DECLARATION OF RICH SEIFERT IN SUPPORT OF PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 9,019,838

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I, Rich Seifert, declare as follows:

I. Introduction

1. I am an expert in the field of communication systems. I submit this declaration on behalf of Petitioner AMX, LLC ("Petitioner") to analyze, render opinions, and/or provide expert testimony regarding the validity of certain claims of U.S. Patent No. 9,019,838 ("the '838 patent"). I understand that Petitioner submitted the '838 patent as Exhibit 1005.

2. I am being compensated at my usual rate of $400 per hour for the time spent by me in connection with these proceedings. This compensation is not contingent upon my opinions or the outcome of the proceedings. I have personal knowledge of the facts set forth in this declaration and, if called to testify as a witness, could and would competently testify to them under oath.

II. Background/Qualifications

3. I am currently the President of Networks & Communications Consulting in Los Gatos, California. I received a Bachelor in Engineering (Electrical Engineering) degree from the City College of New York in 1976. I received a Master of Science (Electrical Engineering) degree in 1979 from the Worcester Polytechnic Institute, a Master of Business Administration degree in 1984 from Clark University, and a Juris Doctor degree in 2006 from Santa Clara University. I have over 45 years of experience in computer and communications

technology, and have worked for the past 35 years on the architecture and design of data communications networks and networking products. My curriculum vitae, which I understand has been submitted as Exhibit 1010, includes a list of publications I have authored and legal cases in which I have been involved.

III. Documents and Materials Considered

4. I understand that Petitioner has submitted a list of materials that I have considered in rendering the opinions expressed herein as Exhibit 1011. In forming my opinions, I have also relied on my experience and education.

IV. Legal Principles

5. I am not a patent attorney and offer no opinions on the law. However, I have been informed by counsel of the legal standards that apply with respect to patent validity and invalidity, and I have applied them in arriving at my conclusions.

6. I understand that in an *inter partes* review the petitioner has the burden of proving a proposition of unpatentability by a preponderance of the evidence. I understand this standard is different from the standard that applies in a district court, where I understand a challenger bears the burden of proving invalidity by clear and convincing evidence.

7. I have been informed and understand that a patent claim is invalid based on anticipation if a single prior art reference discloses all of the limitations

of that claim, and does so in a way that enables on of ordinary skill in the art to make and use the invention. Each of the claim limitations may be expressly or inherently present in the prior art reference. I understand that if the prior art necessarily functions in accordance with, or includes a claim's limitation, then that prior art inherently discloses that limitation. I have relied on this understanding in expressing the opinions set forth below.

8. I understand that a prior art reference describes the claimed invention if it either expressly or inherently describes each and every feature (or element or limitation) set forth in the claim; i.e., in determining whether a single item of prior art anticipates a patent claim, one should take into consideration not only what is expressly disclosed in that item, but also what is inherently present as a natural result of the practice of the system or method disclosed in that item.

9. It is my further understanding that to establish such inherency, the evidence must make clear that the missing descriptive matter is necessarily present in the item of prior art and that it would be so recognized by persons of ordinary skill in the art. I also understand that prior art use of the claimed patented invention that was accidental, unrecognized, or unappreciated at the time of filing can still be an invalidating anticipation.

10. I understand that although multiple prior art references may not be combined to show anticipation, additional references may be used to interpret the

allegedly anticipating reference and shed light on what it would have meant to those skilled in the art at the time of the invention. These additional references must make it clear that the missing descriptive matter in the patent claim is necessarily present in the allegedly anticipating reference, and that it would be so recognized by persons of ordinary skill in the art.

11. I also understand that a patent may not be valid even though the invention is not identically disclosed or described in the prior art 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 in the relevant subject matter at the time the invention was made.

12. To determine if a claim is obvious, the following factors should be considered: (1) the level of ordinary skill in the art at the time the invention was made; (2) the scope and content of the prior art; (3) the differences between the claimed invention and the prior art; and (4) so-called secondary considerations, including evidence of commercial success, long-felt but unsolved need, unsuccessful attempts by others, copying of the claimed invention, unexpected and superior results, acceptance and praise by others, independent invention by others, and the like.

13. For example, I understand that the combination of familiar elements according to known methods is likely to be obvious when it does no more than

yield predictable results. I also understand that an obviousness analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim because a court can take account of the inferences and/or creative steps that a person of ordinary skill in the art would employ.

14. I also understand that the obviousness determination of an invention turns on whether a hypothetical person with ordinary skill and full knowledge of all the pertinent prior art, when faced with the problem to which the claimed invention is addressed, would be led naturally to the solution adopted in the claimed invention or would naturally view that solution as an available alternative. Facts to be evaluated in this analysis include:

1. The scope and contents of the prior art;
2. Differences between the prior art and the claims at issue;
3. The level of ordinary skill in the pertinent art; and
4. Evidence of objective factors suggesting or negating obviousness.

15. I understand that the following rationales may be used to determine whether a piece of prior art can be combined with other prior art or with other information within the knowledge of one of ordinary skill in the art:

A. Combining prior art elements according to known methods to yield predictable results;

B. Simple substitution of one known element for another to obtain predictable results;

C. Use of known techniques to improve similar devices (methods, or products) in the same way;

D. Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;

E. "Obvious to try"—choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;

F. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations would have been predictable to one of ordinary skill in the art; or

G. Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

16. I understand that when a work is available in one field of endeavor, design incentives and/or other market forces, for example, can prompt variations of it, either in the same field or a different one. Moreover, if a person of ordinary skill can implement a predictable variation, I understand that that likely bars its

patentability.

17. I understand that obviousness must be tested as of the time the invention was made. I understand that the test for obviousness is what the combined teachings of the prior art references would have suggested, disclosed, or taught to one of ordinary skill in the art. In particular, it is my understanding that a patent claim is invalid based upon obviousness if it does nothing more than combine familiar elements from one or more prior art references or products according to known methods to yield predictable results. For example, I understand that where a technique has been used to improve one device, and a person of ordinary skill in the art would have recognized that it would improve similar devices in the same way, using that technique is obvious. I understand that obviousness can be proved by showing that a combination of elements was obvious to try, i.e.: that it does no more than yield predictable results; implements a predictable variation; is no more than the predictable use of prior art elements according to their established functions; or when there is design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions. I have been further informed that when a patent claim simply arranges old elements with each element performing the same function it had been known to perform and yields results no more than one would expect from such an arrangement, the combination is obvious.

18. I understand that another factor to be considered is common sense. For example, I understand that common sense teaches that familiar items may have obvious uses beyond their primary purposes, and, in many cases, a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle.

19. I have been informed and understand that the Supreme Court articulated additional guidance for obviousness in its *KSR* decision.[1] My understanding is that the Supreme Court said that technical people of ordinary skill look for guidance in other solutions to problems of a similar nature, and that the obviousness inquiry must track reality, and not legal fictions.[2] I have relied on these understandings in expressing the opinions set forth below.

20. I understand that a new use of an old product or material cannot be claimed as a new product; the apparatus or system itself is old and cannot be patented. I further understand that, in general, merely discovering and claiming a

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1 *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398 (2007).

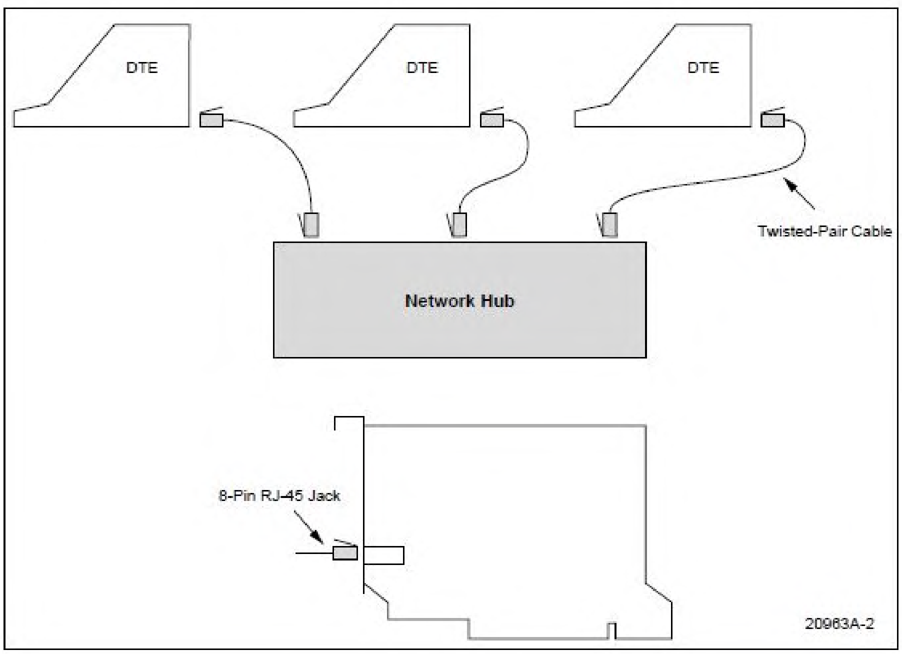
2 "The obviousness analysis in the patent context cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasis on the importance of published articles and the explicit content of issued patents. The diversity of inventive pursuits and of modern technology counsels against limiting the analysis in this way. In many fields it may be that there is little discussion of obvious techniques or combinations, and it often may be the case that market demand, rather than scientific literature, will drive design trends." *KSR*, 550 U.S. at 419.

new benefit to an old process cannot render the process newly patentable.

V. State of the Art

21. The challenged claims recite well-known structural elements: "central piece of network equipment" and "Ethernet connector." These are well-known elements of Ethernet communication systems in the prior art.

22. For example, the following illustration comes from a 1996 hardware user's manual of the AMD PCnet-*FAST* board.



(PCnet-*FAST* at 3-1.) This figure depicts a network hub connected to several pieces of data terminal equipment ("DTE"). Each DTE with the installed PCnet-*FAST* board can connect to the network hub over an Ethernet network using the on-board RJ-45 jack for either 10BASE-T or 100BASE-TX operation. (*Id.*) In this illustration, the network hub constitutes a central piece of network equipment.

30. An Ethernet connector comprising a plurality of contacts was also known in the prior art. In fact, Ethernet connectors comprising a plurality of contacts existed long prior to the 10BASE-T system. For example, the Ethernet Version 1 specification, published on September 30th, 1980 teaches two different Ethernet connectors, each comprising a plurality of connectors. *See generally,* Ethernet V1, Clause 7.

31. A "transceiver cable connector" comprising 15 contacts is disclosed for connecting an Ethernet station to a physically separate transceiver.[3] Ethernet V1 at 53-56 (§7.2). A second "coaxial cable connector" comprising two contacts is disclosed for connecting sections of the shared coaxial cable communications medium. Ethernet V1 at 60 (§7.3.1.2). *See also,* IEEE 802.3-1985 at 114-115 (§8.5 et seq.)

32. Patent Owner's expert also concedes that an Ethernet connector comprising a plurality of contacts was well-known:

> Q: Okay. So this figure is known, an Ethernet connector comprising a plurality of contacts is known, correct?
>
> A: Yes.

(Baxter Dep. Tr. at 113.)

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[3] When the original Ethernet specification was transformed into the IEEE 802.3 specification, first published in 1985, the terms "transceiver cable" and "transceiver cable connector" were changed to "Attachment Unit Interface [AUI} cable" and "Attachment Unit Interface [AUI] connector. *See, generally,* IEEE 802.3-1985 Clause 7.

VI. Claim Construction

33. I understand that in an *inter partes* review, a claim in an unexpired patent must be given its broadest reasonable interpretation in light of the specification of the patent in which it appears.

34. Under the broadest reasonable interpretation standard, I understand that Petitioner has proposed that the following claim term be construed as shown below.

Claim Term	**Claim(s)**	**Construction**
"BaseT"	claim 1	10BASE-T

35. When rendering an opinion, I have used this proposed construction for this term. For all other terms, I have applied the plain meaning of the term to a person of ordinary skill in the art.

