

**UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TENNESSEE
AT CHATTANOOGA**

HOLLEY PERFORMANCE
PRODUCTS INC.,

Plaintiff and Counter-Defendant,

v.
ACES FUEL INJECTION, INC.,

Defendant and Counter-Plaintiff.

Case No. 1:26-cv-59-CEA-CHS

**DEFENDANT/COUNTER PLAINTIFF ACES FUEL INJECTION, INC.'S
INITIAL INVALIDITY CONTENTIONS**

Pursuant to the Scheduling Order (Doc. 31) and Local Patent Rules 3.5 and 3.6 of the Western District of Tennessee, as adopted for purposes of this action, Defendant/Counter-Plaintiff Aces Fuel Injection, Inc. ("Aces") serves these Initial Invalidity Contentions concerning U.S. Patent Nos. 11,409,894 (the "'894 Patent"), 12,203,434 (the "'434 Patent"), 11,118,515 (the "'515 Patent"), and 11,333,083 (the "'083 Patent") (collectively, the "Asserted Patents").

These contentions are based on information reasonably available to Aces at this stage of the litigation and respond to Holley Performance Products Inc.'s ("Holley") Initial Infringement Contentions. Discovery has only recently begun, the Court has not construed any claim term, and Aces' prior-art investigation remains ongoing. Aces may amend or supplement these contentions as permitted by the Federal Rules of Civil Procedure, the Scheduling Order, the applicable Local Patent Rules, and further orders of the Court.

I. ASSERTED PATENTS, CLAIMS, GROUNDS, AND EXHIBITS

These Initial Invalidity Contentions are based on information currently and reasonably available to Aces. Discovery has only recently begun. To date, Holley has not produced any documents in response to Aces' discovery requests, no depositions of either party have been taken, the Court has not issued a claim-construction order, and Aces' investigation and analysis of the prior art remain ongoing. These disclosures are therefore necessarily preliminary.

Aces expressly reserves the right to amend, alter, clarify, modify, revise, and/or supplement these Initial Invalidity Contentions, including by identifying and relying on additional prior art, as additional information becomes available through investigation, analysis, discovery, expert review, claim construction, or other developments in this action, to the extent permitted by the Federal Rules of Civil Procedure, the Local Patent Rules, the Scheduling Order, and further orders of the Court.

Aces may identify additional prior art through its continuing investigation and discovery. Prior art not presently included in these disclosures, whether or not currently known to Aces, may become relevant depending on the claim constructions Holley advances, the claim constructions the Court adopts, and the earliest priority date to which any asserted claim of the Asserted Patents is ultimately determined to be entitled.

Aces understands that Holley presently asserts the following claims and provides the following patent-specific claim charts:

Patent	Asserted Claims	Grounds	Exhibits
11,118,515	Claims 9-10	Farrell in view of JP '794, JP '866, JP '875, and Benoit; Alternatively, Farrell in view of JP '794, JP '866, JP '875, and Wittkopf	Exhibit A
11,333,083	Claims 1, 4, and 5	Farrell in view of JP '794, JP '866, and Benoit; Alternatively, Farrell in view of JP '794, JP '866, and Wittkopf	Exhibit B
11,409,894	Claims 1-9	Farrell in view of Wittkopf and Benoit	Exhibit C
12,203,434	Claims 1-12	Farrell in view of Wittkopf and Benoit	Exhibit D

Aces contends that each asserted claim is invalid under one or more provisions of Title 35 of the United States Code, including at least 35 U.S.C. § 103, on the grounds identified herein and in the accompanying claim charts.

These Initial Invalidity Contentions are supplemented by Exhibits A through D and are served pursuant to Local Patent Rules 3.5 and 3.6 of the Western District of Tennessee, as adopted for purposes of this action. The accompanying exhibits provide limitation-by-limitation disclosures identifying where the limitations of the asserted claims are taught or suggested by the prior art and, where applicable, why a person of ordinary skill in the art would have been motivated to combine the identified references with a reasonable expectation of success.

II. GENERAL DISCLOSURES AND LIMITATIONS

The identification and application of prior art herein and in the accompanying exhibits constitute only Aces' Initial Invalidity Contentions. These contentions may, in part, reflect Holley's apparent view of the scope of the asserted claims as reflected in Holley's Initial Infringement

Contentions. Aces does not accept Holley's apparent constructions or applications of the asserted claims as correct.

Nothing in these contentions shall be treated as an admission that Aces agrees with Holley's claim constructions, that Holley's interpretation of any claim is correct, or that any asserted claim is infringed, valid, or enforceable. Aces may advance claim-construction and non-infringement positions that differ from positions assumed solely for purposes of applying the prior art in these contentions. Any statement concerning the meaning or application of claim language is made solely for purposes of these contentions and does not waive Aces' right to propose, oppose, or otherwise address the construction of any claim term.

If Aces determines that a different construction is appropriate for any claim term, Aces will present that position in accordance with the Court's claim-construction procedures. Aces further reserves the right to amend or supplement these contentions in response to the parties' claim-construction positions, the Markman hearing, the Court's claim-construction rulings, or any subsequent clarification or alteration of the meaning or scope of the asserted claims, to the extent permitted by the governing rules and orders.

Aces' claim charts cite particular teachings and disclosures of the prior art as applied to limitations of the asserted claims. The cited portions are exemplary rather than exhaustive. Aces may rely on uncited portions of the identified references, related patents and publications, prosecution histories, materials incorporated by reference, prior-art products and systems, technical literature, and fact or expert testimony to explain the cited disclosures, establish inherency, show the knowledge of a person of ordinary skill in the art, provide context for the references, or establish the state of the art.

Much of the prior art identified herein reflects the common knowledge of a person of ordinary skill in the art and the state of the art before the relevant filing dates of the Asserted Patents. Aces may rely on the identified references, alone or in combination, as evidence of that common knowledge and state of the art, including to explain what a person of ordinary skill would have understood from the references and why that person would have been motivated to combine their teachings.

