



CISCO SYSTEMS, INC. Petitioner,
v.
ORCKIT CORPORATION., Patent Owner

Case No. IPR2023-00401
U.S. Patent No. 7,545,740

Calmann J. Clements
Haynes and Boone, LLP

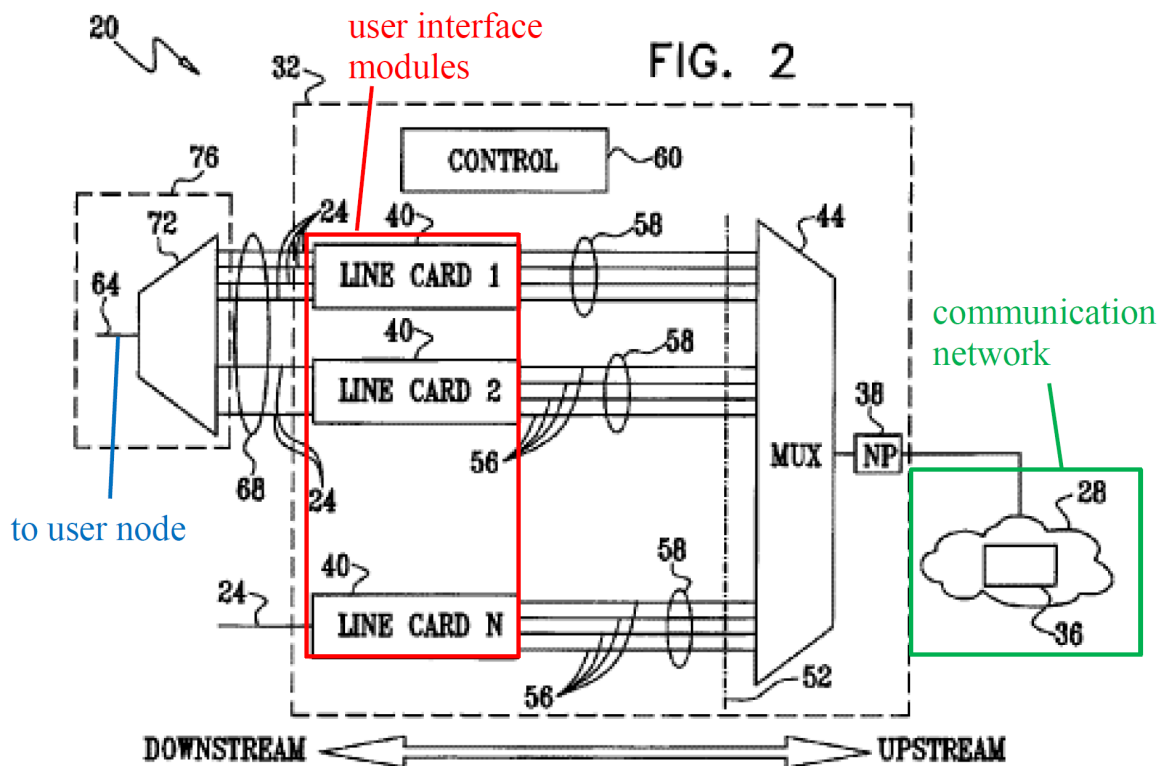
June 12, 2024



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DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

The '740 Patent

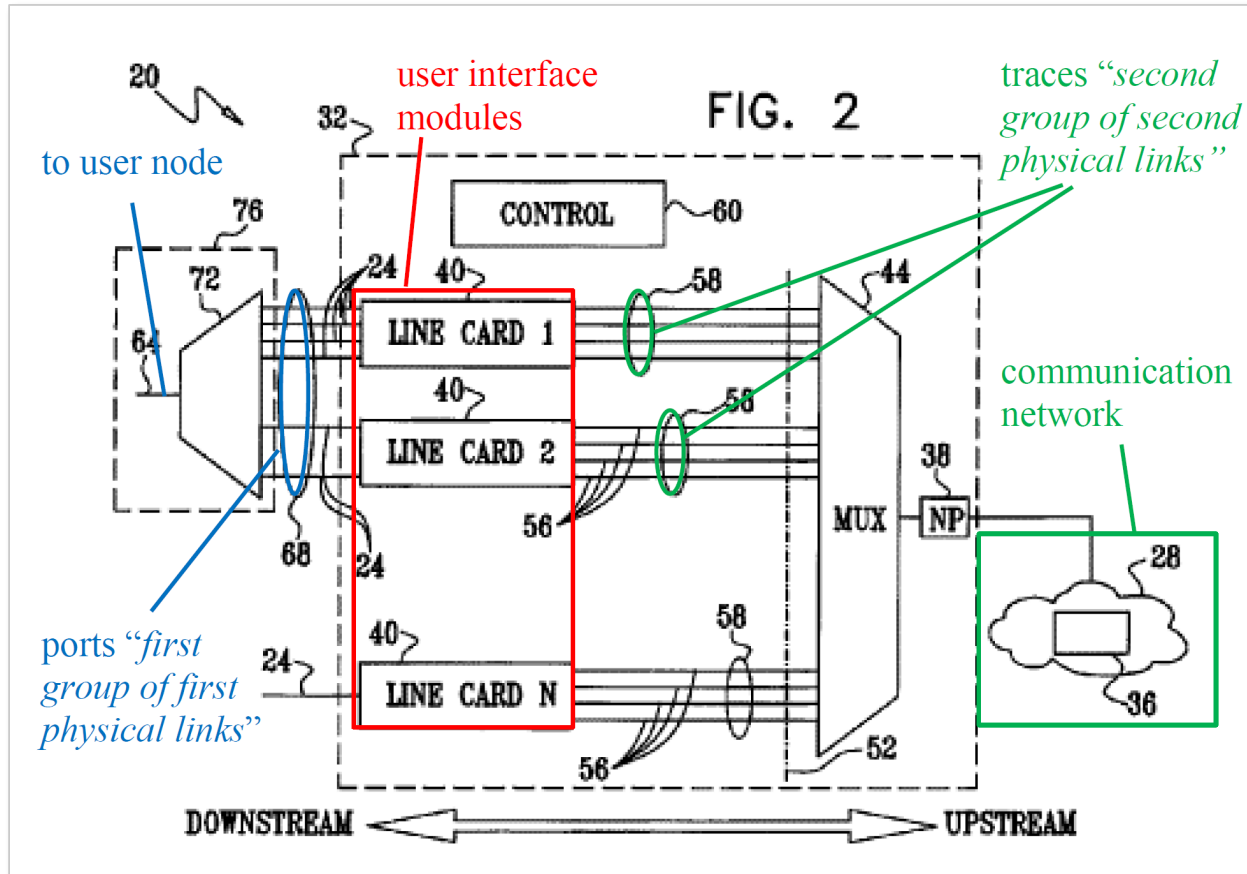


Ex.1001, Fig. 2; Petition, 14.

1. A method for communication, comprising:
 - coupling a network node to one or more interface modules using a first group of first physical links arranged in parallel, at least one of said first physical links being a bi-directional link operative to communicate in both an upstream direction and a downstream direction;
 - coupling each of the one or more interface modules to a communication network using a second group of second physical links arranged in parallel, at least one of said second physical links being a bi-directional link operative to communicate in both an upstream direction and a downstream direction;
 - receiving a data frame having frame attributes sent between the communication network and the network node;
 - selecting, in a single computation based on at least one of the frame attributes, a first physical link out of the first group and a second physical link out of the second group; and
 - sending the data frame over the selected first and second physical links,said sending comprising communicating along at least one of said bi-directional links.

Ex.1001, Claim 1.

The '740 Patent

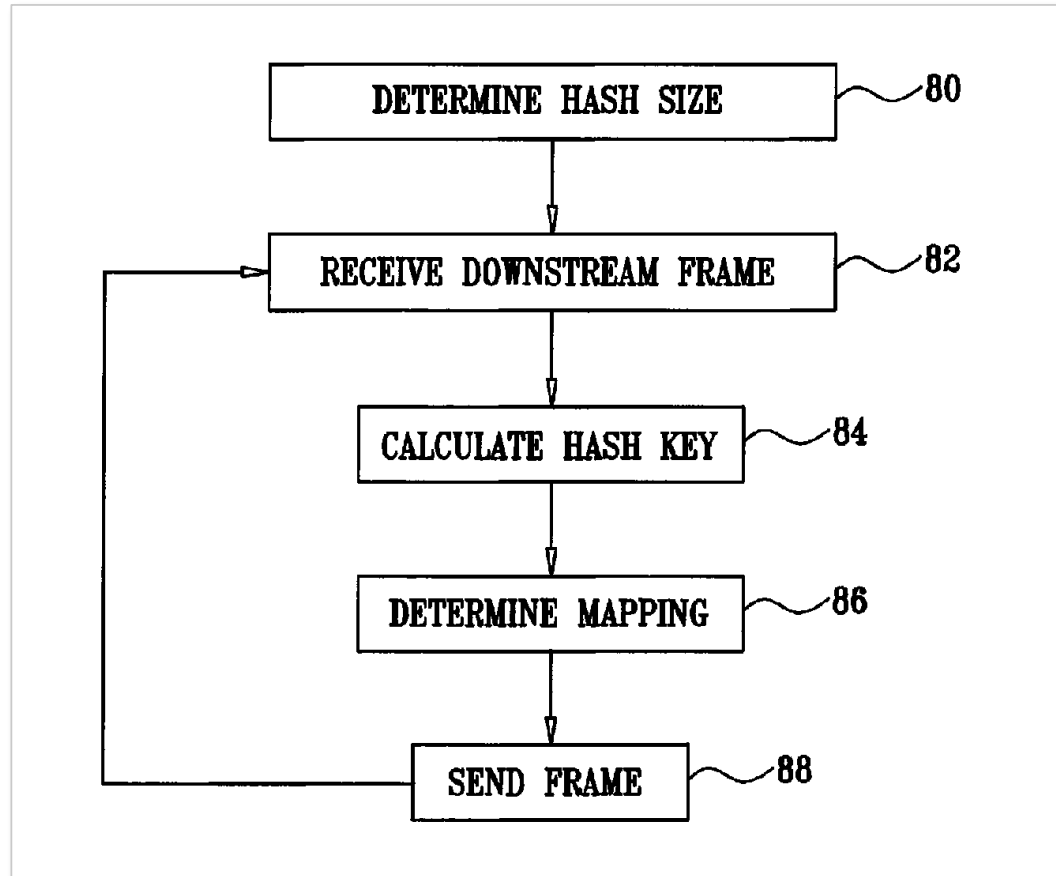


Ex.1001, Fig. 2; Petition, 15.