VII. Person of Ordinary Skill in the Art

36. I have been informed and understand that the following criteria are useful in determining the level of ordinary skill in the art with respect to a given patent: (a) the educational level of the inventor; (b) the type of problems encountered in the art; (c) prior art solutions to those problems; (d) rapidity with which innovations are made; (e) sophistication of the technology in the art; and (f) the educational level of active workers in the field. A person of ordinary skill in the art with respect to the asserted patent would have had at least a B.S. degree in

electrical engineering or computer science, or the equivalent, and at least three years of experience in the design of network communications products.

37. Specifically, such a person would be familiar with, *inter alia*, data communications protocols, data communications standards (and standards under development at the time), and the behavior and use of common data communications products available on the market.

38. At the time of the filing date of the ’838 patent, through the time of the earliest claimed priority date of April 10, 1998, I was at least a person of ordinary skill in the art, and regularly worked with and supervised others at that level of skill.

VIII. Prior Art

A. Katzenberg

39. U.S. Patent No. 6,218,930 was filed on March 7, 2000, claimed priority to a provisional application filed on March 10, 1999, issued on April 17, 2001, and names as its inventors Boris Katzenberg and Joseph A. Deptula. I refer to this patent as “Katzenberg” in this declaration. I understand that Petitioner has submitted Katzenberg as Exhibit 1037.

B. De Nicolo References

1. Overview

40. U.S. Patent No. 6,115,468 was filed on March 26, 1998, issued on September 5, 2000, and names as its inventor Maurilio Tazio De Nicolo. I refer to

this patent as "De Nicolo '468" in this declaration. I understand that Petitioner has submitted De Nicolo '468 as Exhibit 1019.

41. U.S. Patent No. 6,134,666 was filed on March 12, 1998, issued on October 17, 2000, and also names as its inventor Maurilio Tazio De Nicolo. I refer to this patent as "De Nicolo '666" in this declaration. I understand that Petitioner has submitted De Nicolo '666 as Exhibit 1020.

42. Collectively, I refer to De Nicolo '468 and De Nicolo '666 as "the De Nicolo references" in this declaration.

2. Reasons to Combine the De Nicolo References

43. In my opinion, a person of ordinary skill in the art would have combined De Nicolo '468 and De Nicolo '666.

44. Both references disclose techniques for powering a controlled device. In De Nicolo '468, for example, a power supply 144 provides power via two twisted pairs 128a, 128b to a power processor 149, which, in turn, provides power to a portion of an Ethernet device 98. (*See, e.g.*, De Nicolo '468 at FIG. 3.) Similarly, in De Nicolo '666, a power supervisor 14 provides power via a query conductor 28 to a power circuit soft start 44, which, in turn, provides power to power consuming circuitry. (*See, e.g.*, De Nicolo '666 at FIG. 1.) De Nicolo '666 discloses that "multiple query conductors could also be used, if more convenient." (*Id.* at 5:34-38.)

45. In addition, De Nicolo ’468’s disclosure would have motivated a skilled artisan to incorporate De Nicolo ’666’s teachings with those of De Nicolo ’468. For example, like De Nicolo ’666, De Nicolo ’468 discloses “[a] system for supplying DC power to a remote device.” (De Nicolo ’468 at claim 6.) De Nicolo ’468 shows a system with multiple devices (associated with loads 98, 100, and 102) in Figure 3. De Nicolo ’468 also provides that such a system can have one remote device. (*See, e.g.*, De Nicolo ’468 at claim 6 (“[a] system for supplying DC power to a remote device”), claim 12 (“[a] method for supplying a DC power connection and a bi-directional data connection to a remote device”, claim 16 (“[a] system for supplying DC power to a remote device over a 4-wire Ethernet connection”).) A skilled artisan would have understood that the remote device has a maximum power requirement and that it would have been desirable to provide that remote device with a power signal that satisfies the device’s power requirement. With that understanding, a skilled artisan would have incorporated De Nicolo ’666’s technique of determining the remote device’s maximum power requirement by way of a resistor (or other component) into De Nicolo ’468’s system.

46. In other words, it would have been obvious to one of skill in the art to use De Nicolo ’666’s principle of operation together with De Nicolo ’468’s Ethernet-based system. Moreover, because both references name Maurilio Tazio

De Nicolo as their sole inventor, a skilled artisan reviewing one of the De Nicolo references would have reviewed other references naming De Nicolo as an inventor to gain a better understanding of the disclosed teachings.

47. A person of ordinary skill in the art would have understood how to combine De Nicolo 468's teaching with De Nicolo 666's teachings. For example, De Nicolo '468's system in Figure 3 could include a single remote device (*e.g.*, a device that includes load 98) as described, for example, in claim 16 of De Nicolo '468. (De Nicolo '468 at claim 16 ("[a] system for supplying DC power to a remote device over a 4-wire Ethernet connection having a first twisted pair of conductors for transmission of data packets from said remote device and a second twisted pair of conductors for reception of data packets at said remote device").) In this system, the skilled artisan could have included De Nicolo '666's power supervisor 14 (see Figure 1) into De Nicolo '468's power supply module 144 (see Figure 3) and included De Nicolo '666's electronic module 26 (see Figure 1) into De Nicolo '468's power processor 149. This is a routine, common sense design choice that is well within the skilled artisan's knowledge and capabilities. This modification would maintain the De Nicolo '468 circuitry's existing purpose and functionality—providing power and data over the Ethernet pairs 128 and powering the load 98 via the power processor 149. It would also enable the power processor 149 to power the load 98 in the selective manner that De Nicolo '666 teaches.

IX. ’838 Patent

A. Summary of the ’838 Patent

48. The claims of the ’838 patent are directed to a central piece of network equipment comprising an Ethernet connector with first and second pairs of contacts, and functional limitations that the central piece of network equipment detect different magnitudes of DC current flow via at least one of the contacts of the first and second pair and control application of an electrical condition to a contact of the first and second pairs of contacts in response to a magnitude of DC current flow. (’838 patent at 17:13-23.) The ’838 patent incorporates by reference U.S. Patent 5,406,260 (also assigned to the Patent Owner), which discloses a current loop including a portion passing through a pair of contacts. (’260 patent at 3:37-52, Fig. 2.) The ’838 patent states that the ’260 patent already disclosed:

> a means of detecting the unauthorized removal of a networked device by injecting a low current power signal into each existing communications link. A sensor monitors the returning current flow and can thereby detect a removal of the equipment. This method provides a means to monitor the connection status of any networked electronic device thus providing an effective theft detection/deterrent system.

(’838 patent at 2:19-25.)

49. The ’838 patent then states the desire to “provide a further means in which a networked device may also be identified by a unique identification number using the existing network wiring or cabling as a means of communicating this information back to a central location.” (’838 patent at 2:26-30.) The ’838 patent

discloses a modulation scheme for this purpose:

> [A] communication system is provided for generating and monitoring data over a pre-existing wiring or cables [sic] that connect pieces of networked computer equipment to a network. The system includes a communication device or remote module attached to the electronic equipment that transmits information to a central module by impressing a low frequency signal on the wires of the cable. A receiver in the central module monitors the low frequency data to determine the transmitted information from the electronic equipment. The communication device may also be powered by a low current power signal from the central module. The power signal to the communication device may also be fluctuated to provide useful information, such as status information, to the communication device.

(*Id.* at 3:24-37.)

B. Challenged Claims

50. I understand that Petitioner is challenging the validity of claims 1, 2, 7, 26, 29, 38, 40, 47, 55, and 69 of the ’838 patent.

51. Claim 1 is provided below.

> A central piece of network equipment comprising:
> at least one Ethernet connector comprising first and second pairs of contacts used to carry BaseT Ethernet communication signals; and
> the central piece of network equipment to detect different magnitudes of DC current flow via at least one of the contacts of the first and second pairs of contacts and to control application of at least one electrical condition to at least one of the contacts of the first and second pairs of contacts in response to at least one of the magnitudes of the DC current flow.

52. Claim 2 is provided below.

> The central piece of network equipment of claim 1 wherein the different magnitudes of DC current flow are part of a detection protocol.

53. Claim 7 is provided below.

The central piece of network equipment of claim 1 wherein the central piece of network equipment to provide at least one DC current via at least one of the contacts of the first and second pairs of contacts and to detect distinguishing information within the DC current via the at least one of the contacts of the first and second pairs of contacts.

54. Claim 26 is provided below.

The central piece of network equipment of claim 1 wherein the central piece of network equipment to distinguish one end device from at least one other end device based on at least one of the magnitudes of the DC current flow.

55. Claim 29 is provided below.

The central piece of network equipment of claim 1 wherein the central piece of network equipment to distinguish one network object from at least one other network object based on at least one of the magnitudes of the DC current flow.

56. Claim 38 is provided below.

The central piece of network equipment of claim 1 wherein the central piece of network equipment comprises at least one DC supply.

57. Claim 40 is provided below.

The central piece of network equipment of claim 39 wherein the central piece of network equipment to control application of the at least one DC power signal.

58. Claim 47 is provided below.

The central piece of network equipment of claim 1 wherein the at least one electrical condition comprises at least one voltage condition.

59. Claim 55 is provided below.

> The central piece of network equipment of claim 1 wherein the different magnitudes of DC current flow comprise a first magnitude followed by a second magnitude.

60. Claim 69 is provided below.

> The central piece of network equipment of claim 1 wherein the at least one magnitude of DC current flow is used by the central piece of network equipment to control application of at least one DC power signal.

X. Invalidity Analysis of '838 Patent

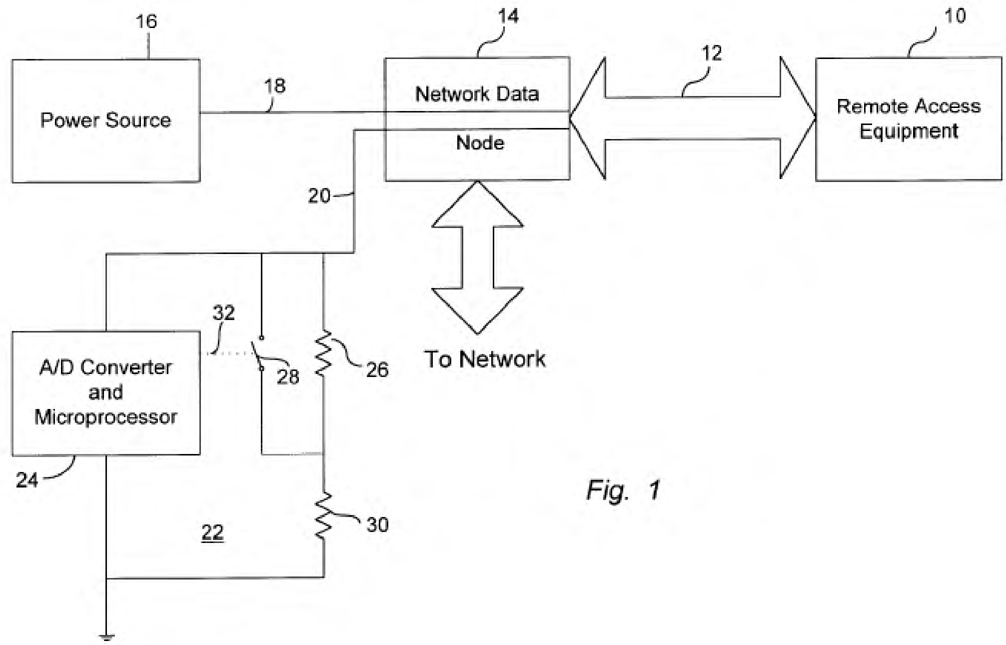
A. The challenged claims are invalid based on Katzenberg.

1. Independent Claim 1

61. In my opinion, Katzenberg meets every limitation of claim 1 for the following reasons.

a. "A central piece of network equipment"

62. Katzenberg meets the preamble of claim 1. For instance, Figure 1 shows "a simplified schematic diagram of the remote power automatic detection system of the present invention." (Katzenberg at 2:21-22.)