The obviousness combinations identified herein are exemplary and alternative grounds. In instances in which a particular invalidity contention involves a combination of references, any one of multiple identified references may be combined with another identified reference where supported by the disclosures, the state of the art, and the knowledge and common sense of a person of ordinary skill in the art. The inclusion of particular exemplary combinations does not exclude other combinations supported by the identified references or the accompanying claim charts.

A reference identified as a primary reference may also be used as a secondary reference, and vice versa, where supported by the disclosure and the knowledge of a person of ordinary skill in the art. Aces does not contend that the references must be physically combined in every respect. Rather, the identified combinations reflect teachings that a person of ordinary skill would have been motivated to combine using known methods to obtain predictable results. The disclosure of a particular combination also does not imply that every identified secondary reference is necessary to establish the invalidity of every limitation or claim addressed by that combination.

The identification of a reference in an obviousness combination is not an admission that the reference does not anticipate one or more asserted claims. Likewise, the identification of a reference as anticipating or disclosing a particular limitation does not preclude Aces from relying

on that reference in an obviousness combination. The identification of exemplary combinations does not exclude additional combinations supported by the references, the state of the art, or the knowledge and common sense of a person of ordinary skill in the art.

Nothing in these contentions constitutes an admission concerning the meaning, scope, validity, enforceability, priority, or infringement of any asserted claim. Aces expressly preserves all positions concerning claim construction, non-infringement, anticipation, obviousness, indefiniteness, written description, enablement, patent eligibility, priority, inventorship, derivation, statutory bars, obviousness-type double patenting, and unenforceability.

III. THE APPLIED PRIOR ART

Subject to Aces' continuing investigation of priority entitlement and prior art status, Aces identifies the following references and relies on them under at least the statutory provisions stated in the accompanying charts and as otherwise permitted by law.

Reference	Publication / Patent	Relevant Date(s)	Asserted Basis
Farrell	US 2009/0145406; U.S. Patent No. 7,735,475	Filed Sept. 19, 2008; published June 11, 2009; issued June 15, 2010	35 U.S.C. § 102(a)(1) and/or (a)(2)
Wittkopf	US 2013/0298868; U.S. Patent No. 9,303,578	Filed May 11, 2012; published Nov. 14, 2013; issued Apr. 5, 2016	35 U.S.C. § 102(a)(2)
Benoit	US 2014/0123944; U.S. Patent No. 9,115,671	Filed Nov. 7, 2012; published May 8, 2014; issued Aug. 25, 2015	35 U.S.C. § 102(a)(2)
JP '794	Japanese Patent Publication No. JP 2012-062794	Published Mar. 29, 2012	35 U.S.C. §§ 102 and/or 103
JP '875	Japanese Patent Publication No. JP 2005-220875	Published Aug. 18, 2005	35 U.S.C. §§ 102 and/or 103

JP '866	Japanese Patent Publication No. JP 2005-307866	Published Nov. 4, 2005	35 U.S.C. §§ 102 and/or 103
---------	--	------------------------	--------------------------------

a. U.S. Patent No. 7,735,475 to Farrell et al. ("Farrell")

Farrell was filed September 19, 2008, claims priority to provisional applications filed October 12, 2007 and May 13, 2008, published as U.S. Patent Application Publication No. 2009/0145406 on June 11, 2009, and issued June 15, 2010. Farrell discloses a carburetor-replacement electronic fuel-injection body having multiple air passages, throttle shafts and plates, fuel injectors mounted to the throttle body, integrated fuel-supply passages, fuel-component covers, and an ECU that controls injection timing and amount.

b. U.S. Patent No. 9,303,578 to Wittkopf et al. ("Wittkopf")

Wittkopf was filed May 11, 2012, published as U.S. Patent Application Publication No. 2013/0298868 on November 14, 2013, and issued April 5, 2016. Wittkopf discloses a carburetor-replacement throttle-body EFI system having an annular fuel-distribution ring, a fuel-injection conduit, a circumferential fuel channel, and multiple outlets that discharge fuel into the air stream.

c. U.S. Patent No. 9,115,671 to Benoit ("Benoit")

Benoit was filed November 7, 2012, published as U.S. Patent Application Publication No. 2014/0123944 on May 8, 2014, and issued August 25, 2015. Benoit discloses a hybrid carburetor and fuel-injection assembly having annular inserts, high-pressure annular fuel cavities, and circumferentially distributed apertures that deliver fuel into air-intake bores.

d. Japanese Patent Publication No. JP 2012-062794 ("JP '794")

JP '794 discloses fuel-distribution structures including a common fuel passage communicating with branch passages that supply multiple fuel injectors. Aces relies on the disclosures of JP '794 identified and applied in the claim charts attached as Exhibits A and B.

e. Japanese Patent Publication No. JP 2005-307866 ("JP '866")

JP '866 discloses a fuel-distribution passage and branch fuel passages supplying injector insertion structures. Aces relies on the disclosures of JP '866 identified and applied in the claim charts attached as Exhibits A and B.

f. Japanese Patent Publication No. JP 2005-220875 ("JP '875")

JP '875 discloses interconnected fuel-feed structures supplying multiple injectors through a common fuel-routing architecture. Aces relies on the disclosures of JP '875 identified and applied in the claim chart attached as Exhibit A.

IV. INCORPORATION OF RELATED IPR MATERIALS

Aces incorporates by reference all invalidity grounds, claim mappings, prior art citations, technical explanations, prosecution history analyses, claim-construction discussions, motivation-to-combine analyses, petitions, exhibits, and supporting declarations filed in Aces Fuel Injection, Inc. v. Holley Performance Products, Inc., IPR2026-00433, concerning the '894 Patent, and IPR2026-00434, concerning the '434 Patent.

