

Exhibit A – Invalidity Chart for PCT Publication No. WO03/100337 titled “Device for Protecting a Heat Exchanger against Corrosion” to Godefroy and Frasca (“Godefroy WO’337”)

PCT Publication No. WO03/100337 to Godefroy and Frasca (“Godefroy WO’337”) was filed on May 28, 2003 and published on December 4, 2003. Godefroy WO’337 is prior art to U.S. Reissue Patent No. RE47,494 (“the ’494 Patent”) at least under pre-AIA 35 U.S.C. § 102(b) and/or at least under AIA 35 U.S.C. § 102(a)(1).

As described in the following claim chart, asserted claims 25-27, 29, 31-37, 42, 43, 45-47 (collectively “the Asserted Claims”) of the ’494 Patent are invalid as anticipated or obvious over Godefroy WO’337. To the extent that Godefroy WO’337 is found not to anticipate one or more of the Asserted Claims of the ’494 Patent, those claims are also invalid as obvious in view of Godefroy WO’337 alone and/or with other prior-art references disclosed in Daimler Trucks North America LLC’s (“DTNA” or “Defendant”) invalidity contentions, including in this Exhibit as set forth below.

The representative citations and quotations provided below should not be construed as limiting. Defendant intends to rely on Godefroy WO’337 and any prior art that may be combined with Godefroy WO’337 in their entirety, rather than only the identified excerpts thereof. Defendant further relies on the knowledge and understanding of a person of ordinary skill in the art as applied to Godefroy WO’337 and any other prior art discussed herein.

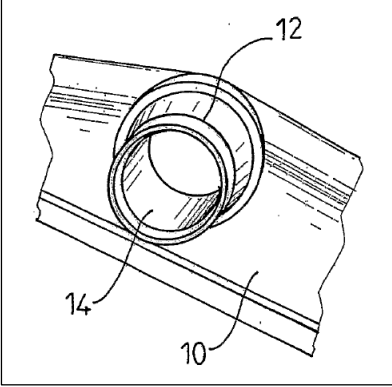
For at least some of the asserted claims, Defendant’s invalidity contentions may be based in part on Electrolysis Prevention Solutions LLC’s (“EPS” or “Plaintiff”) apparent interpretation and application of the claim in its infringement contentions (to the extent Defendant can understand them). However, any such contentions do not represent agreement with Plaintiff’s positions as to the interpretation and application of any claim. Defendant reserves the right to dispute Plaintiff’s interpretation and application of the claims, and to make any argument based on indefiniteness, lack of written description support, enablement, or other issues concerning the validity and enforceability of the claims.

Defendant reserves the right to amend and/or supplement this claim chart as discovery proceeds, after claim construction, in response to any amendments Plaintiff is permitted to make to its infringement contentions, or on any other permissible ground. In addition, to the extent that Plaintiff contends that Godefroy WO’337 does not disclose any claim limitations, Defendant reserves the right to contend that those limitations are disclosed by other prior art that may be combined with Godefroy WO’337.

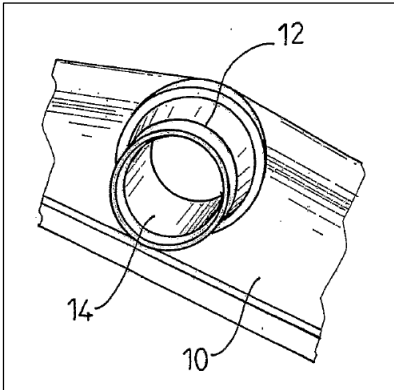
U.S. Reissue Patent No. RE47,494	Godefroy WO’337 (Published on December 4, 2003)
25. A radiator for use in a motor vehicle, the radiator further comprising:	To the extent the preamble is limiting, Godefroy WO’337 discloses or renders obvious a radiator for use in a motor vehicle, according at least to Plaintiff’s apparent reading for the claim terms, as set forth in detail below. <i>The invention concerns a device for protecting the aluminum walls of a heat exchanger against corrosion by an aggressive environment to which its walls are subjected. The device</i>

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	<i>comprises at least a renewable sacrificial resist (14) consisting of elements, in particular zinc and/or magnesium elements, adapted to reduce at least locally the electrochemical potential of the aluminum of the heat exchanger walls. The sacrificial resist can be contained either in the heat exchanger or in a fluid circuit comprising the heat exchanger. The invention is particularly applicable to motor vehicle heat exchangers.</i> Godefroy WO'337 (cert. translation) at Abstract. <i>This is the case in particular for heat exchangers made of light alloy, used in motor vehicles. In a non-limiting manner, said heat exchangers include engine-cooling radiators, radiators or unit heaters intended for heating the passenger compartment, and, in a more general manner, any heat exchanger in which a liquid flows which may be or become corrosive.</i> Godefroy WO'337 (cert. translation) at pg. 1. <i>Reference is first made to Fig. 1 which shows a collector box 10 of a heat exchanger, in particular of a motor vehicle, to which tubing 12 intended for inlet or outlet of a heat transfer fluid is connected.</i> <i>By way of example, the collector box 10 may form part of a cooling radiator of a motor vehicle engine, through which the engine-cooling liquid passes. Said radiator forms part of a fluid circuit, in this case a cooling circuit, through which the above-mentioned cooling liquid passes.</i> <i>In order to avoid any risk of corrosion, a sacrificial resist 14, in this case in the form of a tubular insert applied against the inside wall of the tubing 12, is provided inside the tubing 12. Given the location thereof, the insert is completely soaked by the cooling liquid.</i> <i>Said insert is formed of a renewable sacrificial resist made up of elements capable of reducing at least locally the electrochemical potential of the aluminum of the heat exchanger walls. By way of example, said insert may be formed of zinc and/or magnesium. It may in particular be a zinc alloy, a magnesium alloy, or indeed an alloy of zinc and magnesium.</i> Godefroy WO'337 (cert. translation) at pg. 6.

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a hot liquid inlet to the radiator from an engine of the motor vehicle, the hot liquid inlet providing fluid communication for fluid flow of hot liquid from the engine; and	Godefroy WO'337 discloses or renders obvious a hot liquid inlet to the radiator from an engine of the motor vehicle, the hot liquid inlet providing fluid communication for fluid flow of hot liquid from the engine, according at least to Plaintiff's apparent reading for the claim terms "hot liquid inlet" and "fluid communication." <i>Reference is first made to Fig. 1 which shows a collector box 10 of a heat exchanger, in particular of a motor vehicle, to which tubing 12 intended for inlet or outlet of a heat transfer fluid is connected.</i> <i>By way of example, the collector box 10 may form part of a cooling radiator of a motor vehicle engine, through which the engine-cooling liquid passes. Said radiator forms part of a fluid circuit, in this case a cooling circuit, through which the above-mentioned cooling liquid passes.</i> <i>In order to avoid any risk of corrosion, a sacrificial resist 14, in this case in the form of a tubular insert applied against the inside wall of the tubing 12, is provided inside the tubing 12. Given the location thereof, the insert is completely soaked by the cooling liquid.</i> <i>Said insert is formed of a renewable sacrificial resist made up of elements capable of reducing at least locally the electrochemical potential of the aluminum of the heat exchanger walls. By way of example, said insert may be formed of zinc and/or magnesium. It may in particular be a zinc alloy, a magnesium alloy, or indeed an alloy of zinc and magnesium.</i> Godefroy WO'337 (cert. translation) at pg. 6.

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	 Godefroy WO'337 at Fig. 1, e.g., item 12.
a sacrificial anode installed within 10 inches of the hot liquid inlet of the radiator.	Godefroy WO'337 discloses or renders obvious a sacrificial anode installed within 10 inches of the hot liquid inlet of the radiator, according at least to Plaintiff's apparent reading for the claim terms "sacrificial anode" and "within 10 inches of the hot liquid inlet." <i>For this purpose, the invention proposes a protection device of the type defined above, which comprises at least a renewable sacrificial resist formed of elements capable of reducing at least locally the electrochemical potential of the aluminum of the heat exchanger walls.</i> <i>Said resist is preferably entirely immersed in the aggressive environment, so that the entirety of the resist can be consumed.</i> <i>By way of example, said elements may comprise zinc and/or magnesium.</i> <i>In one embodiment, the sacrificial resist is contained in the heat exchanger. Said heat</i>

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	<i>exchanger may be formed, for example, by a cooling radiator of a motor vehicle engine.</i> Godefroy WO'337 (cert. translation) at pg. 3-4. <i>Said renewable sacrificial resist is intended to provide an introduction of elements, for example zinc and/or magnesium, in a quantity much greater than the quantity theoretically required for the protection, such that said elements are sacrificed, i.e. progressively disappear.</i> <i>In this case, the term “renewable” is intended to refer to a resist which is capable of being recharged with sacrificial elements.</i> <i>As said elements are present in a largely sufficient quantity, the protection will always be ensured, without risk of exhaustion of the elements making up the resist.</i> <i>The elements in question advantageously comprise zinc and/or magnesium. In this case they may in particular be zinc alloys, magnesium alloys, or indeed alloys of zinc and magnesium.</i> Godefroy WO'337 (cert. translation) at pg. 4. <i>According to one embodiment, the sacrificial resist is placed in a selected location of the heat exchanger. It can be contained in a reservoir, in particular in a collector box, of the heat exchanger. It can also be contained in tubing of the heat exchanger.</i> Godefroy WO'337 (cert. translation) at pg. 5. <i>Reference is first made to Fig. 1 which shows a collector box 10 of a heat exchanger, in particular of a motor vehicle, to which tubing 12 intended for inlet or outlet of a heat transfer fluid is connected.</i> <i>By way of example, the collector box 10 may form part of a cooling radiator of a motor vehicle engine, through which the engine-cooling liquid passes. Said radiator forms part of a fluid circuit, in this case a cooling circuit, through which the above-mentioned cooling liquid passes.</i>

