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FLOW ALLOCATION IN A RING TOPOLOGY

FIELD OF THE INVENTION

The present invention relates generally to communication networks, and specifically to methods and systems for efficient allocation of resources for data flow in such networks.

BACKGROUND OF THE INVENTION

Network ring topologies are gaining in popularity, particularly in Internet Protocol (IP) networks. Such networks enable carriers to offer large bandwidth to users in a cost-effective manner. In order to gain these benefits, however, IP needs appropriate support at the Media Access Control (MAC - protocol layer 2) level, to provide functions such as load balancing, protection and clock synchronization.

One solution that has been proposed to meet these needs is the Spatial Reuse Protocol (SRP), which is described by Tsiang et al., in Request for Comments (RFC) 2892 of the Internet Engineering Task Force (IETF). This document, which is available at www.ietf.org/rfc.html, is incorporated herein by reference. SRP relates to the ring network as two overlapping local area networks (LANs), identified arbitrarily as an inner ring and an outer ring. In one of the rings, communication flows clockwise, while in the other it flows counterclockwise. Each node in the ring can communicate directly with all other nodes through either of the rings, using the appropriate MAC addresses of the nodes. Spatial reuse enables different nodes to use different, non-overlapping spans of the same ring simultaneously (unlike earlier

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ring protocols), thus increasing the overall aggregate bandwidth that is available.

Although SRP allows nodes to choose whether to route their packets on the inner or the outer ring, it does not provide any method for nodes to use in deciding which ring to choose. SRP recognizes different packet priority levels, and it also provides a mechanism for congestion control and fair load control on each of the two rings individually at the lower priority level. It thus supplies an infrastructure that can be used by applications to offer different Quality of Service (QoS) options. The SRP RFC, however, does not deal with how IP flows should be assigned to high priority levels or how load control should be accomplished for such high-priority packets.

There are routing protocols known in the art for choosing an optimal path between two nodes when multiple paths are available. These protocols have generally been designed with mesh networks in mind, although they can also be applied to bi-directional ring networks. For example, the Open Shortest First Protocol (OSFP) is a link-state routing protocol that is used to identify and select the path that has the lowest overall "cost." OSFP is described by Moy in RFC 2328 of the IETF, which is available at the above-mentioned Web address and is likewise incorporated herein by reference. This protocol enables a system administrator to assign a cost to each link in the network, so that low-cost links are the ones most likely to be selected for routing. OSFP does not specify, however, how the costs are to be determined. Moreover, since the costs are assigned statically by the system administrator, the protocol does not provide any

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means or basis for updating the costs automatically, while the network is running, in response to network resource constraints.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide improved methods and apparatus for routing data flows in a network.

It is a particular object of some aspects of the present invention to provide a method for controlling flow allocation in a network that is arranged in a ring topology.

It is a further object of some aspects of the present invention to provide a method of data flow allocation that makes optimal use of resources that are available on different network links. The term "resources" in this context, and throughout the specification and claims of the present patent application, refers not only to bandwidth, but also to processing power used to transmit, receive, encrypt or decrypt data, as well as to any other allocable factor that may affect the ability of a network link to convey a data flow between nodes.

In preferred embodiments of the present invention, a communication network comprises a plurality of nodes, which are preferably arranged in a ring topology. The nodes are capable of transmitting data around the ring in either a clockwise or a counterclockwise direction, or in other words, following SRP convention, over an inner or an outer ring within the network. A dispatcher, preferably in the form of a process running on one of the nodes, learns the topology of the network and tracks the use of network resources by each of the nodes while the

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network is running. Whenever a node needs to use network resources to carry a data flow to another node, it first determines whether it already has sufficient resources allocated to it in order to convey the data flow. If the node does not have sufficient resources, it requests an allocation from the dispatcher. Based on the levels of resource use on the links of the inner and outer rings, the dispatcher processes the request and determines whether to allocate the resources and, if so, on which of the rings.

Preferred embodiments of the present invention thus provide the means to select one of a plurality of possible paths through a network between a pair of nodes based on a dynamic assessment of network resource availability that is made by the dispatcher, rather than static link "costs" or other factors used in protocols known in the art. This dynamic capability is of particular applicability and usefulness in ring networks, but it can also be applied to substantially any other multi-path network topology.

There is therefore provided, in accordance with a preferred embodiment of the present invention, in a communication network that includes a plurality of nodes interconnected by links, a method for routing a data flow, including:

receiving a request to allocate one or more resources in the network so as to carry the data flow between first and second ones of the nodes over one of a plurality of paths therebetween, each such path including a respective sequence of the links;

determining, for the links included by each of the paths, respective levels of use of the requested

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resources due to communications in process over the network; and

selecting which of the paths is to carry the data flow responsive to the determined levels of use of the requested resources on the links included in each of the paths.

Preferably, the network includes an Internet Protocol (IP) network, and the nodes are interconnected in a ring, wherein the plurality of paths includes a first path traversing the ring in one direction and a second path traversing the ring in the opposite direction, and wherein selecting which of the paths is to carry the data flow includes selecting the first or the second path. Most preferably, selecting the first or the second path includes conveying the data flow over an inner or outer data link ring within the network provided by a Spatial Reuse Protocol (SRP).

Preferably, the one or more resources include a link bandwidth and, additionally or alternatively, a processing power associated with each of the links.

Preferably, selecting which of the paths is to carry the data flow includes comparing an amount of the one or more resources requested to a resource budget assigned to the first node, and permitting the data flow only if allocating the requested resources will not cause a total of the resources allocated to the first node to exceed the budget. Most preferably, comparing the amount of the one or more resources includes comparing the amount of each of the resources requested to the resource budget assigned for each of the resources, and permitting the data flow includes permitting the flow only if all of the

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resources requested for at least one of the paths are within the budget.

Additionally or alternatively, selecting which of the paths is to carry the data flow includes increasing an allocation to the first node of the one or more requested resources on the selected path by a predetermined quantum. Further additionally or alternatively, selecting which of the paths is to carry the data includes verifying that a sufficient amount of the requested resources is available to carry the data flow on every one of the links included in the selected path.

Preferably, selecting which of the paths is to carry the data flow includes selecting the one of the paths having the lowest level of a predetermined measure of use of the requested resources. Most preferably, selecting the one of the paths includes finding, for each of at least two of the paths, a maximum level of use of at least one of the requested resources, taken over all of the links included in the paths, and selecting the one of the paths having the lowest maximum level of use.

In a preferred embodiment, receiving the request includes choosing a dispatcher within the network to manage allocation of the resources, wherein the dispatcher receives and processes the request. Preferably, choosing the dispatcher includes choosing one of the nodes to act as the dispatcher. Most preferably, the dispatcher is operative as a software process running on the associated node.

There is also provided, in accordance with a preferred embodiment of the present invention, a communication network, including:

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a plurality of nodes;

a plurality of links, interconnecting the nodes to provide communications therebetween; and

a dispatcher, coupled to receive a request to allocate one or more resources in the network so as to carry the data flow between first and second ones of the nodes over one of a plurality of paths therebetween, each such path including a respective sequence of the links, and adapted to determine, for the links included in each of the paths, respective levels of use of the requested resources due to communications in process over the network and to select which of the paths is to carry the data flow responsive to the determined levels of use of the requested resources on the links included in each of the paths.

The present invention will be more fully understood from the following detailed description of the preferred embodiments thereof, taken together with the drawings in which:

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram that schematically illustrates a ring network with a dispatcher for controlling data flow, in accordance with a preferred embodiment of the present invention;

Fig. 2 is a block diagram that schematically illustrates a logical layout of the network of Fig. 1;

Fig. 3 is a flow chart that schematically illustrates a method for assigning network resources to network nodes, in accordance with a preferred embodiment of the present invention;

Fig. 4 is a flow chart that schematically illustrates a method by which a node generates a resource allocation request, in accordance with a preferred embodiment of the present invention;

Fig. 5 is a flow chart that schematically illustrates a method by which a node releases a network resource allocation, in accordance with a preferred embodiment of the present invention;

Fig. 6 is a flow chart that schematically illustrates a method by which a dispatcher selects a network ring on which to allocate resources to a node, in accordance with a preferred embodiment of the present invention; and

Fig. 7 is a flow chart showing a detail of the method of Fig. 6, in accordance with a preferred embodiment of the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Reference is now made to Figs. 1 and 2, which are block diagrams that schematically illustrate an IP ring network 20, in accordance with a preferred embodiment of the present invention. Fig. 1 shows the physical layout of the network, while Fig. 2 shows the logical layout. Network 20 comprises nodes 22, which are connected by links numbered 1 through 6. Each node is identified by the two links that are connected to it, i.e., N_{1_2} between links 1 and 2, and so forth up to N_{6_1}. Each node can communicate with every other node over either a counterclockwise or a clockwise path around the ring. Following SRP convention, these two paths are identified as an inner ring 24 and an outer ring 26, each of which is made up of segments corresponding to the physical links between the nodes.

A dispatcher 28 tracks the use of resources in network 20 and allocates resources to nodes 22 as required. The dispatcher is shown, for the sake of clarity, as an entity that is separate from the network nodes. Alternatively, the dispatcher may be associated with one of the nodes, typically as a software process running on the node. As noted above, the resources with which the dispatcher is concerned typically include bandwidth, as well as processing and encryption power and other capabilities that may be needed by applications that generate data flows from node to node. The resources are preferably classified by priority. In order to make a decision on whether to allocate resources on the inner ring or on the outer ring, as described hereinbelow, the dispatcher first considers the relative availability of the highest-priority resource, and refers

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to the lower-priority resources only when the higher-priority resources did not lead to an unequivocal decision.

For each resource of concern, dispatcher 28 maintains a record of the maximum available quantity of the resource in each segment of rings 24 and 26. This quantity is referred to hereinafter as "segment_maximum", and is denoted $mRi.n$ for the inner loop and $mRo.n$ for the outer loop, wherein n is the segment number (from 1 to 6, in the example of Fig. 1). The dispatcher also maintains a segment utilization table, indicating the current resource utilization for each resource on each of the segments: $Ri.n$ and $Ro.n$ for the inner and outer rings, respectively. Some segments may not have one or more of the resources in question, in which case they will be so marked in the table and will not be considered by the dispatcher in dispatching data flows that require such a resource. The dispatcher updates the values of $Ri.n$ or of $Ro.n$ in the segment utilization table whenever it allocates or deallocates resources for a data flow between two nodes. The update applies to all of the segments along the route between the nodes.

In addition to maintaining segment availability information, the dispatcher is configured with the following parameters for each of the nodes with respect to each of the resources:

- $node_budget_In$ - Maximum amount of the resource that the node can receive on the inner ring.
- $node_budget_Out$ - Maximum amount of the resource that the node can receive on the outer ring.
- $node_used_In$ - Amount of the resource currently allocated to the node on the inner ring.

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- node_used_Out - Amount of the resource currently allocated to the node on the outer ring.
- node_quantum - Amount by which to increase or decrease node_used_In or Out at each resource allocation or deallocation. Resources are allocated in quanta in order to limit the frequency with which allocation and deallocation operations must be performed.

Other parameters used by the dispatcher in its allocation decisions are noted below.

Similarly, each node 22 maintains its own record of the following parameters for each resource with respect to each possible destination node:

- allowed_In - Maximum amount of the resource that is currently available for use by the node on the inner ring for data flow to the specific destination node.
- allowed_Out - Maximum amount of the resource that is currently available for use by the node on the outer ring for data flow to the specific destination node.
- used_In - Amount of the resource currently in use on the inner ring by clients of the node for data flow to the specific destination node.
- used_Out - Amount of the resource currently in use on the outer ring by clients of the node for data flow to the specific destination node.
- node_quantum - As noted above with reference to the dispatcher.

These parameters are used in making flow allocation decisions, as described with reference to the figures

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that follow. Communications between nodes 22 and dispatcher 28 in this regard preferably use a standard protocol, such as the Resource Reservation Protocol (RSVP), described by Braden et al., in IETF RFC 2205, which is available at the above-mentioned Web address and is incorporated herein by reference.

Fig. 3 is a flow chart that schematically illustrates a method for assigning resources to nodes 22, in accordance with a preferred embodiment of the present invention. In preparation for this method, a dispatcher entity is chosen or assigned within network 20, at an assignment step 30. Assuming that dispatcher 28 runs on one of nodes 22, as mentioned above, the dispatcher is preferably chosen by the nodes from among themselves using a suitable network management protocol. An example of such a protocol is the Subnet Bandwidth Manager (SBM) protocol, described by Yavatkar et al., in IETF RFC 2814, which is available at the above-mentioned Web address and is incorporated herein by reference. This protocol also enables the nodes to choose a substitute dispatcher if the original dispatcher is lost due to a node or network failure. At a learning step 32, dispatcher 28 learns the topology of rings 24 and 26 using methods known in the art, as specified by SRP (RFC 2892), for example, and builds the tables of network information to be used subsequently in flow allocations.

