Patent and Trademark Office rejected claims 1-13 of the '166 patent pursuant to 35 U.S.C. s. 102(b) as anticipated by the Louque patent.

Issued in 1886, the Louque patent discloses a balancing system for a steam engine having the cylinder bore and the counterbalance weight on the same side of the crankshaft, where the weight is guided by a rail, as shown in Figure 1 of the Louque patent, reproduced below.

**\*941**



The guide rails (S), which are parallel to the piston's axis and mounted on the engine frame, connect to slots in the counterbalance masses so that the crankshaft (C) and connecting rod (P) drive the counterbalance masses in straight-line motion opposite the motion of the piston. The Louque patent does not disclose a cylinder bore and weight disposed on opposite sides of the crankshaft.

Before the Patent and Trademark Office, plaintiff argued that the Louque patent requires relatively large amounts of space and is not feasible for modern internal combustion engines because it places the cylinder bore and weight on the same side of the crankshaft. In the Louque patent, the center of gravity is high and the engine is relatively unstable. Plaintiff amended the preamble to claim 1 of the '166 patent, changing "a balancing system for an engine" to "a balancing system for an internal combustion engine." In addition, plaintiff argued that claim 4 of the '166 patent required a link arm connecting the counterbalance weight to an eccentric on the crankshaft, whereas the Louque patent did not disclose eccentrics. Ultimately, the Patent and Trademark Office allowed claims 1-13.

Approximately one year after filing the '166 patent application, plaintiff filed a Patent and Trademark international patent application. Claims 1-13 of that application were identical to claims 1-13 of the '166 patent. The European Patent Office performed an international search and issued an initial report indicating that claims 1, 2, 7 and 9-13 were considered to lack novelty or an "inventive step" in view of United States Patent No. 5,927,242 (the Kollock patent) and a British patent, GB 249,693 (the Austin patent). When patents and printed publications are the primary source of prior art for both United States domestic applications and "PCT" international applications, the "PCT" uses novelty and obviousness standards similar to those used under the law of the United States.

In response to the "PCT" 's initial report, plaintiff filed a demand for preliminary examination. The United States Patent and Trademark Office was selected as the international preliminary examining authority charged with preparing an international preliminary examination report. The Patent and Trademark Office reviewed the cited patents and issued a report concluding that claims 1-13 "met the criteria set out in PTC Article 33(2)-(4) because the prior art d[id] not teach or fairly suggest a rail interconnected with a counterbalance weight and crankcase housing," and that "[i]ndustrial applicability as defined by PTC Article 33(4) is [met] by the invention reducing vibration in reciprocating internal combustion engines."

### **c. The Courage engine**

In 2000, as a competitive response to plaintiff's Intek engine, defendant began developing a new engine. Defendant determined that it needed a new single cylinder engine of up to twenty horsepower and a counterbalance weight system to address the vibration caused by piston reciprocation. In designing the new engine, one of defendant's goals was to reduce vibration to levels lower than those of plaintiff's Intek engine.

Defendant named its new engine the Courage engine. At the time defendant began developing the Courage engine, plaintiff's Intek engine did not utilize the balance system claimed in the '166 patent, which plaintiff later marketed as the Anti-Vibration System, or AVS. Defendant did not become aware of plaintiff's AVS system until summer 2001, when defendant's representatives saw a sample of the system in an Intek engine at a trade show.

The Courage engine is a single cylinder engine that employs a mass to balance inertia forces generated by the piston assembly and a portion of the connecting rod assembly. This mass is a counterbalance weight. (Defendant's engineers sometimes refer to the counterbalance weight as a "flying brick.") The counterbalance weight is composed of two identical halves linked together by a pin inserted through the bottom center of the weight. The pin remains parallel to the cylinder axis during reciprocation. The counterbalance weight moves back and forth in response to the rotation of the crankshaft. The mass of the engine's counterbalance weight is distributed on opposite sides of the cylinder axis. It is connected to an eccentric on the crankshaft.

The counterbalance weight in the Courage engine is disposed on a second side of the crankshaft opposite the cylinder bore and is connected to the crankshaft. As the piston moves up, the counterbalance weight is lowered below the piston. As the piston moves down, the counterbalance weight is raised below the piston. During operation, the counterbalance weight moves in the opposite direction of the reciprocating piston. Because the connecting portion of the weight is fixed, the counterbalance weight experiences a "wobbling" or "wagging" motion in addition to the linear motion toward or away from the crankshaft.

To guide the planar motion of its counterbalance weight, the Courage engine uses a bearing that fits between two raised ribs formed integrally with the crankcase housing. Defendant refers to this bearing surface as a "guide shoe." The metal guide shoe is affixed to one end of the counterbalance weight by a pin and can pivot around the pin's axis. The guide shoe fits into a groove in the crankcase housing created by two raised ribs that extend outward from the crankcase. The ribs are parallel to the cylinder axis and guide the planar motion of the counterbalance weight along the ribs' central axis. The ribs form an elongated recess in the space between them. This space receives the guide shoe and guides the motion of the counterbalance weight along its axis as it moves back and forth within the slot in opposition to the reciprocating piston. As the guide shoe moves, the ribs extending from the closure plate do not touch the counterbalance weight.

The pin is loosely placed in the guide shoe. As the counterbalance weight moves back and forth, the pin and the counterbalance weight pivot, causing the weight to "waggle." As the weight waggles, the sides of the guide shoe are not in contact with both ribs at the same time. Instead, the guide shoe moves back and forth in the space between the ribs, never touching both ribs at the same time. There is always empty space between the guide shoe and the back wall created by the two ribs. This "wagging" of the guide shoe causes the counterbalance weight to move across the cylinder axis unequally distributing the counterbalance weight on each side of the cylinder axis. The "wagging" does not affect the ability of the Courage engine to dynamically balance the forces caused by piston reciprocation.

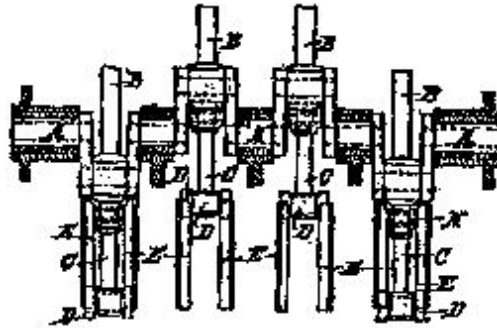
Defendant applied for a patent on the balance system used in the Courage engine. The patent issued on April 5, 2005 as United States Patent No. 6,974,458.

#### **d. Prior art**

Defendant's expert, James Brogdon, identifies numerous patents that he contends anticipate the '166 patent or render its claims obvious: the Louque, Austin, Murata, Kollock, Menen, Fiala, Ogura, Ricardo, Van Ligten and Shirai patents. (The Louque patent is discussed above in reference to the prosecution history of the '166 patent.)

## (1) The Austin patent

The Austin patent is directed to inline non-opposing multiple cylinder engines and discloses a method for using bob weights to balance the secondary inertia forces associated with a reciprocating piston. The primary vibrations of in-line non-opposing multiple cylinder engines are naturally balanced. The figure below (Figure 1 of the '693 patent) shows how the primary inertia forces of the two outside pistons are cancelled by the primary forces generated by the middle pistons.



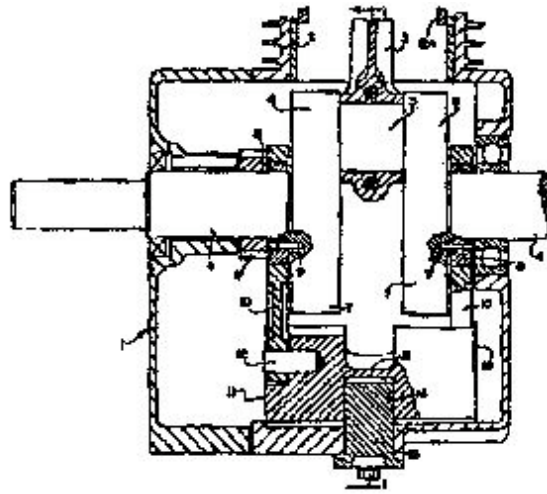
The bob weight (D) is attached to an eccentric and guided by rails (E) that move the weight in the same direction as the piston. Bob weights cannot be applied to single piston engines and cannot be applied to engines with an uneven number of cylinders unless the weights exceed the mass of the piston they are designed to balance.

The Patent and Trademark Office considered the Austin patent during plaintiff's international patent application and issued a report concluding that "the prior art does not teach or fairly suggest a rail interconnected with the counterbalance weight and crankcase housing."

## (2) The Murata patent

During the prosecution of the '166 patent, the U.S. Patent Office considered U.S. Patent No. 4,656,981 (the Murata patent).

**\*944**



(Figure 2 of the Murata patent)

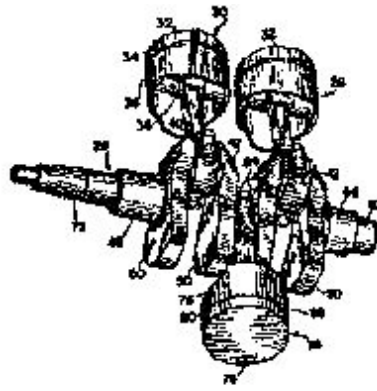
The Murata patent discloses an engine that uses a guide pin (15) to guide the motion of its counterbalance weight (11) generally along an axis parallel to the piston's axis. The guide pin is cantilevered from the crankcase housing and interfaces with a hole (14) in the counterbalance weight. The guide pin cannot direct the planar motion of the counterbalance weight along the axis of the guide pin. Thus, the counterbalance weight could rotate around the guide pin. However, a sidewall engages a stop (16) secured to the crankcase (1) to prevent the weight from rotating (15). The Murata patent does not teach the use of a rail as recited in claim 1 of the '166 patent.

### (3) The Kollock patent

The Kollock patent discloses a balancing system that, like the system disclosed in the Murata patent, uses a guide pin supported on both ends or a cantilevered pin secured to the housing to guide the counterbalance weight, which is not equally distributed on opposite sides of the cylinder axis.

\*945



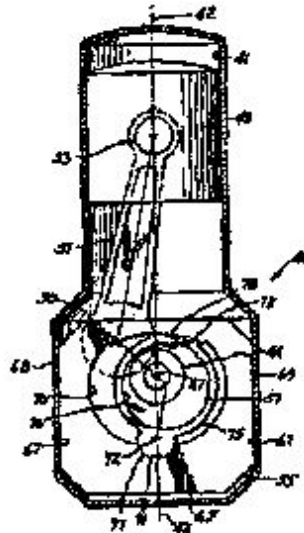


(Figure 1 of the Kollock patent)

The weight is free to rotate around the guide pin. The Kollock patent does not teach or suggest the use of link arms to connect the balance weight with the crankshaft or the use of a rail as recited in claim 1 of the '166 patent.

#### (4) The Menen patent

The Menen patent discloses a crankshaft (44) with two weights (55) mounted in "slideways" (67).