(*Id.* at FIG. 1.) The system includes network data node 14. (*Id.* at 2:46.) Power source 16 "is connected to cable 12 via lines 18 to supply a power level sensing potential to the remote access equipment 10 over one of the cable conductors." (*Id.* at 2:52-57.) "A return path from remote access equipment 10 is connected through a lead 20 to an automatic remote power detector, shown generally as 22." (*Id.* at 2:57-59.)

63. Figure 2 shows the power feed configuration in network data node 14 in greater detail.

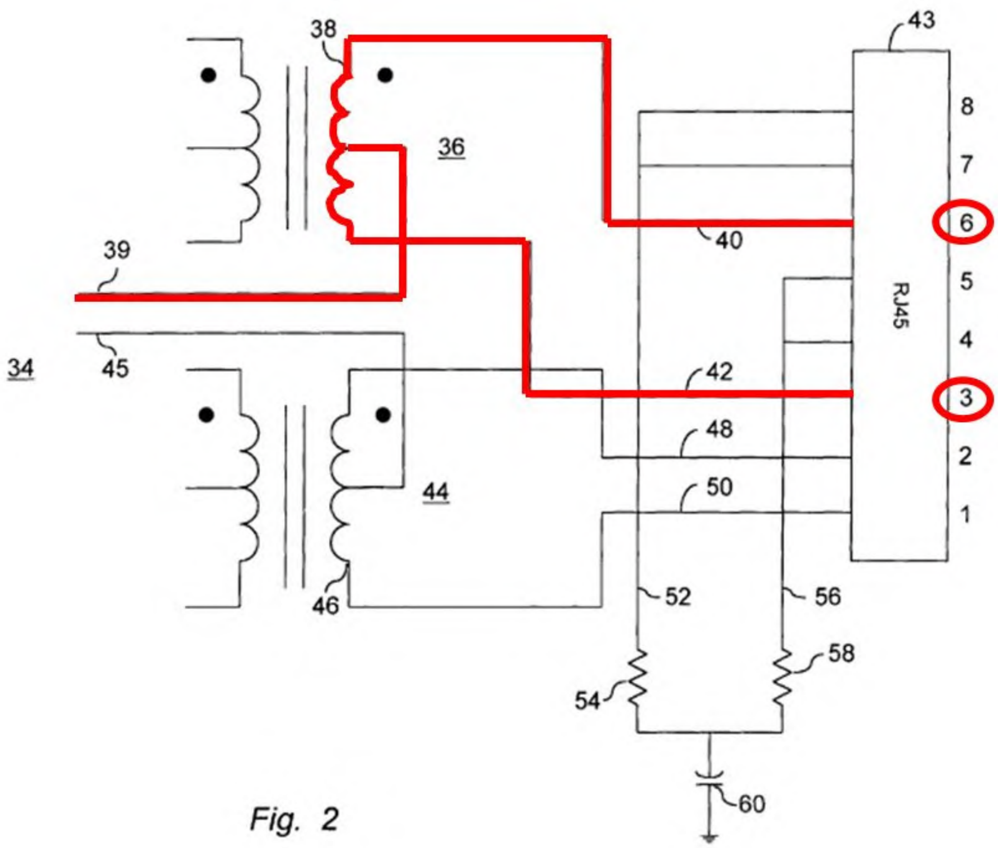


Fig. 2

(*Id.* at FIG. 2 (annotations added).) Lead 39 in Figure 2 corresponds to line 18 in Figure 1. Lead 39 is connected to a first center-tapped data transformer 36, whose winding 38 is connected to terminals 3 and 6 of RJ45 connector 43. (*Id.* at 3:28-38.) Similarly, lead 45 is connected to a second center-tapped transformer 44, whose winding 46 is connected to terminals 1 and 2 of RJ45 connector 43. (*Id.*) Lead 45 corresponds to line 20 in Figure 1.

64. Figure 3 shows backroom (e.g., wiring closet) common equipment that includes 8-port Ethernet switches.

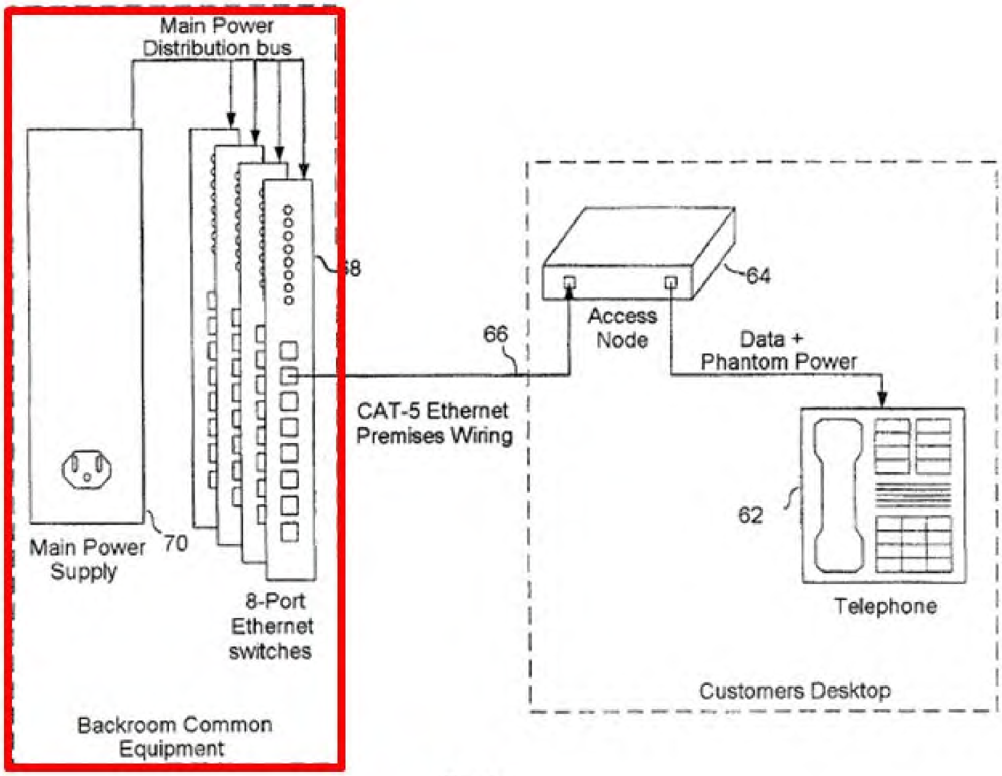


Fig. 3

(*Id.* at FIG. 3 (annotation added).) "The Ethernet switch card incorporates the automatic remote power detector 22 discussed in FIG. 1 and the remote power supply 34 discussed in FIG. 2." (*Id.* at 4:1-4.) The backroom common equipment comprising the 8-port Ethernet switches constitutes a central piece of network equipment, for example, because it can connect to multiple Ethernet devices in an Ethernet network.

b. "at least one Ethernet connector comprising first and second pairs of contacts used to carry BaseT Ethernet communication signals"

65. Katzenberg meets this limitation. For instance, in Figure 2, remote supply 34 is connected to RJ45 connector 43 through the transformer windings.

(Katzenberg at FIG. 3, 3:31-34.) RJ45 connector 43 is an Ethernet connector with 8 contacts, numbered 1 to 8. (*Id.* at FIG. 3.) The data signaling pairs for 10BASE-T are contacts 1, 2, 3, and 6. (*See id.* at 3:44-48 ("Remote power is delivered to the remote equipment over *the existing data signaling pairs* (phantom power feed). Although it is typical that all 8 signal leads are delivered to remote equipment, only *the 4 signaling leads* are guaranteed in practice.") (emphases added).)

66. These contacts constitute two pairs. For example, contacts 1 and 2 can constitute the first pair and contacts 3 and 6 can constitute the second pair. As another example, contacts 1 and 3 can constitute the first pair and contacts 2 and 6 can constitute the second pair.

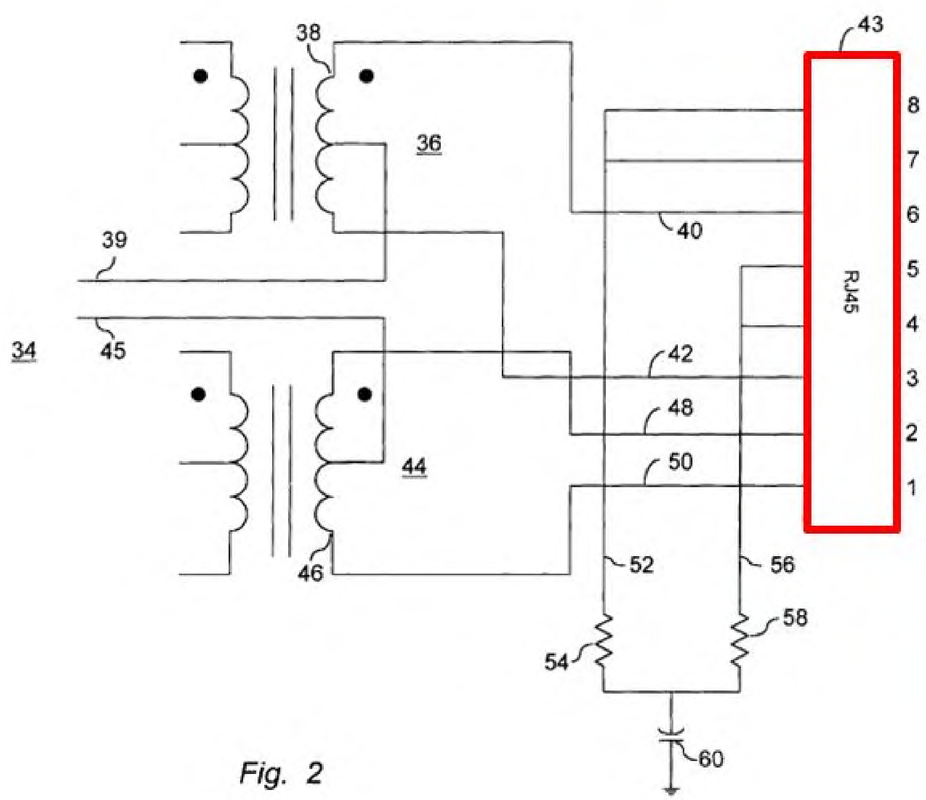


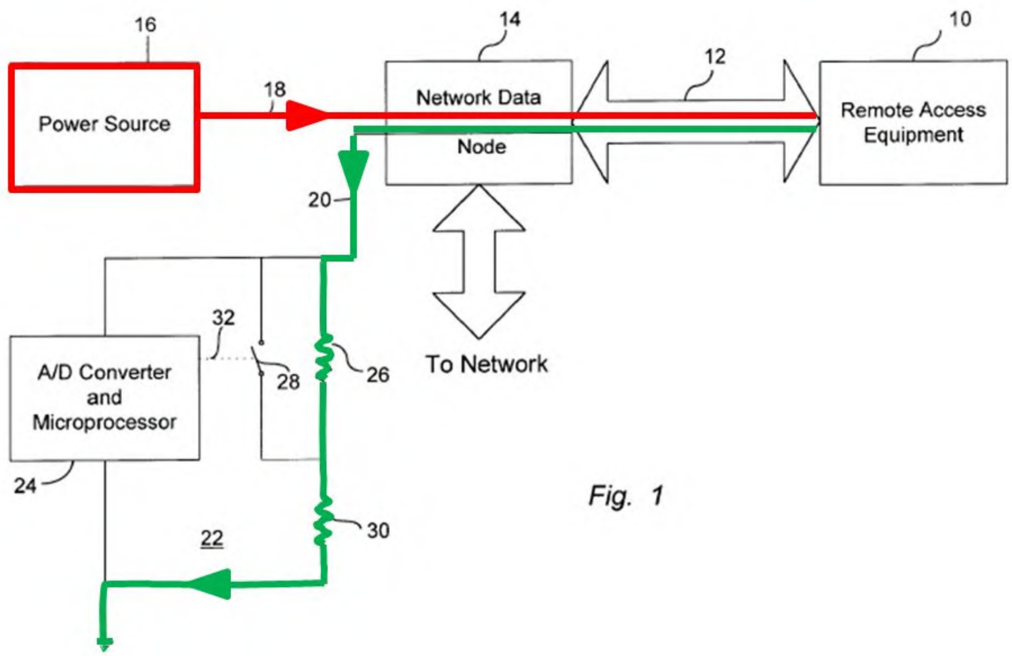
Fig. 2

(*Id.* at FIG. 2 (annotation added).)