When a node receives a request from one of its clients to send data to another node, the node first checks to determine whether it has sufficient resources already allocated to it in order to service the request. If the allocated resources are inadequate, the node submits a resource request to the dispatcher, indicating

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the destination node, at a request step 34. The dispatcher then checks whether there are resources available to the node on either the inner or the outer ring, at an availability checking step 36. There must both be sufficient unallocated resources left in the specific node budget and unused resources left on the appropriate segments of at least one of the rings in order for the dispatcher to grant the node's resource request. If not, the dispatcher refuses the request, at a refusal step 38, and the node returns an appropriate error report to the client application. Preferably, the dispatcher returns an error message to the node indicating the resource or resources that were lacking and thus led to the refusal.

If resources are available, however, the dispatcher determines on which of the rings to allocate the resources, at an assignment step 40. The dispatcher allocates one or more additional quanta to the node on the selected ring for use in communicating with the requested destination node, and the node is then able to carry out the data transmission. The dispatcher also updates its resource utilization tables, incrementing the value of $Ri.n$ or $Ro.n$ for each of the segments along the data flow route by the number of additional resource quanta that it has allocated.

Fig. 4 is a flow chart that schematically shows details of request step 34, in accordance with a preferred embodiment of the present invention. As noted above, after receiving a resource request from one of its clients, the node first checks to determine whether it has sufficient resources already allocated to deal with the request. At an inner ring checking step 42, the node

tests whether its current used_In for each resource to the desired destination, added to the required amount of new resource required, is less than or equal to its current allowed_In for the destination. If so, the node carries out the requested transmission on the inner ring, at an inner ring transmission step 44, without having to communicate with the dispatcher. If the node does not have sufficient resources to handle the request on the inner ring, it performs a similar check with respect to used_Out and allowed_Out, at an outer ring checking step 46. Then, if there are sufficient resources on the outer ring, the node carries out the transmission on the outer ring, at an outer ring transmission step 48. Otherwise, the node requests one or more quanta of the resource, as needed, from the dispatcher, at a quantum request step 50. The process then continues at step 36 (Fig. 3).

Fig. 5 is a flow chart that schematically illustrates a method by which nodes release resources that they no longer need, in accordance with a preferred embodiment of the present invention. The method is invoked when one of the node's clients releases resources that it had earlier requested, at a release step 52. Preferably, a hysteresis factor, p , is used in determining whether to deallocate one or more quanta of the resource (i.e., to return the quanta to the dispatcher). Most preferably, p is set to a value between zero and one.

At a hysteresis step 54, the node determines whether the amount of the resource released by the client is sufficient to justify returning one or more quanta of the resource to the dispatcher. Formally (assuming for the moment that the resource was released on the inner ring),

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if the node finds that $(used_In - \text{resource amount released})$ is less than or equal to $(allowed_In - [1 + p] \times node_quantum)$, then a deallocation step 56 is invoked. In this case, the node asks the dispatcher to remove one quantum from its allocation, while also indicating the destination node for which the removed quantum was previously used, leaving the node with sufficient resources to serve its remaining active data flows. The node reduces its values of both $used_In$ and $allowed_In$ accordingly for the relevant destination node, and the dispatcher similarly reduces $node_used_In$. The dispatcher also decrements $Ri.n$ for each of the segments along the data flow path. Outer ring resources are treated in like manner.

Otherwise, if amount of the released resource does not justify returning a quantum to the dispatcher, the node does not communicate with the dispatcher. Rather, the node keeps the resource for subsequent use, at a resource retainment step 58. In this case, $used_In$ is reduced, but not $allowed_In$.

Fig. 6 is a flow chart that schematically shows details of availability checking step 36, in accordance with a preferred embodiment of the present invention. Dispatcher 28 uses the method of Fig. 6 to determine on which ring (if at all) to allocate resources in response to a node resource request. At a budget checking step 60, in response to a request by a node to allocate a quantum of resources, the dispatcher checks whether allocation of the additional quantum will put the node over budget on either or both of rings 24 and 26. In other words, the dispatcher checks for the inner ring whether $node_used_In + node_quantum > node_budget_In$, and

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likewise for the outer ring. If the quantum will put both rings over budget, the dispatcher refuses the node request at step 38. The test of step 60 is performed for each one of the resources that will be required in order to grant the node request. The dispatcher will not grant the request unless at least one of the rings has a sufficient budget for all of the resources required.

The dispatcher may alternatively find that the node does have sufficient resources in its budget on one of the rings in order to provide the requested resource, but not on the other ring, at a single ring budget step 62. In this case, the dispatcher proceeds to verify that there are sufficient resources available to fill the request on all of the relevant segments of the ring, at a verification step 64. For each of the segments on the chosen ring (say the inner ring) between the requesting node and its destination node, and for each of the resources concerned, the dispatcher checks whether $R_{i,n} + \text{node_quantum} \leq mR_{i,n}$. If this condition is satisfied for all of the resources and all of the segments, the dispatcher assigns the requested resources at step 40. Otherwise, the dispatcher refuses the request at step 38.

It may also occur that the node has sufficient resources in its budget to satisfy the request on both of the rings, at a dual ring budget step 66. In this case, the dispatcher verifies that there are sufficient resources available on all of the relevant segments of both of the rings, at a dual verification step 68. The verification is performed in substantially the same manner as at step 64, described above. If neither of the rings has sufficient resources available on all of its relevant segments, the dispatcher refuses the resource

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request at step 38. If only one of the rings has sufficient resources available on all of its relevant segments, the dispatcher assigns the requested resources on that ring at step 40. If both rings have sufficient resources available on all of the relevant segments, then the dispatcher proceeds to choose the ring that has, generally speaking, the lower level of current resource allocation, at a ring selection step 70, and to assign the requested resources on this ring at step 40.

Fig. 7 is a flow chart that schematically shows details of ring selection step 70, in accordance with a preferred embodiment of the present invention. The method here is based on comparing relative resource usage levels for all of the relevant segments on both of the rings. The relative resource usage level is defined as $Ri.n/mRi.n$ for the inner ring, and $Ro.n/mRo.n$ for the outer ring. A usage ratio, for comparing the relative usage levels of the segments between the source and destination nodes on the outer ring path to those on the inner ring path, is defined as follows:

$$Usage_ratio\left(\frac{outer}{inner}\right) = \frac{Max(Ro.n/mRo.n)}{Max(Ri.n/mRi.n)}$$

Here the maximum of the usage levels is taken over all of the participating segments in each of the paths. The ratio is calculated for each of the resources that is of concern in filling the node request.

In carrying out step 70, the dispatcher makes use of two additional arbitrary parameters: `resource_threshold` and `reduce_quantum`. These parameters are used by the dispatcher to maintain a certain hysteresis in toggling

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back and forth between allocating resources on the inner and outer rings, as described below.

At a first ratio testing step 72, the dispatcher tests the (outer/inner) usage ratio for the resource that has highest priority, and determines whether it is greater than or equal to $1+T$, wherein T is initially set equal to the resource_threshold. If so, the dispatcher concludes that there is substantially heavier resource usage on the outer ring than on the inner ring. Consequently, the dispatcher selects the inner ring for allocation of the requested resources, at an inner ring selection step 74.

Alternatively, at a second ratio testing step 76, the dispatcher tests the (inner/outer) usage ratio (the inverse of the ratio shown in the equation above) for the highest-priority resource. In this case, if the ratio is greater than or equal to $1+T$, the dispatcher selects the outer ring, at an outer ring selection step 78.

If neither of the usage ratios is greater than or equal to $1+T$ for the highest-priority resource, the dispatcher checks to determine whether there are other resources to be taken into account, at a resource checking step 80. If so, the usage ratios for the next resource, in order of priority, are calculated, at a next resource step 82, and steps 72 and 76 are repeated.

If the usage ratios for all of the relevant resources are checked for a given value of T with no conclusive result, T is reduced by an amount equal to reduce_quantum, at a reduction step 84. Steps 72 and 76 are then repeated again using the reduced value of T for all of the resources in order of priority, as described above. This process continues until T is reduced to

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zero, at a termination step 86. At this point, the dispatcher has found the relative resource usage levels to be substantially the same for the inner and outer rings. It thus cannot use the usage levels as a selection criterion. Instead, the dispatcher preferably chooses the shortest path, with the smallest number of nodes to traverse, between the source and destination nodes, at a shortest path step 88. If the paths on the inner and outer rings are of the same length, the dispatcher uses a preprogrammed rule to choose one of the rings, such as always choosing the inner or the outer ring, or a random toggle.

Although preferred embodiments are described hereinabove with reference to a ring topology and to certain specific protocols, such as SRP and IP, used in conjunction with this topology, the principles of the present invention are similarly applicable to networks of other topologies, such as mesh topologies, and other protocols. It will thus be appreciated that the preferred embodiments described above are cited by way of example, and that the present invention is not limited to what has been particularly shown and described hereinabove. Rather, the scope of the present invention includes both combinations and subcombinations of the various features described hereinabove, as well as variations and modifications thereof which would occur to persons skilled in the art upon reading the foregoing description and which are not disclosed in the prior art.

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In preferred embodiments of the present invention, a communication network comprises a plurality of nodes, which are preferably arranged in a ring topology. The nodes are capable of transmitting data around the ring in either a clockwise or a counterclockwise direction, or in other words, following SRP convention, over an inner or an outer ring within the network. A dispatcher, preferably in the form of a process running on one of the nodes, learns the topology of the network and tracks the use of network resources by each of the nodes while the

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Preferred embodiments of the present invention thus provide the means to select one of a plurality of possible paths through a network between a pair of nodes based on a dynamic assessment of network resource availability that is made by the dispatcher, rather than static link "costs" or other factors used in protocols known in the art. This dynamic capability is of particular applicability and usefulness in ring networks, but it can also be applied to substantially any other multi-path network topology.

There is therefore provided, in accordance with a preferred embodiment of the present invention, in a communication network that includes a plurality of nodes interconnected by links, a method for routing a data flow, including:

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Preferably, the network includes an Internet Protocol (IP) network, and the nodes are interconnected in a ring, wherein the plurality of paths includes a first path traversing the ring in one direction and a second path traversing the ring in the opposite direction, and wherein selecting which of the paths is to carry the data flow includes selecting the first or the second path. Most preferably, selecting the first or the second path includes conveying the data flow over an inner or outer data link ring within the network provided by a Spatial Reuse Protocol (SRP).

Preferably, the one or more resources include a link bandwidth and, additionally or alternatively, a processing power associated with each of the links.

Preferably, selecting which of the paths is to carry the data flow includes comparing an amount of the one or more resources requested to a resource budget assigned to the first node, and permitting the data flow only if allocating the requested resources will not cause a total of the resources allocated to the first node to exceed the budget. Most preferably, comparing the amount of the one or more resources includes comparing the amount of each of the resources requested to the resource budget assigned for each of the resources, and permitting the data flow includes permitting the flow only if all of the

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resources requested for at least one of the paths are within the budget.

Additionally or alternatively, selecting which of the paths is to carry the data flow includes increasing an allocation to the first node of the one or more requested resources on the selected path by a predetermined quantum. Further additionally or alternatively, selecting which of the paths is to carry the data includes verifying that a sufficient amount of the requested resources is available to carry the data flow on every one of the links included in the selected path.

Preferably, selecting which of the paths is to carry the data flow includes selecting the one of the paths having the lowest level of a predetermined measure of use of the requested resources. Most preferably, selecting the one of the paths includes finding, for each of at least two of the paths, a maximum level of use of at least one of the requested resources, taken over all of the links included in the paths, and selecting the one of the paths having the lowest maximum level of use.

In a preferred embodiment, receiving the request includes choosing a dispatcher within the network to manage allocation of the resources, wherein the dispatcher receives and processes the request. Preferably, choosing the dispatcher includes choosing one of the nodes to act as the dispatcher. Most preferably, the dispatcher is operative as a software process running on the associated node.

There is also provided, in accordance with a preferred embodiment of the present invention, a communication network, including:

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a plurality of nodes;

a plurality of links, interconnecting the nodes to provide communications therebetween; and

a dispatcher, coupled to receive a request to allocate one or more resources in the network so as to carry the data flow between first and second ones of the nodes over one of a plurality of paths therebetween, each such path including a respective sequence of the links, and adapted to determine, for the links included in each of the paths, respective levels of use of the requested resources due to communications in process over the network and to select which of the paths is to carry the data flow responsive to the determined levels of use of the requested resources on the links included in each of the paths.