(Figure 8 of the Menen patent)

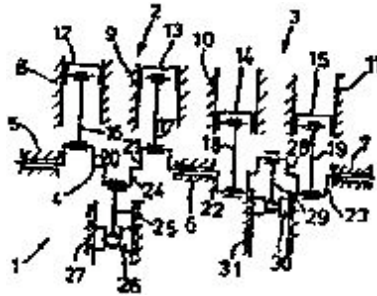
The reciprocating weights surround the crankshaft. A second portion of each weight is disposed on one side of the crankshaft and is supported by the first portion. The first and second portions are configured so that more of the mass of the counterbalance weight is located in the second portion. The weights in the Menen patent can balance only the primary forces stemming from piston reciprocation. They cannot reduce or eliminate the secondary inertia forces of piston reciprocation.

The Menen patent discloses the use of slideways. These slideways may be lubricated rails that provide side and sliding support for the bearing surfaces (68 and 69). The patent provides no detail about the geometry or construction of these slideways.

The weights in the Menen patent are not disposed on a second side of a crankshaft that is generally opposite the first side. The crankshaft runs through the weights. The Menen patent does not teach the use of a slot or link arms.

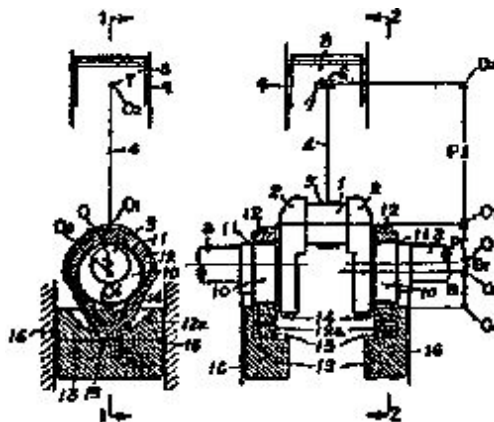
### (5) The Fiala patent

German patent DE 3033803 (the Fiala patent) is directed to sectioned engines. Engines are sectioned to allow sections of cylinders to be turned off when their power is not needed (in slow traffic, for example). As reflected in the figure below (Figure 1 of the Fiala patent), the invention provides a kinematic depiction of a straight line guidance (27) of the weight (26).



### (6) The Ogura patent

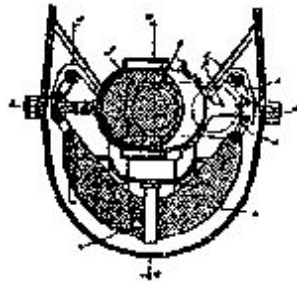
Japanese patent JP61-206844 (the Ogura patent) discloses a gourd shaped link arm (12), as shown in Figure 1 of the patent, that enables the use of heavier counterbalance masses and smaller eccentrics to provide dynamic balance for the reciprocating movement of the piston.



### (7) The Ricardo patent

United States Patent No. 1,342,648 (the Ricardo patent) discloses a balancing mechanism for balancing out the secondary component of the inertia forces stemming from the reciprocating movement of the piston. As reflected in the figure below (Figure 10 of the Ricardo patent), one embodiment of the Ricardo patent uses a guide pin (L) to guide the motion of weight (A). The weight balances only the secondary inertia forces of the piston and leaves the primary component of the inertia forces unchanged.

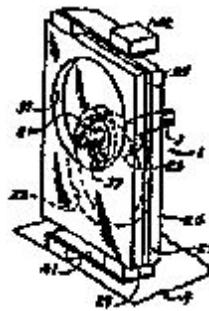
\*947



The guide pin (not shown) is not a rail.

### (8) The Van Ligten patent

United States Patent No. 4,819,592 (the Van Ligten patent) discloses a balancing mechanism having a preferred embodiment with a weight or mass (25) guided by a pair of leaf springs (41 and 42) with the crankshaft (3) going through the center of the mass.

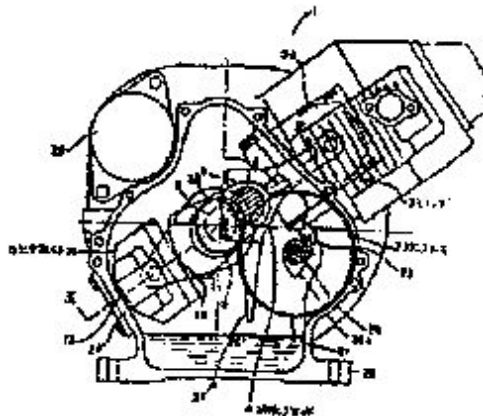


The figure above shows the crankshaft (3) running through the weight. The weight (25) balances only the secondary inertia forces of the piston and leaves the primary component of the inertia forces unchanged. The Van Ligten patent does not disclose a bar that directs the planar motion of a counterbalance weight substantially along its axis.

The Van Ligten patent does not specify that the weight is equally distributed on opposite sides of the cylinder axis.

## (9) The Shirai patent

Japanese patent JP 3-67738 (the Shirai patent) discloses a guide pin used to guide the motion of a counterbalance weight.



The Shirai patent does not disclose how rotation of the counterbalance weight is avoided. It does not disclose a bar or relief that directs the planar motion of the weight substantially along its axis.

### 3. *The '502 Patent*

#### a. Background

In a conventional internal combustion engine, a carburetor mixes air and fuel delivered through a cylinder head to the cylinder chamber. In the cylinder chamber, the air-fuel mixture is ignited by a spark plug. The energy generated by the ignition drives the motion of the piston. Although the carburetor is sometimes connected directly to the cylinder head, for decades engineers have utilized spacers, inserts, ports and other similar devices to connect the carburetor to the cylinder head and direct the air-fuel mixture from the carburetor into the cylinder head.

Companies that manufacture lawn mowers or lawn tractors do not also manufacture the products' engines. Equipment manufacturers differ in their requirements for location and placement of engines within their products. Costs increase substantially when manufacturers have to redesign engines to fit the space available in a variety of devices, such as lawn mowers and lawn tractors. For this reason, it is desirable for engine manufacturers to have a flexible engine design and a manufacturing method that can be modified easily to make engines that can be used in a variety of existing devices.

When an equipment manufacturer selects an engine, one important consideration is the location of certain engine parts, such as the engine's intake position, mounting brackets and drive shaft. An engine may not be compatible with a particular manufacturer's lawn mower because existing features of the lawn mower interfere with parts of the engine; for example, there may not be enough room for a carburetor and fuel tank near an engine's intake position. A manufacturer can incur great expense relocating the intake runner from one position to another to accommodate different carburetor locations in different equipment manufacturer's products because the relocation requires redesigning the cylinder head and related tooling.

The invention claimed by the '502 patent permits an engine's intake position to be altered without having to

redesign the entire engine. A cylinder head incorporating the new invention can be connected to a carburetor that would otherwise be at a different elevation from the intake passageway. Therefore, the engine can be used on a wider variety of vehicles.

**b. Prosecution of the '502 patent**

The inventions disclosed in the '502 patent were conceived no later than May 2, 2000 and were reduced to practice in June 2000. On October 8, 2002, United States Patent No. 6,460,502 (the '502 patent) was issued to Gary Gracyalny for an invention entitled "Engine Cylinder Head Assembly." By virtue of assignment, Briggs & Stratton acquired and continues to maintain all rights, title and interests in and to the '502 patent. The Patent and Trademark Office issued the '502 patent after considering United States Patent No. 3,442,805 (Dzianott), United States Patent No. 3,832,702 (Roberts), United States Patent No. 4,336,777 (Yanagihara), United States Patent No. 6,006,721 (Shannon) and Russian Patent No. RU 2013626 (Kukharev).

The Patent and Trademark Office originally rejected independent claim 1 of the '502 patent as anticipated or obvious in view of United States Patent No. 6,026,774 (Kajihara). The Patent and Trademark Office indicated that dependent claims 2 and 4 "would be allowable" if rewritten in independent form. In response, plaintiff amended claim 1 to include the permissible subject matter of claim 2 and added what issued as claims 15-31. The Patent and Trademark Office then permitted claims 1-31.

Claim 1 of the '502 patent reads as follows:

1. A cylinder head assembly for an internal combustion engine comprising:

an intake port;

an intake runner that receives at least one of air and fuel, said intake runner including:

an entrance;

a section having a first end nearer said entrance and having a second end nearer said intake port;

an adapter having a runner filler disposed within said intake runner;

an intake passageway having a substantially uniform cross-sectional area created at least in part by said runner filler; and

wherein the cross-sectional area of said intake runner decreases from said entrance to said intake port.

'502 patent, col. 6, ln. 54-col. 7, ln. 2.

Claims 2-6, 8 and 11-13 depend from claim 1. They read as follows:

2. A cylinder head assembly according to claim 1, wherein said intake runner includes:

an inclined surface with a semi-circular cross-section; and

a straight surface with the shape of an interior surface of a segmented cylinder.

3. A cylinder head assembly according to claim 1, wherein said runner filler has a contact surface with the shape of an exterior surface of a segmented cylinder.

4. A cylinder head assembly according to claim 1, wherein said intake passageway is formed by said section and said runner filler.

5. A cylinder head assembly according to claim 1, wherein said entrance is elliptical in shape.

6. A cylinder head assembly according to claim 1, wherein said entrance has a [h]eight dimension and a width dimension, said height dimension being greater than said width dimension.

8. A cylinder head assembly according to claim 6, wherein a line including said height dimension is substantially parallel to a longitudinal axis of a piston cylinder.

11. A cylinder head assembly according to claim 1, wherein said cylinder head assembly includes a cylinder head, and said adapter thermally insulates a carburetor from said cylinder head.

12. A cylinder head assembly according to claim 11, wherein said adapter has a spacer that thermally insulates a carburetor from said cylinder head.

13. A cylinder head assembly according to claim 1, wherein said adapter has a substantially cylindrical inlet.

'502 patent, col. 7, lns. 3-19, 23-25, 32-41.

Claim 15 of the '502 patent reads as follows:

15. A cylinder head assembly for an internal combustion engine comprising:

an intake port;

an intake runner that receives at least one of air and fuel, said intake runner including:

an entrance;

a section having a first end nearer said entrance and having a second end nearer said intake port;

an adapter having a runner filler positioned in said intake runner; and

an intake passageway disposed within said intake runner and at least partially defined by said runner filler, wherein the position of said intake passageway is selectable based upon at least one of the position and the configuration of said runner filler.

'502 patent, col. 7, lns. 44-59.

Claims 16-21 depend from Claim 15, and read as follows:

16. The cylinder head assembly of claim 15, wherein said intake passageway has a substantially uniform cross-sectional area.

17. The cylinder head assembly of claim 15, wherein the cross-sectional area of said intake runner decreases from said entrance to said intake port.

18. The cylinder head assembly of claim 15, wherein said entrance is substantially elliptical in shape.

19. The cylinder head assembly of claim 15, wherein said cylinder head assembly includes a cylinder head, and wherein said adapter thermally insulates a carburetor from said cylinder head.

20. The cylinder head assembly of claim 19, wherein said adapter includes a spacer that thermally insulates said carburetor from said cylinder head.