1. A method for communication, comprising:
coupling a network node to one or more interface modules using a first group of first physical links arranged in parallel, at least one of said first physical links being a bi-directional link operative to communicate in both an upstream direction and a downstream direction;
coupling each of the one or more interface modules to a communication network using a second group of second physical links arranged in parallel, at least one of said second physical links being a bi-directional link operative to communicate in both an upstream direction and a downstream direction;
receiving a data frame having frame attributes sent between the communication network and the network node;
selecting, in a single computation based on at least one of the frame attributes, a first physical link out of the first group and a second physical link out of the second group; and
sending the data frame over the selected first and second physical links,
said sending comprising communicating along at least one of said bi-directional links.

Ex.1001, Claim 1.

The '740 Patent

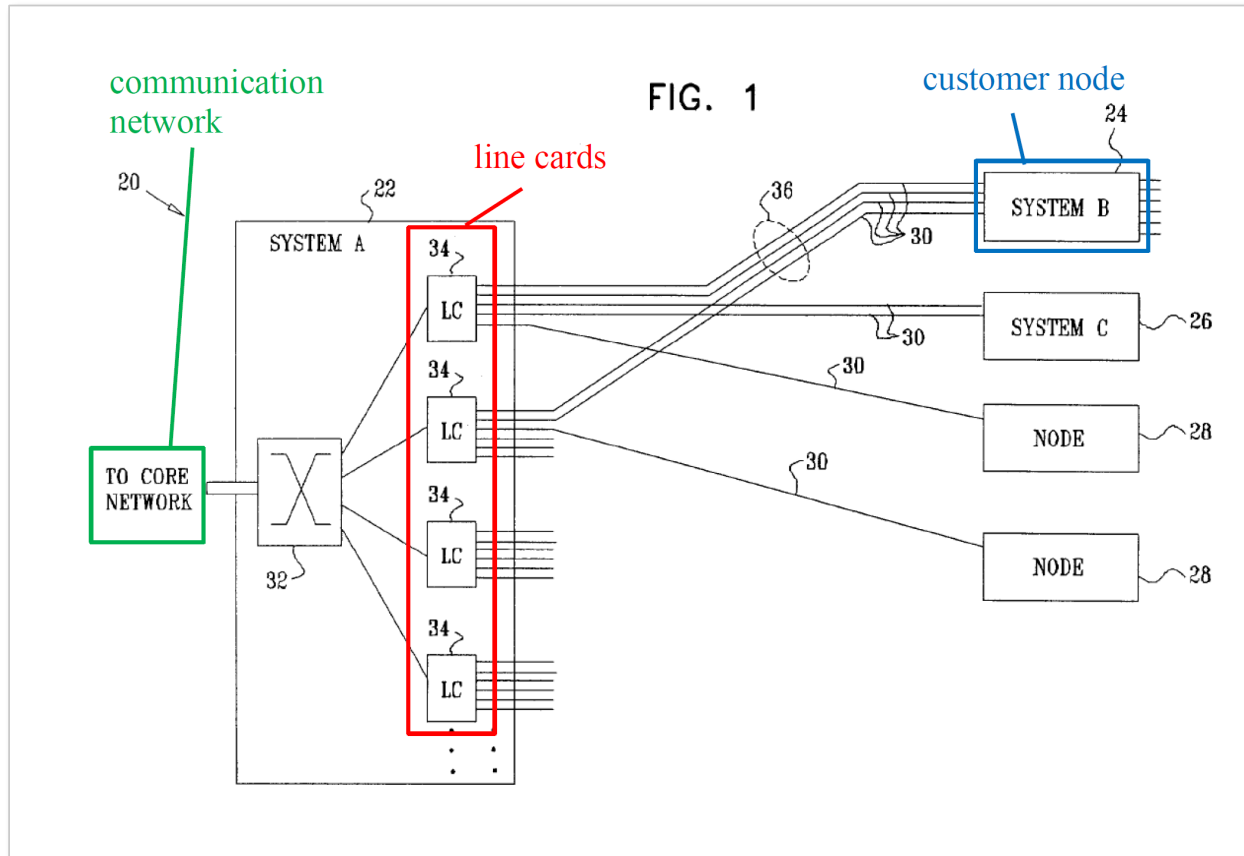


Ex.1001, Fig. 4; Petition, 16.

1. A method for communication, comprising:
coupling a network node to one or more interface modules using a first group of first physical links arranged in parallel, at least one of said first physical links being a bi-directional link operative to communicate in both an upstream direction and a downstream direction;
coupling each of the one or more interface modules to a communication network using a second group of second physical links arranged in parallel, at least one of said second physical links being a bi-directional link operative to communicate in both an upstream direction and a downstream direction;
receiving a data frame having frame attributes sent between the communication network and the network node;
selecting, in a single computation based on at least one of the frame attributes, a first physical link out of the first group and a second physical link out of the second group; and
sending the data frame over the selected first and second physical links,
said sending comprising communicating along at least one of said bi-directional links.

Ex.1001, Claim 1.

The Prior Art: Bruckman

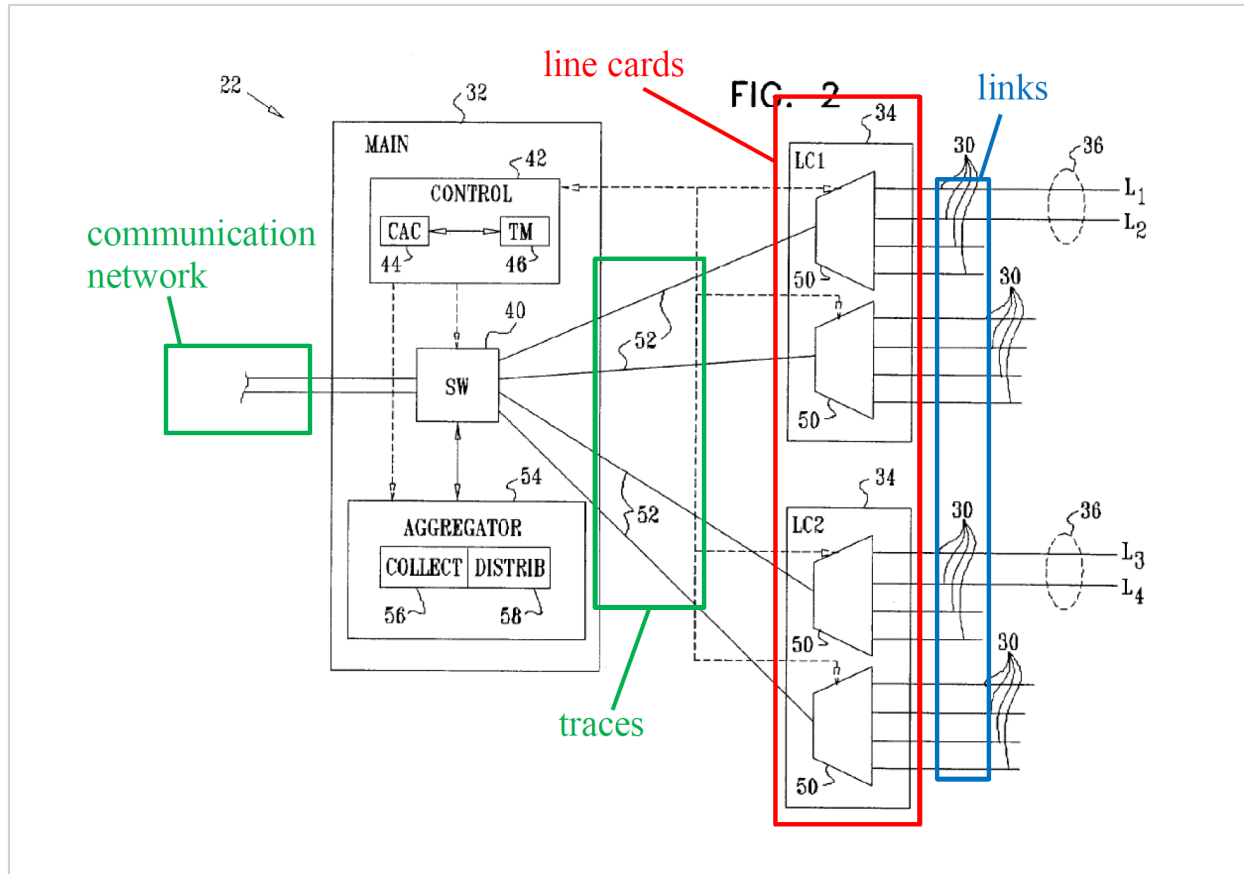


Ex.1005 (Bruckman), Fig. 1; Petition, 24.