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	<i>In order to avoid any risk of corrosion, a sacrificial resist 14, in this case in the form of a tubular insert applied against the inside wall of the tubing 12, is provided inside the tubing 12. Given the location thereof, the insert is completely soaked by the cooling liquid.</i> <i>Said insert is formed of a renewable sacrificial resist made up of elements capable of reducing at least locally the electrochemical potential of the aluminum of the heat exchanger walls. By way of example, said insert may be formed of zinc and/or magnesium. It may in particular be a zinc alloy, a magnesium alloy, or indeed an alloy of zinc and magnesium.</i> Godefroy WO'337 (cert. translation) at pg. 6.  Godefroy WO'337 at Fig. 1, e.g., item 14.
26. The radiator of claim 25, wherein the sacrificial anode	Godefroy WO'337 discloses or renders obvious the radiator of claim 25 wherein the sacrificial anode consists essentially of an active metal, according at least to Plaintiff's apparent reading for the claim term

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consists essentially of an active metal.	“active metal.” <i>For this purpose, the invention proposes a protection device of the type defined above, which comprises at least a renewable sacrificial resist formed of elements capable of reducing at least locally the electrochemical potential of the aluminum of the heat exchanger walls.</i> <i>Said resist is preferably entirely immersed in the aggressive environment, so that the entirety of the resist can be consumed.</i> <i>By way of example, said elements may comprise zinc and/or magnesium.</i> <i>In one embodiment, the sacrificial resist is contained in the heat exchanger. Said heat exchanger may be formed, for example, by a cooling radiator of a motor vehicle engine.</i> Godefroy WO'337 (cert. translation) at pg. 3-4. <i>Said renewable sacrificial resist is intended to provide an introduction of elements, for example zinc and/or magnesium, in a quantity much greater than the quantity theoretically required for the protection, such that said elements are sacrificed, i.e. progressively disappear.</i> <i>In this case, the term “renewable” is intended to refer to a resist which is capable of being recharged with sacrificial elements.</i> <i>As said elements are present in a largely sufficient quantity, the protection will always be ensured, without risk of exhaustion of the elements making up the resist.</i> <i>The elements in question advantageously comprise zinc and/or magnesium. In this case they may in particular be zinc alloys, magnesium alloys, or indeed alloys of zinc and magnesium.</i> Godefroy WO'337 (cert. translation) at pg. 4.
27. The radiator of claim 26, wherein the active metal is at	Godefroy WO'337 discloses or renders obvious the radiator of claim 26 wherein the active metal is at least one of aluminum, magnesium, and zinc, according at least to Plaintiff's apparent reading for the claim

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least one of aluminum, magnesium, and zinc.	terms. <i>For this purpose, the invention proposes a protection device of the type defined above, which comprises at least a renewable sacrificial resist formed of elements capable of reducing at least locally the electrochemical potential of the aluminum of the heat exchanger walls.</i> <i>Said resist is preferably entirely immersed in the aggressive environment, so that the entirety of the resist can be consumed.</i> <i>By way of example, said elements may comprise zinc and/or magnesium.</i> <i>In one embodiment, the sacrificial resist is contained in the heat exchanger. Said heat exchanger may be formed, for example, by a cooling radiator of a motor vehicle engine.</i> Godefroy WO'337 (cert. translation) at pg. 3-4. <i>Said renewable sacrificial resist is intended to provide an introduction of elements, for example zinc and/or magnesium, in a quantity much greater than the quantity theoretically required for the protection, such that said elements are sacrificed, i.e. progressively disappear.</i> <i>In this case, the term “renewable” is intended to refer to a resist which is capable of being recharged with sacrificial elements.</i> <i>As said elements are present in a largely sufficient quantity, the protection will always be ensured, without risk of exhaustion of the elements making up the resist.</i> <i>The elements in question advantageously comprise zinc and/or magnesium. In this case they may in particular be zinc alloys, magnesium alloys, or indeed alloys of zinc and magnesium.</i> Godefroy WO'337 (cert. translation) at pg. 4.
29. The radiator of claim 25 wherein the sacrificial anode is	Godefroy WO'337 discloses or renders obvious the radiator of claim 25 wherein the sacrificial anode is installed onto a surface of the radiator, according at least to Plaintiff's apparent reading for the claim term

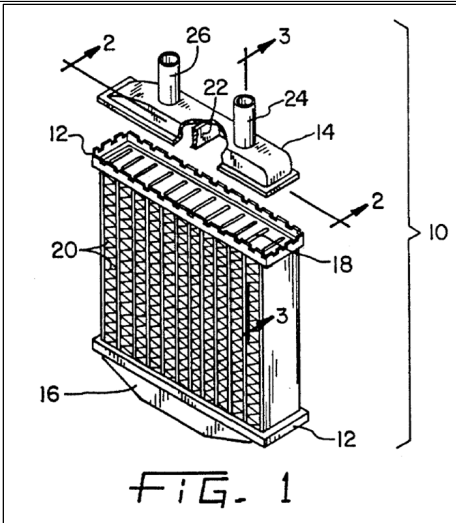
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installed onto a surface of the radiator.	“installed onto a surface.” <i>In another embodiment, the elements of the sacrificial resist are contained in a paint that is applied to an inside wall of the heat exchanger. A paint of this kind advantageously contains more than 80 wt.% of dry extracts of elements, in particular zinc and magnesium.</i> <i>According to one embodiment, the sacrificial resist is placed in a selected location of the heat exchanger. It can be contained in a reservoir, in particular in a collector box, of the heat exchanger. It can also be contained in tubing of the heat exchanger.</i> Godefroy WO'337 (cert. translation) at pg. 5. <i>Reference is first made to Fig. 1 which shows a collector box 10 of a heat exchanger, in particular of a motor vehicle, to which tubing 12 intended for inlet or outlet of a heat transfer fluid is connected.</i> <i>By way of example, the collector box 10 may form part of a cooling radiator of a motor vehicle engine, through which the engine-cooling liquid passes. Said radiator forms part of a fluid circuit, in this case a cooling circuit, through which the above-mentioned cooling liquid passes.</i> <i>In order to avoid any risk of corrosion, a sacrificial resist 14, in this case in the form of a tubular insert applied against the inside wall of the tubing 12, is provided inside the tubing 12. Given the location thereof, the insert is completely soaked by the cooling liquid.</i> <i>Said insert is formed of a renewable sacrificial resist made up of elements capable of reducing at least locally the electrochemical potential of the aluminum of the heat exchanger walls. By way of example, said insert may be formed of zinc and/or magnesium. It may in particular be a zinc alloy, a magnesium alloy, or indeed an alloy of zinc and magnesium.</i> Godefroy WO'337 (cert. translation) at pg. 6. <i>Reference is now made to Fig. 2 which shows a collector box 10 of an elongate design, in which another sacrificial resist 16 according to the invention is placed. Said resist 16 may be formed as an insert that is applied against the inside wall of the collector box, or indeed in</i>

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	<i>the form of a cartridge that is filled with discrete elements, for example granules.</i> <i>In the case of zinc and/or magnesium elements it is possible to use either a zinc and/or magnesium insert, or a cartridge filled with zinc and/or magnesium granules.</i> Godefroy WO'337 (cert. translation) at pg. 6-7.
31. The radiator of claim 25 wherein the radiator comprises aluminum.	Godefroy WO'337 discloses or renders obvious the radiator of claim 25 wherein the radiator comprises aluminum, according at least to Plaintiff's apparent reading for the claim terms. <i>The invention concerns a device for protecting the aluminum walls of a heat exchanger against corrosion by an aggressive environment to which its walls are subjected. The device comprises at least a renewable sacrificial resist (14) consisting of elements, in particular zinc and/or magnesium elements, adapted to reduce at least locally the electrochemical potential of the aluminum of the heat exchanger walls. The sacrificial resist can be contained either in the heat exchanger or in a fluid circuit comprising the heat exchanger. The invention is particularly applicable to motor vehicle heat exchangers.</i> Godefroy WO'337 (cert. translation) at Abstract. <i>The invention relates to the field of heat exchangers, in particular for motor vehicles.</i> <i>It relates more particularly to a device for protecting the aluminum walls of a heat exchanger against corrosion by an aggressive environment to which said walls are subjected.</i> <i>In this case, the term "walls" is intended to cover various flow channels which include, in a non-limiting manner, the tubes and collector boxes of the exchanger, as well as the connection tubing thereof.</i> <i>The term "aluminum" is intended to cover both aluminum per se and various alloys thereof.</i> Godefroy WO'337 (cert. translation) at pg. 1.
32. The radiator of claim 25 wherein the radiator enables air-	Godefroy WO'337 discloses or renders obvious the radiator of claim 25 wherein the radiator enables air-

