

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BizLink Technology, Inc.,

Petitioner,

v.

Anderson Power Products, Inc.,

Patent Owner.

Case No. IPR2024-00687

U.S. Patent No. 8,808,017

DECLARATION OF DR. CHARLES ELDERING

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I. INTRODUCTION

1. I, Dr. Charles Eldering, submit this declaration to state my opinions on the matters described below.

2. I have been retained on behalf of BizLink Technology, Inc. as an independent expert for the above-identified *inter partes* review proceeding involving U.S. Patent No. 8,808,017 (“the ’017 patent”). I am being compensated for my time in connection with this IPR at my standard hourly consulting rate and reimbursed for reasonable out-of-pocket expenses. No part of my compensation depends on the outcome of this proceeding, and I have no other interest in this proceeding. I have been asked to provide my technical review, analysis, insights, and opinions regarding the ’017 patent and the below-noted references that form the basis for the invalidity grounds set forth in the Petition for *Inter Partes* Review of the ’017 patent.

II. QUALIFICATIONS AND BACKGROUND

3. I am well qualified to serve as a technical expert in this matter based upon my educational and work experience. I have personal knowledge and expertise concerning the relevant technologies based upon my education, training, and experience. My relevant experience includes work in research laboratories as well as an electrical engineer in various industrial positions.

4. I have degrees in both physics and electrical engineering, as well as extensive experience in the telecommunications industry.

5. My experience in connectors started early in my career, during summer and part-time jobs as a lab technician while an undergraduate. These positions included working at Friden Mailing Equipment in Oakland, CA, the particle physics lab at Carnegie Mellon University, and at the nuclear geochemistry lab at the Mellon Institute (jobs I held in the period of 1979–1981). In these positions, I was frequently responsible for installing connectors on cables that were used for interconnecting laboratory equipment. I also performed research at the University of California at Davis in the area of nonlinear optical materials. The production of these materials frequently involved the use of high voltage sources that would, on occasion, cause arcing such as that which can occur in connectors.

6. My later experience in the cable industry was gained during my time at General Instrument Corporation from 1993–1995. General Instrument was a significant supplier of equipment to the Multiple System Operators (“MSO’s”). My work at General Instrument included research on noise in the return path of the cable plant, which is related in large part to the quality and integrity of the connectors and cables in the plant.

7. My relevant experience also includes work with John Mezzalingua Associates, Inc. (d/b/a PPC Broadband, Inc., which is now an affiliate of Belden

Inc.), where I have been involved with numerous aspects of cable connectors from approximately 2004 to the present, including the installation of cable and cable connectors on various types of cable, as well as measuring the performance characteristics (e.g., return loss, insertion loss and ground continuity) of installed connectors.

8. In addition to this professional experience, I am a licensed amateur radio operator, holding a General Class license issued by the Federal Communications Commission (FCC) and having the call sign of N3YRB, and having had the prior call signs of KB6ZIR and KD2WWP. I have been an amateur radio operator since approximately 1988, with a lapse in my license from approximately 2014 to 2021. Being an amateur radio operator frequently requires the utilization of connectors as well as good familiarity with the principles of grounding and lightning protection.

9. A copy of curriculum vitae is attached to this declaration as Appendix A.

III. MATERIALS CONSIDERED

10. In forming my opinions, I have reviewed the following documents and other documents cited in this declaration:

Exhibit	Description
1001	U.S. Patent No. 8,808,017 to York et al. (“’017 Patent”)

1002	Prosecution history of U.S. Patent Application No. 13/734,025
1004	U.S. Patent No. 2,838,739 to E.D. Winkler (“ <i>Winkler</i> ”)
1005	U.S. Patent No. 8,182,278 to Kataoka et al. (“ <i>Kataoka</i> ”)
1006	U.S. Patent No. 3,909,099 to E.D. Winkler (“ <i>Winkler2</i> ”)
1007	U.S. Patent No. 4,634,211 to Poliak et al. (“ <i>Poliak</i> ”)
1008	Mroczkowski, Robert S., <i>Electrical Connector Handbook</i> (1998) (“Electrical Connector Handbook” or “the Handbook”)
1009	Complaint in <i>Anderson Power Products, Inc. v. BizLink Technology, Inc. et al.</i> , Case No. 3:23-cv-05436 (NDCA)
1010	Graf, Rudolf F., <i>Modern Dictionary of Electronics, Seventh Edition</i> (1999)
1011	<i>Electrical Arc</i> , Wikipedia.org, available at https://en.wikipedia.org/wiki/Electric_arc
1013	UK Patent Application Publication No. GB2359940A to Yazaki Corporation
1014	U.S. Patent No. 3,691,511 to Gerhard Leonhard Emil Billmann
1015	U.S. Patent No. 6,491,532 B1 to Schoepf et al.
1016	U.S. Patent No. 2,329,793 to N.R. Smith
1020	(18a) <i>Newton’s 3rd Law</i> , nasa.gov, available at https://pwg.gsfc.nasa.gov/stargaze/Snewton3.htm

IV. LEGAL STANDARDS

11. I am not a lawyer. Although I am a registered patent agent, registration number 39,180, I am not an attorney and have not represented others as a patent agent in front of the USPTO in at least the past 10 years. For the purposes

of this declaration, I have been asked to provide my opinions on issues regarding unpatentability. I have been informed of the legal standards discussed below, which I have applied in forming my opinions. My understanding of the legal standards to apply in reaching the conclusions in this declaration is based on discussions with counsel for Petitioner, my experience applying similar standards in other patent-related matters, and my reading of the documents submitted in this proceeding. In preparing this declaration, I have tried to faithfully apply these legal standards to the challenged claims.

12. I have been informed that a dependent claim is a patent claim that refers back to another patent claim. I have been informed that a dependent claim includes all of the limitations of the claim to which it refers. I have been informed that there are two ways in which prior art may render a patent claim unpatentable. First, I have been informed that the prior art can “anticipate” a claim. Second, I have been informed that the prior art can render a claim “obvious” to a person of ordinary skill in the art. I understand that a claim is patentable if, among other things, it was not anticipated and would not have been obvious to a person of ordinary skill in the art in view of the prior art at the priority date of the patent.

13. I have been asked to provide my opinions regarding whether claims 1-4 and 7-12 (“the Challenged Claims”) of the ’017 patent are unpatentable, either because they are anticipated or would have been obvious to a person having

ordinary skill in the art at the time of the alleged invention, in light of the prior art.

I have been informed that in *inter partes* review proceedings, such as this one, the party challenging the patent bears the burden of proving unpatentability by a preponderance of the evidence. I understand that a preponderance of the evidence means “more likely than not.”

A. Prior Art

14. I have been advised and understand that the information used to evaluate whether an invention was new and not obvious when made is generally referred to as “prior art.” I understand that prior art includes patents and printed publications that existed before the earliest priority date of the challenged patent. I have been asked to assume that the references discussed below constitute prior art.

B. Anticipation

15. I have been advised and understand that a patent claim is unpatentable as anticipated under 35 U.S.C. § 102 if each element of that claim is present either explicitly or inherently in a single prior art reference. I have also been advised and understand that, to be an inherent disclosure, the prior art reference must necessarily disclose the limitation. The fact that the reference might practice or contain a claimed limitation is insufficient to establish that the reference inherently teaches the limitation.

C. Obviousness

16. I have been informed that a patent claim may be unpatentable as obvious under 35 U.S.C. § 103 if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious to a person having ordinary skill in the art to which the subject matter pertains at the earliest effective priority date. I have been informed that a proper obviousness analysis includes the following:

- a. Determining the scope and content of the prior art;
- b. Ascertaining the differences between the prior art and the claims at issue;
- c. Resolving the level of ordinary skill in the pertinent art; and
- d. Considering evidence of secondary indicia of non-obviousness (if available).

17. I am not aware of any evidence of secondary indicia but reserve the right to consider it if any is provided to me.

18. I have been informed that the relevant time for considering whether a claim would have been obvious to a person of ordinary skill in the art is the earliest effective priority date. For my obviousness analysis, counsel for Petitioner instructed me to assume that the earliest priority date for the challenged claims is

January 4, 2013. My opinions expressed in this Declaration would not change if I assumed a later priority date.

19. I have been informed that a reference may be modified or combined with other references or with the knowledge of a person of ordinary skill in the art if the person would have found the modification or combination obvious. I have also been informed that a person of ordinary skill in the art is presumed to know all the relevant prior art, and the obviousness analysis may consider the inferences and creative steps that a person of ordinary skill in the art would employ. I have been informed that whether a prior art reference renders a patent claim obvious is determined from the perspective of a person of ordinary skill in the art. I have also been informed that, while there is no requirement that the prior art contain an express suggestion to combine known elements to achieve the claimed invention, and while a suggestion to combine known elements to achieve the claimed invention may come from the prior art as a whole or individually and may consider the inferences and creative steps a person of ordinary skill in the art would employ, as filtered through the knowledge of one skilled in the art, obviousness grounds cannot be sustained by mere conclusory statements and must include some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.

20. In determining whether a prior art reference could have been combined with another prior art reference or other information known to a person having ordinary skill in the art, I have been informed that the following principles may be considered:

- a. A combination of familiar elements according to known methods is likely to be obvious if it yields predictable results;
- b. The substitution of one known element for another is likely to be obvious if it yields predictable results;
- c. The use of a known technique to improve similar items or methods in the same way is likely to be obvious if it yields predictable results;
- d. The application of a known technique to a prior art reference that is ready for improvement is likely to be obvious if it yields predictable results;
- e. Any need or problem known in the field and addressed by the reference can provide a reason for combining the elements in the manner claimed;
- f. A person of ordinary skill often will be able to fit the teachings of multiple references together; and

- g. A proper analysis of obviousness requires a determination of whether a person of ordinary skill in the art would have had a “reasonable expectation of success”—but not “absolute predictability” of success—in achieving the claimed invention by combining prior art references.

21. I have been informed that, when a work is available in one field, design alternatives and other market forces can prompt variations of it, either in the same field or in another. I have been informed that if a person of ordinary skill in the art could have implemented a predictable variation and would have seen the benefit of doing so, that variation is likely to have been obvious. I have been informed that, in many fields, there may be little discussion of obvious combinations, and in these fields, market demand—not scientific literature—may drive design trends. I have been informed that, when there was a design need or market pressure and there are a finite number of predictable solutions, a person of ordinary skill in the art likely would have had a good reason to pursue those known options.

22. I have been informed that combining familiar elements according to known methods and in a predictable way may suggest obviousness when such a combination would yield nothing more than predictable results. I understand, however, that a claim is not obvious merely because every claim element is

disclosed in the prior art and that a party asserting obviousness must still provide a specific rationale to combine or modify the references as recited in the claims and explain why one skilled in the art would have reasonably expected to succeed in doing so.

23. I have been informed that there is no rigid rule that a reference or combination of references must contain a “teaching, suggestion, or motivation” to combine references. But I also understand that the “teaching, suggestion, or motivation” test is one way to establish a rationale for combining elements of the prior art. I have been informed that this test poses the question as to whether there is an express or implied teaching, suggestion, or motivation to combine prior art elements in a way that realizes the claimed invention, and that it seeks to counter impermissible hindsight analysis. I have also been informed that, in an obviousness analysis, prior art must be analogous to the patent being considered. I have been informed that a prior art reference is considered to be analogous, or in the same field of art, if the reference is either (1) in the same field of endeavor as the challenged patent, regardless of the problems the challenged patent and the prior art address, or (2) reasonably pertinent to the particular problem being solved by the challenged patent.

V. LEVEL OF ORDINARY SKILL IN THE ART

24. In rendering the opinions set forth in this declaration, I have been asked to consider the '017 patent's claims and the prior art through the eyes of a person of ordinary skill in the art. I have also been informed that several factors are considered in assessing the level of ordinary skill in the art, including: (1) the types of problems encountered in the art; (2) prior art solutions to those problems, (3) the rapidity with which innovations are made; (4) the sophistication of the technology; and (5) the educational level and years of experience level of those working in the pertinent field.

25. I understand that I must evaluate the '017 patent from the perspective of a person of ordinary skill in the art. That is, the '017 patent must be evaluated through the eyes of a person with ordinary skill in the relevant art at the time of the invention of this patent. It is my opinion that such a person of ordinary skill in the art ("POSITA") would have had at least a bachelor's degree in electrical engineering or a similar field and at least two years of experience working with electrical circuits, including electrical power connectors. Additional relevant work experience can compensate for less education, and vice versa.

26. Based on my educational background and experience, such as my background in laboratory research as well as experience in the telecommunications industry (*see* paragraphs 3 - 8), I am qualified as at least a person of ordinary skill

in the art with respect to the '017 patent. Thus, I am familiar with the knowledge of the person of ordinary skill in the art at the time of the '017 patent's invention. I am able to opine on how a person of ordinary skill in the art would have understood the disclosure and claims of the '017 patent, the disclosures of the prior art, the motivation to combine the prior art, and what combinations would have been obvious and not have been obvious to one of ordinary skill in the art.

VI. OVERVIEW OF TECHNOLOGY

A. The Nature of Electrical Arcing

27. When the electric field between two plates exceeds a threshold known as the dielectric breakdown intensity (frequently referred to as the “breakdown voltage”), a conductive path can form between the two electrodes, resulting in an arc which conducts electricity. In air, the breakdown voltage is 30kV/cm. Exceeding this voltage results in the creation of ions which facilitates the creation of a conductive path along which the arc travels.

28. Below are illustrations of several scenarios when a voltage is placed across two spaced plates, resulting in an electrical field between the plates:

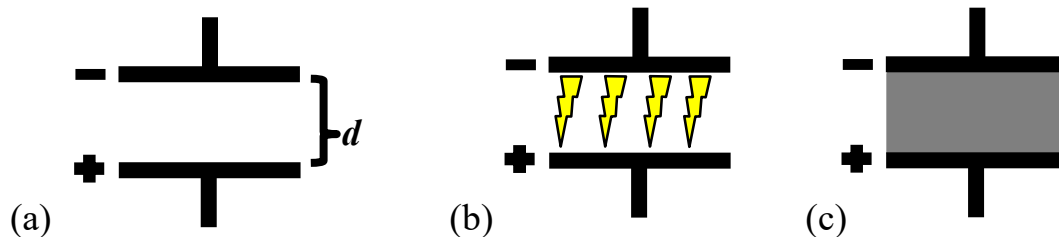


FIG. (a), at the left above, represents a parallel plate capacitor with two plates separated by a distance d . As a POSITA would understand, the electric field between the two parallel capacitive plates is $E = V/d$ where E is the electric field, V is the voltage, and d is the distance between the two plates. The electric field increases as the voltage is increased, or if the distance between the two plates is decreased.

29. FIG. (b), above center, illustrates the situation when the electric field exceeds the so-called breakdown voltage. Once the breakdown voltage is exceeded, the resulting conductive paths (arcs) formed from the creation of ions provides a conductive path that facilitates a current between the two plates. The definition of the word “arc” itself provides a further explanation of the process, with arc being defined as: “a luminous discharge of electricity through a gas characterized by a change in space potential in the immediate vicinity of the cathode; this change is approximately equal to the ionization potential of the gas.” Ex. 1010 at 44.

30. FIG. (c), above right, represents a parallel plate capacitor with a solid dielectric between the plates. A solid dielectric typically exhibits a much higher breakdown voltage, on the order of 5-10 MV/cm. As such, use of a dielectric results in a higher breakdown voltage which can reduce or prevent arcing under certain circumstances.

B. Arcing in the context of connectors

31. Although arcing can occur in the parallel plate capacitor configuration shown above, it is common to have arcing in situations where a charged point or edge is at a distance from another edge or point and with a voltage difference between them that results in dielectric breakdown and conduction of electricity via the resulting arc. The figure below depicts the formation of an arc between two electrode wires in a through-air path:

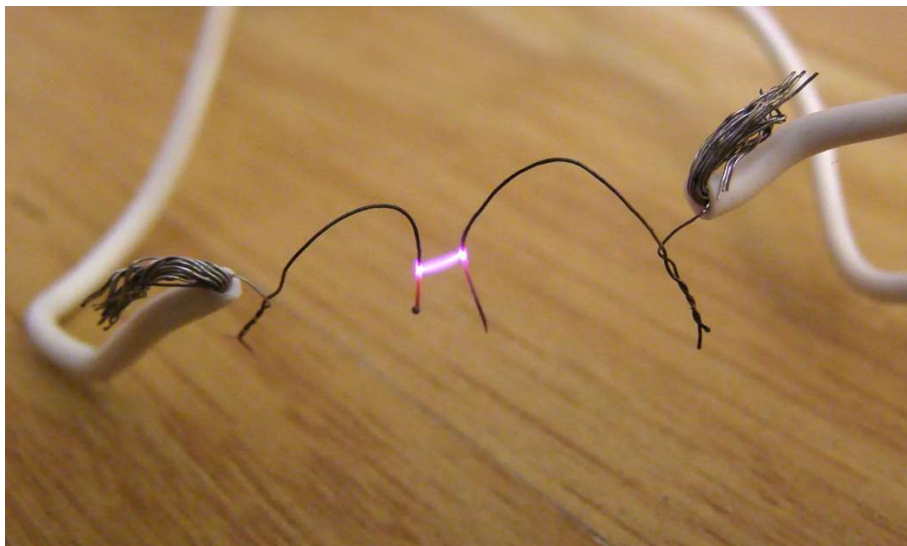


Image from Ex. 1011, captioned “Electric arc between strands of wire”

32. Also, in contrast to the parallel plate capacitor examples I illustrated above, connectors do not typically present flat parallel surfaces over which the fields are generated. With non-planar surfaces, and in particular surfaces with high-angle features (e.g. edges or protrusions commonly found in connectors) the electric field will be higher at the high-angle features than at the planar surface. As

such, dielectric breakdown and arcing can initiate at corners and edges present in the contacts of a connector.

33. Arcing between electrical contacts, such as those in a connector, are well understood and generally avoided. As taught in the '017 patent: “[e]lectrical connectors generally should not be connected or disconnected while the electrical load is turned on. Electrical arcing between the separated contacts of a live electrical connector present a hazard of fire and of burns to the user, and any such arcing tends to reduce the useful life of the connector.” Ex. 1001, 1:13-18.

34. Arcing in connectors is a well-understood problem that has been recognized in several prior patent references as well. Arcing can reduce the useful life of the connector because the arcing process – an inherently high-temperature and violent process – can result in contact erosion, welding, and contamination of the contacts. These changes can lead to degradation of the connector surfaces and undesirable increases in contact resistance. For example, as stated in a UK patent application published in 2001:

When the female connector is mated with the male connector in a conducting state, the front part of the male terminal first comes into contact with the front end of the female terminal, which causes to generate an arc discharge at the contacts to deteriorate or damage the contacts. Further, when the connectors are disengaged, the front end of the male terminal is last disengaged from the front end of the male

terminal, which also causes to generate an arc discharge at the corresponding parts to deteriorate or damage the contacts.

The deterioration of or damage to the contacts prevents the contacts of the female and male terminals from establishing good conduction, which causes to deteriorate the connector in reliability.

Ex. 1013, 1:26-2:10.

35. One of the issues with respect to arcing in connectors is “hot plugging” in which the male and female connector elements are joined while having a voltage differential existing between the connector elements. As an example, a connector in which the female element is at a non-zero voltage (e.g. 48V) and the male voltage is at zero can be considered “hot plugging.”

36. The issue of plugging under load (“hot plugging”) is well understood and was articulated by inventors over 50 years ago:

With plug connectors generally in use today, it has been found that separation of mating contact elements under load often cannot be carried out because the electrical arcs occurring as a result of the discontinuity of the electrical conducting path, cause a considerable wear of the material at the contact-making portion of the connectors. The burning of the contact and the damage effected thereby limit the utilization of such connectors and ultimately render such devices useless. Thus, the high transfer resistance occurring as the mating contact elements are separated bring about an undesirable electrical arc,

the control of which has heretofore been either tolerated or eliminated by removing power from the equipment prior to disengagement of the electrical connectors.

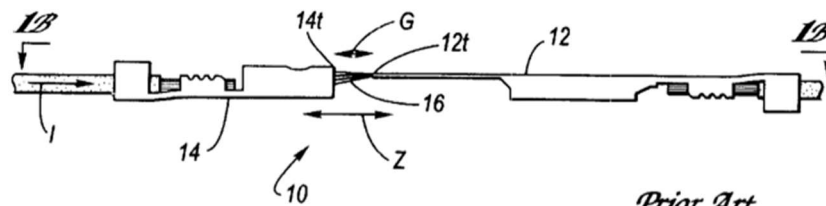
Ex. 1014, 1:14-28. Plugging under load or “hot plugging” cannot always be avoided, with well understood consequences, as articulated by Schoepf et al. in a U.S. patent that issued in 2002:

[D]uring their service life, connectors can be plugged/unplugged under load many times (i.e. “hot plugged”).

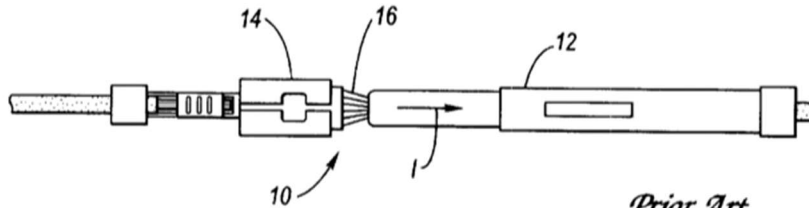
[U]nder specific conditions, a long arc may be generated at engage/disengage, which may cause extensive terminal erosion. This erosion may damage the physical shape of the terminal, preventing re-engagement or proper terminal contact forces after assembly. Additionally, the electrical arc may have serious consequences for the environment or nearby personnel.

Ex. 1015, 1:17-49.

37. Schoepf et al. further illustrated and described the situation in which an electrical arc takes a “most direct path” between terminals:



Prior Art
Fig. 1A



Prior Art
Fig. 1B

FIGS. 1A and 1B depict a pair of matable electrical connectors 10, wherein the male terminal 12 thereof has just been separated from the female terminal 14 thereof, and the tips of the terminals are presently within the terminal proximity zone Z. By “terminal proximity zone” is meant a zone length over which an electrical arc is most prone to arise when the terminals are subjected to an applied voltage (that is, when under load), which length may vary depending, for example, upon circuit load and atmospheric conditions. An electrical arc 16 leaps between the closest tips 12t, 14t of the terminals 12,14, taking a most direct path therebetween. Because a most direct path is taken, the arc energy is maximal, resulting in potential for terminal erosion and for possible personnel injury.”

Ex. 1015, 1:17-49.

38. By 1943, inventors had already determined that electrical arcing could be mitigated and avoided by simply using insulating materials around the contacts, and by blocking air paths between adjacent contacts to close the direct or indirect air paths through which arcing could occur:

Arc-over failures of sockets are usually caused by arcs along air paths between the conductors, and not through the solid insulation. An object of my invention is connectors with male and female connector elements which effectively close all air paths between adjacent wires and contacts.

Ex. 1016, 1:17-23.

39. In summary, the problem of arcing between connectors under load (e.g. “hot plugging”), the related consequences of arcing to connector contacts, and the solution of blocking direct and indirect air paths between contacts to avoid arcing, have been well known and well understood for several decades prior to the ’017 patent.

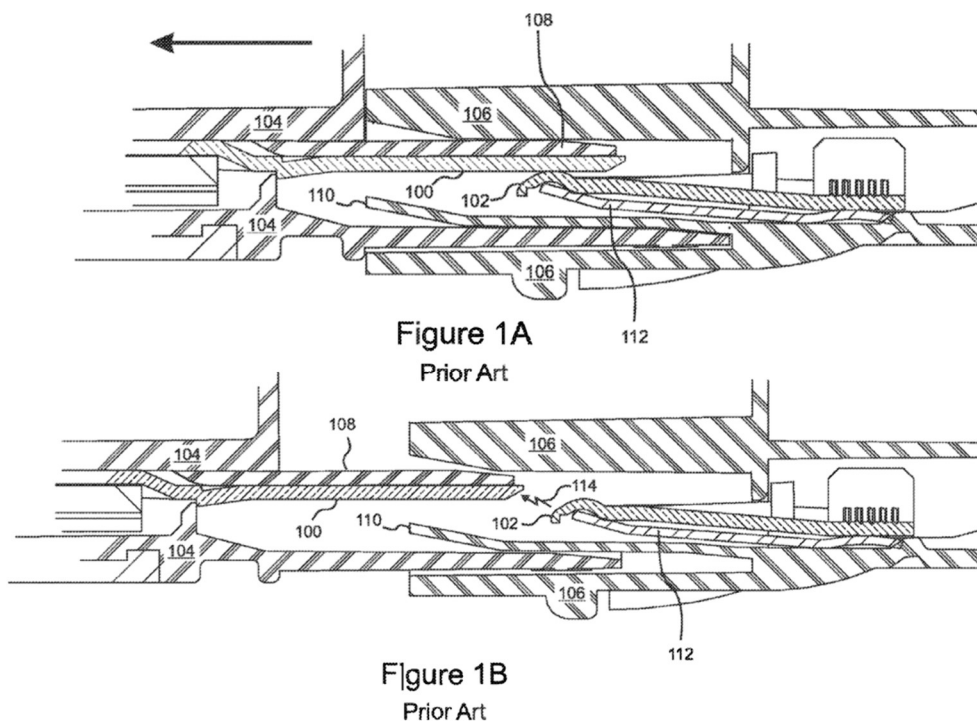
VII. THE ’017 PATENT

A. Summary of the ’017 Patent

40. The ’017 patent purports to address the technical problem of electrical arcing that can occur when connecting or disconnecting electrical power connectors while current is flowing. Ex. 1001, 1:6-8. The patent discloses two ways for addressing this problem: 1) insulation barriers near connectors to block

through-air arcing paths, and 2) a bimetal contact having a transitional segment of high resistivity. *Id.*, 1:55-2:22. The '017 patent has two independent claims: claim 1 recites insulation barriers; and claim 13 recites bimetal contacts. *Id.*, 4:20-24, 5:22-6:5.

41. The '017 patent discloses the structure and configuration of a pair of electrical connectors, and admits that nearly all the disclosed structure was known in the prior art. In Figs. 1A and 1B, the '017 shows a prior art connector pair in a connected configuration (Fig. 1A) and arcing during disconnection (Fig. 1B):



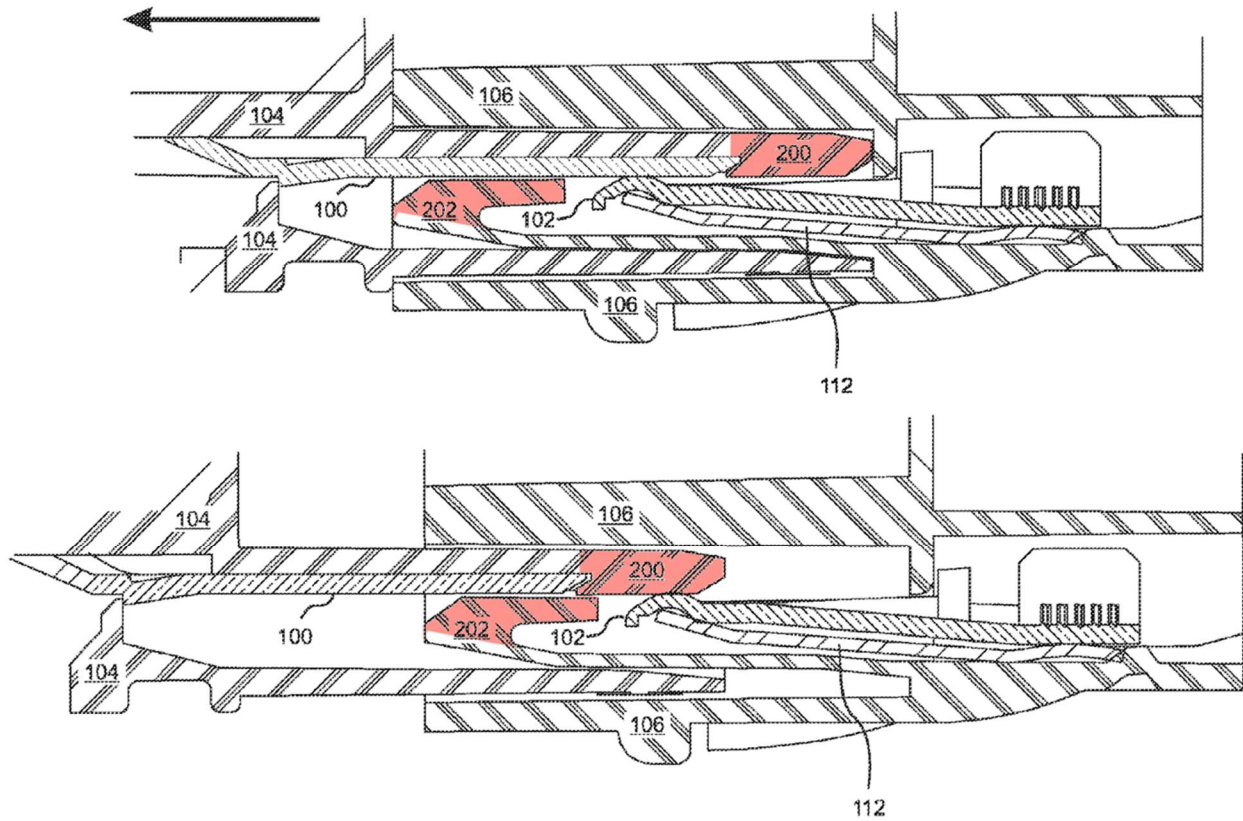
Ex. 1001, Figs. 1A and 1B

As illustrated, the prior art connector pair includes male contact 100 (a first electrical contact), female contact 102 (a second electrical contact), insulated

housing 104 (a first insulated housing), insulated housing 106 (a second insulated housing), and spring 112 that presses the female contact 102 against the male contact 100.

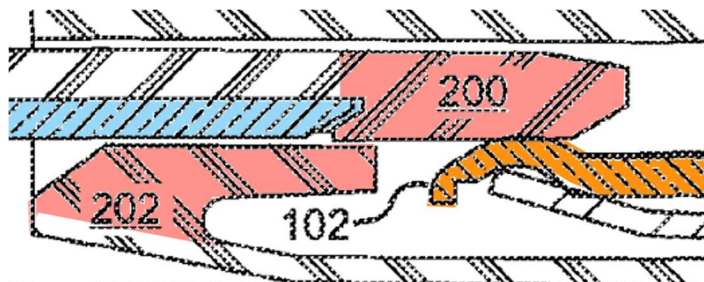
42. The '017 patent next discusses its insulation barriers, shown in Figs. 2A and 2B. At the outset, the '017 patent admits that “[t]he embodiment is similar to the prior art design of FIG. 1A, except that the insulating support structures 108, 110 have been replaced by the insulating barrier structures 200, 202.” Ex. 1001, 3:20-23. Indeed, Figs. 2A and 2B use the same reference numerals to refer to prior art components shown in Figs 1A and 1B, and items 200 and 202 to identify what the alleged invention purportedly added. The diagram below identifies the *only*

substantive differences between the admitted prior art in Figs. 1A and 1B, and the alleged invention in Figs. 2A and 2B:



Ex. 1001, Figs. 2A (top) and 2B (bottom) (both annotated highlighting substantive differences from prior art Figs. 1A and 1B in red)

A portion of Fig. 2B is enlarged below, showing the two **insulating barriers** in **red** engaged with one another to block through-air arcing paths between **male contact 100** (blue, below) and **female contact 102** (orange, below):



Ex. 1001, portion of Fig. 2A (annotated highlighting engaged *insulation barriers* in red, male contact 100 in blue, and female contact 102 in orange)

Therefore, the only difference from the prior art is admittedly limited to the addition of two insulating barriers that “engage with each other when the contacts are separated, thereby closing off all through-air paths between the contacts and suppressing arcing.” Ex. 1001, 1:64-2:3. This configuration in the ’017 patent purports to address the issue that “arcing can still occur through an indirect path that by-passes the insulating barrier.” *Id.*, 1:42-47.