1. A method for communication, comprising:
 coupling a network node to one or more interface modules using a first group of first physical links arranged in parallel, at least one of said first physical links being a bi-directional link operative to communicate in both an upstream direction and a downstream direction;
 coupling each of the one or more interface modules to a communication network using a second group of second physical links arranged in parallel, at least one of said second physical links being a bi-directional link operative to communicate in both an upstream direction and a downstream direction;
 receiving a data frame having frame attributes sent between the communication network and the network node;
 selecting, in a single computation based on at least one of the frame attributes, a first physical link out of the first group and a second physical link out of the second group; and
 sending the data frame over the selected first and second physical links,
 said sending comprising communicating along at least one of said bi-directional links.

Ex.1001, Claim 1.

The Prior Art: Bruckman



Ex.1005 (Bruckman), Fig. 2; Petition, 25.

1. A method for communication, comprising:
coupling a network node to one or more interface modules using a first group of first physical links arranged in parallel, at least one of said first physical links being a bi-directional link operative to communicate in both an upstream direction and a downstream direction;
coupling each of the one or more interface modules to a communication network using a second group of second physical links arranged in parallel, at least one of said second physical links being a bi-directional link operative to communicate in both an upstream direction and a downstream direction;
receiving a data frame having frame attributes sent between the communication network and the network node;
selecting, in a single computation based on at least one of the frame attributes, a first physical link out of the first group and a second physical link out of the second group; and
sending the data frame over the selected first and second physical links,
said sending comprising communicating along at least one of said bi-directional links.

Ex.1001, Claim 1.

The Prior Art: Bruckman

```
A unsigned short hash(unsigned char *hdr, short lagSize)
{
    short i;
    unsigned short hash=178; // initialization value
    for (i=0; i<4; i++)      // hdr is 4 bytes length
B     hash = (hash<<2) + hash + (*hdr>>(i*8) & 0xFF);
C     return (hash % lagSize)
}
```

Ex.1005 (Bruckman), Fig. 4; Petition, 26.

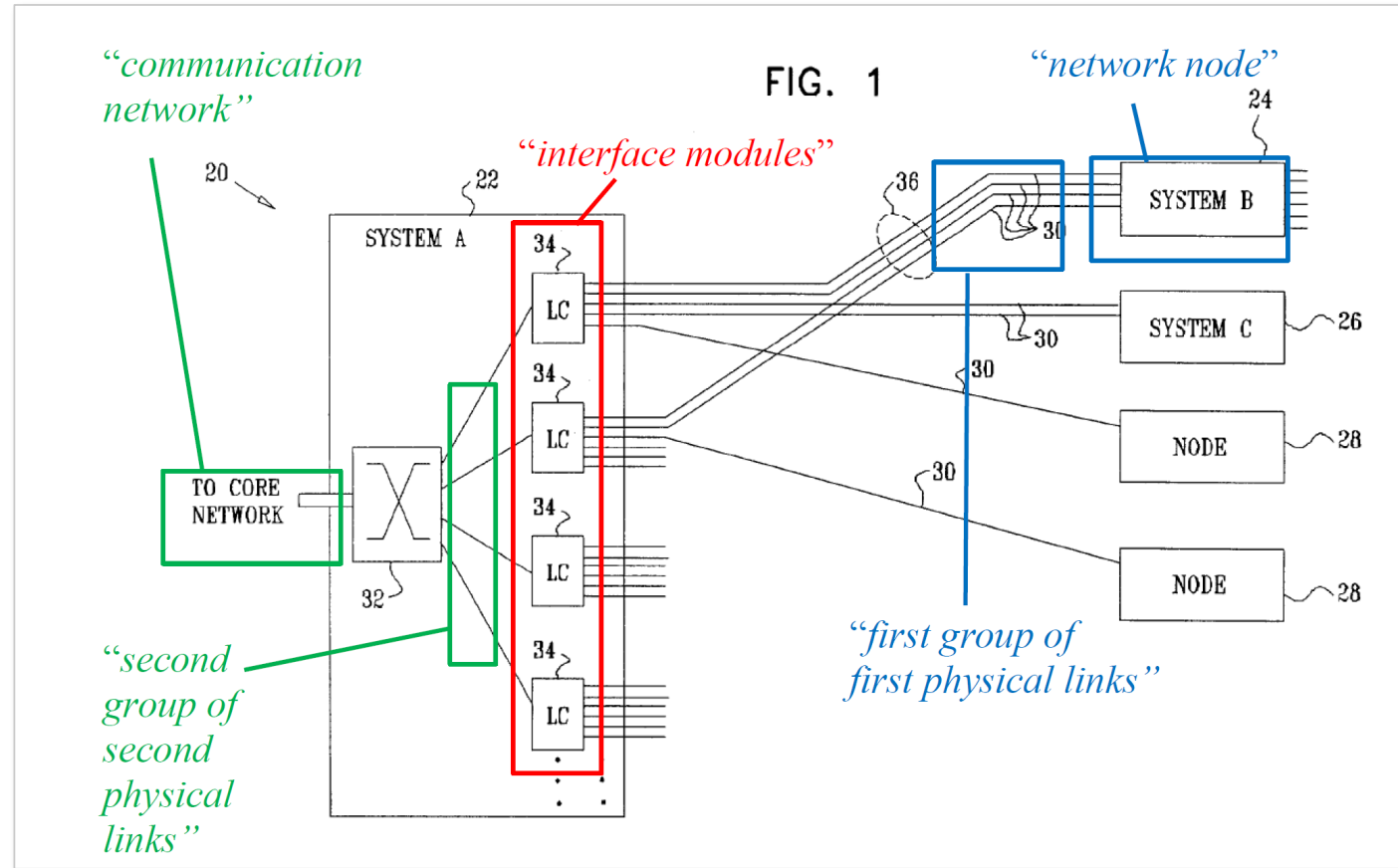
1. A method for communication, comprising:
coupling a network node to one or more interface modules using a first group of first physical links arranged in parallel, at least one of said first physical links being a bi-directional link operative to communicate in both an upstream direction and a downstream direction;
coupling each of the one or more interface modules to a communication network using a second group of second physical links arranged in parallel, at least one of said second physical links being a bi-directional link operative to communicate in both an upstream direction and a downstream direction;
receiving a data frame having frame attributes sent between the communication network and the network node;
selecting, in a single computation based on at least one of the frame attributes, a first physical link out of the first group and a second physical link out of the second group; and
sending the data frame over the selected first and second physical links,
said sending comprising communicating along at least one of said bi-directional links.

Ex.1001, Claim 1.

Key Points

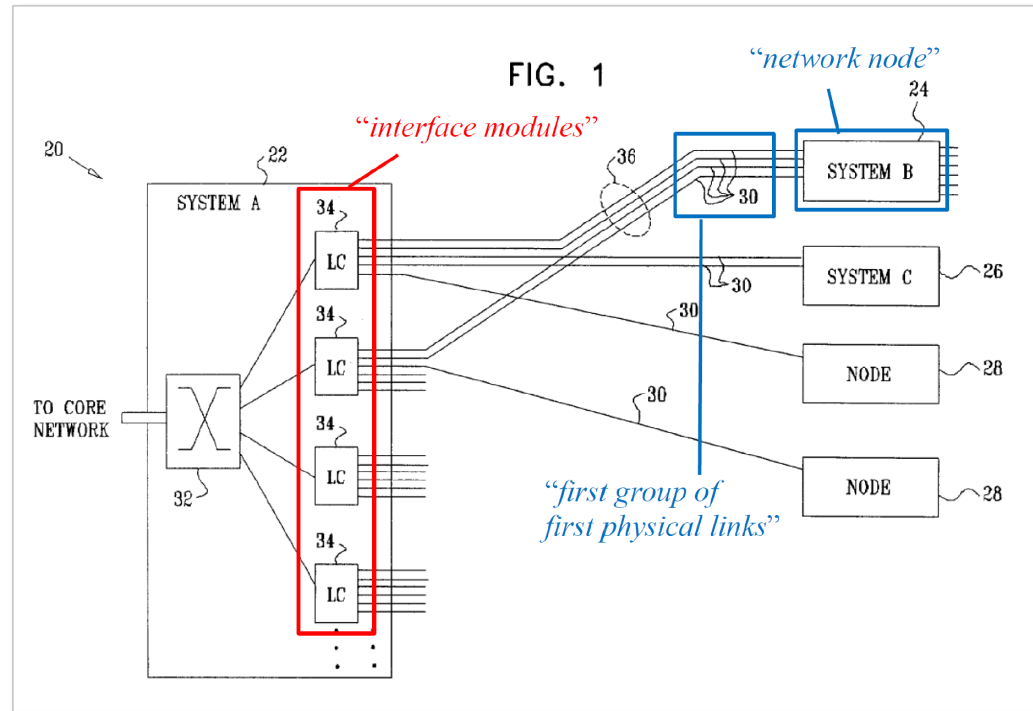
1. Bruckman teaches “*selecting ... a first physical link out of the first group and a second physical link out of the second group.*”
2. Bruckman teaches links “*arranged in parallel.*”
3. Bruckman teaches “*selecting ... in a single computation.*”

Bruckman's single hash results in two selections.