The present invention will be more fully understood from the following detailed description of the preferred embodiments thereof, taken together with the drawings in which:

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BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram that schematically illustrates a ring network with a dispatcher for controlling data flow, in accordance with a preferred embodiment of the present invention;

Fig. 2 is a block diagram that schematically illustrates a logical layout of the network of Fig. 1;

Fig. 3 is a flow chart that schematically illustrates a method for assigning network resources to network nodes, in accordance with a preferred embodiment of the present invention;

Fig. 4 is a flow chart that schematically illustrates a method by which a node generates a resource allocation request, in accordance with a preferred embodiment of the present invention;

Fig. 5 is a flow chart that schematically illustrates a method by which a node releases a network resource allocation, in accordance with a preferred embodiment of the present invention;

Fig. 6 is a flow chart that schematically illustrates a method by which a dispatcher selects a network ring on which to allocate resources to a node, in accordance with a preferred embodiment of the present invention; and

Fig. 7 is a flow chart showing a detail of the method of Fig. 6, in accordance with a preferred embodiment of the present invention.

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DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Reference is now made to Figs. 1 and 2, which are block diagrams that schematically illustrate an IP ring network 20, in accordance with a preferred embodiment of the present invention. Fig. 1 shows the physical layout of the network, while Fig. 2 shows the logical layout. Network 20 comprises nodes 22, which are connected by links numbered 1 through 6. Each node is identified by the two links that are connected to it, i.e., N_{1_2} between links 1 and 2, and so forth up to N_{6_1}. Each node can communicate with every other node over either a counterclockwise or a clockwise path around the ring. Following SRP convention, these two paths are identified as an inner ring 24 and an outer ring 26, each of which is made up of segments corresponding to the physical links between the nodes.

A dispatcher 28 tracks the use of resources in network 20 and allocates resources to nodes 22 as required. The dispatcher is shown, for the sake of clarity, as an entity that is separate from the network nodes. Alternatively, the dispatcher may be associated with one of the nodes, typically as a software process running on the node. As noted above, the resources with which the dispatcher is concerned typically include bandwidth, as well as processing and encryption power and other capabilities that may be needed by applications that generate data flows from node to node. The resources are preferably classified by priority. In order to make a decision on whether to allocate resources on the inner ring or on the outer ring, as described hereinbelow, the dispatcher first considers the relative availability of the highest-priority resource, and refers

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to the lower-priority resources only when the higher-priority resources did not lead to an unequivocal decision.

For each resource of concern, dispatcher 28 maintains a record of the maximum available quantity of the resource in each segment of rings 24 and 26. This quantity is referred to hereinafter as "segment_maximum", and is denoted $mRi.n$ for the inner loop and $mRo.n$ for the outer loop, wherein n is the segment number (from 1 to 6, in the example of Fig. 1). The dispatcher also maintains a segment utilization table, indicating the current resource utilization for each resource on each of the segments: $Ri.n$ and $Ro.n$ for the inner and outer rings, respectively. Some segments may not have one or more of the resources in question, in which case they will be so marked in the table and will not be considered by the dispatcher in dispatching data flows that require such a resource. The dispatcher updates the values of $Ri.n$ or of $Ro.n$ in the segment utilization table whenever it allocates or deallocates resources for a data flow between two nodes. The update applies to all of the segments along the route between the nodes.

In addition to maintaining segment availability information, the dispatcher is configured with the following parameters for each of the nodes with respect to each of the resources:

- `node_budget_In` - Maximum amount of the resource that the node can receive on the inner ring.
- `node_budget_Out` - Maximum amount of the resource that the node can receive on the outer ring.
- `node_used_In` - Amount of the resource currently allocated to the node on the inner ring.

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- node_used_Out - Amount of the resource currently allocated to the node on the outer ring.
- node_quantum - Amount by which to increase or decrease node_used_In or Out at each resource allocation or deallocation. Resources are allocated in quanta in order to limit the frequency with which allocation and deallocation operations must be performed.

Other parameters used by the dispatcher in its allocation decisions are noted below.

Similarly, each node 22 maintains its own record of the following parameters for each resource with respect to each possible destination node:

- allowed_In - Maximum amount of the resource that is currently available for use by the node on the inner ring for data flow to the specific destination node.
- allowed_Out - Maximum amount of the resource that is currently available for use by the node on the outer ring for data flow to the specific destination node.
- used_In - Amount of the resource currently in use on the inner ring by clients of the node for data flow to the specific destination node.
- used_Out - Amount of the resource currently in use on the outer ring by clients of the node for data flow to the specific destination node.
- node_quantum - As noted above with reference to the dispatcher.

These parameters are used in making flow allocation decisions, as described with reference to the figures

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that follow. Communications between nodes 22 and dispatcher 28 in this regard preferably use a standard protocol, such as the Resource Reservation Protocol (RSVP), described by Braden et al., in IETF RFC 2205, which is available at the above-mentioned Web address and is incorporated herein by reference.

Fig. 3 is a flow chart that schematically illustrates a method for assigning resources to nodes 22, in accordance with a preferred embodiment of the present invention. In preparation for this method, a dispatcher entity is chosen or assigned within network 20, at an assignment step 30. Assuming that dispatcher 28 runs on one of nodes 22, as mentioned above, the dispatcher is preferably chosen by the nodes from among themselves using a suitable network management protocol. An example of such a protocol is the Subnet Bandwidth Manager (SBM) protocol, described by Yavatkar et al., in IETF RFC 2814, which is available at the above-mentioned Web address and is incorporated herein by reference. This protocol also enables the nodes to choose a substitute dispatcher if the original dispatcher is lost due to a node or network failure. At a learning step 32, dispatcher 28 learns the topology of rings 24 and 26 using methods known in the art, as specified by SRP (RFC 2892), for example, and builds the tables of network information to be used subsequently in flow allocations.

When a node receives a request from one of its clients to send data to another node, the node first checks to determine whether it has sufficient resources already allocated to it in order to service the request. If the allocated resources are inadequate, the node submits a resource request to the dispatcher, indicating

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the destination node, at a request step 34. The dispatcher then checks whether there are resources available to the node on either the inner or the outer ring, at an availability checking step 36. There must both be sufficient unallocated resources left in the specific node budget and unused resources left on the appropriate segments of at least one of the rings in order for the dispatcher to grant the node's resource request. If not, the dispatcher refuses the request, at a refusal step 38, and the node returns an appropriate error report to the client application. Preferably, the dispatcher returns an error message to the node indicating the resource or resources that were lacking and thus led to the refusal.

If resources are available, however, the dispatcher determines on which of the rings to allocate the resources, at an assignment step 40. The dispatcher allocates one or more additional quanta to the node on the selected ring for use in communicating with the requested destination node, and the node is then able to carry out the data transmission. The dispatcher also updates its resource utilization tables, incrementing the value of $R_{i,n}$ or $R_{o,n}$ for each of the segments along the data flow route by the number of additional resource quanta that it has allocated.

Fig. 4 is a flow chart that schematically shows details of request step 34, in accordance with a preferred embodiment of the present invention. As noted above, after receiving a resource request from one of its clients, the node first checks to determine whether it has sufficient resources already allocated to deal with the request. At an inner ring checking step 42, the node

tests whether its current used_In for each resource to the desired destination, added to the required amount of new resource required, is less than or equal to its current allowed_In for the destination. If so, the node carries out the requested transmission on the inner ring, at an inner ring transmission step 44, without having to communicate with the dispatcher. If the node does not have sufficient resources to handle the request on the inner ring, it performs a similar check with respect to used_Out and allowed_Out, at an outer ring checking step 46. Then, if there are sufficient resources on the outer ring, the node carries out the transmission on the outer ring, at an outer ring transmission step 48. Otherwise, the node requests one or more quanta of the resource, as needed, from the dispatcher, at a quantum request step 50. The process then continues at step 36 (Fig. 3).

Fig. 5 is a flow chart that schematically illustrates a method by which nodes release resources that they no longer need, in accordance with a preferred embodiment of the present invention. The method is invoked when one of the node's clients releases resources that it had earlier requested, at a release step 52. Preferably, a hysteresis factor, p , is used in determining whether to deallocate one or more quanta of the resource (i.e., to return the quanta to the dispatcher). Most preferably, p is set to a value between zero and one.

At a hysteresis step 54, the node determines whether the amount of the resource released by the client is sufficient to justify returning one or more quanta of the resource to the dispatcher. Formally (assuming for the moment that the resource was released on the inner ring),

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if the node finds that ($\text{used_In} - \text{resource amount released}$) is less than or equal to ($\text{allowed_In} - [1 + p] \times \text{node_quantum}$), then a deallocation step 56 is invoked. In this case, the node asks the dispatcher to remove one quantum from its allocation, while also indicating the destination node for which the removed quantum was previously used, leaving the node with sufficient resources to serve its remaining active data flows. The node reduces its values of both used_In and allowed_In accordingly for the relevant destination node, and the dispatcher similarly reduces node_used_In . The dispatcher also decrements $Ri.n$ for each of the segments along the data flow path. Outer ring resources are treated in like manner.

Otherwise, if amount of the released resource does not justify returning a quantum to the dispatcher, the node does not communicate with the dispatcher. Rather, the node keeps the resource for subsequent use, at a resource retainment step 58. In this case, used_In is reduced, but not allowed_In .

Fig. 6 is a flow chart that schematically shows details of availability checking step 36, in accordance with a preferred embodiment of the present invention. Dispatcher 28 uses the method of Fig. 6 to determine on which ring (if at all) to allocate resources in response to a node resource request. At a budget checking step 60, in response to a request by a node to allocate a quantum of resources, the dispatcher checks whether allocation of the additional quantum will put the node over budget on either or both of rings 24 and 26. In other words, the dispatcher checks for the inner ring whether $\text{node_used_In} + \text{node_quantum} > \text{node_budget_In}$, and

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likewise for the outer ring. If the quantum will put both rings over budget, the dispatcher refuses the node request at step 38. The test of step 60 is performed for each one of the resources that will be required in order to grant the node request. The dispatcher will not grant the request unless at least one of the rings has a sufficient budget for all of the resources required.

The dispatcher may alternatively find that the node does have sufficient resources in its budget on one of the rings in order to provide the requested resource, but not on the other ring, at a single ring budget step 62. In this case, the dispatcher proceeds to verify that there are sufficient resources available to fill the request on all of the relevant segments of the ring, at a verification step 64. For each of the segments on the chosen ring (say the inner ring) between the requesting node and its destination node, and for each of the resources concerned, the dispatcher checks whether $Ri.n + node_quantum \leq mRi.n$. If this condition is satisfied for all of the resources and all of the segments, the dispatcher assigns the requested resources at step 40. Otherwise, the dispatcher refuses the request at step 38.

It may also occur that the node has sufficient resources in its budget to satisfy the request on both of the rings, at a dual ring budget step 66. In this case, the dispatcher verifies that there are sufficient resources available on all of the relevant segments of both of the rings, at a dual verification step 68. The verification is performed in substantially the same manner as at step 64, described above. If neither of the rings has sufficient resources available on all of its relevant segments, the dispatcher refuses the resource

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request at step 38. If only one of the rings has sufficient resources available on all of its relevant segments, the dispatcher assigns the requested resources on that ring at step 40. If both rings have sufficient resources available on all of the relevant segments, then the dispatcher proceeds to choose the ring that has, generally speaking, the lower level of current resource allocation, at a ring selection step 70, and to assign the requested resources on this ring at step 40.

Fig. 7 is a flow chart that schematically shows details of ring selection step 70, in accordance with a preferred embodiment of the present invention. The method here is based on comparing relative resource usage levels for all of the relevant segments on both of the rings. The relative resource usage level is defined as $Ri.n/mRi.n$ for the inner ring, and $Ro.n/mRo.n$ for the outer ring. A usage ratio, for comparing the relative usage levels of the segments between the source and destination nodes on the outer ring path to those on the inner ring path, is defined as follows:

$$Usage_ratio\left(\frac{outer}{inner}\right) = \frac{Max(Ro.n/mRo.n)}{Max(Ri.n/mRi.n)}$$

Here the maximum of the usage levels is taken over all of the participating segments in each of the paths. The ratio is calculated for each of the resources that is of concern in filling the node request.

In carrying out step 70, the dispatcher makes use of two additional arbitrary parameters: `resource_threshold` and `reduce_quantum`. These parameters are used by the dispatcher to maintain a certain hysteresis in toggling

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back and forth between allocating resources on the inner and outer rings, as described below.

At a first ratio testing step 72, the dispatcher tests the (outer/inner) usage ratio for the resource that has highest priority, and determines whether it is greater than or equal to $1+T$, wherein T is initially set equal to the `resource_threshold`. If so, the dispatcher concludes that there is substantially heavier resource usage on the outer ring than on the inner ring. Consequently, the dispatcher selects the inner ring for allocation of the requested resources, at an inner ring selection step 74.