B. Priority Date

43. The ’017 patent was filed as Application Number 13/734,025 on January 4, 2013. Ex. 1001, Cover. For the purposes of this Declaration, I have been asked to assume that the ’017 patent has an earliest priority date of January 4, 2013.

VIII. CLAIM CONSTRUCTION

44. I have been informed that in an *inter partes* review, claim terms should be given the meaning that they would have to a person of ordinary skill in the art in question at the time of the patent’s alleged priority date—here, its earliest priority date of January 4, 2013. The person of ordinary skill is deemed to read the claim term not only in the context of the claim in which the disputed term appears, but in the context of the entire patent, including the specification and the

prosecution history. I have also been informed claims should only be construed to the extent necessary to resolve any controversy.

45. I have been instructed that the “intrinsic record” includes the patent itself, including the claims, description, and figures (’017 Patent, Ex. 1001), and the patent’s prosecution history—i.e., the record of proceedings at the U.S. Patent and Trademark Office (“Patent Office”) concerning the patent (Ex. 1002). I understand that, like the claims and written description, the prosecution history provides evidence to a person of ordinary skill in the art of how the inventor intended his or her patent to be understood, and how the Patent Office understood the patent. I understand that the inventor is permitted to apply a special definition to the terms or to limit the scope of claim terms in his or her patent claims, which may differ from the term’s plain and ordinary meaning. That special definition or limitation on scope may be provided in the patent’s written description, the patent’s prosecution history, or both. I understand that claim interpretation may also be informed by “extrinsic evidence” (that is, evidence outside of the patent record itself). I have been informed that extrinsic evidence may include dictionaries, technical treatises, and other materials evidencing the meaning of a claim term and the understanding held by a person of ordinary skill in the art in the relevant time period.

46. I have been asked for purposes of this declaration to apply the plain and ordinary meaning of the claim terms as they would have been understood by a person of ordinary skill in the art at the earliest priority date of the '017 patent. I understand that no claim term's construction is in dispute at this time. Based on my review of these materials and my personal knowledge and experience, I have considered each term of the '017 patent as it would have been understood by a person of ordinary skill in the art at the earliest priority date of January 4, 2013.

IX. PRIOR ART

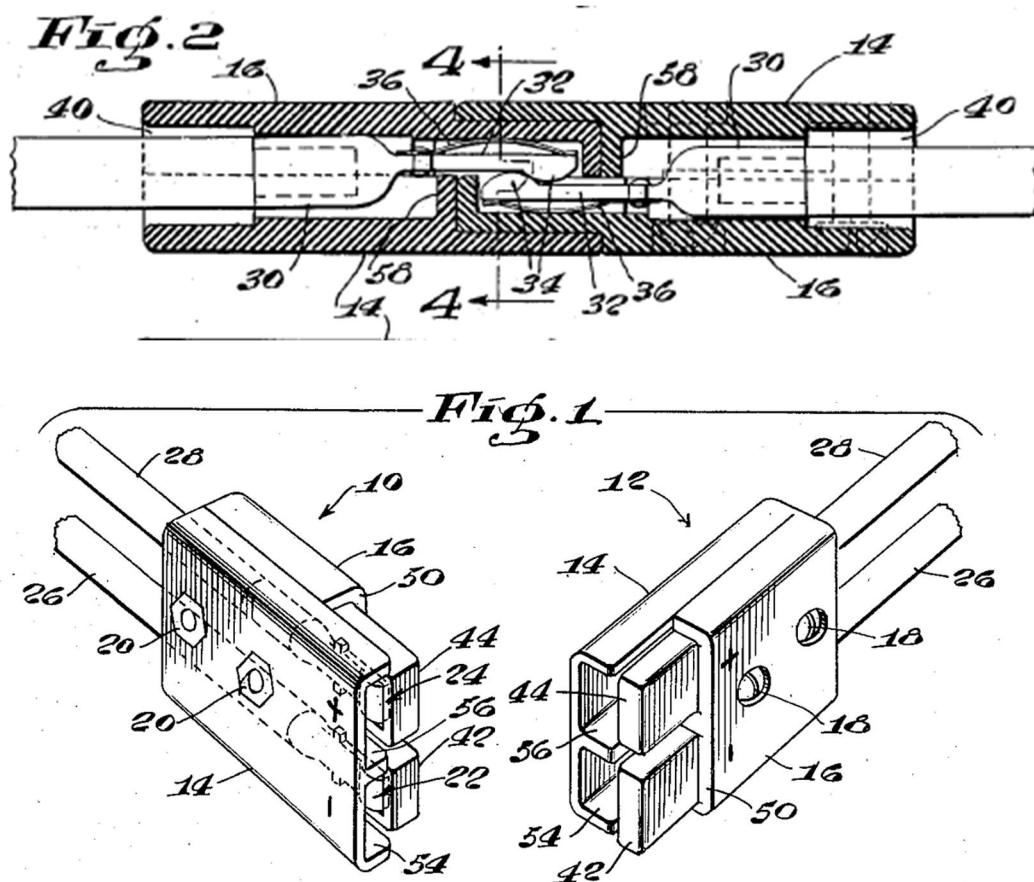
47. In forming my opinions, I reviewed the following prior art references:

Ex. 1004	U.S. Patent No. 2,838,739 to E.D. Winkler (" <i>Winkler</i> ")
Ex. 1005	U.S. Patent No. 8,182,278 to Kataoka et al. (" <i>Kataoka</i> ")
Ex. 1006	U.S. Patent No. 3,909,099 to Edward D. Winkler (" <i>Winkler2</i> ")
Ex. 1007	U.S. Patent No. 4,634,211 to Poliak et al. (" <i>Poliak</i> ")
Ex. 1008	Mroczkowski, Robert S., <i>Electrical Connector Handbook</i> (1998) ("Electrical Connector Handbook" or "the Handbook")

A. *Winkler* (Ex. 1004)

48. *Winkler* is a U.S. patent issued on June 10, 1958, and published over five decades before the '017 patent filing date. I understand that *Winkler* therefore qualifies as prior art to the '017 patent.

49. *Winkler* discloses a pair of electrical connectors 10 and 12 with insulating sections 14 and 16—depicted below as connector 10 on the left and connector 12 at the right. Ex. 1004, Title, 1:67-70, Figs. 1, 2:



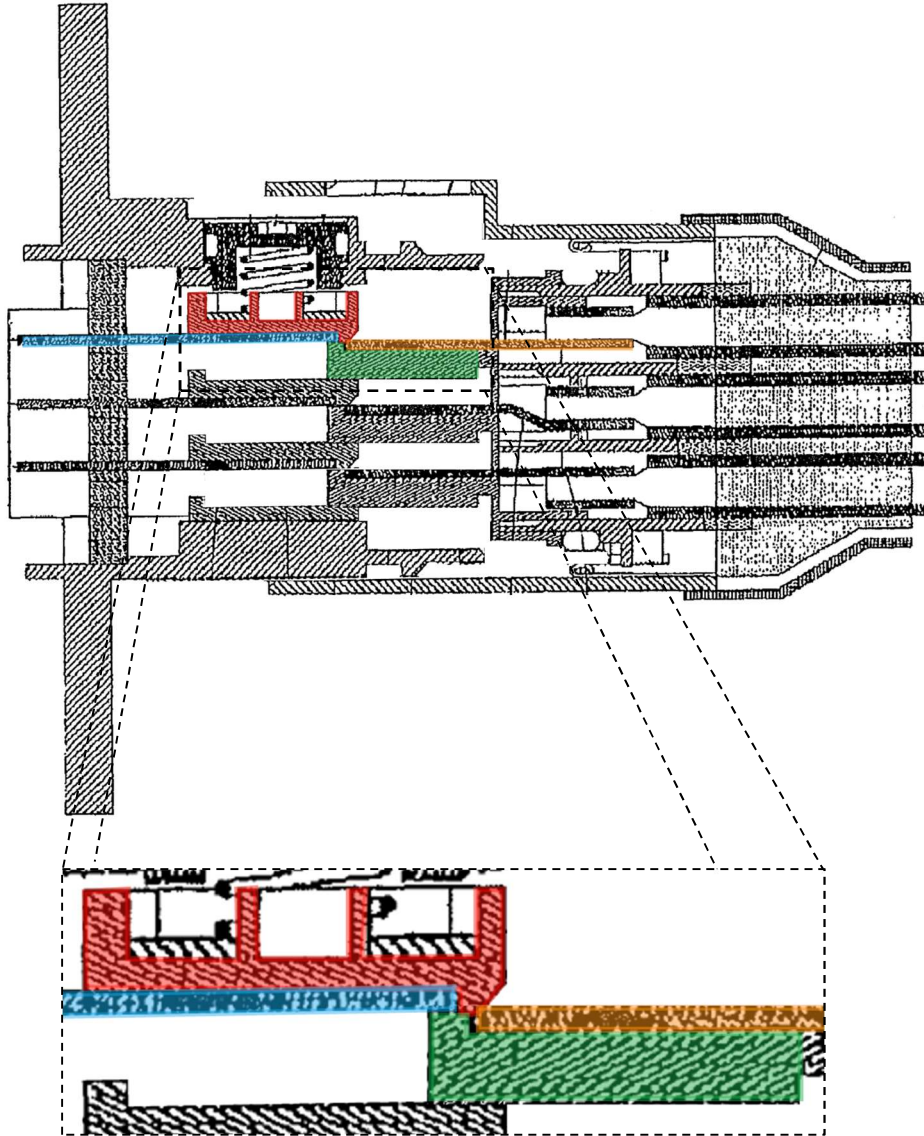
Winkler, Ex. 1004, Figs. 2 and 1 (connectors 10 and 12 with insulating sections 14 and 16)

50. Both connectors are “provided with an insulating housing surrounding and enclosing the terminals for maximum insulating protection.” Ex. 1004, 1:47-50 (“The present connector is provided with **an insulating housing surrounding and enclosing the terminals for maximum insulating protection . . .**”)(emphasis added). The insulated housing includes contact-enclosing pockets 42, 44, “with only the upper contacting portions exposed” and “socket-forming portions extending over the exposed portions of the terminals [to] provide a protective insulating wall above the terminals.” *Id.*, 3:7-13. *Winkler* also recognizes that “arcing at the extreme ends thereof during [contact members’] disengagement” can occur. *Id.* 3:41-42.

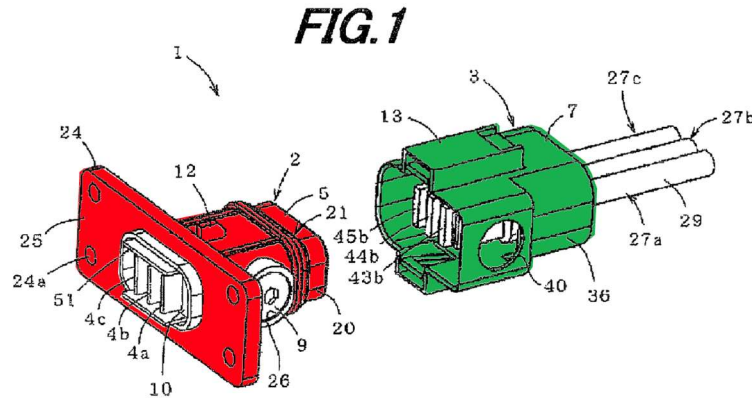
B. *Kataoka* (Ex. 1005)

51. *Kataoka* is a U.S. patent that issued on May 22, 2012, before the ’017 patent filing date of January 4, 2013. I understand that *Kataoka* therefore qualifies as prior art to the ’017 patent.

52. *Kataoka* discloses a “connector . . . for transmitting a large amount of power.” Ex. 1005, 1:12-14. *Kataoka*’s connector includes two sets of connector terminals and two sets of corresponding insulating members:



Annotated diagrams based on Ex. 1005, Fig. 3 (top), with enlarged portion (bottom)(showing **insulating members** in **green** and **red** and **electrical contacts** in **blue** and **orange**)



Ex. 1005, Fig. 1 (annotated to show a **first connector portion 2 in red** and a **second connector portion 3 in green**)

53. Each connector portion has a set of contacting terminals 4 and 6 (electrical contacts annotated in blue and orange) and insulating members shielding the corresponding the electrical contacts (shown in red and green). Ex. 1005, 4:58-5:33 (“each contact point is arranged so as to be sandwiched by the insulators 8a-8d” and “the first insulating members 43a-46a . . . cover at least an end surface of [first connecting terminal 4a (or 4b or 4c)] on a front end side in a fitting direction.”). *Kataoka* discloses covering surfaces of the electrical contacts with insulating barriers so that the electrical contacts “are not exposed in the non-fitted state and it is thereby possible **to prevent** unintentional contact and **electric shock** to a foreign object such as a hand or finger of a worker, etc.” Ex. 1005, 15:12-22 (emphases added). *Kataoka* was assigned on its face to Hitachi Cable, Ltd. *Id.*, cover.

C. *Winkler2* (Ex. 1006)

54. *Winkler2* issued on September 30, 1975, long before the '017 patent filing date. I therefore understand that *Winkler2* qualifies as prior art to the '017 patent.

55. *Winkler2* discloses a pair of electrical connectors substantially similar to the connectors of *Winkler*. See Ex. 1006, Fig. 1; Ex. 1004, Fig. 1. *Winkler2* further discloses that “electrical cable 22 is mechanically and electrically secured to the rigid terminal member 16 by conventional means, such as, by crimping and/or soldering.” Ex. 1006, 2:12-14.

D. *Poliak* (Ex. 1007)

56. *Poliak* issued on January 6, 1987, long before the '017 patent filing date. Ex. 1007, cover. I understand that *Poliak* is therefore prior art to the '017 patent.

57. *Poliak* discloses a screw subassembly for a wiring device. Ex. 1007, title. The subassembly includes a screw that moves a carriage and an attached spring to press conductor wires against electrical terminals. Ex. 1007, abstract, 2:2-68, 4:58-5:15, 6:7-34, Fig. 5.

E. Electrical Connector Handbook (“the Handbook,” Ex. 1008)

58. The Electrical Connector Handbook (“the Handbook”) is a printed publication written by Robert S. Mroczkowski, and identifies itself as published in

1998, fifteen years before the '017 patent filing date. Ex. 1008 at 3. I have been asked to assume that the Handbook is prior art to the '017 patent.

59. The Handbook discloses several types of electrical connectors, their design considerations, uses, and advantages of these different connector types. *See* Ex. 1008 at 78. The Handbook discloses several of the commonly-used terminal configurations recited in dependent claims of the '017 patent, and in my opinion, demonstrates that several dependent claims, such as those reciting insulation displacement and printed wiring boards, would have been obvious to a POSITA.

F. Grounds

60. Based on my review of the materials set forth above, including my application of the knowledge of a person of ordinary skill in the art, it is my opinion that claims 1-4 and 7-12 of the '017 patent are anticipated and/or rendered obvious to one of ordinary skill in the art.

61. In particular, it is my opinion that claims 1-4 and 7-12 of the '017 patent would have been anticipated, rendered obvious, or both to one of ordinary skill in the art on the grounds below:

Ground	Claim(s)	Basis Under 35 U.S.C.	Prior Art
1A	1-4, 9	§ 102	<i>Winkler (Ex. 1004)</i>

Ground	Claim(s)	Basis Under 35 U.S.C.	Prior Art
1B	7	§ 103	<i>Winkler</i> (Ex. 1004) in view of <i>Winkler2</i> (Ex. 1006)
1C	8, 10	§ 103	<i>Winkler</i> (Ex. 1004) in view of Handbook (Ex. 1008)
1D	11, 12	§ 103	<i>Winkler</i> (Ex. 1004) in view of <i>Poliak</i> (Ex. 1007)
2A	1-4	§ 102	<i>Kataoka</i> (Ex. 1005)
2B	7-10	§ 103	<i>Kataoka</i> (Ex. 1005) in view of the Handbook (Ex. 1008)

X. CLAIMS 1-4 and 7-12 ARE UNPATENTABLE OVER THE PRIOR ART

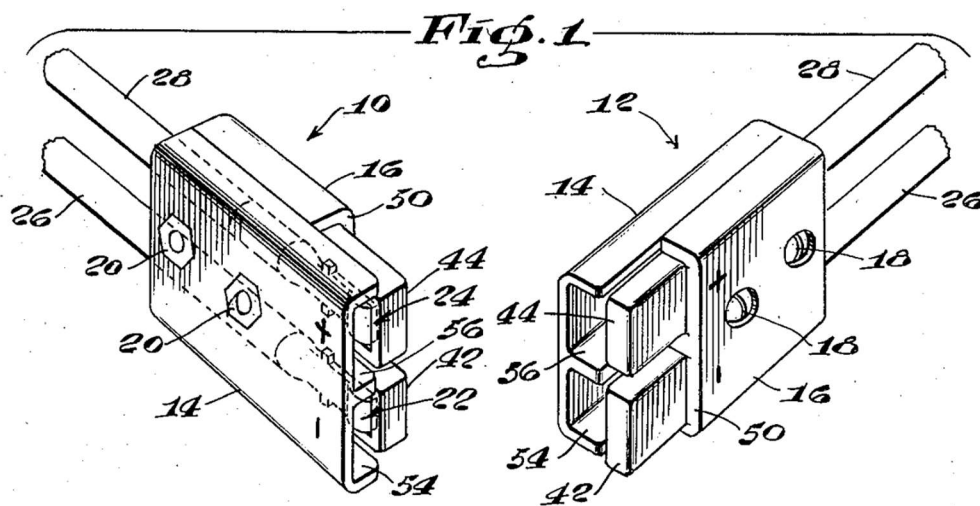
A. Ground 1A: Claims 1-4 and 9 Are Anticipated by *Winkler*

62. In my opinion, *Winkler* discloses each and every element of independent claim 1 and dependent claims 2-4 and 9.

1. Independent Claim 1

a. 1[pre] An electrical connector pair, comprising:

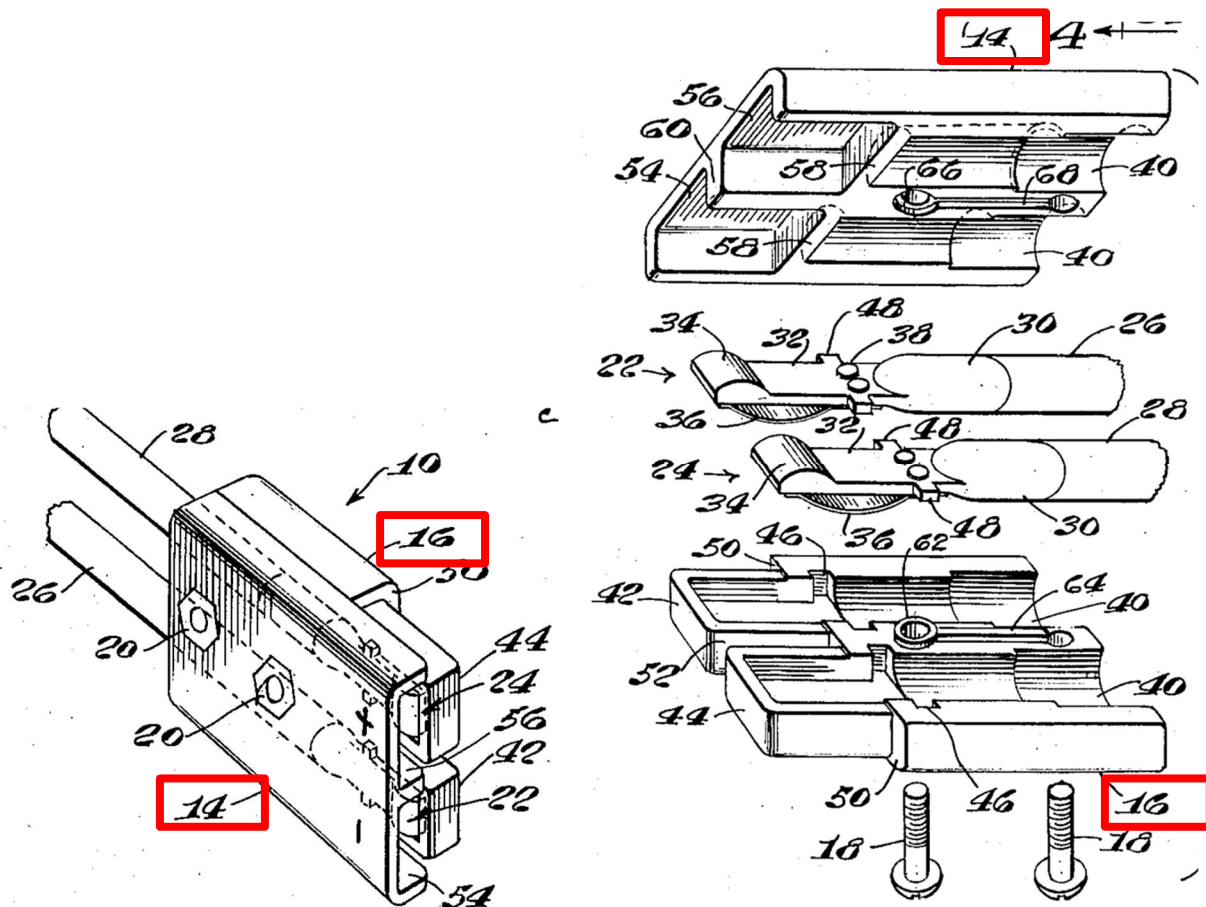
63. In my opinion, *Winkler* discloses 1[pre]. *Winkler* discloses “a pair of two pole electrical cable connectors indicated at 10, 12.” Ex. 1004, 1:68-70. Figure 1 of *Winkler* illustrates connectors 10 and 12:



Winkler, Ex. 1004, Fig. 1 (showing a pair of connectors 10 and 12)

b. 1[a] a first connector having a first insulating housing;

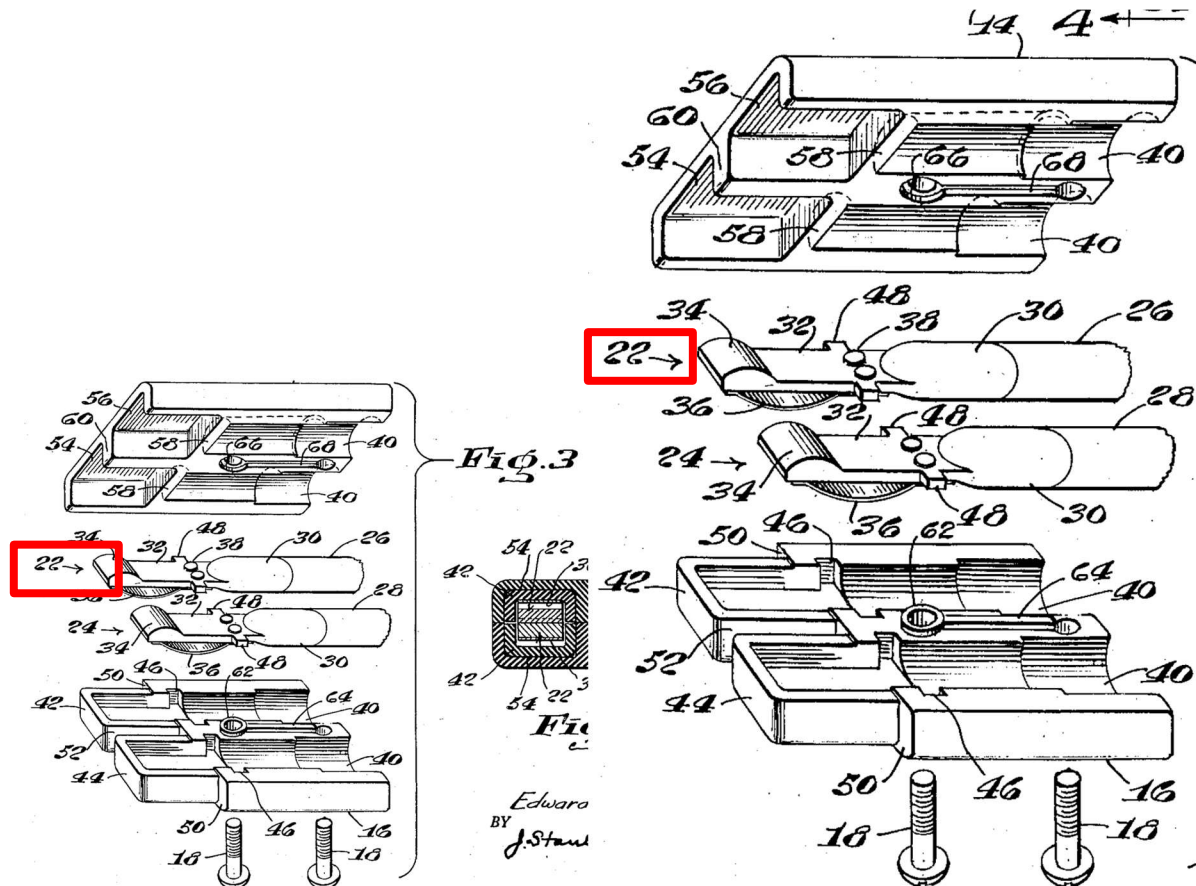
64. In my opinion, *Winkler* discloses 1[a]. *Winkler* discloses a first connector 10 having “an insulating housing split longitudinally to form two half sections comprising an upper half section 14 and a lower half section 16, as viewed in Fig. 3.” Ex. 1004, 1:47-50, 1:68-2:2, 3:7-13.



Ex. 1004, portion of Fig. 1 (left) and Fig. 3 (right) (both annotated circling insulating housing upper half section 14 and lower half section 16)

c. 1[b] a first electrical contact supported within the first insulating housing,

65. In my opinion, *Winkler* discloses 1[b]. *Winkler* discloses a contact member 22, a terminal for electrical cable 26. Ex. 1004, 2:4-7.

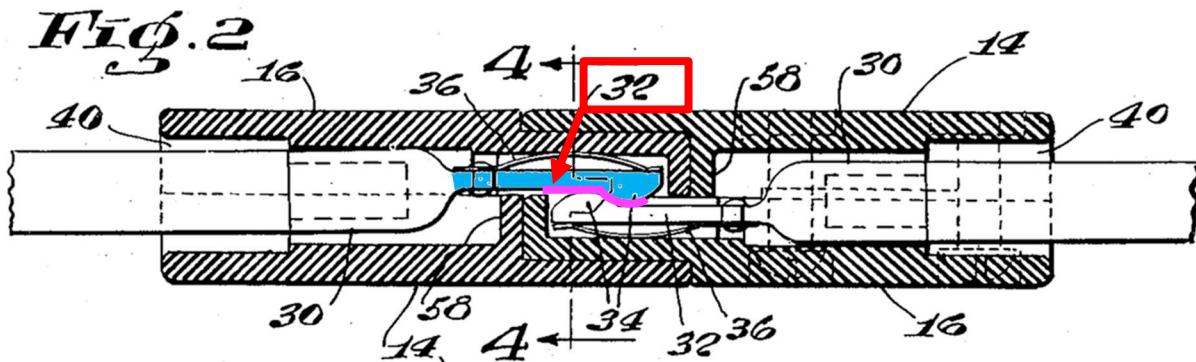


Ex. 1004, portion of Fig. 1 (left) and Fig. 3 (right)
(both annotated circling contact member 22)

66. Figure 1 of *Winkler* above shows that contact member 22 is supported by and enclosed within the insulated housing half sections 14 and 16. Therefore, it is my opinion that contact member 22 of *Winkler* is a “first electrical contact supported within the first insulated housing,” as claimed.

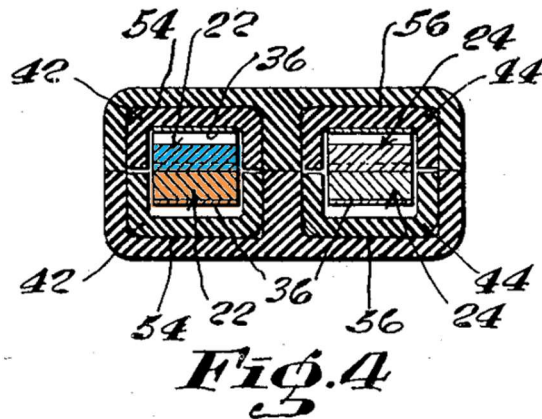
- d. 1[c] the first electrical contact having a connecting surface that is substantially parallel with a longitudinal axis of the insulating housing and terminates in a leading end of the first electrical contact;

67. In my opinion, *Winkler* discloses 1[c]. The contact member 22 of *Winkler* (the “first electrical contact”) has a connecting surface, i.e., an “elongated flat portion 32.” Ex. 1004, 2:10-14.



Ex. 1004, Fig. 2 (annotated highlighting a contact member 22 in blue, circling elongated flat portion 32, and identifying a connecting surface in pink)

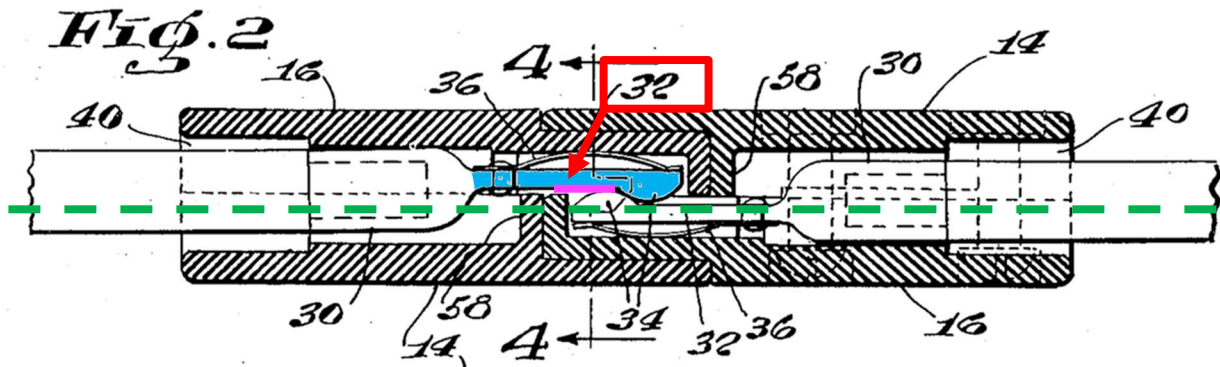
As shown in Fig. 2 of *Winkler*, above, contact member 22 (highlighted in blue, above) includes an elongated flat portion 32. The elongated flat portion 32 is a “connecting surface” as claimed, because a contact member (which is a terminal) from a mated connector establishes an electrical connection with elongated flat portion 32. A cross section of Fig. 2 is provided in Fig. 4:



*Ex. 1004, Fig. 4 (highlighting a second **contact member 22** in **orange**,
and first **contact member 22** in **blue**)*

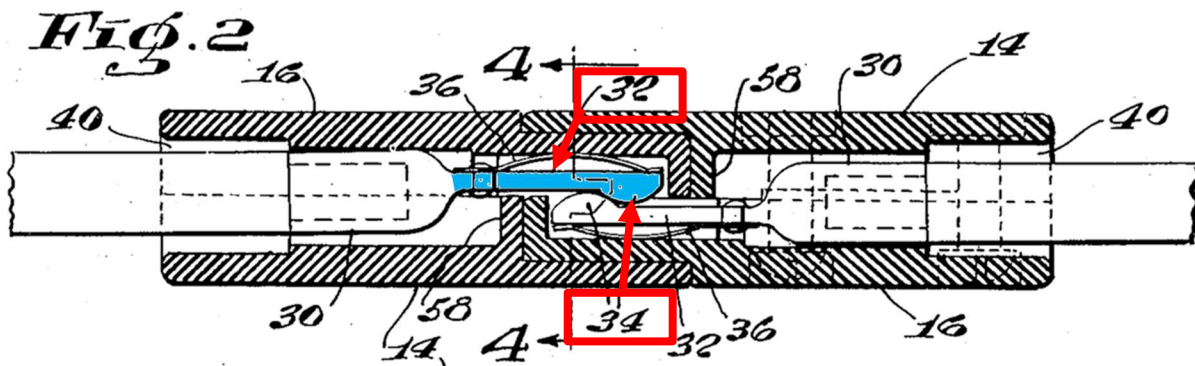
Figure 4 shows a **second contact member 22** connecting to the flat elongated portion 32 of the first **contact member 22**. The cross-sectional view shown in Fig. 4 shows a connection with flat elongated portion 32. *See Fig. 2, above.* Therefore, at least the flat elongated portion 32 of contact member 22 is a “connecting surface,” as claimed.