Ex.1005 (Bruckman), Fig. 1; Petition, 39.

Bruckman's single hash results in two selections.

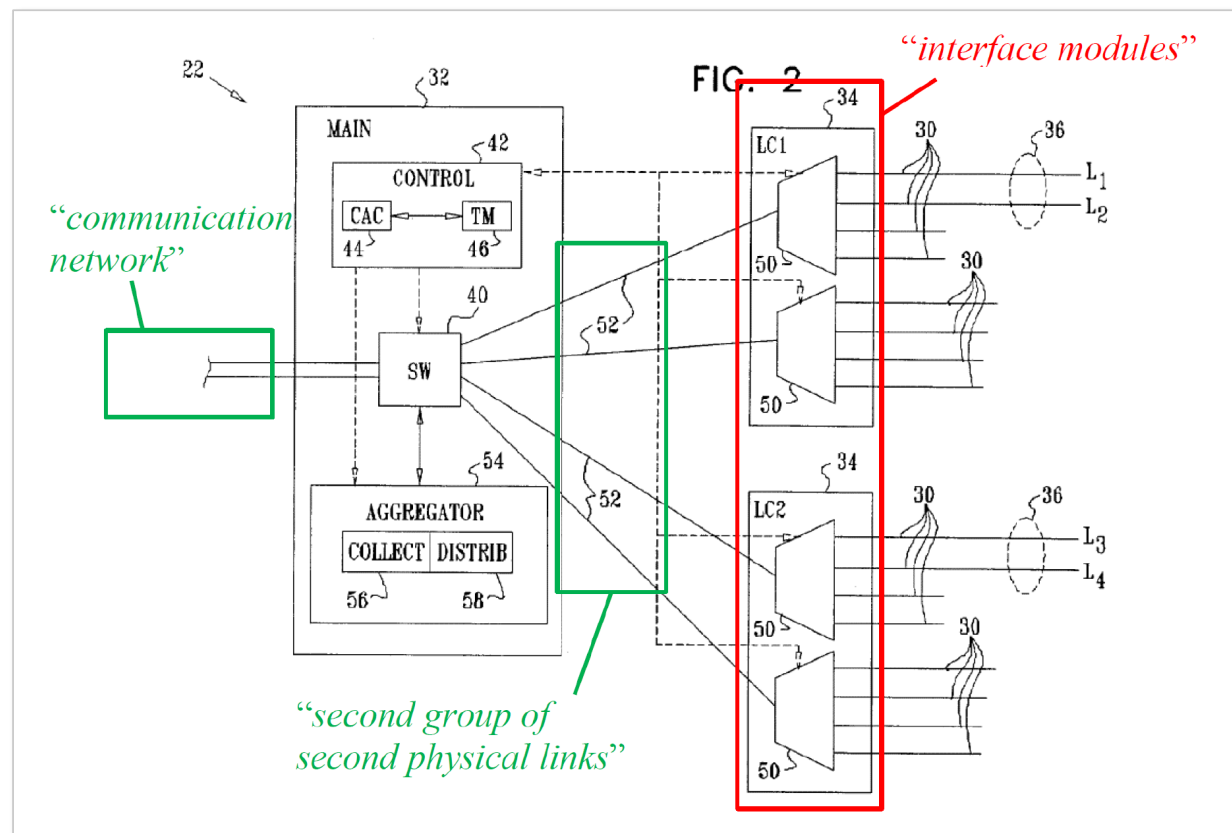


Ex.1005 (Bruckman), Fig. 1; Petition, 35.

[0058] Aggregator 54 comprises a distributor 58, which is responsible for distributing data frames arriving from the network among links 30 in aggregation group 36. Typically, distributor 58 determines the link over which to send each frame based on information in the frame header, as described in the Background of the Invention. Preferably, distributor 58 applies a predetermined hash function to the header information, wherein the hash function satisfies the following criteria:

Ex.1005 (Bruckman), [0058]; Petition, 41.

Bruckman's single hash results in two selections.



Ex.1005 (Bruckman), Fig. 2; Petition, 37.

Patent Owner's proposed claim construction is improper.

Claim 1 recites:

selecting, in a single computation based on at least one of the frame attributes, a first physical link out of the first group and a second physical link out of the second group; and

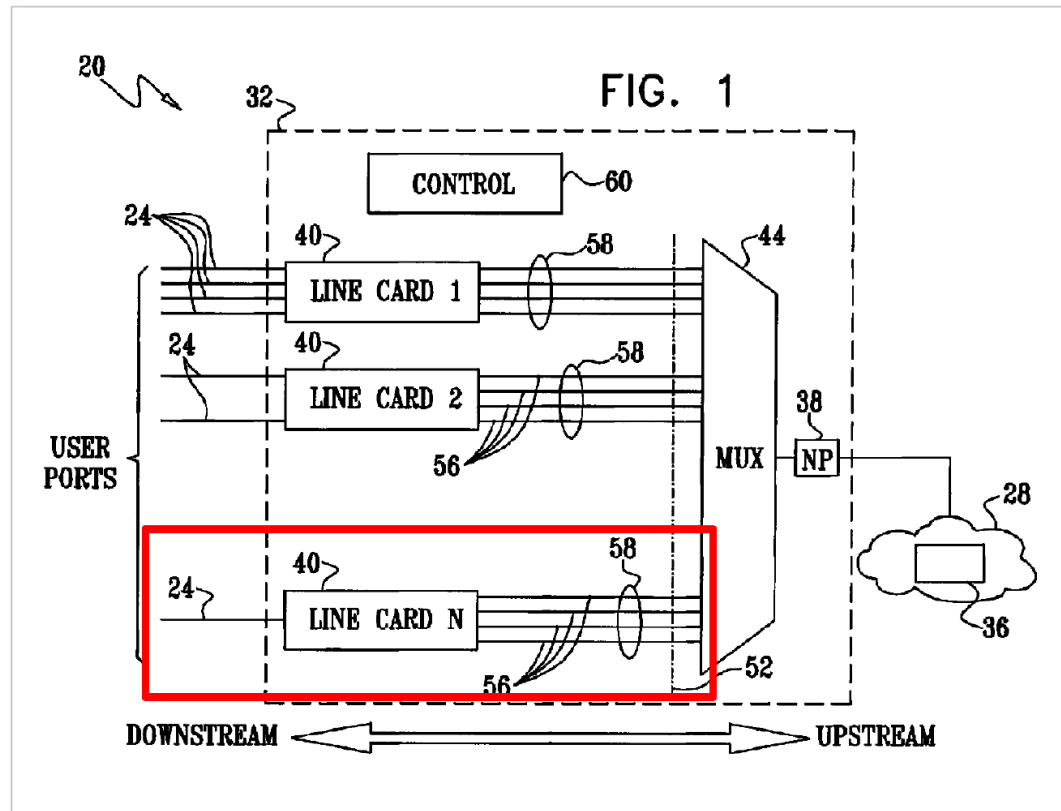
Ex.1001, Claim 1.

Patent Owner seeks to add the following structural limitation:

wherein the first physical link is not fixedly assigned to the second physical link.

Patent Owner Response, 23.

Patent Owner's proposed claim construction is improper.



Ex.1001, Fig. 1; Petitioner Reply, 11.

1. A method for communication, comprising:
coupling a network node to one or more interface modules using a first group of first physical links arranged in parallel, at least one of said first physical links being a **bi-directional link** operative to communicate in both an upstream direction and a downstream direction;
coupling each of the one or more interface modules to a communication network using a second group of second physical links arranged in parallel, at least one of said second physical links being a **bi-directional link** operative to communicate in both an upstream direction and a downstream direction;
receiving a data frame having frame attributes sent between the communication network and the network node;
selecting, in a single computation based on at least one of the frame attributes, a first physical link out of the first group and a second physical link out of the second group; and
sending the data frame over the selected first and second physical links,
said sending comprising communicating along at least one of said bi-directional links.

Ex.1001, Claim 1.

Patent Owner's proposed claim construction is improper.

Unlike some known network element configurations, in which each user port is fixedly assigned to a specific backplane trace, the load balancing operation **in embodiments of the present invention** enables statistical multiplexing of the frames, in which there is no direct relationship or connection between user ports and backplane traces.

Ex.1001, 1:66-2:4; Petitioner Reply, 12.

- **The claims do not recite an embodiment in which there is no direct connection between user ports and traces.**
- **The cited passage contains no clear disavowal of claim scope.**
- **There is no expression of manifest exclusion.**

Petitioner Reply, 11-12.



