**DECLARATION OF RICH SEIFERT IN SUPPORT OF PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 8,902,760**

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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 Petitioners AMX and Dell, Inc. (collectively, "Petitioner") to analyze, render opinions, and/or provide expert testimony regarding the validity of certain claims of U.S. Patent No. 8,902,760 ("the '760 patent"). I understand that Petitioner submitted the '760 patent as Exhibit 1001.

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).

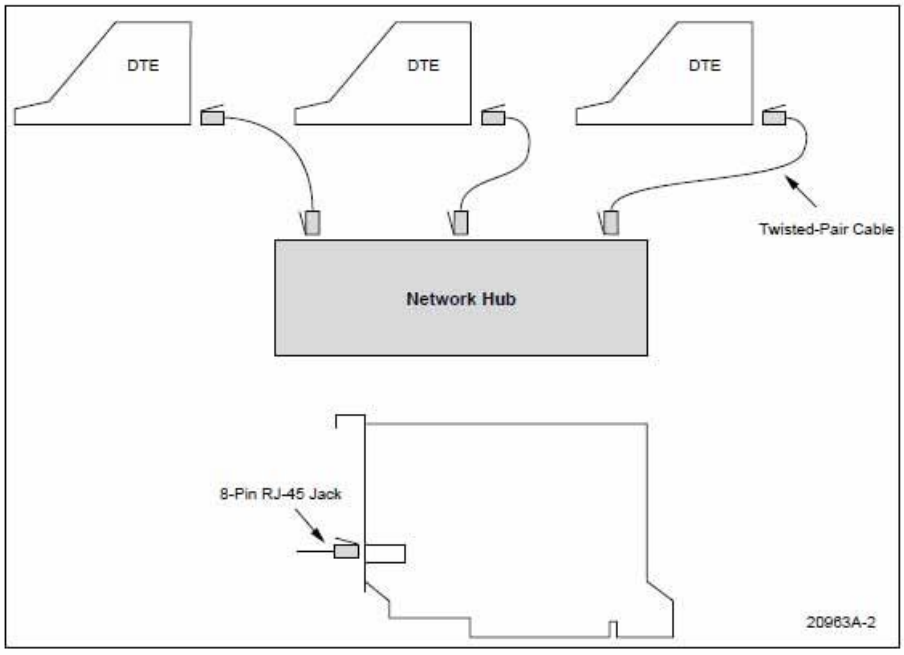
2 "The obviousness analysis in the patent context cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasis on the importance of published articles and the explicit content of issued patents. The diversity of inventive pursuits and of modern 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 BaseT Ethernet equipment," "BaseT Ethernet terminal equipment," "data signaling pairs of conductors," "a DC supply," and "a path." 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 an Ethernet network using the on-board RJ-45 jack for either 10BASE-T or 100BASE-TX connection. (*Id.*) In this illustration, the network hub

constitutes central BaseT Ethernet equipment, the DTEs are pieces of BaseT Ethernet terminal equipment, each piece of equipment necessarily includes a DC supply (*see, e.g.,* PCnet-*FAST* Power Requirements, 3.25W maximum at 5V DC, at 25º C (with NSC 10/100 PHY), PCnet-*FAST* at 4-4), and each twisted pair cable comprises data signaling pairs of conductors. When the network hub is connected to a DTE, the connection provides a path through which current can flow.

23. It was also well-known that magnitudes of DC current can convey information about a device. In fact, this is a simple application of Ohm's law (Current (I) = Voltage (V) ÷ Resistance (R)). For example, U.S. Patent No. 2,822,519 ("Murphy) disclosed an apparatus incorporating in paths "known values of resistors and a meter with a source of direct current to identify circuits that have been connected." (Murphy at 1:20-22.) Murphy uses multiple contacts and twisted pairs. In the context of evaluating how much power to send to a device, the same concept was recognized as well-known prior art in U.S. Patent No. 5,200,686 ("Lee"), in which the resistance in a path (measured using Ohm's law and a known voltage or current) was associated with the power charging requirements for the device.

## VI. Claim Construction

24. 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.

25. 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" | claims 1, 31, 37, 58, 59, 69, 72, 73, 106, 112, 134, 142, 145 | 10BASE-T |

26. 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

27. 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.

28. 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.

29. At the time of the filing date of the ’760 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. De Nicolo References

#### 1. Overview

30. 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.

31. 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.

32. 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

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

34. 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.)

35. 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.

36. 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.

37. 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.

### B. Auto-Negotiation References

#### 1. Overview

38. U.S. Patent No. 5,883,894 is titled "Shared Auto-Negotiation Logic for Multiple Port Network Devices," has a filing date of December 30, 1996, has a date of issuance of March 16, 1999, and names as its inventors Sandeep A. Patel and Claude G. Hayek. I refer to this patent as "Patel" in this declaration. I understand that Petitioner has submitted Patel as Exhibit 1034.

39. The DP83840 Datasheet is titled "DP83840 10/100 Mb/s Ethernet

Physical Layer" and dated November 1995. I refer to this publication as "DP83840 Datasheet" in this declaration. I understand that Petitioner has submitted DP83840 Datasheet as Exhibit 1024.

40. IEEE Std. 802.3u-1995 is titled "Media Access Control (MAC) Parameters, Physical Layer, Medium Attachment Units, and Repeater for 100 Mb/s Operation, Type 100BASE-T (Clauses 21-30)" and was approved by the IEEE Standards Board on June 14, 1995. I refer to this publication as "IEEE 802.3u-1995" in this declaration. I understand that Petitioner has submitted IEEE 802.3u-1995 as Exhibit 1025.

41. IEEE Std. 802.3 is titled "Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications" and is dated July 8, 1993. I refer to this publication as "IEEE 802.3-1993" in this declaration. I understand that Petitioner has submitted IEEE 802.3-1993 as Exhibit 1026.

42. Collectively, I refer to Patel, DP83840 Datasheet, IEEE 802.3u-1995, and IEEE 802.3-1993 as "the Auto-Negotiation references" in this declaration.

43. I note that Patel incorporates by reference Clause 28 of IEEE 802.3u-1995. (Patel at 1:60-64.) I understand that the disclosure in Clause 28 of IEEE 802.3u-1995 is therefore part of the Patel reference.

### 2. Reasons to Combine the Auto-Negotiation References

44. In my opinion, it would have been obvious for a person of ordinary skill in the art to combine the teachings of Patel, DP83840 Datasheet, IEEE 802.3u-1995, and IEEE 802.3-1993.

45. Patel, DP83840 Datasheet, and IEEE 802.3u-1995 all relate to Auto-Negotiation, which is the protocol by which Ethernet devices exchange initial configuration information to identify their capabilities. Clause 28 of IEEE 802.3u-1995 is the portion of the IEEE 802.3 standard that sets forth the Auto-Negotiation protocol,[3] and IEEE 802.3-1993 is the version of the 802.3 standard that was ratified in 1993. DP83840 Datasheet is a datasheet for the DP83840 chip that implements Auto-Negotiation. (DP83840 Datasheet at 1.) DP83840 Datasheet also discloses implementations of an Ethernet node and a repeater that use the DP83840 chip. Finally, Patel provides an Ethernet system for performing Auto-Negotiation in which a central piece of Ethernet equipment (e.g., a repeater or a switch) performs Auto-Negotiation with several Ethernet end stations. (Patel at FIG. 1.)

46. The technologies disclosed in these references are intended to be used together. A person of skill in the art would have combined DP83840 Datasheet with IEEE 802.3u-1995 because DP83840 Datasheet specifically directs readers

[3] IEEE 802.3u was incorporated into IEEE 802.3 at its next consolidated printing in 1996.

(which would include persons of ordinary skill in the art) to clause 28 of the IEEE 802.3u specification for further detail regarding Auto-Negotiation. (DP83840 Datasheet at 26.) The skilled artisan would have combined teachings from IEEE 802.3u-1995 with IEEE 802.3-1993 because they constitute a single, cohesive reference, they collectively define a single standard, they specifically reference one another, and they are not meant to be considered in isolation.

47. The skilled artisan would have also combined Patel with DP83840 Datasheet. The references' teachings fit together in a logical, predictable manner. Patel provides an Auto-Negotiation system that includes central Ethernet equipment (e.g., a repeater or switch) and several Ethernet end stations. Like DP83840 Datasheet, Patel specifically mention IEEE 802.3u-1995 Clause 28 and, in fact, incorporates that clause by reference. Patel does not describe the central equipment and Ethernet stations at the chip level. However, DP83840 Datasheet discloses implementations of a repeater (*see* DP83840 Datasheet at 21) and an Ethernet node (*see id.* at 42), both using the DP83840 chip. The skilled artisan could have incorporated DP83840 Datasheet's repeater implementation into Patel's central equipment 100 (*see* Patel at Figure 1), and could have implemented DP83840 Datasheet's Ethernet node implementation into Ethernet end stations 107-0 to 107-n-1 in Patel (*see id.*). Doing so would have maintained the existing purpose of Patel's central device and Ethernet stations—performing Auto-

Negotiation in an efficient and inexpensive manner. Finally, this combination would have been a routine, common sense design choice for a person having ordinary skill in the art.

## IX. '760 Patent

### A. Summary of the '760 Patent

48. The claims of the '760 patent are directed to a BaseT Ethernet system comprising a piece of central BaseT Ethernet equipment, a piece of BaseT Ethernet terminal equipment, data signaling pairs of conductors, a DC supply, and a path, with several functional limitations: (1) to draw different magnitudes of current flow from the DC supply through a loop formed over the conductors, (2) to detect two different magnitudes of the current flow through the loop, and (3) to control the application of at least one electrical condition to at least two conductors. (*See* '760 patent at 17:15-36.) The '760 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 '760 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.

(*Id.* at 2:19-25.)

49. The ’760 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.” (’760 patent at 2:26-30.) The ’760 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.)

50. The specification emphasizes modulation techniques by which the variation in current transmits identifying information. (*Id.*) In contrast, certain challenged claims recite that a single magnitude of DC current is sufficient to represent information about the claimed device. (’760 patent at 19:52-55, 24:3-6.)

**B. Challenged Claims**

51. I understand that Petitioner is challenging the validity of claims 1, 31,

37, 58, 59, 69, 72 (across 1, 31, 37, 58, 59, and 69), 73, 106, 112, 134, 142, and 145 (across 73, 106, 112, 134, and 142) of the '760 patent.

52. Claim 1 is provided below.

> A BaseT Ethernet system comprising:
>
> a piece of central BaseT Ethernet equipment;
>
> a piece of BaseT Ethernet terminal equipment;
>
> data signaling pairs of conductors comprising first and second pairs used to carry BaseT Ethernet communication signals between the piece of central BaseT Ethernet equipment and the piece of BaseT Ethernet terminal equipment, the first and second pairs physically connect between the piece of BaseT Ethernet terminal equipment and the piece of central BaseT Ethernet equipment, the piece of central BaseT Ethernet equipment having at least one DC supply, the piece of BaseT Ethernet terminal equipment having at least one path to draw different magnitudes of current flow from the at least one DC supply through a loop formed over at least one of the conductors of the first pair and at least one of the conductors of the second pair, the piece of central BaseT Ethernet equipment to detect at least two different magnitudes of the current flow through the loop and to control the application of at least one electrical condition to at least two of the conductors.

53. Claim 31 is provided below.

> The BaseT Ethernet system of claim 1 wherein the BaseT Ethernet terminal equipment comprises a controller coupled to the at least one path.

54. Claim 37 is provided below.

> The BaseT Ethernet system of claim 1 wherein one or more magnitudes of the current flow through the loop represent information about the piece of BaseT Ethernet terminal equipment.

55. Claim 58 is provided below.

> The BaseT Ethernet system of claim 1 wherein the piece of central BaseT Ethernet equipment to detect current flow through the loop via voltage.

56. Claim 59 is provided below.

The BaseT Ethernet system of claim 1 wherein at least one of the different magnitudes of current flow through the loop is part of a detection protocol.

57. Claim 69 is provided below.

The BaseT Ethernet system of claim 1 wherein the piece of central BaseT Ethernet equipment to distinguish the piece of BaseT Ethernet terminal equipment from at least one other piece of BaseT Ethernet terminal equipment.

58. Claim 72 is provided below.

The BaseT Ethernet system according to any one of claims 1, 10-13, 16-18, 21-32, 35-46, 52-57, 59-66, or 67-71 wherein the piece of BaseT Ethernet terminal equipment is a powered-off piece of BaseT Ethernet equipment.

59. Claim 73 is provided below.

A BaseT Ethernet system comprising:

Ethernet cabling having at least first and second individual pairs of conductors used to carry BaseT Ethernet communication signals, the at least first and second individual pairs of conductors physically connect between a piece of BaseT Ethernet terminal equipment and a piece of central network equipment; the piece of central network equipment having at least one DC supply, the piece of BaseT Ethernet terminal equipment having at least one path to draw different magnitudes of current flow via the at least one DC supply through a loop formed over at least one of the conductors of the first pair of conductors and at least one of the conductors of the second pair of conductors, the piece of central network equipment to detect at least two different magnitudes of current flow through the loop.

60. Claim 106 is provided below.

The BaseT Ethernet system of claim 73 wherein the BaseT Ethernet terminal equipment comprises a controller coupled to the at least one path.

61. Claim 112 is provided below.

> The BaseT Ethernet system of claim 73 wherein one or more magnitudes of the current flow through the loop represent information about the piece of BaseT Ethernet terminal equipment.