21. The cylinder head assembly of claim 15, wherein said adapter includes a substantially cylindrical adapter inlet.

'502 patent, col. 8, lns. 1-17.

Claim 22 of the '502 patent reads as follows:

22. A cylinder head assembly for an internal combustion engine comprising:

an intake port;

an intake runner that receives at least one of air and fuel, said intake runner including an entrance having a height dimension than a width dimension of said entrance;

an adapter having an inlet and having a runner filler positioned in said intake runner; and

an intake passageway at least partially defined by said runner filler, said passageway extending from an inlet near said entrance, wherein the position of said inlet is selectable along said height dimension.

'502 patent, col. 8, lns. 18-30

Claims 23-31 depend from claim 22, and read as follows:

23. The cylinder head assembly of claim 22, wherein the cross-sectional area of said intake runner decreases from said entrance to said intake port.

24. The cylinder head assembly of claim 22, wherein said intake passageway has a substantially uniform cross-sectional area.

25. The cylinder head assembly of claim 22, wherein the cross-sectional area of said intake passageway is less than the cross-sectional area of said intake runner.

26. The cylinder head assembly of claim 22, wherein the cross-sectional area of said inlet is less than the cross-sectional area of said entrance.

27. The cylinder head assembly of claim 22, wherein said entrance is substantially elliptical in shape.

28. The cylinder head assembly of claim 22, wherein said cylinder head assembly includes a cylinder head, and said adapter thermally insulates said carburetor from said cylinder head.

29. The cylinder head assembly of claim 27, wherein said adapter includes a spacer that thermally insulates said carburetor from said cylinder head.

30. The cylinder head assembly of claim 26, wherein said adapter includes a substantially cylindrical

adapter inlet.

31. The cylinder head assembly of claim 22, wherein the position of said intake passageway is selectable based upon at least one of the position and the configuration of said runner filler.

'502 patent, col. 8, lns. 31-57.

The figure below (dkt. # 53, exh. 5 at 67) shows an engine cylinder having a piston (P) that is connected to the crankshaft (C) with a connecting rod (R). The crankshaft delivers the engine's power. The combustion cylinder typically has two parts. The top part is referred to as the cylinder head (H). Within the cylinder head are two valves, the intake valve (I), through which air and fuel enter the cylinder prior to combustion, and the exhaust valve (E), through which the burned gas is vented after combustion.



The figure below (dkt. # 53, exh. 5 at 67) is a diagram showing the flow of air and fuel into the cylinder as the piston moves downward in the cylinder during the intake stroke.



The arrow shows the path the air and fuel mixture follows as it enters the cylinder head and flows into the cylinder. The air and fuel mixture passes through a tubular cavity in the cylinder head, through the tubular cavity surrounding the valve stem and then around the open intake valve into the cylinder. The portion of the cavity that surrounds the valve and valve stem is commonly referred to as the intake port. The cavity from the entrance to the intake port is referred to as the intake runner.

Cylinder heads are made of metal, commonly by using a die casting method. Intake runners are typically manufactured in die cast cylinder heads. Die casting prior art cylinder heads often requires inserting an intake runner core or insert diagonally relative to the direction of the die opening. A diagonal slide can be used to create a variety of parts, but makes tooling more complex, requires extra space and limits the number of parts each tool can make at the same time. If the manufacturer uses straight slides, which move



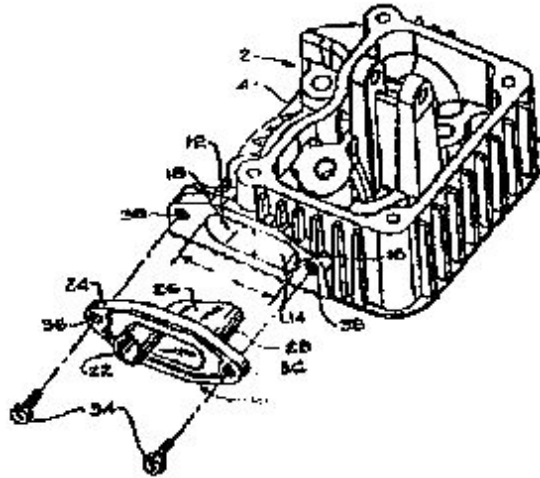
transversely to the die opening direction, the result is a restriction of some prior art options but a maximization of the efficiency of each tool.

The '502 patent solves some of the problems of redesigning engines to fit manufacturers' existing devices. It discloses forming an intake runner cavity that is relatively large and then filling at least some of the cavity space with a runner filler to form and position the intake passageway as desired. The invention allows use of the same die tool to make cylinder heads with different intake positions. The cylinder heads are die cast using straight slides to maximize the number of parts made with each simple, compact die tool. The '502 patent allows the intake position of an engine to be altered without having to die cast a new cylinder head.

The insight of the invention is that the intake runner cavity in the die cast cylinder head is relatively large, so that the particular inlet location and intake passageway can be created using a relatively inexpensive, typically plastic adapter that includes a portion (runner filler) that fills much of the space of the oversized intake runner, leaving only the desired cavity configuration as an intake passageway.

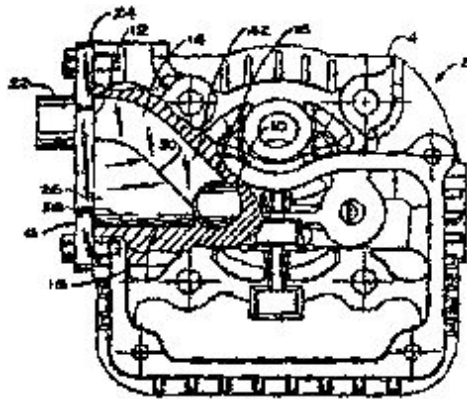
The '502 patent discloses three preferred embodiments of the cylinder head assembly. One embodiment is illustrated below (Figure 2 of the '502 patent).

**\*952**



The cylinder head (2) has an oversized intake runner (14) with an elliptically shaped entrance (12). The adapter (6) has an inlet (22), spacer (24) and runner filler (26). The inlet receives the proper air-fuel mixture from the carburetor. The spacer provides thermal insulation for the carburetor. The runner filler projects into the intake runner (14) and fills a portion of the runner to form the intake passageway for the air-fuel mixture. The adapter is preferably made of plastic, but can be made of other material.

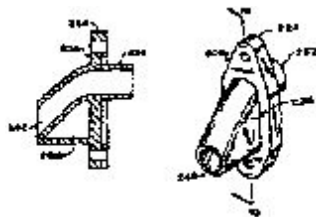
The figure below (Figure 4 of the '502 patent) shows how the adapter is mounted on the cylinder head.



The cylinder head includes an entrance (12), through which the air-fuel mixture enters the cylinder head, an intake port (10), through which the air-fuel mixture exits the cylinder head and an intake runner (14), a cavity within the cylinder head connecting the entrance and the intake port. The adapter is a device that interconnects to the cylinder head, having a runner filler (26) that is inserted into the intake runner of the cylinder head, thereby forming an intake passageway (42).

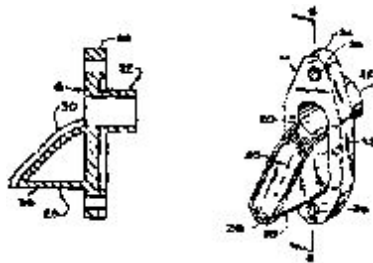
The following figures (Figures 5 and 6 of the '502 patent) show a runner filler with a passage surface (30) having an open, partially circular cross-section.

**\*953**



When inserted into the intake runner of the cylinder head, the passage surface of the runner filler and the inclined surface (18) of the intake runner form a portion of the intake passageway that takes the shape of a substantially tubular conduit. The intake passageway has a substantially uniform cross-sectional area.

The adapter shown in the figures below (Figures 10 and 11 of the '502 patent) has a closed passage surface in which a section of the intake passageway is completely enclosed within the runner filler.



In a carbureted engine, anything that disrupts the air-fuel flow in the intake passageway may reduce engine efficiency by creating flow losses or by altering the air-fuel mixture. By providing an oversized intake runner and filling the excess space with a runner filler connected to an adapter, the invention of the '502 patent creates a substantially straight and uniform passageway from the carburetor to the cylinder. This is achieved by altering the intake position while maintaining a relatively short and straight intake passageway. Using prior methods of manufacture, such a result could be accomplished only by redesigning the cylinder head and incurring the substantial costs of a new die casting process.

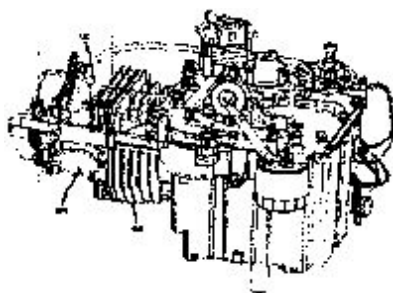
### c. Courage engine cylinder head assembly

Defendant introduced the Courage engine in September 2003. Defendant's earlier Command engine utilized a heat shield deflector to connect the carburetor to the entrance of the cylinder head and to thermally insulate the carburetor from the cylinder head. Defendant wanted to design an engine more powerful than the Command engine. In order to do so, defendant's design engineers needed to improve the airflow characteristics of the cylinder head. To meet this goal, defendant added a "tongue" to the heat shield deflector that protrudes into the entrance of the cylinder head and directs the air-fuel mixture from the carburetor to the intake port in a more efficient manner. A drawing showing the new tongue configuration was prepared in July 1999. However, defendant did not build a prototype of this cylinder head assembly at that time. The idea was set aside because it was determined to be beyond the scope of defendant's project.

In June 2000, defendant began work on the Courage engine, a totally new engine with a new cylinder head design. Early in the development process, defendant decided to use the "Blackjack" tongue insert in the Courage cylinder head assembly. A prototype of the tongue insert was produced in February 2001. Defendant obtained U.S. Patent No. 6,742,488 on the heat deflector shield with the tongue insert. Defendant did not learn of plaintiff's '502 patent until January 11, 2005.

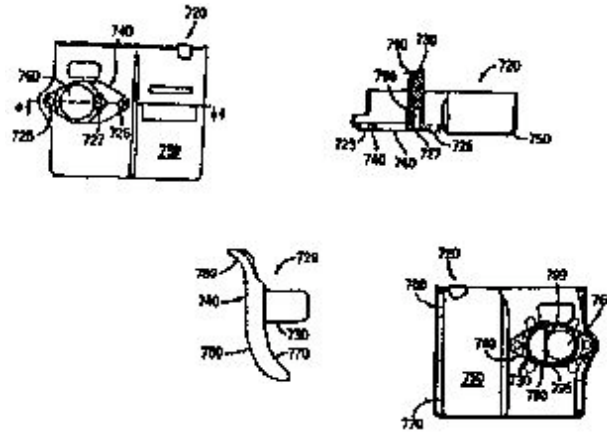
The figure below (dkt.# 71, exh. D, fig.2) shows the entirety of the Courage engine with the outside cover removed, including a cylinder (160), a cylinder head (170) and the entrance to the cylinder head (200).