The accompanying claim charts summarize and apply those disclosures for purposes of these contentions. Aces may rely on the incorporated IPR materials for additional detail concerning where each claim limitation is disclosed, why a person of ordinary skill would have combined the

references, why the proposed combinations would have produced predictable results, and why the references do not teach away from the combinations.

V. INVALIDITY OF THE '515 PATENT

a. Asserted Claims and Ground(s)

Aces contends that claims 9 and 10 of the '515 Patent are invalid under 35 U.S.C. § 103 as obvious over Farrell in view of JP '794, JP '866, JP '875, and Benoit, or alternatively, over Farrell in view of JP '794, JP '866, JP '875, and Wittkopf. The limitation-by-limitation disclosures supporting this ground are set forth in Exhibit A.

b. Summary of Obviousness Analysis

Farrell supplies the EFI throttle-body architecture, including the throttle body, fuel-component covers, fuel injectors, fuel inlet and distribution structures, an ECU housing, and an electronic controller. JP '794 teaches a common fuel passage communicating with branch passages that supply multiple injectors. JP '866 teaches a distribution passage and branch fuel passages supplying injector structures. JP '875 teaches interconnected fuel-feed structures supplying multiple injectors through a common fuel-routing architecture.

A person of ordinary skill in the art would have been motivated to incorporate the Japanese references' known common-passage and branching injector-feed arrangements into Farrell's throttle-body platform to package and route fuel efficiently to multiple injectors using familiar fuel-distribution structures. The proposed combination would have involved the predictable use of known passage geometries within Farrell's existing fuel-component covers and fuel-supply architecture.

Benoit or, alternatively, Wittkopf supplies the annular fuel-distribution structure recited in claim 9, including a fuel-distribution ring and circumferentially distributed apertures for directing fuel into the corresponding bore. A person of ordinary skill in the art would have been motivated to incorporate that known annular fuel-distribution architecture into Farrell's injector-fed airflow passages to improve fuel atomization, air-fuel mixing, and circumferential fuel distribution.

As detailed in Exhibit A, Aces relies on the cited disclosures and figures collectively to teach or suggest the claimed connecting fuel passage, cross-channel passageway, and vertical passageway limitations.

VI. INVALIDITY OF THE '083 PATENT

a. Asserted Claims and Ground(s)

Aces contends that claims 1, 4, and 5 of the '083 Patent are invalid under 35 U.S.C. § 103 as obvious over Farrell in view of JP '794, JP '866, and Benoit, or alternatively, over Farrell in view of JP '794, JP '866, and Wittkopf. The limitation-by-limitation disclosures supporting this ground are set forth in Exhibit B.

To the extent claim 4 incorporates the limitations of claim 2, Aces relies on the disclosures identified for claim 1, together with the disclosures and combinations identified in Exhibit B, as satisfying any limitations incorporated through claim dependency.

b. Summary of Obviousness Analysis

Farrell supplies the underlying four-bore throttle-body architecture, opposite fuel-component covers, injector arrangements, throttle shafts, ECU integration, and fuel-distribution

structures. JP '794 and JP '866 disclose common fuel passages, branch passages, and injector-feed passages supplying multiple injectors.

A person of ordinary skill in the art would have recognized that the Japanese references' common passages and branching injector-feed passages could be incorporated into Farrell's opposite fuel-component covers to route fuel to the injectors associated with multiple bores. The combination uses familiar fuel-routing structures in Farrell's known EFI throttle-body platform and would have yielded predictable packaging and distribution results.

Benoit or, alternatively, Wittkopf supplies the annular fuel-distribution architecture recited in claims 1 and 4, including a fuel-distribution ring associated with a bore, circumferentially distributed fuel apertures, and an injector in fluid communication with the annular fuel-distribution structure. A person of ordinary skill in the art would have been motivated to incorporate that known annular fuel-distribution architecture into Farrell's injector-fed bores to improve atomization, mixing, and circumferential fuel distribution while retaining Farrell's four-bore throttle-body arrangement.

As detailed in Exhibit B, Aces relies on the cited disclosures and figures collectively to teach or suggest the claimed cross-channel and vertical-passageway configuration. Aces does not contend that Farrell alone expressly discloses the fuel distribution ring and fuel aperture limitations of the asserted claims.

VII. INVALIDITY OF THE '894 PATENT

a. Asserted Claims and Ground(s)

Aces contends that claims 1 through 9 of the '894 Patent are invalid under 35 U.S.C. § 103 as obvious over Farrell in view of Wittkopf and Benoit. The limitation-by-limitation disclosures supporting this ground are set forth in Exhibit C.

b. Summary of Obviousness Analysis

Farrell supplies the known carburetor-replacement throttle-body platform, including multiple air intakes, fuel injectors mounted to the throttle body, throttle shafts and plates, fuel-supply structures, and an ECU. Wittkopf or, alternatively, Benoit supplies the annular fuel-distribution architecture recited in the '894 Patent, including an annular ring or insert positioned within the air intake, a circumferential fuel channel, and a plurality of fuel-discharge openings in fluid communication with the channel.

A person of ordinary skill in the art would have been motivated to incorporate Wittkopf's annular ring or Benoit's annular cavity-and-insert structure into Farrell's throttle-body platform to improve fuel distribution, atomization, mixture preparation, and drivability while retaining Farrell's carburetor-replacement architecture. The combinations apply known fuel-distribution techniques to a known device and combine familiar elements according to known methods to obtain predictable results. A person of ordinary skill would have had a reasonable expectation of success because the references disclose compatible throttle-body fuel-delivery structures directed to related design objectives.