Alternatively, at a second ratio testing step 76, the dispatcher tests the (inner/outer) usage ratio (the inverse of the ratio shown in the equation above) for the highest-priority resource. In this case, if the ratio is greater than or equal to $1+T$, the dispatcher selects the outer ring, at an outer ring selection step 78.

If neither of the usage ratios is greater than or equal to $1+T$ for the highest-priority resource, the dispatcher checks to determine whether there are other resources to be taken into account, at a resource checking step 80. If so, the usage ratios for the next resource, in order of priority, are calculated, at a next resource step 82, and steps 72 and 76 are repeated.

If the usage ratios for all of the relevant resources are checked for a given value of T with no conclusive result, T is reduced by an amount equal to `reduce_quantum`, at a reduction step 84. Steps 72 and 76 are then repeated again using the reduced value of T for all of the resources in order of priority, as described above. This process continues until T is reduced to

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zero, at a termination step 86. At this point, the dispatcher has found the relative resource usage levels to be substantially the same for the inner and outer rings. It thus cannot use the usage levels as a selection criterion. Instead, the dispatcher preferably chooses the shortest path, with the smallest number of nodes to traverse, between the source and destination nodes, at a shortest path step 88. If the paths on the inner and outer rings are of the same length, the dispatcher uses a preprogrammed rule to choose one of the rings, such as always choosing the inner or the outer ring, or a random toggle.

Although preferred embodiments are described hereinabove with reference to a ring topology and to certain specific protocols, such as SRP and IP, used in conjunction with this topology, the principles of the present invention are similarly applicable to networks of other topologies, such as mesh topologies, and other protocols. It will thus be appreciated that the preferred embodiments described above are cited by way of example, and that the present invention is not limited to what has been particularly shown and described hereinabove. Rather, the scope of the present invention includes both combinations and subcombinations of the various features described hereinabove, as well as variations and modifications thereof which would occur to persons skilled in the art upon reading the foregoing description and which are not disclosed in the prior art.

CLAIMS

1. In a communication network that includes a plurality of nodes interconnected by links, a method for routing a data flow, comprising:

receiving a request to allocate one or more resources in the network so as to carry the data flow between first and second ones of the nodes over one of a plurality of paths therebetween, each such path comprising a respective sequence of the links;

determining, for the links comprised by each of the paths, respective levels of use of the requested resources due to communications in process over the network; and

selecting which of the paths is to carry the data flow responsive to the determined levels of use of the requested resources on the links comprised in each of the paths.

2. A method according to claim 1, wherein the network comprises an Internet Protocol (IP) network.

3. A method according to claim 1, wherein the nodes are interconnected in a ring, and wherein the plurality of paths comprises a first path traversing the ring in one direction and a second path traversing the ring in the opposite direction, and wherein selecting which of the paths is to carry the data flow comprises selecting the first or the second path.

4. A method according to claim 3, wherein selecting the first or the second path comprises conveying the data flow over an inner or outer data link ring within the network provided by a Spatial Reuse Protocol (SRP).

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5. A method according to claim 1, wherein the one or more resources comprise a link bandwidth.

6. A method according to claim 1, wherein the one or more resources comprise a processing power associated with each of the links.

7. A method according to claim 1, wherein selecting which of the paths is to carry the data flow comprises comparing an amount of the one or more resources requested to a resource budget assigned to the first node, and permitting the data flow only if allocating the requested resources will not cause a total of the resources allocated to the first node to exceed the budget.

8. A method according to claim 7, wherein comparing the amount of the one or more resources comprises comparing the amount of each of the resources requested to the resource budget assigned for each of the resources, and wherein permitting the data flow comprises permitting the flow only if all of the resources requested for at least one of the paths are within the budget.

9. A method according to claim 1, wherein selecting which of the paths is to carry the data flow comprises increasing an allocation to the first node of the one or more requested resources on the selected path by a predetermined quantum.

10. A method according to claim 1, wherein selecting which of the paths is to carry the data comprises verifying that a sufficient amount of the requested resources is available to carry the data flow on every one of the links comprised in the selected path.

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11. A method according to claim 1, wherein selecting which of the paths is to carry the data flow comprises selecting the one of the paths having the lowest level of a predetermined measure of use of the requested resources.

12. A method according to claim 11, wherein selecting the one of the paths comprises finding, for each of at least two of the paths, a maximum level of use of at least one of the requested resources, taken over all of the links comprised in the paths, and selecting the one of the paths having the lowest maximum level of use.

13. A method according to claim 1, wherein receiving the request comprises choosing a dispatcher within the network to manage allocation of the resources, wherein the dispatcher receives and processes the request.

14. A method according to claim 13, wherein choosing the dispatcher comprises choosing one of the nodes to act as the dispatcher.

15. A communication network, comprising:

a plurality of nodes;

a plurality of links, interconnecting the nodes to provide communications therebetween; and

a dispatcher, coupled to receive a request to allocate one or more resources in the network so as to carry the data flow between first and second ones of the nodes over one of a plurality of paths therebetween, each such path comprising a respective sequence of the links, and adapted to determine, for the links comprised in each of the paths, respective levels of use of the requested resources due to communications in process over the network and to select which of the paths is to carry the

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data flow responsive to the determined levels of use of the requested resources on the links comprised in each of the paths.

16. A network according to claim 15, wherein the nodes are adapted to communicate using an Internet Protocol (IP).

17. A network according to claim 15, wherein the nodes are interconnected in a ring, and wherein the plurality of paths comprises a first path traversing the ring in one direction and a second path traversing the ring in the opposite direction, and wherein the dispatcher is configured to select the first or the second path to carry the data flow.

18. A network according to claim 17, wherein the first and the second paths respectively comprise inner and outer data link ring within the network provided by a Spatial Reuse Protocol (SRP).

19. A network according to claim 15, wherein the one or more resources comprise a link bandwidth.

20. A network according to claim 15, wherein the one or more resources comprise a processing power associated with each of the links.

21. A network according to claim 15, wherein the dispatcher is adapted to compare an amount of the one or more resources requested to a resource budget assigned to the first node, and to permit the data flow only if allocating the requested resources will not cause a total of the resources allocated to the first node to exceed the budget.

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22. A network according to claim 21, wherein the dispatcher is adapted to compare the amount of each of the resources requested to the resource budget assigned for each of the resources, and to permit the data flow only if all of the resources requested for at least one of the paths are within the budget.

23. A network according to claim 15, wherein the dispatcher is configured to change an allocation to the first node of the one or more requested resources on the selected path by a predetermined quantum.

24. A network according to claim 15, wherein the dispatcher is adapt to select one of the paths to carry the data flow only after verifying that a sufficient amount of the requested resources is available to carry the data flow on every one of the links comprised in the selected path.

25. A network according to claim 15, wherein the dispatcher is adapted to select for carrying the data flow the one of the paths that has the lowest level of a predetermined measure of use of the requested resources.

26. A network according to claim 25, wherein the measure of use comprises, for each of at least two of the paths, a maximum level of use of at least one of the requested resources, taken over all of the links comprised in the paths.

27. A network according to claim 15, wherein the dispatcher is associated with one of the nodes.

28. A network according to claim 27, wherein the dispatcher is operative as a software process running on the associated node.

CLAIMS

1. In a communication network that includes a plurality of nodes interconnected by links, a method for routing a data flow, comprising:

receiving a request to allocate one or more resources in the network so as to carry the data flow between first and second ones of the nodes over one of a plurality of paths therebetween, each such path comprising a respective sequence of the links;

determining, for the links comprised by each of the paths, respective levels of use of the requested resources due to communications in process over the network; and

selecting which of the paths is to carry the data flow responsive to the determined levels of use of the requested resources on the links comprised in each of the paths.

2. A method according to claim 1, wherein the network comprises an Internet Protocol (IP) network.

3. A method according to claim 1, wherein the nodes are interconnected in a ring, and wherein the plurality of paths comprises a first path traversing the ring in one direction and a second path traversing the ring in the opposite direction, and wherein selecting which of the paths is to carry the data flow comprises selecting the first or the second path.

4. A method according to claim 3, wherein selecting the first or the second path comprises conveying the data flow over an inner or outer data link ring within the network provided by a Spatial Reuse Protocol (SRP).

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5. A method according to claim 1, wherein the one or more resources comprise a link bandwidth.

6. A method according to claim 1, wherein the one or more resources comprise a processing power associated with each of the links.

7. A method according to claim 1, wherein selecting which of the paths is to carry the data flow comprises comparing an amount of the one or more resources requested to a resource budget assigned to the first node, and permitting the data flow only if allocating the requested resources will not cause a total of the resources allocated to the first node to exceed the budget.

8. A method according to claim 7, wherein comparing the amount of the one or more resources comprises comparing the amount of each of the resources requested to the resource budget assigned for each of the resources, and wherein permitting the data flow comprises permitting the flow only if all of the resources requested for at least one of the paths are within the budget.

9. A method according to claim 1, wherein selecting which of the paths is to carry the data flow comprises increasing an allocation to the first node of the one or more requested resources on the selected path by a predetermined quantum.

10. A method according to claim 1, wherein selecting which of the paths is to carry the data comprises verifying that a sufficient amount of the requested resources is available to carry the data flow on every one of the links comprised in the selected path.

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11. A method according to claim 1, wherein selecting which of the paths is to carry the data flow comprises selecting the one of the paths having the lowest level of a predetermined measure of use of the requested resources.

12. A method according to claim 11, wherein selecting the one of the paths comprises finding, for each of at least two of the paths, a maximum level of use of at least one of the requested resources, taken over all of the links comprised in the paths, and selecting the one of the paths having the lowest maximum level of use.

13. A method according to claim 1, wherein receiving the request comprises choosing a dispatcher within the network to manage allocation of the resources, wherein the dispatcher receives and processes the request.

14. A method according to claim 13, wherein choosing the dispatcher comprises choosing one of the nodes to act as the dispatcher.

15. A communication network, comprising:

a plurality of nodes;

a plurality of links, interconnecting the nodes to provide communications therebetween; and

a dispatcher, coupled to receive a request to allocate one or more resources in the network so as to carry the data flow between first and second ones of the nodes over one of a plurality of paths therebetween, each such path comprising a respective sequence of the links, and adapted to determine, for the links comprised in each of the paths, respective levels of use of the requested resources due to communications in process over the network and to select which of the paths is to carry the

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data flow responsive to the determined levels of use of the requested resources on the links comprised in each of the paths.

16. A network according to claim 15, wherein the nodes are adapted to communicate using an Internet Protocol (IP).

17. A network according to claim 15, wherein the nodes are interconnected in a ring, and wherein the plurality of paths comprises a first path traversing the ring in one direction and a second path traversing the ring in the opposite direction, and wherein the dispatcher is configured to select the first or the second path to carry the data flow.

18. A network according to claim 17, wherein the first and the second paths respectively comprise inner and outer data link ring within the network provided by a Spatial Reuse Protocol (SRP).

19. A network according to claim 15, wherein the one or more resources comprise a link bandwidth.

20. A network according to claim 15, wherein the one or more resources comprise a processing power associated with each of the links.

21. A network according to claim 15, wherein the dispatcher is adapted to compare an amount of the one or more resources requested to a resource budget assigned to the first node, and to permit the data flow only if allocating the requested resources will not cause a total of the resources allocated to the first node to exceed the budget.

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22. A network according to claim 21, wherein the dispatcher is adapted to compare the amount of each of the resources requested to the resource budget assigned for each of the resources, and to permit the data flow only if all of the resources requested for at least one of the paths are within the budget.

23. A network according to claim 15, wherein the dispatcher is configured to change an allocation to the first node of the one or more requested resources on the selected path by a predetermined quantum.

24. A network according to claim 15, wherein the dispatcher is adapted to select one of the paths to carry the data flow only after verifying that a sufficient amount of the requested resources is available to carry the data flow on every one of the links comprised in the selected path.

25. A network according to claim 15, wherein the dispatcher is adapted to select for carrying the data flow the one of the paths that has the lowest level of a predetermined measure of use of the requested resources.

26. A network according to claim 25, wherein the measure of use comprises, for each of at least two of the paths, a maximum level of use of at least one of the requested resources, taken over all of the links comprised in the paths.

27. A network according to claim 15, wherein the dispatcher is associated with one of the nodes.

28. A network according to claim 27, wherein the dispatcher is operative as a software process running on the associated node.

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ABSTRACT

In a communication network that includes a plurality of nodes interconnected by links, a method for routing a data flow includes receiving a request to allocate one or more resources in the network so as to carry the data flow between first and second ones of the nodes over one of a plurality of paths therebetween, each such path including a respective sequence of the links. For the links included in each of the paths, respective levels of use of the requested resources due to communications in process over the network are determined. The path that is to carry the data flow is selected responsive to the determined levels of use of the requested resources on the links included in each of the paths.