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cooling of the hot liquid.	cooling of the hot liquid, according at least to Plaintiff's apparent reading for the claim terms. <i>This is the case in particular for heat exchangers made of light alloy, used in motor vehicles. In a non-limiting manner, said heat exchangers include engine-cooling radiators, radiators or unit heaters intended for heating the passenger compartment, and, in a more general manner, any heat exchanger in which a liquid flows which may be or become corrosive.</i> Godefroy WO'337 (cert. translation) at pg. 1. <i>Reference is first made to Fig. 1 which shows a collector box 10 of a heat exchanger, in particular of a motor vehicle, to which tubing 12 intended for inlet or outlet of a heat transfer fluid is connected.</i> <i>By way of example, the collector box 10 may form part of a cooling radiator of a motor vehicle engine, through which the engine-cooling liquid passes. Said radiator forms part of a fluid circuit, in this case a cooling circuit, through which the above-mentioned cooling liquid passes.</i> <i>In order to avoid any risk of corrosion, a sacrificial resist 14, in this case in the form of a tubular insert applied against the inside wall of the tubing 12, is provided inside the tubing 12. Given the location thereof, the insert is completely soaked by the cooling liquid.</i> <i>Said insert is formed of a renewable sacrificial resist made up of elements capable of reducing at least locally the electrochemical potential of the aluminum of the heat exchanger walls. By way of example, said insert may be formed of zinc and/or magnesium. It may in particular be a zinc alloy, a magnesium alloy, or indeed an alloy of zinc and magnesium.</i> Godefroy WO'337 (cert. translation) at pg. 6. To the extent that Godefroy WO'337 does not expressly describe that the radiator enables "air-cooling of the hot liquid" as claimed, a person of ordinary skill in the art would have understood the radiator of Godefroy WO'337 to enable air-cooling of the hot liquid. For example, the Oxford English Dictionary

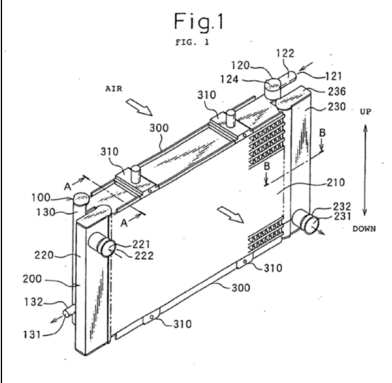
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	defines a “radiator” as “[i]n an internal combustion engine: a bank of thin tubes in which fluid (usually water) that has been circulated through the cylinder to cool it is itself cooled by the surrounding air.”¹ Further, the ‘494 Patent admits in the Background that “[a] typical radiator is made up of a storage tank” which “has . . . a core of cooling tubes, which is where the coolant liquid flows, and fins, connected to these cooling tubes, which transfers heat to the air that is pulled or pushed through the fins and round the tubes for heat transfer from the coolant to the air passing through.” See, e.g., the ‘494 Patent at 1:47-55. In addition, O’Connor ‘783, Hopkins AU’202, and Ozaki EP’311 each expressly describes that a radiator enables “air-cooling of the hot liquid,” as shown in the excerpts below. For example, O’Connor ‘783 describes the radiator enables air-cooling of the hot liquid: <i>A method for reducing the internal erosion of a brazed aluminum heat exchanger, such as a heater core used in automotive applications. The heat exchanger is composed of a tank and header that form a chamber, a number of coolant tubes secured to the header such that ends of the tubes project into the chamber, and an inlet to the chamber disposed opposite to the tubes so as to direct a coolant toward the ends of the tubes. A sacrificial erosion member is brazed to the tank so as to be in the path of the coolant as the coolant flows from the inlet into the chamber, such that the coolant impinges the erosion member as it enters the chamber. As a result, the coolant is deflected away from the ends of the tube so as to reduce erosion of the ends of the tubes. Furthermore, the erosion member serves to enhance the efficiency of the heat exchanger by improving the flow distribution of the coolant among the tubes.</i> O’Connor ‘783 at Abstract.

¹ See, e.g., Oxford English Dictionary definition #4 for “radiator” accessed at <https://www.oed.com/view/Entry/157248>.

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	 O'Connor '783 at Fig. 1. <i>The present invention relates to heat exchangers, and particularly those of the type used as heater cores in automobile heating systems. More particularly, this invention relates to an improved monolithic aluminum heat exchanger whose service life is extended by the inclusion of a sacrificial member that significantly reduces the tendency for erosion within the heat exchanger, and more particularly reduces the amount of erosion which occurs at the ends of the heat exchanger's coolant tubes.</i> O'Connor '783 at 1:4-12.

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	<i>Heat exchangers are employed within the automotive industry as radiators which cool the engine coolant, condensers and evaporators for use in air conditioning systems, and heater cores. In order to efficiently maximize the amount of surface area available for transferring heat between the environment and a fluid flowing through the heat exchanger, the design of the heat exchanger is typically of a tube-and-fin type in which numerous tubes thermally communicate with high surface area fins. The fins enhance the ability of the heat exchanger to transfer heat from the fluid to the environment, or vice versa. For example, heat exchangers used in the automotive industry as heater cores serve to transfer heat from the engine coolant to the air entering the passenger compartment.</i> O'Connor '783 at 1:16-30. <i>Heat exchangers are increasingly being formed by a brazing operation in which the individual components of the heat exchanger are permanently joined together with a brazing alloy. Generally, brazed heat exchangers are lower in weight and are better able to radiate heat as compared to heat exchangers formed by known mechanical assembly techniques. An example of a brazed heat exchanger is the headered tube-and-center (HTC) type, which utilizes a number of parallel tubes which are brazed to and between a pair of headers, with finned centers being brazed between each adjacent pair of tubes. Conventionally, headered tube-and-center heat exchangers have been constructed by inserting the parallel tubes into apertures formed in each of an opposing pair of headers. A finned center is then positioned between each adjacent pair of parallel tubes. A tank is attached to each header so as to form reservoirs which are in fluidic communication with the tubes through the apertures. One or both tanks include one or more ports which serve as an inlet and outlet to the heat exchanger.</i> O'Connor '783 at 1:31-49. <i>Shown in FIG. 1 is a headered tube-and-center type heater core 10 which can be formed in accordance with this invention. The tube-and-center design is preferred for heat exchangers used in automotive applications, such as the heater core 10 shown, because the design maximizes the amount of surface area that is in contact with incoming air. The air is forced around the high surface area provided by finned centers 20 located between adjacent pairs of pipes or tubes 18, providing for a high heat exchange rate between the air and a suitable fluid which flows through the tubes 18. The tubes 18 are oriented to be geometrically in parallel with each other, as well as hydraulically in parallel, between a pair of headers 12.</i>

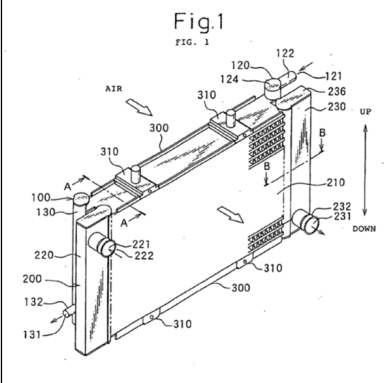
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	<i>The end of each tube 18 is received within a corresponding aperture formed in each of the headers 12.</i> O'Connor '783 at 4:57-5:4. <i>See also, e.g., O'Connor '783 at Figs. 2, 3, 4, 5.</i> In addition, Hopkins AU'202 describes the radiator enables air-cooling of the hot liquid: <i>Typical engine cooling systems include the following components:</i> <i>A radiator tank for cooling incoming heated water from the engine by way of heat conduction to the outside of the radiator tubes from where it is transferred to passing air;</i> <i>An electric cooling fan for providing the concentrated stream of air between the radiator tubes;</i> Hopkins AU'202 at pg. 2, ll. 11-16. Ozaki EP'311 also describes the radiator enables air-cooling of the hot liquid: <i>[0023] On the other hand, the radiator core 210 has a similar construction to that of the condenser core portion 110 and comprises radiator tubes 211 disposed in parallel with the condenser tubes 111 and fins 212.</i> <i>[0024] Both the core portions 110, 210 are arranged in series in a direction in which air flows with a gap being provided between the core portions for cutting off heat conduction there between.</i> Ozaki EP'311 at [0023]-[0024].

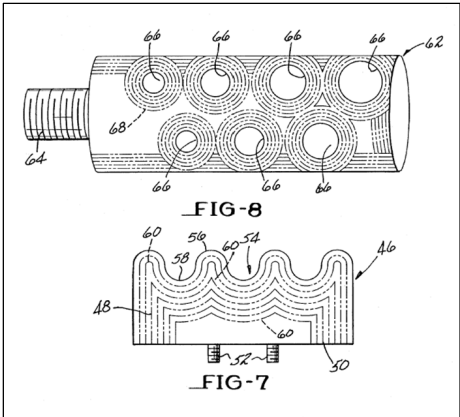
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	 Ozaki EP'311 at Fig. 1, e.g., arrows representing "AIR."
33. The radiator of claim 25, further comprising a second sacrificial anode.	Godefroy WO'337 discloses or renders obvious the radiator of claim 25 further comprising a second sacrificial anode, according at least to Plaintiff's apparent reading for the claim term "second sacrificial anode." <i>Another possible response appears to be that of modifying the content of the sacrificial element, but in this case, too, this is not well controlled, since the percentages, for example of zinc, vary from 0.8% to 5%, indeed 15%. In the case of such percentages, problems arise relating to the diffusion of the zinc in the case of brazed exchangers, and also problems relating to the recyclability of these alloys.</i> <i>[...]</i> <i>[The invention] furthermore aims to provide a protection device of this kind which is compatible with all types of heat exchangers, whether these be brazed heat exchangers, or</i>