\*954



During operation, a piston moves horizontally back and forth within the cylinder and toward and away from the cylinder head.

As shown below, the Courage heat shield deflector consists of a tongue (730), a flange (740), a baffle (750) and an inlet (760).

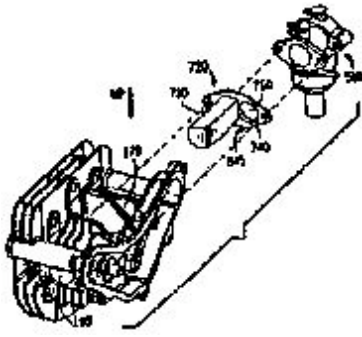


(dkt.# 71, exh. D, fig.3-6)

The Courage cylinder head assembly has an intake port and an intake runner that receives an air-fuel mixture. This cavity in the cylinder head permits air, fuel and a mixture of air and fuel to flow from the carburetor to the intake port. The engine includes an entrance and a section that can be defined as having a first end nearer the entrance and a second end nearer the intake port.

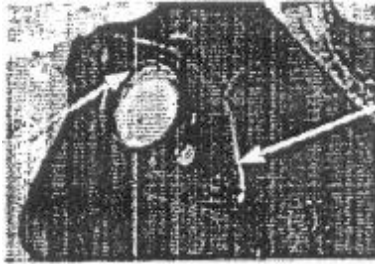
The tongue is inserted into the intake runner of the cylinder head. Together with the surface of the intake runner, it forms the intake passageway leading to the intake port. One surface of the tongue is cylindrical and the other is generally flat. As the tongue decreases in thickness from the cylindrical inlet on the heat shield, the flat surface of the tongue slopes down to the cylindrical surface at the tip. When the plastic component is in place, the tongue protrudes into the cylinder head intake runner and is positioned along a portion of the wall of the intake runner.

The figure below (dkt.# 71, exh. D, fig.8) shows an exploded view perspective of the carburetor (510), the adapter (720) and the cylinder head (170).



The heat shield deflector is shown missing from the baffle.

The figure shown below (dkt. # 53, exh. 5 at 71) shows the outside face of the plastic component that connects the Courageengine's carburetor and cylinder head. In its actual use on Courage engines, this component includes a heat shield.



The plastic molded component includes a raised, roughly diamond-shaped, portion surrounding a circular inlet through which the air-fuel mixture passes. It includes a tongue that fits into the intake runner, filling a portion of it to define a remaining space that serves as an intake passageway. The raised portion of the component corresponds to the "flange" claimed in defendant's '488 patent.

The Courage intake passageway is formed by the surface of the tongue insert of the heat deflector shield and the surface of the intake runner. The entrance and the runner are just large enough to accommodate the tongue and the dimensions of the desired intake passageway. The Courage engine's runner filler is open and does not enclose any portion of the intake passageway.

The figure below (dkt.# 71, exh. D, fig.9) shows twelve cross-sectional measurements taken by defendant at various points along the length of the Courage intake passageway.

The engine's intake passageway extends from the entrance to the intake runner (760), through the cross-section marked C, through the cross-section marked K. The cross-sectional areas of the sections shown in the figure above were measured using a standard computer program that has a margin of error of less than 1%. Section K is part of the intake passageway. The increase in area between section H and section K is 70.21%.

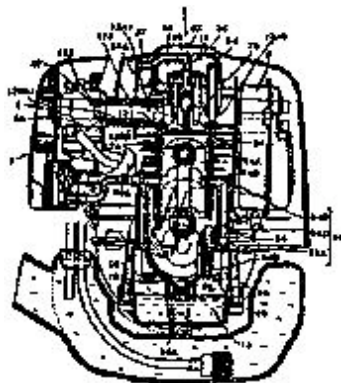
The Courage intake component's orientation is fixed. The carburetor is bolted to the flange of the heat shield deflector. The Courage engine employs only one cylinder head assembly design; original equipment manufacturers fit the engine "as is" into their equipment. Defendant has never altered the design of the cylinder head assembly for a specific original equipment manufacturer application. If defendant were to alter the position of the intake passageway, doing so would materially change the airflow characteristics of the cylinder head and sacrifice aerodynamic efficiency. Similarly, if defendant were to change the position of the inlet to the heat shield deflector, it would be required to alter the position of the carburetor, thereby significantly decreasing engine power.

#### **d. Prior art**

The use of a thermally insulating spacer between the carburetor and the cylinder head was known in the art prior to the issuance of the '502 patent. The Watanabe, Katano, McFarlane, Notaras and Tsutsumi patents show a runner filler and a component that attaches a carburetor or manifold to the entrance of a cylinder head. The Shannon, Dzianott and Kukharev patents do not show a connection between the cylinder head and carburetor.

##### **(1) The Watanabe patent**

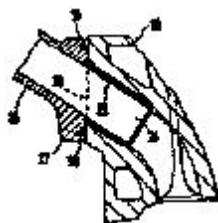
The figure shown below corresponds to Figure 3 of U.S. Patent No. 6,260,536 (the Watanabe patent). It shows a connecting pipe (120) provided between the carburetor (4) and the intake port (12A1) of the cylinder.



The base end of the connecting pipe (120) is secured to the carburetor by bolts.

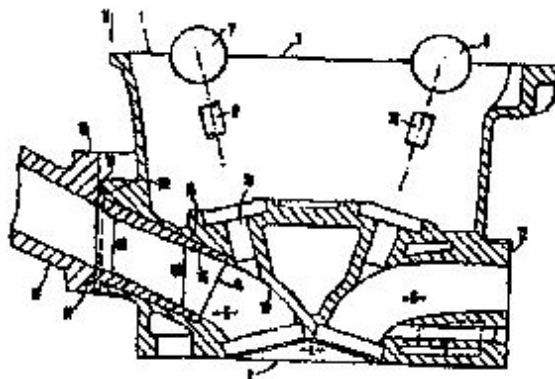
**(2) The Rutschmann patent**

German patent DE 198 33 618 (the Rutschmann patent) shows a one piece intake attachment (26) that is connected by a flange (27) to a vertical wall (28) of a cylinder head (29).



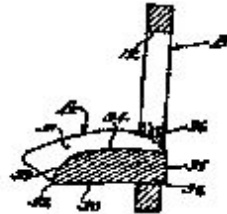
By necessity, the carburetor or manifold must abut the other side of the flange (27). The "intake attachment" connects the carburetor or manifold to the cylinder head.

The figure below (Figure 1 of the Rutschmann patent) shows a cylinder head (1) with an intake passage (5) leading from the entrance of the cylinder head to the intake port. A molding (14) is inserted into the intake passage, reaching over only a portion of the intake passage.



### (3) The Cousimano patent

United States Patent No. 4,302,935 (the Cousimano patent) shows a device that connects the exhaust port to an exhaust manifold. Figure 4 of the Cousimano patent shows an insert header comprising an insert (A) and a header plate (B). The insert is formed to occupy the lower side of the exhaust passageway and port.



(Figure 4 of the Cousimano patent)

#### 4. Notice of alleged infringement

Plaintiff's AVS engines incorporate the '166 patent. (Plaintiff does not sell any products embodying the '502 patent.) The AVS engine balance system is not marked with any patent numbers or other patent-related information, such as the term "patent" or the abbreviation "pat," though it is marked with other non-patent related numbers, letters and symbols. Plaintiff does not provide patent-related information on any other part of the engines containing the AVS balancing system. The outside portion of engines incorporating the '166 patent are marked with other information, including brand labels, miscellaneous numbers and instructions. There are at least three blank areas on the outside of the engines that are unused and measure approximately three inches by two and one-half inches, twelve inches by three and one-half inches and five inches by two and three-quarter inches, respectively. Nothing on plaintiff's balance system discloses the patent or directs consumers to the user manual for patent-related information.

Plaintiff's AVS engines incorporate a minimum of five and a maximum of eleven patents owned by plaintiff. Plaintiff ships approximately 30% of its engines incorporating the '166 patent in boxes not marked with the '166 patent number. The remaining 70% are shipped on pallets. Most or all of the engines shipped on pallets are not contained in boxes. Engines shipped on pallets contain no reference to any patents except those contained in the owner's manual shipped on the pallet. When an engine incorporating the '166 patent is manufactured, shipped and sold, the listing of the '166 patent in the owner's manual accompanying the engine is the only indication that the engine contains the patented system.

Deborah Spanic has been plaintiff's counsel for intellectual property since January 2005. Before assuming her current position, Spanic was plaintiff's manager of intellectual property from September 2002 to December 2004. In July 2004, Spanic held a meeting with plaintiff's business managers to discuss options for marking the patent number on plaintiff's products. Although the meeting participants discussed using labels or hand tags to mark plaintiff's products, nothing was done to "follow up" on the options raised at the meeting.

In a letter dated January 11, 2005, plaintiff's counsel notified Natalie Black, defendant's senior vice



president, general counsel and corporate secretary, of the existence of the '166 and '502 patents. In the letter, plaintiff asserted its belief that defendant's Courage Series engines infringed the '166 and '502 patents. Plaintiff seeks lost profits and royalties in excess of \$15 million from defendant.

## **B. Opinion**

[5] Infringement analysis is a two-step process in which the court must first construe the claims at issue and then compare the properly construed claims to the accused device. *Cybor Corp. v. FAS Technologies, Inc.*, 138 F.3d 1448, 1454 (Fed.Cir.1998). Claim construction is a legal determination to be made by the court, while infringement is a question of fact. *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed.Cir.1996).

### **1. Claim Construction**

[6] Claim construction begins with and remains focused on the language of the claims. *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1116 (Fed.Cir.2004). It is well settled that to construe an asserted claim, the court should look first to the intrinsic evidence of the patent itself, including the claims, the specification and its prosecution history, if it is in evidence. *Vitronics*, 90 F.3d at 1582.

[7] [8] [9] Construction of the disputed terms begins with the language of the claims. "The construction of claims is simply a way of elaborating the normally terse claim language in order to understand and explain, but not to change, the scope of the claims." *Embrex, Inc. v. Service Engineering Corp.*, 216 F.3d 1343, 1347 (Fed.Cir.2000). "There is a 'heavy presumption' that the terms used in claims 'mean what they say and have the ordinary meaning that would be attributed to those words by persons skilled in the relevant art.' " *SuperGuide Corp. v. DirecTV Enterprises, Inc.*, 358 F.3d 870, 874-75 (Fed.Cir.2004) (quoting *Texas Digital Systems, Inc. v. Telegenix, Inc.*, 308 F.3d 1193, 1202 (Fed.Cir.2002)). Dictionaries, encyclopedias and treatises are extrinsic evidence that may be used in determining the ordinary and customary meaning of claim term language, but the specification remains "the single best guide to the meaning of a disputed term." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1321 Fed. Cir.2005) (quoting *Vitronics*, 90 F.3d at 1582). "[P]atent law permits the patentee to choose to be his or her own lexicographer by clearly setting forth an explicit definition for a claim term that could differ in scope from that which would be afforded by its ordinary meaning." *Rexnord Corp. v. Laitram Corp.*, 274 F.3d 1336, 1342 (Fed.Cir.2001).