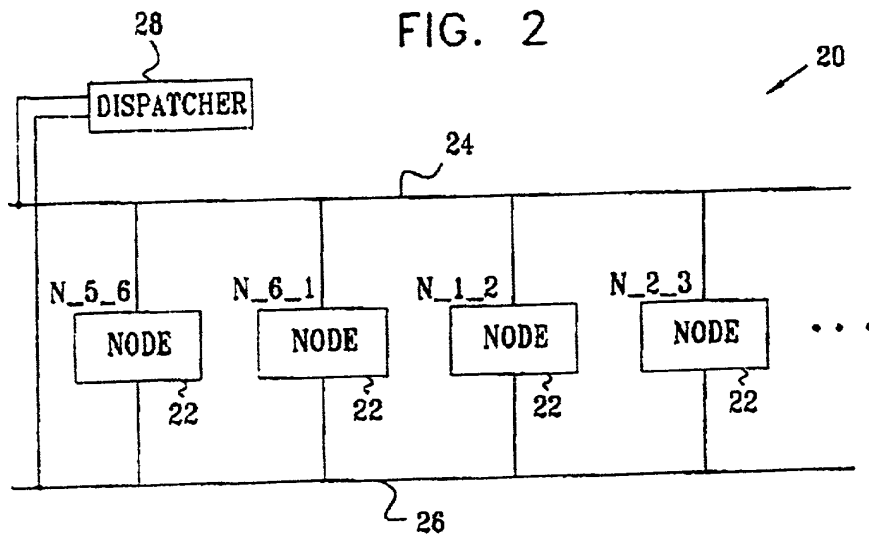
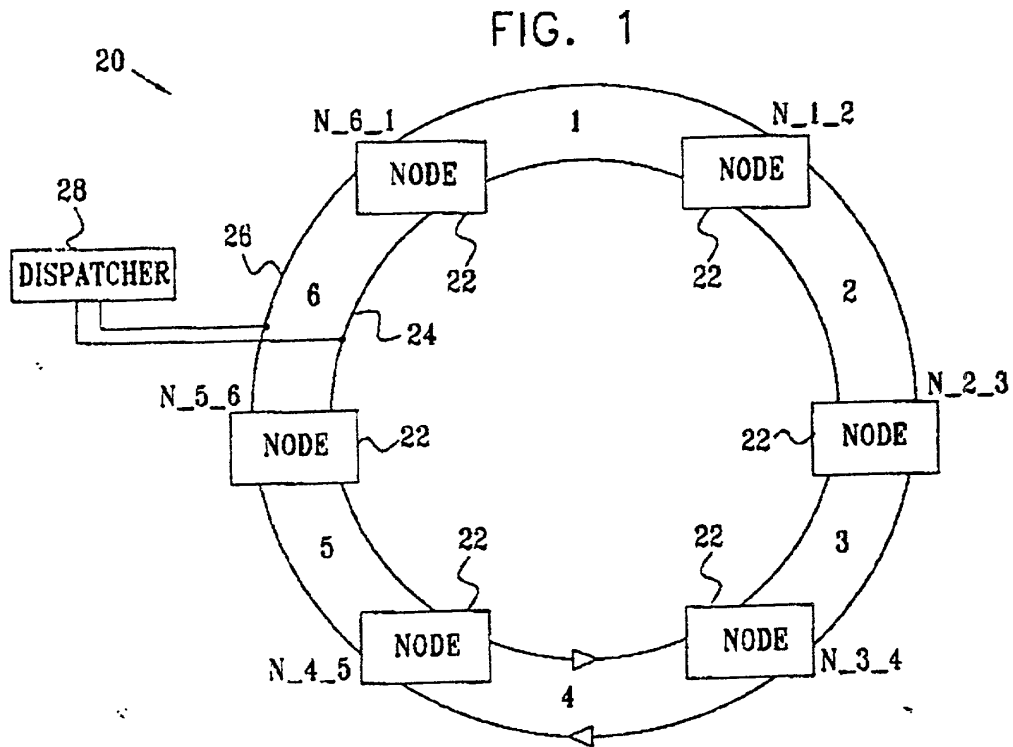
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ABSTRACT

In a communication network that includes a plurality of nodes interconnected by links, a method for routing a data flow includes receiving a request to allocate one or more resources in the network so as to carry the data flow between first and second ones of the nodes over one of a plurality of paths therebetween, each such path including a respective sequence of the links. For the links included in each of the paths, respective levels of use of the requested resources due to communications in process over the network are determined. The path that is to carry the data flow is selected responsive to the determined levels of use of the requested resources on the links included in each of the paths.