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	<i>heat exchangers obtained by mechanical assembly.</i> Godefroy WO'337 (cert. translation) at pg. 3. To the extent that Godefroy WO'337 is found not to explicitly disclose or teach that the radiator further comprises “a second sacrificial anode” as claimed, it would have been obvious for a person of ordinary skill in the art to include a second sacrificial anode, such as any one of the additional sacrificial anodes described by Godefroy WO'337 or any one of the sacrificial anodes described in Masayuki JP'2069, Ozaki EP'311, or MacKenna '149. Modifying the radiator taught by Godefroy WO'337 to include “a second sacrificial anode,” such as any of those described by any one of Godefroy WO'337, Masayuki JP'2069, Ozaki EP'311, and MacKenna '149 is merely the combination of familiar components according to known methods, and the resulting combination would yield predictable results. For example, Godefroy WO'337 describes that “the sacrificial resist is placed in a selected location of the heat exchanger” including examples of various acceptable locations such as “in a reservoir,” “in a collector box,” or “contained in tubing” of the heat exchanger. <i>See, e.g.</i>, Godefroy WO'337 (cert. translation) at pg. 5. Each of these references provide interrelated teachings, for instance, regarding the use of sacrificial anodes to protect an aluminum or aluminum alloy heat exchanger from galvanic corrosion. As evidenced by the teachings of Masayuki JP'2069, Ozaki EP'311, and MacKenna '149, the use of sacrificial anodes to protect an aluminum heat exchanger was well-known in the art. A POSITA would recognize that the use of a second sacrificial anode, such as expressly taught by Masayuki JP'2069 and Ozaki EP'311, would provide additional corrosion protection to other areas of the radiator taught by Godefroy WO'337. Incorporating an additional sacrificial anode as taught by any one of Masayuki JP'2069, Ozaki EP'311, or MacKenna '149 to the radiator taught by Godefroy WO'337 would yield similar benefits as those described by each of the Masayuki JP'2069, Ozaki EP'311, and MacKenna '149 prior art. Such combinations are predictable variations of the techniques in the individual references. Thus, a POSITA would be able to make this modification to the Godefroy WO'337 radiator without undue experimentation and with reasonable expectations of success. For example, Masayuki JP'2069 describes that the radiator includes a plurality of sacrificial anodes (which would include “a second sacrificial anode”): <i>Further, it is preferable to provide the sacrificial anode over the entire length of the radiator tube so that the radiator tube is uniformly subjected to the anticorrosion action in the longitudinal direction.</i>

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	<i>Alternatively, a sacrificial anode divided into a plurality of parts in the longitudinal direction can be attached to the inner surface of the tube under the condition that the potential difference $\Delta E \geq 20$ mV is maintained between the farthest hybrid potential E2 and the pitting potential E1. .. When the sacrificial anode is attached to the inner surface of the tube over the entire length in the longitudinal direction, it becomes easy to maintain the area ratio $S2 / S1 = 0.1$ to 3 at any part of the pipeline. As the tube material, the present invention is not particularly bound, but 1000 series alloys, 2000 series alloys, 3000 series alloys, 6000 series alloys, 7000 series alloys and clads of these alloys are used as long as the brazing property is not impaired. Materials are used. It is also possible to use an alloy to which trace elements such as Si, Fe, Cu, Mn, Mg, Ti, and Zr are added.</i> Masayuki JP'2069 at [0014] (machine translation). <i>5. The Al alloy radiator according to claim 1, wherein one or more sacrificial anodes are attached over the entire inner surface of the Al alloy tube.</i> Masayuki JP'2069 at Claim 5 (machine translation). <i>8. The anticorrosion method according to claim 6, wherein a single or a plurality of sacrificial anodes are attached over the entire inner surface of the Al alloy tube.</i> Masayuki JP'2069 at Claim 8 (machine translation). Ozaki EP'311 also describes that the radiator includes a second sacrificial anode: <i>[0041] Since the first radiator tank 220 and the second condenser tank 130 are similar in construction to the second radiator tank 230 and the first condenser tank 120, in the following description, unless otherwise stated, when used, the radiator tank 230 is meant to include both the radiators 220, 230, and similarly, when used, the condenser tank is meant to include both the condenser tanks 120, 130.</i> Ozaki EP'311 at [0041], describing that the description of tank 230 also applies to tank 220, so that both tanks would include the described internal sacrificial layer. <i>[0046] On the other hand, in the radiator tank member 235, a brazing material is clad on one</i>

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	<i>side of an aluminum core material (a base material), as shown in Fig. 8B, whereas a sacrificial layer material comprising a sacrificial material (zinc in this embodiment) having a lower electric potential than that of the core material is disposed to be clad on the other side of the core material, and when the brazing sheet material is press bent in a predetermined fashion, the radiator tank member 235 is formed so as to have an L-shaped cross section. Note that as this occurs, the radiator tank member 235 is press bent such that the side thereof where the sacrificial layer material is clad constitutes an internal surface of the radiator tank main body 234.</i> Ozaki EP'311 at [0046]. <i>[0054] In addition, the radiator tank main body 234 is heated as a closed space by closing the openings of the radiator tank main body 234 with the radiator tank caps 236, the evaporated sacrificial material is assuredly prevented from being radiated out of the radiator tank main body 234, and the corrosion preventing layer can also be formed on the internal surfaces of the radiator caps 236 with ease. Consequently, it is ensured that the corrosion preventing layer can be formed on the internal surfaces of the radiator tank 230 without increasing the amount of the sacrificial material (zinc) uselessly.</i> Ozaki EP'311 at [0054].

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	Fig.1 FIG. 1  Ozaki EP'311 at Fig. 1. In addition, MacKenna '149 describes a sacrificial anode that when included as described would be a second sacrificial anode: <i>Metal corrosion which occurs under conditions of use is mitigated and controlled by a sacrificial anode device which can be easily attached to, and detached from the corrosion-prone object. In ambient applications, the anode and cathode components of the device may be distinct metallic elements which may be alloys, or layers of alloys, and which are configured so as to optimize the interface surface area between the anode and cathode, while being sufficiently compact to be placed essentially in any corrosion-prone location. In extremely wet applications, such as underwater, or in water circulating or storage systems, the anode may be an effectively configured block of metal, and the cathode will be the water constituent of the environment in question. The optimized anode/cathode interface area provides increased operating life for the device, reduces material waste, and strengthens the</i>

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	structure of the device. MacKenna '149 at Abstract.  FIG-8 is a side view of a cylindrical device with multiple circular openings. FIG-7 is a cross-sectional view of a wavy structure with internal features. MacKenna '149 at Figs. 7, 8, e.g., items 46, 62. <i>FIG. 7 is a side view of another embodiment of the invention which is designed for use in watery environment applications; and</i> <i>FIG. 8 is a side view of another embodiment of the invention which is designed for use in watery environment applications.</i> MacKenna '149 at 4:10-15. <i>This invention relates to the mitigation and control of metal corrosion in ambient conditions,</i>

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	<i>and in watery environments, and to a method and apparatus for minimizing corrosion of metal parts. More particularly, this invention relates to an anodic sacrificial device wherein the interface surface area contact between the anode and cathode components of the device is optimized so as to provide increased operational life.</i> MacKenna '149 at 1:7-14. <i>Sacrificial Anodes:</i> <i>Sacrificial anodes are the negative side of a cathode/anode circuit. The cathode is the positive side, and the anode is a solid piece of metal which freely gives up electrons due to its atomic composition. Three metals commonly used as the anode electron donor are zinc, aluminum, and magnesium. Typically, the metal anode will be connected to the metal to be protected by a ground strap, or by forming threads on one end of the metal anode body and screwing the anode into a tapped port in the metal being protected. A drawback with present day anodes is the fact that they tend to degrade unevenly, and often end up being adhered to the part they are protecting by anodic corrosion. Since the anodes must be periodically replaced, this adherence is undesirable. Still another problem with present day sacrificial anodes is the fact that frequently the poor consumption patterns and uneven degradation will result in pieces of the anode breaking away, which can result in problems in a circulating fluid system.</i> <i>It would be very desirable to provide a sacrificial anode device that would operate with consistent consumption patterns, and a longer operational life with minimal material waste. It would also be highly desirable to provide a sacrificial anode device that could be easily mounted directly on essentially any structural surface which is prone to corrosion, and could be easily replaced when necessary.</i> MacKenna '149 at 2:7-33. <i>While the aforesaid dry environment embodiment may also be used in a watery environment, a differently configured watery environment embodiment of the invention could likewise be used. In the watery environment embodiment, the sacrificial anode takes the form of a block of a properly configured electron donor metal, such as zinc, aluminum or the like, which anodic metal block will be directly secured to the body being protected from corrosion. In the watery environment, the water serves in the cathode capacity In this embodiment of the</i>

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	<i>invention, the anode body is specially configured so as to optimize the surface area contact with the water cathode. The anode will be fastened to the structure being protected, and the surface on the anode will be configured so as to ensure that maximum sacrificial corrosion occurs on surfaces on the anode which are distal of the structure being protected.</i> MacKenna '149 at 3:17-33. <i>It is a further object of this invention to provide a sacrificial anode of the character described which may be removably fastened to the structure being protected.</i> MacKenna '149 at 3:38-40. <i>It is another object of this invention to provide a sacrificial anode of the character described which can be used in watery enviroment applications and which is configured so as to preferentially corrode at the areas of the anode which are most distal of the structure being protected.</i> MacKenna '149 at 3:46-50. <i>FIG. 7 shows an embodiment of a sacrificial anode which is designed for use in a watery environment, and which is denoted generally by the numeral 46. The device 46 consists of a block of anodic metal 48 which has a first surface 50 that is adapted to be secured to the structure being protected. Bolts 52 may be provided to facilitate securement of the block 48 to the structure being protected, The block 48 has an opposite undulating surface 54 provided with alternating ridges 56 and valleys 58 that serve to optimize the area of the surface 54. Phantom lines 60 illustrate successive sacrificial corrosion generations which will occur on the surface 54 of the block 48. It will be noted that as the block 48 corrodes, the area of the corroding surface 54 will continue to be optimized relative to the size of the block 48.</i> MacKenna '149 at 5:27-40. <i>FIG. 8 illustrates a second embodiment of a sacrificial anode which is also designed for use in a watery environment, and which is denoted generally by the numeral 62. The anode 62 takes the general shape of a cylinder and has one end thereof which is provided with a threaded boss 64 that facilitates securement of the anode 62 to the structure being protected.</i>