VIII. INVALIDITY OF THE '434 PATENT

a. Asserted Claims and Ground(s)

Aces contends that claims 1 through 12 of the '434 Patent are invalid under 35 U.S.C. § 103 as obvious over Farrell in view of Wittkopf and Benoit. The limitation-by-limitation disclosures supporting this ground are set forth in Exhibit D.

b. Summary of Obviousness Analysis

Farrell supplies the known carburetor-replacement throttle-body platform, including vertically extending air intakes, fuel injectors, throttle plates and shafts, fuel-supply structures, and an electronic controller. Wittkopf or, alternatively, Benoit supplies the annular fuel channel and plural-orifice architecture used to distribute pressurized fuel around and into the air intake.

A person of ordinary skill in the art would have been motivated to combine Farrell with either secondary reference to improve fuel distribution, atomization, and mixture uniformity while retaining Farrell's carburetor-replacement EFI architecture. The combinations apply known fuel-distribution techniques to a known EFI platform and would predictably yield more uniform fuel delivery, mixing, and atomization.

IX. ADDITIONAL INVALIDITY GROUNDS

a. Anticipation

Aces' principal presently disclosed grounds are obviousness grounds. Identification of those grounds does not concede that no identified reference anticipates any asserted claim under Holley's apparent claim constructions. Aces preserves the right to assert anticipation under 35 U.S.C. § 102 based on patents, publications, products, systems, public uses, sales, offers for sale, or other prior-art activities identified through discovery and continuing investigation, subject to the governing rules and orders.

b. Invalidity Under 35 U.S.C. § 112

Aces preserves all defenses under 35 U.S.C. § 112, including lack of written description, lack of enablement, and indefiniteness. These defenses may depend on Holley's claim-construction and infringement positions, including the scope Holley assigns to terms such as 'annular ring,' 'fuel ring,' 'fuel channel,' 'fuel port,' 'orifice,' 'air intake,' 'cross-channel passageway,' 'vertical passageway,' 'fuel component cover,' and the preamble language of the asserted claims.

c. Other Grounds

Aces preserves all defenses concerning patent eligibility, priority, inventorship, derivation, statutory bars, obviousness-type double patenting, and unenforceability that may be supported by discovery, expert analysis, claim construction, or continuing investigation.

X. DOCUMENT PRODUCTION UNDER LPR 3.6

Aces has produced or will produce, in accordance with the Scheduling Order and the parties' discovery obligations, the documents presently relied upon in support of these invalidity contentions, including the identified prior-art references, the prosecution histories of the Asserted Patents, the petitions and exhibits filed in IPR2026-00433 and IPR2026-00434, and other nonprivileged supporting materials presently relied upon. Aces will supplement its production as additional nonprivileged supporting materials are identified.

XI. RESERVATION OF RIGHTS

Aces' investigation remains ongoing. Aces reserves the right to amend or supplement these contentions based on information obtained through party and third-party discovery, expert

analysis, claim construction, inspection or testing of prior-art products, further prior-art searching, and additional information that becomes available, as permitted by the Federal Rules of Civil Procedure, the Local Patent Rules, the Scheduling Order, and further orders of the Court.

Nothing in these contentions limits Aces' ability to rely on additional portions of the identified references, additional references or combinations, additional statutory grounds, claim-construction positions, expert testimony, or other evidence to the extent permitted by the governing rules and orders.

Respectfully submitted,

CHAMBLISS, BAHNER & STOPHEL, P.C.

By: /s/ John G. Jackson

John G. Jackson (Bar No. 013840)

Susie Lodico (Bar No. 023754)

Peter Newman (Bar No. 040524)

Liberty Tower

605 Chestnut Street, Suite 1700

Chattanooga, TN 37450

Telephone: (423) 757 0246

Facsimile: (423) 508 1246

Email: jjackson@chamblisslaw.com

slodico@chamblisslaw.com

pnewman@chamblisslaw.com

Attorneys for Defendant/Counter Plaintiff Aces Fuel Injection, Inc.

CERTIFICATE OF SERVICE

I hereby certify that on September 30, 2026, a true and correct copy of Aces Fuel Injection, Inc.'s Initial Invalidity Contentions was served via E Mail upon the following:

Jessica Malloy Thorpe
MILLER & MARTIN PLLC
Suite 1200, Volunteer Building
832 Georgia Avenue
Chattanooga, TN 37402
Telephone: (423) 756 6600

Facsimile: (423) 785 8480
jessica.malloy-thorpe@millermartin.com

Marc Lorelli*
John P. Rondini*
Yasmeen Moradshahi*
BROOKS KUSHMAN P.C.
150 W. Second St., Suite 400N
Royal Oak, Michigan 48067 3846
Tel (248) 358 4400 | Fax (248) 358 3351
mlorelli@brookskushman.com
jrondini@brookskushman.com
ymoradshahi@brookskushman.com
*admitted *pro hac vice*

Attorneys for Plaintiff and Counter Defendant

/s/John G. Jackson

John G. Jackson

EXHIBIT C

U.S. Patent No. 11,409,894	Prior Art Reference(s)	Disclosure in Prior Art
1[pre] A fuel injection throttle body for an internal combustion engine, comprising:	Farrell	Farrell discloses a fuel injection body designed to replace existing carburetors on internal combustion engines. Farrell, Title; Abstract; 1:17-26; 2:44-46.
[1a] an air intake extending through said fuel injection throttle body;	Farrell	Farrell discloses four passages 146, 148, 150, and 152 extending through the main throttle body from top surface 140 through lower flange 142. Each passage constitutes an air intake extending through the throttle body. Farrell, 3:12-29; Figs. 4, 5, and 8.
[1b] a fuel port in said fuel injection throttle body;	Farrell	Farrell discloses that each passageway 146, 148, 150, and 152 intersects with a fuel injector receptacle 180 and that each receptacle 180 extends from a side surface of main throttle body 102 into a corresponding passageway. The receptacles constitute fuel ports in the fuel injection throttle body. Farrell, 3:46-51; 6:16-34; Fig. 5.
[1c] an electronic fuel injector disposed in said fuel injection throttle body, said electronic fuel injector in fluid communication with a fuel supply and with said fuel port;	Farrell; Wittkopf	Farrell discloses fuel injectors 110, 112, 114, and 116 mounted to main throttle body 102, fuel distribution passages 242 supplying fuel to the injectors, and an ECU controlling injection timing and amount. Farrell, 2:56-60; 6:16-22; 6:43-45; Figs. 2 and 12. Wittkopf discloses circumferential groove 146 formed about annular insert 141 within bore 112. Circumferential groove 146 fluidly connects fuel injection conduit 142 with axial outlet grooves 144 and constitutes a fuel channel disposed about the inner wall of the air intake. Wittkopf, 5:51-53; 5:64-6:17; Figs. 3 and 4.