68. Furthermore, elongated flat portion 32 (having the claimed “**connecting surface**” shown in **pink** below) is substantially parallel with a **longitudinal axis** of the insulating housing, which is comprised of half sections 14 and 16:



Ex. 1004, Fig. 2 (annotated highlighting a contact member 22 in blue, adding a longitudinal axis in green, circling elongated flat portion 32, and identifying a connecting surface in pink)

69. In my opinion, the connecting surface of *Winkler*'s contact member 22 "terminates in a leading end of the first electrical contact," as claimed. *Winkler*'s disclosure is thus consistent with Patent Owner's apparent interpretation of 1[c]. As shown in Fig. 2 of *Winkler*, contact member 22 has a leading end called a "convex end portion 34." Ex. 1004, 2:10-14.

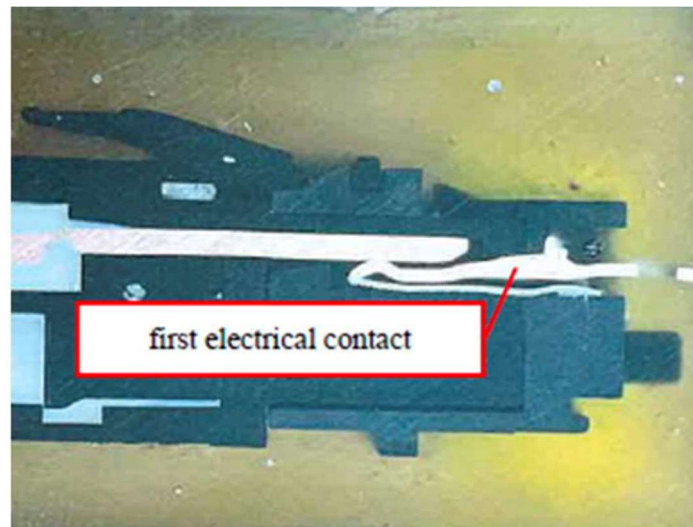


Ex. 1004, Fig. 2 (annotated highlighting a contact member 22 in blue, and circling elongated flat portion 32 and convex end portion 34)

The flat elongated portion 32 of contact member 22 ends at convex end portion 34, which is at the end of contact member 22.

70. For these reasons, It is my opinion that *Winkler's* contact member 22 constitutes the claimed “the first electrical contact having a connecting surface that is substantially parallel with a longitudinal axis of the insulating housing and terminates in a leading end of the first electrical contact,” and is therefore my opinion that *Winkler* discloses 1[c].

71. Additionally, it is my opinion that *Winkler's* disclosure is consistent with Patent Owner's apparent interpretation of 1[c]. I understand that, in asserting the '017 patent in the related, pending litigation against the Petitioner BizLink Technology, Patent Owner Anderson Power mapped limitation 1[c] to an electrical contact having a similarly convex end:



Ex. 1009 at 11 (showing Patent Owner's interpretation of 1[c])

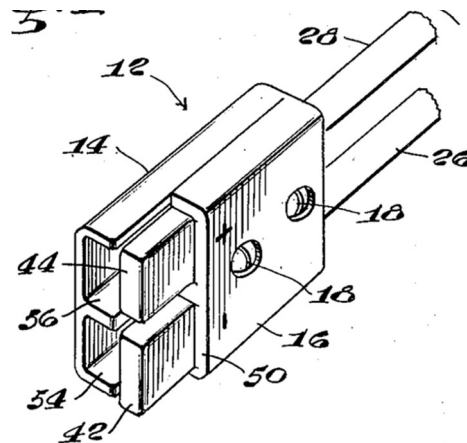
In other words, Patent Owner appears to suggest that an electrical contact with a convex end as shown above as meeting the claimed “connecting surface that is

substantially parallel with a longitudinal axis of the insulating housing and terminates in a leading end of the first electrical contact.” Ex. 1009 at 11.

Therefore, it is my opinion that *Winkler*’s convex end portion constitutes substantially the same structure that Patent Owner alleges meets 1[c].

e. 1[d] a second connector having a second insulating housing;

72. In my opinion, *Winkler* discloses 1[d]. *Winkler* discloses a pair of identical connectors 10 and 12. Ex. 1004, 1:27-28, 2:4-10. Just as connector 10 of *Winkler* constitutes the claimed “first connector” of 1[b], connector 12 constitutes the “second connector” of 1[d]. Insulated housing upper half 14 and lower half 16 of connector 12 forms the claimed “second insulating housing”:



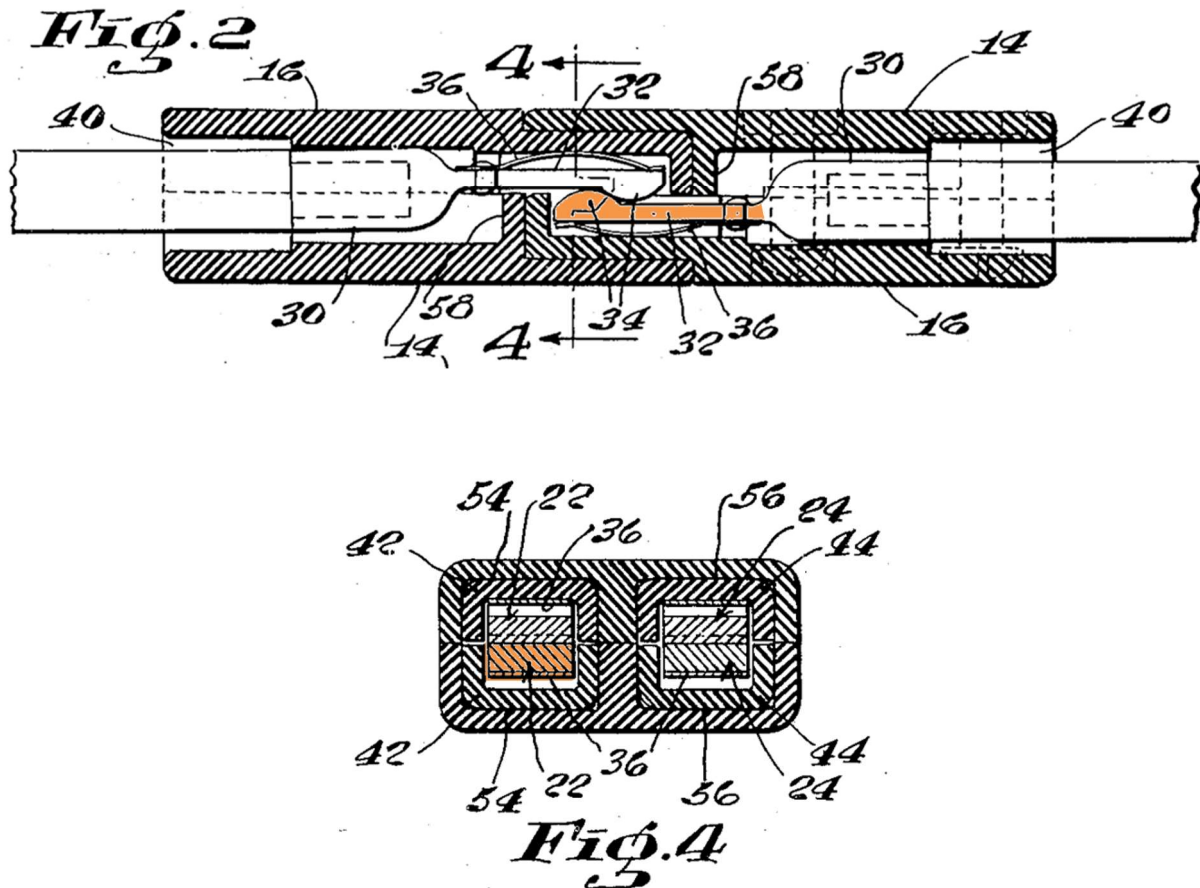
Ex. 1004, portion of Fig. 1 (showing a second connector 12)

For these reasons and the reasons discussed in Section X.A.1.c regarding connector 10, *Winkler* meets 1[d].

- f. 1[e] a second electrical contact supported within the second insulating housing,

73. In my opinion, *Winkler* discloses 1[e]. *Winkler* discloses that “each insulated housing is arranged to support two identical contact members 22, 24.”

Ex, 1004, 2:4-6. Figures 2 and 4 of *Winkler* are highlighted to show a second electrical contact 22 supported within the second insulating housing, in orange:

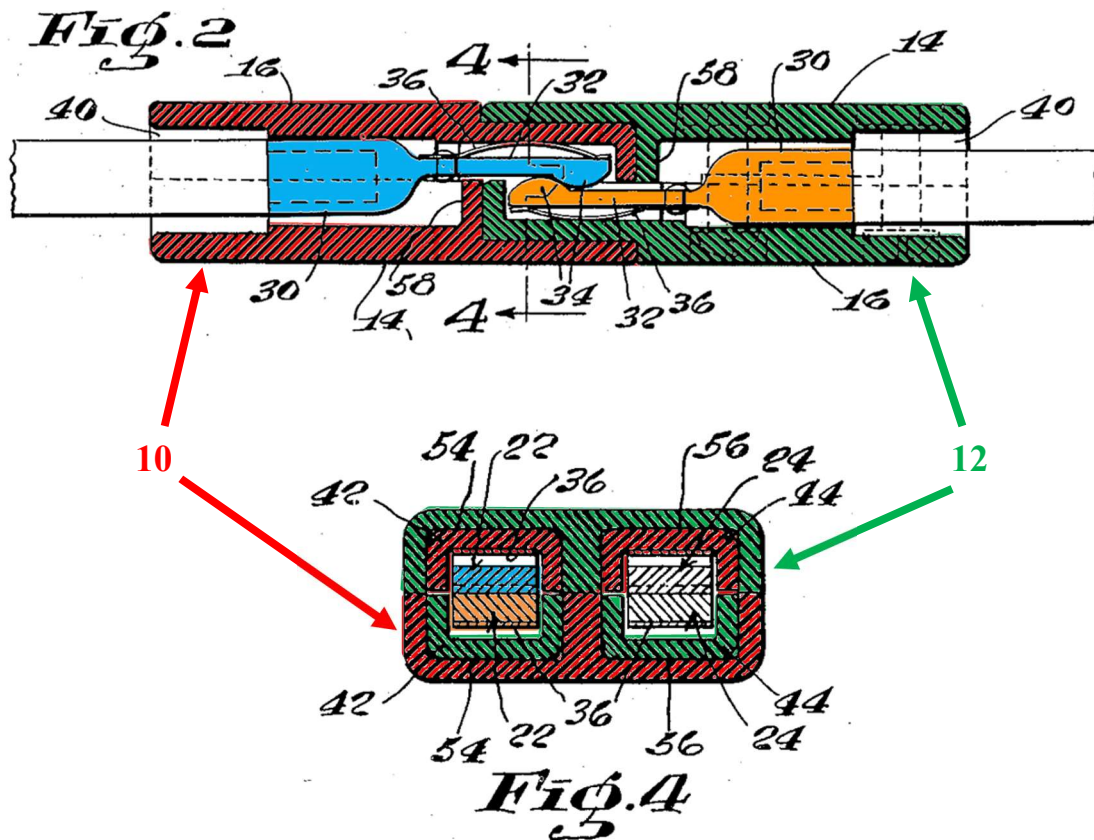


Ex. 1004, Figs. 2 and 4 (annotated highlighting
a second **contact member 22** in **orange**)

Winkler discloses that contact member 22 is a terminal for electrical cable 26. Ex. 1004, 2:4-7. Therefore, contact member 22 is an “electrical contact” as claimed. For these reasons, as well as the reasons discussed in Section X.A.1.c regarding contact member 22 in the identical first connector 10, *Winkler* meets 1[e].

- g. 1[f] the second electrical contact being configured to laterally engage with the connecting surface of the first electrical contact when the first connector is mated with the second connector;**

74. In my opinion, *Winkler* discloses 1[f]. *Winkler* discloses identical connectors 10 and 12 that are configured to be mated, as shown in Fig. 2, below. When connectors 10 and 12 are mated, contact member 22 (the “electrical contact”) of each connector engage laterally with one another. Fig. 4 of *Winkler* shows a cross sectional view of the mated connectors and shows lateral engagement of the first and second electrical contacts:



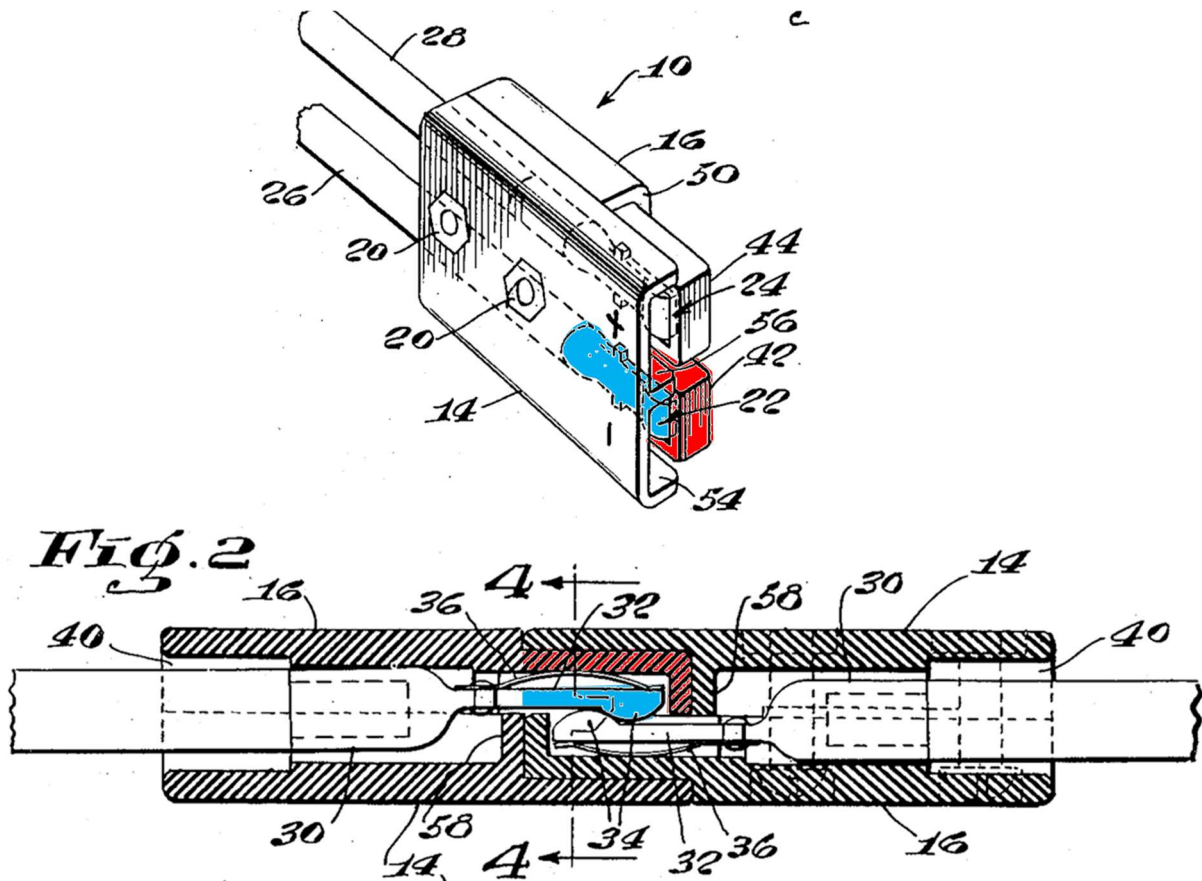
Ex. 1004, Fig. 2 (annotated highlighting a **first connector 10** in **red** being mated with a **second connector 12** in **green**, the **first connector** having a **first electrical contact** in **blue** that laterally engages with a **second electrical contact** in **orange**)

75. The contact members 22 (including their front ends 32 and 34) in *Winkler* (the first and second electrical contacts) “laterally engage” with one another as claimed, because they are placed in “interlocking engagement with each other when fully engaged.” Ex. 1004, 4:50-56. More particularly, the two spring-pressed contact members 22 are slidingly engaged with one another, such that “as the connectors approach full engagement, the springs 36 effect upward movement of the terminals in their pockets to present the curved portions 34 in hooked or

interlocked relation to each other.” *Id.*, 3:18-27. For these reasons, it is my opinion that *Winkler* discloses 1[f].

- h. 1[g] a first insulating barrier within the first connector extending beyond and covering the leading end of the first electrical contact; and**

76. *Winkler* discloses 1[g]. *Winkler*’s connector 10 includes a terminal receiving pockets 42 and 44 in the lower half section 16 of the insulated housing. Ex. 1004, 2:23-25. *Winkler*’s receiving pocket is a “first insulating barrier” that “cover[s] the leading end of the first electrical contact” as claimed. And *Winkler* describes that “[t]he lower half section 16 of the housing is provided with **two spaced forwardly extended terminal-receiving pockets 42, 44 substantially U-shaped in cross section and closed at their outer ends.**” *Id.*, 2:25-26 (emphases added).



*Ex. 1004, portion of Fig. 1 (top), Fig. 2 (bottom) (annotated highlighting a **contact member 22** in **blue**, and a **receiving pocket 42** in **red**)*

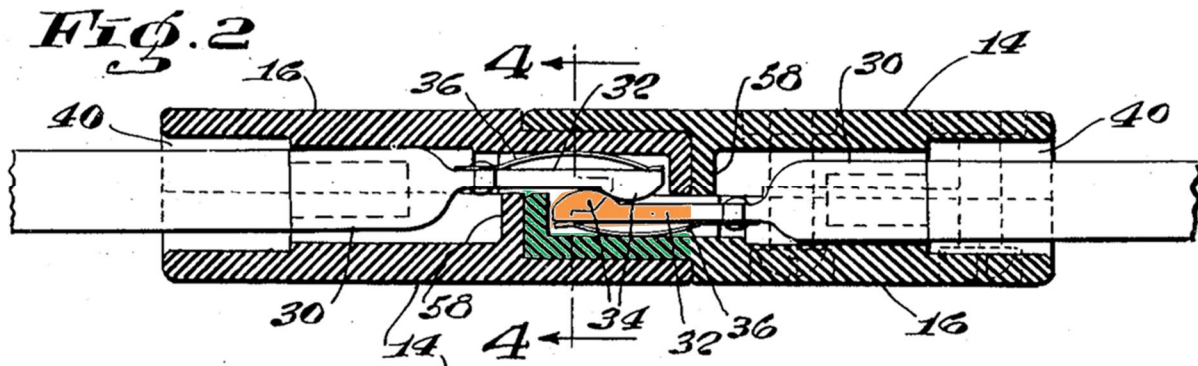
Consistent with the figures above, *Winkler* states that contact member 22 is “enclosed in the pocket[] 42.” *Ex. 1004*, 3:7-9; *see also id.*, 2:39-40. Receiving pocket 42 is thus a first insulating barrier that extends beyond and covers a leading end of contact member 22. Therefore, it is my opinion that receiving pocket 42 constitutes the claimed “first insulating barrier,” and *Winkler* meets 1[g].

77. Relatedly, I note that Patent Owner itself also characterized, as well known before the alleged invention, the use of an insulator barrier to covering a

conductive leading end, stating as background information that “[a]nother approach is to include **an insulating barrier that covers the leading end of one of the electrical contacts and blocks the direct through-air path** between the contacts.” Ex. 1001, 1:42-44 (emphasis added).

- i. **1[h] a second insulating barrier extending beyond the second electrical contact within the second connector,**

78. In my opinion, *Winkler* discloses 1[h]. Because *Winkler* discloses a pair of identical connectors 10 and 12, Ex. 1004, 1:27-28, 2:4-10, second connector 12 has the same structure as connector 10. Second connector 12 also includes a terminal receiving pocket 42 that is a “second insulating barrier extending beyond the second electrical contact” for the same reasons as discussed above with respect to the first connector 10 for 1[g]. See Section X.A.1.h. The “second insulating barrier” of the second connector is highlighted in green in *Winkler* Fig. 2, below:

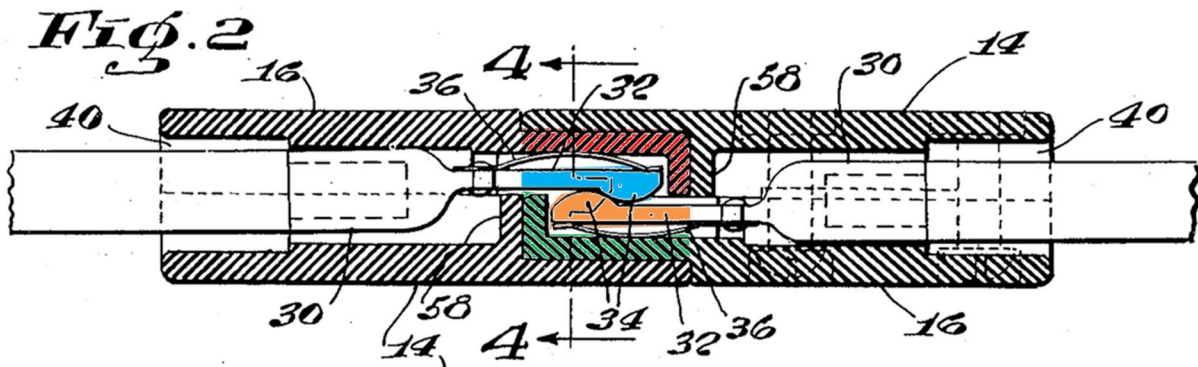


Ex. 1004, Fig. 2 (annotated highlighting a **contact member 22** of a second connector in **orange**, and a **receiving pocket 42** of the second connector in **green**)

For the reasons discussed above, it is my opinion that *Winkler* discloses 1[h].

- j. 1[i] the second insulating barrier being configured so as to be in close proximity with the first insulating barrier when the first and second connectors are partially disconnected and the first and second electrical contacts are separated by a short distance, thereby blocking substantially all through-air arcing paths between the first and second electrical contacts.

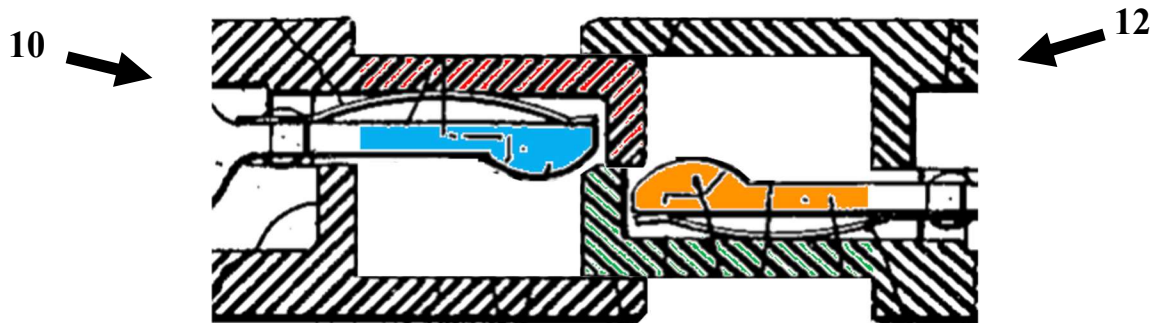
79. In my opinion, *Winkler* discloses 1[i]. *Winkler* discloses a first connector having a **first insulating barrier** and **first electrical contact**, and a second electrical connector having a **second insulating barrier** and **second electrical contact**, as annotated in Fig. 2 of *Winkler*, below:



Ex. 1004, Fig. 2 (annotated highlighting a **first electrical contact** in blue and a **first insulating barrier** in red of a first connector, and a **second electrical contact** in orange and a **second insulating barrier** in green of a second connector)

80. In my opinion, the first insulating barrier and the second insulating barrier are configured to be in close proximity to one another when the first and second connectors are partially disconnected. As illustrated in the figure below, created based on FIG. 2 of *Winkler* and developed by taking the components of each half of the connector and recreating them in a separated state, the **second**

insulating barrier of *Winkler* (the right side insulating portion of the connector, in **green**) is in close proximity to the **first insulating barrier** located on the left side portion of connector (in **red**):

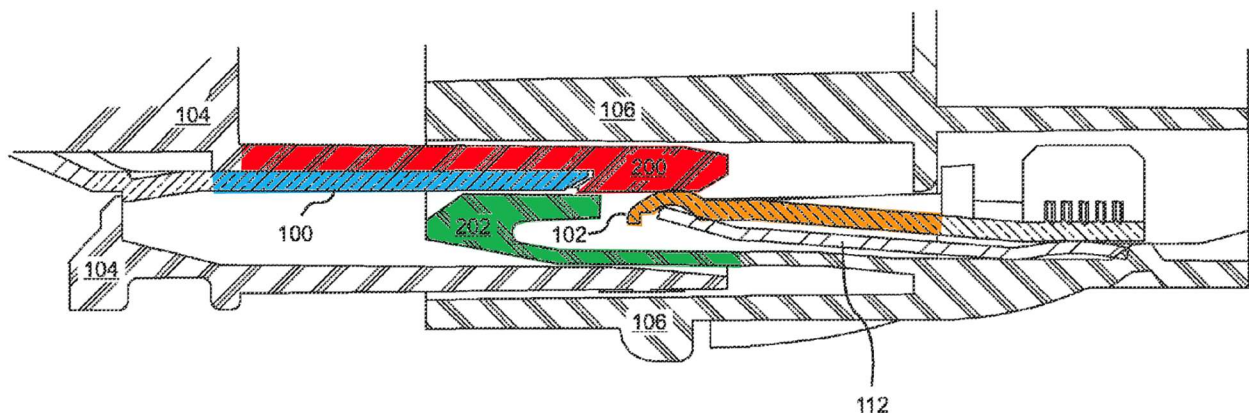


Annotated diagram based on Ex. 1004, Fig. 2 showing the first connector 10 and second connector 12 partially disconnected

81. As illustrated in the diagram above, when the first connector (left) and second connector (right) are partially disconnected, the **first contact member** (in **blue**) is separated from the **second contact member** (in **orange**) by a short distance. In this configuration, the closed ends of the **first insulation barrier** (in **red**) and the **second insulation barrier** (in **green**) are in close proximity to one another. As shown in the diagram above, the first and second insulation barriers block substantially all through-air arcing paths between the **first contact member** and the **second contact member**. Therefore, it is my opinion that *Winkler* meets 1[i].

82. In the position illustrated above, the insulating barriers of *Winkler* are “blocking substantially all through-air arcing paths between the first and second electrical contacts” as required by claim element 1[i]. This is in fact accomplished by the second insulating barrier being configured “so as to be in close proximity with the first insulating barrier when the first and second connectors are partially disconnected and the first and second electrical contacts are separated by a short distance” as required by claim element 1[i].

83. I note that the disclosed structure in *Winkler* exhibits the same arc-path blocking functionality as that depicted in the '017 patent, as shown in Fig. 2B:

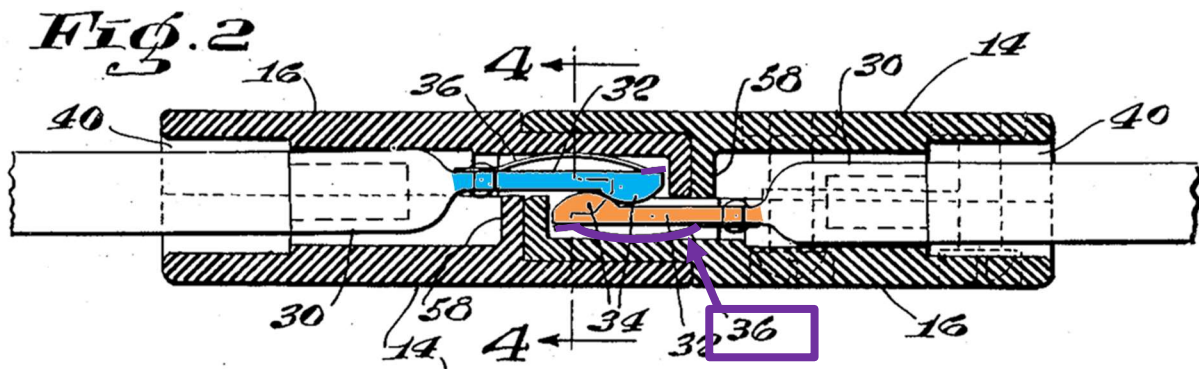


'017 Patent (Ex. 1001), Fig. 2B (annotated highlighting **first barrier structure 200** in **red**, **second barrier structure 202** in **green**, **first contact 100** in **blue**, and **second contact 102** in **orange**)

84. In my opinion, *Winkler* discloses every limitation of independent claim 1 for the reasons discussed above, and thus anticipates claim 1.

2. **Claim 2.** The connector pair of claim 1, further comprising a contact tensioning mechanism that presses the second electrical contact against the engaging surface of the first electrical contact when the first and second connectors are connected.

85. In my opinion, *Winkler* anticipates claim 2. *Winkler* discloses a leaf spring 36 that is a “contact tensioning mechanism.” Leaf spring 36 is shown in Fig. 2, below:



Ex. 1004, Fig. 2 (annotated highlighting leaf spring 36 in purple, first electrical contact in blue, and second electrical contact in orange)

Figure 2 shows the first and second connectors being connected. Leaf spring 36 (outlined in purple above) presses the second electrical contact (in orange above) against the engaging surface of the first electrical contact (in blue above) when the first and second connectors are connected. In particular, the leaf spring 36 presses curved portion 34 of the second electrical contact against the curved portion 34 and the flat elongated portion 32 of the first electrical contact. *Winkler* states that “the contacting end of each terminal is enclosed in its respective pocket except for the engaging face thereof which is resiliently urged by the leaf spring 36

toward the cooperating terminal.” Ex. 1004, 2:39-43 (emphasis added). According to *Winkler*, flat elongated portion 32 is part of the “contacting end” of the terminal, and therefore elongated portion 32 of each electrical contact is also pressed against one another by leaf spring 36. *See id.*, 2:10-14, 4:41-43. *Winkler* further states that “springs 36 effect upward movement of the terminals in their pockets to present the curved portions 34 in hooked or interlocked relation to each other . . .” *Id.*, 3:24-27.