62. Claim 134 is provided below.

> The BaseT Ethernet system of claim 73 wherein at least one of the different magnitudes of current flow through the loop is part of a detection protocol.

63. Claim 142 is provided below.

> The BaseT Ethernet system of claim 73 wherein the piece of central network equipment to distinguish the piece of BaseT Ethernet terminal equipment from at least one other piece of BaseT Ethernet terminal equipment.

64. Claim 145 is provided below.

> The BaseT Ethernet system according to any one of claims 73, 82-91, 94-107, 108-121, 127-132, 134-129, or 140-144 wherein the piece of BaseT Ethernet terminal equipment is a powered-off piece of BaseT Ethernet equipment.

## X. Invalidity Analysis of '760 Patent

### A. The challenged claims are obvious based on the De Nicolo references.

#### 1. Independent Claim 1

65. In my opinion, the De Nicolo references disclose every limitation of claim 1 for the following reasons.

##### a. "A BaseT Ethernet system"

66. De Nicolo '468 meets the preamble. De Nicolo '468 discloses an Ethernet system in which power and data can be transmitted to Ethernet devices over Ethernet twisted pair lines. (De Nicolo '468 at 3:5-12.) For instance, in FIG. 3, power and data can be transmitted to the Ethernet equipment comprising load

98, power processor 149, and transformer 118 over Ethernet link 128, which comprises twisted pair 128a and twisted pair 128b. (*Id.* at 3:13-50.)

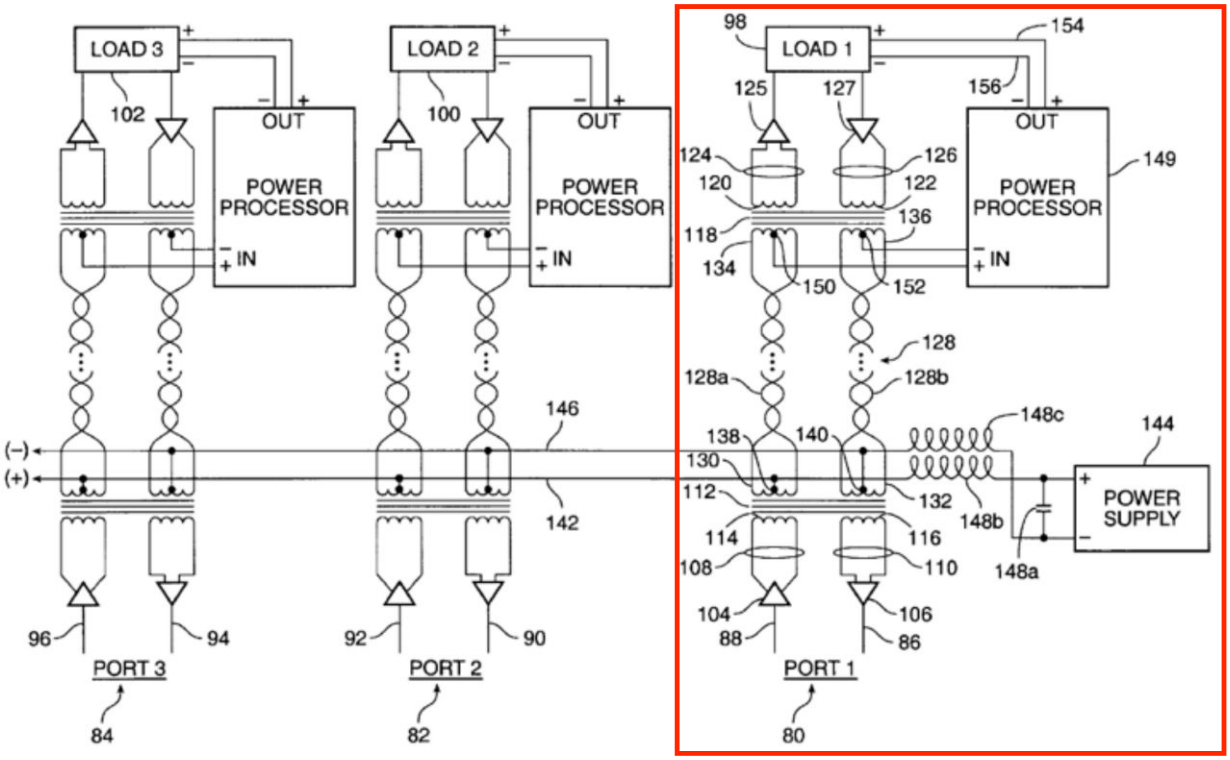



FIG. 3

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

67. A person of ordinary skill in the art would have understood that the 4-wire Ethernet connection could be used to transmit 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.*, De Nicolo '468 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.

**b. "a piece of central BaseT Ethernet equipment"**

68. 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.) In this system, the equipment comprising power supply 144 and ports 1-3 is a piece of central Ethernet 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 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.

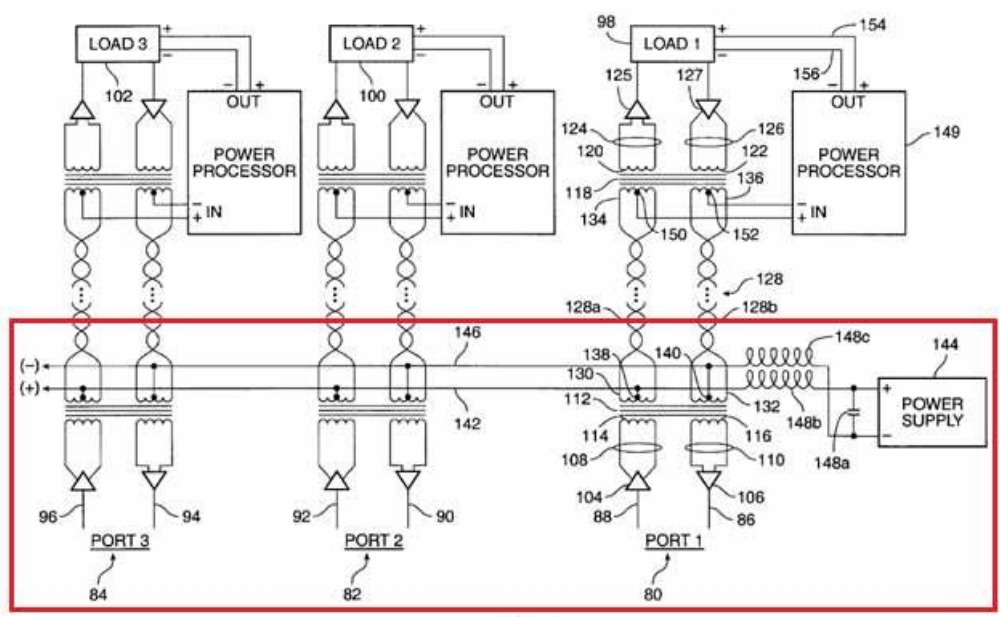



FIG. 3

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

69. A person of ordinary skill in the art would have understood that the piece of central Ethernet equipment in Figure 3 could use its 4-wire Ethernet connection to twisted pairs 128a and 128b to transmit 10BASE-T Ethernet communication signals. *See* Section X.A.1.a.

**c. "a piece of BaseT Ethernet terminal equipment"**

70. De Nicolo '468 meets this limitation. For instance, in Figure 3, provided below, load 98, power processor 149, receiver 125, driver 127, and transformer 118 together constitute Ethernet terminal equipment that is connected to twisted pairs 128a and 128b. (De Nicolo '468 at 3:9-20.)

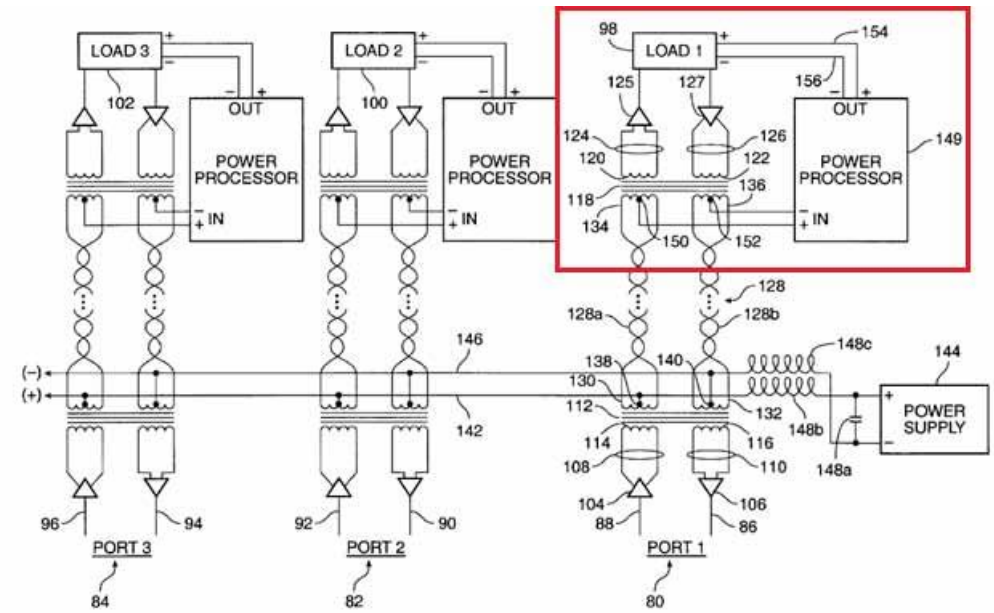



FIG. 3

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

71. A person of ordinary skill in the art would have understood that the piece of Ethernet terminal equipment in Figure 3 could use its 4-wire Ethernet connection to twisted pairs 128a and 128b to transmit 10BASE-T Ethernet communication signals. *See* Section X.A.1.a.

**d. "data signaling pairs of conductors comprising first and second pairs used to carry BaseT Ethernet communication signals between the piece of central BaseT Ethernet equipment and the piece of BaseT Ethernet terminal equipment, the first and second pairs physically connect between the piece of BaseT Ethernet terminal equipment and the piece of central BaseT Ethernet equipment"**

72. De Nicolo '468 meets this limitation. For instance, in Figure 3, provided below, the Ethernet system includes data signaling pairs of conductors (e.g., link 128) comprising a first pair (e.g., twisted pair 128a) and second pair

(e.g., twisted pair 128b). (De Nicolo '468 at 3:26-32.) Twisted pairs 128a and 128b are used to carry Ethernet communication signals between the piece of central Ethernet equipment and the piece of Ethernet terminal equipment. (*Id.* at 3:9-12.) As shown in Figure 3, twisted pairs 128a and 128b are physically connected between the piece of central Ethernet equipment and the piece of Ethernet terminal equipment.

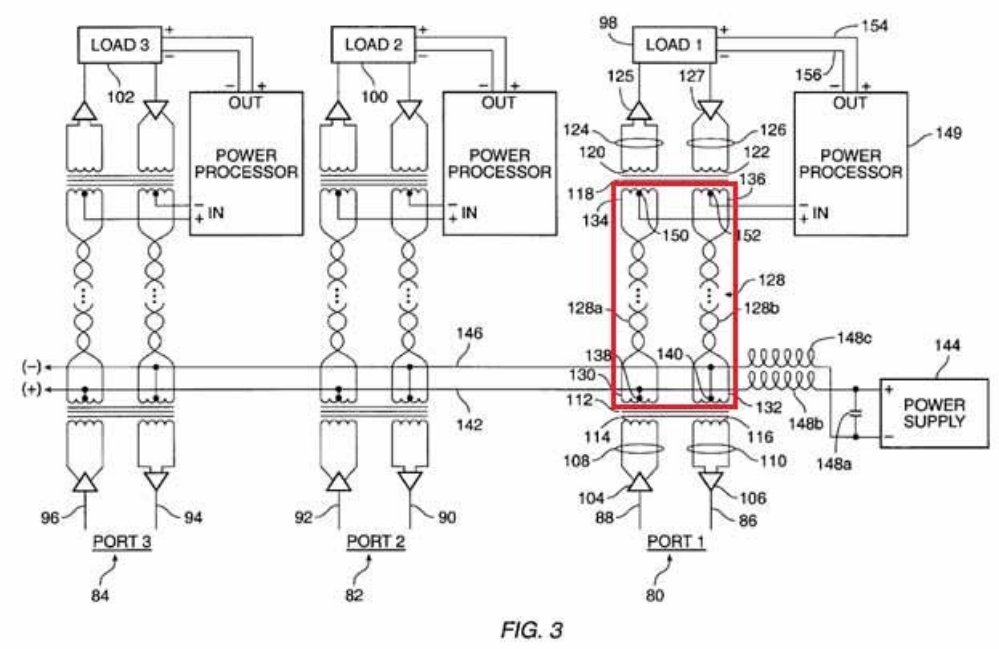



FIG. 3

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

73. A person of ordinary skill in the art would have understood that the 4-wire Ethernet connection comprising twisted pairs 128a and 128b can carry 10BASE-T Ethernet communication signals. *See* Section X.A.1.a.

**e. "the piece of central BaseT Ethernet equipment having at least one DC supply"**

74. De Nicolo '468 meets this limitation. For instance, in Figure 3,

provided below, the central Ethernet equipment has power supply 144, which is a DC supply. (De Nicolo '468 at 3:33-43.)