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	<i>The anode 62 has a plurality of transaxial through passages 66 formed therein which passages 66 serve to optimize the surface area of the anode 62 that will be subjected to sacrificial corrosion. It will be noted that the diameter of the passages 66 increases as the distance from the passages 66 to the threaded end of the anode 62 increases. Thus the diameter of the passages 66 most distal of the threads 64 will be larger than the diameter of the passages 66 most proximal to the threads 64. In this way, the degree of sacrificial corrosion of the anode 62 will increase distally of the threaded end of the anode. The anode 62 will thus gradually shrink back toward the threads 64 as it corrodes. Phantom lines 68 illustrate successive generations of sacrificial corrosion of the anode 62 around the passages 66 and along the sides of the anode. Both of the anodes 48 and 62 are formed from electron donor metals such as zinc, aluminum, magnesium or the like.</i> MacKenna '149 at 5:41-63.
34. The radiator of claim 25, wherein the hot liquid is coolant.	Godefroy WO'337 discloses or renders obvious the radiator of claim 25 wherein the hot liquid is coolant, according at least to Plaintiff's apparent reading for the claim term "coolant." <i>Heat exchangers of this kind are typically made up of a bundle of tubes connected to one or more collector boxes which define a volume through which a heat transfer fluid passes, most often a liquid which may be or become corrosive.</i> <i>Liquids, which may be acidic, neutral, or basic, i.e. the pH of which is generally between 2 and 10, typically pass through said exchangers.</i> <i>This is the case in particular for heat exchangers made of light alloy, used in motor vehicles. In a non-limiting manner, said heat exchangers include engine-cooling radiators, radiators or unit heaters intended for heating the passenger compartment, and, in a more general manner, any heat exchanger in which a liquid flows which may be or become corrosive.</i> Godefroy WO'337 (cert. translation) at pg. 1. <i>Reference is first made to Fig. 1 which shows a collector box 10 of a heat exchanger, in particular of a motor vehicle, to which tubing 12 intended for inlet or outlet of a heat transfer fluid is connected.</i>

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	<i>By way of example, the collector box 10 may form part of a cooling radiator of a motor vehicle engine, through which the engine-cooling liquid passes. Said radiator forms part of a fluid circuit, in this case a cooling circuit, through which the above-mentioned cooling liquid passes.</i> <i>In order to avoid any risk of corrosion, a sacrificial resist 14, in this case in the form of a tubular insert applied against the inside wall of the tubing 12, is provided inside the tubing 12. Given the location thereof, the insert is completely soaked by the cooling liquid.</i> Godefroy WO'337 (cert. translation) at pg. 6.
35. The radiator of claim 25, wherein the hot liquid is water.	Godefroy WO'337 discloses or renders obvious the radiator of claim 25 wherein the hot liquid is water, according at least to Plaintiff's apparent reading for the claim term "water." <i>Heat exchangers of this kind are typically made up of a bundle of tubes connected to one or more collector boxes which define a volume through which a heat transfer fluid passes, most often a liquid which may be or become corrosive.</i> <i>Liquids, which may be acidic, neutral, or basic, i.e. the pH of which is generally between 2 and 10, typically pass through said exchangers.</i> <i>This is the case in particular for heat exchangers made of light alloy, used in motor vehicles. In a non-limiting manner, said heat exchangers include engine-cooling radiators, radiators or unit heaters intended for heating the passenger compartment, and, in a more general manner, any heat exchanger in which a liquid flows which may be or become corrosive.</i> Godefroy WO'337 (cert. translation) at pg. 1. <i>Reference is first made to Fig. 1 which shows a collector box 10 of a heat exchanger, in particular of a motor vehicle, to which tubing 12 intended for inlet or outlet of a heat transfer fluid is connected.</i> <i>By way of example, the collector box 10 may form part of a cooling radiator of a motor vehicle engine, through which the engine-cooling liquid passes. Said radiator forms part of a fluid circuit, in this case a cooling circuit, through which the above-mentioned cooling liquid</i>

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	<i>passes.</i> <i>In order to avoid any risk of corrosion, a sacrificial resist 14, in this case in the form of a tubular insert applied against the inside wall of the tubing 12, is provided inside the tubing 12. Given the location thereof, the insert is completely soaked by the cooling liquid.</i> Godefroy WO'337 (cert. translation) at pg. 6. To the extent that Godefroy WO'337 does not expressly describe that the hot liquid is “water” as claimed, a person of ordinary skill in the art would have understood water to be the simple substitution of one known element (water) for another (the cooling liquid of Godefroy WO'337) to obtain a predictable result. Water was a known choice of liquid in radiator systems as of the claimed priority date of the '494 Patent. For example, the '494 Patent admits in the Background that “[a]utomobile cooling systems circulate water and coolant liquids through an engine's water jacket, head, and water pump to facilitate heat transfer” and that “[a]fter absorbing the heat, the hot liquid is piped back to the radiator/storage tank which is a liquid to air heat exchanger.” See, e.g., the '494 Patent at 1:43-47. In addition, Ozaki EP'311, Masayuki JP'2069, and Brown '357 each expressly describes that the hot liquid is “water,” as shown in the excerpts below. For example, Ozaki EP'311 describes the hot liquid is water: <i>[0004] Cooling water or coolant is filled in the radiator tank, and therefore a corrosion preventing layer needs to be formed on internal surfaces of the radiator tank. To this end, in general, an aluminum sheet material having a corrosion preventing layer of zinc formed on the surface thereof is pressed into shapes and the members so pressed into shapes are then joined together through brazing, whereby a header tank is provided which has the corrosion preventing layer formed on the internal surfaces thereof.</i> Ozaki EP'311 at [0004]. In addition, Masayuki JP'2069 describes the hot liquid is water: <i>Aluminum materials have pitting corrosion in fresh water containing a large amount of anions such as Cl⁻ and SO₄²⁻. Therefore, in order to use an aluminum material as a structural material for a radiator, it is necessary to take measures to suppress pitting corrosion. As a means for improving corrosion resistance, it is the mainstream to use a clad</i>

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	material utilizing the sacrificial anode effect of Zn. For example, in order to impart corrosion resistance to the wetted portion inside the radiator, the wetted side has a layer structure of Al-Zn-based skin material / Al-Mn-based core material / Al-Si-based brazing material, which is an Al-Zn-based alloy. The radiator tube is made of clad material. Masayuki JP'2069 at [0002] (machine translation). <i>For example, the radiator is not always supplied with the ideal liquid, and tap water may be supplied instead of the antifreeze liquid. Moreover, the quality of tap water changes depending on the river water system supplied, and the corrosive action on the Al alloy fluctuates. The present invention has been devised to solve such a problem, specifying the material combination of the tube material and the sacrificial anode material, and sacrificing having a specified surface area with respect to the inner surface of the radiator tube. By attaching an anode, the radiator tube is always maintained below the pitting potential, and the purpose is to reliably protect the radiator from corrosion even if the corrosive environment fluctuates.</i> Masayuki JP'2069 at [0005] (machine translation). Brown '357 also describes the hot liquid is water: <i>It is well known that the agitation and heat present in the solutions circulating through radiators and engine cooling systems cause the precipitation of calcium sulphates, and other materials from the water. Chemical and electrolytic action may be set up in the cooling system which corrodes the exposed surfaces thereof. This is particularly true in warm weather where the cooling liquid is relatively high in temperature.</i> Brown '357 at 1:6-14. <i>The principal objects of the present invention are to provide a self-contained all-metal electrolytic device for use in a cooling system in such a manner that water in the system passes around and through said electrolytic device; to provide a zinc alloy sacrificial element in a corrosion preventing device; to provide an all-metal electrolytic device of dissimilar metals, one consisting of an electro-negative element with respect to iron and the other an electro-positive element with respect to iron, which when placed in the water of a cooling</i>