[1d] a fuel channel disposed about an inner wall of said air intake;	Wittkopf	Wittkopf discloses circumferential groove 146 formed about annular insert 141 within bore 112. Circumferential groove 146 fluidly connects fuel injection conduit 142 with axial outlet grooves 144 and constitutes a fuel channel disposed about the inner wall of the air intake. Wittkopf, 5:51-52; 5:64-6:17; Figs. 3 and 4.
[1e] said fuel channel formed by one or both of an annular ring and said inner wall of said air intake, said annular ring disposed within said air intake and along said inner wall of said air intake;	Wittkopf	Wittkopf discloses annular ring 140 comprising ring-shaped insert 141 received within ring-shaped outer housing 143 in bore 112. Circumferential groove 146 is shown formed in insert 141, but Wittkopf teaches that the circumferential groove may instead be formed within outer housing 143, which is preferably integral with the throttle-body casting. Wittkopf thus teaches a fuel channel formed by the annular ring, the throttle-body wall, or both, with the annular ring disposed within and along the inner wall of the air intake. Wittkopf, 5:64-6:17; Figs. 3 and 4.
[1f] a plurality of orifices disposed in said annular ring and in fluid communication with said fuel channel;	Benoit	Benoit discloses insert 26 disposed within bore 28 and a plurality of apertures 40 extending through insert 26 from annular cavity 36 to Venturi-shaped barrel 30. Apertures 40 are circumferentially distributed around insert 26 and are in fluid communication with annular cavity 36. Benoit, 3:29-55; 3:44-51; 3:65-4:9; Figs. 2 and 3.
[1g] wherein pressurized fuel is forced through said fuel port, through said fuel channel, and through said plurality of orifices in order to mix with air moving through said air intake;	Benoit	Benoit discloses fuel injector 38 delivering a high-pressure flow of fuel into annular cavity 36. Fuel flows from cavity 36 through apertures 40 into the low-pressure airflow in Venturi-shaped barrel 30. Benoit states that fuel from the annular cavity is uniformly delivered into the airflow around the

		perimeter of barrel 30 to create a more uniform air-fuel mixture. Benoit, 3:41-58; Fig. 2.
[1h] a throttle shaft and throttle plate disposed within said air intake for rotation therein to vary an air flow moving through the air intake; and,	Farrell	Farrell discloses throttle shaft apertures 182 extending fully through main throttle body 102 and configured to receive rotatable throttle shafts attached to throttle plates. The throttle shafts and throttle plates are positioned in airflow passages 146, 148, 150, and 152 and regulate airflow through those passages. Farrell, 3:54-59; 3:65-4:4; Figs. 5, 7, and 10.
[1i] an electronic control unit to control fuel flow from said electronic fuel injector.	Farrell	Farrell discloses housing 300 containing circuitry 310 and main board 320, including an ECU that controls injection timing and amount. Controlling injection timing and amount controls fuel flow from the electronic fuel injectors. Farrell, 8:48-54; Fig. 14.

U.S. Patent No. 11,409,894	Prior Art Reference(s)	Disclosure in Prior Art
[2] The fuel injection throttle body of claim 1, said plurality of orifices oriented in one of a radial direction or a non-radial direction.	Benoit; alternatively, Wittkopf	Benoit discloses apertures 40 extending from annular grooves 34 and cavities 36 inward to the narrow regions of Venturi-shaped barrels 30. Figure 2 depicts apertures 40 extending radially inward from the annular cavities toward the air-intake bores. Benoit, 3:48-51; 3:65-4:4; Fig. 2. Alternatively, Wittkopf discloses axial outlet grooves 144 extending axially along annular ring 140 and discharging fuel downwardly at or near the bottom of the ring, thereby teaching non-radially oriented orifices. Wittkopf, 5:62-63; 6:6-17; Figs. 3 and 4.

U.S. Patent No. 11,409,894	Prior Art Reference(s)	Disclosure in Prior Art
[3] The fuel injection throttle body of claim 1, said fuel injection throttle body configured to replace a carburetor.	Farrell	Farrell expressly discloses a fuel injection unit designed for replacement of existing carburetors and a fuel injection body sized and configured to replace a carburetor, such as a standard 4150 double-pumper carburetor. Farrell, Title; Abstract; 1:17-19; 2:44-51.

U.S. Patent No. 11,409,894	Prior Art Reference(s)	Disclosure in Prior Art
[4] The fuel injection throttle body of claim 1, said fuel port having an axis that is substantially perpendicular to said throttle shaft.	Farrell	Farrell discloses fuel injector receptacles 180 extending inwardly from a side surface of main throttle body 102 toward corresponding passageways, with each receptacle having centerline F. Farrell also discloses throttle shaft apertures 182 extending fully through the main throttle body. Figures 5 and 10 depict centerline F of receptacle 180 as substantially perpendicular to the throttle-shaft axis. Farrell, 3:46-59; 3:65-4:4; Figs. 5 and 10.