Key Points

1. Bruckman teaches “*selecting ... a first physical link out of the first group and a second physical link out of the second group.*”
2. Bruckman teaches links “*arranged in parallel.*”
3. Bruckman teaches “*selecting ... in a single computation.*”

Bruckman's traces are “*arranged in parallel.*”

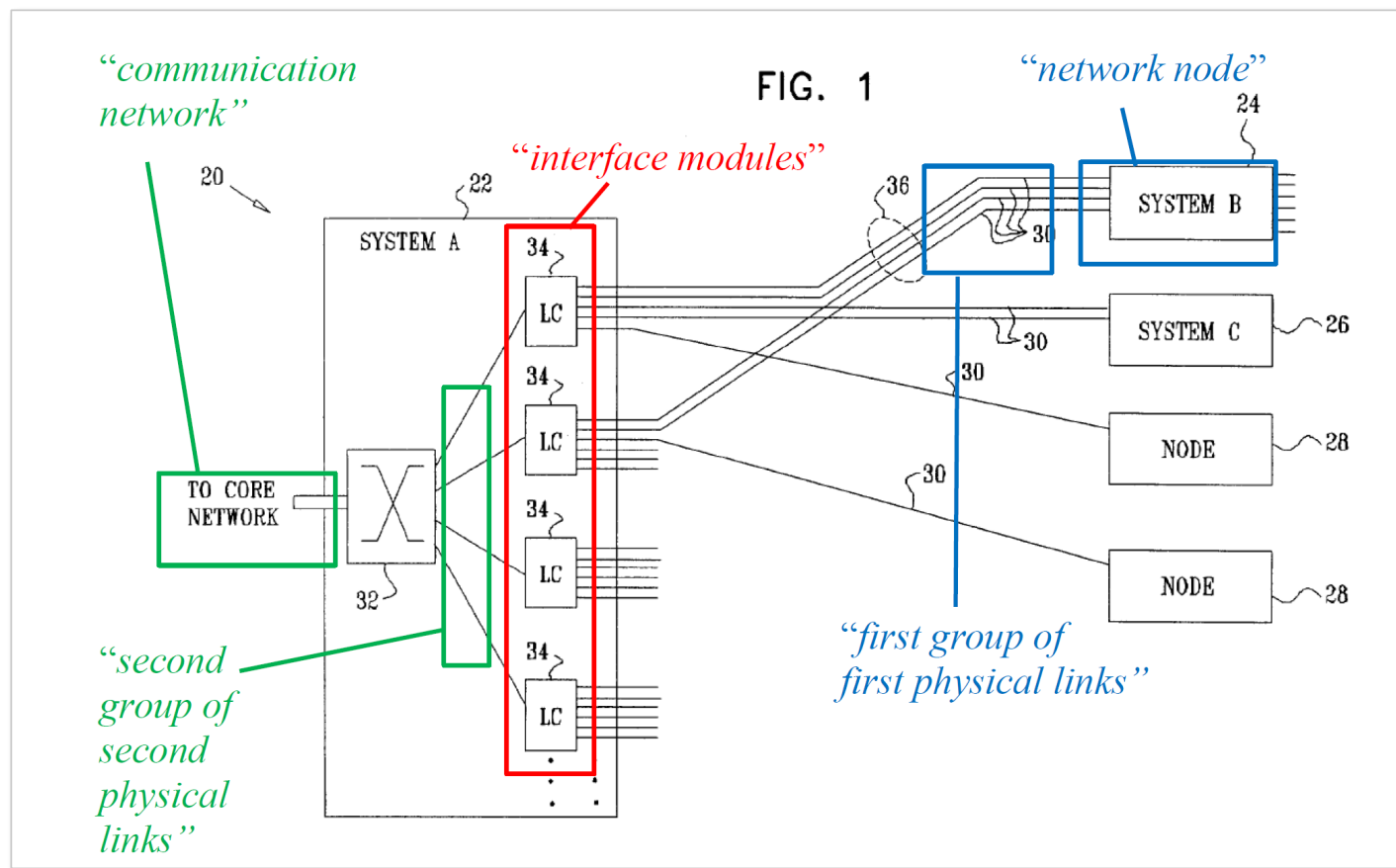
[0002] Link aggregation is a technique by which a group of parallel physical links between two endpoints in a data network can be joined together into a single logical link.

Ex.1005 (Bruckman), [0002]; Petition, 38.

(i.e., a failure in one of the line cards). As a result of spreading group 36 over two (or more) line cards, the link aggregation function applies not only to links 30 in group 36 but also to traces 52 that connect to multiplexers 50 that serve these links. Therefore, aggregator 54 resides on main card 32. Alternatively, if all the links in an aggregation group connect to the same multiplexer, the link aggregation function may reside on line card 34.

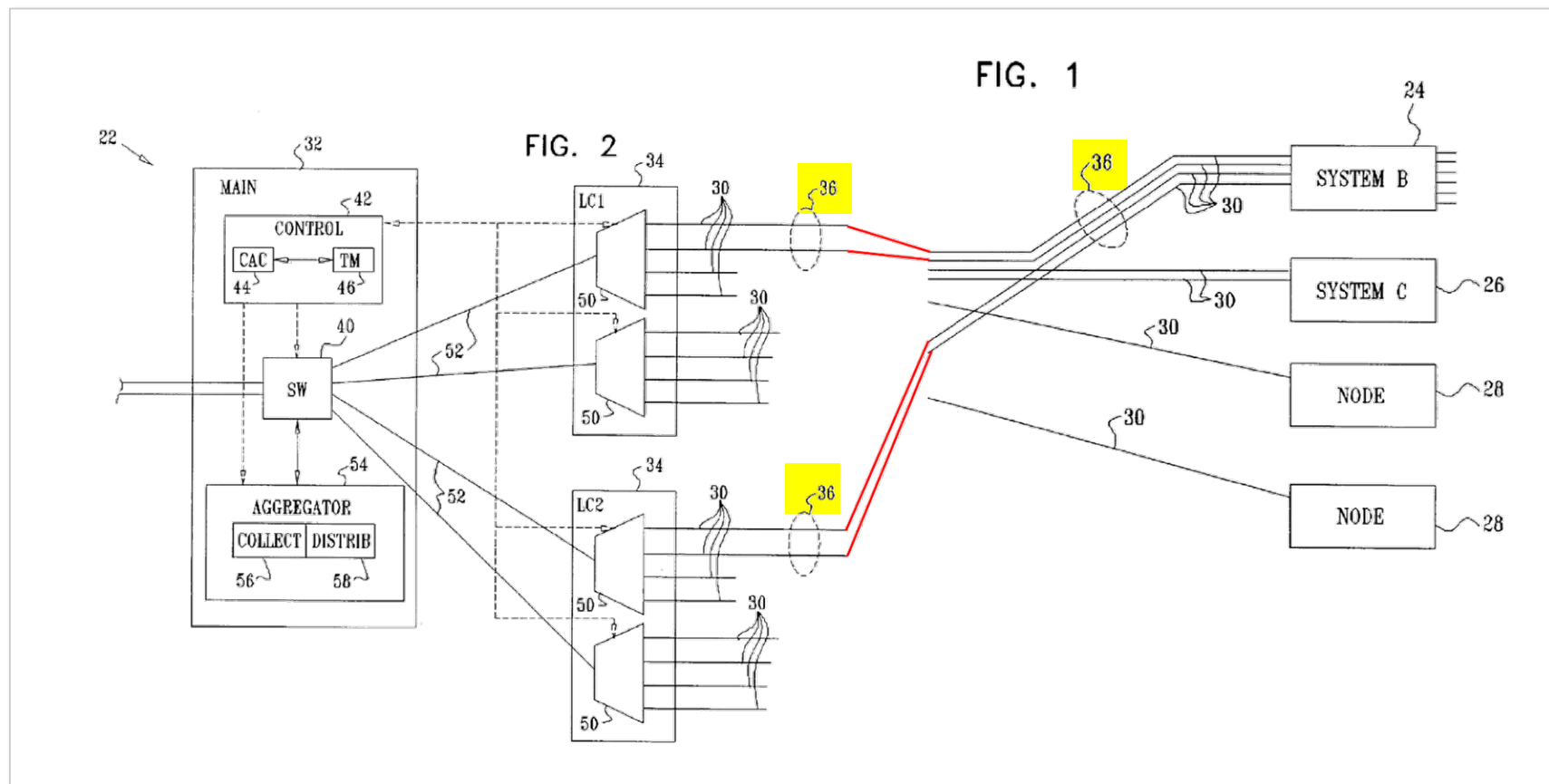
Ex.1005 (Bruckman), [0057]; Petition, 38.

Bruckman's traces are *“arranged in parallel.”*



Ex.1005 (Bruckman), Fig. 1; Petition, 39.

Bruckman's traces are “*arranged in parallel.*”



Ex.1005, Figs. 1 & 2; Petitioner Reply, 23.

Patent Owner's implicit claim construction is improper.