86. For the reasons above, it is my opinion that each of *Winkler*’s leaf springs 36 constitutes the claimed “contact tensioning mechanism,” and *Winkler* anticipates claim 2.

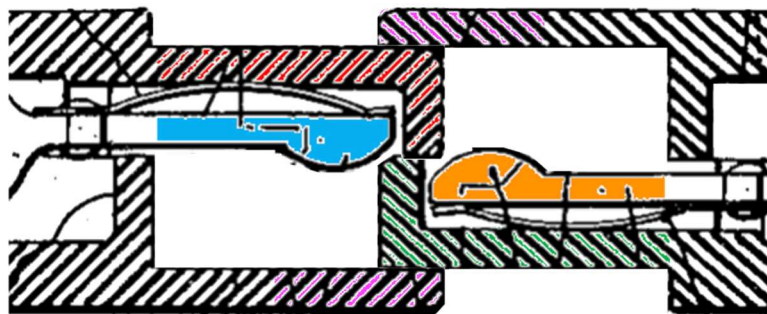
3. Claim 3. The connector pair of claim 2, wherein the contact tensioning mechanism includes a spring.

87. In my opinion, *Winkler* anticipates claim 3. As discussed in Section X.A.2, *Winkler* discloses the contact tensioning mechanism of claim 2, from which claim 3 depends. *Winkler* discloses a leaf spring 36, which is a type of spring. *See* Ex. 1004, 2:14-17, 2:28-32, 2:39-43, 3:23-27, 3:31-34. The ’017 patent is not limited to any type of spring and does not exclude or teach away from leaf springs. Therefore, *Winkler* anticipates claim 3.

4. **Claim 4. The connector pair of claim 1, further comprising a barrier tensioning mechanism that presses the first and second insulating barriers against each other when the first and second connectors are partially disconnected and the first and second electrical contacts are separated by a short distance.**

88. In my opinion, *Winkler* anticipates claim 4. As I discussed in Sections X.A.1.h and X.A.1.i, *Winkler* discloses the first and second insulating barriers of 1[g] and 1[h], respectively. Also, the first and second insulating barriers of *Winkler* are configured to be in close proximity when the first and second connectors are partially disconnected and the first and second electrical contacts are separated by a short distance, as I explained above with respect to 1[i] and illustrated in a diagram created based on *Winkler* Fig. 2. See Section X.A.1.j.

89. *Winkler* discloses the “barrier tensioning mechanism” of claim 4. As shown in the diagram below, outer portions of each connector housing in *Winkler* form narrow openings in the connectors, such that the first and second insulating barriers are pressed together when the connectors are partially disconnected:



Annotated diagram based on Ex. 1004, Fig. 2 showing the first connector 10 and second connector 12 partially disconnected (with **barrier tensioning mechanisms** in pink, a **first insulating barrier** in red, and a **second insulating barrier** in green)

The pink highlighted portions of each connector housing are **barrier tensioning mechanisms** because they cause the **first insulating barrier** and the **second insulating barrier** to press against each another.

90. The '017 patent does not provide any limiting disclosure about the claimed “barrier tensioning mechanism” other than stating “[s]ome embodiments include a spring or other tensioning mechanism that presses the male and female insulating barriers against each other when the connectors are partially disconnected.” Ex. 1001, 3:37-40. The '017 patent does not appear to require anything more than what *Winkler* discloses. Therefore, it is my opinion that *Winkler* anticipates claim 4.

5. Claim 9. The connector pair of claim 1, wherein at least one of the first and second electrical contacts includes a terminal for soldering a wire or and electrical component to the contact.

91. In my opinion, *Winkler* anticipates claim 9. As a preliminary matter, I have been asked to assume, for the purposes of this declaration, that “wire or and electrical component” in the claim means “wire or an electrical component.” *Winkler* discloses contact members 22 that are first and second electrical contacts, as explained with respect to 1[b] and 1[e]. See Sections VI.A.1.c, VI.A.1.f. *Winkler* discloses that “each terminal is provided with a cylindrical end portion 30 bored to

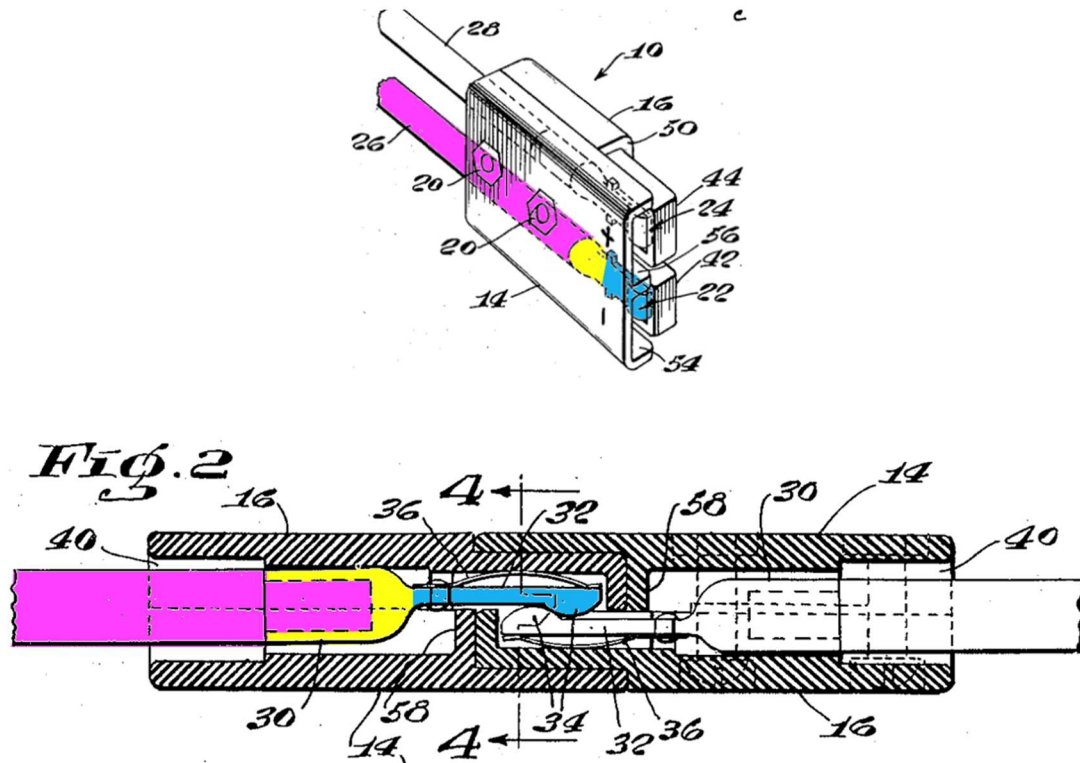
receive the end of the cable into which it may be soldered.” Ex. 1004, 2:8-10. The cable of *Winkler* is a “wire” as well as an “electric component” because the cable transfers electricity.

92. *Winkler* discloses all that claim 9 requires. The terms “soldering,” “wire,” and “electrical component” do not appear anywhere in the ’017 patent besides the claims. Therefore, the ’017 patent does not contain any limiting description that distinguishes claim 9 from *Winkler*, and in my opinion, *Winkler* anticipates claim 9.

B. Ground 1B: Claim 7 is Obvious Over *Winkler* in view of *Winkler2*

93. In my opinion, the combination of *Winkler* and *Winkler2* renders claim 7 obvious. Claim 7 recites “[t]he connector pair of claim 1, wherein at least one of the first and second electrical contacts includes a terminal for crimping to a wire.” *Winkler* discloses electrical connectors 10 and 22 having contact members 22 that are the first and second electrical contacts of claim 1, as I explained in Sections X.A.1.c and X.A.1.e, addressing 1[b] and 1[d], respectively.

a cylindrical end portion 30 of each terminal. Ex. 1004, 2:8-10, Figs. 1 and 2:



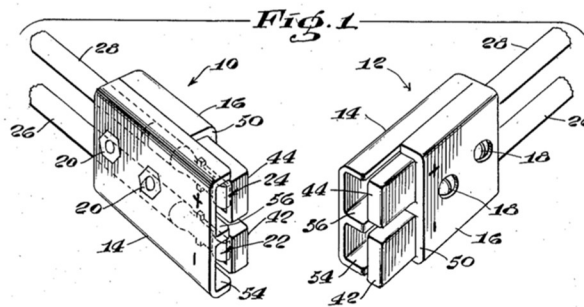
Ex. 1004, portion of Fig. 1 (top) and Fig. 2 (bottom)
 (both annotated highlighting **first connector terminal 22** in **blue**, **cylindrical end portion 30** of the terminal in **yellow**, and **cable 26** in **pink**)

Winkler discloses connecting the end of **cable 26** to the **cylindrical end portion 30** of **contact member 22** by soldering. Ex. 1004, 2:8-10. In my opinion, a POSITA would have understood that *Winkler*'s cable 26 differs from the claimed "wire" in nomenclature only, not in substance. For example, the Handbook recites "wire/cable" interchangeably. *See* Ex. 1008 at 21, 27.

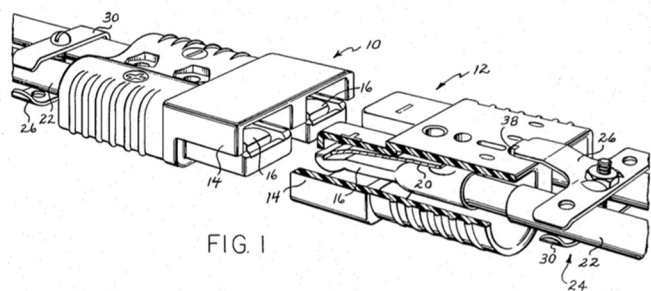
95. *Winkler* does not disclose other ways to attach cable 26 to the cylindrical end portion 30 of contact member 22 besides soldering. Thus, *Winkler*

does not disclose “a terminal for crimping to a wire” as claimed, but *Winkler2* does.

96. In my opinion, *Winkler2* is analogous art to *Winkler* and the '017 patent. *Winkler2* and *Winkler* are by the same inventor, Edward D Winkler, and both are in the same technical field of electrical connectors, as the '017 patent. See Ex. 1004, cover, 1:15; Ex. 1006, cover, 1:5-8. *Winkler2* discloses the same style of electrical connector as *Winkler*, with similar insulated housings and connector terminals, as can be seen by Figure 1 of each reference:

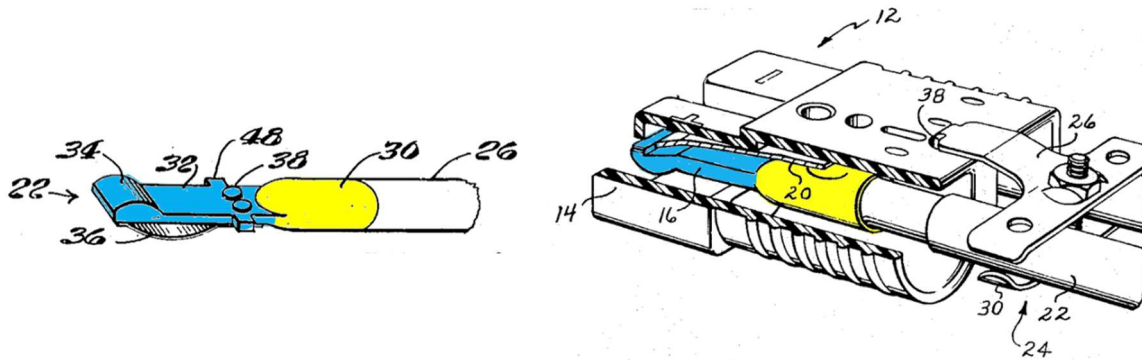


Ex. 1004, Fig. 1



Ex. 1006, Fig. 1

Like *Winkler*, *Winkler2* discloses an electrical contact called a “terminal member 16,” and shows terminal member 16 having a cylindrical end portion like *Winkler*’s cylindrical end portion 30:



Ex. 1004, portion of Fig. 3 (left) and Ex. 1006, portion of Fig. 1 (right) (both annotated highlighting the **electrical contacts** in **blue**, and the **cylindrical end portions** in **yellow**)

97. In addition to disclosing the same general electrical connector as *Winkler*, *Winkler2* discloses a terminal for crimping to a wire. *Winkler2* discloses that “[a]n electrical cable 22 is mechanically and electrically secured to the rigid terminal member 16 by conventional means, such as, by crimping and/or soldering.” Ex. 1006, 2:12-14.

98. In my opinion, it would have been obvious to a person of ordinary skill in the art by January 4, 2013 – the filing date of the ’017 patent – to modify *Winkler* to include the terminal for crimping a wire disclosed in *Winkler2*. Modifying the contact member 22 of *Winkler* to include the crimping terminal of *Winkler2* would have yielded an electrical connector that attaches to wires using soldering and/or crimping, as disclosed in *Winkler2*. In my opinion, the modification would have involved the application of the known wire crimping technique or *Winkler2* to the known electrical connector of *Winkler*, to yield

predictable results of rigidly securing a cable to the contact member, ensuring a reliable and physical and electrical connection.

99. It is also my opinion that modifying *Winkler* based on *Winkler2* would have involved the application of the known wire crimping technique disclosed in *Winkler2*, to improve the similar electrical connectors of *Winkler*, to provide a strong mechanical connection. Even though *Winkler* discloses soldering as one technique for connecting a cable to a terminal, *Winkler2* discloses attaching a wire by crimping either in addition to soldering or instead of soldering. Ex. 1006, 2:12-14. I note that *Winkler2* discloses both techniques as being “conventional” nearly forty years before the ’017 patent. *Id.*

100. In my opinion, a POSITA would have expected success in modifying *Winkler* to include the crimping terminal of *Winkler2*. As I explained above, *Winkler* and *Winkler2* disclose the same type of electrical connector with similar components and configuration. Therefore, the hardware of *Winkler* and *Winkler2* is already very similar. In my opinion, *Winkler2*’s disclosure of a similar electrical connector with a terminal for crimping would have informed a POSITA that little or no modification would have been needed to the other components of *Winkler*’s connectors 10 and 12, other than modifying cylindrical end portion 30 to be able to solder *and/or crimp* a wire such as cable 26. In my opinion, any necessary modifications to the components of *Winkler* would have been well within the

capabilities of a POSITA, who would have known to combine the teachings of *Winkler2* with those of *Winkler*. For example, it is my opinion that a POSITA would have been able to modify the cylindrical end portion 30 of *Winkler*, if necessary, to allow the cylindrical walls to crimp a wire inserted into the cylindrical end portion 30. In my opinion, a POSITA would have had a reasonable expectation of success and the modification would have yielded a predictable result, including the secure attachment of a cable to the terminal thus providing electrical connectivity with good mechanical integrity.

101. For the reasons above, it is my opinion that claim 7 would have been obvious based on *Winkler* in view of *Winkler2*.

C. Ground 1C: Claims 8 and 10 are Obvious Over *Winkler* in view of the Handbook

1. Claim 8. The connector pair of claim 1, wherein at least one of the first and second electrical contacts includes a terminal for soldering to a printed circuit or wiring board.

102. In my opinion, *Winkler* in combination with the Handbook renders claim 8 obvious. *Winkler* discloses electrical connectors 10 and 12 having contact members 22 that are the first and second electrical contacts of claim 1. *See* Sections VI.A.1.c, VI.A.1.e. *Winkler* also discloses its connector as being suitable for “general use,” including soldering a cable to cylindrical end portion 30 of contact member 22. *Winkler*, 1:16-20, 2:6-10; *see also* Section X.B, discussing

claim 7. It is therefore my opinion that cylindrical end portion 30 is a “terminal for soldering,” as recited in claim 8.

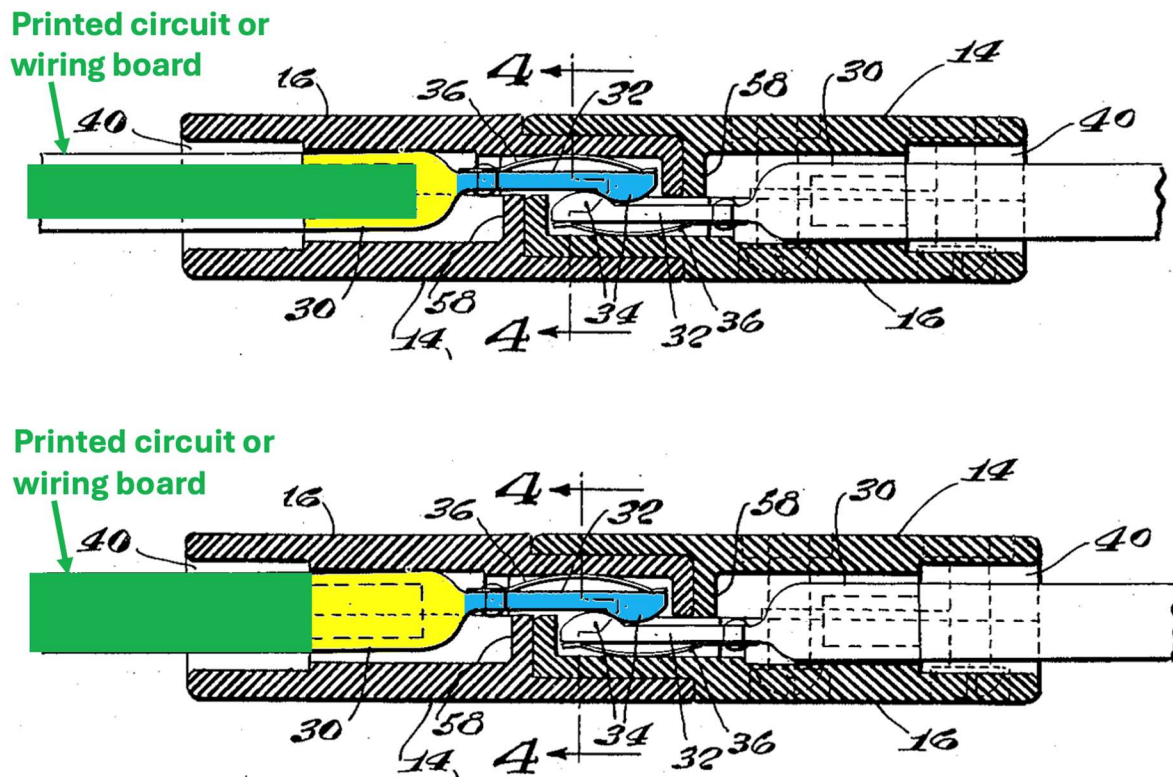
103. *Winkler*’s connector terminal is capable of soldering to a printed circuit or wiring board (also generally referred to as a “board”) because it can be soldered to cables or other metallic objects with sufficient heat. Although *Winkler*’s is capable of the use case recited in claim 8, *Winkler* fails to explicitly disclose soldering to a board. I note that neither claim 8 nor the ’017 patent provides any details about the claimed “printed circuit or wiring board,” or any additional information about claim 8.

104. The Handbook discloses soldering to a printed wiring board. According to the Handbook, “[t]here are two major media through which [permanent] connections are established: (a) wires or cables and (b) printed wiring boards (PWBs).” Ex. 1008 at 21. The Handbook recognizes that PWBs have been used and known since at least the 1950s. *Id.* The Handbook further discloses that “[s]oldering is the dominant metallurgical technology used in PWB applications” and discloses Surface Mount Technology (SMT) as one of the two prevalent connection techniques for attaching electronics to a printed wiring board, the other being through hole technology. *Id.* at 22, *see also* 74-77

105. In my opinion, it would have been obvious to a POSITA at the time of the ’017 patent to use *Winkler*’s terminal for soldering to a printed circuit or wiring

board. For example, it would have been obvious to solder *Winkler's* cylindrical end portion 30 (a terminal formed with *Winkler's* contact member 22) to a printed circuit or wiring board inserted within the end of housing portions 14 and 16.

POSITAs would have been guided as to how to solder *Winkler's* cylindrical end portion 30 to such a board, using the surface mount soldering or through hole techniques disclosed in the Handbook. *See* Ex. 1008 at 21-22, *see also* 74-77. This application of *Winkler's* connector would have looked like one of the following examples:

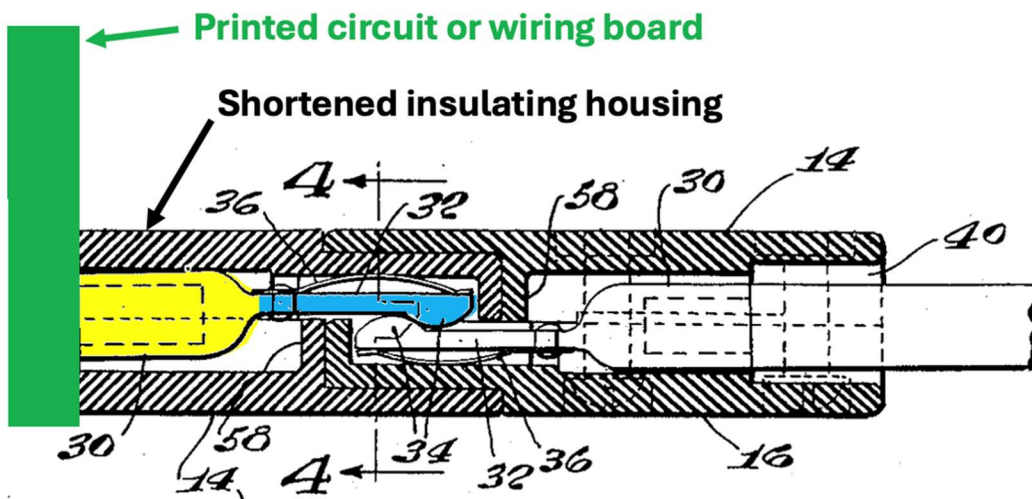
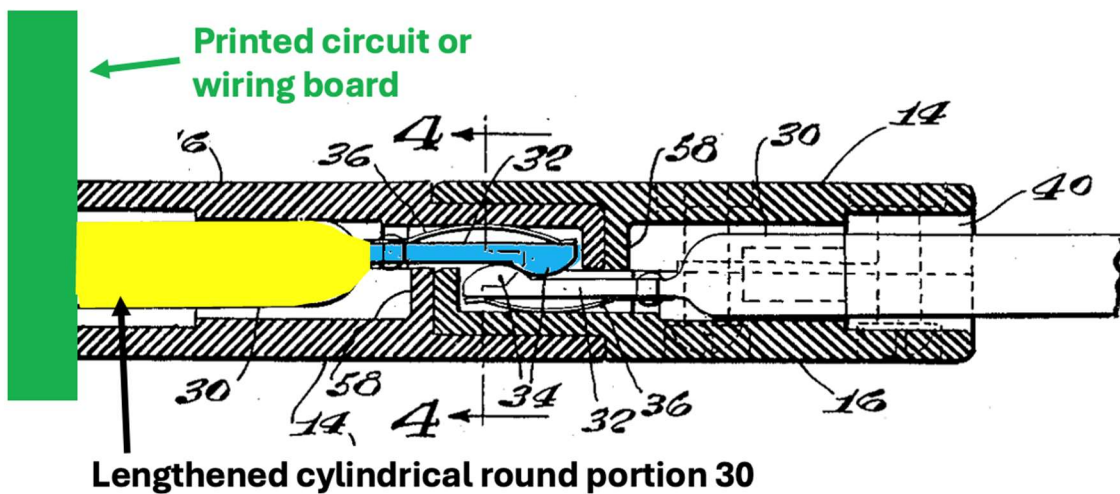


*Diagrams based on Winkler Fig. 2 (modified to show a **printed circuit or wiring board in green** soldered to **cylindrical end portion 30 in yellow**)*

Illustrated above are two alternative ways that a POSITA would have soldered a printed circuit or wiring board to *Winkler*'s cylindrical end portion 30, without modifying the components of *Winkler*'s connector. In the upper diagram above, a part of a printed circuit or wiring board may be sized to fit within the bored end of cylindrical end portion 30, and soldered using SMT or through hole soldering techniques disclosed in the Handbook. In the lower diagram above, a printed circuit or wiring board may be inserted between the housing halves 14 and 16 of *Winkler*'s connector 10, and soldered to the end of cylindrical end portion 30 using SMT soldering techniques disclosed in the Handbook.

106. It is also my opinion that it would have been obvious to a POSITA to alternatively modify *Winkler*'s cylindrical end portion 30 (part of *Winkler*'s "terminal") for soldering to a printed circuit or wiring board positioned perpendicular to *Winkler*'s connector, using SMT or through hole soldering techniques disclosed in the Handbook. In this scenario, it would have been obvious to a POSITA to lengthen cylindrical end portion 30 so that it extends to the end of the housing or beyond and contacts a printed wiring or circuit board surface or extends through receiving holes in the board. Additionally, or alternatively, it would have been obvious to a POSITA to shorten housing portions 14 and 16 to achieve the same result of cylindrical end portion 30 extending to the end of the housing and contacting a printed circuit or wiring board surface or extending

through receiving holes in the board. The modified connector of *Winkler* would have been soldered to the board using known SMT or through hole soldering techniques as disclosed in the Handbook. *See* Ex. 1008 at 21-22, *see also* 74-77. The modified *Winkler* connector soldered to a perpendicular board would have looked like one of the following examples:



Diagrams based on Winkler Fig. 2 (modified to show a **printed circuit or wiring board in green** soldered to **cylindrical end portion 30 in yellow**)

As shown in the upper diagram above, the metal **cylindrical end portion 30** (in **yellow**) of *Winkler's* connector could be easily extended to the end of the housing halves 14 and 16, to contact a surface of the **printed circuit or wiring board** (in **green**). In the lower diagram above, the housing halves 14 and 16 of *Winkler's* connector could be shortened so that the metal **cylindrical end portion 30** (in **yellow**) is exposed to contact the surface of the **printed circuit or wiring board** (in **green**). Although shown in a perpendicular configuration above a POSITA at the time would have understood that a configuration in which a 90° bend could be incorporated into metal **cylindrical end portion 30** (in **yellow**) of *Winkler's* connector as well as the end of the housing halves 14 and 16, resulting in a connector which mounted parallel to the circuit board.

107. In my opinion, modifying *Winkler* based on the Handbook would have involved applying the known technique of surface mount soldering a connector to a printed wiring board as disclosed in the Handbook, to *Winkler's* known connector, to yield predictable results of adding *Winkler's* connector having “maximum insulating protection” to known electrical components such as printed circuit or wiring boards. Additionally, modifying *Winkler* for soldering to a board would have involved combining *Winkler's* known electrical connector with known

printed wiring boards disclosed in the Handbook, using known surface mount soldering techniques disclosed in the Handbook, to provide the predictable results discussed above. I note that the Handbook demonstrates that it was known to solder electrical connectors to printed circuit or wiring boards. *See* Ex. 1008 at 21-22, *see also* 74-77.

108. In my opinion, POSITAs would have expected success in soldering *Winkler*'s connector to a printed circuit or wiring board ("board"), without requiring any modification to *Winkler*'s connector. For example, a board sized to fit within *Winkler*'s connector housing would have allowed for soldering *Winkler*'s connector to the board without modifying connector components. Alternatively, it is my opinion that a POSITA would have been capable of shortening insulated housings 14 and 16, and/or lengthening cylindrical end portion 30 to expose it for soldering to a board. Lengthening or shortening these components at the rear end of *Winkler*'s connector would not affect the design or functionality of contact members 22 and insulation barriers at the front end.

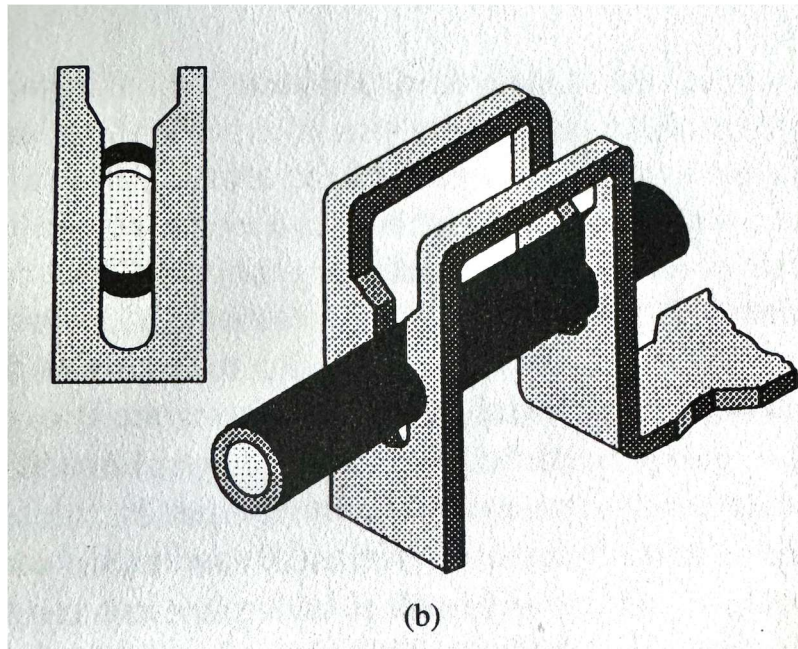
109. For the reasons above, it is my opinion that claim 8 would have been obvious based on *Winkler* in view of the Handbook.

- 2. Claim 10. The connector pair of claim 1, wherein at least one of the first and second electrical contacts includes a terminal using insulation displacement for attaching a wire to the contact.**

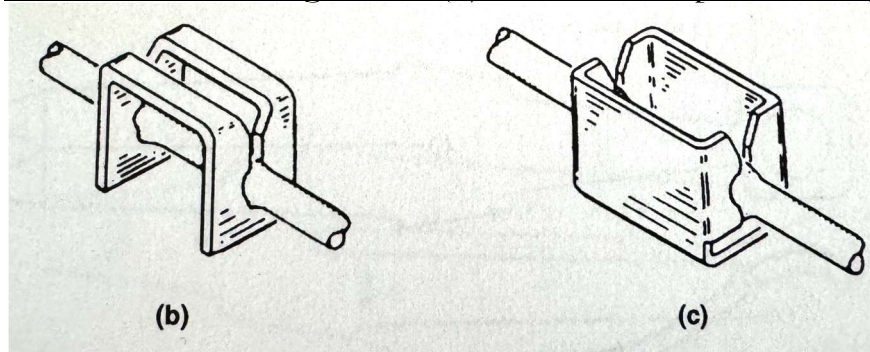
110. In my opinion, the combination of *Winkler* and the Handbook renders claim 10 obvious. Claim 10 recites “using insulation displacement for attaching a wire to the contact” as “a terminal” of “one of the first and second electrical contacts.” *Winkler* discloses electrical connectors 10 and 12 having contact members 22 that are the first and second electrical contacts of claim 1, as explained in Sections VI.A.1.c and VI.A.1.e, addressing 1[b] and 1[d], respectively. *Winkler*’s contact members 22 include a cylindrical end portion 30 that is a terminal for attaching a wire to the contact member 22 by soldering, as I explained with respect to claims 7 and 9. *See* Sections X.A.5, X.B. In my opinion, a POSITA would have understood that soldering involves removing a portion of the insulation from cable 26 and attaching the metal wire of the cable to the metal terminal using solder. Ex. 1004, 2:4-10, Figs. 2, 3, 6, 7. Although this may involve a form of cable insulation “displacement,” i.e., displacing the insulation with conductive contact, *Winkler* does not use the exact “displacement” wording as claim 10 does.