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	<i>system generates a slight electric current; to provide an electrolytic device of dissimilar metals wherein an element of metal such as zinc acting as a negative electrode is supported in a barrel formed of metal such as copper acting as a positive electrode; to provide a self-contained electrolytic device of dissimilar metals with members for mounting said device in a radiator hose connection between a radiator and engine; to provide for mounting an electrolytic device of this character in a cooling system duct in spaced relation to the walls thereof; to provide an electrolytic device that will perform successfully in any conventional brand of antifreeze used in engine cooling systems; to provide resilient members on a self-contained electrolytic device for mounting same in a cooling system; to provide a resilient mounting for the sacrificial elements in an electrolytic device; and to provide a corrosion and scale preventer of this character which is simple in construction, efficient in operation, economical to manufacture and readily installed in a cooling system.</i> Brown '357 at 1:25-2:3. <i>I designates a corrosion and scale prevention device consisting of dissimilar metals adapted to be immersed in the cooling liquid in an engine cooling system, and preferably mounted in a hose connection 2 of an engine 3 and radiator 4. As illustrated in Fig. 1, the engine 3 is preferably provided with a water pump 5 having an inlet 6 connected by a hose 7 with the lower end of the radiator 4, whereby operation of the engine will cause water to be drawn from the lower part of the radiator and forced upwardly through the engine to a connection 8 at the upper end thereof, aid connection being connected with the upper portion of the radiator by means of the hose connection 2. In the illustrated instance the engine is provided with a fan 9 adapted to draw air through the radiator to cool the water passing therethrough.</i> Brown '357 at 2:27-44.
36. The radiator of claim 25, wherein the hot liquid is antifreeze.	Godefroy WO'337 discloses or renders obvious the radiator of claim 25 wherein the hot liquid is antifreeze, according at least to Plaintiff's apparent reading for the claim term "antifreeze." <i>Heat exchangers of this kind are typically made up of a bundle of tubes connected to one or more collector boxes which define a volume through which a heat transfer fluid passes, most often a liquid which may be or become corrosive.</i>

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	<i>Liquids, which may be acidic, neutral, or basic, i.e. the pH of which is generally between 2 and 10, typically pass through said exchangers.</i> <i>This is the case in particular for heat exchangers made of light alloy, used in motor vehicles. In a non-limiting manner, said heat exchangers include engine-cooling radiators, radiators or unit heaters intended for heating the passenger compartment, and, in a more general manner, any heat exchanger in which a liquid flows which may be or become corrosive.</i> Godefroy WO'337 (cert. translation) at pg. 1. <i>Reference is first made to Fig. 1 which shows a collector box 10 of a heat exchanger, in particular of a motor vehicle, to which tubing 12 intended for inlet or outlet of a heat transfer fluid is connected.</i> <i>By way of example, the collector box 10 may form part of a cooling radiator of a motor vehicle engine, through which the engine-cooling liquid passes. Said radiator forms part of a fluid circuit, in this case a cooling circuit, through which the above-mentioned cooling liquid passes.</i> <i>In order to avoid any risk of corrosion, a sacrificial resist 14, in this case in the form of a tubular insert applied against the inside wall of the tubing 12, is provided inside the tubing 12. Given the location thereof, the insert is completely soaked by the cooling liquid.</i> Godefroy WO'337 (cert. translation) at pg. 6. To the extent that Godefroy WO'337 does not expressly describe that the hot liquid is "antifreeze" as claimed, a person of ordinary skill in the art would have understood water to be the simple substitution of one known element (antifreeze) for another (the cooling liquid of Godefroy WO'337) to obtain a predictable result. Antifreeze was a known choice of liquid in radiator systems as of the claimed priority date of the '494 Patent. In addition, Masayuki JP'2069 and Brown '357 each expressly describes that the hot liquid is "antifreeze," as shown in the excerpts below. For example, Masayuki JP'2069 describes the hot liquid is antifreeze: <i>For example, the radiator is not always supplied with the ideal liquid, and tap water may be</i>

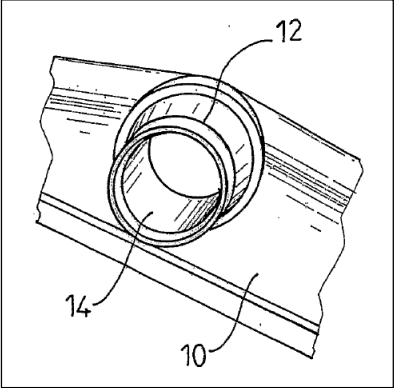
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	supplied instead of the antifreeze liquid. Moreover, the quality of tap water changes depending on the river water system supplied, and the corrosive action on the Al alloy fluctuates. The present invention has been devised to solve such a problem, specifying the material combination of the tube material and the sacrificial anode material, and sacrificing having a specified surface area with respect to the inner surface of the radiator tube. By attaching an anode, the radiator tube is always maintained below the pitting potential, and the purpose is to reliably protect the radiator from corrosion even if the corrosive environment fluctuates. Masayuki JP'2069 at [0005] (machine translation). Brown '357 also describes the hot liquid is antifreeze: <i>The principal objects of the present invention are to provide a self-contained all-metal electrolytic device for use in a cooling system in such a manner that water in the system passes around and through said electrolytic device; to provide a zinc alloy sacrificial element in a corrosion preventing device; to provide an all-metal electrolytic device of dissimilar metals, one consisting of an electro-negative element with respect to iron and the other an electro-positive element with respect to iron, which when placed in the water of a cooling system generates a slight electric current; to provide an electrolytic device of dissimilar metals wherein an element of metal such as zinc acting as a negative electrode is supported in a barrel formed of metal such as copper acting as a positive electrode; to provide a self-contained electrolytic device of dissimilar metals with members for mounting said device in a radiator hose connection between a radiator and engine; to provide for mounting an electrolytic device of this character in a cooling system duct in spaced relation to the walls thereof; to provide an electrolytic device that will perform successfully in any conventional brand of antifreeze used in engine cooling systems; to provide resilient members on a self-contained electrolytic device for mounting same in a cooling system; to provide a resilient mounting for the sacrificial elements in an electrolytic device; and to provide a corrosion and scale preventer of this character which is simple in construction, efficient in operation, economical to manufacture and readily installed in a cooling system.</i> Brown '357 at 1:25-2:3.
37. An electrolysis prevention device	To the extent the preamble is limiting, Godefroy WO'337 discloses or renders obvious an electrolysis

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for preventing corrosion, the electrolysis prevention device comprising:	prevention device for preventing corrosion, according at least to Plaintiff's apparent reading for the claim terms, as set forth in detail below. <i>The invention concerns a device for protecting the aluminum walls of a heat exchanger against corrosion by an aggressive environment to which its walls are subjected. The device comprises at least a renewable sacrificial resist (14) consisting of elements, in particular zinc and/or magnesium elements, adapted to reduce at least locally the electrochemical potential of the aluminum of the heat exchanger walls. The sacrificial resist can be contained either in the heat exchanger or in a fluid circuit comprising the heat exchanger. The invention is particularly applicable to motor vehicle heat exchangers.</i> Godefroy WO'337 (cert. translation) at Abstract.
a sacrificial anode made of an active metal; and	Godefroy WO'337 discloses or renders obvious a sacrificial anode made of an active metal, according at least to Plaintiff's apparent reading for the claim terms "sacrificial anode" and "active metal." <i>For this purpose, the invention proposes a protection device of the type defined above, which comprises at least a renewable sacrificial resist formed of elements capable of reducing at least locally the electrochemical potential of the aluminum of the heat exchanger walls.</i> <i>Said resist is preferably entirely immersed in the aggressive environment, so that the entirety of the resist can be consumed.</i> <i>By way of example, said elements may comprise zinc and/or magnesium.</i> <i>In one embodiment, the sacrificial resist is contained in the heat exchanger. Said heat exchanger may be formed, for example, by a cooling radiator of a motor vehicle engine.</i> Godefroy WO'337 (cert. translation) at pg. 3-4. <i>Said renewable sacrificial resist is intended to provide an introduction of elements, for example zinc and/or magnesium, in a quantity much greater than the quantity theoretically required for the protection, such that said elements are sacrificed, i.e. progressively disappear.</i>

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	<i>In this case, the term “renewable” is intended to refer to a resist which is capable of being recharged with sacrificial elements.</i> <i>As said elements are present in a largely sufficient quantity, the protection will always be ensured, without risk of exhaustion of the elements making up the resist.</i> <i>The elements in question advantageously comprise zinc and/or magnesium. In this case they may in particular be zinc alloys, magnesium alloys, or indeed alloys of zinc and magnesium.</i> Godefroy WO'337 (cert. translation) at pg. 4.
an anode holder supporting the sacrificial anode, the anode holder adapted for installation in an engine radiator within 10 inches of a hot liquid inlet to the engine radiator.	Godefroy WO'337 discloses or renders obvious an anode holder supporting the sacrificial anode, the anode holder adapted for installation in an engine radiator within 10 inches of a hot liquid inlet to the engine radiator, according at least to Plaintiff's apparent reading for the claim terms “anode holder,” “within 10 inches” and “hot liquid inlet.” <i>The sacrificial resist may be present in different forms.</i> <i>It may in particular be present in the form of discrete elements, in particular in the form of a powder, granules, pellets, etc.</i> <i>It may also be present in the form of continuous elements, in particular in the form of plates or inserts, having a thickness of from 0.1 to 30 mm.</i> <i>The elements of the sacrificial resist are advantageously contained in a receptacle that is permeable to the aggressive environment. As a receptacle in particular a sachet or a cartridge is envisaged, advantageously made of stainless steel and/or plastics material, comprising passage openings for the aggressive environment.</i> <i>It is also conceivable for the elements of the sacrificial resist to be contained in a recess of the heat exchanger which is exposed to the aggressive environment.</i> Godefroy WO'337 (cert. translation) at pg. 4-5.