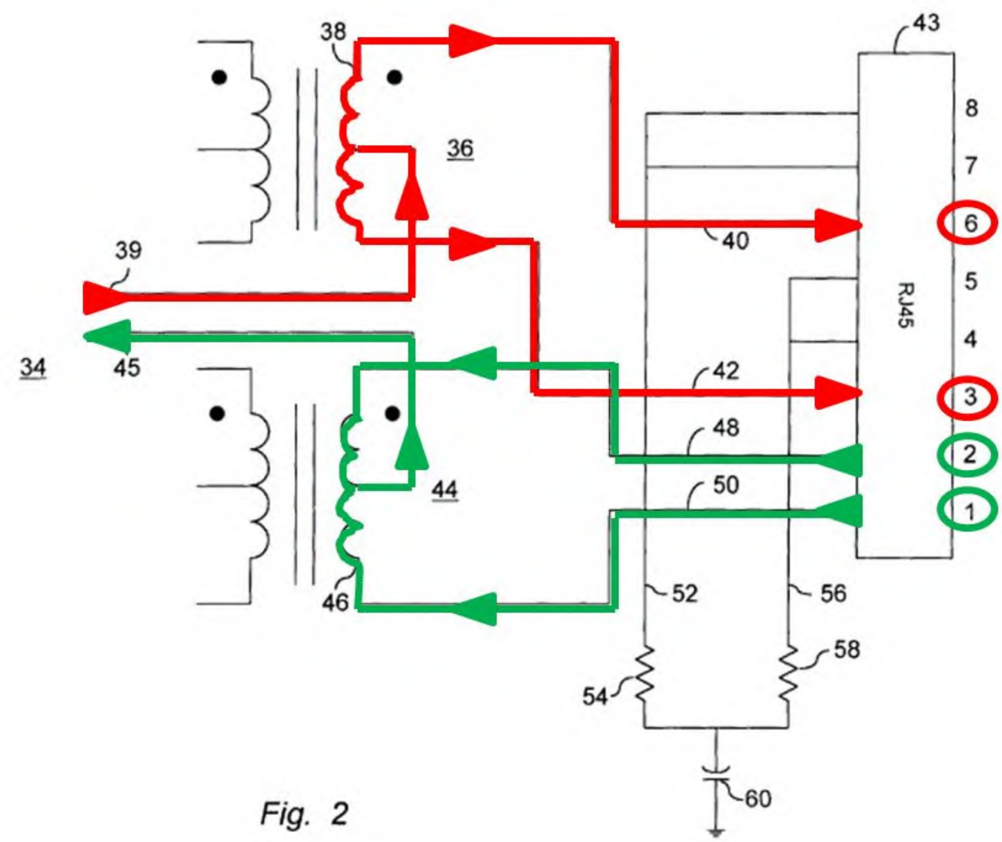
67. The first and second pairs of contacts can carry 10BASE-T Ethernet communication signals. Remote supply 34 is part of a switch in a "10/100 Ethernet" network. (*See id.* at Title ("Apparatus and Method for Remotely Powering Access Equipment Over a *10/100 Switched Ethernet Network*") (emphasis added), 2:36-38 ("a remote access device 10 which is compatible with *10/100 Ethernet* requirements").) The switch therefore transmits and receives 10BASE-T communication signals through contacts 1, 2, 3, and 6 when the switch communicates with a 10BASE-T Ethernet device.

c. "the central piece of network equipment to detect different magnitudes of DC current flow via at least one of the contacts of the first and second pairs of contacts"

68. Katzenberg meets this limitation. For instance, Katzenberg discloses that "[a]utomatic detection of remote equipment being connected to the network is accomplished by delivering a low level current (approx. 20 ma) to the network interface and measuring a voltage drop in the return path." (Katzenberg at 2:66-3:2.) In the following figures, the low level current is supplied via the red path and returns via the green path.



(*Id.* at FIG. 1 (annotations added).)



(*Id.* at FIG. 2 (annotations added).) In the forward path, power source 16 provides the low level current (approximately 20 mA) to line 18, which corresponds to line 39 in Figure 2. Line 39 is connected to a first center-tapped data transformer 36, whose transformer winding 38 is connected by leads 40 and 42 to terminals 6 and 3, respectively, of RJ45 connector 43. (*Id.* at 3:31-34.) In this way, low level current of approximately 20 mA is supplied through terminals 3 and 6 of RJ45 connector 43.

69. In the return path from the Remote Access Equipment, current is received through contacts 1 and 2 of RJ45 connector 43. This current is provided via center tap 44 to lead 45, which corresponds to lead 20 in FIG. 1. Lead 20 provides the current through R26 and R30 to the reference point. The A/D converter and microprocessor 24 of detector 22 measures the current by monitoring the voltage at the top of R26 in order to detect whether the remote equipment is able to support a remote power feed. (*Id.* at 2:59-3:27.)

70. "There are three states which can be determined: no voltage drop, a fixed level voltage drop or a varying level voltage drop." (*Id.* at 3:2-4.) In the first state, there is no voltage drop in the path, indicative of a short circuit between the relevant connector contacts in Remote Access Equipment 10. In the second state, there is a fixed voltage drop, indicative of a resistive termination (or an open circuit) between the relevant connector contacts in Remote Access Equipment 10.

In the third state, there is a varying voltage drop, meaning that the current received through contacts 1 and 2 has different magnitudes of current over time. Katzenberg explains that this varying voltage "creates a 'sawtooth' voltage level in the return path." (*Id.* at 3:16-17.) The sawtooth voltage level provides a DC current with different magnitudes through contacts 1 and 2. Katzenberg explains that this sawtooth pattern is indicative of:

> "the presence of [a] dc-dc switching supply in the remote equipment. The varying level is created by the remote power supply beginning to start up but the low current level is unable to sustain the start up. This cycle continues to be repeated creating a 'sawtooth' voltage level in the return path."

(*Id.* at 3:12-17.)

71. When Katzenberg's detector 22 detects the sawtooth voltage level (in the third state), it detects different magnitudes of DC current because the measured voltage is a function of that current under Ohm's Law (V = I x R). This current flows through contacts 1, 2, 3, and 6 so it flows through "at least one of the contacts of the first and second pairs of contacts."

d. "[the central piece of network equipment] to control application of at least one electrical condition to at least one of the contacts of the first and second pairs of contacts in response to at least one of the magnitudes of the DC current flow"

72. Katzenberg meets this limitation. For instance, when the detector 22

(Figure 1) determines that remote access equipment 10 is operating in the third state (varying voltage/current level), "the remote equipment is identified as known access equipment capable of accepting remote power." (*See* Katzenberg at 3:12-24.) At this point, "[r]emote power is delivered to the remote equipment over the existing data signaling pairs (phantom power feed)." (*Id.* at 3:44-45.) As discussed in the previous section, and as shown below, "[p]ower feed is through a center tap lead 39 and power return is through a center tap lead 45." (*Id.* at 3:37-38.)

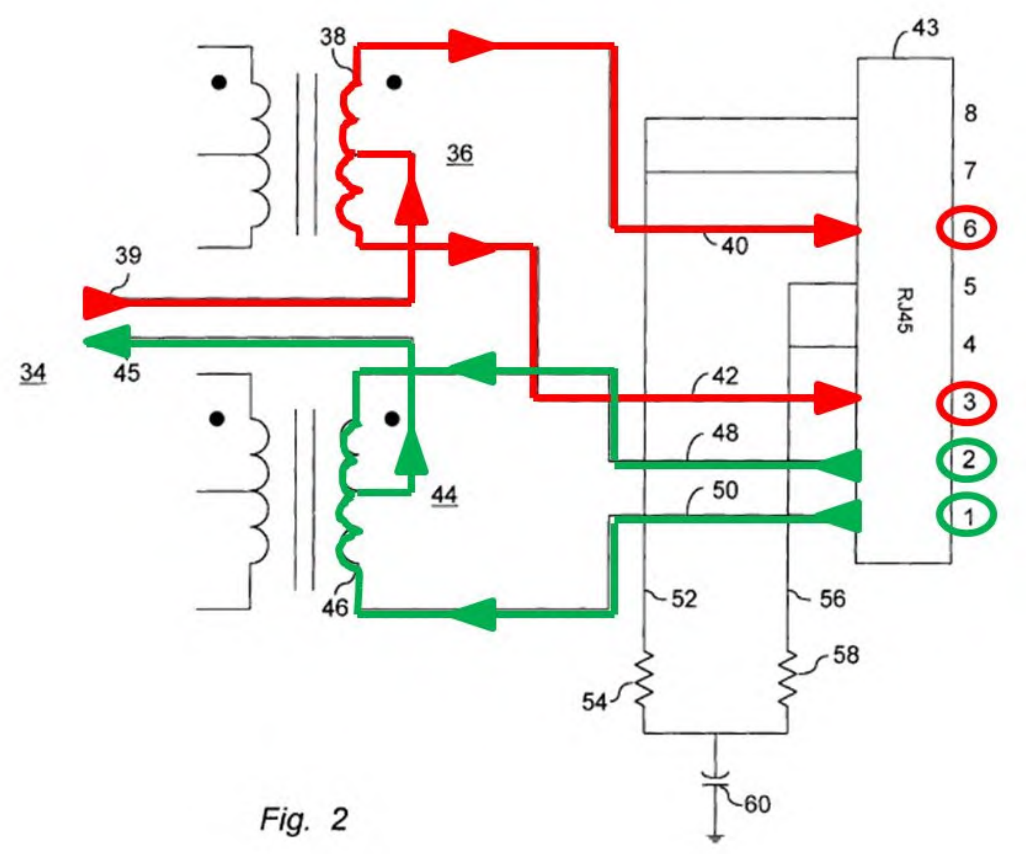


Fig. 2

(*Id.* at FIG. 2 (annotations added).)

73. By supplying power through line 39 to contacts 3 and 6 of RJ45

connector 43, the switch incorporating power supply 34 and RJ45 connector 43 applies an electrical condition (*e.g.*, a voltage) to contacts 3 and 6, which constitute "at least one of the contacts of the first and second pairs of contacts." as a skilled artisan would interpret that language. A person of ordinary skill in the art would understand this claim language to require at least one contact of the four contacts consisting of the first and second pairs in view of the specification. (*See, e.g.*, '838 patent at FIG. 5.) Under this interpretation, regardless of how the pairs of contacts are defined, the current flows through at least one contact (*i.e.*, contacts 3 and 6) of the contacts of the first and second pairs of contacts (*i.e.*, contacts 1, 2, 3, and 6).

74. Even if that claim language more narrowly requires at least one contact of the first pair *and* at least one contact of the second pair, Katzenberg meets this requirement when the first pair are contacts 1 and 3 and the second pair are contacts 2 and 6. In particular, when the switch supplies power through line 39 to contacts 3 and 6, it applies an electrical condition (*e.g.*, voltage) to contact 3 of the first pair (contacts 1 and 3 in this scenario) and contact 6 of the second pair (contacts 2 and 6 in this scenario).

2. Claim 2: "wherein the different magnitudes of DC current flow are part of a detection protocol"

75. Katzenberg meets this limitation. For instance, Katzenberg discloses a technique for automatically detecting remote equipment connected to a 10/100 switched Ethernet network. (Katzenberg at 1:51-54.) This "is accomplished by

delivering a low level current (approx.. 20 ma) to the network interface and measuring a voltage drop in the return path. There are three states which can be determined: no voltage drop, a fixed level voltage drop or a varying level voltage drop." (*Id.* at 2:66-3:4.) As explained in Section X.A.1.c (claim 1 limitation), state 1 (no voltage drop) and state 2 (fixed level voltage drop) have different magnitudes of DC current, and state 3 (varying level voltage drop) independently has different magnitudes of DC current. These different magnitudes of DC current are part of a detection protocol in which remote power is supplied if state 3 (varying level voltage drop) is detected but is not supplied if state 1 (no voltage drop) or state 2 (fixed level voltage drop) is detected. (Katzenberg at 2:66-3:58.)