111. Although *Winkler* does not disclose a “terminal using insulation displacement” as claimed in claim 10, the Handbook does. The Electrical Connector Handbook (the Handbook) discloses an insulation displacement connector as being well-known before the ’017 patent. In particular, the Handbook

discloses insulation displacement connectors as a known technique for mechanically and electrically attaching a wire/cable to an electrical contact. Ex. 1008 at 13-14, Fig. 1.2:

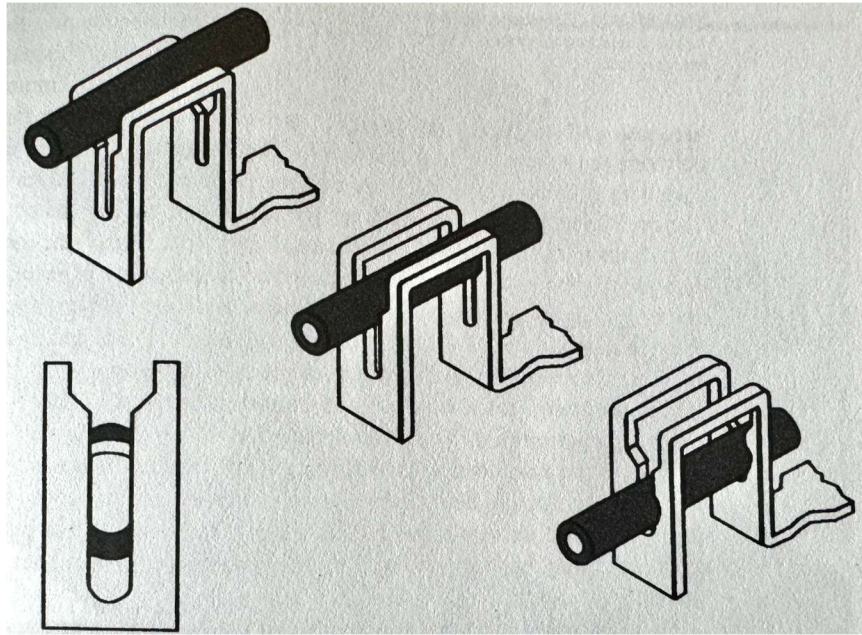


Ex. 1008, Fig. 1.2(b) (showing “Schematic illustrations of mechanical permanent connection technologies: . . . (b) insulation displacement”)



Ex. 1008, Fig. 9.32(b) and (c) (showing “Schematic illustrations of IDC terminal designs”)

As shown, the insulation displacement terminal includes a slot through which a wire/cable is inserted to displace insulation to form a conductive contact with the rest of the insulation intact. Ex. 1008 at 14, Fig. 1.2, *see also* 56, Fig. 9.26:

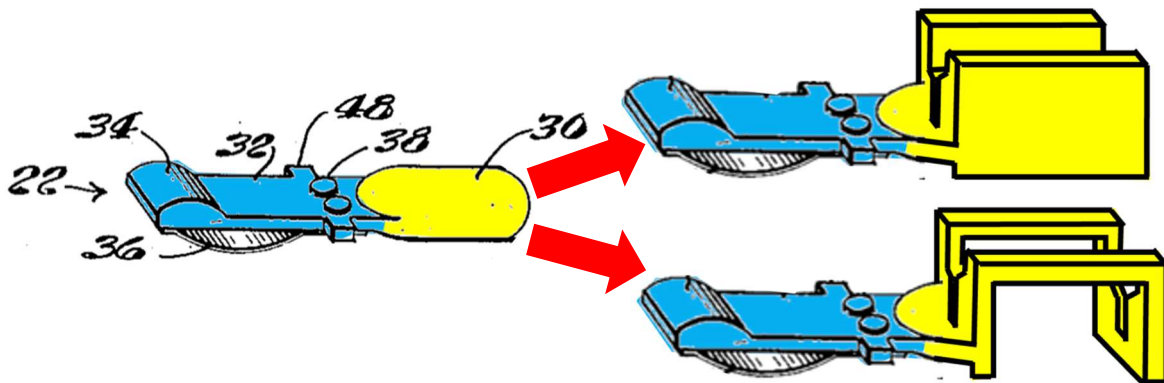


Ex. 1008, Fig. 9.26 (“Schematic of the insulation displacement connection process”)

Notably, the '017 patent specification does not explain or discuss “insulation displacement” anywhere, reciting the term only in claim 10. Nothing in the '017 patent distinguishes the insulation displacement terminal recited in claim 10 from what is disclosed in the Handbook.

112. The Handbook is analogous art to *Winkler* and to the '017 patent. All three are in the same field of endeavor; like *Winkler* and the '017 patent, the Handbook discloses electrical connectors that attach to cables/wires.

113. In my opinion, it would have been obvious to a POSITA to modify contact member 22 in *Winkler*'s electrical connectors 10 and 12 to use insulation displacement as disclosed in the Handbook. The modification would have involved modifying or replacing cylindrical end portion 30 with an insulation displacement terminal to enable conductive coupling to a wire, such as with soldering, displacement, or other ways. For example, it is my opinion that it would have been obvious to modify cylindrical end portion 30 to close the end of the terminal and include a slot for inserting a wire/cable. Such a modification would have amounted to applying the known insulation displacement technique disclosed in the Handbook to the known electrical connector or connector contact of *Winkler*. As another example, in my opinion, it would have been obvious to replace the cylindrical end portion 30 of *Winkler* with the insulation displacement terminal of the Handbook. In my opinion, a POSITA would have had at least a reasonable expectation of success and the modification would have yielded a predictable result, including the secure attachment of a cable to the terminal thus providing electrical connectivity with good mechanical integrity. Under either modification, the modified contact member of *Winkler* would have had the following exemplary appearances:



Ex. 1004, portion of Fig. 3 in Winkler (left), Diagrams (right), created based on portion of Ex. 1004, Fig. 3 and Ex. 1008, Figs. 1.2(b) in the Handbook, 9.26, and 9.24 (b) and (c) (showing versions of a **contact member 22** of Winkler (in **blue**) modified to have an **insulation displacement terminal** (in **yellow**))

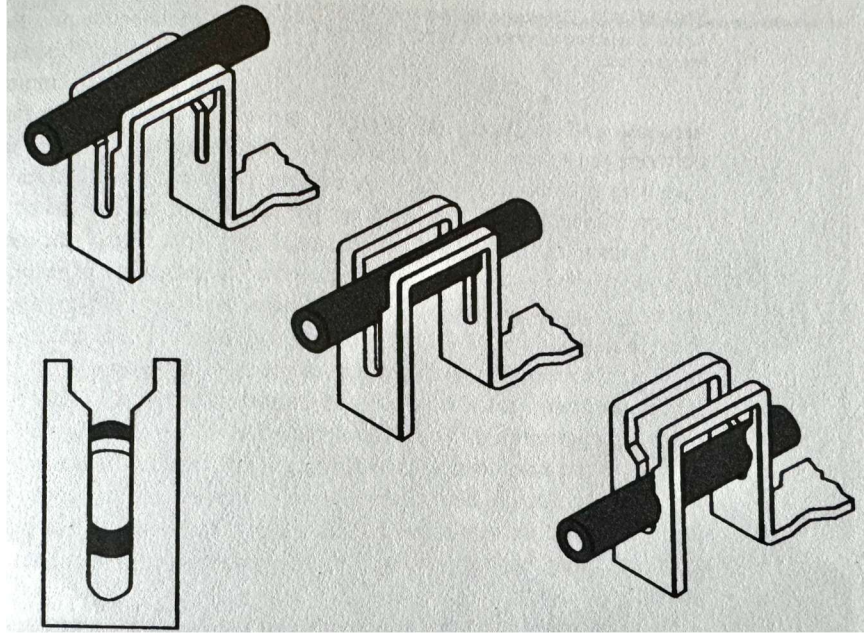
114. *Winkler*'s electrical connector was ready for improvements in wire connection techniques, because *Winkler* discloses only the technique of soldering a wire to its connector terminals. In my opinion, a POSITA would have understood that soldering would have required additional equipment, steps, and skill to remove the cable insulation and to solder the cable end to the terminal. An insulation displacement terminal would have improved *Winkler*, simplifying the process "attaching a wire to contact" as recited in claim 10. For example, the Handbook teaches that:

[I]t is not necessary to remove the insulation from a wire to make an IDC [insulation displacement connection]. Instead, the insulation is displaced from the conductor by the contact beams as the wire is inserted into the terminal. **This simple difference, along with lower connection force requirements, provides IDC technology with**

numerous advantages with respect to connector assembly and application in the field.

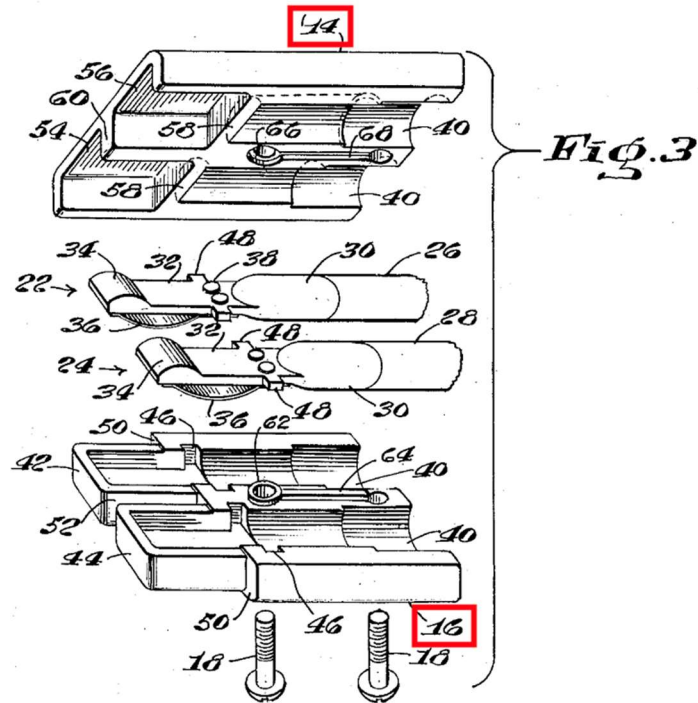
Ex. 1008 at 55, *see also* 55-69 (emphasis added). In my opinion, modifying *Winkler*'s electrical connectors with insulation displacement terminals would have yielded predictable and advantageous results, simplifying the process of attaching a wire to the connector. As the Handbook explains, this needs no or little equipment, step, or skill, because "it is not necessary to remove the insulation from a wire to make an IDC [insulation displacement connection]" as the Handbook states above.

115. In my opinion, a POSITA would have expected success in modifying *Winkler* to have a terminal using insulation displacement for attaching a wire to the electrical contact. Connectors 10 and 12 of *Winkler* would have required only minor modifications that were within the capabilities of a POSITA. For example, only minor modifications would have been needed to change cylindrical end portion 30 of *Winkler*'s contact member 22, to include slots for connecting a wire. In my opinion, POSITAs would have also been capable of replacing cylindrical end portion with the insulation displacement connectors illustrated in the Handbook. At least Figure 9.26 of the Handbook illustrates how the right-hand side of the insulation displacement terminal would have attached to the contact member 22 of *Winkler*:



Ex. 1008, Fig. 9.26

The insulated housing halves 14 and 16 of *Winkler's* connectors would not have required much, if any, modification to accommodate insulation displacement terminals:



Ex. 1004, Fig. 3 (annotated circling upper and lower half sections 14 and 16 of the insulating housing)

The split housing of *Winkler*'s connectors would have allowed one to simply press a wire into an insulation displacement connector slot, before securing the two halves together using bolts 18 and nuts. It is also my opinion that a POSITA could have easily enlarged or reconfigured one or more of the insulated housing halves 14 and 16, if additional space or a different housing shape is needed to accommodate insulation displacement connector slot(s). Any such modification (near the rear end) would have had no or little effect on the insulation barriers of the electrical contacts (near the front end).

116. Furthermore, claim 10 does not recite any specific dimension, location, or shape of the claimed "terminal using insulation displacement." Nor

does the '017 Patent specification. Claim 10 refers to the claimed terminal as being part of “one of the first and second electrical connector.” Claim 1, which claim 10 depends from, recites the “first connector having a first insulating housing” and the “second connector having a second insulating housing.” In my opinion, a POSITA would have understood that the dimensions of the insulation displacement terminal could have been adjusted based on the dimensions of the connector housings and/or the dimensions of the wire. Additionally, it is my opinion that it would have been within the capabilities of a POSITA to modify, configure, or shape the connector housings, if necessary, to accommodate an insulation displacement terminal. I note that neither claim 1 nor claim 10 recites any specific dimension, shape, or configuration of the claimed first and second insulator housing. Nor do they indicate whether each housing encloses only a part of or the entirety of the corresponding connector.

117. For the reasons above, it is my opinion that claim 10 would have been obvious to a POSITA based on *Winkler* in view of the Handbook.

D. Ground 1D: Claims 11 And 12 Are Obvious Over *Winkler* In View Of *Poliak*

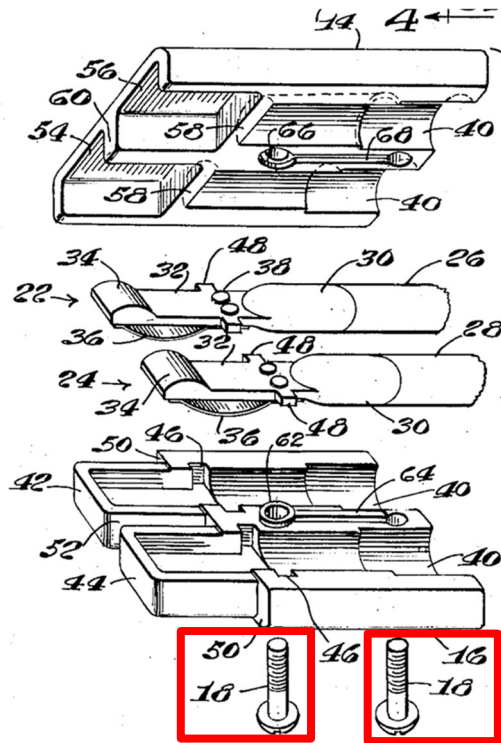
118. *Winkler* discloses the connector pair of claim 1 having first and second electrical contacts, as explained with respect to 1[b], 1[c], 1[e], and 1[f]. See Sections X.A.1.b, c, f, and g. Claims 11 and 12 recite a screw terminal and spring mechanism, respectively, for attaching a wire to the contact. In my opinion,

Winkler in view of *Poliak* renders obvious the additional limitations of claims 11 and 12.

119. I note that the claimed “screw” and “spring” do not appear anywhere in the ’017 patent specification. Nor does the ’017 patent distinguish the limitations of claims 11 and 12 from the prior art or the prior art combination discussed here.

1. Claim 11. The connector pair of claim 1, wherein at least one of the first and second electrical contacts includes a screw terminal for attaching a wire to the contact.

120. In my opinion, *Winkler* in view of *Poliak* renders claim 11 obvious. *Winkler* discloses a connector having an insulated housing formed by portions 14 and 16. The housing portions are joined using bolts 18, which are illustrated as threaded screws. Ex. 1004, 1:67-2:3, Fig. 1, Fig. 3:



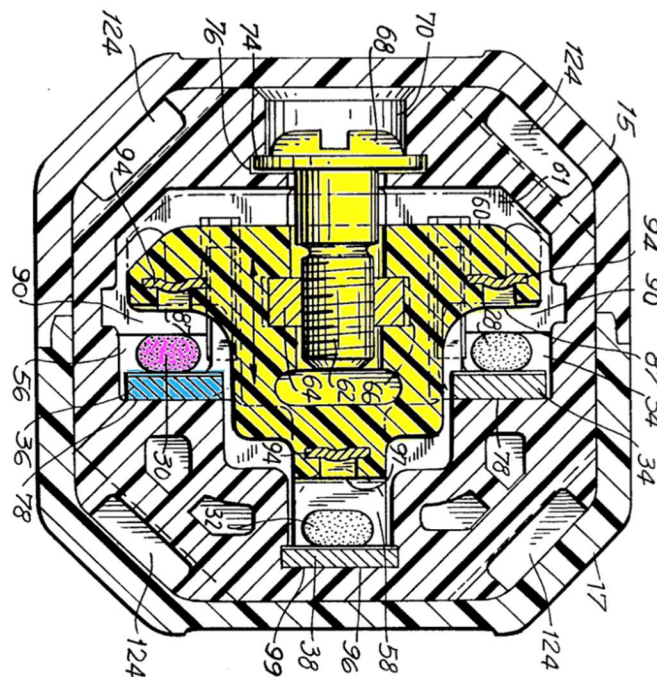
Ex. 1004, Fig. 3 in Winkler (annotated circling bolts 18)

Bolts 18 pass through holes between contact members 22 and 24 in the insulated housing halves, and are secured using nuts 20 (not shown in Fig. 3 above). Ex. 1004, Figs. 1, 3, 5, 7. It is thus my opinion that *Winkler* discloses a “screw terminal” as claimed, and the ’017 patent does not describe, illustrate, or otherwise explain a “screw terminal” in a manner that distinguishes *Winkler*.

121. *Winkler* does not disclose a screw terminal being used “for attaching a wire to the [first or second electrical] contact” as claimed. *Poliak* does.

122. *Poliak* discloses a “device that electrically connects conductors from a cable to the electrical contacts of a plug or receptacle by means of a single

fastener.” Ex. 1007, Abstract. The device includes a screw 62 that is rotated in relation to a nut 64, and nut 64 moves a carriage 60 to press conductors 28, 30, and 32 (i.e., wires) against electrical contacts 34, 36, and 38. *Id.*, 5:10-15, 6:7-29, Figs. 3, 5, 10-12. Three biasing springs 90 are also used to press the conductors tightly against the contacts. *Id.*, 6:30-34.



Ex. 1007, Fig. 5 in Poliak (rotated and annotated; screw 62, nut 64, and carriage 60 in yellow, conductor 30 in pink, and electric contact 36 in blue)

As shown above, screw 62 can be rotated to move carriage 60 downward, pressing a conductor 30 against electrical contact 36. Biasing spring 90 (not highlighted above) presses conductor 30 to the contacts. The screw 62, carriage 60, and biasing spring 90 of *Poliak* constitute “a screw terminal for attaching a wire to the contact” as claimed in claim 11.

123. In my opinion, it would have been obvious to a POSITA to modify the connectors 10 and/or 12 of *Winkler* to include the screw terminal of *Poliak*. *Poliak* is analogous art to both *Winkler* and the '017 patent; all three are in the same field of endeavor of electrical connectors attached to wires. In my opinion, a POSITA would have found it obvious to modify *Winkler* based on *Poliak* in at least two alternative ways.

124. As a first alternative modification, it is my opinion that a POSITA would have found it obvious to modify at least one of the existing bolts 18 and nuts 20 in *Winkler* to include the carriage 60 of *Poliak*, to press *Winkler*'s cable 26 against contact member 22. The modification would have involved replacing cylindrical end portion 30 of contact member 22 with an open, semi-circular, or flat end, and modifying one of the existing bolts 18 in *Winkler* to add a carriage and spring:

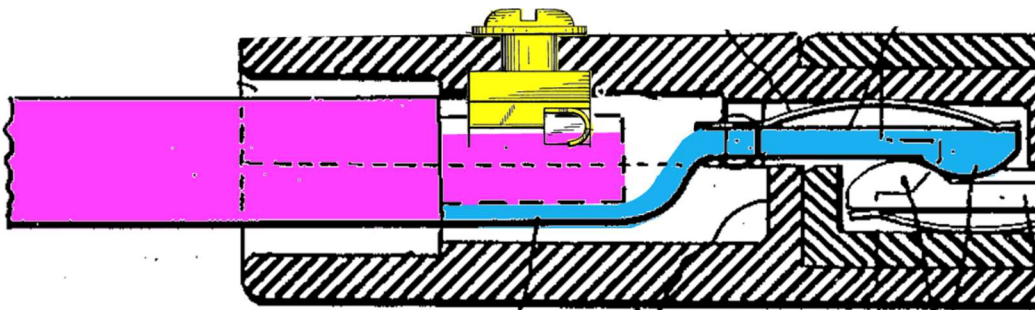


Diagram created based on a portion of Ex. 1004, Fig. 2 in Winkler and Ex. 1007, Fig. 10 in Poliak (annotated to show electrical contact in blue, a cable 26 in pink and modified to add carriage 60 and spring 90 of Poliak in yellow)

The resulting combination would have modified one of the existing bolts 18 of *Winkler* to move a carriage that secures cable 26 and/or cable 28 to contact member 22 and/or contact member 24, while the other bolt 18 secures the insulated housing halves together as taught by *Winkler*.

125. As a second alternative modification, it is my opinion that a POSITA would have found it obvious to modify connectors 10 and 12 of *Winkler* to incorporate the device of *Poliak* including the carriage 60 and spring 90 of *Poliak*, and add screw 62 and nut 64 of *Poliak*, thereby adding a third screw to *Winkler*'s connector. The combination would have looked similar to the cross-sectional diagram shown above, except that *Winkler*'s connector would include three screws: the existing two bolts 18 that connect the insulated housing halves, and a third screw dedicated to moving a carriage 60 and spring 90 from *Poliak*.

126. In my opinion, modifying *Winkler* based on *Poliak* would have involved applying the known screw terminal-based wire connection technique and mechanism of *Poliak* to the known electrical connectors of *Winkler*. *Poliak* discloses that securing wiring cables to electrical contacts using screws was generally known and conventional even before filing *Poliak*. Ex. 1007, 1:10-17. *Poliak* also published decades before the '017 patent, and thus the screw terminal of *Poliak* was known long before the '017 patent.

127. *Winkler*'s connector was ready for improvements in connecting wires to electric contacts that *Poliak* discloses. *Winkler* discloses electrical contacts with ends bored for soldering cables. Ex. 1004, 2:4-10. Soldering was known to provide a good electrical connection (*see* Ex. 1006, 1:28-29), but required additional equipment and time to solder wires to the electrical contacts. Thus, *Winkler*'s connectors were ready for improvements in techniques to attach wires to the connectors.

128. In my opinion, modification based on *Poliak* would have yielded predictable results. In particular, *Poliak* discloses its screw terminal as “an electrical wiring attachment device allowing quick attachment of electrical conductors to electrical contacts in a plug or receptacle that has few parts and is easy to assemble” and “accomplishes the task of attachment by the turning of a single screw.” Ex. 1007, 2:15-25. In my opinion, POSITAs would have recognized that *Winkler*'s connectors 10 and 12 would have benefited from the addition of *Poliak*'s screw terminal to provide a quick cable attachment mechanism using a single screw.

129. In my opinion, a POSITA would have expected success in modifying *Winkler*'s connectors 10 and 12 to include the screw terminal of *Poliak*. Both *Winkler* and *Poliak* provide detailed illustrations that would have guided POSITAs how to incorporate the screw terminal of *Poliak* into the connector of *Winkler*. The

connectors of *Winkler* would have required only minor modification that would have been within the capabilities of a POSITA, guided by *Poliak*'s disclosure. For example, it is my opinion that it would have been within the capabilities of a POSITA to repurpose one of two bolts 18 of *Winkler* to add the carriage 60 and spring 90 of *Poliak*, and to modify the insulated housing of *Winkler* to accommodate the additional components. In my opinion, it would have also been within the capabilities of a POSITA to alternatively reposition bolts 18 of *Winkler* to accommodate the screw terminal of *Poliak* including an additional screw, carriage 60, and spring 90.

130. For the reasons I discussed above, it is my opinion that claim 11 would have been obvious based on *Winkler* in view of *Poliak*.

2. Claim 12. The connector pair of claim 1, wherein at least one of the first or second electrical contact is configured with a terminal using a spring mechanism for attaching at least one wire to the contact.

131. In my opinion, Claim 12 would have been obvious based on *Winkler* in view of *Poliak*. As I explained with respect to claim 11 above, the combination of *Winkler* in view of *Poliak* discloses an electrical connector with a screw terminal for attaching a wire to an electrical contact. *See* Section X.D.1. The screw terminal of *Poliak* includes a biasing member/spring 90 that is moved by a carriage 60 to press a conductor wire tightly against an electrical contact. *See* Ex. 1007, 5:47-58, 6:24-34, 8:10-12, Figs. 3, 5, 10-12. It is therefore my opinion that the

screw terminal of *Poliak* includes “a spring mechanism for attaching at least one wire to the contact” as claimed. As I also explained in Section X.D.1, it would have been obvious to a POSITA to modify the connectors 10 and 12 of *Winkler* to include the screw terminal including a screw, carriage, and spring of *Poliak*, to yield the predictable results of providing a quick attachment of cables to electrical contacts using a single screw.

132. In my opinion, it would have been obvious to a POSITA to include a spring mechanism in the terminal that attaches a cable to *Winkler*’s connectors 10 and 12. *Poliak* also teaches using its mechanism to provide “strongly biased connections” for one or more cables, with easy assembly and few parts, and teaches using spring 90 to aid the carriage 60 in tightly pressing conductors against the electrical contacts. Ex. 1007, 2:2-32, 6:27-32. More than a decade before the ’017 patent, the Electrical Connector Handbook disclosed the use of contact springs in electrical connectors to “allow[] for the formation of the permanent connections.” Ex. 1008 at 15. In my opinion, a POSITA would have had a reasonable expectation of success and the modification would have yielded a predictable result, including maintaining the electrical connection by pressing conductors against the electrical contacts. For these additional reasons, it is my opinion that it would have been obvious to modify the connectors of *Winkler* to

include the terminal and spring mechanism of *Poliak*. Therefore, in my opinion, claim 12 would have been obvious based on *Winkler* in view of *Poliak*.

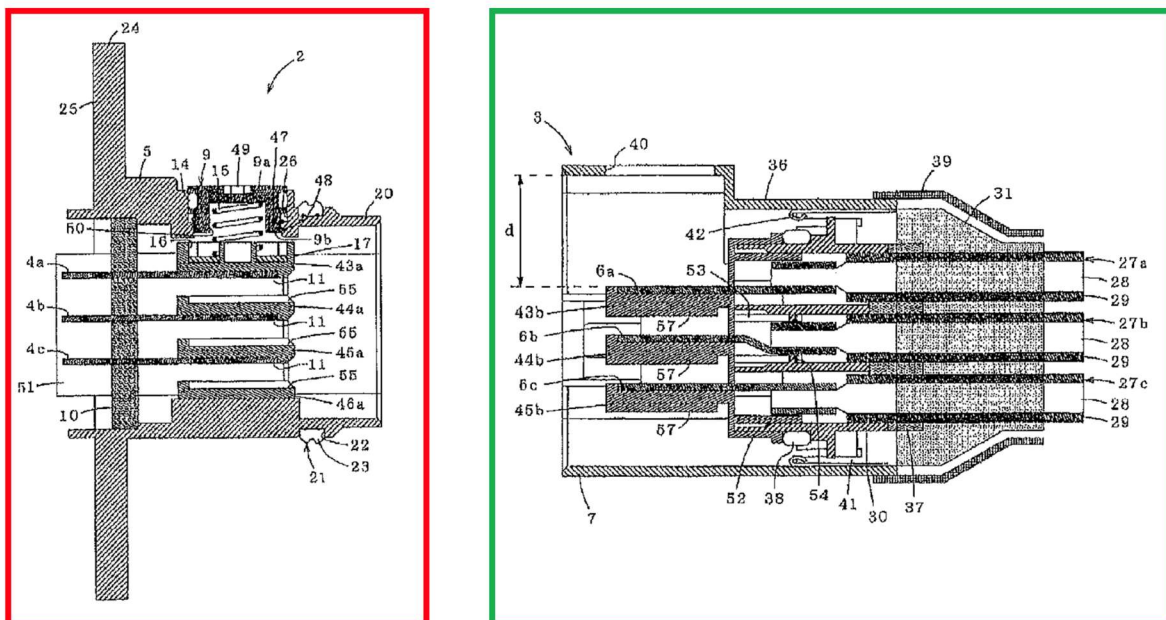
E. Ground 2A: Claims 1-4 Are Anticipated by *Kataoka*

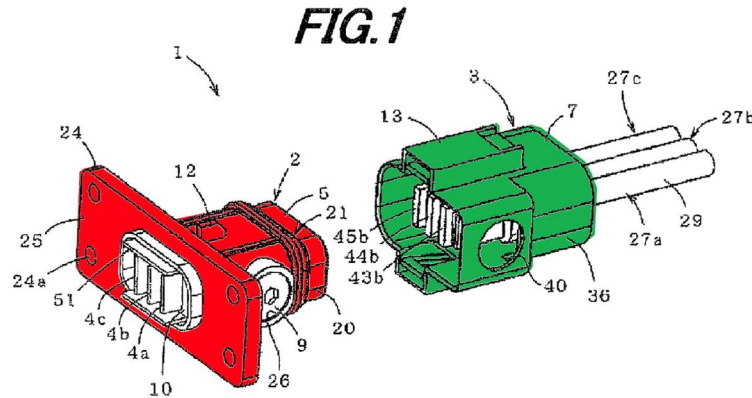
133. In my opinion, *Kataoka* discloses each and every element of independent claim 1 and dependent claims 2-4.

1. Independent Claim 1

a. 1[pre] An electrical connector pair, comprising:

134. In my opinion, *Kataoka* discloses an electrical connector pair. *Kataoka* discloses a connector 1 including a first connector portion 2 and a second connector portion 3 that fit together, depicted below as a first connector portion 2 on the left and a second connector portion 3 on the right. Ex. 1005, 4:43-52, Cover, Fig. 1.

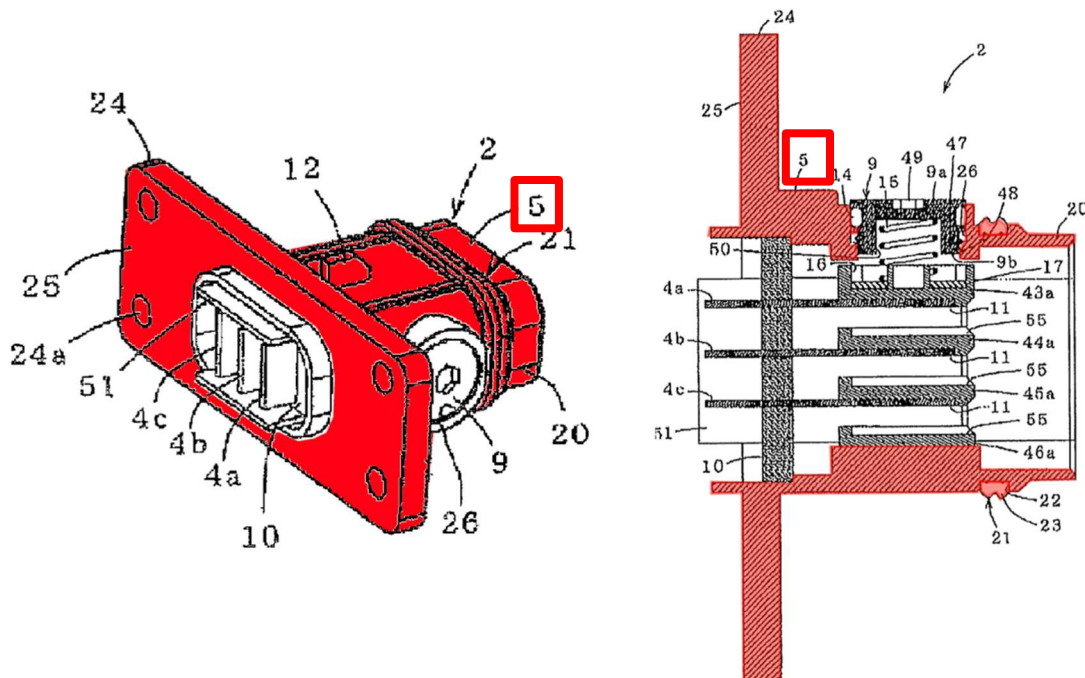




*Ex. 1005, Cover (top), Fig. 1 (bottom) (both annotated showing a **first connector portion 2** in **red** and a **second connector portion 3** in **green**)*

b. 1[a] a first connector having a first insulating housing;

135. In my opinion, *Kataoka* discloses 1[a]. *Kataoka* discloses a first connector portion 2 that has a first terminal housing 5. *Ex. 1005*, 4:53-54, 8:50-67.