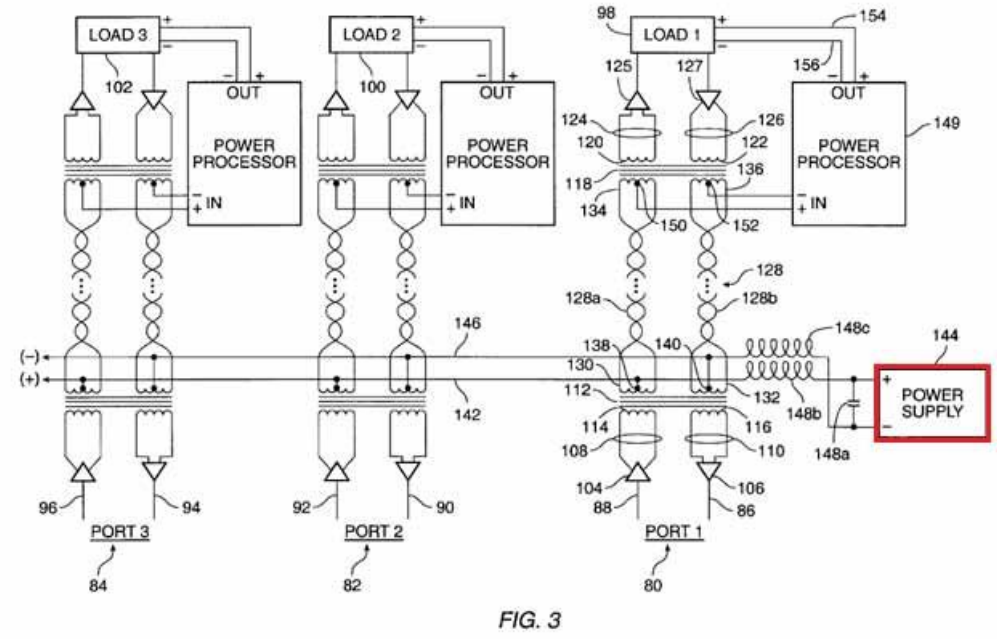



FIG. 3

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

**f. "the piece of BaseT Ethernet terminal equipment having at least one path to draw different magnitudes of current flow from the at least one DC supply through a loop formed over at least one of the conductors of the first pair and at least one of the conductors of the second pair"**

75. De Nicolo '468 meets this limitation. For instance, in Figure 3, provided below, a path is formed from the power supply 144 to the "+" and "-" inputs of power processor 149 as shown by the annotations below. Specifically, the first and second primary center taps 150, 152 connect to power processor 149 for DC power extraction. (*Id.* at Abstract.) Through the path, the power processor 149 draws DC current.

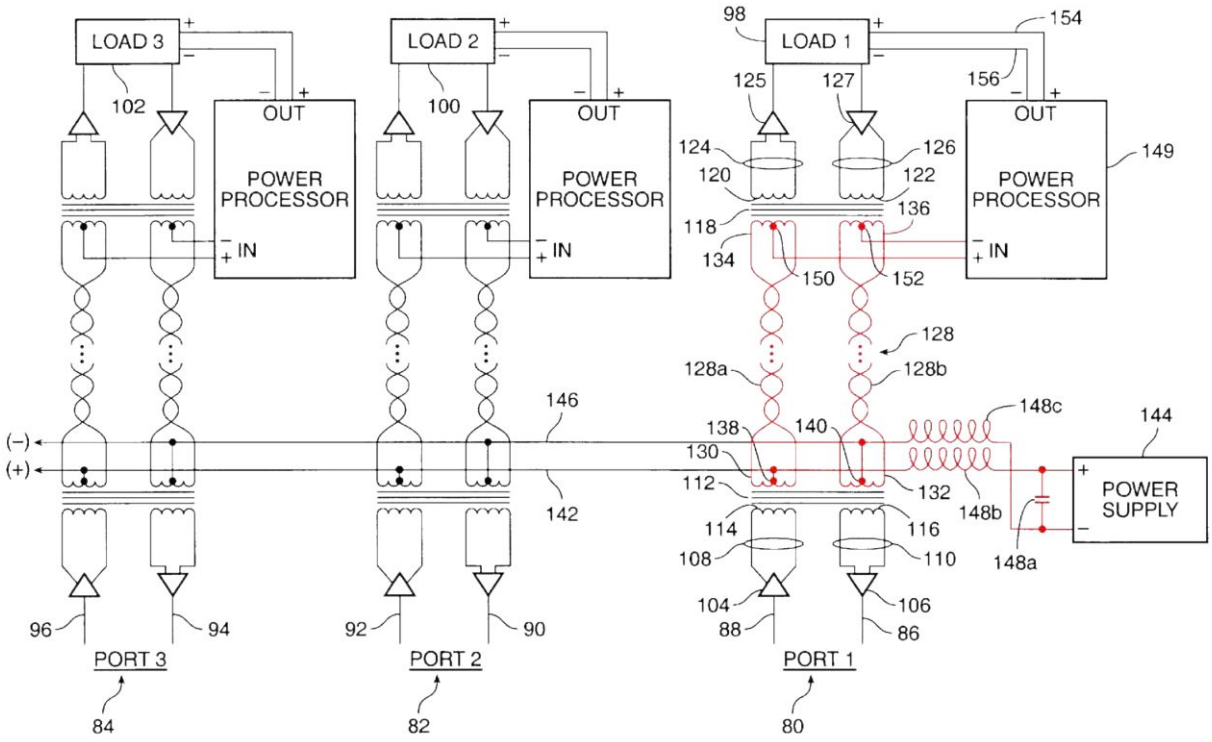



FIG. 3

(De Nicolo ’468 at FIG. 3 (annotations added).)

76. Power processor 149 can draw any suitable magnitudes of DC current from power supply 144. In addition, load 98 can draw any suitable magnitudes of DC current from the power processor 149, especially because De Nicolo '468 provides that power processor 149 can adjust the power it provides to load 98 based on the load's requirements. (De Nicolo '666 at 3:47-50.) In operation, load 98 necessarily draws different magnitudes of current. For example, the load's current draw changes depending on whether it is on-hook or off-hook. As another example, the load's current draw changes depending on whether it performs basic features or more advanced features requiring additional processing power and/or memory utilization.

**g. "the piece of central BaseT Ethernet equipment to detect at least two different magnitudes of the current flow through the loop and to control the application of at least one electrical condition to at least two of the conductors"**

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

78. De Nicolo '666 provides that a piece of equipment detects at least two different magnitudes of current and controls application of an electrical condition. For instance, in Figure 1, provided below, electronic module 26 is connected to power supervisor 14 via backplane 12. (De Nicolo '666 at 3:33.) Analog to digital converter 32 converts the voltage on query conductor 28 to a digital value for use by programmed microprocessor 24. (*Id.* at 3:47-49.)

79. As shown by the annotations below, different magnitudes of current flow through query conductor 28 depending on whether the current flows through resistor R1 in series with query line 28. (De Nicolo '666 at 3:40-4:9.)

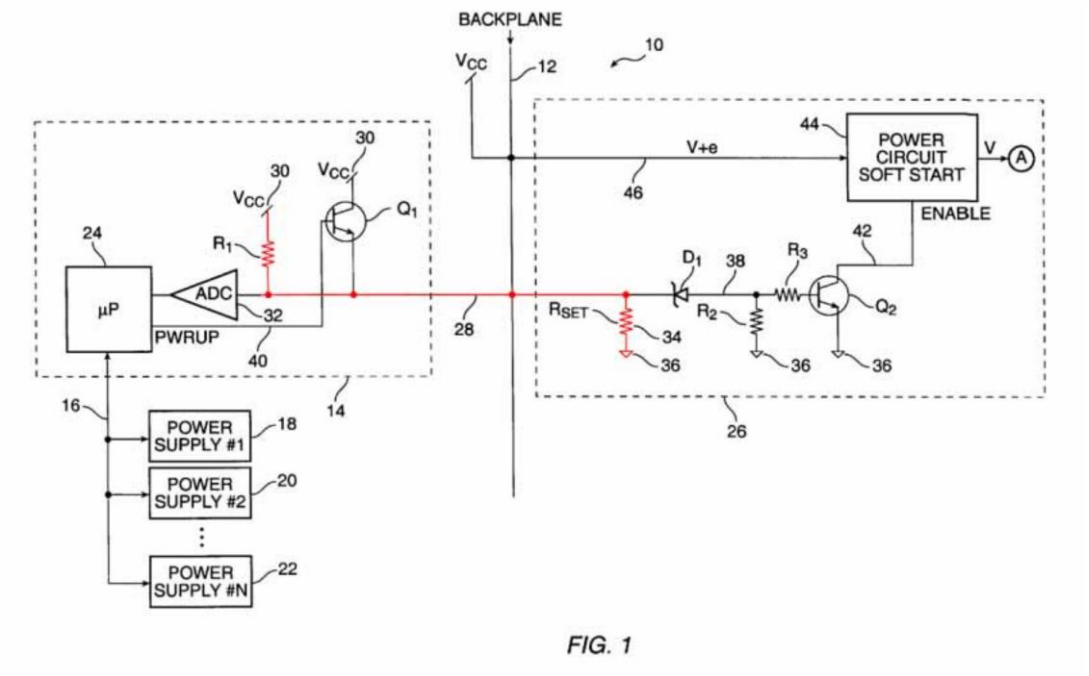



FIG. 1

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

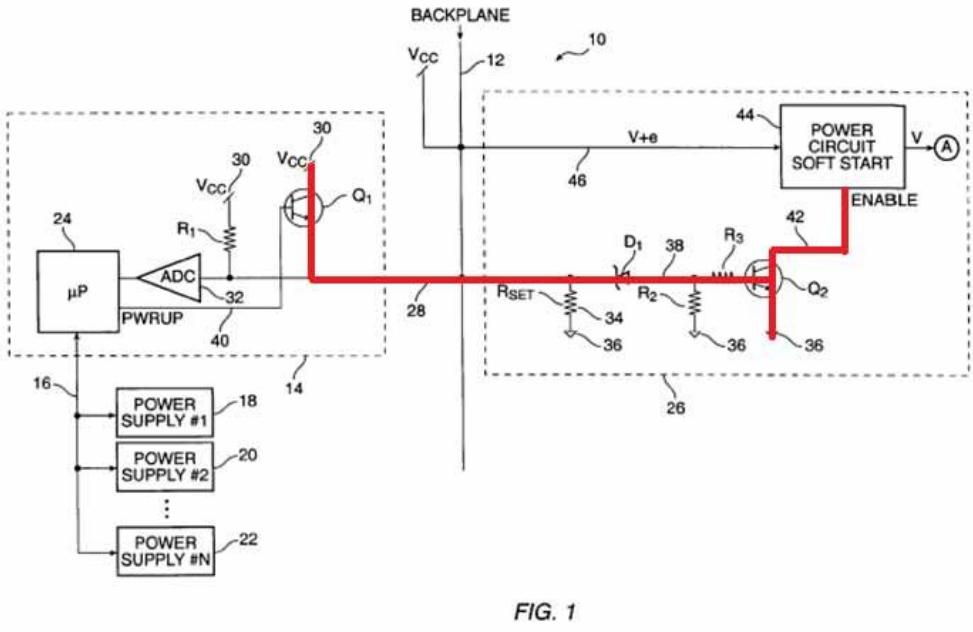



FIG. 1

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

80. As the top figure shows, if transistor Q1 is not enabled, then the voltage Vcc drops across R1. (*Id.* at 3:40-4:9.) This results in a relatively low current that flows through query conductor 28. (*Id.*) As this current flows through

query conductor 28, microprocessor 24 detects the voltage resulting from this current flow. (*Id.*) In this way, microprocessor 24 detects a first magnitude of current that flows through query conductor 28.

81. If Q1 is enabled, 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.*) As this current flows through query conductor 28, microprocessor 24 detects the voltage resulting from this higher current flow. (*Id.*) In this way, microprocessor 24 detects a second magnitude of current that flows through query conductor 28. Therefore, microprocessor 24 detects two different magnitudes of current that flows through query conductor 28.

82. Microprocessor 24 also controls the application of a voltage condition. For instance, microprocessor 24 sends the PWRUP signal on line 40 to transistor Q1. (*Id.* at 3:63-67.) This permits current to flow from Vcc through Q1 to query line 28, which passes the current through backplane 12 to electronic module 26. In this way, microprocessor 24 controls the application of a voltage condition (*e.g.*, voltage Vcc through transistor Q1) to electronic module 26.

83. As discussed in Section X.A.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 ("[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 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.

84. In this way, De Nicolo '468's piece of central Ethernet equipment could detect at least two different magnitudes of current flowing through the loop (*e.g.*, the loop formed over twisted pairs 128a and 128b) and control the application of a voltage condition (*e.g.*, voltage from power supply 144) to at least two of the conductors (*e.g.*, twisted pair 128a).

### 2. Claim 31: "wherein the BaseT Ethernet terminal equipment comprises a controller coupled to the at least one path"

85. De Nicolo '468 and De Nicolo '666 independently meet this limitation. For instance, in De Nicolo '468, power processor 149 is a controller, which includes circuitry that is coupled to the path annotated below.