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	<i>According to one embodiment, the sacrificial resist is placed in a selected location of the heat exchanger. It can be contained in a reservoir, in particular in a collector box, of the heat exchanger. It can also be contained in tubing of the heat exchanger.</i> Godefroy WO'337 (cert. translation) at pg. 5. <i>Reference is now made to Fig. 2 which shows a collector box 10 of an elongate design, in which another sacrificial resist 16 according to the invention is placed. Said resist 16 may be formed as an insert that is applied against the inside wall of the collector box, or indeed in the form of a cartridge that is filled with discrete elements, for example granules.</i> <i>In the case of zinc and/or magnesium elements it is possible to use either a zinc and/or magnesium insert, or a cartridge filled with zinc and/or magnesium granules.</i> <i>Reference is now made to Fig. 3 which shows another collector box 10, having a generally U-shaped cross section, of a heat exchanger. A sacrificial resist 18 according to the invention is placed inside the collector box. In the example, said resist is formed as an insert or a cartridge containing discrete elements, in particular granules. As is the case in Fig. 2, the insert may in particular be based on zinc and/or aluminum, and the cartridge may in particular contain zinc and/or aluminum granules.</i> Godefroy WO'337 (cert. translation) at pp. 6-7.

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	Godefroy WO'337 (cert. translation) at Figs. 2, 3. <i>Reference is first made to Fig. 1 which shows a collector box 10 of a heat exchanger, in particular of a motor vehicle, to which tubing 12 intended for inlet or outlet of a heat transfer fluid is connected.</i> <i>By way of example, the collector box 10 may form part of a cooling radiator of a motor vehicle engine, through which the engine-cooling liquid passes. Said radiator forms part of a fluid circuit, in this case a cooling circuit, through which the above-mentioned cooling liquid passes.</i> <i>In order to avoid any risk of corrosion, a sacrificial resist 14, in this case in the form of a tubular insert applied against the inside wall of the tubing 12, is provided inside the tubing 12. Given the location thereof, the insert is completely soaked by the cooling liquid.</i> <i>Said insert is formed of a renewable sacrificial resist made up of elements capable of reducing at least locally the electrochemical potential of the aluminum of the heat exchanger walls. By way of example, said insert may be formed of zinc and/or magnesium. It may in particular be a zinc alloy, a magnesium alloy, or indeed an alloy of zinc and magnesium.</i>

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	Godefroy WO'337 (cert. translation) at pg. 6.  Godefroy WO'337 at Fig. 1.
42. The electrolysis prevention device of claim 37, wherein the engine radiator comprises aluminum.	Godefroy WO'337 discloses or renders obvious the electrolysis prevention device of claim 37 wherein the engine radiator comprises aluminum, according at least to Plaintiff's apparent reading for the claim terms. <i>The invention concerns a device for protecting the aluminum walls of a heat exchanger against corrosion by an aggressive environment to which its walls are subjected. The device comprises at least a renewable sacrificial resist (14) consisting of elements, in particular zinc and/or magnesium elements, adapted to reduce at least locally the electrochemical potential of the aluminum of the heat exchanger walls. The sacrificial resist can be contained either in the heat exchanger or in a fluid circuit comprising the heat exchanger. The invention is particularly applicable to motor vehicle heat exchangers.</i>

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	Godefroy WO'337 (cert. translation) at Abstract. <i>The invention relates to the field of heat exchangers, in particular for motor vehicles.</i> <i>It relates more particularly to a device for protecting the aluminum walls of a heat exchanger against corrosion by an aggressive environment to which said walls are subjected.</i> <i>In this case, the term “walls” is intended to cover various flow channels which include, in a non-limiting manner, the tubes and collector boxes of the exchanger, as well as the connection tubing thereof.</i> <i>The term “aluminum” is intended to cover both aluminum per se and various alloys thereof.</i> Godefroy WO'337 (cert. translation) at pg. 1.
43. The electrolysis prevention device of claim 37, wherein the anode holder enables the sacrificial anode to be located within fluid flow of the hot coolant inlet.	Godefroy WO'337 discloses or renders obvious the electrolysis prevention device of claim 37 wherein the anode holder enables the sacrificial anode to be located within fluid flow of the hot coolant inlet, according at least to Plaintiff's apparent reading for the claim term “located within fluid flow of the hot coolant inlet.” <i>The sacrificial resist may be present in different forms.</i> <i>It may in particular be present in the form of discrete elements, in particular in the form of a powder, granules, pellets, etc.</i> <i>It may also be present in the form of continuous elements, in particular in the form of plates or inserts, having a thickness of from 0.1 to 30 mm.</i> <i>The elements of the sacrificial resist are advantageously contained in a receptacle that is permeable to the aggressive environment. As a receptacle in particular a sachet or a cartridge is envisaged, advantageously made of stainless steel and/or plastics material, comprising passage openings for the aggressive environment.</i> <i>It is also conceivable for the elements of the sacrificial resist to be contained in a recess of the</i>

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	<i>heat exchanger which is exposed to the aggressive environment.</i> Godefroy WO'337 (cert. translation) at pg. 4-5. <i>Reference is first made to Fig. 1 which shows a collector box 10 of a heat exchanger, in particular of a motor vehicle, to which tubing 12 intended for inlet or outlet of a heat transfer fluid is connected.</i> <i>By way of example, the collector box 10 may form part of a cooling radiator of a motor vehicle engine, through which the engine-cooling liquid passes. Said radiator forms part of a fluid circuit, in this case a cooling circuit, through which the above-mentioned cooling liquid passes.</i> <i>In order to avoid any risk of corrosion, a sacrificial resist 14, in this case in the form of a tubular insert applied against the inside wall of the tubing 12, is provided inside the tubing 12. Given the location thereof, the insert is completely soaked by the cooling liquid.</i> <i>Said insert is formed of a renewable sacrificial resist made up of elements capable of reducing at least locally the electrochemical potential of the aluminum of the heat exchanger walls. By way of example, said insert may be formed of zinc and/or magnesium. It may in particular be a zinc alloy, a magnesium alloy, or indeed an alloy of zinc and magnesium.</i> Godefroy WO'337 (cert. translation) at pg. 6. <i>Whatever the location thereof, the sacrificial resist is capable of being completely immersed in the aggressive environment.</i> Godefroy WO'337 (cert. translation) at pg. 7. <i>Reference is now made to Fig. 2 which shows a collector box 10 of an elongate design, in which another sacrificial resist 16 according to the invention is placed. Said resist 16 may be formed as an insert that is applied against the inside wall of the collector box, or indeed in the form of a cartridge that is filled with discrete elements, for example granules.</i> <i>In the case of zinc and/or magnesium elements it is possible to use either a zinc and/or</i>

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	<i>magnesium insert, or a cartridge filled with zinc and/or magnesium granules.</i> <i>Reference is now made to Fig. 3 which shows another collector box 10, having a generally U-shaped cross section, of a heat exchanger. A sacrificial resist 18 according to the invention is placed inside the collector box. In the example, said resist is formed as an insert or a cartridge containing discrete elements, in particular granules. As is the case in Fig. 2, the insert may in particular be based on zinc and/or aluminum, and the cartridge may in particular contain zinc and/or aluminum granules.</i> Godefroy WO'337 (cert. translation) at pp. 6-7.
45. The electrolysis prevention device of claim 37, wherein the hot liquid is coolant.	Godefroy WO'337 discloses or renders obvious the electrolysis prevention device of claim 37 wherein the hot liquid is coolant, according to at least Plaintiff's apparent reading for the claim term "coolant." <i>Heat exchangers of this kind are typically made up of a bundle of tubes connected to one or more collector boxes which define a volume through which a heat transfer fluid passes, most often a liquid which may be or become corrosive.</i> <i>Liquids, which may be acidic, neutral, or basic, i.e. the pH of which is generally between 2 and 10, typically pass through said exchangers.</i> <i>This is the case in particular for heat exchangers made of light alloy, used in motor vehicles. In a non-limiting manner, said heat exchangers include engine-cooling radiators, radiators or unit heaters intended for heating the passenger compartment, and, in a more general manner, any heat exchanger in which a liquid flows which may be or become corrosive.</i> Godefroy WO'337 (cert. translation) at pg. 1. <i>Reference is first made to Fig. 1 which shows a collector box 10 of a heat exchanger, in particular of a motor vehicle, to which tubing 12 intended for inlet or outlet of a heat transfer fluid is connected.</i> <i>By way of example, the collector box 10 may form part of a cooling radiator of a motor vehicle engine, through which the engine-cooling liquid passes. Said radiator forms part of a fluid circuit, in this case a cooling circuit, through which the above-mentioned cooling liquid</i>

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	<i>passes.</i> <i>In order to avoid any risk of corrosion, a sacrificial resist 14, in this case in the form of a tubular insert applied against the inside wall of the tubing 12, is provided inside the tubing 12. Given the location thereof, the insert is completely soaked by the cooling liquid.</i> Godefroy WO'337 (cert. translation) at pg. 6.
46. The electrolysis prevention device of claim 37, wherein the hot liquid is water.	Godefroy WO'337 discloses or renders obvious the electrolysis prevention device of claim 37 wherein the hot liquid is water, according at least to Plaintiff's apparent reading for the claim term "water." <i>Heat exchangers of this kind are typically made up of a bundle of tubes connected to one or more collector boxes which define a volume through which a heat transfer fluid passes, most often a liquid which may be or become corrosive.</i> <i>Liquids, which may be acidic, neutral, or basic, i.e. the pH of which is generally between 2 and 10, typically pass through said exchangers.</i> <i>This is the case in particular for heat exchangers made of light alloy, used in motor vehicles. In a non-limiting manner, said heat exchangers include engine-cooling radiators, radiators or unit heaters intended for heating the passenger compartment, and, in a more general manner, any heat exchanger in which a liquid flows which may be or become corrosive.</i> Godefroy WO'337 (cert. translation) at pg. 1. <i>Reference is first made to Fig. 1 which shows a collector box 10 of a heat exchanger, in particular of a motor vehicle, to which tubing 12 intended for inlet or outlet of a heat transfer fluid is connected.</i> <i>By way of example, the collector box 10 may form part of a cooling radiator of a motor vehicle engine, through which the engine-cooling liquid passes. Said radiator forms part of a fluid circuit, in this case a cooling circuit, through which the above-mentioned cooling liquid passes.</i> <i>In order to avoid any risk of corrosion, a sacrificial resist 14, in this case in the form of a</i>