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FIG. 1



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FIG. 3

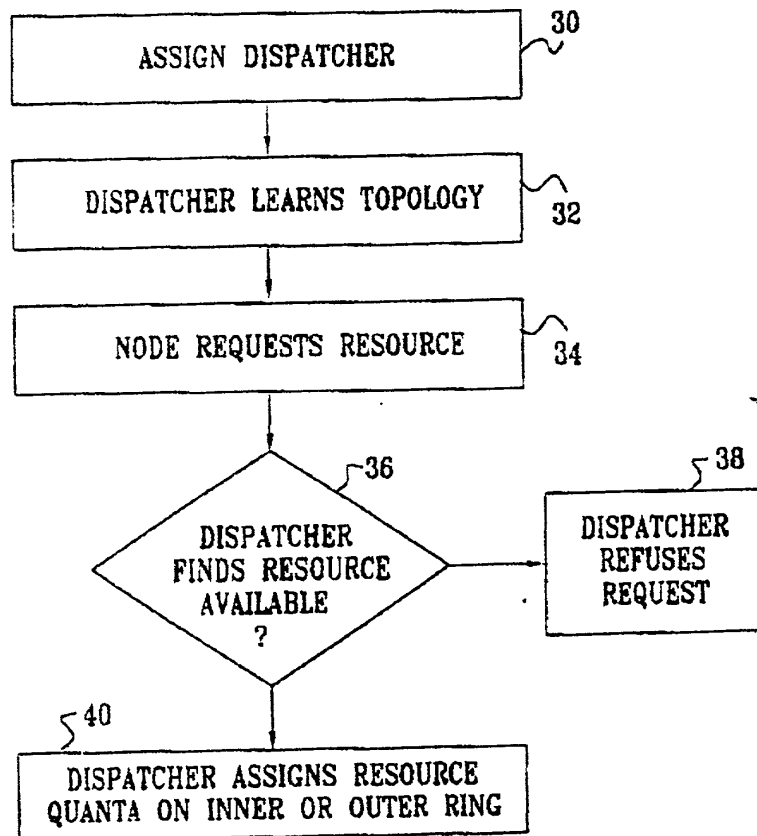


FIG. 4

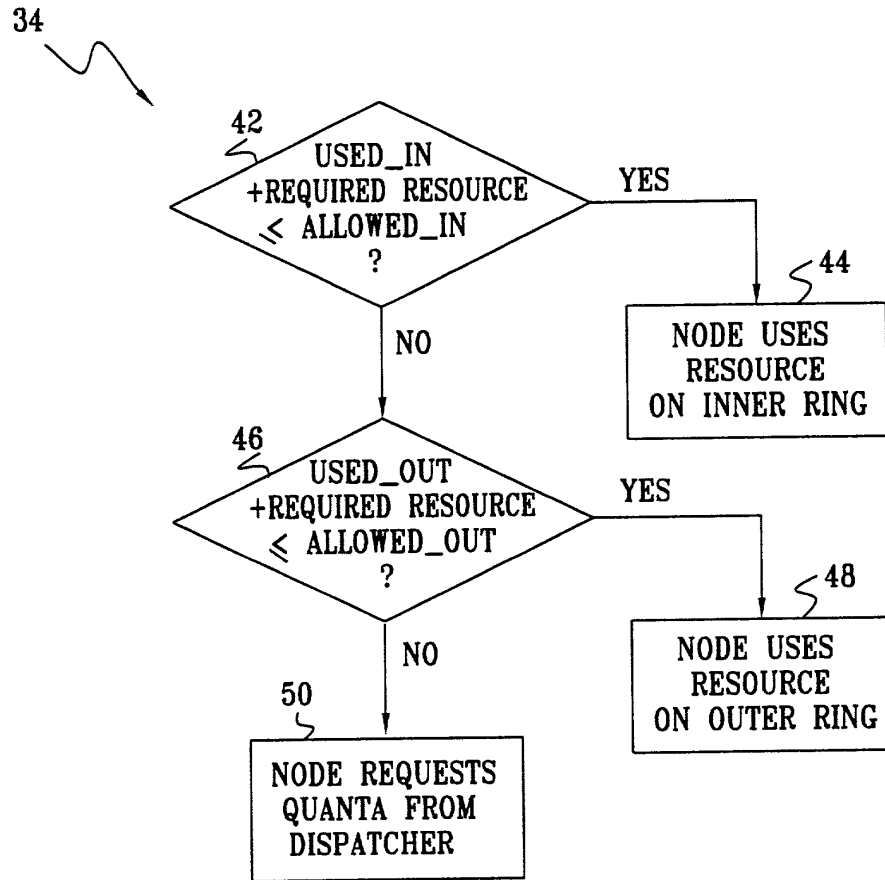


FIG. 5

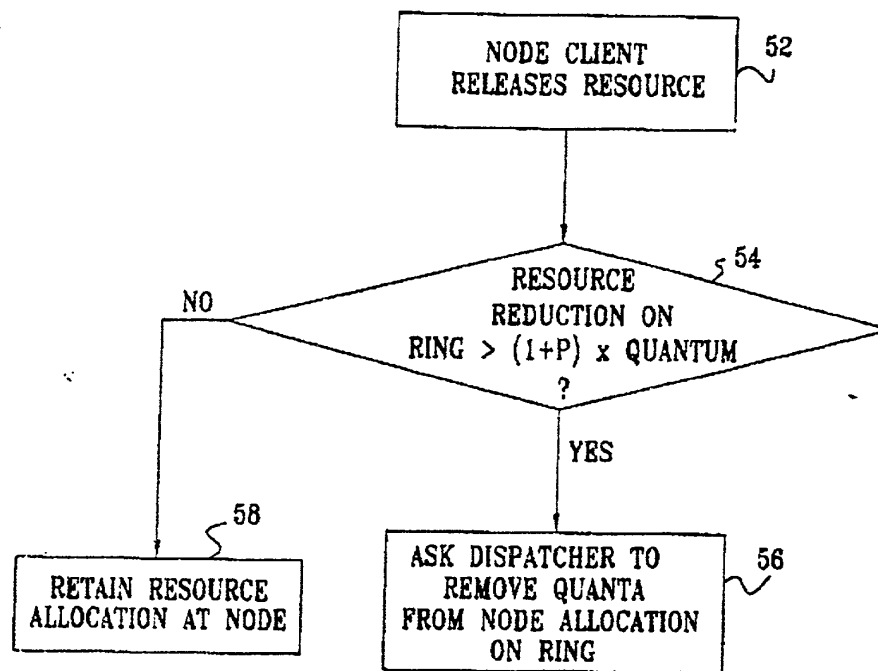
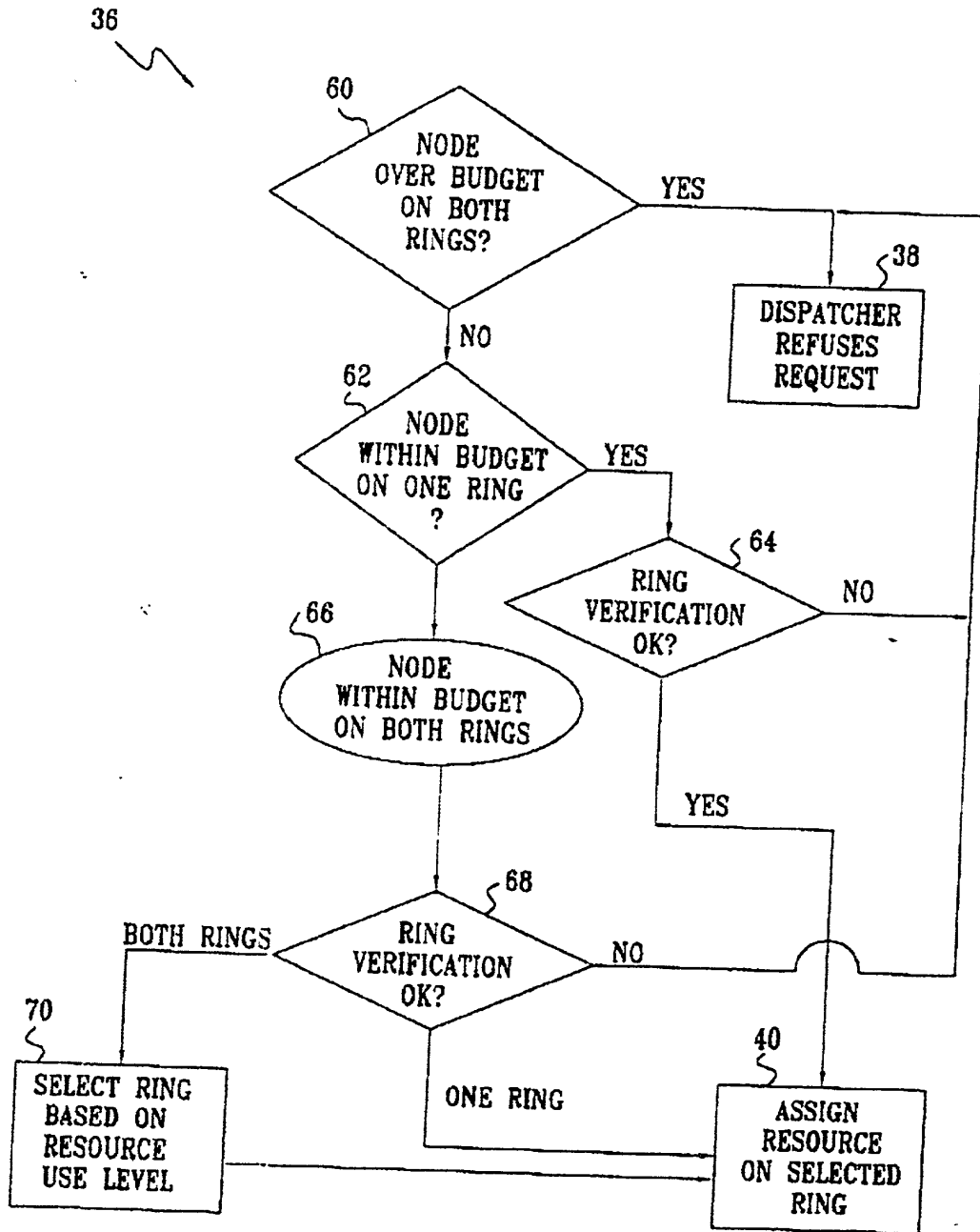
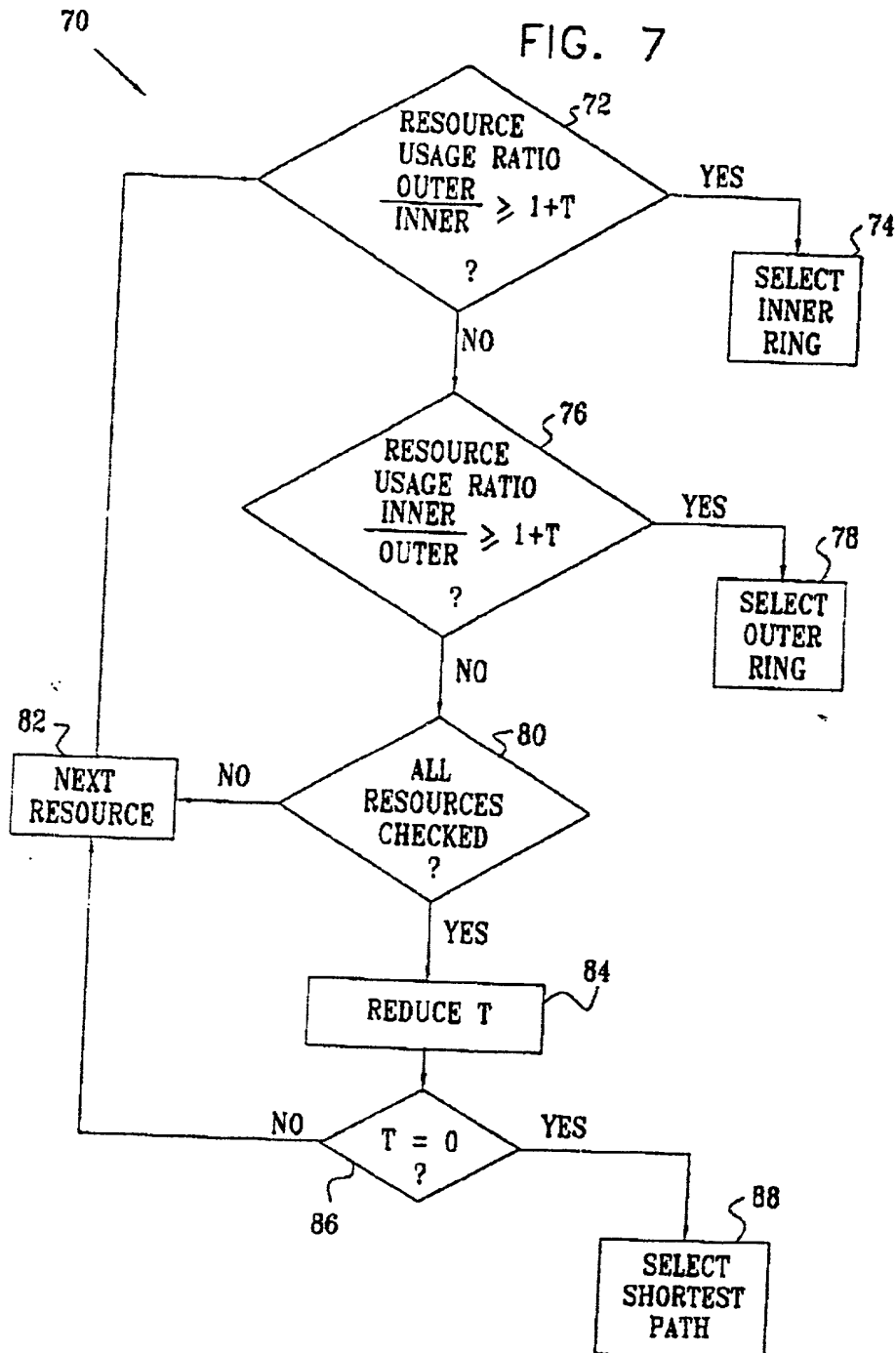


FIG. 6



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[illegible]

FIG. 1

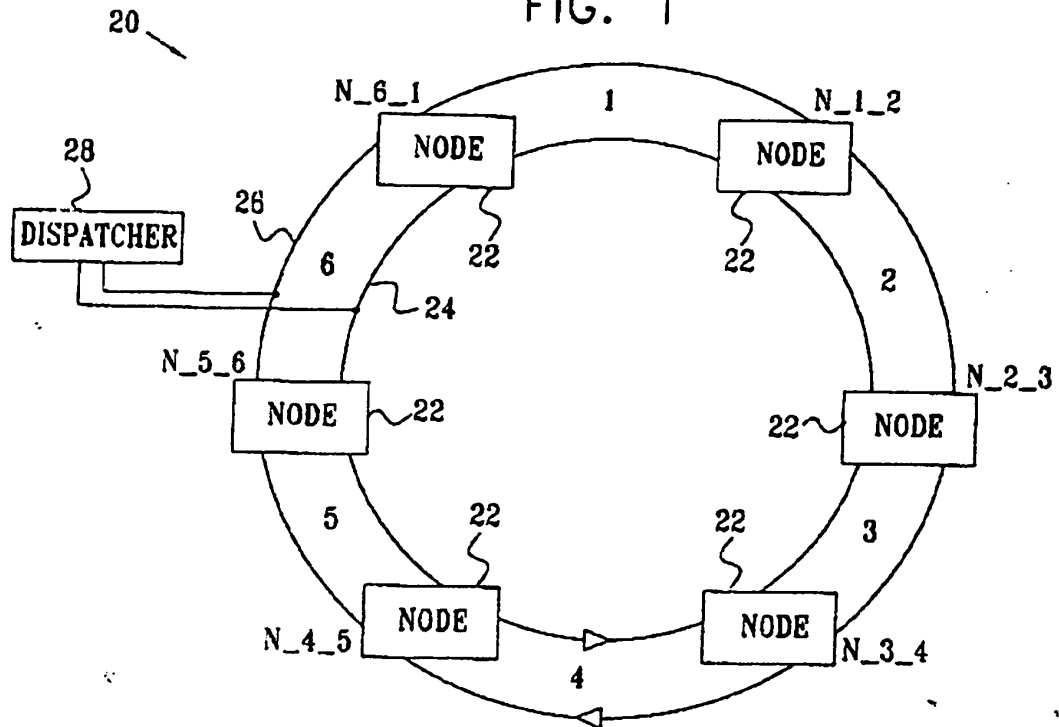
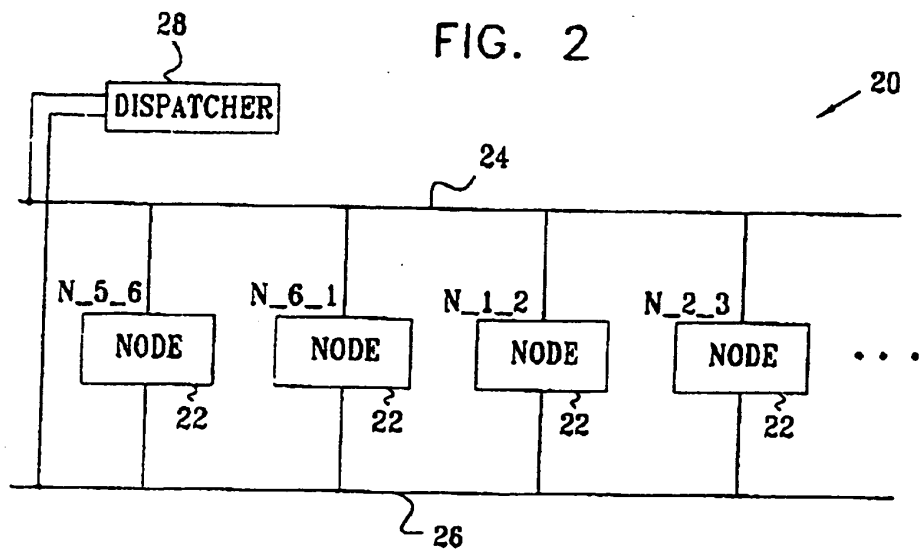