[10] In addition, "the specification may define claim terms 'by implication' so that the meaning may be 'found in or ascertained by a reading of the patent documents.' " *Bell Atlantic Network Services, Inc. v. Covad*, 262 F.3d 1258, 1268 (Fed.Cir.2001). Although the patent specification may not be used to rewrite the claim language, *SuperGuide*, 358 F.3d at 875, the specification may be used to interpret what the patent holder meant by a word or phrase in the claim, *E.I. du Pont de Nemours & Co. v. Phillips Petroleum Co.*, 849 F.2d 1430, 1433 (Fed.Cir.1988).

#### **a. '166 patent terms**

The parties have asked the court to construe four terms contained in the '166 patent: "counterbalance weight," "reciprocating," "rail" and "interconnected with." In addition, it is necessary to construe the term "link arms."

#### **1) "counterbalance weight"**

[11] Plaintiff's proposed definition of "counterbalance weight" is "a mass that provides significant dynamic balance for the reciprocating effective mass of the piston." (Dynamic balance is "the state of having the weight (of a pulley, shaft, or the like) so distributed that there will be no vibration when running." *Merriam-Webster New International Dictionary* 206 (2d ed.1958).) Defendant proposes that "counterbalance weight"

be defined as "a weight that counters forces associated with movement of a piston."

The '166 patent's written description distinguishes between counter weights, which counter only the primary forces of piston reciprocation, and counterbalance weights, which counter primary and secondary forces of piston reciprocation. '166 patent, col. 1, lns. 26-40. The innovation behind the '166 counterbalance weight system is its ability to guide the counterbalance weight to reduce the vibrations caused by piston reciprocation. The invention does this by improving the engine's dynamic balance. Defendant's proposed construction fails to capture the essential difference between counterweights and counterbalance weights as described in the patent. Therefore, I will construe the term "counterbalance weight" to mean a mass that provides significant dynamic balance by countering forces associated with the movement of a piston.

## 2) "reciprocating"

[12] Plaintiff proposes that "reciprocating" be defined as "to and fro movement." Defendant proposes the definition "back and forth motion in a straight line."

The ordinary meaning of the term "reciprocating" is ambiguous. Plaintiff cites *Webster's Third New International Dictionary*, which defines "reciprocating" as "characterized by alternation in movement: moving to and fro." *Webster's Third New International Dictionary* 1895 (1986). However, the *New Oxford American Dictionary* defines "reciprocating" as "mo[tion] backward and forward in a straight line." *New Oxford American Dictionary* 1422 (2001).

Defendant argues that when "reciprocating" is construed in the context of the entire patent specification, it is limited to purely linear motion. The '166 patent abstract states "an engine counterbalancing system [with] a counterbalance weight that reciprocates *in a linear manner* in opposition to piston movement." (Emphasis added) Moreover, the written description reads:

An engine balancing system is disclosed in which the counterbalance weight moves *in a linear manner* in opposition to the reciprocating piston ... An advantage of this present invention is that the counterbalance weight moves *in a linear manner* in opposition to the linear motion of the reciprocating piston, for improved balancing.

'166 patent, col. 1, lns. 43-45 (emphasis added).

Plaintiff contends that its construction best captures the meaning that "one skilled in the art" would attribute to "reciprocating." In support of its broader reading of the term, plaintiff cites *Virginia Panel Corp. v. MAC Panel Co.*, 133 F.3d 860 (Fed.Cir.1997), in which the court construed the meaning of "reciprocating" in the context of a mechanism for engaging a test adapter and receiver. In that case, the defendant argued that the term "reciprocating" should be limited to linear motion because (1) the "reciprocating" slide plates shown in the preferred embodiments moved only in a line and (2) because the patent's written description referred twice to the motion of the slide plates as linear. *Id.* at 866. The court held:

Without an express intent to impart a novel meaning to claim terms, an inventor's claim terms take on their ordinary meaning. That ordinary meaning was established at trial; the uncontroverted evidence, including a recognized treatise, indicated that those skilled in the mechanical arts would have understood "reciprocating" to mean motion in which "a point traverses the same path and reverses its motion at the ends of such a path."

*Id.*

[13] The role of claim construction in infringement analysis is not to limit or to broaden patent claims, but

rather to define the invention that has been patented. *Netword, LLC v. Centraal Corp.*, 242 F.3d 1347, 1352 (Fed.Cir.2001). Claims are always construed in light of the specifications of which they are a part. *Id.* However, where a specification does not *require* a limitation, that limitation should not be read from the specification into the claims. *Specialty Composites v. Cabot Corp.*, 845 F.2d 981 (Fed.Cir.1988). In this case, the patent specification describes the motion of the counterbalance weight as movement "in a linear manner." The description distinguishes the motion of the '166 counterbalance weight from prior "rotating" counterbalance weights but it does not require that the counterbalance weight move in a perfectly straight line in all possible embodiments. The phrase "in a linear manner" (instead of "in a straight line") leaves room for the possibility of a counterbalance weight that reciprocates along a less than a perfectly straight path.

[14] Moreover, plaintiff argues that the term "reciprocating," cannot be limited to purely linear reciprocation as used in independent claim 1 because if it did dependent claim 12 would be rendered meaningless. (Claim 12 claims "the system of claim 1, wherein said counterbalance weight moves *linearly* in opposition to piston reciprocation." (Emphasis added)). Under the doctrine of claim differentiation, it is presumed that different claims will have different scopes. *E.g.*, *Phillips*, 415 F.3d at 1315 ("the presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim"). The presumption is especially strong when the limitation in dispute is the only meaningful difference between an independent and dependent claim and one party is urging that the limitation in the dependent claim should be read into the independent claim, as defendant does here. *Sunrace Roots Enterprise Co., Ltd. v. SRAM Corp.*, 336 F.3d 1298, 1303 (Fed.Cir.2003).

Defendant suggests that the claims can be distinguished on the ground that claim 12 requires the counterbalance weight to move "in opposition to piston reciprocation," whereas claim 1 requires merely that the counterbalance weight reciprocate "in response to the rotation of the crankshaft." The suggestion is unpersuasive because it depends upon a presumption that the limitations "moves linearly" and "reciprocating" have the same meaning. Such a presumption is unwarranted when the patentee has chosen to use different claim terms, raising the presumption that the terms are intended to reflect differences in the scope of the claims. *Forest Labs., Inc. v. Abbott Labs.*, 239 F.3d 1305, 1310 (Fed.Cir.2001). Because the plain language of the claim is consistent with the meaning plaintiff proposes and because defendant has not provided evidence sufficient to overcome the presumption in favor of differentiating between the meaning of claim 1 and claim 12, I will construe reciprocating to mean back and forth motion.

### 3) "rail"

[15] Plaintiff proposes that "rail" be defined as "a bar or relief that serves to direct the planar motion of an interfacing component substantially along the axis of the rail." Defendant proposes the definition, "a bar with at least two substantially perpendicular surfaces that is fixed to one structure extending longitudinally upon which another structure is slidable and which serves to direct the motion of that structure along the axis of the bar." I construe "rail" to mean a bar that serves to direct substantially the motion of another component along the axis of the rail.

The specification does not define the term "rail." Although the written description states that the disclosed invention "also includes at least one rail interconnected with the crankcase housing such that the counterbalance weight is slidable along the rail," nothing in the claim language itself requires that the component guided by the rail *must* "slide" along, or otherwise maintain constant contact with the rail at all times as the weight reciprocates. '166 patent, col. 1, lns. 55-57. Neither the claim nor the written description indicates that the rails must direct the motion of the counterbalance weight completely, rather than "substantially" or generally along the axis of the rail. Also, however, neither the claim language nor the written description limits rails to guiding only the planar motion of the counterbalance weight.

[16] Figure 4 of the '166 patent shows rails (34, 40 & 42) along which the counterbalance weight slides. Because all the rails shown in Figure 4 are bars with at least two substantially perpendicular surfaces, defendant contends that the term rail should be construed to require a bar with two substantially perpendicular surfaces. "Although the specification may well indicate that certain embodiments are preferred, particular embodiments appearing in the specification will not be read into the claims when the claim language is broader than such embodiments." *Tate Access Floors, Inc. v. Maxcess Technologies, Inc.*, 222 F.3d 958, 966 (Fed.Cir.2000); *Kemco Sales, Inc. v. Control Papers Co.*, 208 F.3d 1352, 1362 (Fed.Cir.2000). The claim language does not include any limitation requiring two "substantially perpendicular" surfaces. Therefore, I will construe "rail" to mean a bar that serves to direct substantially the motion of a component that slides along the axis of the rail.

#### 4) "interconnected with"

[17] Plaintiff proposes that "interconnected with" be construed to mean "two parts or components that are connected without regard to the form or realization of the connection ( *e.g.*, integral, jointed, rigid or pivotal)." Defendant proposes the definition "integral with or the equivalent" and contends that the term should be construed to "exclude relative movement between two components that are interconnected." I construe the phrase "interconnected with" to mean a connection between two components, without regard to the form of the connection.

The ordinary meaning of the word "interconnect" is to "connect with each other." *New Oxford American Dictionary* 884 (2001). Although a patentee may choose to be his own lexicographer, he need not assign a claim term a narrower meaning than the ordinary one. Defendant argues that "interconnected with" should require an integral connection between rails and the crankcase housing and between slots and the counterbalance weight because the figures shown in the '166 patent all display integral connections between these elements. However, because the ordinary meaning of the claim language is broader than the embodiments shown in the specification, the embodiments alone cannot be used to read limitations into the claim. *Tate Access Floors, Inc.*, 222 F.3d at 966.

Furthermore, the written description militates against defendant's proposed construction of the term. The description states that a "rail could alternately be formed on weight (26) and the slot or recess *formed integral or otherwise interconnected with* the crankcase housing." '166 patent, col. 3, lns. 11-13 (emphasis added). The language of the specification indicates that an integral connection is just one example of how interconnecting a rail with the crankcase housing. Contrary to defendant's assertion, it is not the only means by which such an interconnection can be achieved. Therefore, I will construe the phrase "interconnected with" to mean a connection between two components, without regard to the form of the connection.

#### (5) "link arms"

[18] Claims 2, 4 and 6 do not define the term "link arms," which is not a term with an ordinary meaning. The parties have not suggested that the term has any "particular meaning in [the] field of art." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed.Cir.2005). Therefore, I turn to the specification itself, which "necessarily informs the proper construction of the claims." *Network Commerce, Inc. v. Microsoft Corp.*, 422 F.3d 1353, 1359 (Fed.Cir.2005).