U.S. Patent No. 11,409,894	Prior Art Reference(s)	Disclosure in Prior Art
5[pre] A fuel injection throttle body, comprising:	Farrell	Farrell discloses a fuel injection body designed as an electronic-fuel-injection replacement for existing carburetors. Farrell, Title; Abstract; 1:17-26; 2:44-46.
[5a] an air intake extending from an upper side of said fuel injection throttle body to a lower side and defining a flow path for air through said fuel injection throttle body;	Farrell	Farrell discloses four passages 146, 148, 150, and 152 extending from top surface 140 through lower flange 142. Each passage defines an airflow path

		extending from the upper side to the lower side of the throttle body. Farrell, 3:14-29; Figs. 4, 5, and 8.
[5b] a fuel port disposed in said fuel injection throttle body;	Farrell	Farrell discloses fuel injector receptacles 180 extending from a side surface of main throttle body 102 into corresponding airflow passageways 146, 148, 150, and 152. The receptacles constitute fuel ports disposed in the fuel injection throttle body. Farrell, 3:46-51; Fig. 5.
[5c] an electronic fuel injector disposed in said fuel port of said fuel injection throttle body, said fuel port receiving fuel from said electronic fuel injector;	Farrell; Wittkopf	Farrell discloses fuel injectors 110, 112, 114, and 116 mounted to main throttle body 102 at injector receptacles 180 and delivering fuel into the corresponding airflow passageways. Farrell, 2:56-60; 3:46-64; 6:16-22; Figs. 2 and 5. Farrell further discloses an ECU controlling injection timing and amount. Farrell, 8:48-54. Wittkopf confirms that fuel injectors are electromechanical devices actuated by electrical current. Wittkopf, 1:59-65.
[5d] a fuel channel defined by an inner wall of said air intake, an annular ring, or both;	Wittkopf	Wittkopf discloses circumferential groove 146 formed about annular insert 141. Wittkopf teaches that circumferential groove 146 may be formed in insert 141, in surrounding outer housing 143, or in both. Outer housing 143 is preferably formed integrally with the throttle-body casting. Wittkopf, 5:64-6:17; Figs. 3 and 4.
[5e] said annular ring positioned at said inner wall of said air intake;	Wittkopf	Wittkopf discloses annular fuel-distribution ring 140 positioned within bore 112. Ring 140 includes ring-shaped insert 141 received within ring-shaped outer housing 143, positioning the annular ring at

		the inner wall of the air-intake bore. Wittkopf, 5:40-52; 5:64-6:5; Figs. 3 and 4.
[5f] a plurality of orifices disposed through said annular ring, said plurality of orifices in fluid communication with said fuel channel, said fuel port, and said electronic fuel injector to disperse fuel into said air intake;	Benoit	Benoit discloses a plurality of apertures 40 extending through annular insert 26 from annular cavity 36 to Venturi-shaped barrel 30. Fuel injector 38 delivers pressurized fuel into cavity 36, and apertures 40 convey the fuel from cavity 36 through insert 26 into the air-intake bore. Benoit, 3:29-57; Figs. 2 and 3.
[5g] an electronic control unit to control the electronic fuel injector;	Farrell	Farrell discloses housing 300 containing circuitry 310 and main board 320, including an ECU that controls injection timing and amount. Farrell, 8:48-54; Fig. 14.
[5h] a shaft extending through said air intake and a throttle plate disposed on said shaft, said throttle plate rotatable to vary airflow through said air intake;	Farrell	Farrell discloses throttle shaft apertures 182 extending fully through main throttle body 102 and configured to receive rotatable throttle shafts attached to throttle plates disposed within airflow passages 146, 148, 150, and 152. Farrell, 3:54-59; 3:65-4:4; Figs. 5, 7, and 10.
[5i] said fuel injection throttle body configured to replace a carburetor of an internal combustion engine.	Farrell	Farrell expressly discloses a fuel injection unit designed for replacement of existing carburetors and a fuel injection body sized and configured to replace a carburetor, such as a standard 4150 double-pumper carburetor. Farrell, Title; Abstract; 1:17-19; 2:44-51.

U.S. Patent No. 11,409,894	Prior Art Reference(s)	Disclosure in Prior Art
[6] The fuel injection throttle body of claim 5 wherein said plurality of orifices are either radially oriented or non-radially oriented.	Benoit; alternatively, Wittkopf	Benoit discloses apertures 40 extending from annular cavities 36 inward toward the interiors of Venturi-shaped barrels 30. Figure 2 depicts apertures 40 extending radially inward from the annular cavities into the air-intake bores. Benoit, 3:48-51; 3:65-4:4; Figs. 2 and 3. Alternatively, Wittkopf discloses axial outlet grooves 144 extending along annular ring 140 and discharging fuel downwardly, thereby teaching non-radially oriented orifices. Wittkopf, 5:62-63; 6:6-17; Figs. 3 and 4.
U.S. Patent No. 11,409,894	Prior Art Reference(s)	Disclosure in Prior Art
[7] The fuel injection throttle body of claim 6 wherein said plurality of orifices are each spaced apart between 20 and 38 degrees.	Benoit	Benoit teaches that apertures 40 are generally uniformly spaced around the circumference of insert 26 and that insert 26 may include any desired number of apertures. Benoit, 3:65-4:9; Figs. 2 and 3. Uniformly arranging 10 to 18 apertures around a 360-degree circumference produces spacing between adjacent apertures ranging from 36 degrees to 20 degrees. Selecting an aperture count within that range would have been a routine implementation of Benoit's express teaching to select a desired number of uniformly spaced apertures to obtain uniform fuel delivery.