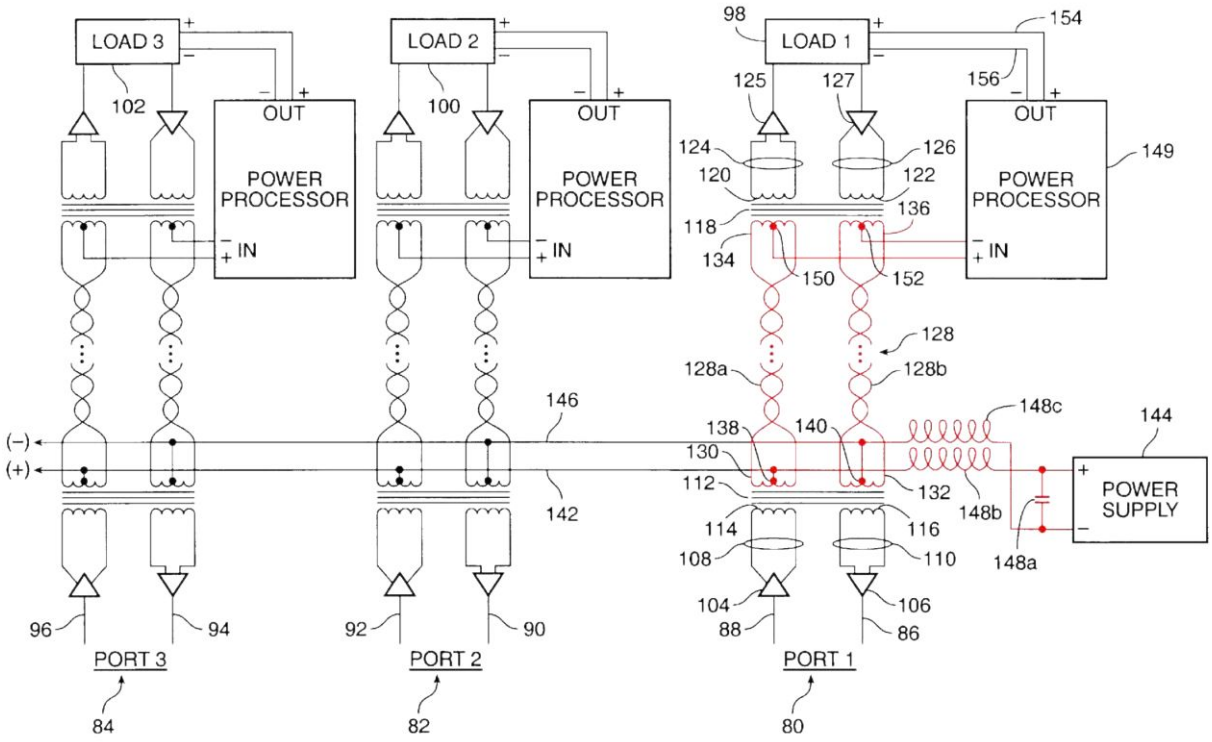



FIG. 3

(De Nicolo ’468 at FIG. 3 (annotations added).)

86. In De Nicolo ’666, for example, power circuit soft start 44 operates “to slowly turn on power available on line 46 and apply it to the power consuming circuitry of module 26 denoted 'A' while the ENABLE signal is asserted on line 42.” (De Nicolo '666 at 4:11-15, FIG. 1.) Power circuit soft start 44 is coupled to the query conductor 28 via Zener diode D1, line 38, resistor R3, transistor Q2, and line 42. De Nicolo '666 also discloses a prestart area 72, for example, which “may carry on extensive communications with power supervisor 64 and power supervisor 64 may require information in addition to maximum power requirement-for example, a password could be required, or a particular range of

serial numbers could be required." (*Id.* at 4:67-5:5, FIG. 4.) The prestart area is coupled to the query line 68. The power start soft circuit and prestart area independently satisfy the claimed controller.

### 3. Claim 37: "wherein one or more magnitudes of the current flow through the loop represent information about the piece of BaseT Ethernet terminal equipment"

87. De Nicolo '666 discloses that one or more magnitudes of current represent information about the piece of equipment. For example, De Nicolo '666 discloses that a magnitude of a DC current through query conductor 28 represents information about the maximum power requirement of electronic module 26.

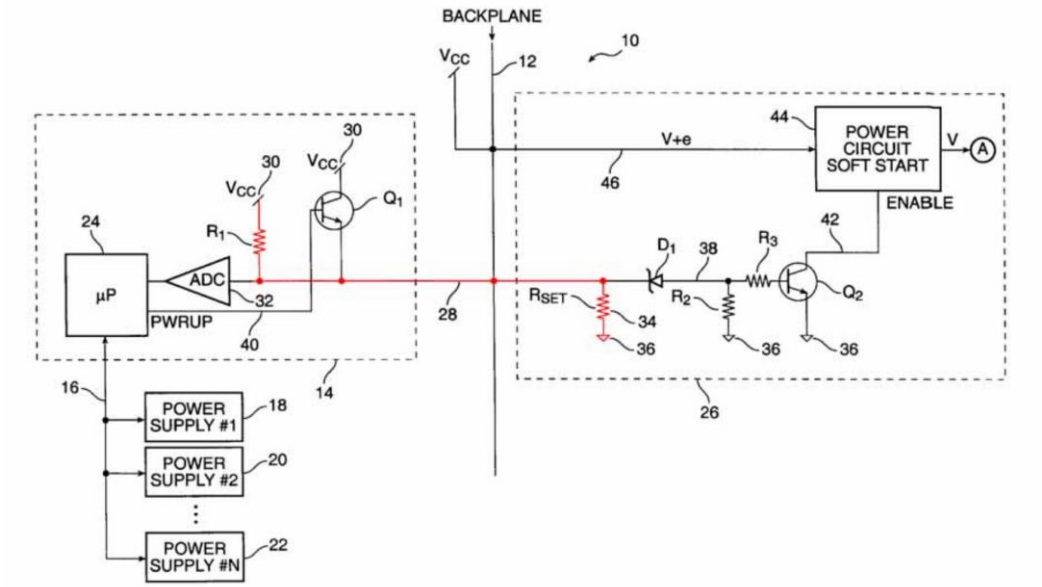



FIG. 1

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

88. De Nicolo '666 explains that each electronic module 26 has a particular power requirement which fluctuates, but also has a known maximum power requirement or demand. (*Id.* at 1:55-58, 3:32-40.) This maximum power

requirement is determined by the value of resistor Rset 34 and communicated by an analog voltage signal on the query conductor 28 passing from electronic module 26 through backplane 12 to power supervisor 14. (*Id.* at 3:50-56, 4:40-56.) Thus, an impedance element is used to encode the information about the equipment, which manifests itself as a voltage signal on the conductor 28, where the voltage is a function of the impedance element. (*Id*.)

89. As discussed above, De Nicolo '666's teachings are combinable with the circuitry in De Nicolo '468's Ethernet system, and when their teachings are combined, one or more magnitudes of current flowing through the loop (*e.g.*, the loop comprising twisted pairs 128a and 128b) represent information about the maximum power requirement of the piece of BaseT Ethernet terminal equipment (*e.g.*, the equipment comprising load 98 and power processor 149).

#### 4. Claim 58: "wherein the piece of central BaseT Ethernet equipment to detect current flow through the loop via voltage"

90. As discussed in Section X.A.1.g, De Nicolo '666 provides that microprocessor 24 in power supervisor 14 detects current flowing through query conductor 28 via voltage applied to the input of A/D converter 32. As discussed in the same section, De Nicolo '666's teachings are combinable with the circuitry in De Nicolo '468's Ethernet system, and when their teachings are combined, the piece of central BaseT Ethernet equipment in De Nicolo '468 (*e.g.*, the equipment

comprising power supply 144) detects current flowing through the loop via voltage applied to the corresponding measurement apparatus incorporated from the teaching of De Nicolo 666..

**5. Claim 59: "wherein at least one of the different magnitudes of current flow through the loop is part of a detection protocol"**

91. De Nicolo '666 provides that at least one of the different magnitudes of current is part of a detection protocol. For example, De Nicolo '666 discloses a detection protocol by which a power supervisor can detect a device and query it to determine its maximum current requirement, and see if turning it on would exceed the power resources available to the system. As part of that protocol, different magnitudes of current can flow through the query conductor 28 and line 46. (De Nicolo '666 at 3:40 - 4:15, 5:16-25.)

92. As discussed in Section X.A.1.g, De Nicolo '666's teachings are combinable with the circuitry in De Nicolo '468's Ethernet system, and when their teachings are combined, the different magnitudes of current flowing through the loop formed over twisted pairs 128a and 128b are part of a detection protocol.

**6. Claim 69: "wherein the piece of central BaseT Ethernet equipment to distinguish the piece of BaseT Ethernet terminal equipment from at least one other piece of BaseT Ethernet terminal equipment"**

93. De Nicolo '666 discloses that power supervisor 14 can distinguish one piece of equipment from another. For instance, De Nicolo '666 discloses that the

particular electronic module 26 shown 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." (*Id*. at 3:50-57.) Based on De Nicolo '666's disclosure, a person of ordinary skill in the art would have understood that the information about the module's maximum current or power requirement distinguishes that particular module 26 from other modules connected to the backplane 12, for example, because De Nicolo '666 discloses that backplane 12 "provides electrical interconnections among a plurality of electronic modules or cards which are electrically attached to it (e.g., plugged into it)" (De Nicolo '666 at 2:30-35) and that "[e]ach modular processor card of a modular electronic system carries a component defining its maximum current or power requirements" (De Nicolo '666 at 1:55-57.)

### 7. Claim 72: "wherein the piece of BaseT Ethernet terminal equipment is a powered-off piece of BaseT Ethernet equipment"

94. I understand that in the district court, Patent Owner has argued that "powered-off Ethernet equipment" is equipment without its operating power. This is not the plain and ordinary meaning of "powered-off Ethernet equipment" for the reasons I provided in my district court declaration, dated January 21, 2006, which I

understand has been submitted as Exhibit 1029. But to the extent that Patent Owner's interpretation applies here, De Nicolo '666 discloses this limitation.

95. For example, De Nicolo '666 discloses that "[t]he supervisor will determine the current/power requirements of a processor card while the card is substantially powered off." (De Nicolo '666 at 1:60-62.) To the extent Patent Owner's interpretation of "powered-off Ethernet equipment" applies here, one of ordinary skill in the art would have understood from this disclosure that at least some circuitry in the processor card lacks operational power while the supervisor determines the current/power requirements of the card.

96. As another example, De Nicolo '666 discloses that "[p]ower circuit soft start 44 operates in a conventional manner, such as that shown in FIG. 2, to slowly turn on power available on line 46 and apply it to the power consuming circuitry of module 26 denoted 'A' while the ENABLE signal is asserted on line 42." (De Nicolo '666 at 4:11- 15.) To the extent Patent Owner's interpretation of "powered-off Ethernet terminal equipment" applies here, one of ordinary skill in the art would have understood from this disclosure that at least some circuitry in the power consuming circuitry of module 26 lacks operational power before the power circuit soft start 44 applies power to it.

97. As yet another example, De Nicolo '666 discloses that "[p]restart area 72's circuitry is powered by connection to line 74, but the bulk of the power-

consuming circuitry of module 66 remains unpowered until the prestart area 72 receives instructions from power supervisor 64 to turn on module 66." (Id. at 4:63-67.) To the extent Patent Owner's interpretation of "powered-off Ethernet equipment" applies here, one of ordinary skill in the art would have understood from this disclosure that the bulk of the power-consuming circuitry of module 66 remains unpowered and, therefore, lacks operational power until the prestart area 72 receives instructions from power supervisor 64 to turn on module 66.

### 8. Independent Claim 73

98. In my opinion, the De Nicolo references disclose every limitation of claim 73 for the following reasons.

#### a. "A BaseT Ethernet system"

99. De Nicolo '468 meets the preamble for the reasons discussed in Section X.A.1.a (claim 1 preamble).

#### b. "Ethernet cabling having at least first and second individual pairs of conductors used to carry BaseT Ethernet communication signals, the at least first and second individual pairs of conductors physically connect between a piece of BaseT Ethernet terminal equipment and a piece of central network equipment"

100. De Nicolo '468 meets this limitation for the reasons discussed in Sections X.A.1.b to X.A.1.d (claim 1 limitations).

#### c. "the piece of central network equipment having at least one DC supply"

101. De Nicolo '468 meets this limitation for the reasons discussed in

Section X.A.1.e (claim 1 limitation).

**d. "the piece of BaseT Ethernet terminal equipment having at least one path to draw different magnitudes of current flow via the at least one DC supply through a loop formed over at least one of the conductors of the first pair of conductors and at least one of the conductors of the second pair of conductors"**

102. De Nicolo '468 meets this limitation for the reasons discussed in Section X.A.1.f (claim 1 limitation).

**e. "the piece of central network equipment to detect at least two different magnitudes of current flow through the loop"**

103. De Nicolo '468 in combination with De Nicolo '666 meets this limitation for the reasons discussed in Section X.A.1.g (claim 1 limitation).

**9. Claim 106: "wherein the BaseT Ethernet terminal equipment comprises a controller coupled to the at least one path"**

104. De Nicolo '468 and De Nicolo '666 independently meet this limitation for the reasons discussed in Section X.A.2 (claim 31).

**10. Claim 112: "wherein one or more magnitudes of the current flow through the loop represent information about the piece of BaseT Ethernet terminal equipment"**

105. De Nicolo '468 in combination with De Nicolo '666 meets this limitation for the reasons discussed in Section X.A.3 (claim 37).

**11. Claim 134: "wherein at least one of the different magnitudes of current flow through the loop is part of a detection protocol"**

106. De Nicolo '468 in combination with De Nicolo '666 meets this limitation for the reasons discussed in Section X.A.5 (claim 59).