The '166 patent's abstract claims "two spaced link arms that engage two respective eccentrics of the crankshaft." The written description states that the invention comprises "at least one link arm that couples the counterbalance weight to the crankshaft. In the preferred embodiment, two spaced link arms are used." '166 patent, col. 1, lns. 52-54. Although the embodiments shown in the patent specification show link arms that are separate mechanical components from the counterbalance weight, the specification does not require the link arms to be separate pieces of machinery, but it identifies their purpose as coupling the

counterbalance weight to the crankshaft. Relying on the description of the link arms' purpose provided by the written description, as well as the non-limiting language of the claim itself, I construe "link arms" to be components that couple the counterbalance weight to the crankshaft.

#### **b. '502 patent terms**

The parties have asked for construction of five terms and phrases contained in the '502 patent: "adapter," "runner filler," "substantially uniform cross-sectional area," "an intake passageway ... at least partially defined by said runner filler" and "selectable."

##### **1) "adapter"**

[19] Plaintiff proposes that "adapter" be defined as "a device that permits the cylinder head's intake position to be altered." Defendant proposes the definition "a device used to connect different pieces of apparatus." I conclude that an "adapter" is a device used to connect different pieces of apparatus. No specialized definition of "adapter" is provided in either the claim language or the written description of the '502 patent. Though plaintiff does not propose the following construction in its brief, I note that plaintiff proposed the fact that "one of ordinary skill in the art reading the ['502] patent would define 'adapter' ... to mean a component that is used to effect operative compatibility between different parts of a system." Plt.'s Reply to PPOF, dkt. # 87, para. 179. Defendant did not dispute the proposal. Practically speaking, this construction is identical to defendant's insofar as it implies that an adapter connects pieces of apparatus so that they can operate compatibly, that is, together. Defendant's construction gains further support from the ordinary meaning of the term. An adapter is defined as "a device connecting pieces of equipment that cannot be connected directly." *New Oxford American Dictionary* 17 (2001). Because the patent specification does not indicate that the term should be given a meaning outside its ordinary definition, I will construe an "adapter" to be a device used to connect different pieces of apparatus.

##### **2) "runner filler"**

Plaintiff proposes that "runner filler" be defined as "an element that volumetrically shapes the intake runner cavity to form an intake passageway." Defendant proposes the definition, "a component that is positioned within, and fully defines at least part of, the intake passageway." I conclude that a "runner filler" is a component that partially fills the intake runner, thereby forming at least a portion of the intake passageway.

Defendant's proposal would make a runner filler of any object placed within the intake runner. This is a broader construction of the term than the patent itself claims. The '502 patent's written description states: "The present invention solves some of the problems of redesigning engines to fit existing o [riginal] e[quipment] m[anufacturer's] devices by forming an intake runner cavity that is relatively large and then filling at least some of the cavity space with a runner filler to form and position the intake passageway as desired." The '502 invention relies on the ability of the runner filler to fill portions of the intake runner cavity to form the intake passageway.

Although plaintiff's proposal comes closer to defining the term as claimed in the '502 patent, it states that the runner filler shapes the intake *runner cavity*, rather than the intake *passageway*. According to the '502 patent specification, the intake runner cavity does not change its shape. It is oversized and remains so without regard to the shape or size of the inserted runner filler. It is the intake passageway that is shaped by the runner filler, either partially (in the case of "open" runner fillers) or fully (in the case of "closed" runner fillers). Therefore, I will construe "runner filler" to be a component that partially fills the intake runner, thereby forming at least a portion of the intake passageway.

##### **3) "substantially uniform cross-sectional area"**

[20] Plaintiff argues that the court should decide whether an intake passageway has a "substantially uniform cross-sectional area" by reference to its cross-sectional area size and its cross-sectional area shape. Defendant suggests that an intake passageway has a substantially uniform cross-sectional area if it has largely or approximately the same cross-sectional area across its length. I conclude that an intake passageway has a substantially uniform cross-sectional area if it has approximately the same cross-sectional area across its length.

The '502 patent does not distinguish between the cross-sectional area "size" and "shape," either explicitly or implicitly. The ordinary meaning of the word cross-section is "a surface or shape that is or would be exposed by making a straight cut through something, especially at right angles to the axis." *New Oxford American Dictionary* 409 (2001). The ordinary meaning of "area" is "a measure of the size of a two-dimensional surface, or of a region on such a surface." *McGraw-Hill Dictionary of Scientific and Technical Terms* 113 (6th ed.2003). Thus, the cross-sectional area of an intake passageway is the measurement of the surface that would be exposed by making a straight cut through the intake passageway. Therefore, an intake passageway has a substantially uniform cross-sectional area if it has approximately the same cross-sectional area across its length.

#### **4) "an intake passageway ... at least partially defined by said runner filler"**

[21] Plaintiff proposes that the phrase "an intake passageway ... at least partially defined by said runner filler" does not need to be construed because its meaning is clear. Defendant proposes that the phrase be construed to mean that the runner filler must enclose at least a segment of the intake passageway. I conclude that the runner filler may "at least partially define" the intake passageway without enclosing it.

Defendant argues that the preferred embodiments shown in the '502 patent disclose two types of runner fillers. Some completely enclose the intake passageway when inserted into the runner filler. Defendant calls these "closed" runner fillers. Others are only semi-circular and, when inserted into the runner filler, cooperate with the intake runner to form the intake passageway. Defendant calls these "open" runner fillers. Defendant contends that independent claims 15 and 22 equate the claim term "defined" with the word "enclosed." Therefore, defendant argues, claims 15 and 22 require the use of closed runner fillers.

In support of its position, defendant relies solely on the embodiments shown in the patent specification. The embodiments that correspond to claims 15 and 22 show closed runner fillers. However, the court will "not import limitations into claims from examples or embodiments appearing only in a patent's written description, even when a specification describes very specific embodiments of the invention ... unless the specification makes clear that the patentee intends for the claims and the embodiments in the specification to be strictly coextensive." *JVW Enterprises, Inc. v. Interact Accessories, Inc.*, 424 F.3d 1324 (Fed.Cir.2005). The '502 patent does not indicate that the invention taught by claims 15 and 22 is limited to those in which a closed runner filler is used to completely enclose the intake passageway. In order to "at least partially define" the intake passageway, the runner filler must form only a portion of the intake passageway. It may do so by completely forming a segment of the intake passageway or by partially forming a segment of the intake passageway.

#### **5) "selectable"**

[22] Plaintiff proposes that "selectable" be defined as "a design choice." Defendant proposes the definition, "capable of being altered." I conclude that selectable means capable of being altered.

Claims 15 and 22 both use the term selectable. Claim 15 requires the "position of said intake passageway [to be] selectable based upon at least one of the position and the configuration of said runner filler," while claim 22 requires the "position of the inlet [to be] selectable." Plaintiff emphasizes the invention of the '502

patent, which is a cylinder head that can be used in a variety of engine configurations. The '502 patent teaches altering the size or position of the intake passageway by changing the size or shape of the runner filler. Therefore, plaintiff argues, "selectable" means the ability to make different design choices.

Defendant does not deny that the '502 patent teaches changing the runner filler to alter the shape or size of the intake passageway. However, defendant contends that plaintiff's proposed construction is so broad as to render the term "selectable" meaningless. After all, equipment designers necessarily make "design choices" at some point in the production of any cylinder head. Defendant contends that an intake passageway and inlet are not "selectable" within the meaning of claims 15 and 22 unless those components can be altered without undermining the functioning of the cylinder head.

The patent does not define selectable. The ordinary meaning of the term is "capable of being chosen." *Webster's New World Dictionary* 3, 1299 (4th ed.2001). Like plaintiff's original proposal, this definition is inadequate to give any meaning to the term as it is used in claims 15 and 22. All designs are "chosen," but not all designs infringe the '502 patent. I conclude that "selectable" as used in claims 15 and 22 refers to intake passageway positions and inlets that can be altered without disturbing the function of the cylinder head.

## **2. Infringement analysis**

### **a. The '166 patent**

[23] To support a finding of infringement, a "patentee must show that the accused device meets each claim limitation either literally or under the doctrine of equivalents." *Catalina Marketing International, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 812 (Fed.Cir.2002). Plaintiff contends that defendant's Courage engine literally infringes claims 1-2, 4, 6-11 and 13 of the '166 patent.

#### **(1) claim 1**

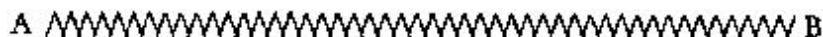
[24] The undisputed facts reveal that the Courage engine contains a balancing system for an internal combustion engine having a crankcase housing and a cylinder bore defining a cylinder axis. In order to infringe independent claim 1 of the '166 patent, the Courage engine must also contain: (1) a crankshaft substantially within the crankcase housing, wherein the cylinder bore is disposed on a first side of the crankshaft; (2) a piston disposed in the cylinder bore for reciprocal movement generally along the cylinder axis in response to rotation of the crankshaft; (3) a counterbalance weight disposed on a second side of the crankshaft that is generally opposite the first side, with the counterbalance weight reciprocating in response to rotation of the crankshaft; and (4) a rail interconnected with the counterbalance weight or the crankcase housing so that the rail guides the counterbalance weight during reciprocation of the counterbalance weight.

The parties do not dispute that the Courage engine contains a crankshaft substantially within the crankcase housing or that the cylinder bore is disposed on a first side of the crankshaft or that a piston is disposed in the cylinder bore for reciprocal movement along the cylinder axis in response to rotation of the crankshaft. However, they dispute whether the Courage counterbalance weight reciprocates in response to rotation of the crankshaft and whether the engine contains one or more rails that guide the counterbalance weight as it reciprocates.

The undisputed facts are that the Courage counterbalance weight moves back and forth in response to the rotation of the crankshaft. Defendant argues that the Courage counterbalance weight moves differently from the counterbalance weight disclosed by the '166 patent. The path between points A and B taken by the weight disclosed in the '166 patent can be traced as a straight line:



On the other hand, the Courage engine "wobbles" as it reciprocates. The guide shoe, to which the weight is attached, rocks back and forth as it travels toward and away from the reciprocating piston, tracing a path similar to the one shown below:



Because I construe reciprocation to require back and forth movement instead of purely linear back and forth movement, I find that the Courage engine reciprocates within the meaning of the '166 patent despite its "wagging" motion.

Next, plaintiff contends that the Courage engine's ribs are rails interconnected with the crankcase housing and that the engine's guide shoe is a rail interconnected with the counterbalance weight. Plaintiff contends that the ribs on the Courage engine substantially direct the motion of the guide shoe and its attached counterbalance weight along the axis of the rib.

The undisputed facts show that the ribs of the Courage engine are bars between which the guide shoe "waggles" substantially along the ribs' central axis as the counterbalance weight makes its way back and forth in response to the movement of the piston. Also, the facts show that the ribs are formed integrally with the crankcase housing and are therefore interconnected with it. Therefore, the ribs are rails within the meaning of claim 1 of the '166 patent.

Plaintiff contends that the guide shoe is also a rail, substantially directing the motion of the counterbalance weight on the guide shoe's axis. The undisputed facts show that the guide shoe is a metal bar that guides the motion of the counterbalance weight along its axis as it moves back and forth in the slot. Therefore, the guide shoe is also a rail within the meaning of the '166 patent.