FIG. 2



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FIG. 3

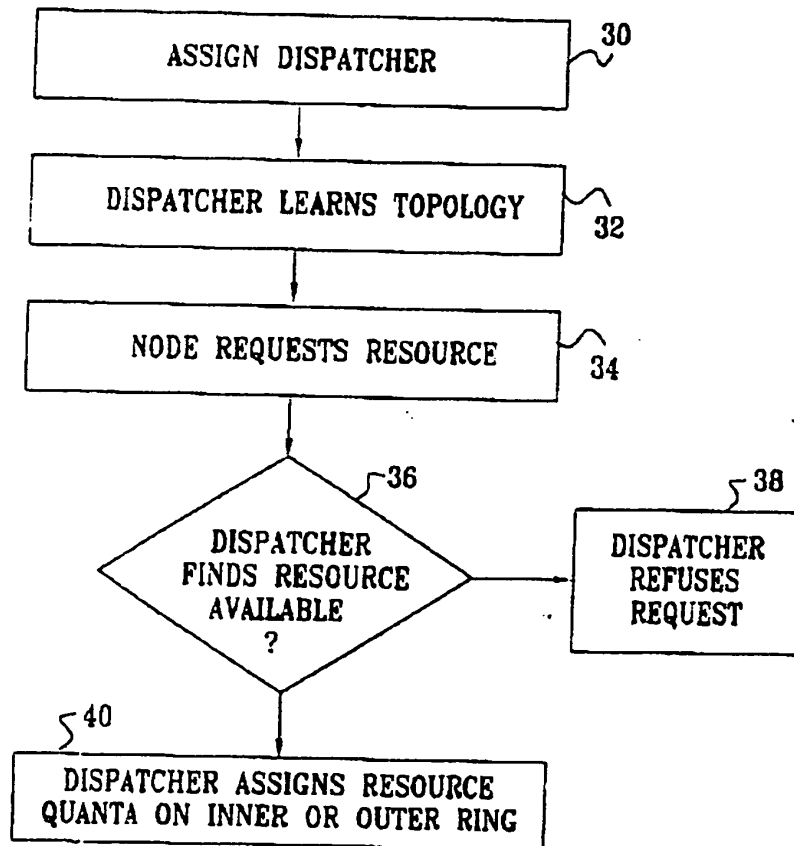


FIG. 4

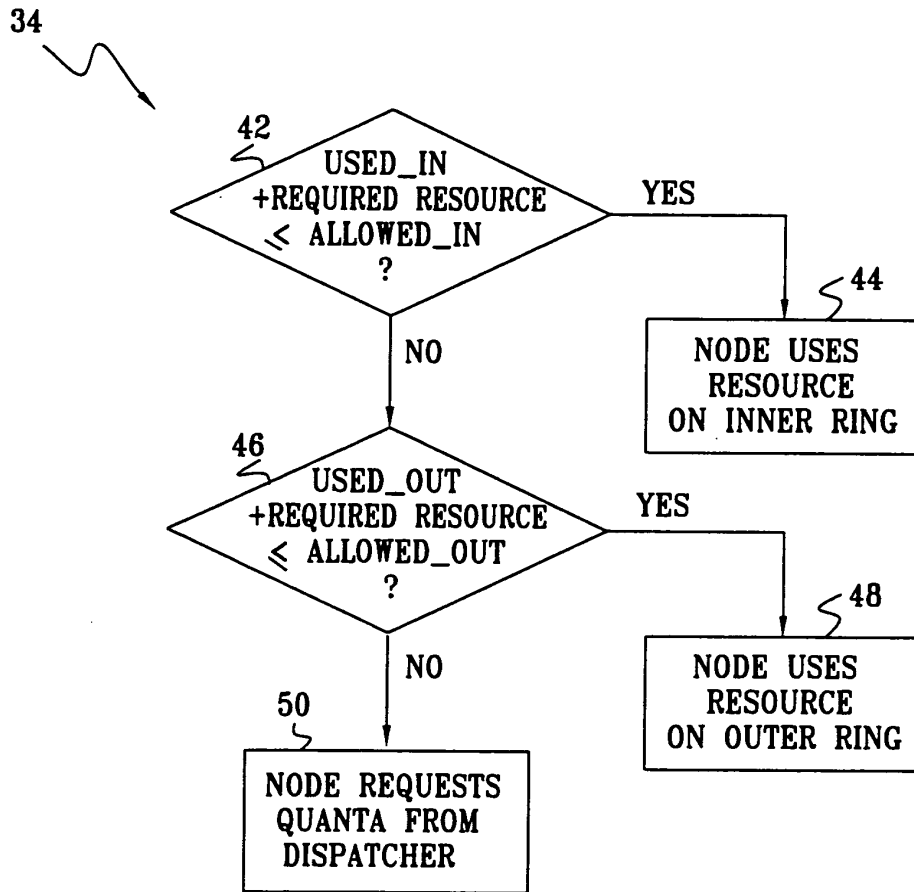


FIG. 5

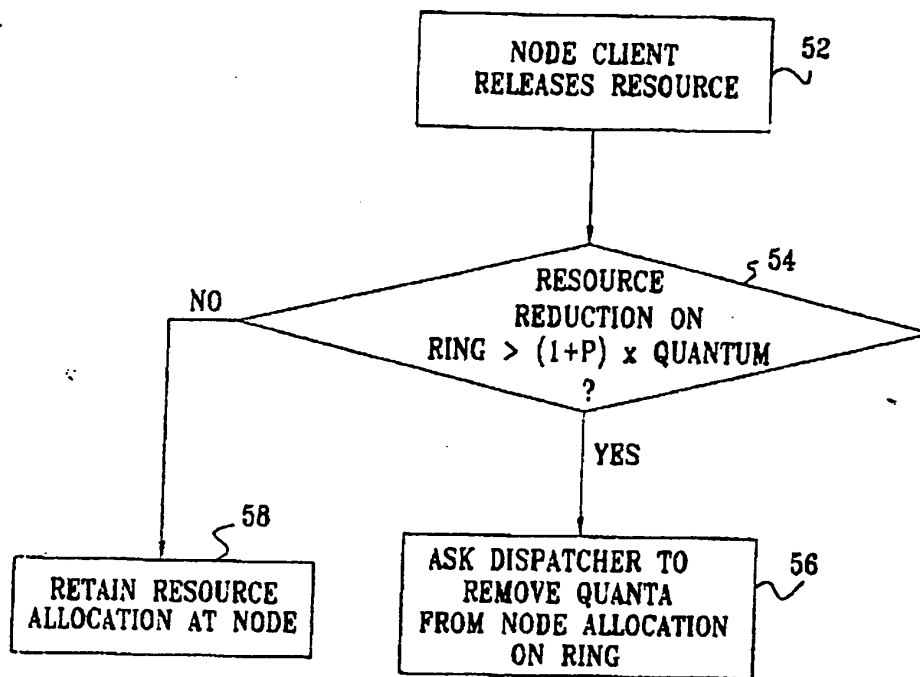
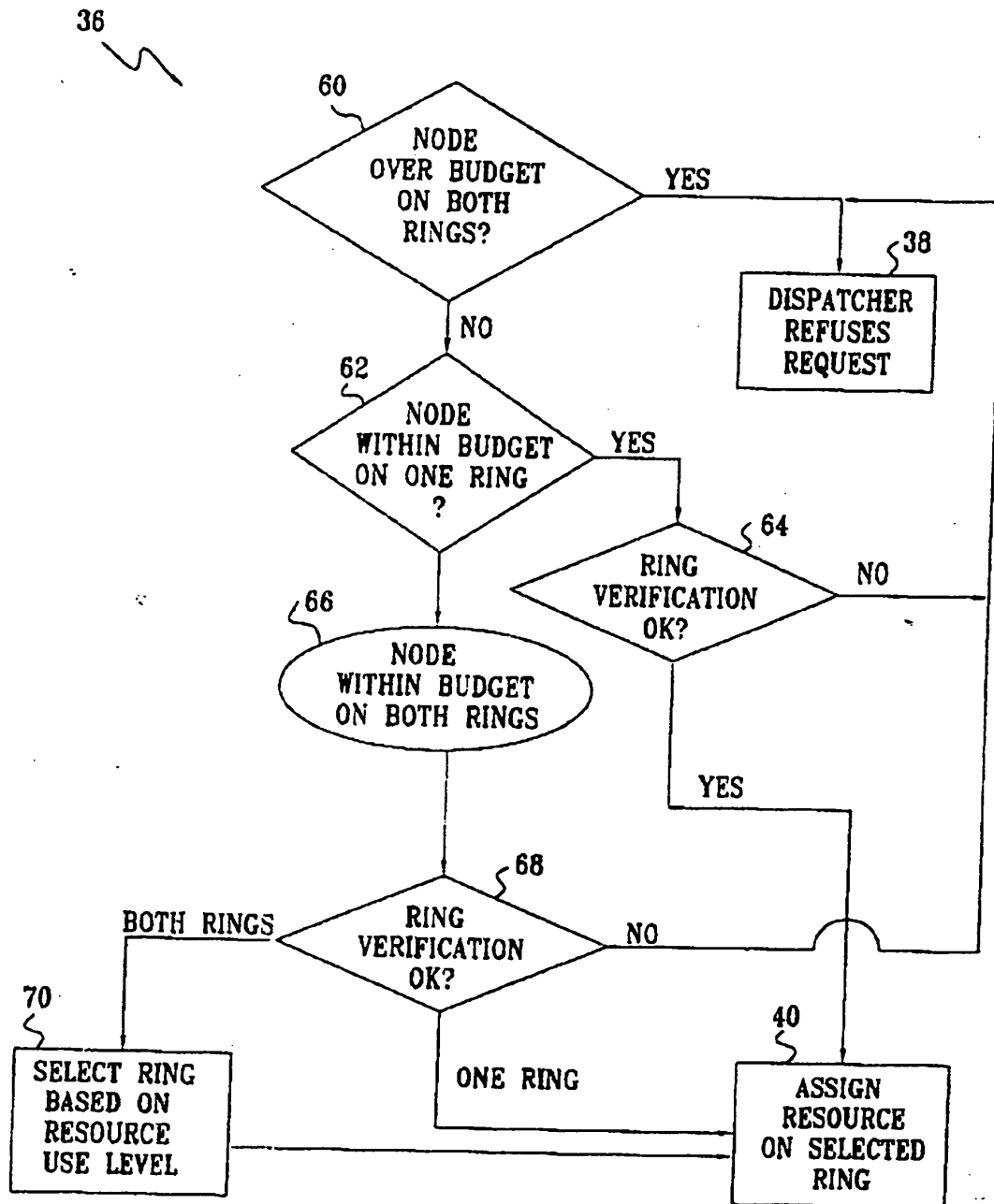
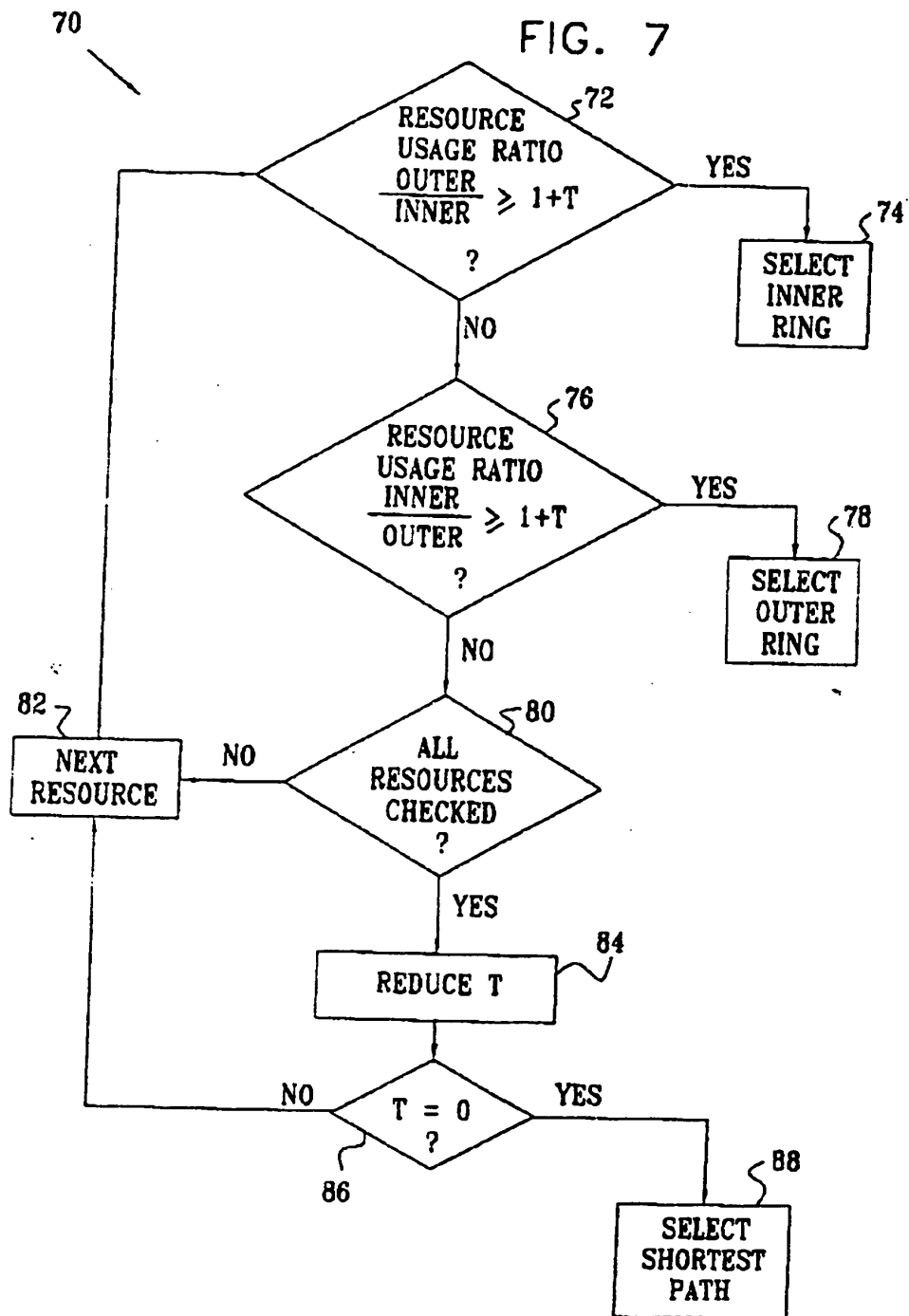


FIG. 6



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WASHINGTON, D.C. 20231
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Bib Data Sheet

CONFIRMATION NO. 6186

SERIAL NUMBER 09/756,946	FILING DATE 01/09/2001 RULE	CLASS 370	GROUP ART UNIT 2661	ATTORNEY DOCKET NO. 6727/01145
APPLICANTS Leon Bruckman, Petach Tikva, ISRAEL; ** CONTINUING DATA ***** <i>N/A</i> ** FOREIGN APPLICATIONS ***** <i>N/A</i>				
IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 02/22/2001				
Foreign Priority claimed ☐ yes ☒ no 35 USC 119 (a-d) conditions met ☐ yes ☐ no ☐ Met after Allowance Verified and Acknowledged <i>[Signature]</i> Examiner's Signature <i>[Signature]</i> Initials <i>[Signature]</i>		STATE OR COUNTRY ISRAEL	SHEETS DRAWING 6	TOTAL CLAIMS 28
			INDEPENDENT CLAIMS 2	
ADDRESS DARBY & DARBY P.C. 805 Third Avenue New York ,NY 10022				
TITLE Flow allocation in a ring topology				
FILING FEE RECEIVED 854	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit	

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POSITION	INITIALS	ID NO.	DATE
FEE DETERMINATION			
O.I.P.E. CLASSIFIER		49	2/3/01
FORMALITY REVIEW	JS	TC906	02/22/01
RESPONSE FORMALITY REVIEW			

INDEX OF CLAIMS

✓ Rejected N Non-elected
 = ... Allowed I Interference
 - (Through numeral)... Canceled A Appeal
 + ... Restricted O Objected

Claim	Date
Final Original	
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	Class	Subclass
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PATENT NUMBER

U.S. UTILITY Patent Application

O.I.P.E. TR SCANNED GCH3 Q.A. JET	PATENT DATE
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APPLICATION NO. 09/756946	CONT/PRIOR	CLASS 370	SUBCLASS 460	ART UNIT ~~2661~~	EXAMINER KADING ~~TRAJ~~
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3. Secretary	3. Mr. J. H. ...
4. Treasurer	4. Mr. J. H. ...
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94. Member	94. Mr. J. H. ...
95. Member	95. Mr. J.