3. Claim 7: "wherein the central piece of network equipment to provide at least one DC current via at least one of the contacts of the first and second pairs of contacts and to detect distinguishing information within the DC current via the at least one of the contacts of the first and second pairs of contacts"

76. Katzenberg meets this limitation. For instance, as discussed in connection with claim 1, and as shown below, "[p]ower feed is through a center tap lead 39 and power return is through a center tap lead 45." (Katzenberg at 3:37-38.)

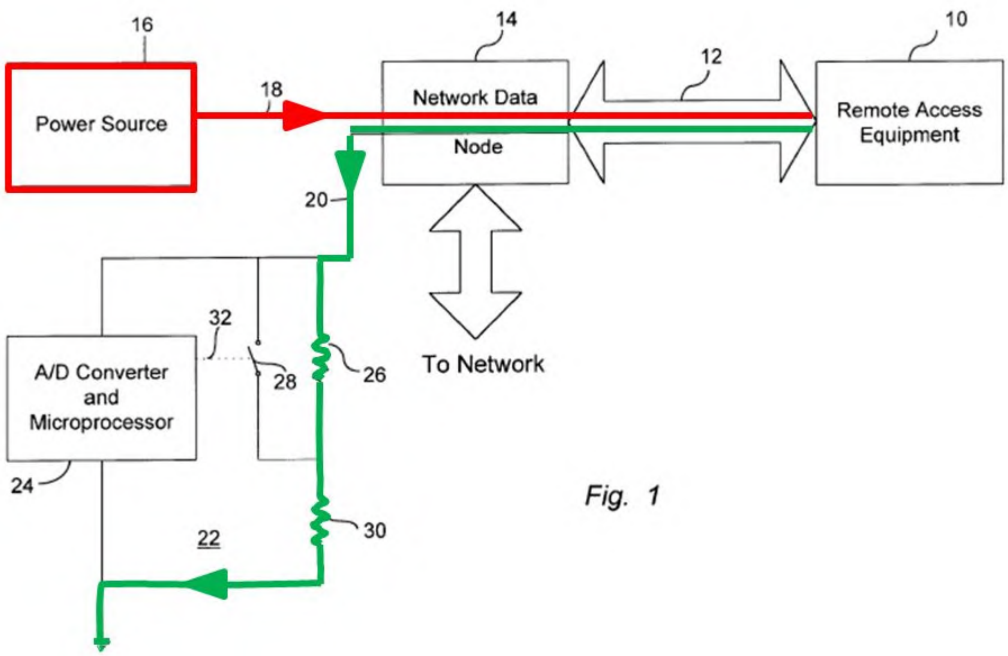


Fig. 1

(*Id.* at FIG. 1 (annotations added).)

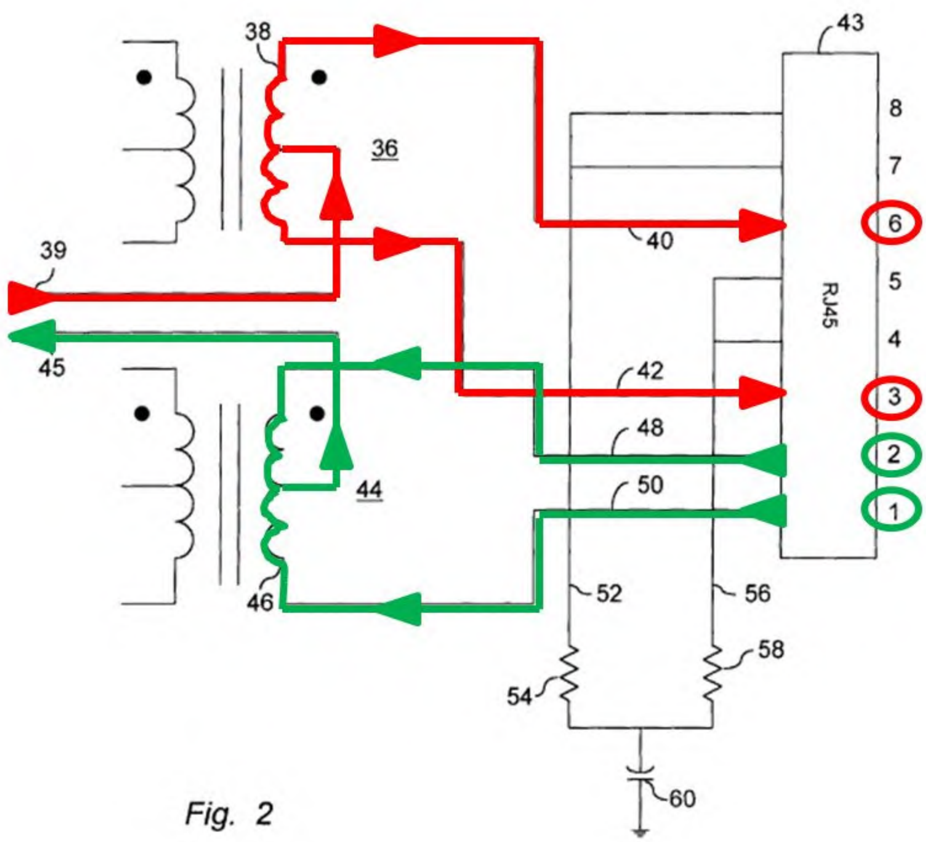


Fig. 2

(*Id.* at FIG. 2 (annotations added).)

77. As discussed in Section X.A.1.c (claim 1 limitation), power source 16 provides a low level current (approximately 20 mA) through line 18 (which corresponds to line 19) to contacts 3 and 6 of RJ45 connector 43. As also discussed in that section, the current returns through contacts 1 and 2 and flows to line 45 (which corresponds to line 20) and then to detector 22 comprising A/D converter and microprocessor 24, R26, and R30. Microprocessor 24 detects the level of the current and determines if remote access equipment 10 is capable of accepting remote power. (Katzenberg at 2:59-3:42.) In this way, the switch comprising power source 16, power supply 34, and detector 22 provides low level current from power source 16 to detector 22 via contacts 1, 2, 3, and 6 of RJ45 connector 43, and detects the resulting voltage level induced by that current. The voltage level constitutes "information within the DC current" because it is a direct measurement of the current and provides information about whether the remote access equipment 10 is capable of accepting remote power. The voltage level constitutes "distinguishing information" because it distinguishes a device that is unable to support remote power feed (characterized by no voltage drop or a fixed level voltage drop) from a device that is capable of supporting remote power feed (characterized by a varying voltage level).

4. Claim 26: "wherein the central piece of network equipment to distinguish one end device from at least one other end device based on at least one of the magnitudes of the DC current flow"

78. Katzenberg meets this limitation. For instance, Katzenberg discloses that "[a]utomatic detection of remote equipment being connected to the network is accomplished by delivering a low level current (approx. 20 ma) to the network interface and measuring a voltage drop in the return path." (Katzenberg at 2:66-3:2.) "There are three states which can be determined: no voltage drop, a fixed level voltage drop or a varying level voltage drop." (*Id.* at 3:2-4.) If detector 22 detects no voltage drop or a fixed level voltage drop, then microprocessor 24 determines that the remote equipment is unable to support remote power feed. (Id. at 3:4-11.) However, if detector 22 detects a varying voltage level, then microprocessor 24 determines the remote equipment is capable of supporting remote power feed. (*Id.* at 3:11-27.) In this way, the switch incorporating detector 22 distinguishes one end device (*e.g.*, a device unable to support remote power feed) from another device (*e.g.*, a device capable of supporting remote power feed).

79. Figure 3 shows that one port of 8-port switch 68 is connected to equipment (access node 64 and telephone 62). A person of ordinary skill in the art would have understood that other ports of 8-port switch 68 could similarly be connected to equipment and that switch 68 could apply Katzenberg's detection

technique to distinguish equipment connected to one port from equipment connected to another port.

5. Claim 29: "wherein the central piece of network equipment to distinguish one network object from at least one other network object based on at least one of the magnitudes of the DC current flow"

80. Katzenberg meets this limitation for the reasons in Section X.A.4 (claim 26). Claim 29 is identical to claim 26, except that claim 29 uses the term "network object" while claim 26 uses the term "end device." Any end device connected to switch 68 is also a network object, so the reasoning in Section X.A.4 (claim 26) also applies to claim 29.

6. Claim 38: "wherein the central piece of network equipment comprises at least one DC supply"

81. Katzenberg meets this limitation. For instance, in Figure 2, Katzenberg provides power supply 34. Power supply 34 provides DC power through the path annotated below.

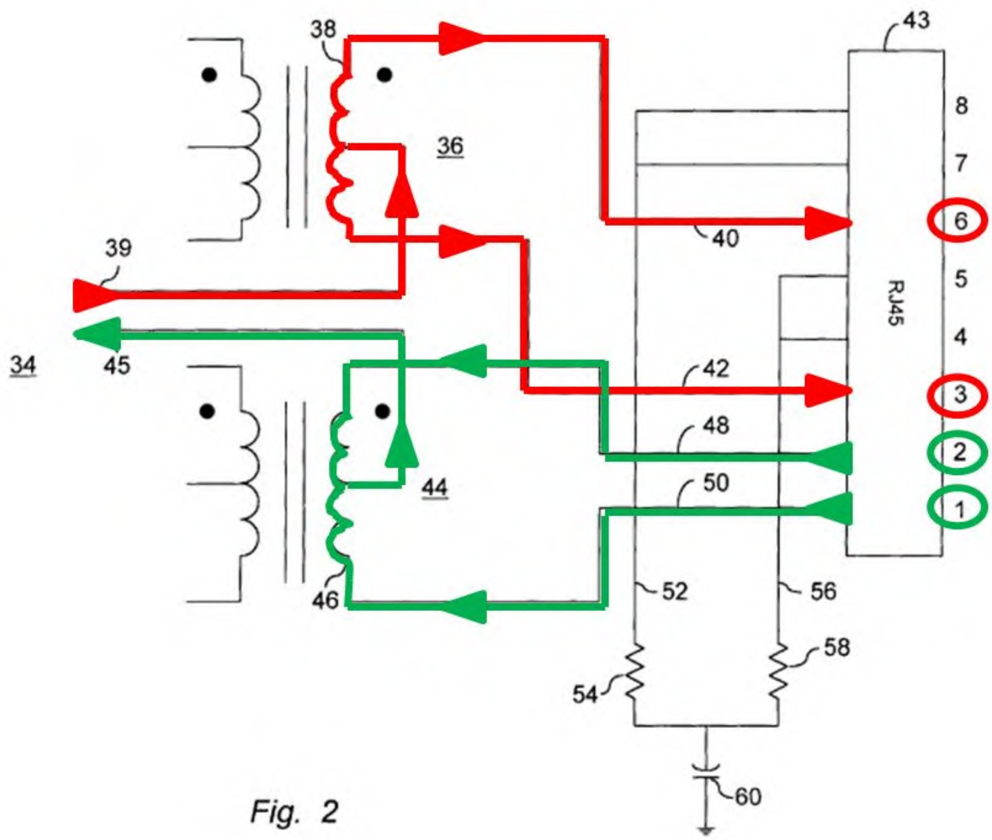


Fig. 2

(*Id.* at FIG. 2 (annotations added).)

82. For instance, as discussed in Section X.A.1.c and X.A.1.d (claim 1 limitations), power supply 34 provides the low level current (approx. 20 mA) and the circuitry shown in Figure 2 delivers DC power to a device that is determined to be capable of accepting remote power.