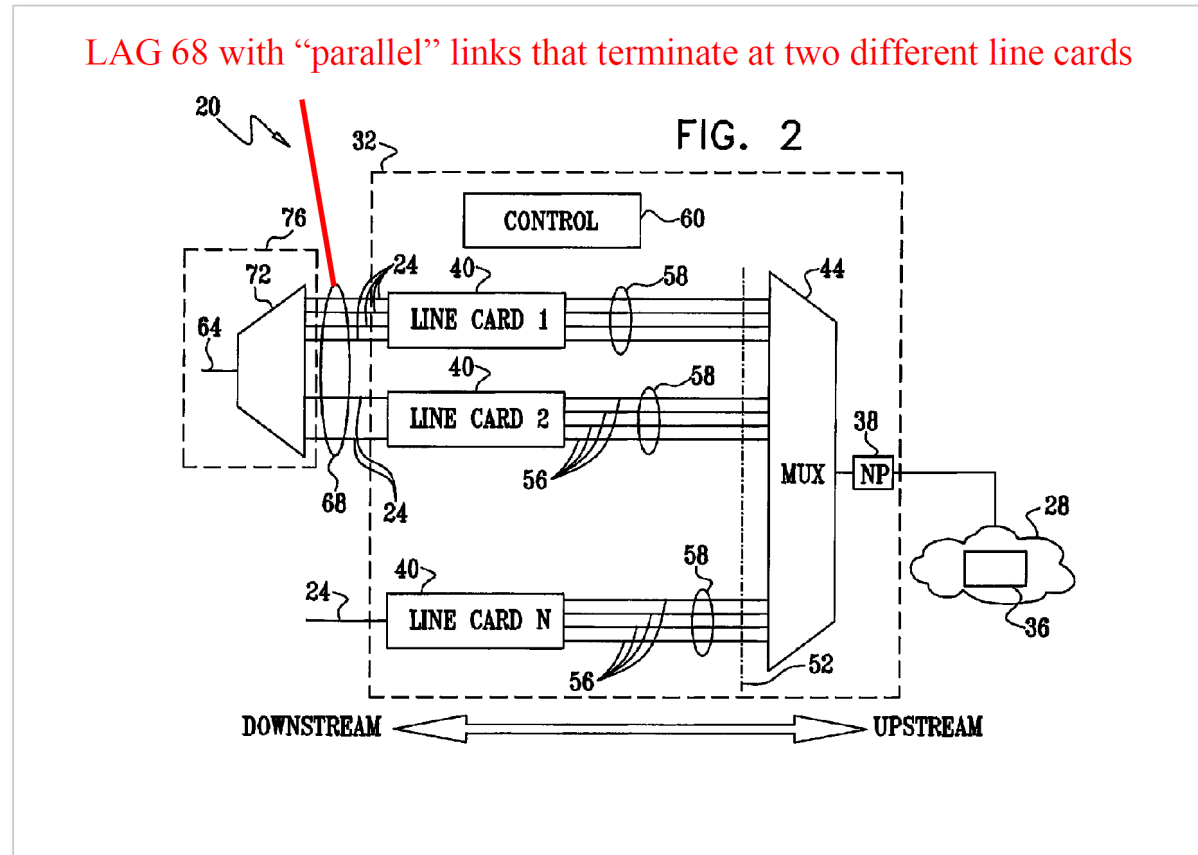
- **Patent Owner implies a narrow definition of “parallel.”**
- **Patent Owner argues that in order for links to be “parallel” they must terminate at the same “relevant endpoints”**

In the context of the '740 patent, the relevant endpoints are those which would enable a principal innovation in the network element architecture disclosed in the '740 patent, in particular, the lack of a pre-assigned relationship between (i) the second links that connect the network to the interface module and (ii) the first links that connect the interface module to a user. Ex2024 [Gomez Decl.], ¶85. This

Patent Owner Response, 37-38.



Patent Owner's implicit claim construction is improper.

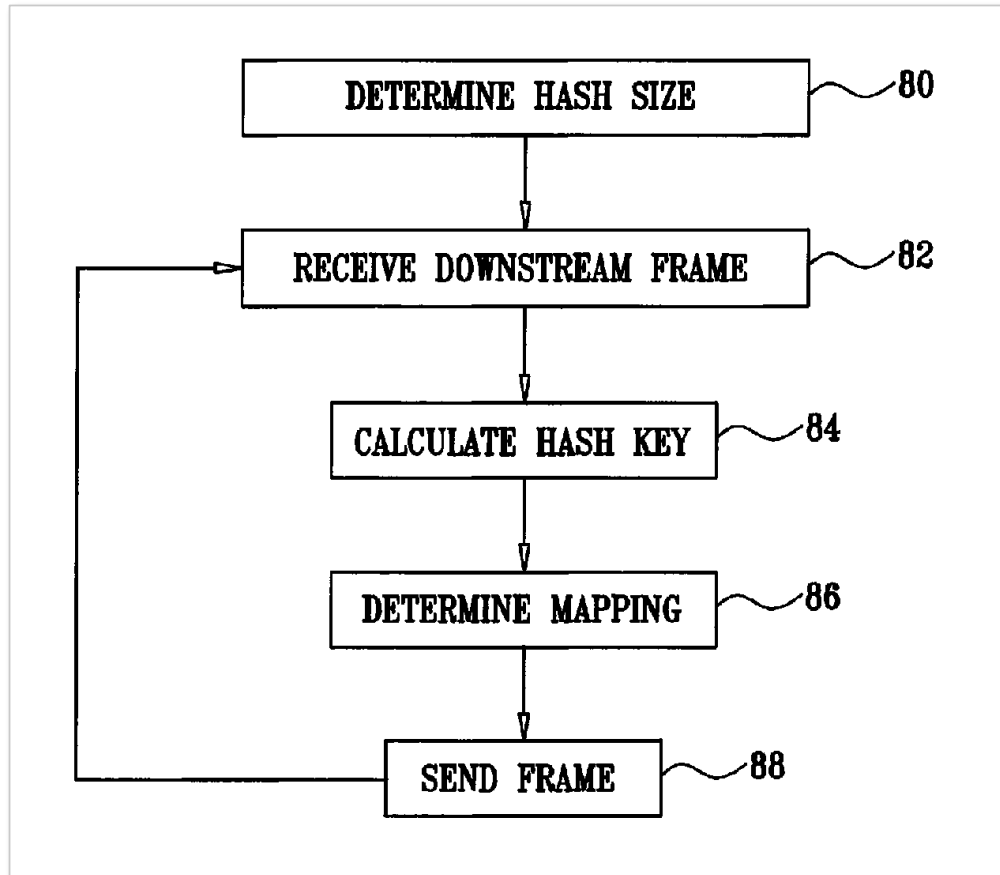


Ex.1001, Fig. 2; Petitioner Reply, 15.

Key Points

1. Bruckman teaches “*selecting ... a first physical link out of the first group and a second physical link out of the second group.*”
2. Bruckman teaches links “*arranged in parallel.*”
3. Bruckman teaches “*selecting ... in a single computation.*”

Bruckman teaches a “*single computation*.”



Ex.1001, Fig. 4; Petition, 16.

It is apparent that the “*single computation*” does not refer to performing the *selecting* process in a single step, but rather to a single computational result of a hashing function (e.g., single value) that *selects* the outcome. See, e.g., Ex.1001, 5:29-31. Thus, the single value, or the final processing step that produces that single value, are examples of a “*single computation*.” Ex.1003, ¶¶34-36.

Petition, 19-20.

Bruckman teaches a “*single computation*.”

[0058] Aggregator 54 comprises a distributor 58, which is responsible for distributing data frames arriving from the network among links 30 in aggregation group 36. Typically, distributor 58 determines the link over which to send each frame based on information in the frame header, as described in the Background of the Invention. Preferably, distributor 58 applies a predetermined hash function to the header information, wherein the hash function satisfies the following criteria:

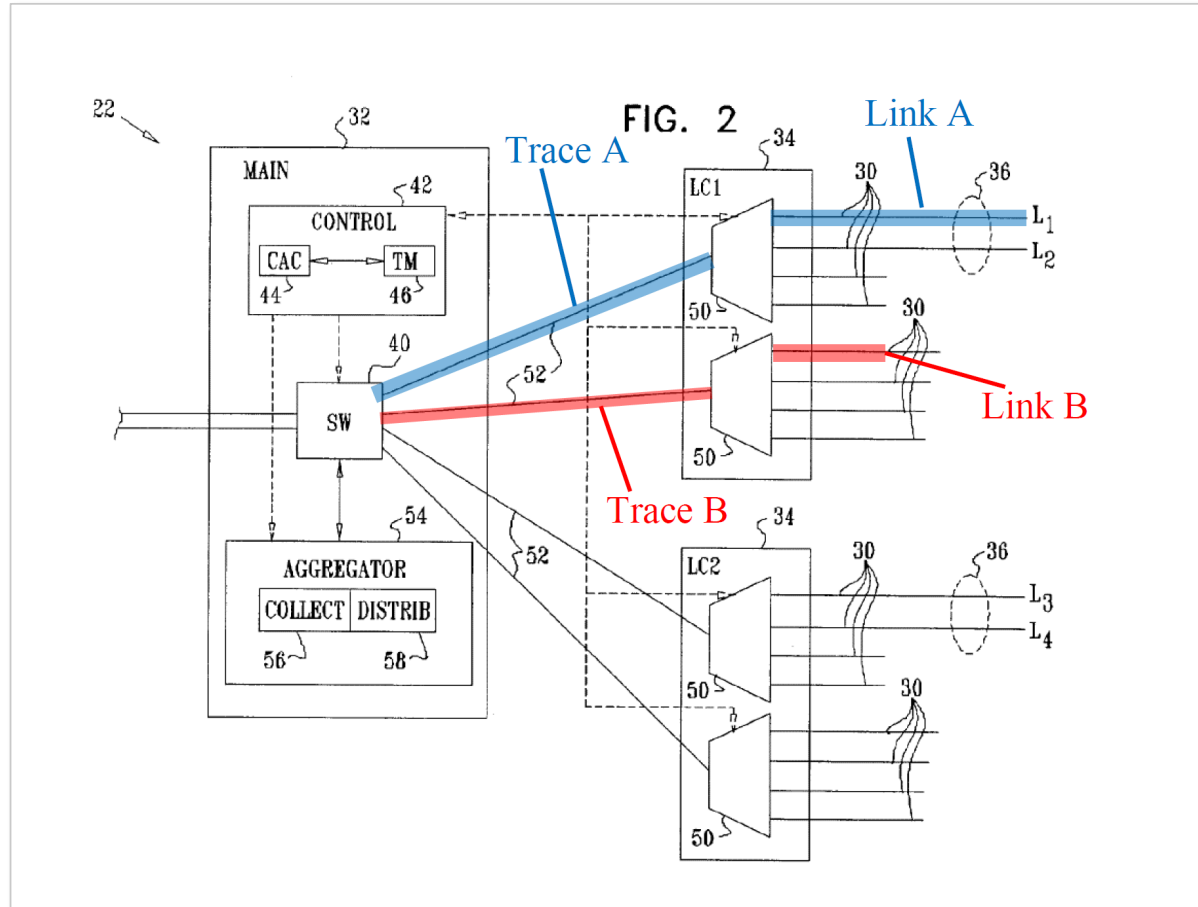
Ex.1005 (Bruckman), [0058]; Petition, 41.

```
unsigned short hash(unsigned char *hdr, short lagSize)
{
    short i;
    unsigned short hash=178; // initialization value
    for (i=0; i<4; i++)        // hdr is 4 bytes length
        hash = (hash<<2) + hash + (*hdr>>(i*8) & 0xFF);
    return (hash % lagSize);
}
```

“single computation”

Ex.1005 (Bruckman), Table 1; Petition, 41.

Bruckman teaches a “single computation.”

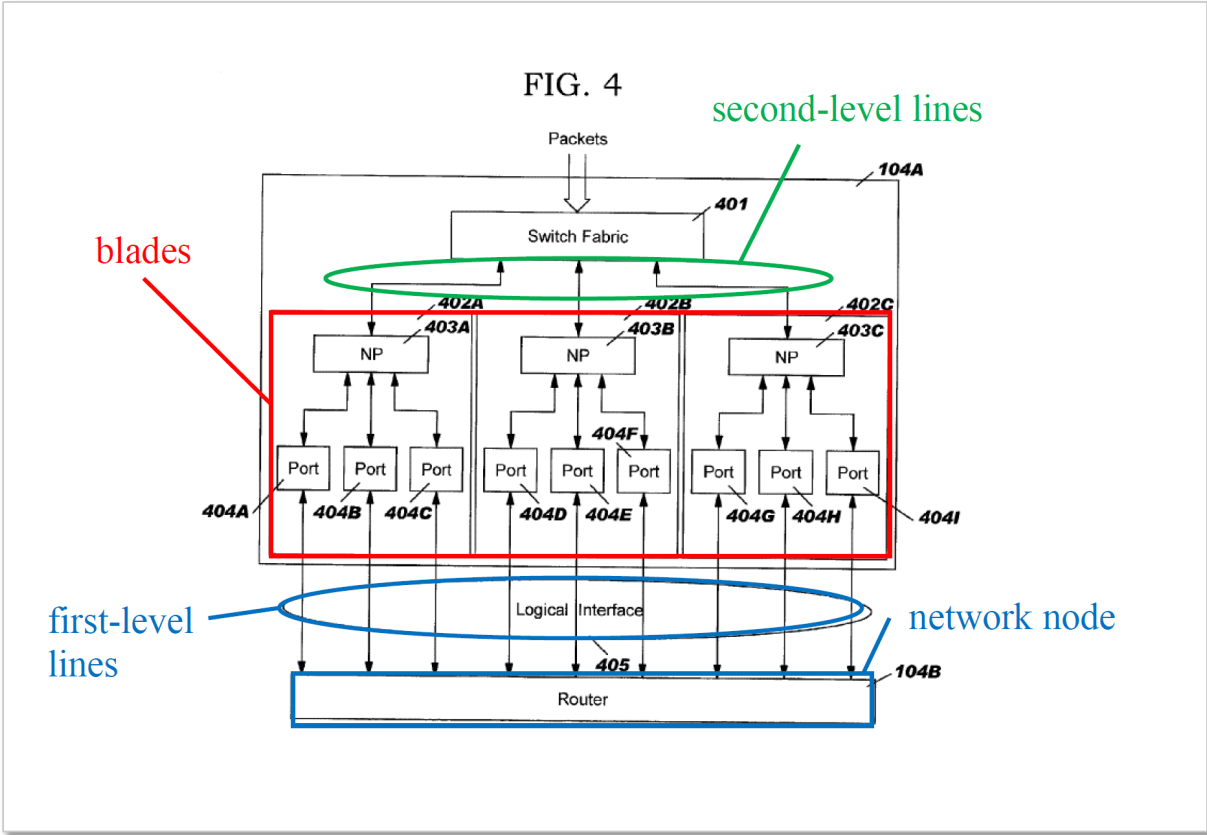


“Bruckman’s selection of a link 30 also determines which trace 52 will transmit the data frame.”

Petition, 43.

Ex.1005 (Bruckman), Fig. 2; Petition, 43.

Basso teaches a “single computation.”



Ex.1006 (Basso), Fig. 4; Petition, 44.

Basso teaches a “*single computation.*”

[0011] A hash function may then be performed on the received packet to generate a hash value. In one embodiment, a hash function may be performed on the source and destination address in the packet header to generate a hash value.

[0012] The hash value generated may be used to index into the table associated with a particular logical interface. Upon indexing into the table associated with the logical interface, an appropriate blade/port combination may be identified to transmit the received packet of data. In one embodiment, a blade/port combination may be selected in the indexed entry of the table associated with the logical interface by using a portion of the bits of the hashed value. The received packet may then be transmitted through the identified blade/port combination to the next destination (next destination previously identified by the next destination address in the forwarding table).

Ex.1006 (Basso), [0011]-[0012]; Petition, 45.



Patent Owner does not distinguish Bruckman.

temporal requirement in the claims. DI, 30.² Though Patent Owner agrees there is no temporal requirement, Patent Owner respectfully submits that the claims nonetheless require two distinct selections.

Patent Owner Response, 22-23.

Patent Owner.” DI, 30. Respectfully, Patent Owner did not intend its Preliminary Response arguments to be interpreted to require a temporal requirement. Indeed, since both selections are performed by a “single computation,” the claims clearly allow for both selections to be performed at the same time.

Patent Owner Response, 22-23.

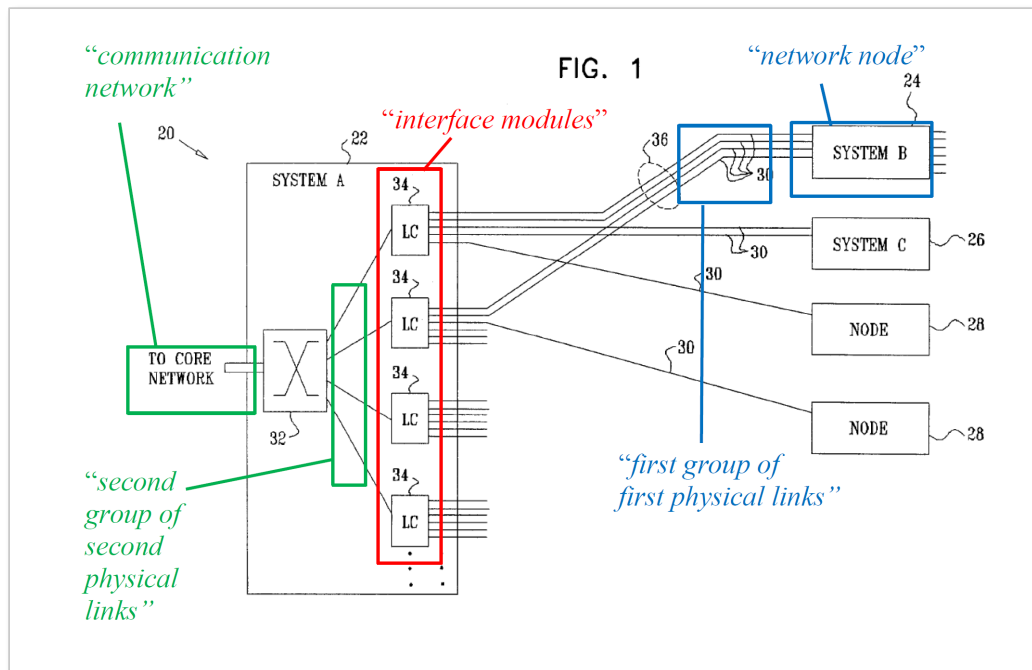


Patent Owner does not distinguish Bruckman.