U.S. Patent No. 11,409,894	Prior Art Reference(s)	Disclosure in Prior Art
[8] The fuel injection throttle body of claim 5 wherein said fuel is atomized when entering the air intake.	Benoit	Benoit expressly teaches that high-pressure fuel flows from cavity 36 through apertures 40 into the low-pressure airflow in Venturi-shaped barrel 30 and that, because of the pressure difference, the fuel atomizes in the air extremely quickly and efficiently. Benoit, 3:51-64.
U.S. Patent No. 11,409,894	Prior Art Reference(s)	Disclosure in Prior Art
[9] The fuel injection throttle body of claim 5 wherein said fuel port is oriented at an angle relative to said shaft.	Farrell	Farrell discloses fuel injector receptacles 180 extending inwardly from a side surface of the throttle body and throttle shaft apertures 182 extending fully through the main throttle body. Figures 5 and 10 depict the receptacle axis as oriented at an angle relative to the throttle-shaft axis. Farrell, 3:46-57; 3:65-4:4; Figs. 5 and 10.

EXHIBIT D

U.S. Patent No. 12,203,434	Prior Art Reference(s)	Disclosure in Prior Art
1[pre] A fuel injection throttle body for a non-carbureted internal combustion engine, comprising:	Farrell; Wittkopf	Farrell discloses a fuel injection body designed to replace existing carburetors and including a throttle body, fuel injectors, throttle plates, and ECU control. Farrell, Title; Abstract; 1:21-26. Wittkopf discloses a throttle body fuel injection system designed and arranged to replace four-barrel carburetors. Wittkopf, 4:12-14. Together, Farrell and Wittkopf teach a fuel injection throttle body for a non-carbureted internal combustion engine.
[1a] an air intake extending through said fuel injection throttle body in a vertical orientation;	Farrell	Farrell discloses four passages (146, 148, 150, 152) extending through the throttle body from top surface 140 through lower flange 142, constituting air intakes extending through the throttle body in a vertical orientation. Farrell, 3:12-16; Fig. 4.
[1b] said air intake capable of allowing an airflow to move from an upper end to a lower end of said air intake;	Farrell	The passages extend from the upper end of the throttle body to the lower end and allow airflow through the throttle body. Farrell, 3:14-28.
[1c] a fuel port in said fuel injection throttle body and capable of receiving fuel from an electronic fuel injector;	Farrell; Wittkopf	Farrell discloses fuel injector receptacles 180 extending into the air passages and receiving fuel injectors. Farrell, 3:46-51. Wittkopf discloses fuel injection conduit 142 through which fuel from injector 104 enters annular ring 140. Wittkopf, 6:3-13. These structures constitute a fuel port capable of receiving fuel from an electronic fuel injector.

[1d] a fuel channel in fluid communication with said fuel port to receive said fuel;	Wittkopf	Wittkopf discloses circumferential groove 146 formed about insert 141 and fluidly connected to fuel injection conduit 142. Circumferential groove 146 constitutes a fuel channel in fluid communication with the fuel port to receive fuel. Wittkopf, 6:5-13; Fig. 4.
[1e] a plurality of orifices disposed annularly about said air intake allowing said fuel to pass from said fuel channel into said air intake;	Wittkopf	Wittkopf discloses axial grooves/outlets 144 distributed around annular ring 140 and connected to circumferential groove 146, allowing fuel to flow from the fuel channel into the air intake. These outlets constitute a plurality of orifices disposed annularly about the air intake. Wittkopf, 6:5-32; Fig. 4.
[1f] a throttle plate disposed in said air intake and rotatable on a shaft, said throttle plate movable to vary the airflow moving through the air intake; and,	Farrell	Farrell discloses throttle shafts and throttle plates positioned within the passages and rotatable to regulate airflow through the throttle body. Farrell, 3:65-4:4.
[1g] an electronic controller which controls said electronic fuel injector.	Farrell	Farrell discloses an ECU housed within housing 300 that controls fuel injection timing and fuel delivery amount. Farrell, 8:48-54; Fig. 14.

U.S. Patent No. 12,203,434	Prior Art Reference(s)	Disclosure in Prior Art
[2] The fuel injection throttle body of claim 1, said air intake comprising at least two air intakes.	Farrell	Farrell discloses four passages (146, 148, 150, 152) extending through the main throttle body from the top surface to the lower flange. Each passage constitutes an air intake. Farrell therefore discloses at least two air intakes. Farrell, 3:14-16.

U.S. Patent No. 12,203,434		Prior Art Reference(s)	Disclosure in Prior Art
[3] The fuel injection throttle body of claim 1, said air intake comprising four air intakes.		Farrell	Farrell discloses four passages (146, 148, 150, 152) extending through the main throttle body from the top surface to the lower flange. Each passage constitutes an air intake. Farrell therefore discloses four air intakes. Farrell, 3:14-16.
U.S. Patent No. 12,203,434		Prior Art Reference(s)	Disclosure in Prior Art
[4] The fuel injection throttle body of claim 1, said electronic controller disposed on a side of said fuel injection throttle body.		Farrell	Farrell discloses housing 300 mounted to the side of the throttle body and containing circuitry including an ECU that controls injection timing and amount. Farrell, 8:48-54; Fig. 14.
U.S. Patent No. 12,203,434		Prior Art Reference(s)	Disclosure in Prior Art
[5] The fuel injection throttle body of claim 1, said plurality of orifices comprising one or more sizes.		Benoit	Benoit expressly teaches apertures that may be uniformly sized or differently sized. Benoit, 4:4-9. The prior art therefore teaches a plurality of orifices being one or more sizes.
U.S. Patent No. 12,203,434		Prior Art Reference(s)	Disclosure in Prior Art
[6] The fuel injection throttle body of claim 1, further comprising a fuel ring disposed within said air intake, wherein said fuel channel is formed in said fuel injection throttle body, or said fuel ring, or both.		Wittkopf	Wittkopf discloses annular ring 140 disposed within bore 112. Wittkopf further teaches that circumferential groove 146 and axial grooves 144 may be formed in insert 141 (the annular ring), in outer housing 143 (the throttle body), or in both. Thus, Wittkopf teaches a fuel ring disposed within