Because the counterbalance weight reciprocates and the ribs and guide shoe of the Courage engine constitute a rail, the Courage engine infringes claim 1 of the '166 patent.

**(2) claims 2, 4 and 6**

[25] Defendant contends that the Courage engine does not infringe dependent claims 2, 4 or 6 because the counterbalance weight used in the Courage engine is constructed as a single piece. Implicit in this argument is the assumption that a single component cannot be characterized as both a counterbalance weight and link arms. Plaintiff contends that the top and bottom portions of the Courage counterbalance weight are link arms that encircle an eccentric portion of the crankshaft, as do the link arms shown in the preferred embodiments of the '166 patent.

The Courage engine's counterbalance weight contains a thin top and bottom portion that encircle the crankshaft. These portions of the counterbalance weight engage an eccentric portion of the crankshaft, connecting the solid mass of the weight to the crankshaft. Although these connecting portions are not separate pieces of machinery, they indisputably "couple the counterbalance weight to the crankshaft" and therefore are link arms within the meaning of the '166 patent. Therefore, the Courage engine infringes



claims 2, 4 and 6 of the '166 patent.

**(3) claims 7-10**

As noted above, the Courage engine contains three rails (the two ribs and the guide shoe). Therefore, dependent claims 7 and 8 are infringed.

The parties do not dispute that the space between the ribs constitutes a slot that receives the guide shoe or that the ribs in the Courage engine are "substantially parallel" to the cylinder axis. Therefore, dependent claims 9 and 10 are infringed also.

**(4) claim 11**

[26] It is difficult to understand plaintiff's argument that the Courage engine infringes dependent claim 11 of the '166 patent. Plaintiff asserts that the "insides of the slot" formed between the engine's two ribs have guide surfaces that engage and guide the counterbalance weight. Defendant concedes that these surfaces are guides, but contends that the guide surfaces cannot "engage" the counterbalance weight because they do not touch it. Instead, they contact only the guide shoe.

Plaintiff contends that the indirect connection between the counterbalance weight, guide shoe and guide surfaces constitutes engagement between the counterbalance weight and guide surface. The ordinary meaning of engage is "to interlock or interact." *Webster's Third New International Dictionary* 751 (1993). Plaintiff suggests that the counterbalance weight and guide surface meet this definition.

I agree that the ordinary meaning of engage should be used to determine whether the Courage engine infringes claim 11 of the '166 patent. No other meaning is proposed in the claim language or implied in the written description. However, applying the ordinary meaning to the guide surfaces of the Courage engine leads to the conclusion that they do not engage or "interlock with" the counterbalance weight. Rather, they connect exclusively with the guide shoe. Therefore, I will deny plaintiff's motion for summary judgment with respect to its claim that the Courage engine infringes claim 11 of the '166 patent.

**(5) claim 13**

[27] Plaintiff contends that the Courage engine infringes claim 13 of the '166, which requires the mass of the counterbalance weight to be equally distributed on opposite sides of the cylinder axis. Defendant does not dispute that the counterbalance weight of the Courage engine is composed of two identical (that is, equal) sides connected in the middle. However, defendant contends that the counterbalance weight engine is not equally disposed on opposite sides of the cylinder axis because, as the counterbalance weight waggles back and forth, its weight lies unequally on each side of the cylinder axis.

Plaintiff argues that claim 13 does not require that the mass of the counterbalance weight be equally disposed on opposite sides of the axis at all times during operation, but only that the "structure" of the engine meet the limitation. Plaintiff contends that the Courage engine meets this limitation twice each cycle: once when the piston is fully extended and once when it is fully compressed. However, plaintiff failed to propose as fact that when the piston is fully extended and once when it is fully compressed the counterbalance weight is equally disposed on opposite sides of the axis. The undisputed facts are that the Courage engine's counterbalance weight waggles from side to side, distributing its weight unequally as it waggles. Therefore, I will deny plaintiff's motion for summary judgment on its claim that the Courage engine infringes claim 13 of the '166 patent.

**b. The '502 patent**

Plaintiff contends that defendant's Courage engine literally infringes independent claims 1, 15 and 22 and dependent claims 2-6, 8, 11-13, 16-21 and 23-31 of the '502 patent. I find that material facts are in dispute, preventing resolution of this contention on summary judgment.

**(1) independent claim 1 and dependent claims 2-6, 8, and 11-13**

[28] It is undisputed that the Courage engine contains an intake port and an intake runner that receives an air-fuel mixture. The intake runner cavity permits air, fuel and a mixture of air and fuel to flow from the carburetor to the intake port. The engine includes an entrance and a section that can be defined as having a first end nearer the entrance and a second end nearer the intake port.

The Courage engine's heat shield deflector connects to the cylinder head to direct air flow from the carburetor to the intake port. The heat shield deflector contains a tongue insert that fits into the intake runner. Together with the surface of the intake runner, the tongue forms the intake passageway leading to the intake port. Because the heat shield deflector is a device used to connect different pieces of equipment, it is an adapter. The tongue insert is a component that partially fills the intake runner, thereby forming at least a portion of the intake passageway and is therefore a runner filler.

In order to infringe independent claim 1 of the '502 patent, the Courage engine must also contain an intake passageway having a substantially uniform cross-sectional area created at least in part by the runner filler and, within the intake passageway, the cross-sectional area of the intake runner must decrease from the entrance to the intake port.

The parties dispute whether the Courage engine's intake passageway has a substantially uniform cross-sectional area. Plaintiff's expert believes that the cross-sectional area of the Courage intake passageway varies by approximately 27% over its length and that this degree of variation would be considered "substantially uniform" by those skilled in the art. Defendant's chief engineer takes the position that the cross-sectional area of the intake passageway varies by approximately 70% over its length. This dispute of material fact precludes summary judgment. Therefore, I will deny plaintiff's motion with regard to its claim that the Courage engine literally infringes claims 1, 2-6, 8, and 11-13 of the '502 patent.

**(2) independent claim 15 and dependent claims 16-18**

[29] As described above, defendant's engine contains an intake port, an intake runner that receives a fuel-air mixture and includes an entrance and a section having a first end nearer the entrance and a second end nearer the intake port, and an adapter having a runner filler positioned in the intake runner. In order to infringe independent claim 1 of the '502 patent, the Courage engine must also contain an intake passageway (1) disposed within the intake runner and (2) at least partially defined by the runner filler and (3) in which the position of the intake passageway is selectable based upon the position or configuration of the runner filler.

Defendant concedes that the tongue insert is disposed within the intake runner. However, it argues that the tongue insert does not at least partially define the intake passageway because, as an open runner filler, it does not fully enclose a portion of the intake passageway. I concluded earlier that a runner filler forms at least a portion of the intake passageway when it partially or wholly encloses a portion of the passageway. The undisputed facts are that the tongue insert, together with the surface of the intake runner, forms the intake passageway leading to the intake port. Therefore, the tongue "at least partially defines" the intake passageway.

The parties dispute whether the Courage engine's intake passageway can be altered without disturbing the function of the cylinder head and therefore is selectable. Plaintiff contends that the intake passageway of the

Courage engine can be altered by changing the configuration of the tongue insert on the heat shield deflector. Defendant contends that the Courage engine's heat shield deflector and tongue cannot be changed without negatively affecting the performance of the engine. Because the "selectability" of the intake passageway is a material fact in dispute, I will deny plaintiff's motion with respect to its claim that the Courage engine literally infringes claims 15-18 of the '502 patent.

### **(3) independent claim 22 and dependent claims 23-31**

As is the case with plaintiff's other claims regarding infringement of the '502 patent, disputed material facts preclude summary judgment with respect to plaintiff's claims that the Courage engine infringes patent claims 22-31. In order to infringe independent claim 22, the Courage engine must contain an intake passageway at least partially defined by the runner filler and extending from an inlet near the entrance. The position of the inlet must be selectable along the height dimension.

Once again, the parties dispute whether the inlet position is fixed or alterable, relying on the same evidence they use to dispute the selectability of the intake passageway position. Because this disputed fact is material, I will deny plaintiff's motion with respect to its claim that the Courage engine literally infringes claims 22-31 of the '502 patent.

### **3. Invalidity analysis**

[30] [31] Patents are presumptively valid. 35 U.S.C. s. 282. Defendant contends that the '106 and '502 patents are invalid because they were anticipated and rendered obvious by the prior art. Defendants must prove invalidity by clear and convincing evidence. *Connell v. Sears Roebuck & Co.*, 722 F.2d 1542, 1549 (Fed.Cir.1983). When addressing the question of invalidity, the court must begin with construction of the patent's claims. *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1348 (Fed.Cir.2005). Next, the court must determine whether a prior art reference discloses each and every limitation of the claim expressly or inherently. *Scripps Clinic & Research Found. v. Genentech, Inc.*, 927 F.2d 1565, 1576-77 (Fed.Cir.1991). Whether prior art discloses each limitation of the claim is a question of fact. *Akamai Technologies, Inc. v. Cable & Wireless Internet Services, Inc.*, 344 F.3d 1186, 1192-1193 (Fed.Cir.2003).

Before the court can grant summary judgment, the moving party must show that there are no disputes of material fact with respect to the prior art. *Sentry Protection Products, Inc. v. Eagle Mfg. Co.*, 400 F.3d 910, 914 (Fed.Cir.2005). Moreover, summary judgment may be granted only when it is clear that the moving party is entitled to judgment as matter of law. Because material disputes of fact exist with respect to the validity of the '166 patent, I will deny plaintiff's motion for summary judgment with respect to its claim that the '166 patent is not invalid in light of prior art. Also, because plaintiff has not met its burden of adducing facts that would support judgment in its favor and because a material fact is in dispute, I will deny plaintiff's motion for summary judgment with respect to its claim that the '502 patent is not invalid in light of prior art.

#### **a. The '166 patent**

Although both parties have proposed facts relating to Austin, Ogura, Fiala, Van Ligten, Kollock, Ricardo, Murata, Shirai, Ljunstrom and Menen, defendant contends in its response brief only that the '166 patent is anticipated by the Austin, Menen, Ricardo, Van Ligten, Ogura and Fiala patents and rendered obvious by combinations of the Austin and Loque patents combined with either the Murata, Kollock or Shirai patents. Therefore, I will assume that the Ljunstrom patent is no longer at issue.

[32] [33] With regard to the Ogura and Fiala patents, defendant disclosed for the first time in its response brief that the kinematic drawings found in those references can be read to include a rail as the term is used in the '166 patent. I have already stricken those arguments because they were not disclosed to plaintiff. Defendant has not introduced any other ground for concluding that the Ogura and Fiala patents teach rails.

A claim is anticipated only if each and every limitation is found either expressly or inherently in a single prior art reference. *See, e.g., Celeritas Tech., Ltd., v. Rockwell Int'l Corp.*, 150 F.3d 1354, 1361 (Fed.Cir.1998). In the absence of facts showing that rails are expressly or inherently present in the Ogura and Fiala patents, those references cannot anticipate independent claim 1 of the '166 patent and therefore do not render the patent invalid.