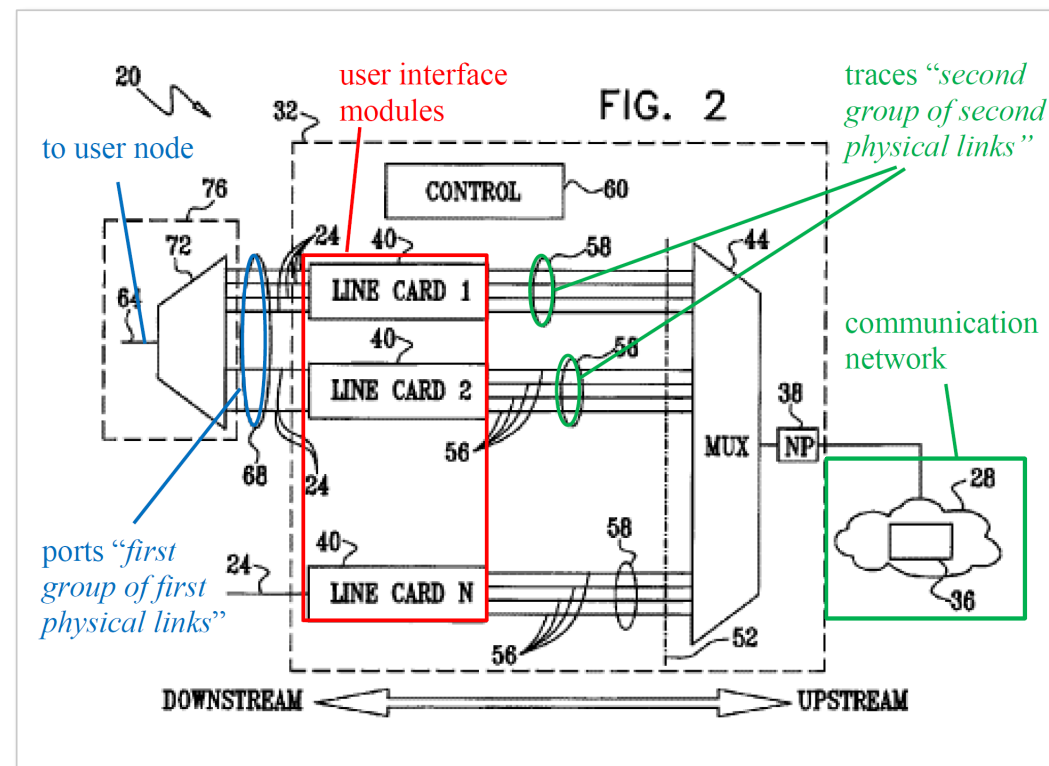
group” are dispositive. However, the specification also supports this distinction with disclosures about (i) the lack of direct relationship between the first and second groups of physical links; (ii) the rationale behind providing these groups as separate from one another; (iii) the performance of two mapping operations in sequence (i.e., two selections); and (iv) the manner in which the single computation makes this

Patent Owner Response, 54.

Bruckman teaches what is claimed.



Ex.1005 (Bruckman), Fig. 1; Petition, 39.



Ex.1001, Fig. 2; Petition, 15.



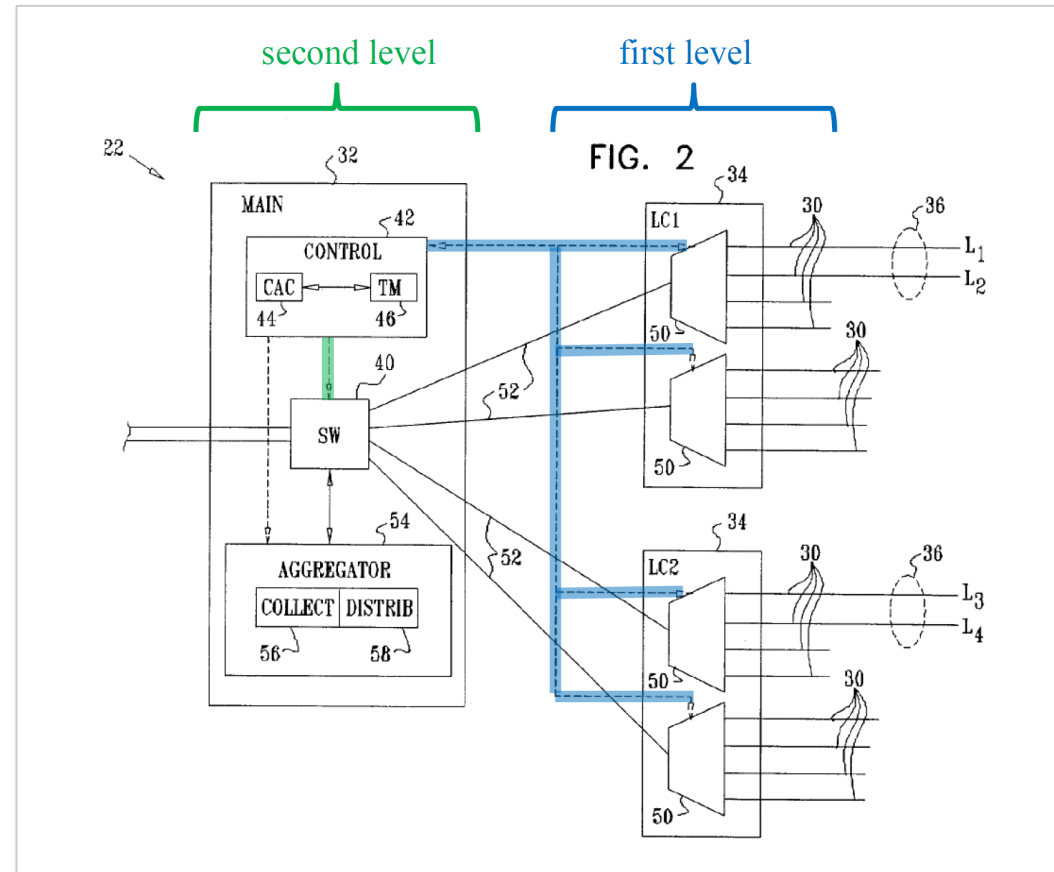
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EVIDENCE

Additional Slides

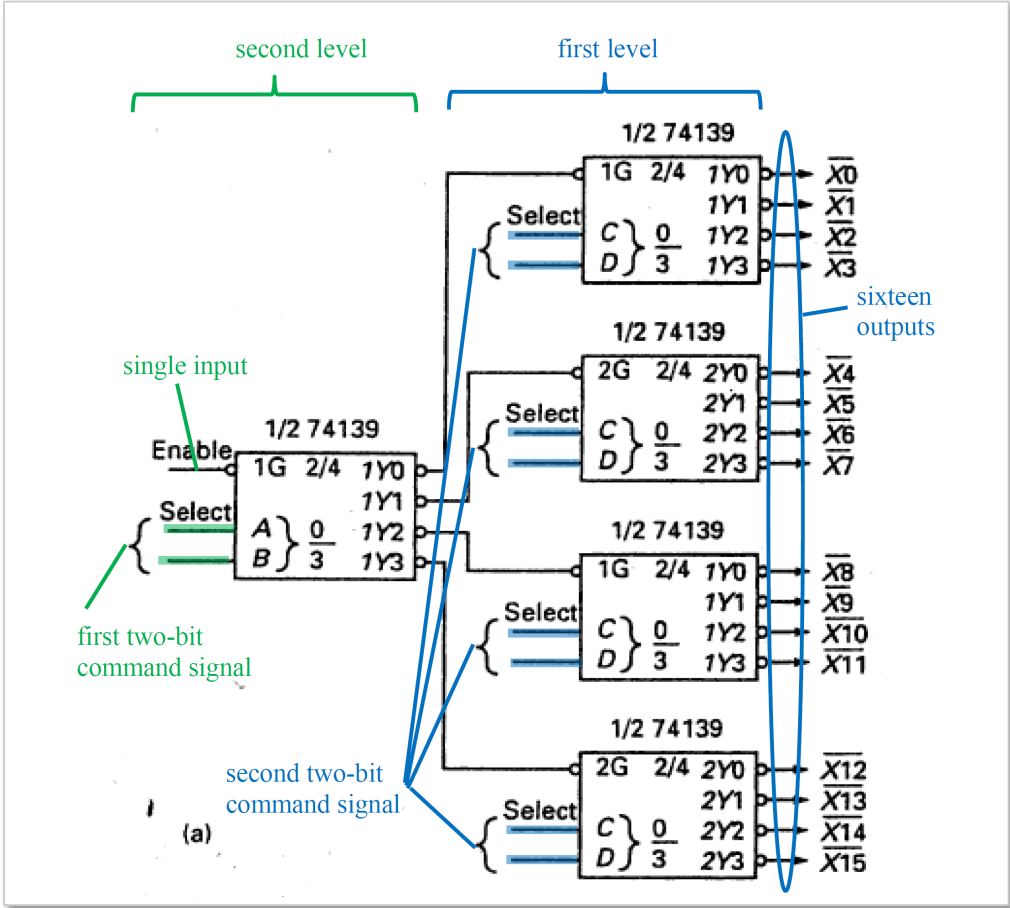


Bruckman's selection determines links from two groups.



Ex.1005 (Bruckman), Fig. 2; Petition, 60.

Bruckman's selection determines links from two groups.



Ex.1007 (Holdsworth), Fig. 5.17(a); Petition, 62.