			the air intake and a fuel channel formed in the fuel ring, the throttle body, or both. Wittkopf, 5:64-6:17.
U.S. Patent No. 12,203,434	Prior Art Reference(s)	Disclosure in Prior Art	
7[pre] A fuel injection throttle body for a non-carbureted internal combustion engine, comprising:	Farrell; Wittkopf	Farrell discloses a fuel injection body "designed for replacement of existing carburetors" and a fuel injection body "sized and configured to replace a carburetor." Farrell, Abstract; 2:44-46. Wittkopf likewise discloses a throttle body fuel injection system "designed and arranged to easily replace four-barrel carburetors." Wittkopf, 4:12-14. Together, Farrell and Wittkopf disclose a fuel injection throttle body for a non-carbureted internal combustion engine.	
[7a] a plurality of air intakes that extend between an upper end of said fuel injection throttle body and a lower end wherein airflow moves through from said upper end to said lower end;	Farrell	Farrell discloses four passages (146, 148, 150, 152) extending through the throttle body from top surface 140 through lower flange 142. The passages define airflow paths extending from the upper end to the lower end of the throttle body. Farrell, 3:14-16, 3:25-28.	
[7b] each air intake of said plurality of air intakes having a fuel port disposed in said fuel injection throttle body, and capable of receiving fuel from an electronic fuel injector;	Farrell	Farrell discloses that each passageway 146, 148, 150, and 152 intersects a fuel injector receptacle 180 and that each receptacle extends from the side surface of the throttle body into the corresponding passageway. Farrell, 3:46-51. Each receptacle receives a fuel injector and therefore constitutes a fuel port associated with each air intake.	
[7c] each said electronic fuel injector configured to be in fluid communication with a fuel supply;	Farrell	Farrell discloses fuel introduction ports 244, fuel distribution passages 242, and fuel injector supply	

		ports 250 that supply fuel to injectors 110, 112, 114, and 116. Fuel is supplied to the injectors from a fuel source through the fuel distribution passages. Farrell, 6:16-22, 6:43-45.
[7d] a fuel channel disposed within each said air intake, said fuel channel receiving fuel from said electronic fuel injector;	Benoit	Benoit discloses annularly-shaped cavities 36 that receive fuel from fuel injectors 38. Benoit states that "each of the fuel injectors 38 is in fluid communication with one of the annularly-shaped cavities 36 for delivering a high-pressured flow of fuel into its respective cavity 36." Benoit, 3:44-48. The cavity 36 constitutes the claimed fuel channel receiving fuel from the electronic fuel injector.
[7e] a plurality of orifices disposed in an annular ring allowing said fuel to flow from said fuel channel into said air intake;	Benoit	Benoit discloses annularly-shaped cavity 36 receiving fuel from fuel injector 38 and a plurality of apertures 40 extending from the cavity 36 to the Venturi-shaped barrel 30. The apertures 40 allow fuel to flow from cavity 36 into the airflow passage and constitute a plurality of orifices disposed in an annular ring. Benoit, 3:44-51, 4:1-4.
[7f] wherein said fuel passes through said plurality of orifices and mixes with said airflow moving between said upper end and said lower end;	Wittkopf	Fuel distribution ring 140 introduces fuel into the air stream and provides superior mixing and distribution. Wittkopf, 5:51-53; 6:18-20.
[7g] a throttle shaft having a throttle plate thereon, said throttle plate rotatably disposed within said air intake; and,	Farrell	Farrell discloses throttle shafts carrying throttle plates positioned within the airflow passages and rotatable to regulate airflow. Farrell, 3:65-4:4.
[7h] an electronic control unit to control said fuel from each said electronic fuel injector.	Farrell	Farrell discloses an ECU that controls injection timing and fuel delivery amount. Farrell, 8:48-54; Fig. 14.

U.S. Patent No. 12,203,434		Prior Art Reference(s)	Disclosure in Prior Art
[8] The fuel injection throttle body of claim 7, said plurality of air intakes comprising two air intakes.		Farrell	Farrell expressly discloses four passages (146, 148, 150, 152) extending through the throttle body. Farrell, 3:14-16. The prior art therefore contemplates embodiments having two air intakes.
U.S. Patent No. 12,203,434		Prior Art Reference(s)	Disclosure in Prior Art
[9] The fuel injection throttle body of claim 7, said plurality of air intakes comprising four air intakes.		Farrell	Farrell expressly discloses four passages (146, 148, 150, 152) extending through the throttle body. Farrell, 3:14-16.
U.S. Patent No. 12,203,434		Prior Art Reference(s)	Disclosure in Prior Art
[10] The fuel injection throttle body of claim 7, said plurality of orifices being one or more sizes.		Wittkopf; Benoit	Benoit expressly teaches apertures that may be uniformly sized or differently sized. Benoit, 4:4-9. The prior art therefore teaches a plurality of orifices being one or more sizes.
U.S. Patent No. 12,203,434		Prior Art Reference(s)	Disclosure in Prior Art
[11] The fuel injection throttle body of claim 7 further comprising each said annular ring disposed in one said air intake of said plurality of air intakes.		Wittkopf	Wittkopf discloses annular ring 140 positioned within the throttle body bore. A POSA would understand the annular ring to be disposed within each air intake of the combined system. Wittkopf, 5:64-6:5.

U.S. Patent No. 12,203,434	Prior Art Reference(s)	Disclosure in Prior Art
[12] The fuel injection throttle body of claim 11, said fuel channel formed in said fuel injection throttle body, or said annular ring, or both.	Wittkopf	Wittkopf teaches that the fuel channel may be formed in insert 141, outer housing 143, or both structures. Thus, the fuel channel may be formed in the annular ring, the throttle body, or both. Wittkopf, 6:7-17.