[34] With respect to the Austin, Menen, Ricardo and Van Ligten patents, the parties dispute whether the weights disclosed in these patents balance both primary and secondary forces of piston movement, thereby creating significant dynamic balance and rendering the weights counterbalance weights within the meaning of the '166 patent. It is undisputed that the patents disclose the remaining claims of the '166 patent. Defendant has conceded that if the court defines counterbalance weight as I have, that is, a mass that provides significant dynamic balance, the Ricardo and Van Ligten patents do not disclose counterbalance weights. However, defendant maintains that the Austin and Menen patents disclose counterbalance weights even under the construction it opposed. Because the parties dispute whether the Austin or Menen patents contain a counterbalance weight and therefore anticipate the '166 patent, I will deny plaintiff's motion with respect to the question whether prior art anticipates the '166 patent.

[35] Next, plaintiff contends that defendant has failed to provide clear and convincing evidence that combinations of Austin and Loque with either Kollock, Murata or Menen render the '166 patent obvious. At trial defendant bears the burden of proving its counterclaim of invalidity by clear and convincing evidence. However, on plaintiff's motion for summary judgment, the burden rests with plaintiff to show that no material facts are in dispute. Fed.R.Civ.P. 56(c). On a motion for summary judgment, if the moving party makes a *prima facie* case for summary judgment, the burden of production shifts to the non-moving party to present specific evidence indicating there is a genuine issue for trial. *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 250, 106 S.Ct. 2505, 91 L.Ed.2d 202 (1986). The grant of summary judgment of invalidity for obviousness must be done on a claim by claim basis. *Knoll Pharmaceutical Co., Inc. v. Teva Pharmaceuticals USA, Inc.*, 367 F.3d 1381, 1383 (Fed.Cir.2004). Therefore, the "accused infringer must prove by clear and convincing evidence that each claim that is challenged cannot reasonably be held to be non-obvious." *Id.*

[36] [37] A patent claim is obvious, and therefore invalid, when the differences between the claimed invention and the prior art "are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art." 35 U.S.C. s. 103. When an obviousness argument is based on a combination of prior art references, "the relevant inquiry is whether there is a reason, suggestion, or motivation in the prior art that would lead one of ordinary skill in the art to combine the references, and that would also suggest a reasonable likelihood of success." *Smiths Industries Medical Systems, Inc. v. Vital Signs, Inc.*, 183 F.3d 1347, 1356 (Fed.Cir.1999). The Court of Appeals for the Federal Circuit has consistently held that obviousness requires a finding that a "skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed." *In Re Rouffet*, 149 F.3d 1350, 1357 (Fed.Cir.1998).

[38] As the party moving for summary judgment, plaintiff bears the burden of introducing all facts necessary to grant judgment in its favor. Plaintiff has not shown that the Murata, Kollock and Shirai patents lacked any features of the '166 patent other than rails. Therefore, drawing all inferences in favor of defendant, I will assume for the purpose of this motion that the Murata, Kollock and Shirai patents contain the claims of the '166 patent with the possible exception of rails.

Defendant's expert contends that one skilled in the art would have been motivated to modify the guide pins taught in Murata, Kollock and Shirai to create a rail as taught by the '166 patent and would have had a reasonable expectation of success in doing so. Plaintiff disputes this proposition, contending that defendant

lacks clear and convincing evidence of a motivation to combine these patents and that the commercial success of the Intek engine is secondary evidence of the non-obviousness of the '166 patent. Therefore, because these material facts are at issue, I will deny plaintiff's motion for summary judgment with respect to its claim that the '166 patent is not obvious in light of prior art.

**b. The '502 patent**

Defendant contends the '502 patent is anticipated by five prior art references: the Roberts, Shannon, Macfarlane (United States Patent No. 4,805,573), Tsutsumi and Rutschmann patents. In addition, defendant contends that if the Courage engine's cylinder head is found to infringe the '502 patent, the '502 patent is rendered invalid by the Courage cylinder head itself, which defendant contends was invented first. Defendant contends also that numerous combinations of prior art render the '502 patent invalid for obviousness.

The party moving for summary judgment bears the burden of showing that it is entitled to judgment under established principles. *Yorger v. Pittsburgh Corning Corp.*, 733 F.2d 1215, 1222 (7th Cir.1984). To make a *prima facie* case of validity, plaintiff needed to provide facts to support the arguments that (1) none of defendant's prior art references displayed every claim of the '502 patent and (2) one skilled in the art would not have been motivated to combine defendant's proposed combinations of prior art references with a reasonable expectation of success in doing so.

[39] Plaintiff has proposed that none of the prior art references cited by defendant contain an adapter, runner filler or inlet that is selectable along the height dimension. Plaintiff's proposals are deficient in two ways. First, plaintiff relies on its proposed constructions of these claims terms, many of which this court has not adopted. Second, although plaintiff has proposed specific facts relating to the Shannon, Kukharev, Yanagihara, Tsutsumi and Dzianott patents, it has not proposed facts specific to the Roberts, Macfarlane and Rutschmann patents. In the absence of a fact-specific allegation that these patents do not meet every claim of the '502 patent, plaintiff has failed to make a *prima facie* argument in favor of summary judgment. Therefore, I will deny plaintiff's motion with respect to its claim that the '502 patent is not invalid as anticipated.

[40] Plaintiff contends also that the '502 patent is not obvious. Although it is undisputed that defendant's expert has stated over 200 grounds for finding the '502 patent invalid as obvious, neither party has proposed facts or arguments that make clear the combinations of prior art upon which defendant's obviousness claims rely. However, it is clear that the parties dispute the ultimate facts: whether one skilled in the art would have been motivated to combine the references and would have had a reasonable likelihood of success. *Smiths Industries Medical Systems, Inc.*, 183 F.3d at 1356. Therefore, because a dispute of material fact exists, I will deny plaintiff's motion for summary judgment with respect to its claim that the '502 patent is not obvious in light of prior art.

***C. Defendant's Motion for Partial Summary Judgment Limiting Damages***

[41] Defendant argues that if it is found liable for infringement of the '166 patent, damages should be limited to those incurred after January 11, 2005, the date on which plaintiff provided notice of the alleged infringement.

35 U.S.C. s. 287(a) states:

Patentees and persons offering for sale or selling within the United States any patented article ... may give notice to the public that the same is patented, either by fixing thereon the word "patent" or the abbreviation "pat.," together with the number of the patent or, when from the character of the article this cannot be done,

by fixing to it or to the package wherein one or more of them is contained, a label containing a like notice. In the event of failure so to mark, no damages shall be recovered by the patentee in any action for infringement, except on proof that the infringer was notified of the infringement and continued to infringe thereafter, in which event damages may be recovered only for infringement occurring after such notice.

It is undisputed that plaintiff does not provide marking on its AVS engines indicating that the engines are subject to a patent. Other markings are contained on the outside of the engine and on various internal components. If plaintiff wished to mark its engine with the patent, it could have done so. Therefore, plaintiff has failed to comply with the marking requirements of s. 287(a).

However, plaintiff contends that s. 287 does not apply to the invention disclosed in the '166 patent because it is not an "article" within the meaning of s. 287. The Court of Appeals for the Federal Circuit has held that s. 287 does not apply when a "patent is directed to a process or a method." *Bandag, Inc. v. Gerrard Tire Co.*, 704 F.2d 1578, 1581 (Fed.Cir.1983). Plaintiff asks the court to create a similar exception to the marking requirement for inventions, like plaintiff's, that disclose a "system" rather than an "article." Plaintiff acknowledges that no prior court has recognized a "system" exception to s. 287(a).

Method patents are exempt from the marking requirements of s. 287(a) because the inventions they claim are *ideas* and are therefore incapable of being marked. According to the language of the '166 patent, plaintiff's invention is a "counterbalancing system [that] has a counterbalance weight that reciprocates in a linear manner in opposition to piston movement." The "system" is not an idea, but rather a set of components that work together in a unique way. Plaintiff's invention is an article with the meaning of s. 287(a).

[42] The marking statute serves three purposes: (1) helping to avoid innocent infringement; (2) encouraging patentees to give notice to the public that the article is patented; and (3) aiding the public to identify whether an article is patented. *Nike, Inc. v. Wal-Mart Stores, Inc.*, 138 F.3d 1437, 1443 (Fed.Cir.1998). Plaintiff concedes that there is room for it to mark the AVS engine with the '166 patent number. It has not presented any compelling reason why its failure to do so should be excused because of the nature of the patent itself.

It is undisputed that defendant received actual notice of its infringement of the '166 patent on January 11, 2005, when plaintiff's counsel mailed a letter to defendant's senior vice president, counsel and corporate secretary, notifying them that plaintiff believed the Courage series engines infringed the '166 patent. Because that was the first day on which notice was given, it is the first day from which damages began to accrue. Therefore, I will grant defendant's motion for partial summary judgment limiting damages for infringement of the '166 patent to those incurred after January 11, 2005.

## ORDER

IT IS ORDERED that

1. The disputed claims of plaintiff Briggs and Stratton's U.S. Patents Nos. 6,382,166 and 6,460,502 are construed as follows:

a. A "counterbalance weight" is a mass that provides significant dynamic balance by countering forces associated with the movement of a piston.

b. "Reciprocating" means back and forth movement.

c. A "rail" is a bar that serves to direct substantially the motion of a component along the axis of the rail.

- d. The phrase "interconnected with" means a connection between two components, without regard to the form of the connection.
- e. "Link arms" are components that couple the counterbalance weight to the crankshaft.
- f. An "adapter" is a device used to connect different pieces of apparatus.
- g. The "runner filler" is a component that partially fills the intake runner, thereby forming at least a portion of the intake passageway.
- h. An intake passageway has "a substantially uniform cross-sectional area" if it has approximately the same cross-sectional area across its length.
- i. "An intake passageway ... at least partially defined by said runner filler" is an intake passageway in which the runner filler forms at least a portion of the intake passageway by partially or wholly enclosing a portion of the intake passageway.
- j. "Selectable," as used in claims 15 and 22 of the '502 patent, refers to intake passageway positions and inlets that can be altered without disturbing the function of the cylinder head.

2. Plaintiff's motion to strike is GRANTED in part and DENIED in part.

3. Plaintiff's motion for summary judgment is GRANTED with respect to plaintiff's claims that the Courage series engine literally infringes claims 1, 2, 4, 6, 7, 8, 9 and 10 of the '166 patent and DENIED with respect to plaintiff's claim that the Courage engine infringes claims 11 and 13 of the '166 patent.

4. Plaintiff's motion for summary judgment is DENIED with respect to plaintiff's claim that the '166 patent is not invalid.

5. Plaintiff's motion for summary judgment is DENIED with respect to plaintiff's claim that the Courage series engine literally infringes 1, 2-6, 8, 11-13 and 15-31 of the '502 patent.

6. Plaintiff's motion for summary judgment is DENIED with respect to plaintiff's claims that the '502 patent is not invalid.

7. Defendant's motion for partial summary judgment limiting damages is GRANTED.

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