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	<i>tubular insert applied against the inside wall of the tubing 12, is provided inside the tubing 12. Given the location thereof, the insert is completely soaked by the cooling liquid.</i> Godefroy WO'337 (cert. translation) at pg. 6. To the extent that Godefroy WO'337 does not expressly describe that the hot liquid is "water" as claimed, a person of ordinary skill in the art would have understood water to be the simple substitution of one known element (water) for another (the cooling liquid of Godefroy WO'337) to obtain a predictable result. Water was a known choice of liquid in radiator systems as of the claimed priority date of the '494 Patent. For example, the '494 Patent admits in the Background that "[a]utomobile cooling systems circulate water and coolant liquids through an engine's water jacket, head, and water pump to facilitate heat transfer" and that "[a]fter absorbing the heat, the hot liquid is piped back to the radiator/storage tank which is a liquid to air heat exchanger." See, e.g., the '494 Patent at 1:43-47. In addition, Ozaki EP'311, Masayuki JP'2069, and Brown '357 each expressly describes that the hot liquid is "water," as shown in the excerpts below. For example, Ozaki EP'311 describes the hot liquid is water: In addition, Masayuki JP'2069 describes the hot liquid is water: <i>Aluminum materials have pitting corrosion in fresh water containing a large amount of anions such as Cl⁻ and SO₄²⁻. Therefore, in order to use an aluminum material as a structural material for a radiator, it is necessary to take measures to suppress pitting corrosion. As a means for improving corrosion resistance, it is the mainstream to use a clad material utilizing the sacrificial anode effect of Zn. For example, in order to impart corrosion resistance to the wetted portion inside the radiator, the wetted side has a layer structure of Al-Zn-based skin material / Al-Mn-based core material / Al-Si-based brazing material, which is an Al-Zn-based alloy. The radiator tube is made of clad material.</i> Masayuki JP'2069 at [0002] (machine translation). <i>For example, the radiator is not always supplied with the ideal liquid, and tap water may be supplied instead of the antifreeze liquid. Moreover, the quality of tap water changes depending on the river water system supplied, and the corrosive action on the Al alloy fluctuates. The present invention has been devised to solve such a problem, specifying the material combination of the tube material and the sacrificial anode material, and sacrificing</i>

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	<i>having a specified surface area with respect to the inner surface of the radiator tube. By attaching an anode, the radiator tube is always maintained below the pitting potential, and the purpose is to reliably protect the radiator from corrosion even if the corrosive environment fluctuates.</i> Masayuki JP'2069 at [0005] (machine translation). Brown '357 also describes the hot liquid is water: <i>It is well known that the agitation and heat present in the solutions circulating through radiators and engine cooling systems cause the precipitation of calcium sulphates, and other materials from the water. Chemical and electrolytic action may be set up in the cooling system which corrodes the exposed surfaces thereof. This is particularly true in warm weather where the cooling liquid is relatively high in temperature.</i> Brown '357 at 1:6-14. <i>The principal objects of the present invention are to provide a self-contained all-metal electrolytic device for use in a cooling system in such a manner that water in the system passes around and through said electrolytic device; to provide a zinc alloy sacrificial element in a corrosion preventing device; to provide an all-metal electrolytic device of dissimilar metals, one consisting of an electro-negative element with respect to iron and the other an electro-positive element with respect to iron, which when placed in the water of a cooling system generates a slight electric current; to provide an electrolytic device of dissimilar metals wherein an element of metal such as zinc acting as a negative electrode is supported in a barrel formed of metal such as copper acting as a positive electrode; to provide a self-contained electrolytic device of dissimilar metals with members for mounting said device in a radiator hose connection between a radiator and engine; to provide for mounting an electrolytic device of this character in a cooling system duct in spaced relation to the walls thereof; to provide an electrolytic device that will perform successfully in any conventional brand of antifreeze used in engine cooling systems; to provide resilient members on a self-contained electrolytic device for mounting same in a cooling system; to provide a resilient mounting for the sacrificial elements in an electrolytic device; and to provide a corrosion and scale preventer of this character which is simple in construction, efficient in operation,</i>

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	<i>economical to manufacture and readily installed in a cooling system.</i> Brown '357 at 1:25-2:3. <i>I designates a corrosion and scale prevention device consisting of dissimilar metals adapted to be immersed in the cooling liquid in an engine cooling system, and preferably mounted in a hose connection 2 of an engine 3 and radiator 4. As illustrated in Fig. 1, the engine 3 is preferably provided with a water pump 5 having an inlet 6 connected by a hose 7 with the lower end of the radiator 4, whereby operation of the engine will cause water to be drawn from the lower part of the radiator and forced upwardly through the engine to a connection 8 at the upper end thereof, aid connection being connected with the upper portion of the radiator by means of the hose connection 2. In the illustrated instance the engine is provided with a fan 9 adapted to draw air through the radiator to cool the water passing therethrough.</i> Brown '357 at 2:27-44.
47. The electrolysis prevention device of claim 37, wherein the hot liquid is antifreeze.	Godefroy WO'337 discloses or renders obvious the electrolysis prevention device of claim 37 wherein the hot liquid is antifreeze, according at least to Plaintiff's apparent reading for the claim term "antifreeze." <i>Heat exchangers of this kind are typically made up of a bundle of tubes connected to one or more collector boxes which define a volume through which a heat transfer fluid passes, most often a liquid which may be or become corrosive.</i> <i>Liquids, which may be acidic, neutral, or basic, i.e. the pH of which is generally between 2 and 10, typically pass through said exchangers.</i> <i>This is the case in particular for heat exchangers made of light alloy, used in motor vehicles. In a non-limiting manner, said heat exchangers include engine-cooling radiators, radiators or unit heaters intended for heating the passenger compartment, and, in a more general manner, any heat exchanger in which a liquid flows which may be or become corrosive.</i> Godefroy WO'337 (cert. translation) at pg. 1. <i>Reference is first made to Fig. 1 which shows a collector box 10 of a heat exchanger, in</i>

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	<i>particular of a motor vehicle, to which tubing 12 intended for inlet or outlet of a heat transfer fluid is connected.</i> <i>By way of example, the collector box 10 may form part of a cooling radiator of a motor vehicle engine, through which the engine-cooling liquid passes. Said radiator forms part of a fluid circuit, in this case a cooling circuit, through which the above-mentioned cooling liquid passes.</i> <i>In order to avoid any risk of corrosion, a sacrificial resist 14, in this case in the form of a tubular insert applied against the inside wall of the tubing 12, is provided inside the tubing 12. Given the location thereof, the insert is completely soaked by the cooling liquid.</i> Godefroy WO'337 (cert. translation) at pg. 6. To the extent that Godefroy WO'337 does not expressly describe that the hot liquid is "antifreeze" as claimed, a person of ordinary skill in the art would have understood water to be the simple substitution of one known element (antifreeze) for another (the cooling liquid of Godefroy WO'337) to obtain a predictable result. Antifreeze was a known choice of liquid in radiator systems as of the claimed priority date of the '494 Patent. In addition, Masayuki JP'2069 and Brown '357 each expressly describes that the hot liquid is "antifreeze," as shown in the excerpts below. For example, Masayuki JP'2069 describes the hot liquid is antifreeze: <i>For example, the radiator is not always supplied with the ideal liquid, and tap water may be supplied instead of the antifreeze liquid. Moreover, the quality of tap water changes depending on the river water system supplied, and the corrosive action on the Al alloy fluctuates. The present invention has been devised to solve such a problem, specifying the material combination of the tube material and the sacrificial anode material, and sacrificing having a specified surface area with respect to the inner surface of the radiator tube. By attaching an anode, the radiator tube is always maintained below the pitting potential, and the purpose is to reliably protect the radiator from corrosion even if the corrosive environment fluctuates.</i> Masayuki JP'2069 at [0005] (machine translation).

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	Brown '357 also describes the hot liquid is antifreeze: <i>The principal objects of the present invention are to provide a self-contained all-metal electrolytic device for use in a cooling system in such a manner that water in the system passes around and through said electrolytic device; to provide a zinc alloy sacrificial element in a corrosion preventing device; to provide an all-metal electrolytic device of dissimilar metals, one consisting of an electro-negative element with respect to iron and the other an electro-positive element with respect to iron, which when placed in the water of a cooling system generates a slight electric current; to provide an electrolytic device of dissimilar metals wherein an element of metal such as zinc acting as a negative electrode is supported in a barrel formed of metal such as copper acting as a positive electrode; to provide a self-contained electrolytic device of dissimilar metals with members for mounting said device in a radiator hose connection between a radiator and engine; to provide for mounting an electrolytic device of this character in a cooling system duct in spaced relation to the walls thereof; to provide an electrolytic device that will perform successfully in any conventional brand of antifreeze used in engine cooling systems; to provide resilient members on a self-contained electrolytic device for mounting same in a cooling system; to provide a resilient mounting for the sacrificial elements in an electrolytic device; and to provide a corrosion and scale preventer of this character which is simple in construction, efficient in operation, economical to manufacture and readily installed in a cooling system.</i> Brown '357 at 1:25-2:3.