7. Claim 40: "wherein the central piece of network equipment to control application of the at least one DC power signal"

83. Katzenberg meets this limitation for the reasons in Section X.A.1.d (claim 1 limitation).

8. Claim 47: "wherein the at least one electrical condition comprises at least one voltage condition"

84. Katzenberg meets this limitation for the reasons in Section X.A.1.d (claim 1 limitation).

9. Claim 55: "wherein the different magnitudes of DC current flow comprise a first magnitude followed by a second magnitude"

85. Katzenberg meets this limitation. For instance, Katzenberg discloses that in response to a low level DC current (approximately 20 mA), a DC-DC switching supply in the remote equipment creates a varying level voltage drop. (Katzenberg at 3:12-16.) This results in a "sawtooth" voltage level in the return path. (*Id.* at 3:16-17.) This "sawtooth" (varying) voltage level indicates that the DC current in the return path has different magnitudes over time, comprising a first magnitude followed by a second magnitude.

10. Claim 69: "wherein the at least one magnitude of DC current flow is used by the central piece of network equipment to control application of at least one DC power signal"

86. Katzenberg meets this limitation for the reasons in Sections X.A.1.c and X.A.1.d (claim 1 limitations).

B. The challenged claims are invalid based on the De Nicolo references.

1. Independent Claim 1

87. In my opinion, the De Nicolo references meet every limitation of

claim 1 for the following reasons.

a. "A central piece of network equipment"

88. De Nicolo '468 meets this limitation. For instance, Figure 3, provided below, shows an Ethernet telephone power distribution system. (De Nicolo '468 at 2:60-62.)

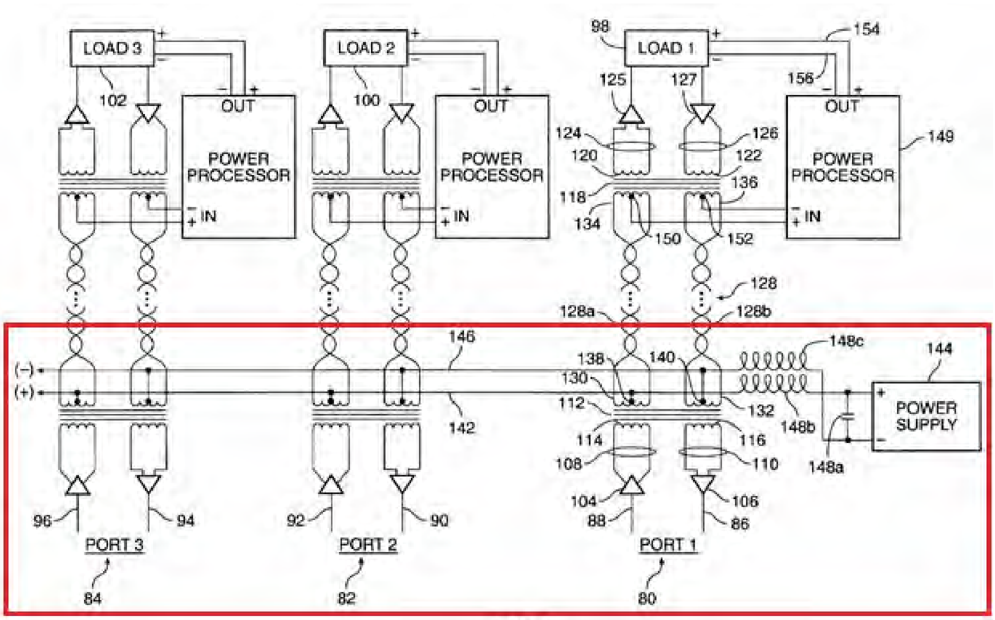


FIG. 3

(*Id.* at FIG. 3 (annotation added).)

89. In this system, the equipment comprising power supply 144, chokes 148b and c, and ports 1-3 is a central piece of network equipment, for example, because it can communicate with one or more Ethernet devices (*e.g.*, the device comprising load 98 and power processor 149) over 4-wire Ethernet connections. Based on Figure 3, a person of ordinary skill in the art would have understood that power supply 144, chokes 148b and c, and ports 1-3 are integrated in a single piece

of equipment. As a practical matter, power supply 144 must be within the same equipment as ports 1-3 in order to be connected to center taps 138 and 140 (which are not normally available as contacts on a standard 10BASE-T Ethernet connector) as shown in Figure 3.

b. "at least one Ethernet connector comprising first and second pairs of contacts used to carry BaseT Ethernet communication signals"

90. De Nicolo '468 meets this limitation. For instance, De Nicolo '468 discloses:

> "Ethernet link 128 couples first and second secondaries 130, 132 of first transformer 112 to first and second primaries 134, 136 of second transformer. Ethernet link 128 preferably comprises a pair of twisted pair conductors 128a and 128b wherein twisted pair 128a connects first secondary 130 to first primary 134 of the twisted pair 128b connects second secondary B2 to several primary 136."

(De Nicolo '468 at 3:25-32.) A person of ordinary skill in the art would have understood from De Nicolo '468's disclosure that an Ethernet connector with first and second pairs of contacts would have been necessary to connect the Ethernet link 128 to the secondaries of transformer 112, particularly because De Nicolo '468 discloses that its system applies "without any need for rewiring premises having an existing 4-wire Ethernet system." (*Id.* at 2:20-34.) A person of ordinary skill in the art would therefore have understood that transformer windings 130 and 132 would connect to the twisted pair wiring 128 using an Ethernet connector, comprising at least two pairs of contacts.

91. A person of ordinary skill in the art would have also understood that the 4-wire Ethernet connection could be used to carry 10BASE-T Ethernet communication signals, particularly because the 802.3 standard discloses 10BASE–T using a two-pair wiring system to convey Ethernet signals. De Nicolo ’468 is directed specifically towards feeding power to Ethernet telephones using the existing 4-wire connection. (*See, e.g.*, *id.* at Title, 1:6-8, 1:26-30, 2:20-22.) A person of ordinary skill in the art would have understood that the 10 Mb/s data rate of 10BASE-T would be more than adequate to support telephonic communications, which typically require less than 100 kb/s for each channel.

c. “the central piece of network equipment to detect different magnitudes of DC current flow via at least one of the contacts of the first and second pairs of contacts”

92. De Nicolo ’468 in combination with De Nicolo ’666 meets this limitation.

93. De Nicolo ’666 discloses detecting different magnitudes of DC current flow. For instance, in Figure 1, provided below, microprocessor 24 detects the voltage on query conductor 28. (De Nicolo ’666 at 3:48-50.) Different magnitudes of DC current flow through query conductor 28, depending on whether

the current flows through resistor R1 in series with query line 28. (*Id.* at 3:40-4:9.)

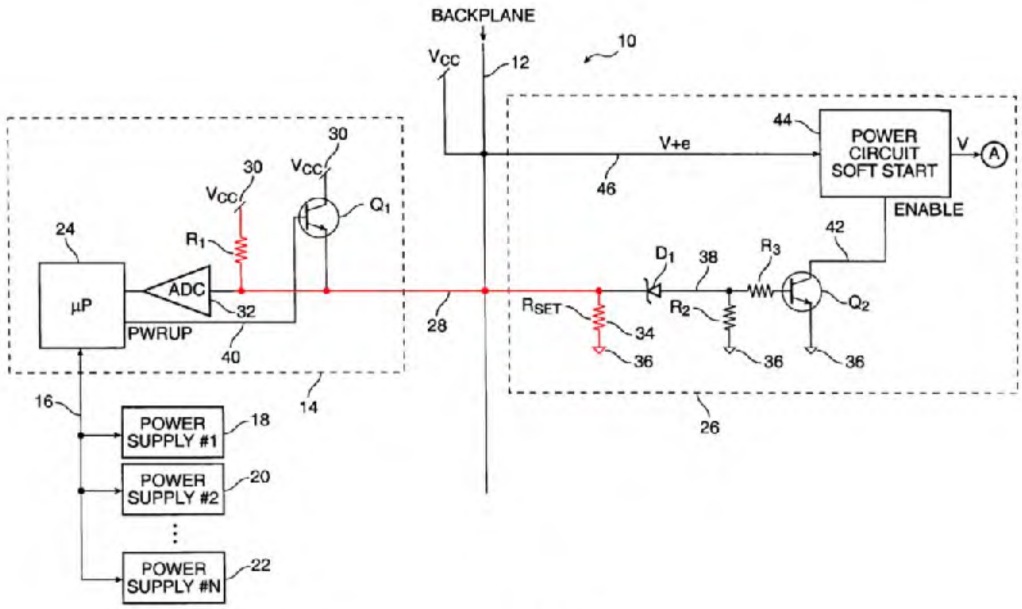


FIG. 1

(*Id.* at FIG. 1 (annotations added).)

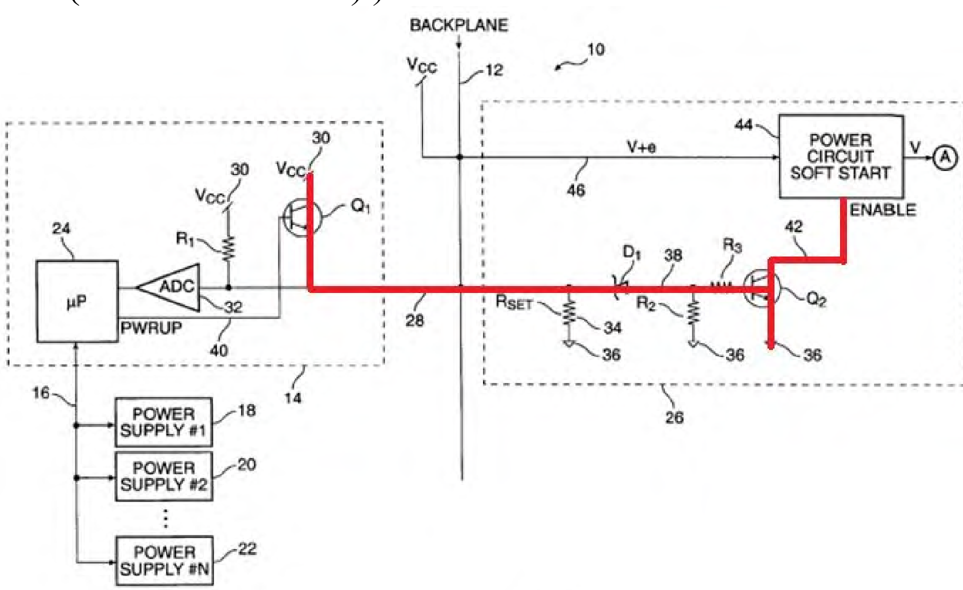


FIG. 1

(*Id.* at FIG. 1 (annotations added).)

94. As the top figure shows, if transistor Q1 is not enabled, then the voltage Vcc drops across R1. (*Id.* at 3:40-4:9.) In this situation, microprocessor 24

detects a lower voltage corresponding to a lower magnitude of current flowing through query line 28. However, if Q1 is enabled via the PWRUP line, as the bottom figure shows, then voltage Vcc does not drop across R1, resulting in a higher voltage value applied to query line 28 and, in turn, a higher magnitude of DC current through query line 28. (*Id.*) In this situation, microprocessor 24 detects a higher voltage corresponding to a higher magnitude of DC current flowing through query line 28. In this way, microprocessor 24 detects different magnitudes of DC current.

95. As discussed in Section VIII.B.2, De Nicolo ’666’s teachings are combinable with De Nicolo ’468’s teachings. For example, De Nicolo ’468’s system in Figure 3 could include a single remote device (*e.g.*, a device that includes load 98) as described, for example, in claim 16 of De Nicolo ’468. (De Nicolo ’468 at claim 16.) In this system, the skilled artisan could have included De Nicolo ’666’s power supervisor 14 into De Nicolo ’468’s piece of central Ethernet equipment (*e.g.*, the equipment comprising power supply module 144) and included De Nicolo ’666’s electronic module 26 into De Nicolo ’468’s piece of Ethernet terminal equipment (*e.g.*, the equipment comprising power processor 149), thereby combining De Nicolo ’468’s Ethernet circuitry with De Nicolo ’666’s power detection and control technique.