**12. Claim 142: "wherein the piece of central network equipment to distinguish the piece of BaseT Ethernet terminal equipment from at least one other piece of BaseT Ethernet terminal equipment"**

107. De Nicolo '468 in combination with De Nicolo '666 meets this limitation for the reasons discussed in Section X.A.6 (claim 69).

**13. Claim 145: "wherein the piece of BaseT Ethernet terminal equipment is a powered-off piece of BaseT Ethernet equipment"**

108. De Nicolo '468 in combination with De Nicolo '666 meets this limitation for the reasons discussed in Section X.A.7 (claim 72).

## B. The challenged claims are obvious based on the Auto-Negotiation references.

### 1. Independent Claim 1

109. In my opinion, the Auto-Negotiation references disclose every limitation of claim 1 for the following reasons.

#### a. "A BaseT Ethernet system"

110. Patel meets the preamble. For instance, in Figure 1, provided below, Patel provides a network that includes network intermediate device 100 and end stations 107-0 – 107-n-1. (Patel at 3:67-4:2, 4:21-23.) End stations 107-0 and 107-1 support 10BASE-T technology. (*Id.* at 4:25-26.) Network intermediate device 100 and end stations 107-0 and 107-1 constitute a BaseT Ethernet system.

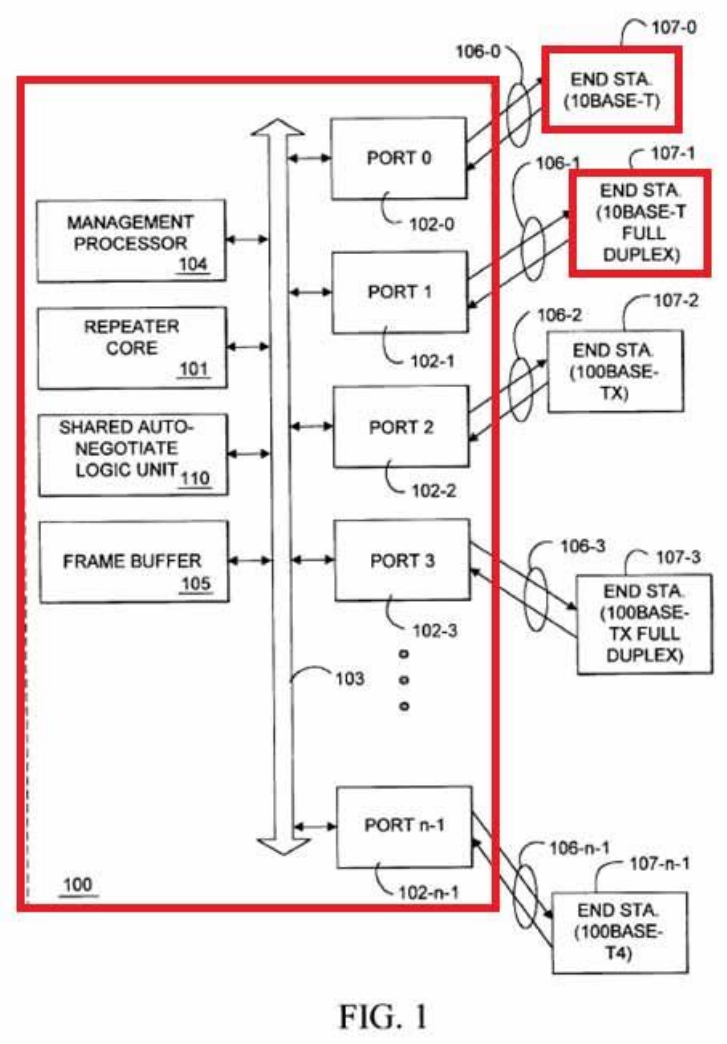



FIG. 1

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

**b. "a piece of central BaseT Ethernet equipment"**

111. Patel and DP83840 Datasheet independently meet this limitation. For instance, in FIG. 1, provided below, Patel discloses central BaseT equipment as network intermediate device 100. (Patel at 3:67-4:2.) Network intermediate device 100 is a piece of central BaseT Ethernet equipment because it consists of a repeater, switch, or bridge that allows device 100 to interconnect end stations 107-0 to 107-n-1, at least some of which support 10BASE-T technology (*e.g.*, end

stations 107-0 and 107-1). (*Id.* at 4:2-8, 4:26-31.) A person of ordinary skill in the art would have understood that all of the connected end stations could be 10BASE-T devices. Indeed, for intermediate device 100 to operate as a repeater, all of the end stations must operate at the same data rate, even if some of those devices are capable of higher data rates.

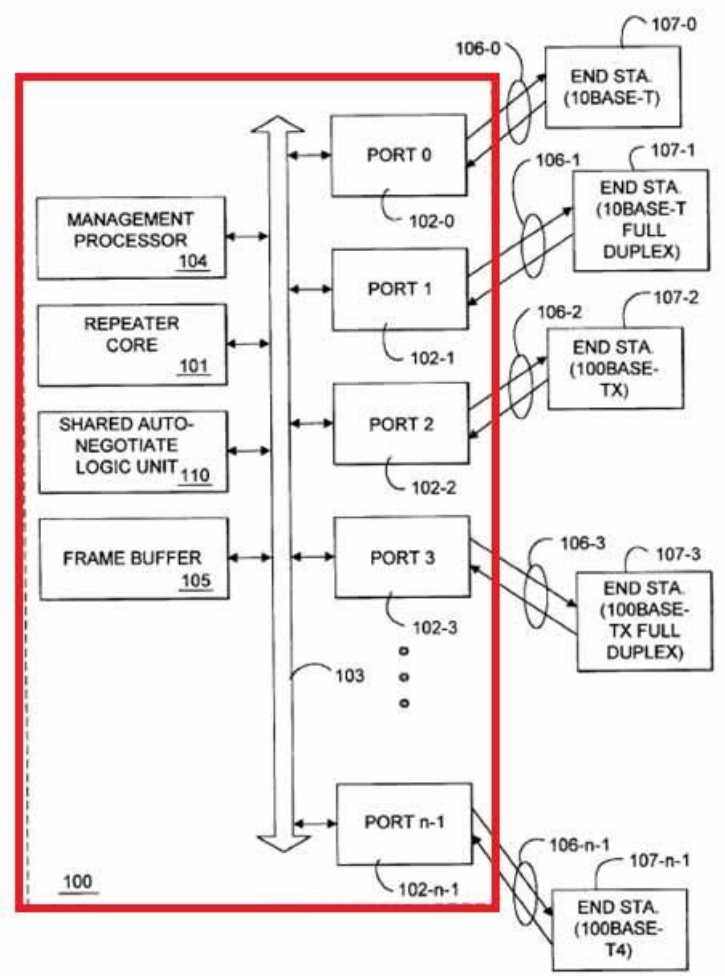



FIG. 1

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

112. DP83840 Datasheet also meets this limitation. The Datasheet refers to

the DP83840 as a "Physical Layer device for Ethernet 10BASE-T and 100BASE-X." (DP83840 Datasheet at 1, 4.) The Datasheet further references a repeater and provides a diagram of a repeater clock distribution system that incorporates multiple DP83840 chips. (*Id.* at 21.) A person of ordinary skill in the art would have understood that a repeater is a piece of central BaseT Ethernet equipment. (*See* 802.3-1993 at § 9.)

**c. "a piece of BaseT Ethernet terminal equipment"**

113. Patel and DP83840 Datasheet independently meet this limitation. For instance, in Figure 1, provided below, Patel discloses end station 107-0, which "supports 10BASE-T technology." (Patel at 4:25-26.) As another example, "[e]nd station 107-1 supports 10BASE-T full duplex technology." (*Id.* at 4:27-28.) End station 107-0 and end station 107-1 are independent examples of pieces of BaseT Ethernet terminal equipment.

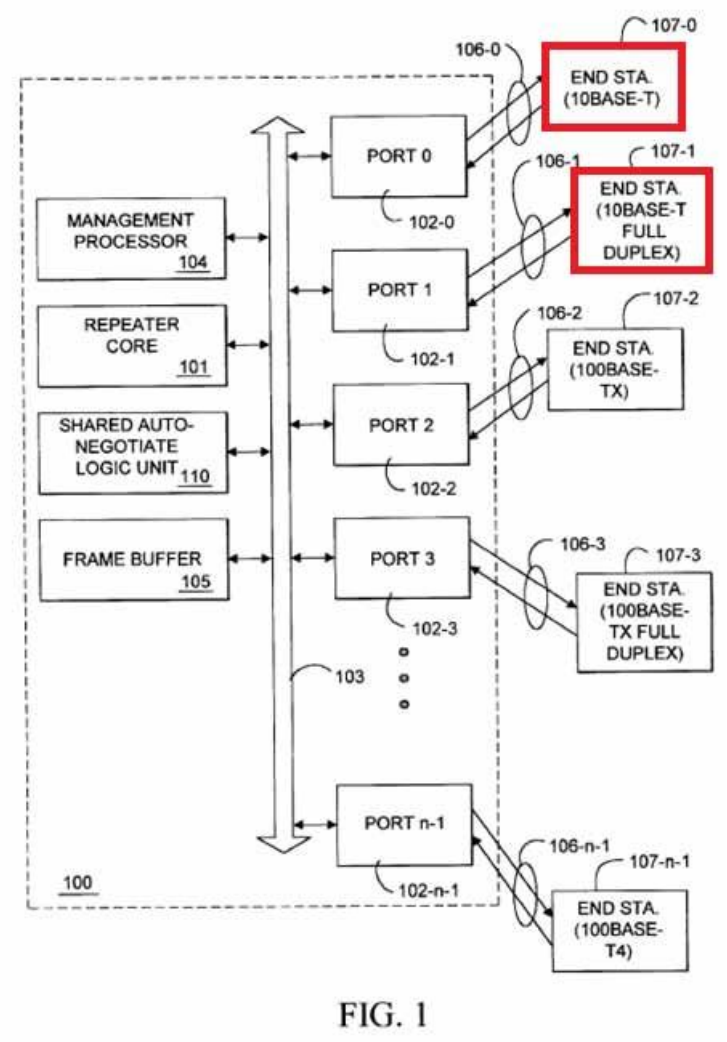



FIG. 1

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

114. DP83840 Datasheet also meets this limitation. For instance, DP83840 Datasheet refers to the DP83840 as a "Physical Layer device for Ethernet 10BASE-T and 100BASE-X." (DP83840 Datasheet at 1, 4.) The Datasheet further provides a diagram of an Ethernet node that incorporates the DP83840 chip.

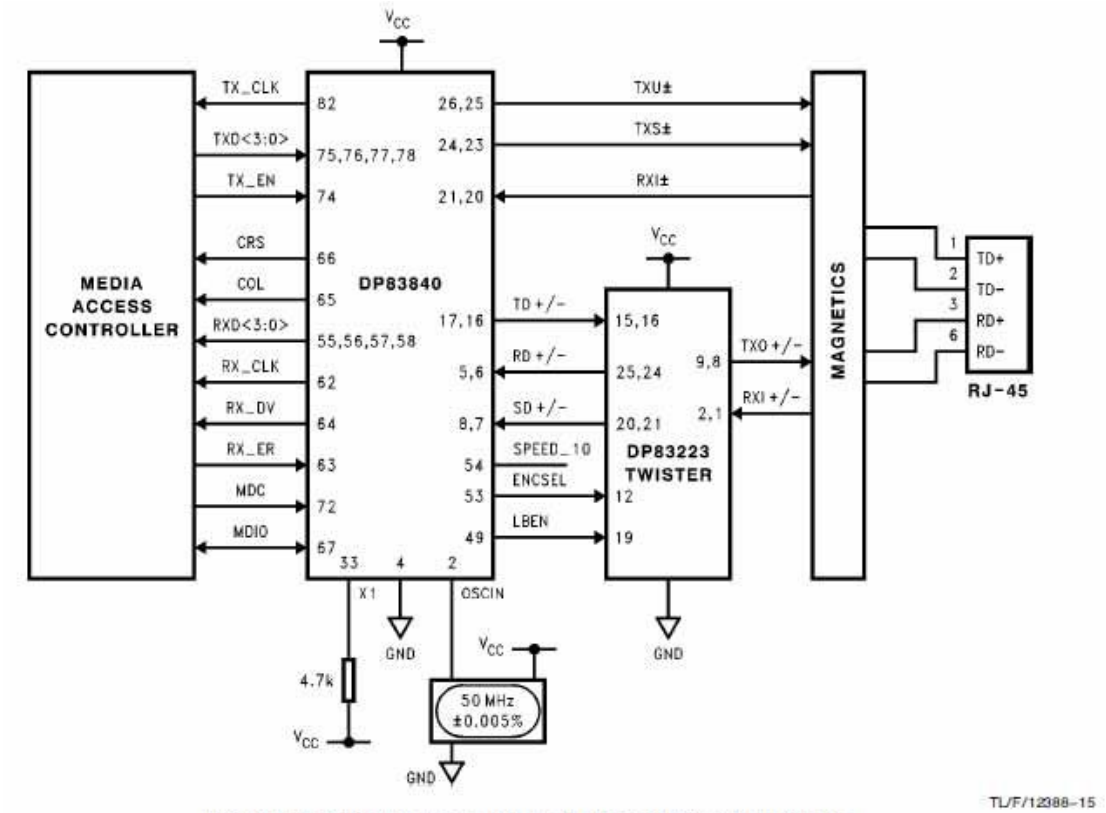



**FIGURE 15. Typical Implementation of a 10/100 Mb/s Ethernet Node**

(DP83840 Datasheet at 42 (see FIG. 15).)