*Ex. 1005, portion of Fig. 1 (left) and Fig. 4A (right) (annotated showing **housing 5** in **red**.)*

Housing 5 is an “insulating housing,” as claimed, because it is formed of non-conductive resin. Ex. 1005, 9:38-45. As shown in the figures above, housing 5 surrounds the inner components of the connector portion. Housing 5 of first connector portion 2 surrounds the internal contacts and protects the internal contacts from the environment: Housing 5 includes cylindrical body 20 and a terminal housing waterproof structure 21 that protect the electrical terminals from elements such as water. Ex. 1005, 12:34-43.

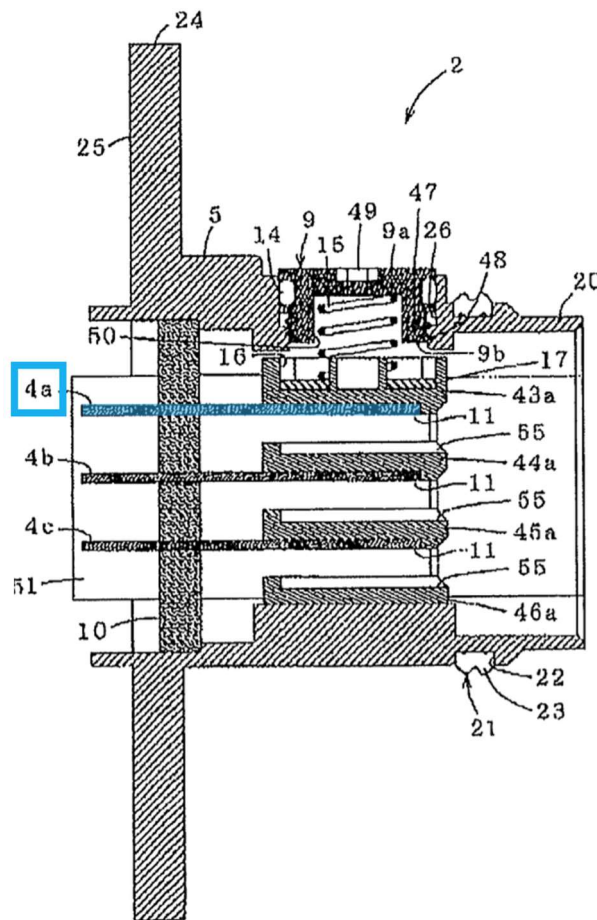
136. I note that the '017 patent discloses “insulated housings” as having the same functionality and purpose as *Kataoka*’s housing 5. For example, the '017 patent states that “[i]nsulated housings 104, 106 surround the male and female contacts, and shield the contacts from environmental hazards, as well as providing some protection to a user in case arcing occurs when the user is handling the connector pair.” Ex. 1001, 3:2-6. Housing 5 of *Kataoka* serves the same purposes of surrounding the contacts and shielding from environment hazards, as explained above. Therefore, it is my opinion that *Kataoka* discloses 1[a].

c. 1[b] a first electrical contact supported within the first insulating housing,

137. In my opinion, *Kataoka* discloses 1[b]. First connector portion 2 includes a first connecting terminal 4a, which is a “first *electrical* contact” because it electrically connects the first connector portion 2 to a terminal 6a of the second connector portion 3. Ex. 1005, 6:6-14, 8:38-49. *Kataoka* discloses that “electricity

of different voltage and/or current is fed to each of the first connecting terminals 4a-4c” and that “[e]ach of the first connecting terminals 4a-4c should be formed of a highly conductive metal.” Ex. 1005, 6:60-7:3.

138. First connecting terminal 4a is also “supported within the first insulating housing” as claimed. Fig. 4A is annotated below to highlight first insulating terminal 4a:



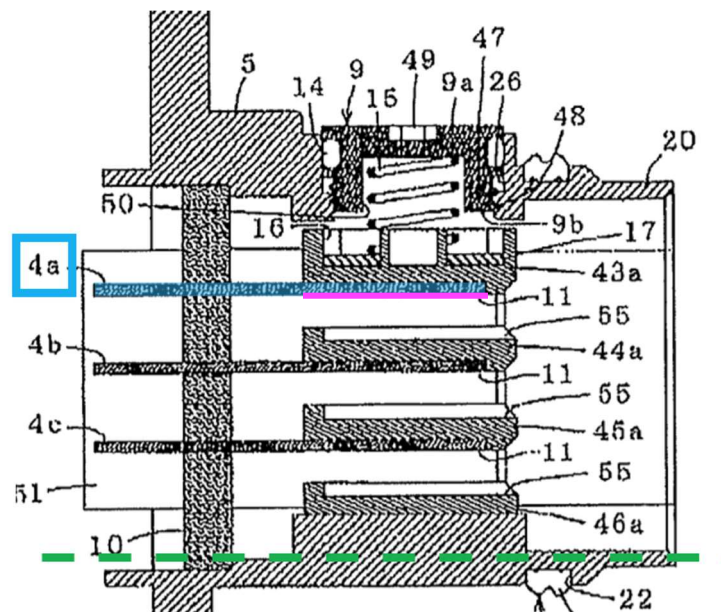
Ex. 1005, Fig. 4A (annotated showing [first connection terminal 4a in blue](#))

As shown in Fig. 4A above, first connecting terminal 4a is a “first electrical contact” that is supported within housing 5 (the “first insulated housing”).

Therefore, *Kataoka* meets 1[b].

- d. **1[c] the first electrical contact having a connecting surface that is substantially parallel with a longitudinal axis of the insulating housing and terminates in a leading end of the first electrical contact;**

139. In my opinion, *Kataoka* discloses 1[c]. The first connecting terminal 4a of *Kataoka* (the “first electrical contact”) has a connecting surface that is substantially parallel with a longitudinal axis of housing 5 (“the insulated housing”):

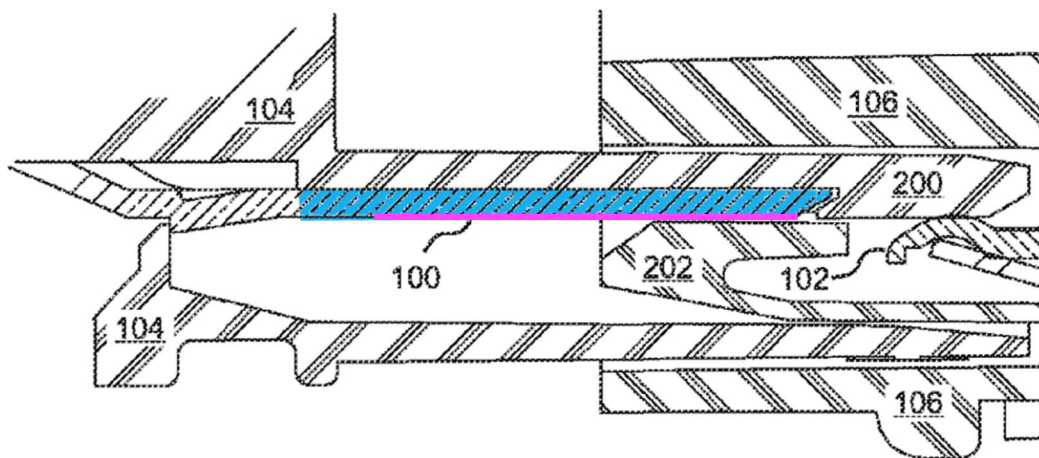


Ex. 1005, portion of Fig. 4A (annotated highlighting *first connection terminal 4a* in *blue*, indicating a *bottom surface* in *pink*, and indicating a *longitudinal axis of housing 5* as a *dashed green line*)

In the annotated figure above, the **bottom surface** (in **pink**, above) of **first connection terminal 4a** is substantially parallel with the **longitudinal axis of housing 5**, represented by a dashed green line. In my opinion, the **bottom surface** is a “connecting surface” as claimed, because it is a surface that connects with a second connection terminal 6a. *See* Ex. 1005, Figs. 3, 10.

140. Furthermore, the connecting surface of first connection terminal 4a terminates at the right-hand side of the first connection terminal 4a, which is a leading end of this electrical contact in *Kataoka*.

141. I note that the '017 illustrates the same structure for male contact 100:

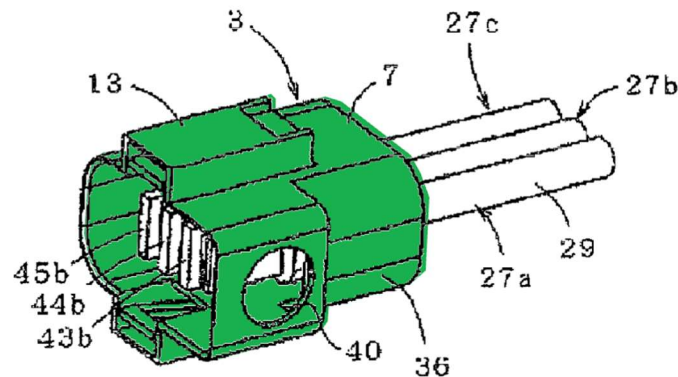


'017 Patent, portion of Fig. 2A (annotated highlighting **first male contact 100** in **blue**, and indicating a **connecting surface** in **pink**)

Kataoka's first connection terminal 4a has the same structure as first male contact 100 in the '017 patent; thus, *Kataoka* meets 1[c].

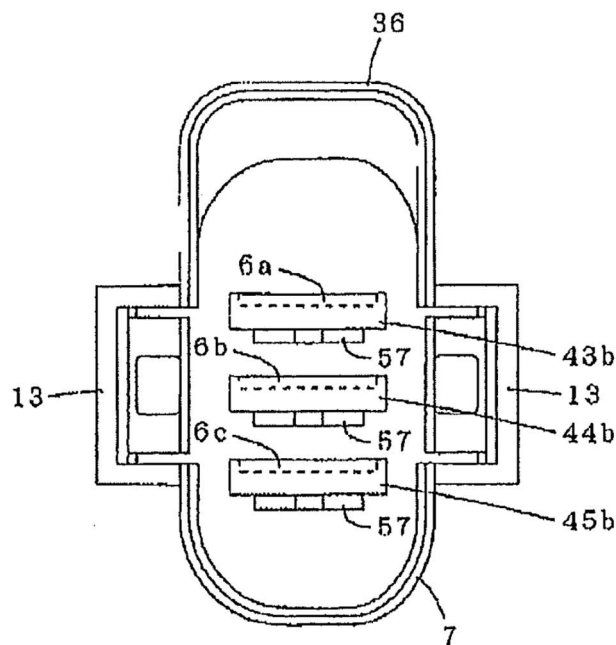
- e. **1[d] a second connector having a second insulating housing;**

142. In my opinion, *Kataoka* discloses 1[d]. *Kataoka* discloses a second connector portion 3 having housing 7:



Ex. 1005, portion of Fig. 1 (annotated highlighting
second connector portion 3 in green)

Housing 7 includes a cylindrical body 36 that surrounds second connecting terminals 6a-6c. Ex. 1005, 12:17-64, Figs. 1, 6B:

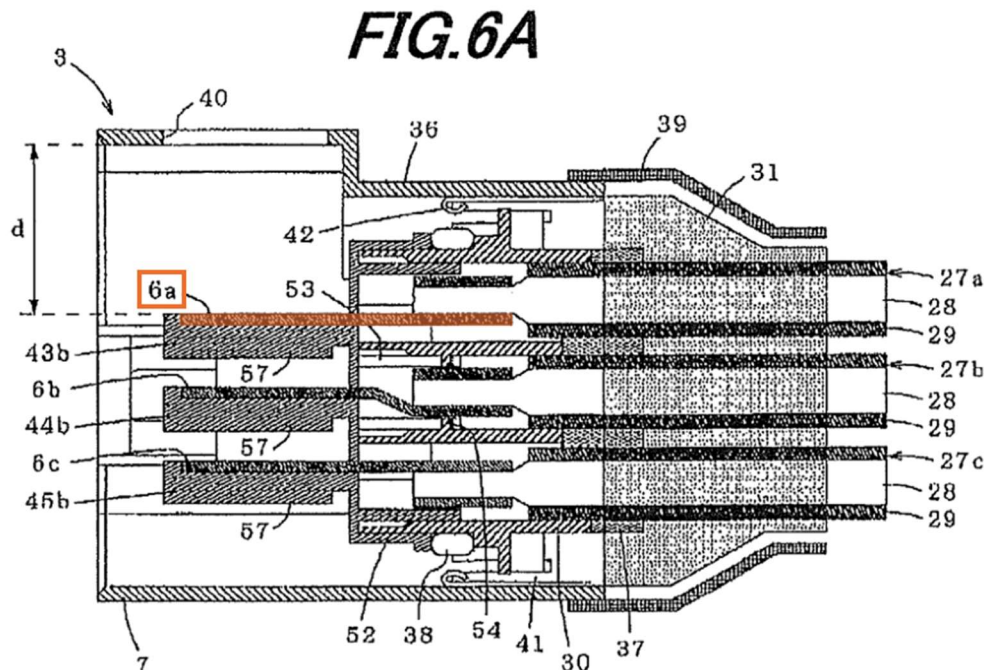


Ex. 1005, portion of Fig. 6B

Like housing 5 of the first connector portion 2 discussed above, second terminal housing 7 of second connector portion 3 surrounds the contact members and protects them from the environment. Ex. 1005, 4:56-66, 10:19-29, 12:17-43, Figs. 6A, 6B. Therefore, it is my opinion that housing 7 constitutes the claimed “insulating housing.”

f. 1[e] a second electrical contact supported within the second insulating housing,

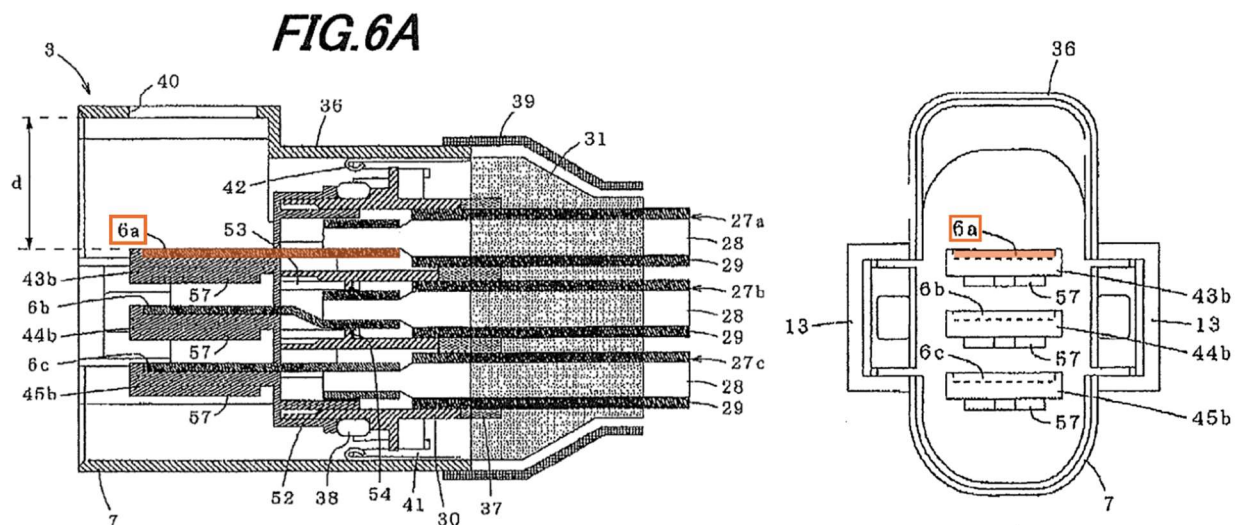
143. In my opinion, *Kataoka* discloses 1[e]. Second connector portion 3 in *Kataoka* includes a second connecting terminal 6a. Ex. 1005, 4:56-5:9, 5:27-33, Fig. 6A.



Ex. 1005, Fig. 6A (annotated highlighting **second connecting terminal 6a** in orange)

Second connecting terminals 6a-6c are “formed of a highly conductive material” and transmit “electricity of different voltage and/or current.” Ex. 1005, 10:45-59. It is therefore my opinion that second connecting terminal 6a is a “second electrical contact” as claimed.

144. In my opinion, second connecting terminal 6a of *Kataoka* is also “supported within the second insulating housing,” as claimed. In describing Fig. 6, *Kataoka* states “the second connector portion 3 has the second terminal housing 7 in which plural (three) aligned second connecting terminals (female terminals) 6a-6c are housed.” Ex. 1005, 10:19-22. Figures 6A and 6B of *Kataoka* also show that second connecting terminal 6a is supported *within* housing 7, which surrounds the second connecting terminals 6a-6c:

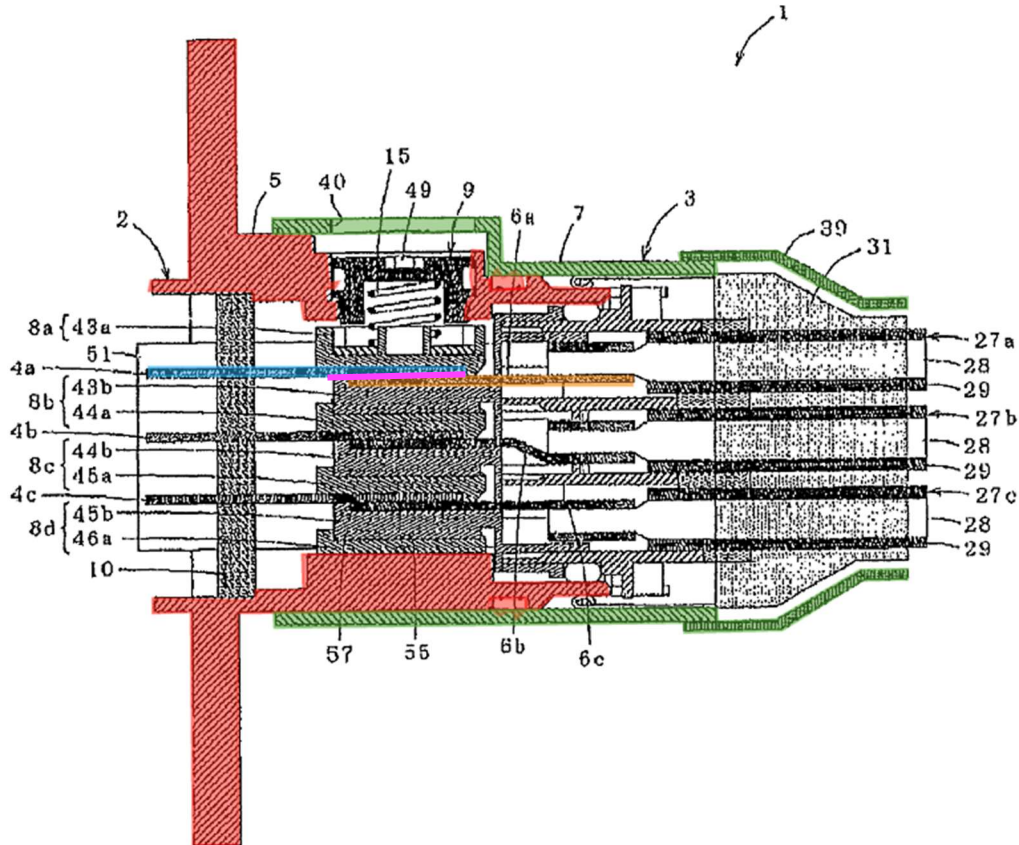


Ex. 1005, Fig. 6A (left) and portion of Fig. 6B (right)
(annotated highlighting **second connecting terminal 6a in orange**)

See also Ex. 1005, 12:17-43. Because second connecting terminal 6a is located inside housing 7, which includes cylindrical body 36, it is my opinion that second connecting terminal 6a is a “second electrical contact supported within the second insulating housing” as claimed.

- g. 1[f] the second electrical contact being configured to laterally engage with the connecting surface of the first electrical contact when the first connector is mated with the second connector;**

145. In my opinion, *Kataoka* discloses 1[f]. Second connecting terminal 6a in *Kataoka* is a “second electrical contact,” and first connecting terminal 4a is a “first electrical contact” as explained above in Sections X.E.1.c and X.E.1.f. The first and second electrical contacts 4a and 6a are “in surface-to-surface contact” with one another. Ex. 1005, 16:15-17. Figure 3 of *Kataoka* shows a cross section of the second connector portion 3:



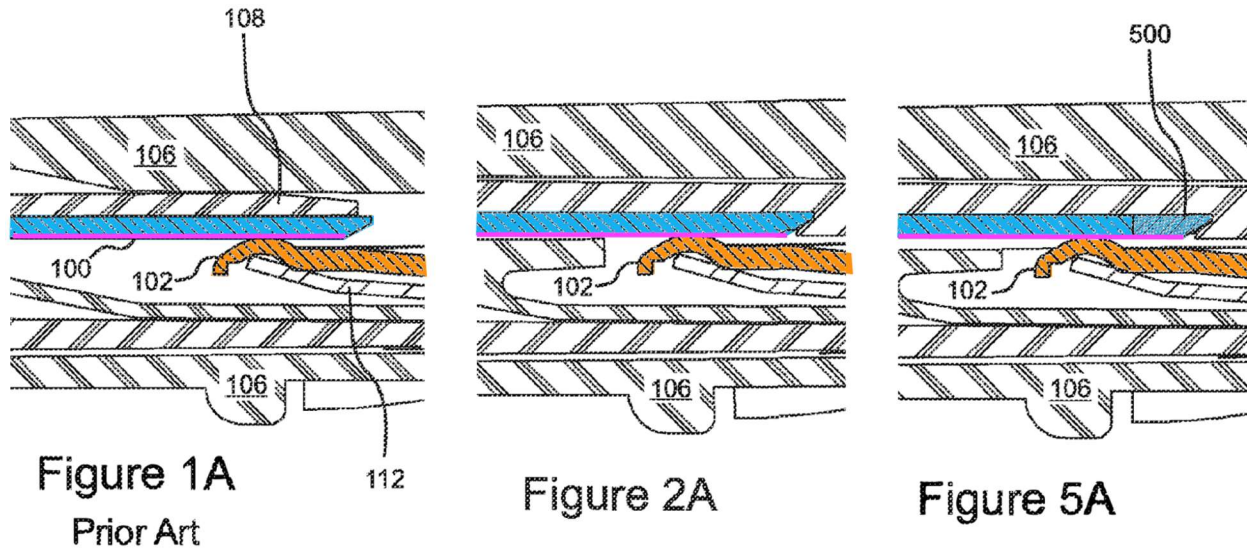
*Ex. 1005, Fig. 3 (annotated highlighting a **first connector** in red, a **first electrical contact** in blue, a **second connector** in green, a **second electrical contact** in orange, and indicating a **connecting surface** in pink)*

Figure 3 shows a **first connector** mated to a **second connector** because the figure illustrates “the connector after the first connector portion [2] is fitted to the second connector [3].” Ex. 1005, 4:6-7. Figure 3 also shows a **second connection terminal 6a** (the **second electrical contact**) laterally engaging the **bottom surface** (the **connecting surface**) of **first connection terminal 4a** (the **first electrical contact**). Therefore, it is my opinion that *Kataoka* meets 1[f].

146. In my opinion, *Kataoka* further discloses a connecting member 9 “collectively fixing and electrically connecting the plural first connecting terminals 4a-4c to the plural second connecting terminals 6a-6c at each contact point by pressing the insulator 8a adjacent thereto.” Ex. 1005, 4:60-63, *see also* 8:38-49. That is, first connecting terminals 4a-4c are pressed laterally against connecting terminals 6a-6c by a connecting member 9. Therefore, it is my opinion that *Kataoka* meets 1[f].

147. Notably, the claim term “laterally engage” does not appear anywhere in the ’017 patent other than in claim 1. Ex. 1001, 4:30. In my opinion, a POSITA would understand that the term “laterally engage” in the context of claim 1 means that the connector elements (“connecting terminals”) move laterally, or perpendicular to the longitudinal axis, to engage.

148. This is illustrated in. The ’017 patent illustrates a top side surface of the **second connector** (in **orange** below) touching a **bottom surface** (in **pink** below) of the **first connector** (in **blue** below):



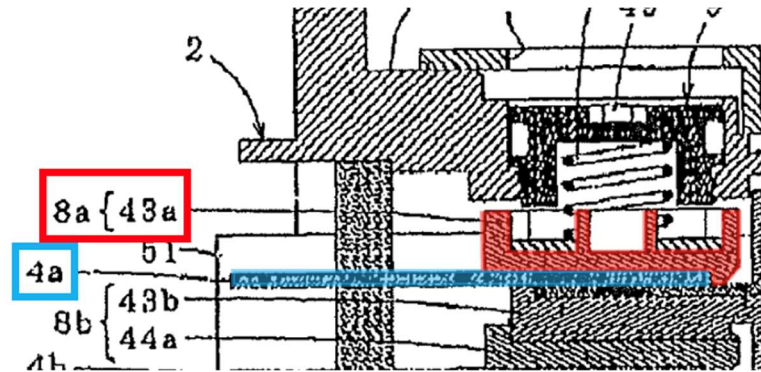
'017 Patent, portions of Figs. 1A, 2A, 3A (annotated highlighting **male contact 100** in **blue**, **female contact 102** in **orange**, and indicating **a connecting surface** in **pink**)

In the '017 patent embodiments shown in Figures 2A and 5A, a bottom surface of the first electrical contact is a connecting surface that engages a top surface of the second electrical contact, in the exact same manner as the prior art shown in Figure 1A. *Kataoka* discloses the same engagement between first connecting terminal 4a and second connecting terminal 6a, as explained above. For this additional reason, it is my opinion that *Kataoka* meets 1[f].

- h. 1[g] a first insulating barrier within the first connector extending beyond and covering the leading end of the first electrical contact; and**

149. In my opinion, *Kataoka* discloses 1[g]. First connector portion 2 of *Kataoka* includes first connecting terminals 4a-4c that are “sandwiched by the insulators 8a-8d formed of a non-conductive resin with a predetermined thickness,

thereby forming a laminated structure.” Ex. 1005, 4:65-5:9. Insulator 8a includes a first insulating member 43a. Ex. 1005, 5:10-16, Fig. 3. First insulating member 43a is fixed to the end of first connecting terminal 4a (the first electrical contact). Ex. 1005, 14:23-26.

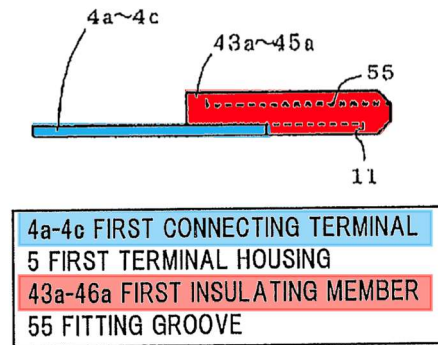


Ex. 1005, portion of Fig. 3 (annotated highlighting **insulator 8a** and **first insulating member 43a** in red, and **first connecting terminal 4a** in blue)

Insulating member 43a of insulator 8a is an “insulating barrier” by name, because it is formed of non-conductive material as explained above. Furthermore, insulator 8a and first insulating member 43a, serve, as insulators, to increase the breakdown voltage over that of air (when no insulator is present) such that it “ensure[s] insulation between the contact points (or between a contact point and the first terminal housing)” and prevents dielectric breakdown from occurring.” Ex. 1005, 5:37-38, *see also* 6:42-45. Insulator 8a and first insulating member 43a are therefore both examples of an “insulating barrier” as claimed.

150. Insulating member 43a is a first insulating barrier “extending beyond and covering the leading end of the first electrical contact” as claimed. In

discussing Fig. 5A, *Kataoka* discloses that “first insulating members 43a–45a are positioned and fixed so as to protrude on the front-end side of the first connecting terminals 4a–4c.” Ex. 1005, 7:4-6, Fig. 5A:



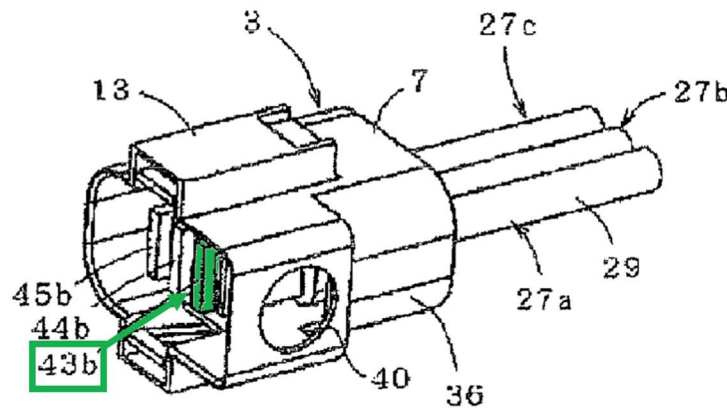
Ex. 1005, Fig. 5A (legend repositioned, and annotated highlighting **first connecting terminal 4a** in **blue**, and **first insulating member 43a** in **red**)

As shown above in Fig. 5A, the **first insulating member 43a** (in **red**) extends to the right beyond the end of **first connecting terminal 4a** (in **blue**). The **first insulating member 43a** also covers the righthand end of **first connecting terminal 4a**, which is the “leading end” of the first electrical contact when the connectors are mated. *See* Ex. 1005, Fig 3 (above). *Kataoka* explains that in this configuration, “second connecting terminals 6a-6c do not contact with the end surface of the first connecting terminals 4a-4c when the first connector portion 2 is fitted to the second connector portion 3.” Ex. 1005, 7:24-26.

151. For the reasons above, it is my opinion that *Kataoka* discloses 1[g].

- i. **1[h] a second insulating barrier extending beyond the second electrical contact within the second connector,**

152. In my opinion, *Kataoka* discloses 1[h]. The second connector portion 3 of *Kataoka* (the second connector) includes a second insulating member 43b. Ex. 1005, Figs. 1, 3, 6A.