96. In this way, De Nicolo ’468’s central piece of network equipment

could detect different magnitudes of DC current via at least one of the contacts (*e.g.*, the contacts connecting the central piece of network equipment to twisted pair 128b) of the first and second pair of contacts.

d. "[the central piece of network equipment] to control application of at least one electrical condition to at least one of the contacts of the first and second pairs of contacts in response to at least one of the magnitudes of the DC current flow"

97. De Nicolo '468 in combination with De Nicolo '666 meets this limitation.

98. De Nicolo '666 discloses that the central piece of network equipment controls application of an electrical condition in response to a magnitude of DC current. For instance, De Nicolo '666 provides that "[i]f microprocessor 24 decides that sufficient power resources are available to permit module 26 to be turned on with its now known maximum power requirement, then microprocessor 24 sends a signal 'PWRUP' on line 40 to a switch shown here as transistor Q1. The presence of the PWRUP signal on the control gate of transistor Q1 permits current to flow through Q1 from Vcc to query line 28. This voltage, not dropping through resistor R1, will cause a higher voltage to obtain on query line 28." (De Nicolo '666 at 3:63-4:4.)

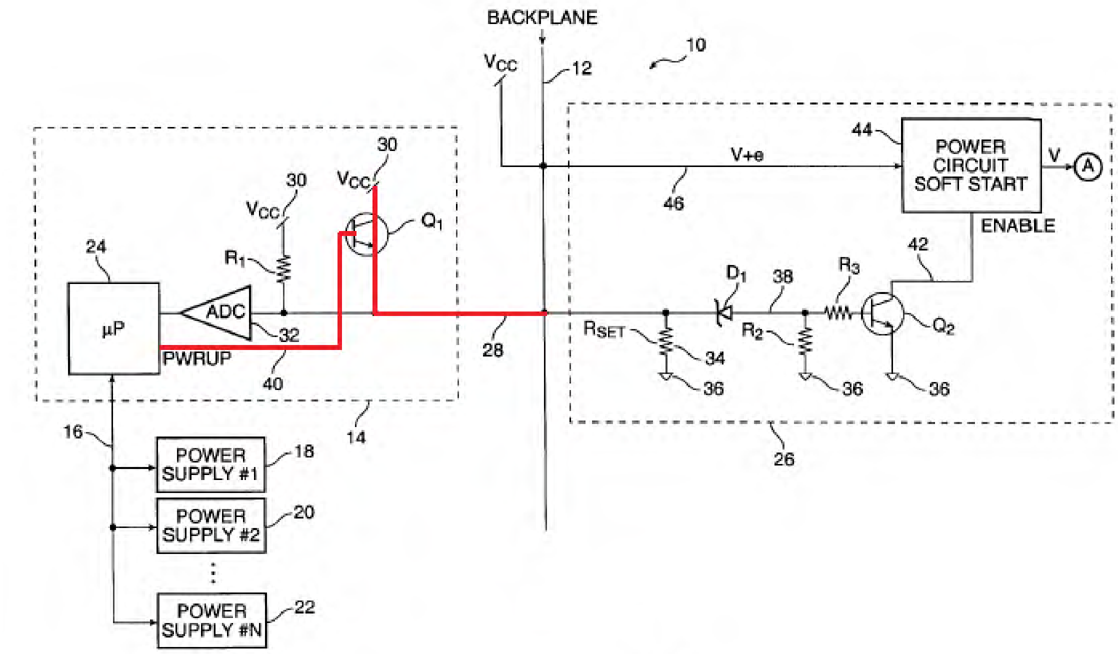


FIG. 1

(De Nicolo ’666 at FIG. 1 (annotations added).)

99. By applying the PWRUP signal to the base of transistor Q1, microprocessor 24 controls application of voltage Vcc (e.g., a voltage condition) to the contact at backplane 12.

100. As discussed in Section VIII.B.2, De Nicolo ’666’s teachings are combinable with De Nicolo ’468’s teachings. Combined with De Nicolo ’666’s teachings, De Nicolo ’468’s central piece of network equipment could control application of a voltage condition to at least one of the contacts (e.g., (*e.g.*, the contacts connecting the central piece of network equipment to twisted pair 128a) of the first and second pairs of contacts.

2. Claim 2: "wherein the different magnitudes of DC current flow are part of a detection protocol"

101. De Nicolo '666 meets this limitation. For example, De Nicolo '666 discloses a detection protocol by which a power supervisor can detect a device and query it to determine if turning it on would exceed power resources available to the system. In particular, "[resistor] Rset 34, disposed between query conductor and a source of a second voltage 36, such as ground, encodes a voltage signal on query conductor 28, the voltage being a function of the resistance of resistor 34. For example, Rset 34 could be 25 ohms if power demand of the module is 5 amperes, 50 ohms if 10 amperes, 75 ohms if 15 amperes, and 100 ohms if 20 amperes.". (De Nicolo '666 at 3:51-57; *see also id.* at 3:58-4:15, 5:16-25.) As part of the detection protocol, the power supervisor measures the voltage at the query conductor 28 to determine the electronic module's maximum power demand, which is a current value such as 5, 10, 15, or 20 amperes.

3. Claim 7: "wherein the central piece of network equipment to provide at least one DC current via at least one of the contacts of the first and second pairs of contacts and to detect distinguishing information within the DC current via the at least one of the contacts of the first and second pairs of contacts"

102. De Nicolo '666 discloses that power supervisor 14 provides a DC current and detects distinguishing information within the DC current. For example, as shown by the annotations below, De Nicolo '666 discloses providing DC current

from Vcc through resistor R1 to query line 28, where the current flows through the contact at backplane 12 and through resistor Rset 34 to reference 36. The analog to digital converter 32 detects the voltage at query line 28 and provides digital values to the microcontroller 24. In this way, power supervisor 14 provides a DC current through query line 28 and detects electronic module 26's maximum power requirement by measuring the voltage at query line 28. This voltage is "information within" the DC current because the voltage represents a direct measurement of that DC current and provides information about the maximum power requirement of electronic module 26. The voltage is also "distinguishing information" because it distinguishes electronic module 26 from another electronic module that is connected to backplane 12 and has a different power requirement, as encoded by a different value of Rset.

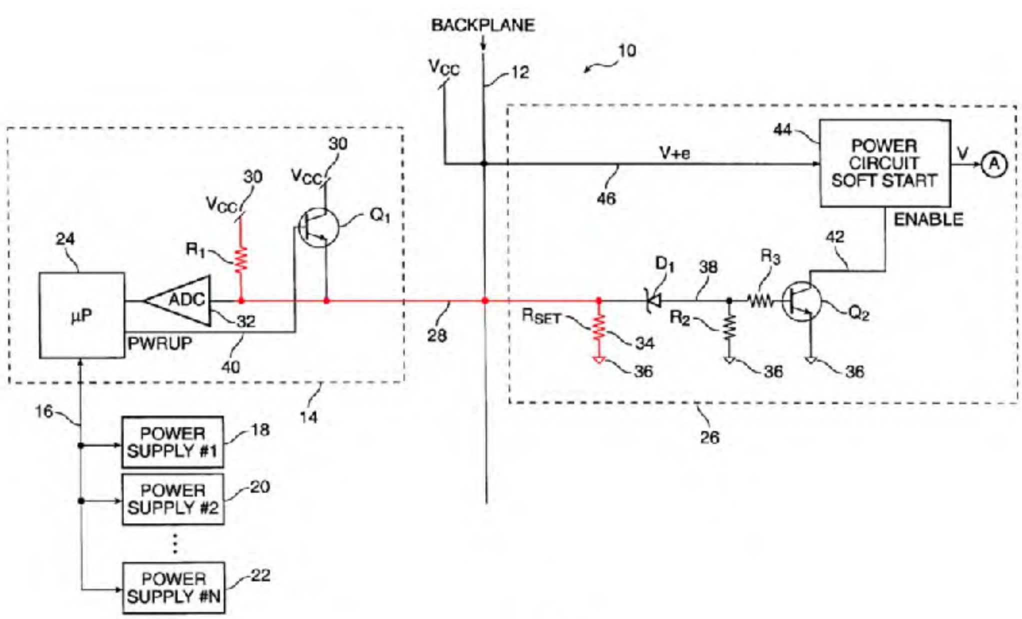


FIG. 1

(De Nicolo ’666 at FIG. 1.) As discussed in Section VIII.B.2, De Nicolo ’666’s teachings are combinable with De Nicolo ’468’s teachings. Combined with De Nicolo ’666’s teachings, De Nicolo ’468’s central piece of network equipment can provide a DC current and detect distinguishing information within the DC current using the same set of contacts of the first and second pairs of contacts.

4. Claim 26: “wherein the central piece of network equipment to distinguish one end device from at least one other end device based on at least one of the magnitudes of the DC current flow”

103. De Nicolo ’666 discloses that power supervisor 14 can distinguish one electronic module from another. The electronic module 26 in Figure 1 has a resistor Rset 34 that the module 26 uses to convey information about the module’s maximum current or power requirement via the query conductor 28. (De Nicolo ’666 at 3:40-57.) “For example, Rset 34 could be 25 ohms if power demand of the module is 5 amperes, 50 ohms if 10 amperes, 75 ohms if 15 amperes, and 100 ohms if 20 amperes.” (De Nicolo ’666 at 3:55-57.) Multiple modules, each with their own maximum power requirement, can be connected to backplane 12. (*Id.* at 2:30-35.) When two modules connected to backplane 12 have different Rset values, microprocessor 24 can distinguish one module from the other based on the magnitude of current that flows to each module from power supervisor 14.

104. As discussed in Section VIII.B.2, De Nicolo ’666’s teachings are

combinable with De Nicolo ’468’s teachings. Combined with De Nicolo ’666’s teachings, De Nicolo ’468’s central piece of network equipment can distinguish one end device from another end device based on one or more magnitudes of the DC current.

5. Claim 29: “wherein the central piece of network equipment to distinguish one network object from at least one other network object based on at least one of the magnitudes of the DC current flow”

105. The De Nicolo references meet this limitation for the reasons in Section X.B.4 (claim 26). Claim 29 is identical to claim 26, except that claim 29 uses the term “network object” while claim 26 uses the term “end device.” The end devices in De Nicolo ’468 are also network objects, so the reasoning in Section X.B.4 (claim 26) also applies to claim 29.

6. Claim 38: “wherein the central piece of network equipment comprises at least one DC supply”

106. De Nicolo ’468 meets this limitation. For instance, in Figure 3, the central Ethernet equipment has power supply 144, which is a DC supply. (De Nicolo ’468 at 3:33-43.)

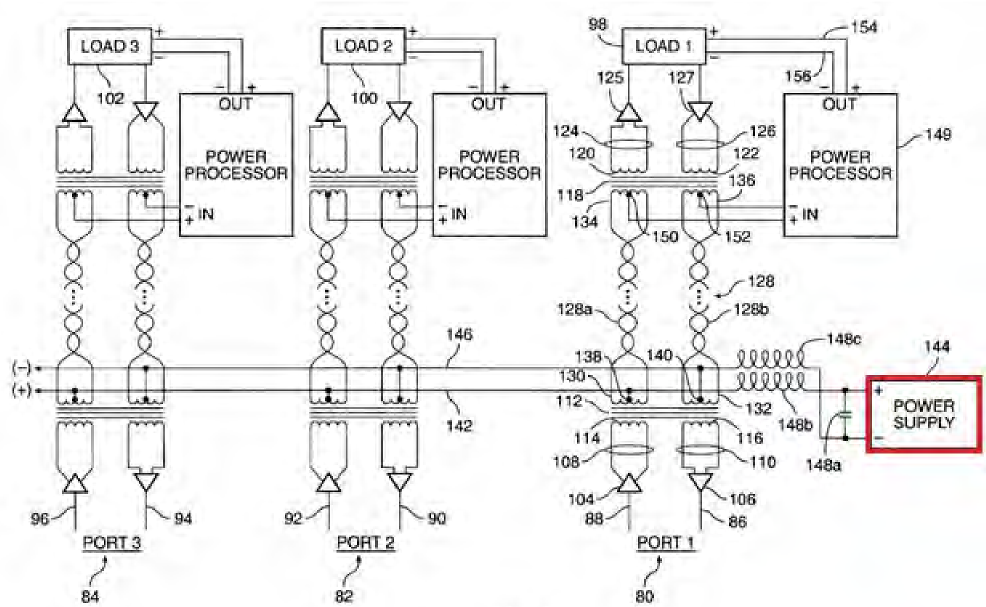


FIG. 3

(De Nicolo '468 at FIG. 3 (annotation added).)