**d. "data signaling pairs of conductors comprising first and second pairs used to carry BaseT Ethernet communication signals between the piece of central BaseT Ethernet equipment and the piece of BaseT Ethernet terminal equipment, the first and second pairs physically connect between the piece of BaseT Ethernet terminal equipment and the piece of central BaseT Ethernet equipment"**

115. Patel meets this limitation. For instance, in Figure 1, provided below, Patel shows that port 0 102-0 of network intermediate device 100 is connected to end station 107-0 via links 106-0. (Patel at 4:9-14.) "[E]nd station 107-0 supports 10 BASE-T technology." (*Id.* at 4:25-26.) Patel also discloses that the 10BASE-T

standard "specifies a 10 megabit per second carrier sense multiple access with collision detection (CSMA/CD) LAN over two pairs of twisted pair telephone wire." (*Id.* at 1:23-26.) Therefore, based on Patel's disclosure, a person of ordinary skill in the art would have understood that links 106-0 are twisted pairs of conductors. The skilled artisan would have also known this independently from his own knowledge of the IEEE 802.3 standard.

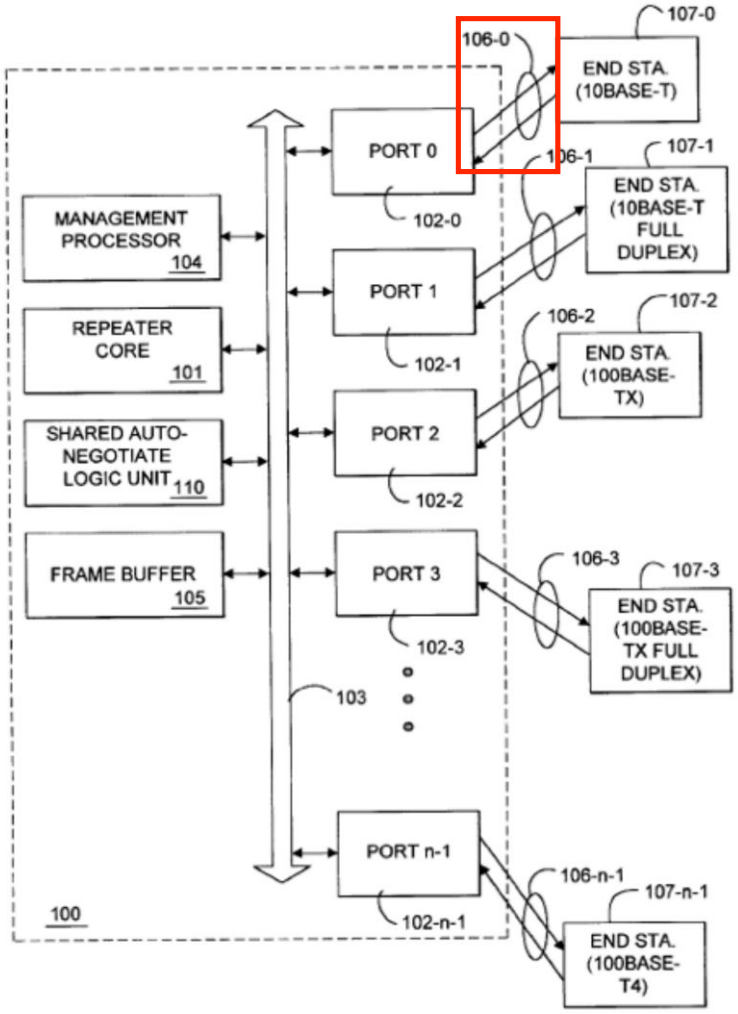



FIG. 1

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

116. DP83840 Datasheet also meets this limitation. For instance, DP83840 Datasheet provides that the DP83840 chip supports 10BASE-T. (DP83840 Datasheet at 1.) A person of ordinary skill in the art would have understood that by supporting 10BASE-T the DP83840 chip also supports the Category 3 cable, the specifications of which are described in IEEE 802.3-1993. (*See* IEEE 802.3-1993 at § 7.) The skilled artisan would have also understood that this cable would be physically connected between two pieces of Ethernet equipment such as the repeater that the DP83840 Datasheet references on page 21 and the Ethernet node that the Datasheet references on page 42. Each of those pieces of equipment would have an RJ-45 connector for physically connecting the equipment to the cable. For instance, Figure 15, provided below, shows that the Ethernet node has an RJ-45 connector. DP83840 Datasheet provides that TXU- and TXU+ are unshielded twisted pair outputs and states that "[t]his differential output pair is the filtered 10BASE-T transmit data for UTP [Unshielded Twisted Pair] cable." (DP3840 Datasheet at 7.) The Datasheet also provides that RXI- and RXI+ are twisted pair receive inputs and states that "[t]hese are the differential 10BASE-T receive data inputs for either STP [Shielded Twisted Pair] or UTP [Unshielded Twisted Pair]." (*Id.*)

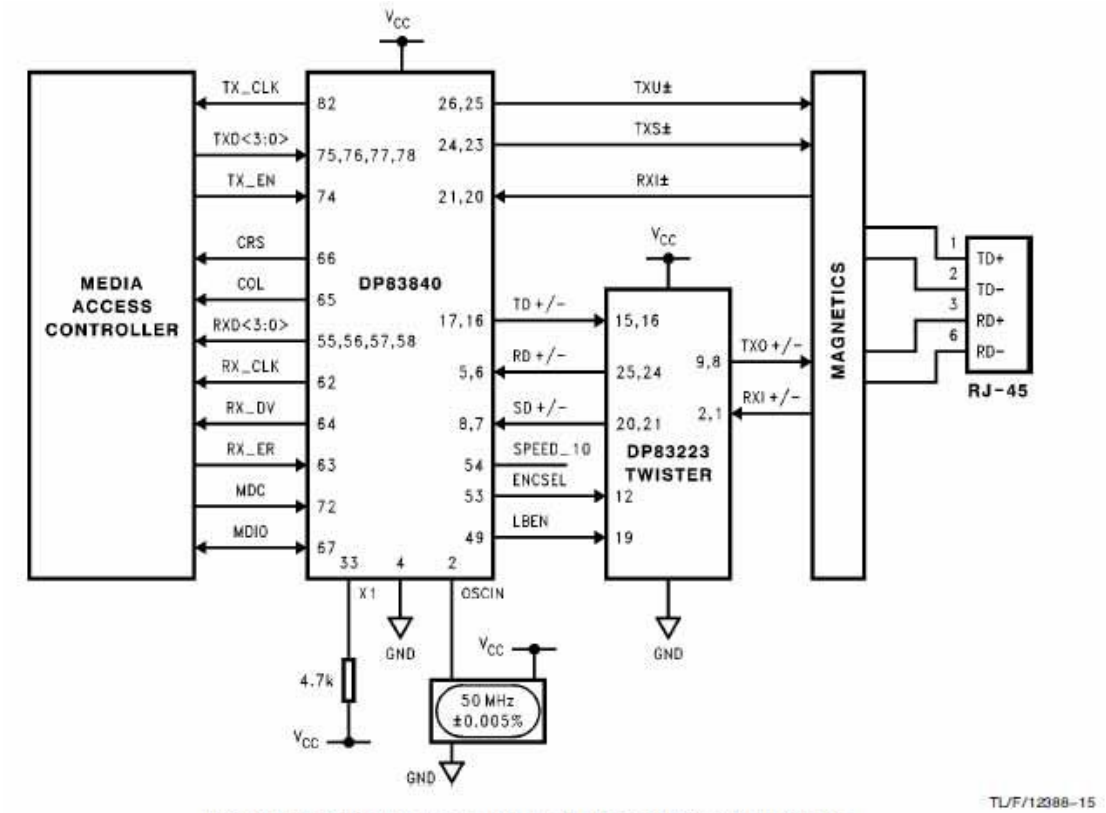



**FIGURE 15. Typical Implementation of a 10/100 Mb/s Ethernet Node**

(*Id.* at 42 (see FIG. 15).)

**e. "the piece of central BaseT Ethernet equipment having at least one DC supply"**

117. Patel provides a DC supply. For instance, in Figure 1, network intermediate device 100 comprises repeater core 101, management processor 104, and shared Auto-Negotiation logic unit 110. A person of ordinary skill in the art would have understood the need for at least one DC supply to power repeater core 101, management processor 104, and shared Auto-Negotiation logic unit 110, as well as any circuitry within the individual Ethernet Ports 1 and 2.

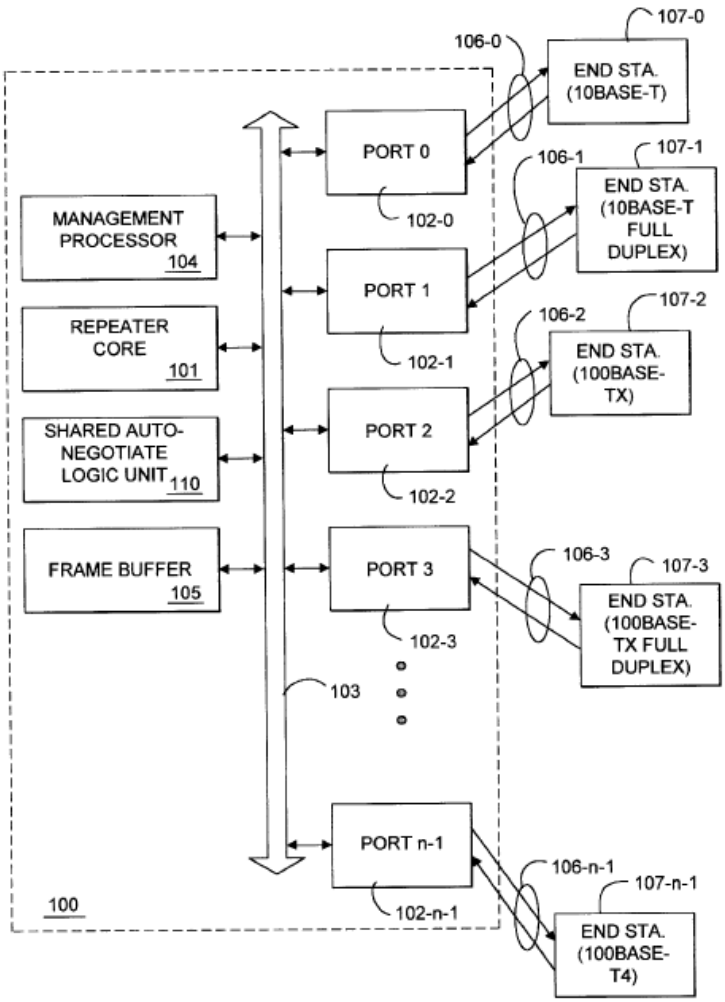



FIG. 1

(Patel at FIG. 1.)

118. DP83840 Datasheet also provides a DC supply. For instance, in Figure 11, provided below, DP83840 Datasheet shows a diagram of a repeater clock distribution system that incorporates multiple DP83840 chips. (DP83840 Datasheet at 21.) DP83840 Datasheet provides that Vcc for the DP83840 chip should be in the range from 4.75 to 5.25 V. (*Id.* at 46.) Because each DP83840 chip in the repeater requires a DC voltage in this range, there must necessarily be at

least one DC supply in the repeater providing the voltage.

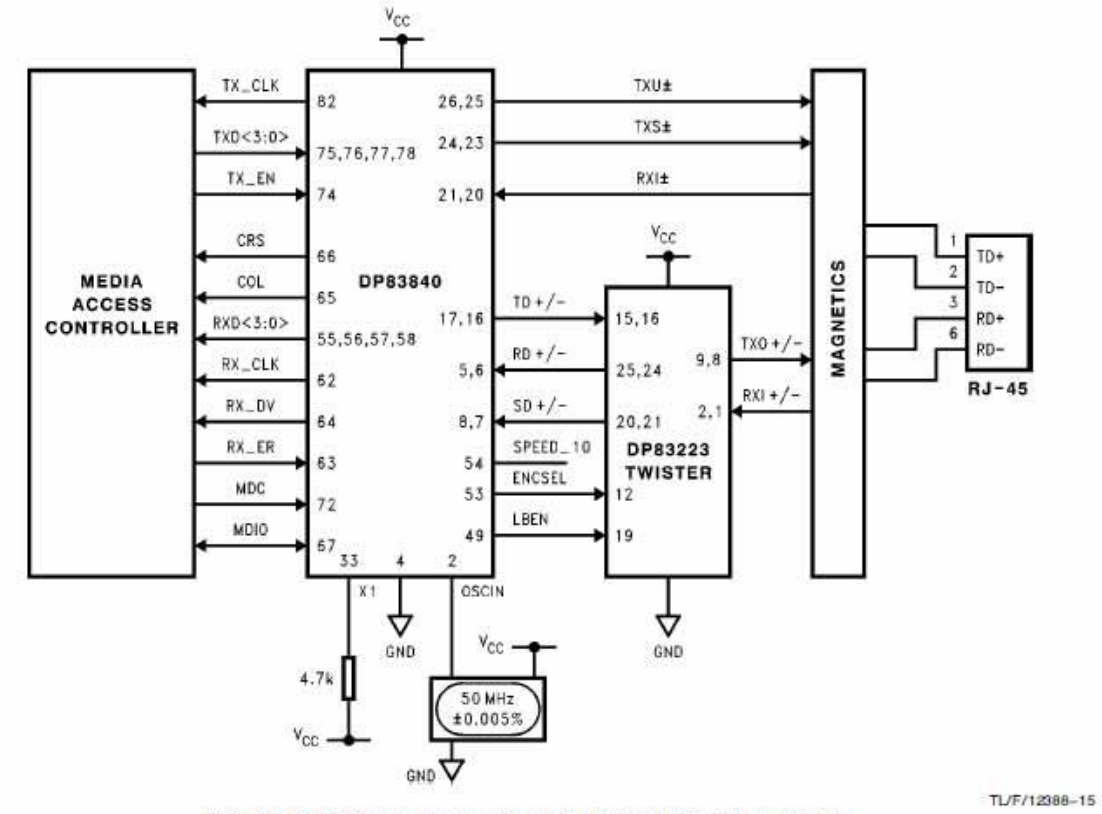



**FIGURE 15. Typical Implementation of a 10/100 Mb/s Ethernet Node**

(*Id.* at 42.)