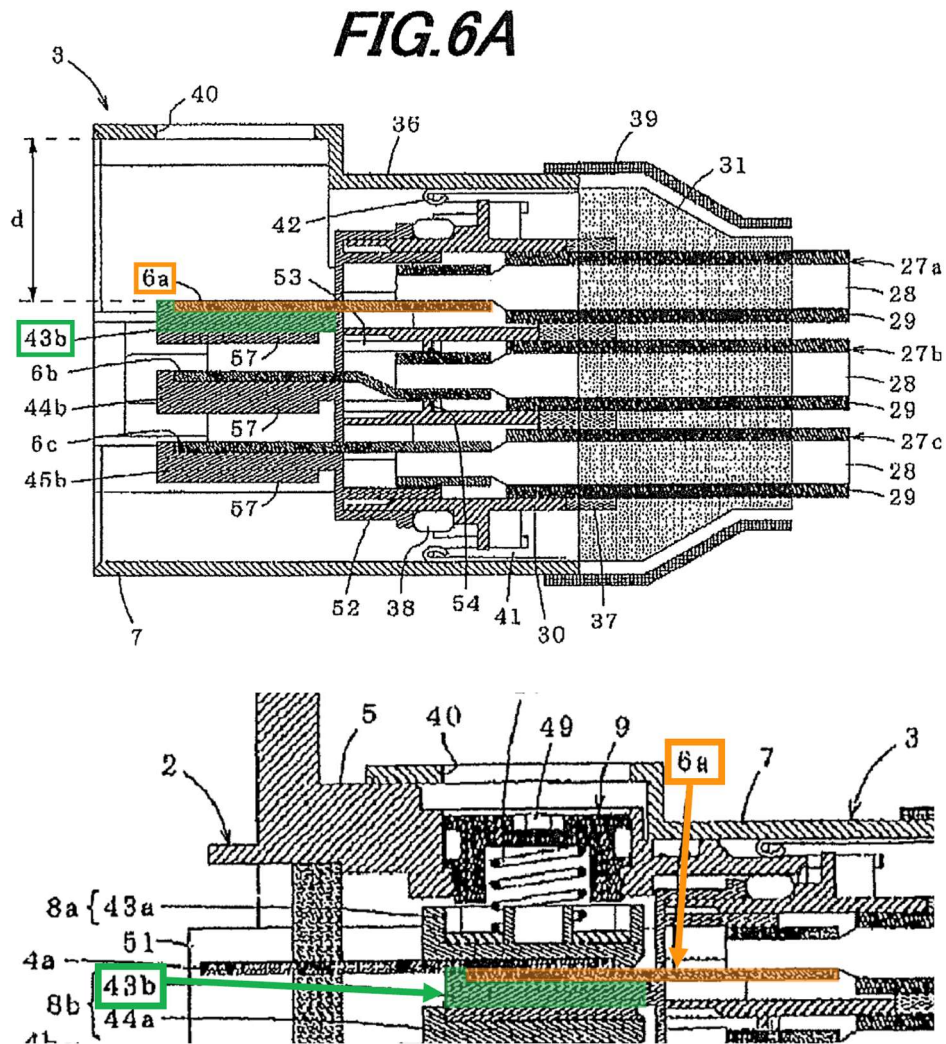


Ex. 1005, portion of Fig. 1 (annotated highlighting **second insulating member 43b** in **green**, of second connector portion 3)

Figure 1 of *Kataoka*, above, shows second connector portion 3 with a **second insulating member 43b** in **green**. The perspective view of second connector portion 3 above shows that second insulating member 43b is *within* the second connector portion 3. This configuration is also shown in the cross-section view shown in Fig. 6A (below). It is thus my opinion that second insulating member 43b is “a second Insulating member . . . within the second connector” as claimed.

153. In my opinion, second insulating member 43b is also a “second insulating barrier extending beyond the second electrical contact” as claimed. Second connecting terminal 6a of *Kataoka* is a “second electrical contact,” as

explained above with respect to 1[e]. Section X.E.1.f. *Kataoka* discloses that “[w]hen the second connecting terminal 6a (or 6b or 6c) is adjacent thereto, the second insulating members 43b-45b are fixed to another surface of the adjacent second connecting terminal 6a (or 6b or 6c) so as to cover at least an end surface thereof on a front-end side in a fitting direction.” Ex. 1005, 5:28-33. Figures 6A and 3, below, show the **second insulating member 43b** (in green) extending beyond the left end of the **second connecting terminal 6a** (in orange):

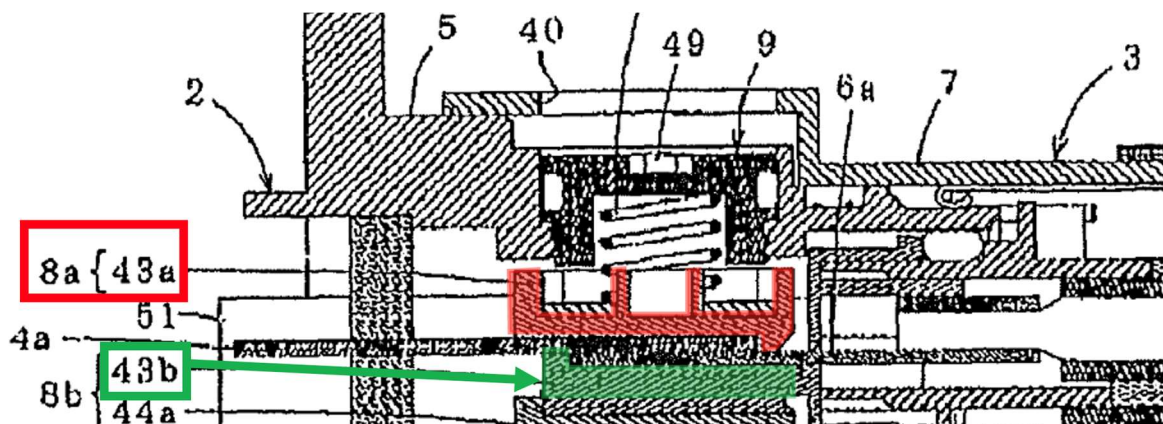


Ex. 1005, Fig. 6A (top) and portion of Fig. 3 (bottom) (both annotated highlighting **second connecting terminal 6a** in orange, and **second insulating member 43b** in green)

154. For the reasons above, it is my opinion that *Kataoka* meets 1[h].

- j. 1[i] the second insulating barrier being configured so as to be in close proximity with the first insulating barrier when the first and second connectors are partially disconnected and the first and second electrical contacts are separated by a short distance, thereby blocking substantially all through-air arcing paths between the first and second electrical contacts.

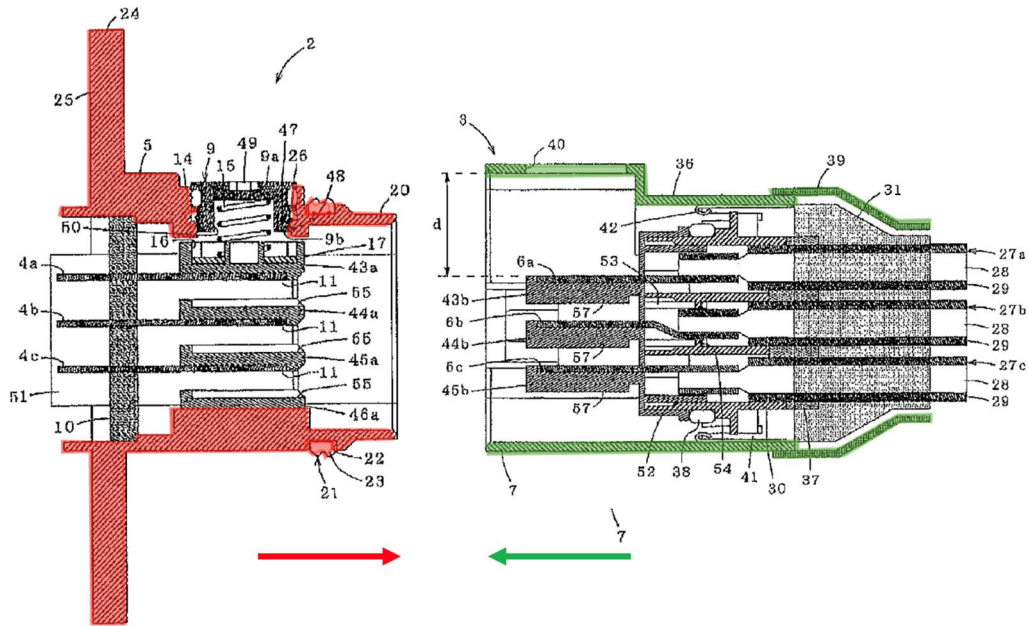
155. In my opinion, *Kataoka* discloses 1[i]. The **second insulating member 43b** (the second insulating barrier) of second connector portion 3 (the second connector) is “configured to as to be in close proximity” with **first insulating member 43a** (the first insulating barrier) of the first connector portion 2 (the first connector):



Ex. 1005, portion of Fig. 3 (annotated highlighting **first insulating member 43a** in red and **second insulating member 43b** in green)

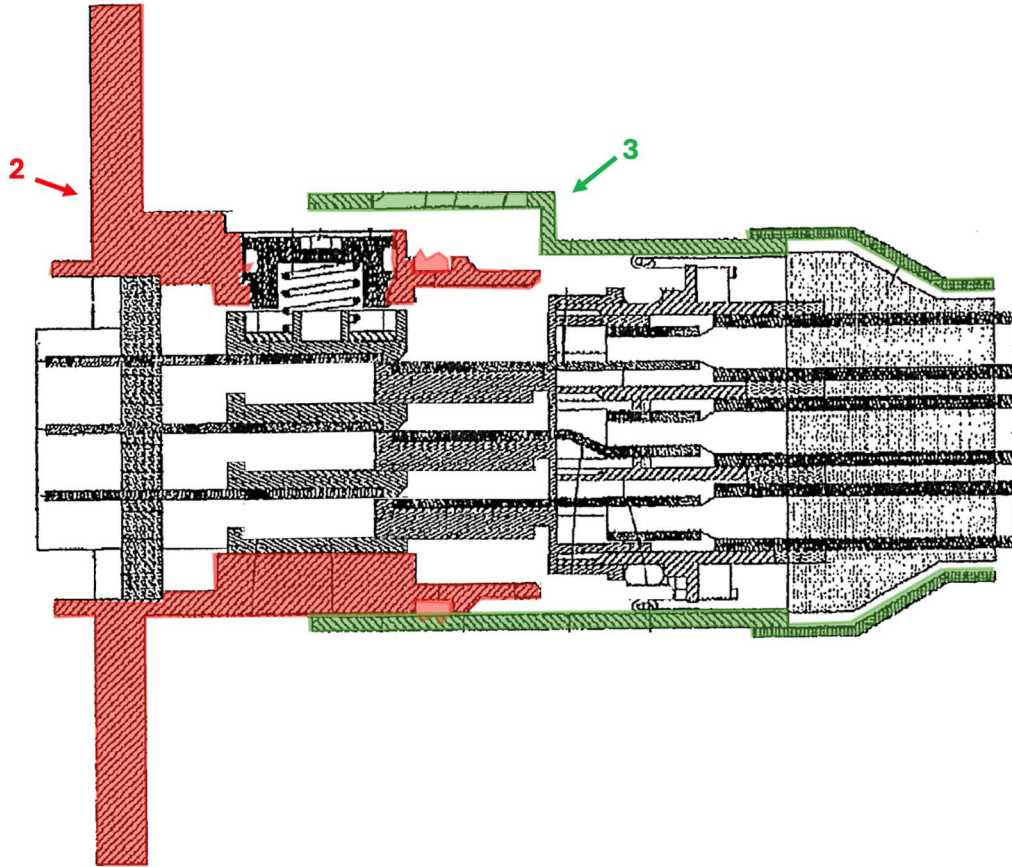
Kataoka discloses that the first insulating member 43 overlaps with second insulating member 43b. Ex. 1005, 13:50-52, Fig. 3 (above). *Kataoka* also discloses a connecting member 9 that presses insulator 8a (having first insulating member 43a) against insulator 8b (having second insulating member 43b), to sandwich the electrical contacts together. Ex. 1005, 14:50-65, Fig. 3 (portion reproduced above). Therefore, *Kataoka*'s second insulating barrier (**second insulating member 43b**) is configured to be in close proximity to the first insulating barrier (**first insulating member 43a**) when the first and second connector portions are connected.

156. *Kataoka*'s second insulating barrier is also "configured to be in close proximity with the first insulating barrier when the first and second connectors are *partially disconnected*," as claimed. A diagram based on the cover image of *Kataoka* shows how the **first connector (red)** and **second connector (green)** are connected to one another:



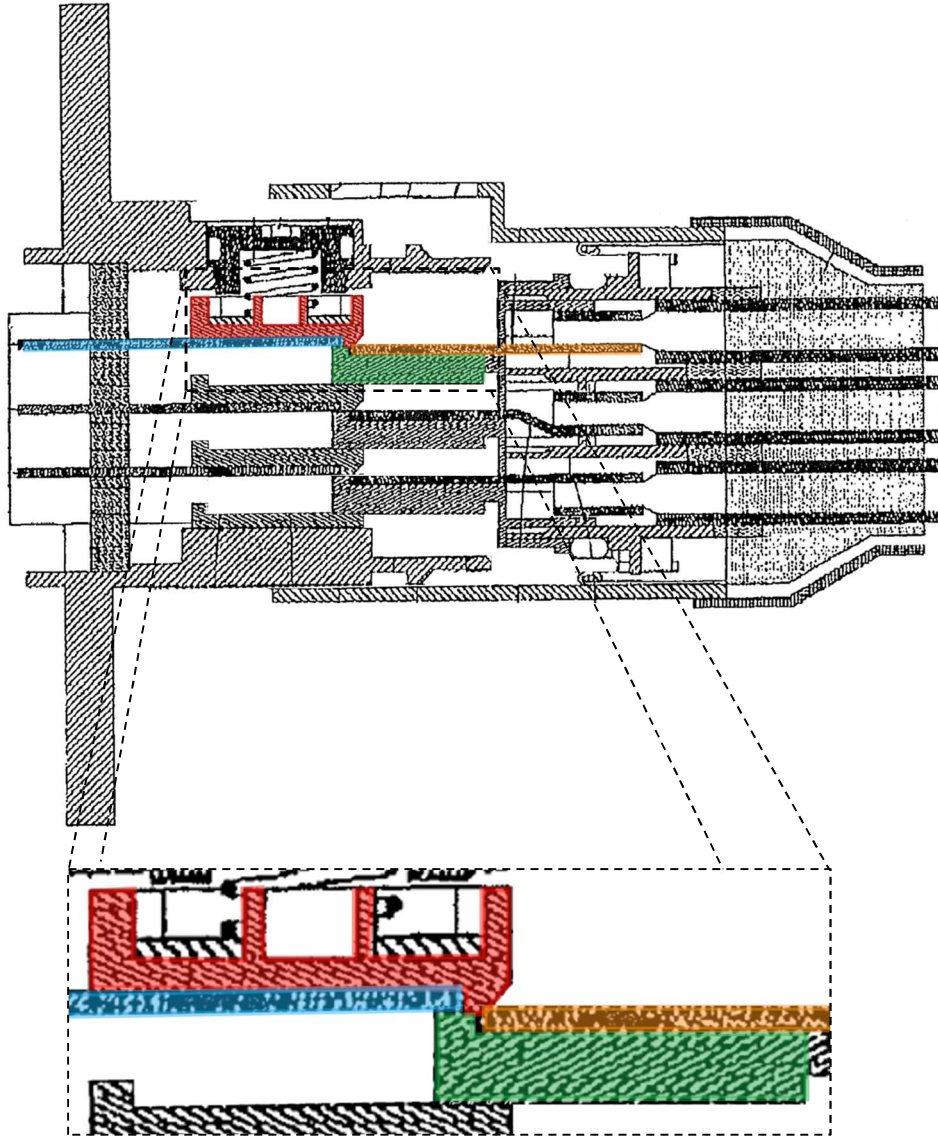
Annotated diagram based on Ex. 1005, Cover (showing a cross section of a **first connector** in **red** and a **second connector** in **green**, with arrows indicating the direction of fitting the first and second connector)

Another diagram shows the first and second connectors in a partially connected / disconnected configuration:



Annotated diagram based on Ex. 1005, Fig. 3 (showing a **first connector in red** and a **second connector in green** in a partially disconnected configuration)

When the first connector portion 2 (the first connector) and the second connector portion 3 (the second connector) of *Kataoka* are partially disconnected, and the first and second electrical contacts are separated by a short distance, the first and second insulating barriers of *Kataoka* are in close proximity, as illustrated in the diagram below:



*Annotated diagram based on Ex. 1005, Fig. 3 (top), with enlarged portion (bottom) (showing a **first insulating barrier** in **red** and a **second insulating barrier** in **green** of a connector pair in a partially disconnected configuration, a **first electrical contact** in **blue**, and a **second electrical contact** in **orange**)*

When *Kataoka*'s connectors are partially disconnected, as illustrated above, the **first electrical contact** (**blue**, above) and the **second electrical contact** (**orange**, above) are separated by a short distance. In this configuration, the leading portion of both the **first insulating barrier** (**red**, above) and the **second insulating**

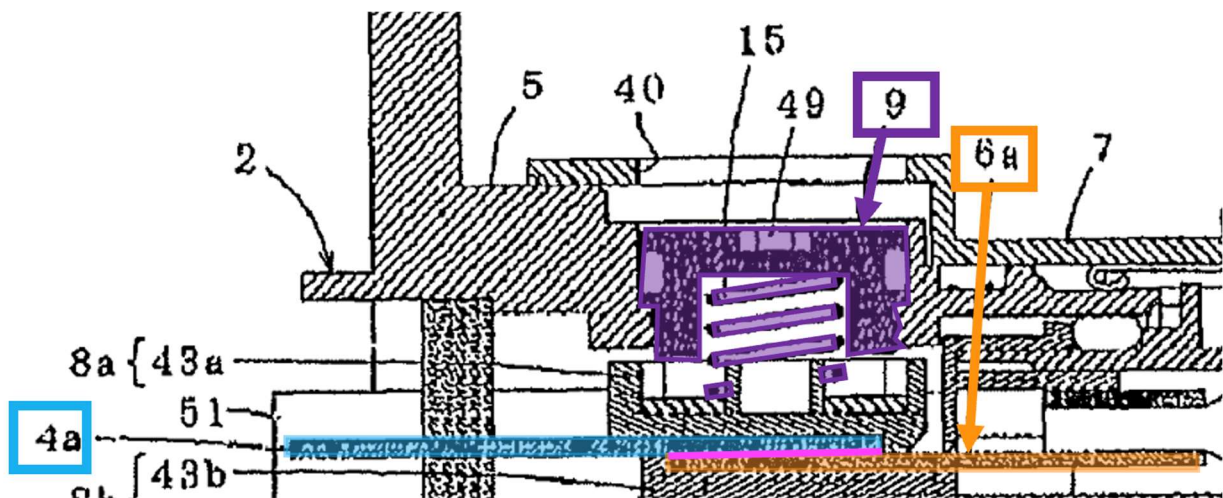
barrier (green, above) are in close proximity. Because the **first insulating barrier** and the **second insulating barrier**, in the configuration illustrated above, have substantially higher dielectric breakdown voltages than air and there for eliminate the initiation of arcing between the **first** and **second electrical contacts**, they therefore “block[] substantially all through-air arcing paths between the **first** and **second electrical contacts**,” as claimed. This is apparent from the diagram above, because there is no air gap or other through-air arcing path between the first insulating barrier and the second insulating barrier.

157. It is my opinion that the diagram above is consistent with *Kataoka*’s expressly disclosure of preventing electric shock by fixing the first insulating members 43a and the second insulating member 43b to the surfaces of the first connecting terminal 4a and the second connecting terminal 6a, respectively, so that the terminals are “not exposed in the non-fitted state.” Ex. 1005, 15:12-22. Therefore, in my opinion, *Kataoka* discloses 1[i].

158. For the reasons above, it is my opinion that *Kataoka* discloses every limitation of independent claim 1, and thus anticipates claim 1.

2. **Claim 2.** The connector pair of claim 1, further comprising a contact tensioning mechanism that presses the second electrical contact against the engaging surface of the first electrical contact when the first and second connectors are connected.

159. In my opinion, *Kataoka* anticipates claim 2. *Kataoka* discloses a connecting member 9 “collectively fixing and electrically connecting the plural first connecting terminals 4a-4c to the plural second connecting terminals 6a-6c at each contact point by pressing the insulator 8a adjacent thereto.” Ex. 1005, 4:60-63, *see also* 8:13-19, 8:38-49, 14:50-65, Fig. 3:



Ex. 1005, annotated portion of Fig. 3 (highlighting **connecting member 9** in purple, **first connecting terminal 4a** in blue, and **second connecting terminal 6a** in orange, and indicating a **connecting surface** in pink)

Figure 3 of *Kataoka*, above, shows the first connector portion 2 and second connector portion 3 in a “fitted” or connected configuration. As shown above, **connecting member 9** includes an elastic member 15, such as a spring, that imparts a pressing force on insulator 8a which, in turn, presses the **second**

connecting terminal 6a against the connecting surface of the first connecting terminal 4a.

160. I also note that, even if Fig. 3 above was interpreted as showing connecting member 9 pressing the first connecting terminal 4a against second connecting terminal 4b, it is my opinion that a POSITA would have understood that under Newtons 3rd law, when one object exerts a force on a second object, the second object exerts an equal and opposite force on the first. *See* Ex. 1020 at 1.

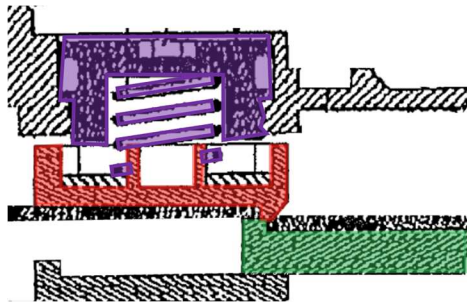
161. For these reasons, it is my opinion that connecting member 9 of *Kataoka* constitutes the claimed “contact tensioning mechanism;” thus, *Kataoka* meets claim 2.

3. Claim 3. The connector pair of claim 2, wherein the contact tensioning mechanism includes a spring.

162. In my opinion, *Kataoka* anticipates claim 3. *Kataoka* discloses the limitations of claim 2 including a connecting member 9 that constitutes the claimed “contact mechanism,” as explained in Section X.E.2. *Kataoka* discloses connecting member 9 including an elastic member 15 such as a spring. Ex. 1005, 8:13-19. Furthermore, the figures of *Kataoka* illustrate a cross-sectional view of elastic member 15 being a coil or helical spring. *See* Section X.E.2; Ex. 1005, Figs. 3, 4A, 10. For these reasons, it is my opinion that *Kataoka* discloses claim 3.

4. **Claim 4. The connector pair of claim 1, further comprising a barrier tensioning mechanism that presses the first and second insulating barriers against each other when the first and second connectors are partially disconnected and the first and second electrical contacts are separated by a short distance.**

163. In my opinion, *Kataoka* anticipates claim 4. *Kataoka* discloses connecting member 9 that “press[es] the adjacent insulator 8a” which includes first insulating member 43a (the first insulating barrier of claim 1). Ex. 1005, 6:10-13, *see also* 5:10-16, 5:51-57, Figs. 3, 4A, 10. A diagram created based on *Kataoka* Fig. 3 illustrates how the connecting member would press insulating member 43a (the first insulating barrier) of insulator 8a against the second insulating barrier, when the connectors are partially disconnected:



Annotated diagram based on Ex. 1005, Fig. 3 (showing a **first insulating barrier** in **red** and a **second insulating barrier** in **green** of a connector pair in a partially disconnected configuration, and a **connecting member 9** in **purple**)

The diagram above shows part of the first connector portion 2 (the first connector) and part of the second connector portion 3 (the second connector) of *Kataoka* in a partially-disconnected configuration. The first and second electrical contacts (not highlighted above) are separated by a short distance in this configuration. As

shown above, **first insulating barrier 43a** (in **red**) of insulator 8a is pressed against the **second insulating barrier 43b** by **connecting member 9**.

164. For these reasons, it is my opinion that connecting member 9 of *Kataoka* constitutes the “barrier tensioning mechanism” of claim 4. Therefore, *Kataoka* meets claim 4.

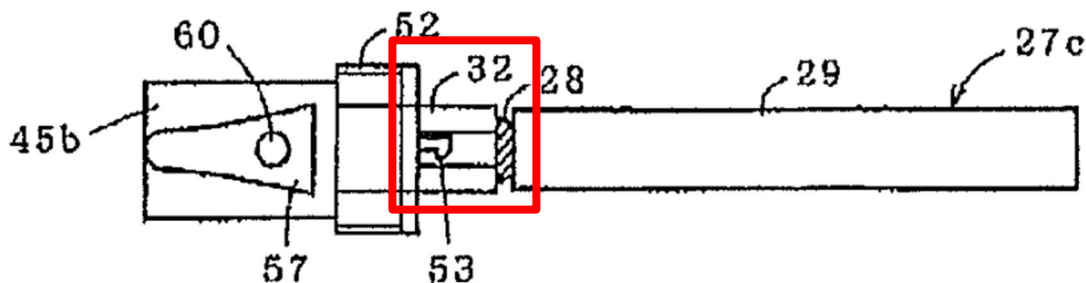
F. Ground 2B: Claims 7-10 Are Obvious Over *Kataoka* In View Of the Handbook

165. In my opinion, *Kataoka* in view of the Handbook renders claims 7-10 obvious. Claims 7-10 recite a terminal for connecting the first or second electrical contact using various known, common, and decades-old techniques, such as soldering, crimping, and insulation displacement. Because these dependent claims recite known and common techniques, the '017 patent does not, in any way, describe the limitations of claims 7-10 in a manner that distinguishes the prior art. I note that the '017 patent does not describe claims 7-10 at all; several terms of claims 7-10 do not appear anywhere in the '017 patent specification or figures, and the limitations appear only in the claims in the original, as-filed application. For example, I note that the words “crimping,” “solder,” and “terminal” do not appear anywhere in the '017 patent other than dependent claims 7-12.

166. As I explain below, it is my opinion that claims 7-10 are obvious over *Kataoka* in view of the Handbook.

1. **Claim 7. The connector pair of claim 1, wherein at least one of the first and second electrical contacts includes a terminal for crimping to a wire.**

167. In my opinion, claim 7 is obvious over *Kataoka* in view of the Handbook. *Kataoka* discloses the connector pair of claim 1 including first and second electrical contacts, as explained with respect to 1[c] and 1[e]. See Sections X.E.1.d, X.E.1.f. *Kataoka* further discloses second connecting terminal 6a that connects to a cable and is thus “a terminal for [connecting] to a wire” as claimed. Ex. 1005, Figs. 6A, 6B, 10:30-59. Second connecting terminal 6a has a “caulking portion 32” for attaching an exposed conductor at an end portion of a cable. Ex. 1005, 10:30-59, Figs. 7-8. I also note that Figs. 7A, 7B, 8A, 8B, 11A, 11B, 12A, and 12B illustrate a terminal connecting to a wire, and shows a crimping-like terminal in Fig. 12B:

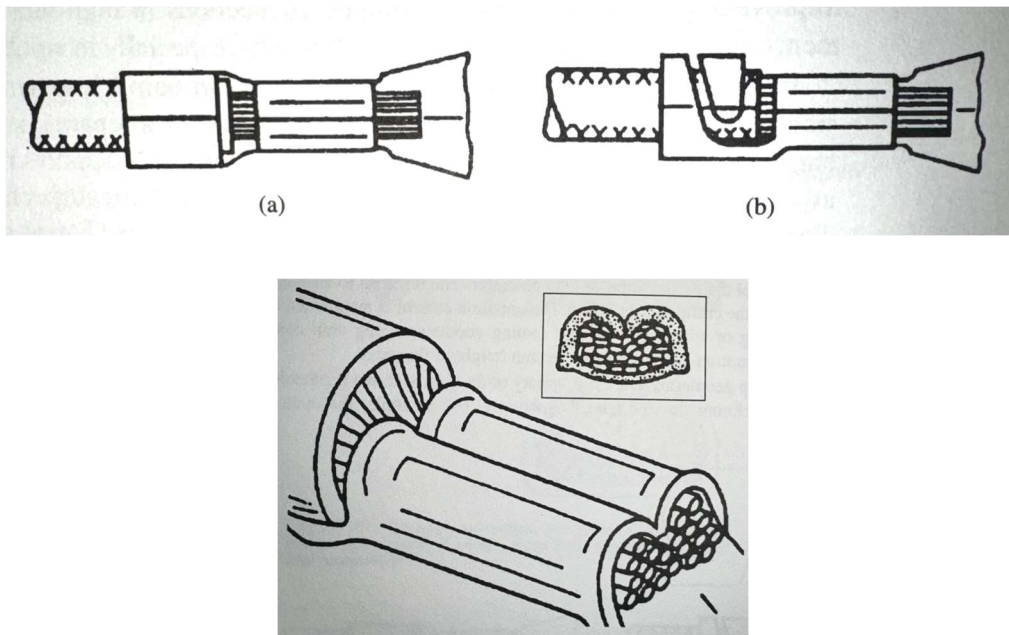


Ex. 1005, Fig. 12B (annotated circling caulking portion 32 which appears as a crimping terminal)

The terminal of *Kataoka* resembles a “female spade connector” which was (and is) a well-known connector terminal used in appliances, automotive and electronics,

as well as in other applications. The '017 patent does not mention “crimping” other than in claim 7, and the figures do not purport to show “a terminal for crimping to a wire” as claimed. Nevertheless, although *Kataoka* illustrates a terminal for crimping to a wire, *Kataoka* does not expressly disclose crimping.

168. The Handbook discloses that crimping was a known type of connection to a wire or cable, and discloses crimped wire connections as among “the oldest of the technologies” for connecting a wire or cable, “dating back to the 1940s.” Ex. 1008 at 13, 32. The Handbook includes several illustrations of crimp terminals like the “caulking portion 32” in Fig. 12B of *Kataoka*, above:



Ex. 1008, at 37, 39, showing Fig. 9.8 (top) and Fig. 9.10 (bottom)

Therefore, the Handbook discloses a terminal for crimping to a wire.

169. In my opinion, it would have been obvious to a POSITA to implement caulking portion 32 of *Kataoka* with a terminal for crimping to a wire as disclosed in the Handbook. The Handbook is analogous art to *Kataoka* and both are analogous to the '017 patent, as all three are in the same field of endeavor of electrical connectors. Modifying *Kataoka* based on the Handbook would have involved simple substitution of *Kataoka*'s caulking portion 32 for the Handbook's known crimping terminal, to obtain the predictable results of making a permanent connection to a wire/cable using a well-known crimping technique. *See* Ex. 1008 at 32-33. The modification would have also involved applying the known crimping technique of the Handbook to the known "caulking portion 32" of *Kataoka*. In my opinion, *Kataoka*'s connector was ready for improvement, because *Kataoka* does not give details as to how wires are connected to caulking portion 32. However, both *Kataoka* and the Handbook have similar hardware for connecting wires. *See* Ex. 1008 at 32-33; Ex. 1005, 10:30-59, Figs. 7-8, 12B.