107. De Nicolo '666 also meets this limitation. For instance, the source of voltage Vcc 30 in Figure 1 of De Nicolo '666 is the output of a DC supply.

7. Claim 40: "wherein the central piece of network equipment to control application of the at least one DC power signal"

108. Claim 40 depends on claim 39, which I understand is not a challenged claim in this petition. However, I understand that the De Nicolo references must meet the limitations of claim 39 in order for them to meet the limitations of claim 40.

109. Claim 39 recites, "The central piece of network equipment of claim 38 wherein the at least one DC supply to provide at least one DC power signal." De Nicolo '468 meets that limitation. As shown in FIG. 3 of De Nicolo '468, power supply 144 provides a DC power signal via twisted pairs 128a and 128b to the

equipment comprising, *inter alia*, power processor 149 and load 98. (De Nicolo ’468 at 3:32-50.) De Nicolo ’666 also meets that limitation. As shown in FIG. 1 of De Nicolo ’666, Vcc provides a DC power signal via line 46 to power circuit soft start 44, which, upon receiving an enable signal via line 42, uses that power signal to power the load. (De Nicolo ’666 at 4:10-15.)

110. De Nicolo ’666 provides that microprocessor 24 controls application of a DC power signal by providing a PWRUP signal via line 40 to the base of transistor Q1. (De Nicolo ’666 at 3:63-4:10.) De Nicolo ’468 provides a DC power signal from power supply 144. (De Nicolo ’468 at 3:32-50.) As discussed in Section VIII.B.2, De Nicolo ’666’s teachings are combinable with De Nicolo ’468’s teachings. Combined with De Nicolo ’666’s teachings, De Nicolo ’468’s central piece of network equipment can control application of a DC power signal.

8. Claim 47: “wherein the at least one electrical condition comprises at least one voltage condition”

111. De Nicolo ’666 provides that power supervisor 14 applies a voltage condtion (*e.g.*, Vcc, either directly or through R1) to the contact at query line 28 and backplane 12 for the reasons I provide above in connection with claim 1. (*See* Sections X.B.1.c and d.)

9. Claim 55: “wherein the different magnitudes of DC current flow comprise a first magnitude followed by a second magnitude”

112. De Nicolo ’666 discloses this limitation. For example, De Nicolo ’666

discloses that the magnitude of the current flowing through query conductor 28 changes after the PWRUP signal is provided to the base of transistor Q1. Before the PWRUP signal is provided to the base of Q1, a relatively lower magnitude of current flows through query line 28. After the PWRUP signal is provided to the base of Q1, a relatively higher magnitude of current flows through query line 28. (*See* Section X.B.1.c.)

10. Claim 69: "wherein the at least one magnitude of DC current flow is used by the central piece of network equipment to control application of at least one DC power signal"

113. De Nicolo '666 discloses this limitation for the reasons I provide above in connection with claim 1. (*See* Sections X.A.1.c and d.).

XI. Analysis of Provisional Application No. 60/081,279

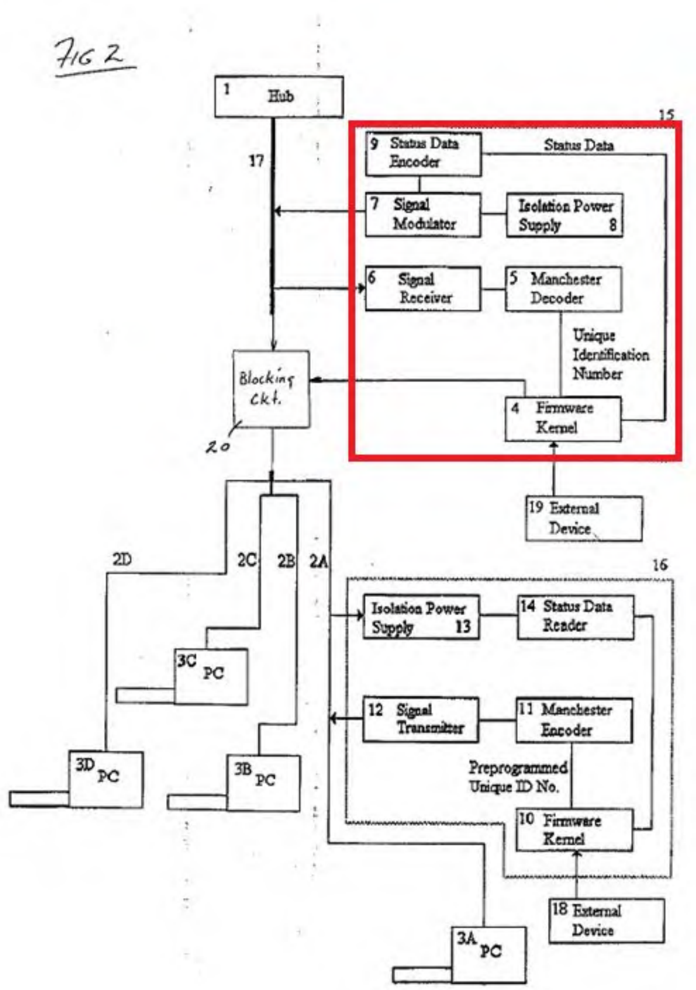
114. The '838 patent claims the benefit of U.S. Provisional Patent Application No. 60,081,279 ("the '279 provisional"). ('838 patent at 1:18-20.)

115. I have been asked to review the '279 provisional and consider whether it discloses the following limitation of claim 1 of the '838 patent: "[the central piece of network equipment] . . . to control application of at least one electrical condition to at least one of the contacts of the first and second pairs of contacts in response to at least one of the magnitudes of the DC current flow."

116. In my opinion, the '279 provisional does not disclose this limitation. In particular, the '279 provisional does not disclose that a central piece of network

equipment can control application of an electrical condition *in response to one magnitude* of DC current flow.

117. In my review of the ’279 provisional, I found that the only portion of the application that could correspond to the claimed “central piece of network equipment” is identification receiver 15, which is shown in Figure 2 (provided below), although identification receiver 15 does not meet certain limitations of the “central piece of network equipment,” as discussed below.

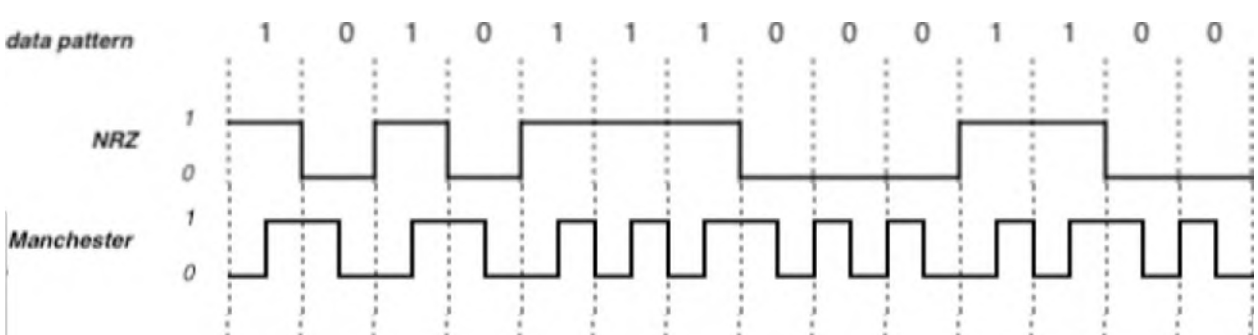


(’279 provisional at FIG. 2 (annotation added).)

118. "[I]dentification receiver 15 monitors identification transmitter circuitry 16, which may be permanently attached to remotely located electronic workstations 3A through 3D over the computer network 17." (*Id.* at 4:8-11.) Using isolation power supply 8 and signal modulator 7, receiver 15 provides a power signal encoded with status information to identification circuitry 16. (*Id.* at 5:9-21.)

119. Isolation power supply 13 draws power and provides the status information to firmware kernel 10. (*Id.* at 5:22-6:2.) Firmware kernel 10 provides a preprogrammed unique identification number to Manchester encoder 11, which passes an encoded signal to transmitter 12, which then sends the encoded number across data communication link 2A. (*Id.* at 6:3-7.) By definition, this Manchester-encoded signal has different magnitudes.

120. The figure below depicts Manchester and NRZ (non-return-to-zero) encoding of an arbitrary data stream.



(*See* Gigabit Ethernet at 226 (Fig. 12-3).) NRZ coding represents a logic "1" as a high signal, and a logic "0" as a low signal. Thus, NRZ can provide information (a logic zero or one) using only a single magnitude of current or voltage. In contrast, Manchester encoding uses transitions between a high and low current or voltage to represent data. That is, there are always *two* magnitudes of current or voltage representing a single bit of data. Thus, Manchester encoding cannot provide information using a single magnitude of current or voltage as required by the claim. In addition, the provisional application does not offer any other possible encoding scheme other than Manchester.

121. Receiver 6 receives the signal and passes it to Manchester decoder 5, which passes it on to firmware kernel 4. (*Id.* at 6:11-13.) Firmware kernel 4 may pass this information to external device 19 or provide a blocking signal to blocking circuit 20 to deny an unauthorized computer access to network information via hub 1. (*Id.* at 6:13-16.)

122. Identification receiver 15 does not control application of an electrical condition *in response to one magnitude* of DC current flow, as explained above. According to the '279 provisional, all of the information that transmitter 16 provides to receiver 15 is in Manchester-encoded format because the ID transmitter's signal transmitter 12 receives its sole input from Manchester encoder 11. (*Id.* at FIG. 2, 6:3-7.) Similarly, all of the information that identification receiver 15 receives is in Manchester-encoded format because the sole output of its signal receiver 6 goes to Manchester decoder 5. (*Id.* at FIG. 2, 6:11-13.) Identification receiver 15 does not control anything in response to a single

magnitude of a Manchester-encoded signal. No individual magnitude of a Manchester code provides useable information. As a result, when signal receiver 6 receives a Manchester-encoded signal, Manchester decoder 5 must evaluate the signal's transitions, each transition being composed of multiple different magnitudes, in order to identify any useable information. Without this information, firmware kernel 4 does not perform any controlling function. (*Id.* at 6:13-14 ("The firmware kernel may now pass *this received information* on to an external device 19, such as a computer responsible for asset tracking.") (emphasis added).) Therefore, receiver 15 does not control any electrical condition *in response to one magnitude* of DC current flow.

123. The '279 provisional's discussion of the prior art also does not disclose "[the central piece of network equipment] . . . to control application of at least one electrical condition to at least one of the contacts of the first and second pairs of contacts in response to at least one of the magnitudes of the DC current flow." On page 2, the '279 provisional discusses U.S. Patent No. 5,406,260 in a single paragraph, provided below:

> "One method that attempted to control the theft aspect of TCO is disclosed in U.S. Pat. No. 5,406,260 issued to Cummings et. Al, (hereby incorporated by reference) which discusses a means of detecting the unauthorized removal of a networked device by injecting a low current power signal into each existing communications link. A

> sensor monitors the returning current flow and can thereby detect a removal of the equipment. This method provides a means to monitor the connection status of any networked electronic device thus providing an effective theft detection/deterrent system."

(*Id.* at 2:5-11.)

124. While the '260 patent does use a single magnitude of current to provide central equipment with information (e.g., that a remote device is properly connected to the cable), the paragraph cited here in the '279 provisional does not provide any disclosure about controlling application of an electrical condition to at least one of the contacts of the first and second pairs of contacts in response to a single magnitude of DC current.

I, Rich Seifert, do hereby declare and state, 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, under Section 1001 of Title 18 of the United States Code.

Dated: 2 March 2016

Rich Seifert