**f. "the piece of BaseT Ethernet terminal equipment having at least one path to draw different magnitudes of current flow from the at least one DC supply through a loop formed over at least one of the conductors of the first pair and at least one of the conductors of the second pair"**

119. Patel, its incorporated-by-reference disclosure of IEEE 802.3u-1995 Clause 28, and DP83840 Datasheet meet this limitation. For instance, in Figure 1, Patel provides that port 0 102-0 of network intermediate device 100 is connected to 10BASE-T end station 107-0 via links 106-0, which comprises two twisted pairs of

conductors. (Patel at 1:23-26, 4:10-14.)

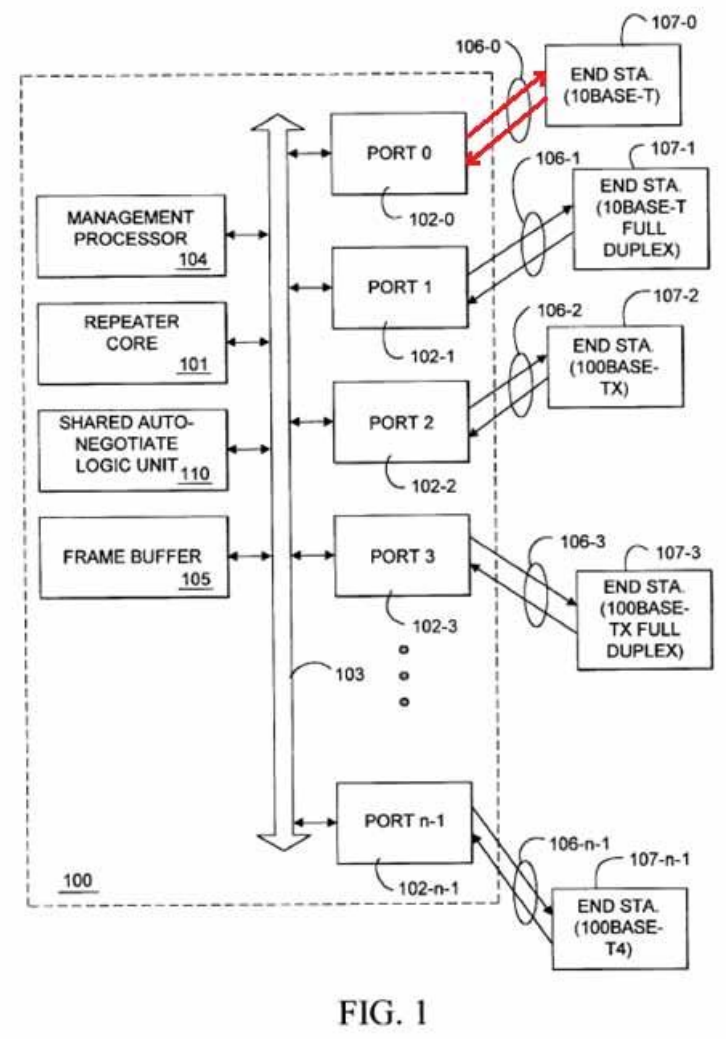
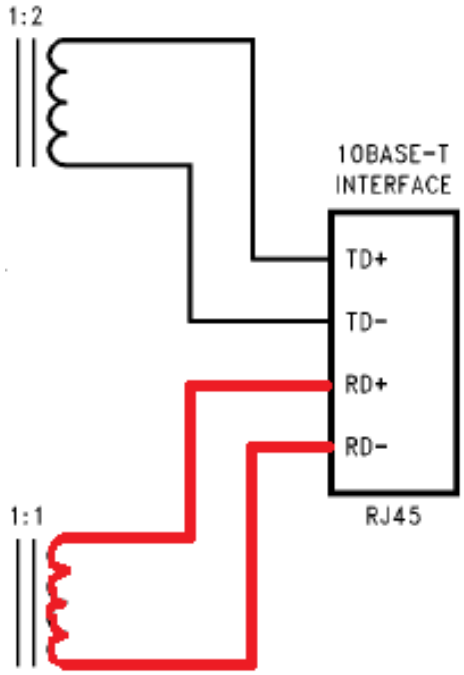



FIG. 1

(*Id.* at FIG. 1 (annotations added).) A loop is formed over at least one conductor of the first pair and at least one conductor of the second pair. Using these pairs of conductors, intermediate device 100 and 10BASE-T end station 107-0 perform Auto-Negotiation. (*Id.* at 4:32-5:12.)

120. DP83840 Datasheet provides that the piece of Ethernet terminal equipment has a path to draw different magnitudes of current. For example, as

shown by the annotation below, there is a path coupled across pins RD+ and RD- of the RJ-45 connector.

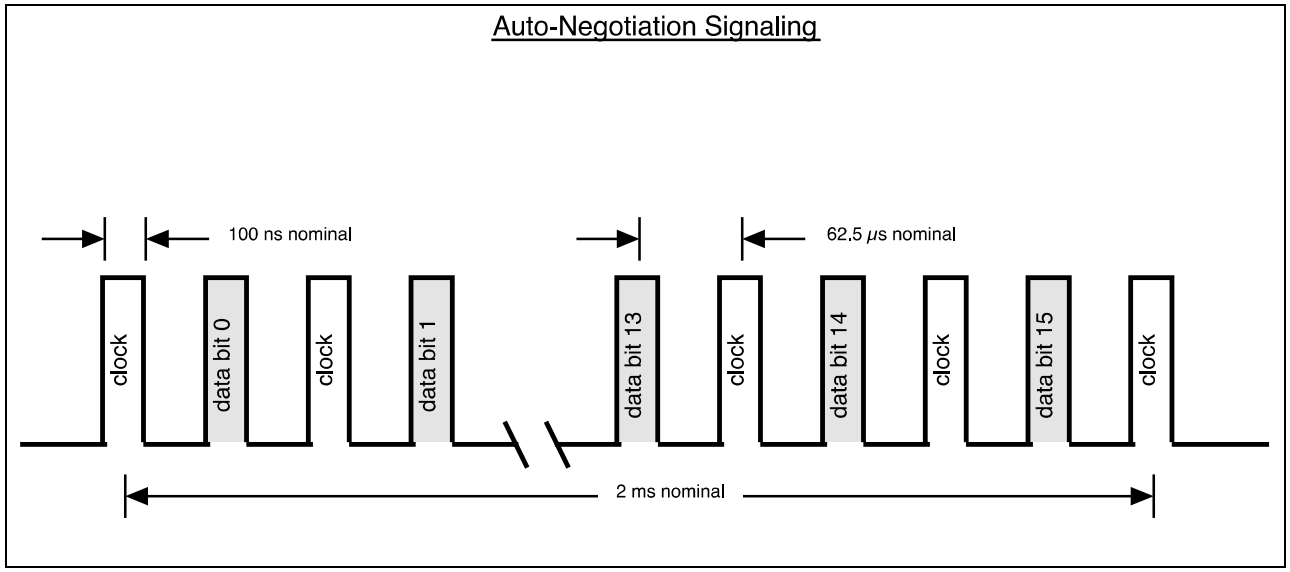



(DP83840 Data Sheet at 24 (annotations added).) As discussed in Section X.B.2, this 10BASE-T interface and path is combinable into end station 107-0 in FIG. 1 of Patel.

121. The path draws different magnitudes of current when network intermediate device 100 performs, or attempts to perform, Auto-Negotiation with end station 107-0. In particular, Clause 28 of IEEE 802.3u-1995 (which Patel incorporates by reference) explains that Auto-Negotiation provides a "means to exchange information between two devices that share a link segment and to automatically configure both devices to take maximum advantage of their abilities." (IEEE 802.3u-1995 at 235.) To achieve Auto-Negotiation, each capable

device "issues FLP Bursts at power up, on command from management, or due to user interaction." (*Id.*)

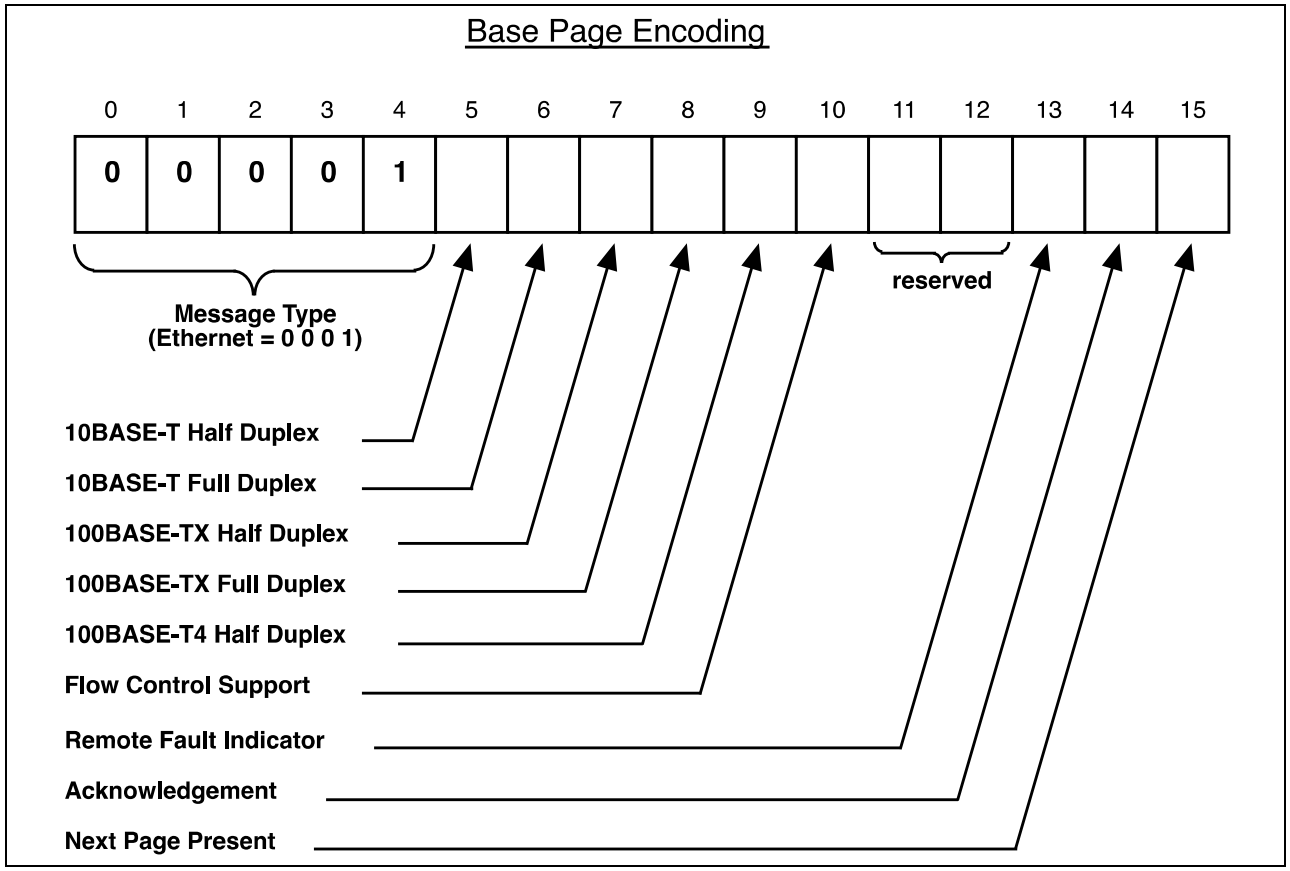
122. The FLP Bursts have different magnitudes of current. An FLP Burst has 33 pulse positions. (*Id.* at 239.) The odd-numbered pulse positions are clock positions that carry clock information, while the even-numbered positions are data positions that carry data. (*Id.*) Every clock position contains a link pulse. (*Id.*) A given data position either contains a link pulse (representing logic "1") or lacks a link pulse (representing logic "0"). (IEEE 802.3u-1995 at 239.) This scheme is depicted in the figure below:




Gigabit Ethernet at 137 (Fig. 8-3)

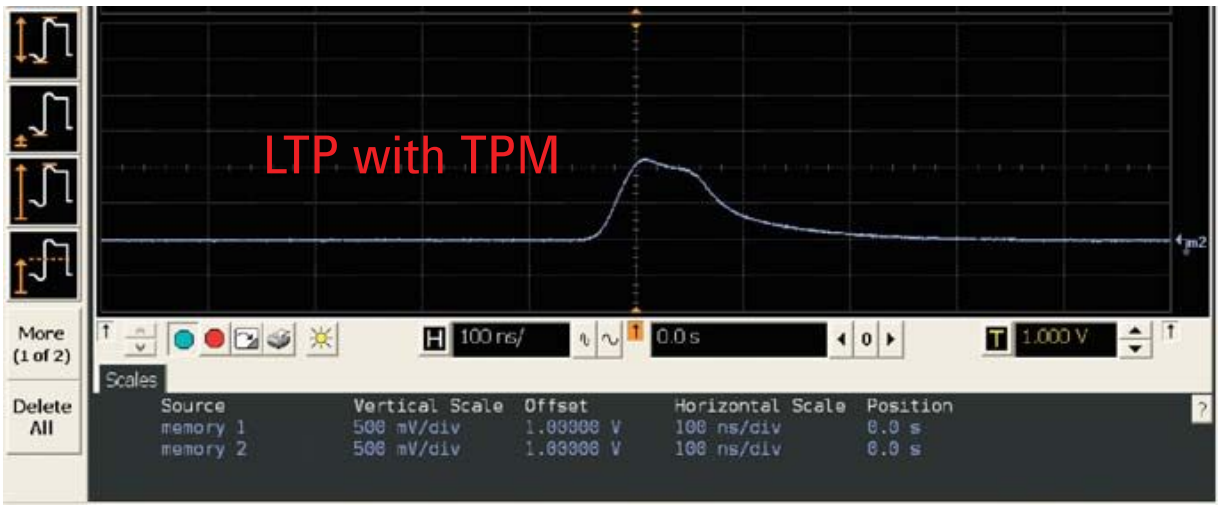
123. FLP Bursts have link pulses in some positions and no link pulses in other positions. For example, an FLP Burst can have some logic "1" data positions and other logic "0" data positions, depending on the information in the FLP Burst's

Technology Ability field, depicted below. (IEEE 802.3u-1995 at 241, 344.) As another example, if a first FLP Burst's Toggle field has a value of "1," the next FLP Burst's Toggle field will have a value of "0." (*Id.* at 247.)