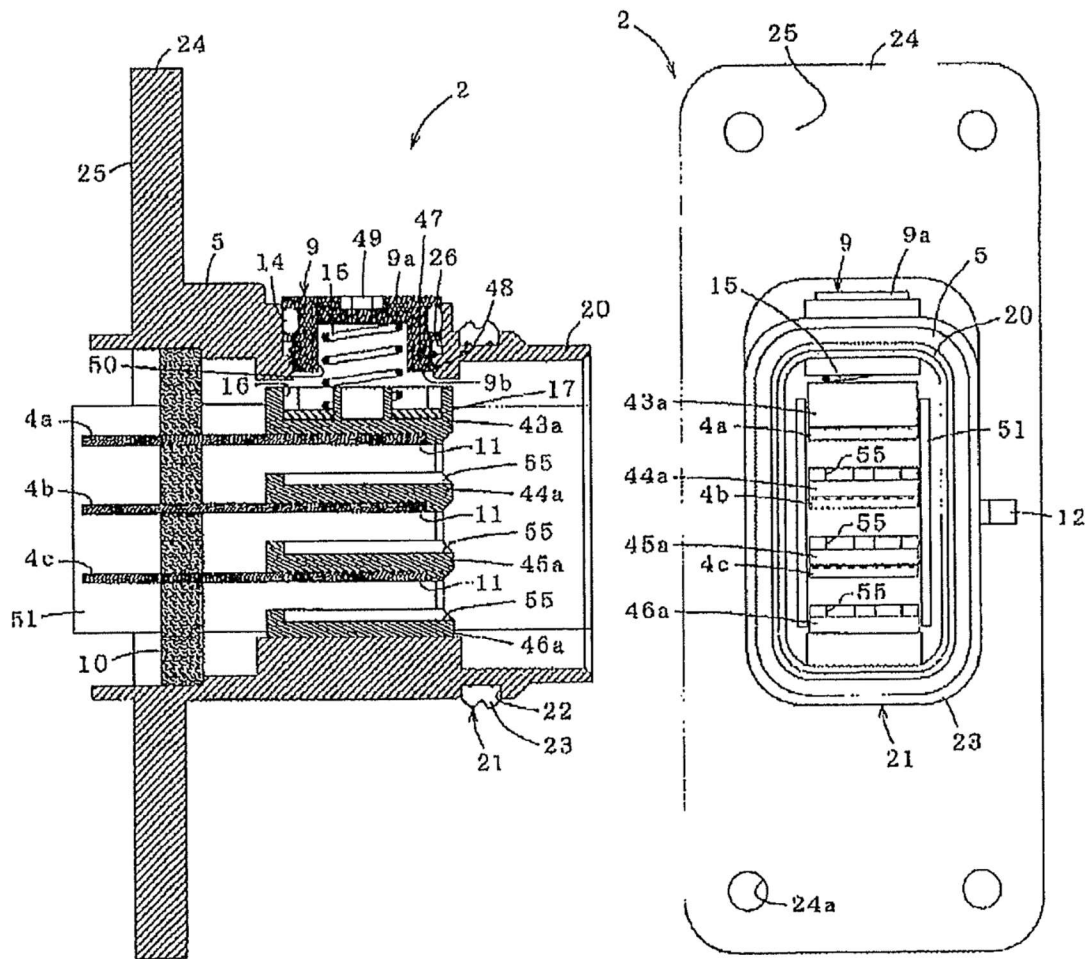
170. In my opinion, a POSITA would have expected success in modifying *Kataoka*'s caulking portion 32 (*Kataoka*'s terminal) for crimping to a wire, as disclosed in the Handbook. As I explained above, *Kataoka*'s caulking portion 32 already has the same appearance as the crimping terminals in the Handbook. There would be few, if any, changes needed to the hardware of *Kataoka* in order to crimp caulking portion 32 to a wire. In my opinion, a POSITA would only need to

deform the caulking portion 32 of *Kataoka* to form a permanent connection with a wire, guided by the Handbook's disclosure of known crimping techniques. *See* Ex. 1008 at 32-55.

171. For the reasons above, it is my opinion that claim 7 would have been obvious based on *Kataoka* in view of the Handbook.

2. Claim 8. The connector pair of claim 1, wherein at least one of the first and second electrical contacts includes a terminal for soldering to a printed circuit or wiring board.

172. In my opinion, claim 8 is obvious over *Kataoka* in view of the Handbook. *Kataoka* discloses the connector pair of claim 1 including first and second electrical contacts, as I explained with respect to 1[c] and 1[e]. *See* Sections X.E.1.d, X.E.1.f. *Kataoka* further discloses first connector portion 2 having a first connecting terminal 4a. Ex. 1005, Figs. 4A, 4B:



Ex. 1005, Figs. 4A (left) and 4B (right)

The first connecting terminals 4a-4c are formed of “highly conductive metal such as silver, copper or aluminum.” Ex. 1005, 6:65-67. First connector portion 2 (shown above) is “fitted to a shield case of [a] motor, and portions of the first connecting terminals 4a-4c exposed from the first terminal housing 5 are connected to each terminal of a terminal block which is installed in the shield case of the motor.” Ex. 1005, 5:60-65. Therefore, *Kataoka* discloses an exposed terminal that can be connected to an electronic device such as a motor. In my opinion, any

conductive metal component can be soldered to a printed circuit or wiring board, with a sufficient amount of heat depending on the type of solder used.

Nevertheless, *Kataoka* fails to expressly disclose using a terminal “for soldering to a printed circuit or wiring board” as recited in claim 8. The Handbook discloses the claimed usage.

173. The Handbook discloses soldering to a printed wiring board. According to the Handbook, “[t]here are two major media through which [permanent] connections are established: (a) wires or cables and (b) printed wiring boards (PWBs).” Ex. 1008 at 21. According to the Handbook, PWBs have been used and known since at least the 1950s. *Id.* The Handbook further discloses that “[s]oldering is the dominant metallurgical technology used in PWB applications” and discloses surface mount technology (SMT) as one of the two prevalent connection techniques for attaching electronics to a printed wiring board. *Id.* at 21, *see also* 74-77.

174. In my opinion, it would have been obvious to a POSITA to use the first connecting terminal 4a of *Kataoka*’s first connector portion 2 as a terminal for soldering to a printed circuit or wiring board, as disclosed in the Handbook. The combination would have involved simply combining the known terminal of *Kataoka* with the known printed wiring board of the Handbook. The combination would have been made using known methods such as surface mount technology

soldering techniques disclosed in the Handbook. *See* Ex. 1008 at 74-77. For example, in my opinion a POSITA would have found it obvious to use the exposed end of connecting terminal 4a (i.e., the left side of 4a, in *Kataoka*'s Fig. 4A above), as a terminal that is soldered to a printed wiring board of a device such as an electric motor, using the surface mount soldering technology disclosed in the Handbook. The combination would have yielded the predictable results of providing a permanent electrical connection between *Kataoka*'s first connector portion that is intended for use in an electric motor (*see* Ex. 1005, 5:60-6:3) and a power supply or control board of the motor that is a printed circuit or wiring board.

175. In my opinion, a POSITA would have expected success in combining *Kataoka* with the Handbook's teaching of soldering to a printed wiring board. *Kataoka*'s first connector portion 2 already has a metallic connecting terminal 4a with an exposed end, and would not require any physical modification to solder the terminal to a printed wiring board. In my opinion, a POSITA would have been guided by the Handbook's disclosure about how to solder the exposed end of connecting terminal 4a to a printed wiring board, such as by using surface mount technology. In my opinion, a POSITA would have had a reasonable expectation of success and the modification would have yielded a predictable result, including the connection of the connector of *Kataoka* to a printed circuit or wiring board by soldering.

176. For the reasons above, it is my opinion that claim 8 would have been obvious based on *Kataoka* in view of the Handbook.

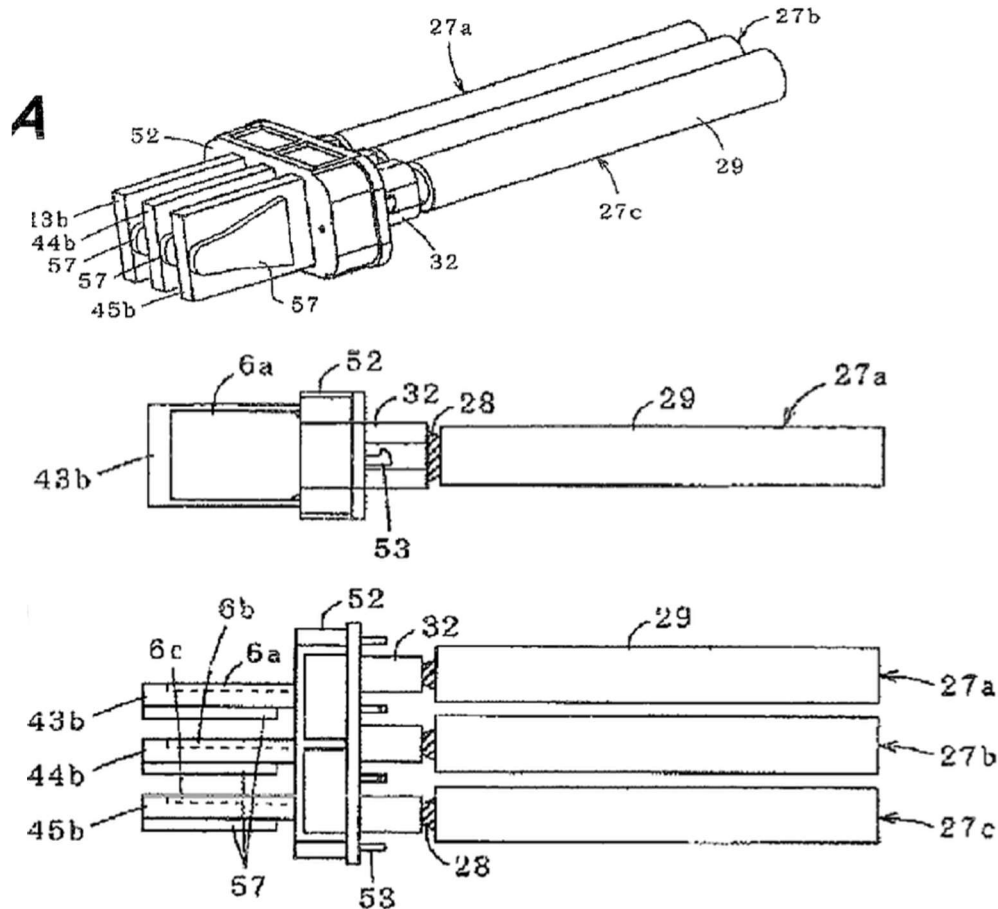
3. Claim 9. The connector pair of claim 1, wherein at least one of the first and second electrical contacts includes a terminal for soldering a wire or and electrical component to the contact.

177. In my opinion, claim 9 is obvious based on *Kataoka* in view of the Handbook. Claim 9 is obvious for the reasons I discussed above with respect to claim 8. *See* Section X.F.2. The combination of *Kataoka* and the Handbook includes a terminal for soldering to a printed wiring board, as I explained above. *Id.* A printed wiring board is an “electrical component,” and the ’017 patent does not define “electrical component” in a manner that distinguishes a printed wiring board. Additionally, *Kataoka* discloses connecting an exposed end of connecting terminal 4a to “a terminal block which is installed in the shield case of the motor.” Ex. 1005, 5:60-65. In my opinion, a POSITA would have understood that an electrical terminal block is another example of an “electrical component.” As I explained above with respect to claim 8, it is my opinion that it would have been obvious to a POSITA to solder *Kataoka*’s connecting terminal 4a to form a permanent electrical connection with an electrical component, such as a printed wiring board. *See* Section X.F.2. In my opinion, a POSITA would have had a reasonable expectation of success and the modification would have yielded a predictable result, including the utilization of a terminal for soldering a wire or

electrical component to the contact. It is therefore also my opinion that claim 9 is obvious for the same reasons that claim 8 is obvious based on *Kataoka* in view of the Handbook.

4. Claim 10. The connector pair of claim 1, wherein at least one of the first and second electrical contacts includes a terminal using insulation displacement for attaching a wire to the contact.

178. In my opinion, *Kataoka* in view of the Handbook renders claim 10 obvious. *Kataoka* discloses the connector pair of claim 1 including first and second electrical contacts, as explained with respect to 1[c] and 1[e]. See Sections X.E.1.d, X.E.1.f. *Kataoka* further discloses metal second connecting terminal 6a that connects to a cable and is thus “a terminal for [connecting] to a wire” as claimed. Ex. 1005, Figs. 6A, 6B, 10:30-59. Second connecting terminal 6a (the electrical contact) has a “caulking portion 32” for attaching an exposed conductor at an end portion of a cable 27a. Ex. 1005, 10:30-59, Figs. 7-8. Figs 9A-9D further illustrate second connecting terminals 6a-6c having caulking portions 32.



Ex. 1005, Figs. 9A (top), 9B (middle), 9D (bottom)

As shown above, caulking portion 32 of the metal second connecting terminal 6a encircles the end of cable 27a. I note that *Kataoka* does not explain specifically how caulking portion 32 of the metal second connecting terminal 6a connects to cable 27a. Furthermore, in the figures above, the insulation layer 29 appears to be removed at the end of cable 27a, such that caulking portion 32 attaches to the bare metallic conductors of cable 27a. Thus, in my opinion, *Kataoka* teaches, but does not expressly disclose, a terminal “for using insulation displacement for attaching a wire to the contact” as claimed.

179. The Electrical Connector Handbook (the Handbook) discloses an insulation displacement connector as being well-known before the '017 patent. In particular, the Handbook discloses insulation displacement connectors as a known technique for mechanically and electrically attaching a wire/cable to an electrical contact, to form a permanent connection. Ex. 1008 at 13-14, Figs. 1.2, 9.32, 9.26.

180. In my opinion, the Handbook is analogous art to *Kataoka* and to the '017 patent. All three are in the same field of endeavor; like *Kataoka* and the '017 patent, the Handbook discloses electrical connectors that attach to cables/wires.

181. In my opinion, it would have been obvious to a POSITA to modify the caulking portion 32 in *Kataoka*'s second connecting terminal 6a to use insulation displacement, as disclosed in the Handbook. The modification would have involved modifying or replacing caulking portion 32 with an insulation displacement terminal. For example, in my opinion it would have been obvious to a POSITA to modify caulking portion 32 to close the end of the portion and include a slot for inserting a wire/cable. Such a modification would have amounted to applying the known insulation displacement technique disclosed in the Handbook to the known electrical connector of *Kataoka*.

182. In my opinion, it would have alternatively been obvious to replace the caulking portion 32 of *Kataoka* with the insulation displacement terminal of the Handbook. Under either modification, the modified connecting terminal of

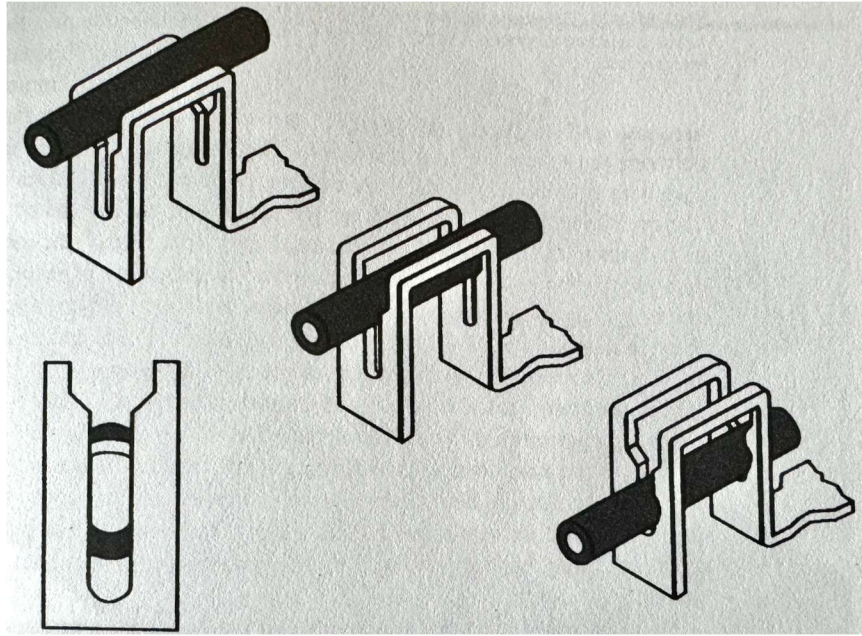
Kataoka would have appeared similar to Figs. 9A-9D of *Kataoka*, except with slotted terminals in place of caulking portions 32.

183. In my opinion, a POSITA would have understood that dimensions of *Kataoka*'s caulking portion 32 as modified to use insulation displacement could have been adjusted based on the dimensions of the second terminal housing 7. *See* Ex. 1005, Figs. 1, 3, 6B. It is also my opinion that a POSITA would have been capable of modifying the second terminal housing 7, if necessary, to accommodate an insulation displacement terminal in place of caulking portion 32.

184. *Kataoka*'s electrical connector was ready for improvements in wire connection techniques, because *Kataoka* is silent regarding techniques to secure cable 27a to the caulking portion 32 of second connecting terminal 6a. In my opinion, a POSITA would have understood that connecting a cable 27a to a caulking portion 32 as illustrated in Figs. 9A-9D of *Kataoka* would have required additional equipment such as tools to remove the insulation from cable 27a, and to connect the bare end of the cable to the terminal using known techniques such as soldering or crimping. In my opinion, an insulation displacement terminal would have improved *Kataoka* because the Handbook teaches that insulation removal is not necessary. *See* Ex. 1008 at 55, *see also* 55-69. Therefore, modifying *Kataoka*'s terminal to use insulation displacement would have yielded the predictable results

and advantages of simplifying the process of permanently attaching a wire/cable to the connector, and without the need for additional equipment or skill.

185. In my opinion, a POSITA would have expected success in modifying *Kataoka* to have a terminal using insulation displacement for attaching a wire to the electrical contact. Second connecting terminal 6a of *Kataoka* would have required only minor modifications that were within the capabilities of a POSITA. For example, only minor modifications would have been needed to reshape the metallic caulking portion 32 of *Kataoka* to have slots for connecting a wire. It is also my opinion that POSITAs would have alternatively been capable of replacing caulking portion 32, which looks like a crimping terminal, with the insulation displacement terminals illustrated in the Handbook. At least Figure 9.26 of the Handbook illustrates how the right-hand side of the insulation displacement terminal would have attached to the second connecting terminal 6a of *Kataoka*:



Ex. 1008, Fig. 9.26

In my opinion, a POSITA would have understood that any necessary changes to the caulking portion side of *Kataoka*'s second connector portion 2 (near the rear end) would have had no effect on the mating surfaces of first and section connecting terminals 4a and 4b, or to *Kataoka*'s insulation barriers (near the front end).

186. For the reasons above, it is my opinion that claim 10 would have been obvious based on *Kataoka* in view of the Handbook.

XI. CONCLUSION

187. For the reasons set forth above, in my opinion, a person of ordinary skill in the art as described in paragraph 19 would have considered the claims 1-4 and 7-12 of the '017 patent to be anticipated and/or obvious over the prior art discussed above.

188. In signing this declaration, I understand that the declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I acknowledge that I may be subject to cross-examination in this case and that cross-examination will take place within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

189. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: May 13, 2024

By: 

Charles A. Eldering, Ph.D.

APPENDIX A

Curriculum Vitae
Dr. Charles A. Eldering

CAsE Analysis, Inc.
620 Wilson Ave, PMB 101
Brooklyn, NY 11207

215.913.7214
cae@caseanalysisgroup.com

AREAS OF SPECIALIZATION: Extensive technical and market expertise in the areas of telecommunications, microelectronics, consumer electronics, targeted advertising, location-based services, data mining, and bioinformatics, with over 30 years of industrial experience. Highly skilled in the management and utilization of patents including infringement analysis and documentation of use of claimed technology.

EDUCATION:

- 1989 University of California; Davis, California
 Ph.D. Electrical Engineering
- 1985 Syracuse University; Syracuse, New York
 M.S. Solid State Science and Technology
- 1981 Carnegie Mellon University; Pittsburgh, Pennsylvania
 B.S. Physics

OTHER QUALIFICATIONS:

Registered U.S. Patent Agent. Registration No. 39,180
FCC Licensed General Class Amateur Radio Operator, N3YRB

EMPLOYMENT HISTORY:

December 2013 to present:

CAsE Analysis, Inc.
Founder & President

September 2022 to present

SitNet LLC
Founder and Managing Member

May 2000 to December 2021

Expanse Networks/Expanse Bioinformatics
Founder and President

December 1997 to December 2013:

Technology, Patents & Licensing, Inc. (now TechPats)
Founder and President

October 1995 to November 1997:

Next Level Communications, Rohnert Park, CA
Director, Advanced Systems Engineering

September 1993 to September 1995:

General Instrument Corporation, Hatboro, PA
Manager, Fiber-to-the-Curb/Switched Digital Video Systems; March 1995 to September 1995
Manager, Broadband Systems Engineering; January 1994 to March 1995
Senior Project Engineer, Systems Engineering; September 1993 to December 1993

January 1990 to August 1993:

Alcatel, Madrid, Spain
Senior Engineer/Manager, Fiber in the Loop R&D; October 1990 to August 1993
Consultant; January 1990 to September 1990

June 1986 to August 1990:

University of California, Davis, CA
Researcher, Department of Electrical and Computer Engineering

October 1981 to May 1986:

United States Air Force, Rome Laboratory, Rome, NY

Officer

EXPERT WITNESSING:

1. *CommScope Technologies v. Belden Nos.*, IPR2023-01056, -01058, -01061, -01062 (PTAB)
2. *PPC v. Perfect Vision Manufacturing, Inc.*, Case No. 4:22-CV-204 (Eastern District of Arkansas)
3. *PPC v. Perfect Vision Manufacturing, Inc.*, Case No. 4:22-CV-163 (Eastern District of Arkansas)
4. *PCC v. CommScope Technologies, LLC*, Case No. 22-783-RGA (District of Delaware)
5. *PPC v. Charles Industries, LLC and Amphenol Corporation*, Case No. 1:22-CV-01517 (District of Delaware)
6. *Belden v. CommScope, Inc.*, Case No. 22-782-RGA (District of Delaware)
7. *Amphenol Corporation v. PPC Broadband, Inc.*, Nos. IPR2022-00718, -00719, -00720 and -00721 (PTAB).
8. *PPC Broadband, Inc. v. Amphenol Corporation*, Nos. IPR2022, -00830, -00831, -00946, -00947, -01087, -01088 (PTAB).
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TEACHING APPOINTMENTS:

- University of California at Davis. Lecturer, Electronics Laboratory, (1987-88).
- State University of New York, Utica/Rome. Adjunct Professor, Electronics, (1985-86).

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59. U.S. Patent 8,365,216 Video stream modification to defeat detection
60. U.S. Patent 8,358,204 Dynamic tactile interface
61. U.S. Patent 8,346,307 Method of displaying contact information
62. U.S. Patent 8,335,854 Performing services on behalf of low-power devices
63. U.S. Patent 8,326,648 System for secure mobile healthcare selection
64. U.S. Patent 8,306,975 Expanded interest recommendation engine and variable personalization
65. U.S. Patent 8,290,351 Alternative advertising in prerecorded media
66. U.S. Patent 8,280,633 Weather risk estimation system and method
67. U.S. Patent 8,273,425 Nanotube assisted self-cleaning material
68. U.S. Patent 8,266,256 Virtualization for low-power networks
69. U.S. Patent 8,258,956 RFID tag filtering and monitoring
70. U.S. Patent 8,255,403 Pangenetic web satisfaction prediction system
71. U.S. Patent 8,253,703 Elastomeric wave tactile interface
72. U.S. Patent 8,234,244 Method of distributing contact and calendar records
73. U.S. Patent 8,225,347 Advertisement filtering and storage for targeted advertisement systems
74. U.S. Patent 8,224,835 Expanding attribute profiles
75. U.S. Patent 8,209,319 Compiling co-associating bioattributes

- 76. U.S. Patent 8,200,509 Masked data record access
- 77. U.S. Patent 8,185,597 Providing notifications to an individual in a multi-dimensional personal information network
- 78. U.S. Patent 8,185,461 Longevity analysis and modifiable attribute identification
- 79. U.S. Patent 8,180,675 System and method for automatically managing avail inventory data and avail pricing
- 80. U.S. Patent 8,151,295 Queue based advertisement scheduling and sales
- 81. U.S. Patent 8,150,422 Method of displaying contact information
- 82. U.S. Patent 8,126,486 Adaptive antenna weighting system for wireless local area and personal area networks
- 83. U.S. Patent 8,121,915 Generating financial plans using a personal information aggregator
- 84. U.S. Patent 8,116,616 Alternative advertising in prerecorded media
- 85. U.S. Patent 8,108,406 Pangenetic web user behavior prediction system
- 86. U.S. Patent 8,099,424 Treatment determination and impact analysis
- 87. U.S. Patent 8,087,045 Grouping advertisement subavails
- 88. U.S. Patent 8,077,021 Dynamic tactile interface
- 89. U.S. Patent 8,075,980 Diffraction grating assisted self-cleaning material
- 90. U.S. Patent 8,073,708 Aggregating personal healthcare information
- 91. U.S. Patent 8,073,194 Video entity recognition in compressed digital video streams
- 92. U.S. Patent 8,072,314 Secondary card reader
- 93. U.S. Patent 8,065,324 Weight and diet attribute combination discovery
- 94. U.S. Patent 8,055,643 Predisposition modification
- 95. U.S. Patent 8,051,033 Predisposition prediction using attribute combinations
- 96. U.S. Patent 8,046,798 Profiling and identification of television viewers
- 97. U.S. Patent 8,024,348 Expanding attribute profiles
- 98. U.S. Patent 7,984,466 Advertising management system for digital video streams
- 99. U.S. Patent 7,970,827 Providing notifications to an individual in a multi-dimensional personal information network
- 100.U.S. Patent 7,962,934 Advertising monitoring system
- 101.U.S. Patent 7,952,480 RFID tag filtering and monitoring
- 102.U.S. Patent 7,949,565 Privacy-protected advertising system
- 103.U.S. Patent 7,941,434 Efficiently compiling co-associating bioattributes
- 104.U.S. Patent 7,941,329 Insurance optimization and longevity analysis
- 105.U.S. Patent 7,933,912 Compiling co-associating bioattributes using expanded bioattribute profiles
- 106.U.S. Patent 7,930,714 Video detection and insertion
- 107.U.S. Patent 7,917,438 System for secure mobile healthcare selection
- 108.U.S. Patent 7,870,576 Targeted advertising through electronic program guide
- 109.U.S. Patent 7,844,609 Attribute combination discovery
- 110.U.S. Patent 7,818,310 Predisposition modification

111.U.S. Patent 7,810,114	Advertisement filtering and storage for targeted advertisement systems
112.U.S. Patent 7,809,154	Video entity recognition in compressed digital video streams
113.U.S. Patent 7,801,956	Providing notifications to an individual in a multi-dimensional personal information network
114.U.S. Patent 7,797,302	Compiling co-associating bioattributes
115.U.S. Patent 7,694,318	Video detection and insertion
116.U.S. Patent 7,690,013	Advertisement monitoring system
117.U.S. Patent 7,690,011	Video stream modification to defeat detection
118.U.S. Patent 7,689,682	Obtaining lists of nodes of a multi-dimensional network
119.U.S. Patent 7,500,258	Advertisement subgroups for digital streams
120.U.S. Patent 7,440,674	Alternative advertising in prerecorded media
121.U.S. Patent 7,432,811	RFID tag filtering and monitoring
122.U.S. Patent 7,420,458	Secondary card reader
123.U.S. Patent 7,331,057	Grouping advertisement subavails
124.U.S. Patent 7,328,448	Advertisement distribution system for distributing targeted advertisements in television systems
125.U.S. Patent 7,313,811	Optical conversion device
126.U.S. Patent 7,298,264	RFID tag filtering and monitoring
127.U.S. Patent 7,260,823	Profiling and identification of television viewers
128.U.S. Patent 7,240,355	Subscriber characterization system with filters
129.U.S. Patent 7,177,844	Apparatus and method for activation of a security module in a set-top retail environment
130.U.S. Patent 7,152,237	Delivering advertisements to the set-top-box
131.U.S. Patent 7,150,030	Subscriber characterization system
132.U.S. Patent 7,062,510	Consumer profiling and advertisement selection system
133.U.S. Patent 7,039,932	Queue-based head-end advertisement scheduling method and apparatus
134.U.S. Patent 6,915,530	Ingress detection and characterization by time/frequency map
135.U.S. Patent 6,882,709	Enhanced broadband telephony services
136.U.S. Patent 6,880,170	Ingress detection and attenuation
137.U.S. Patent 6,820,277	Advertising management system for digital video streams
138.U.S. Patent 6,714,917	Subscriber identification based on electronic program guide data
139.U.S. Patent 6,704,930	Advertisement insertion techniques for digital video streams
140.U.S. Patent 6,684,194	Subscriber identification system
141.U.S. Patent 6,615,039	Advertisement subgroups for digital streams
142.U.S. Patent 6,560,578	Advertisement selection system supporting discretionary target market characteristics
143.U.S. Patent 6,457,010	Client-server based subscriber characterization system
144.U.S. Patent 6,324,519	Advertisement auction system
145.U.S. Patent 6,321,384	Noise reduction in cable return paths

146.U.S. Patent 6,317,884	Video, data, and telephony gateway
147.U.S. Patent 6,298,348	Consumer profiling system
148.U.S. Patent 6,216,129	Advertisement selection system supporting discretionary target market characteristics
149.U.S. Patent 6,078,593	Method and apparatus for reliable operation of universal voice grade cards
150.U.S. Patent 5,881,362	Method of ingress noise reduction in cable return paths
151.U.S. Patent 5,742,591	Interference cancellation system for CATV return transmissions
152.U.S. Patent 5,479,451	Method and device for data recovery in burst mode systems
153.U.S. Patent 5,408,525	Diverter interface between two telecommunication lines and a station set
154.U.S. Patent 5,357,588	Opto-electronic transducer device for optical link termination equipment and application thereof to various types of optical link
155.U.S. Patent 4,813,772	Electro-optical interface
156.U.S. Patent 4,698,587	Method of characterizing critical timing paths and analyzing timing related failure modes in very large scale integrated circuits

FUNDED RESEARCH PROPOSALS:

- Raised \$3.6 million in capital (December 1999 through April 2000) for Expanse Networks, Inc. for development of systems and intellectual property in the area of targeted advertising.
- Kowel, S.T., A. Knoesen (principal investigators) and C.A. Eldering (proposal co-author), *Polymeric Ultrathin Film Multilayered Modulators*, funded by NSF Quantum Electronics, Waves and Beams Program for approximately \$300,000 over 3 years.

PROFESSIONAL ACTIVITIES AND PUBLIC RECOGNITION:

- Recognized in *IAM Strategy 250 – The World's Leading IP Strategists* published by *Intellectual Asset Management (IAM) Magazine* (2009-2011). *IAM Strategy 300* (2012-2013).
- Certified Passive Home Consultant, *Passive Home Institute*.
- Guest Editor. Feature topic: Patents and Telecommunications. *IEEE Communications Magazine* (July, 2000).
- Cited in "Who Owns the Knowledge Economy? Patent Wars." *The Economist*, (April 8-14, 2000).
- Cited in "Access: Not a Rocket Science" *Cable World*, (February, 2000).
- Cited in "Patents Considered Vital to Thrive on the Internet." *New York Times Outlook 2000*, (December, 1999).
- Guest Editor for Feature topic: Broadband Technologies and Trials. *IEEE Communications Magazine* (October, 1999).
- Guest Editor for Feature topic: Broadband Deployment in a Deregulated Environment. *IEEE Communications Magazine* (July, 1998).
- Member of *Network Reliability and Interoperability Council* and contributor to NRIC reports to FCC on interoperability and telecommunications deregulation.
- Senior Member, *IEEE*.
- Chair, *Access Subcommittee of IEEE Communications Society*.
- Member, Technical Program Committee and Session Chair, *IEEE Communications Society Broadband '96 Conference*.
- Invited speaker, 1995 *IEEE/LEOS Summer Topical Meeting*.

- Co-chair, 1991 *SPIE Fibers '91 Conference*.
- Chair, 1993 *SPIE Conference on LANs and MANS*.
- Invited participant, 1990 *Gordon Conference on Organic Thin Films*.

LANGUAGES:

- English: native language
- Spanish: speak, read, and write
- Portuguese: speak, read and write
- German: working knowledge
- Italian: working knowledge