Gigabit Ethernet at 136 (Fig. 8-2).

124. A link pulse is a positive pulse, which has different magnitudes of current, due both to its controlled rise and fall times, and the action of a coupling transformer. (IEEE 802.3-1993 at 259.) For example, the following illustration shows a waveform of a link pulse (also called a link test pulse (LTP)) of a device that is connected to the twisted-pair model (TPM) specified in IEEE 802.3.




(Agilent Application Note at 3.)

125. As can be seen from the figure, in an FLP Burst, any given position containing a link pulse has different magnitudes of current. As a result, when 10BASE-T end station 107-0 in Figure 1 of Patel receives an FLP Burst from the intermediate device 100, 10BASE-T end station 107-0 draws different magnitudes of current via the path annotated above.

**g. "the piece of central BaseT Ethernet equipment to detect at least two different magnitudes of the current flow through the loop and to control the application of at least one electrical condition to at least two of the conductors"**

126. Patel and its incorporated-by-reference disclosure of IEEE 802.3u-1995 Clause 28 meet this limitation. As discussed in the previous section, the network intermediate device 100 performs (or attempts to perform) Auto-Negotiation with end station 107-0. In that process, as explained by IEEE 802.3u-1995, end station 107-0 (if it is capable of Auto-Negotiation) transmits an FLP

Burst to network intermediate device 100. (IEEE 802.3u-1995 at 235.) If end station 107-0 is a legacy 10BASE-T device, it will send individual link pulses rather than FLP Bursts. As explained in the previous section, the link pulse in an FLP Burst has different magnitudes of current. (IEEE 802.3-1993 at 259.) For the same reason, an individual link pulse also has different magnitudes of current, since an FLP burst is simply a series of link test pulses with specific timing characteristics. In this way, regardless of whether end station 107-0 transmits an FLP Burst or individual link pulses, network intermediate device 100 detects at least two different magnitudes of current through the loop formed over the twisted pairs connecting intermediate device 100 to end station 107-0.

127. Intermediate device 100 transmits an FLP Burst and/or individual link pulses to end station 107-0. (IEEE 802.3u-1995 at 235, 238.) In doing so, intermediate device 100 applies voltage (*e.g.*, an electrical condition) to the transmit pair of conductors.

### 2. Claim 31: "wherein the BaseT Ethernet terminal equipment comprises a controller coupled to the at least one path"

128. DP83840 Datasheet meets this limitation. DP83840 Datasheet discloses that the Ethernet terminal equipment includes a controller. For instance, in Figure 15, DP83840 Datasheet shows a Media Access Controller, which is coupled to the path created by the conductors. This controller forms Ethernet frames and receives Ethernet frames from the link.

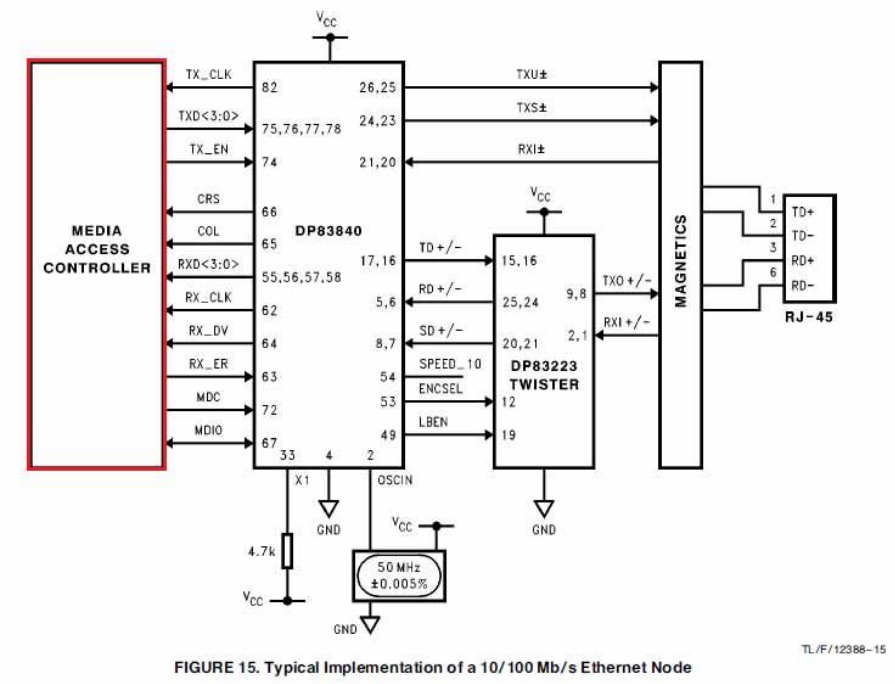



FIGURE 15. Typical Implementation of a 10/100 Mb/s Ethernet Node

(DP83840 Datasheet at 42 (annotation added).)

129. In addition, DP83840 Datasheet provides that "[s]oftware can determine which mode has been configured by Auto-Negotiation." (*Id.* at 26.) This implies that the Ethernet node contains a microprocessor, i.e., a controller that runs this software.

### 3. Claim 37: "wherein one or more magnitudes of the current flow through the loop represent information about the piece of BaseT Ethernet terminal equipment"

130. Patel and its incorporated-by-reference disclosure of IEEE 802.3u-1995 Clause 28 meet this limitation. For instance, IEEE 802.3u-1995 provides that an FLP Burst contains a Technology Ability field, whose magnitudes represent information about which technologies a device supports. (IEEE 802.3u-1995 at 241.) The Technology Ability field is an eight-bit field in the Auto-Negotiation

base page that is used to indicate the ability of the station, such as support for 10BASE-T, 100BASE-TX, 100BASE-T4, as well as full duplex capabilities. (*Id.* at 17, 241, 344 (showing bit assignments). In addition, an FLP Burst that a device sends to its link partner can identify the sending device as being capable of Auto-Negotiation. (*Id.* at 243.)

#### 4. Claim 58: "wherein the piece of central BaseT Ethernet equipment to detect current flow through the loop via voltage"

131. In Patel, the detection of FLP bursts and link pulses (current pulses) is done by measuring the voltage generated by that current into the 100 ohm termination impedance of the twisted pair line. That is, a voltage comparator/detector detects the FLP current flow.

132. In addition, network intermediate device 100 must have a power source that applies voltage to its circuitry before it can perform Auto-Negotiation. As a result, when intermediate device 100 detects current through the loop (*e.g.*, by receiving an FLP Burst), intermediate device 100 does so through the use of voltage from its internal power source.

#### 5. Claim 59: "wherein at least one of the different magnitudes of current flow through the loop is part of a detection protocol"

133. Patel and its incorporated-by-reference disclosure of IEEE 802.3u-1995 Clause 28 meet this limitation. For instance, IEEE 802.3u-1995 Clause 28

provides that FLP bursts are transmitted as part of the Auto-Negotiation detection protocol. (IEEE 802.3u-1995 at 235.) As part of this protocol, intermediate device 100 and 10BASE-T end station 107-0, shown in Figure 1 of Patel, send each other FLP bursts and/or link pulses.

**6. Claim 69: "wherein the piece of central BaseT Ethernet equipment to distinguish the piece of BaseT Ethernet terminal equipment from at least one other piece of BaseT Ethernet terminal equipment"**

134. Patel and its incorporated-by-reference disclosure of IEEE 802.3u-1995 meet this limitation. IEEE 802.3u-1995 provides that an FLP Burst contains a Technology Ability field. As a result, when intermediate network device 100 performs Auto-Negotiation with end stations 107-0 and 107-1, device 100 receives FLP bursts from those end stations. Each of those FLP bursts contains a Technology Ability field that allows the intermediate network device 100 to distinguish the capabilities of end station 107-0 from end station 107-1.

**7. Claim 72: "wherein the piece of BaseT Ethernet terminal equipment is a powered-off piece of BaseT Ethernet equipment"**

135. I understand that in the district court, Patent Owner has argued that "powered-off Ethernet terminal equipment" is equipment without its operating power. This is not the plain and ordinary meaning of "powered-off Ethernet terminal equipment" for the reasons I provided in my district court declaration, dated January 21, 2006, which I understand has been submitted as Exhibit 1029.

But to the extent that Patent Owner's interpretation applies here, Patel discloses this limitation.

136. Patel discloses an Ethernet system in which network equipment 100 performs Auto-Negotiation with end stations 107-0 to 107-n-1. (Patel at 4:32-5:12.) Auto-Negotiation is an initial procedure by which two connected devices choose transmission parameters, such as data rate. This procedure takes place before the devices begin transmitting Ethernet data to each other. A skilled artisan would have understood that circuitry in the end station responsible for Auto-Negotiation could be powered on while other circuitry not necessary for Auto-Negotiation could be powered off or in a low-power state. In fact, this would likely be the case, since it is entirely possible that Auto-Negotiation might determine that there is no link partner (i.e., no central network device connected to an end station). There would be no need to provide power to any of the network interface circuitry (other than that used for Auto-Negotiation) until it was determined that this was an active, usable link. This would have been a routine design choice for the skilled artisan. One reason to implement the circuitry in this manner is to save power.

### 8. Independent Claim 73

137. In my opinion, the Auto-Negotiation references disclose every limitation of claim 73 for the following reasons.

**a. "A BaseT Ethernet system"**

138. Patel meet the preamble for the reasons discussed in Section X.B.1.a (claim 1 preamble).

**b. "Ethernet cabling having at least first and second individual pairs of conductors used to carry BaseT Ethernet communication signals, the at least first and second individual pairs of conductors physically connect between a piece of BaseT Ethernet terminal equipment and a piece of central network equipment"**

139. Patel and DP83840 Datasheet independently meet this limitation for the reasons discussed in Section X.B.1.b to X.B.1.d (claim 1 limitations).

**c. "the piece of central network equipment having at least one DC supply"**

140. Patel and DP83840 Datasheet independently meet this limitation for the reasons discussed in Section X.B.1.e (claim 1 limitation).

**d. "the piece of BaseT Ethernet terminal equipment having at least one path to draw different magnitudes of current flow via the at least one DC supply through a loop formed over at least one of the conductors of the first pair of conductors and at least one of the conductors of the second pair of conductors"**

141. Patel and DP83840 Datasheet meet this limitation for the reasons discussed in Section X.B.1.f (claim 1 limitation).

**e. "the piece of central network equipment to detect at least two different magnitudes of current flow through the loop"**

142. Patel meets this limitation for the reasons discussed in Section

X.B.1.g (claim 1 limitation).

**9. Claim 106: "wherein the BaseT Ethernet terminal equipment comprises a controller coupled to the at least one path"**

143. DP83840 Datasheet meets this limitation for the reasons discussed in Section X.B.2 (claim 31).

**10. Claim 112: "wherein one or more magnitudes of the current flow through the loop represent information about the piece of BaseT Ethernet terminal equipment"**

144. Patel meets this limitation for the reasons discussed in Section X.B.3 (claim 37).

**11. Claim 134: "wherein at least one of the different magnitudes of current flow through the loop is part of a detection protocol"**

145. Patel meets this limitation for the reasons discussed in Section X.B.5 (claim 59).

**12. Claim 142: "wherein the piece of central network equipment to distinguish the piece of BaseT Ethernet terminal equipment from at least one other piece of BaseT Ethernet terminal equipment"**

146. Patel meets this limitation for the reasons discussed in Section X.B.6 (claim 69).

**13. Claim 145: "wherein the piece of BaseT Ethernet terminal equipment is a powered-off piece of BaseT Ethernet equipment"**

147. Patel meets this limitation for the reasons discussed in Section X.B.7

(claim 72).

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: February 18, 2016

Rich Seifert