Leon Bruckman

Flow allocation in a ring topology

PTO-2040
12/99[illegible]

☐ TERMINAL DISCLAIMER	DRAWINGS Sheets Drwg. Figs. Drwg. Print Fig.		CLAIMS ALLOWED	
			Total Claims	Print Claim for O.G.
☐ The term of this patent subsequent to _____ (date) has been disclaimed. ☐ The term of this patent shall not extend beyond the expiration date of U.S Patent. No. _____ _____ _____	_____ (Assistant Examiner) (Date)		NOTICE OF ALLOWANCE MAILED	
	_____ (Primary Examiner) (Date)		ISSUE FEE	
			Amount Due	Date Paid
☐ The terminal ____ months of this patent have been disclaimed.	_____ (Legal Instruments Examiner) (Date)		ISSUE BATCH NUMBER	
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#83

Docket No.: _____

**DECLARATION
AND POWER OF ATTORNEY
Original Application**

As a below named inventor, I declare that the information given herein is true, that I believe that I am the original, first and sole inventor if only one name is listed at 1 below, or a joint inventor if plural inventors are named below, of the invention entitled:

FLOW ALLOCATION IN A RING TOPOLOGY

which is described and claimed in:

☒ the attached specification or ☐ the specification in application
Serial No.
Filed

that I do not know and do not believe that the same was ever known or used in the United States of America before my or our invention thereof or patented or described in any printed publication in any country before my or our invention thereof, or more than one year prior to this application, or in public use or on sale in the United States of America more than one year prior to this application, that the invention has not been patented or made the subject of an inventor's certificate issued before the date of this application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months prior to this application, that I acknowledge my duty to disclose information of which I am aware which is material to patentability in accordance with 37 CFR §1.56. I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I hereby claim the priority benefits under 35 U.S.C. §119 of any application(s) for patent or inventor's certificate listed below. All foreign applications for patent or inventor's certificate on this invention filed by me or my legal representatives or assigns prior to the application(s) of which priority is claimed are also identified below.

PRIOR APPLICATION(S), IF ANY, OF WHICH PRIORITY IS CLAIMED

<u>COUNTRY</u>	<u>APPLICATION NO.</u>	<u>DATE OF FILING</u>
NONE		

ALL FOREIGN APPLICATIONS, IF ANY, FILED PRIOR
TO THE APPLICATION(S) OF WHICH PRIORITY IS CLAIMED

COUNTRY APPLICATION NO. DATE OF FILING

POWER OF ATTORNEY:

As a named inventor, I hereby appoint the following attorney(s) and/or agents(s) to prosecute this application and transact all business in the Patent and Trademark office connected therewith: Gordon D. Coplein #19,165, William F. Dudine, Jr. #20,569, Michael J. Sweedler #19,937, S. Peter Ludwig #25,351, Paul Fields #20,298, Marc S. Gross #19,614, Joseph B. Lerch #26,936, Melvin C. Garner #26,272, Ethan Horwitz #27,646, Beverly B. Goodwin #28,417, Adda C. Gogoris #29,714, Martin E. Goldstein #20,869, Bert J. Lewen #19,407, Henry Sternberg #22,408, Peter C. Schechter #31,662, Robert Schaffer #31,194, Robert C. Sullivan, Jr. #30,499, Ira J. Levy #35,587, Joseph R. Robinson #33,448, Scott G. Lindvall #40,325

all of the firm of DARBY & DARBY P.C., 805 Third Avenue, New York, NY 10022

SEND CORRESPONDENCE TO:

DIRECT TELEPHONE CALLS TO:

DARBY & DARBY P.C.
805 Third Avenue
New York, NY 10022

S. Peter Ludwig

212-527-7700

FULL NAME AND RESIDENCE OF INVENTOR 1

LAST NAME: BRUCKMAN

FIRST NAME: Leon

MIDDLE NAME:

CITY: Petach Tikva

STATE OR FOREIGN COUNTRY: Israel

COUNTRY OF CITIZENSHIP: Israel

POST OFFICE ADDRESS:

3 Degei Reuven Street

CITY:

Petach Tikva

STATE OR COUNTRY:

Israel

ZIP CODE: 49402

FULL NAME AND RESIDENCE OF INVENTOR 2

LAST NAME: FIRST NAME: MIDDLE NAME:
CITY: STATE OR FOREIGN COUNTRY:
COUNTRY OF CITIZENSHIP:
POST OFFICE ADDRESS: CITY: STATE OR COUNTRY:
ZIP CODE:

FULL NAME AND RESIDENCE OF INVENTOR 3

LAST NAME: FIRST NAME: MIDDLE NAME:
CITY: STATE OR FOREIGN COUNTRY:
COUNTRY OF CITIZENSHIP:
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I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

SIGNATURE OF INVENTOR 1:  DATED: 19/12/00

SIGNATURE OF INVENTOR 2: _____ DATED: _____

SIGNATURE OF INVENTOR 3: _____ DATED: _____

#83

Docket No.: _____

**DECLARATION
AND POWER OF ATTORNEY
Original Application**

As a below named inventor, I declare that the information given herein is true, that I believe that I am the original, first and sole inventor if only one name is listed at 1 below, or a joint inventor if plural inventors are named below, of the invention entitled:

FLOW ALLOCATION IN A RING TOPOLOGY

which is described and claimed in:

☒ the attached specification or ☐ the specification in application
Serial No.
Filed

that I do not know and do not believe that the same was ever known or used in the United States of America before my or our invention thereof or patented or described in any printed publication in any country before my or our invention thereof, or more than one year prior to this application, or in public use or on sale in the United States of America more than one year prior to this application, that the invention has not been patented or made the subject of an inventor's certificate issued before the date of this application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months prior to this application, that I acknowledge my duty to disclose information of which I am aware which is material to patentability in accordance with 37 CFR §1.56. I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I hereby claim the priority benefits under 35 U.S.C. §119 of any application(s) for patent or inventor's certificate listed below. All foreign applications for patent or inventor's certificate on this invention filed by me or my legal representatives or assigns prior to the application(s) of which priority is claimed are also identified below.

PRIOR APPLICATION(S), IF ANY, OF WHICH PRIORITY IS CLAIMED

<u>COUNTRY</u>	<u>APPLICATION NO.</u>	<u>DATE OF FILING</u>
NONE		

FOOTNOTES 94695260

<u>COUNTRY</u>	<u>APPLICATION NO.</u>	<u>DATE OF FILING</u>
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As a named inventor, I hereby appoint the following attorney(s) and/or agents(s) to prosecute this application and transact all business in the Patent and Trademark office connected therewith: Gordon D. Coplein #19,165, William F. Dudine, Jr. #20,569, Michael J. Sweedler #19,937, S. Peter Ludwig #25,351, Paul Fields #20,298, Marc S. Gross #19,614, Joseph B. Lerch #26,936, Melvin C. Garner #26,272, Ethan Horwitz #27,646, Beverly B. Goodwin #28,417, Adda C. Gogoris #29,714, Martin E. Goldstein #20,869, Bert J. Lewen #19,407, Henry Sternberg #22,408, Peter C. Schechter #31,662, Robert Schaffer #31,194, Robert C. Sullivan, Jr. #30,499, Ira J. Levy #35,587, Joseph R. Robinson #33,448, Scott G. Lindvall #40,325

DIRECT TELEPHONE CALLS TO:

S. Peter Ludwig
212-527-7700

MIDDLE NAME:

STATE OR FOREIGN COUNTRY: Israel

STATE OR COUNTRY:

Israel

ZIP CODE: 49402

FULL NAME AND RESIDENCE OF INVENTOR 2

LAST NAME:

FIRST NAME:

MIDDLE NAME:

CITY:

STATE OR FOREIGN COUNTRY:

COUNTRY OF CITIZENSHIP:

POST OFFICE ADDRESS:

CITY:

STATE OR COUNTRY:

ZIP CODE:

FULL NAME AND RESIDENCE OF INVENTOR 3

LAST NAME:

FIRST NAME:

MIDDLE NAME:

CITY:

STATE OR FOREIGN COUNTRY:

COUNTRY OF CITIZENSHIP:

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

SIGNATURE OF INVENTOR 1:  DATED: 19/12/00

SIGNATURE OF INVENTOR 2: _____ DATED: _____

SIGNATURE OF INVENTOR 3: _____ DATED: _____

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SEARCHED			
Class	Sub.	Date	Exmr.
370	389	7-16-04	
↓	375.21	↓	↓
	375.41		
	375.42		
	406		
	439		
	460		

INTERFERENCE SEARCHED			
Class	Sub.	Date	Exmr.

SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
	Date	Exmr.
EST	7-16-04	

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D Beck
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805 Third Avenue
New York, New York 10022
212-527-7700

Docket No: 6727/01145

09756946-010901

Box PATENT APPLICATION
Assistant Commissioner for Patents
Washington, DC 20231

Sir:

Enclosed please find an application for United States patent as identified below:

Inventor/s (name ALL inventors): **Leon BRUCKMAN**

Title: **FLOW ALLOCATION IN A RING TOPOLOGY**

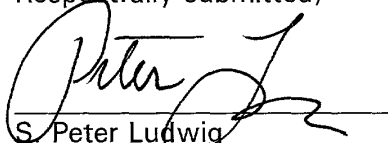
including the items indicated:

1. Specification and 28 claims: 2 indep.; 26 dep.; _ multiple dep.
2. ☒ Executed declaration and power of attorney
☐ Unexecuted declaration and power of attorney
3. ☒ Formal drawings, 6 sheets (Figs. 1-7)
☐ Informal drawings, _ sheets (Figs.)
4. ☒ Assignment for recording to: ORCKIT COMMUNICATIONS LTD.

5. [X] Check in amount of \$894.00, (\$854 filing; \$40 recording)
(See attached **Fee Computation Sheet**)

Date: January 8, 2001

Respectfully submitted,


S. Peter Ludwig
Reg. No. 25,351
Attorney for Applicant(s)

FOR FILING

Serial No. TO BE ASSIGNED

Docket No. 6727/01145

PATENT FEE COMPUTATION SHEET

	No. of Claims Presented	Extra Claims Previously Paid For	Number of Extra Claims	Rate
Basic Fee				\$710.00
Total Claims	28 - 20	- 0 = 8	x \$18.00	\$144.00
Independent Claims	2 - 3	- 0 = 0	x \$80.00	\$0.00
Multiple Dependent Claims		- if so, add	\$270.00	\$0.00
Surcharge for late submission of filing fee and/or declaration (\$130.00)				\$0.00
SUBTOTAL				\$854.00
☐ Small Entity REDUCTION (Half of Subtotal)				\$0.00
Fee for recordation of assignment (\$40.00)				\$40.00
Charge for filing non-English language application (\$130.00)				\$0.00
TOTAL				\$894.00

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DARBY & DARBY P.C.

805 Third Avenue
New York, New York 10022
212-527-7700

Docket No: 6727/01145

1c978 U.S. PTO
01/09/01

Box PATENT APPLICATION
Assistant Commissioner for Patents
Washington, DC 20231

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☐ Informal drawings, _ sheets (Figs.)
4. ☒ Assignment for recording to: ORCKIT COMMUNICATIONS LTD.

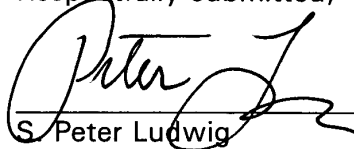
b

3

5. [X] Check in amount of \$894.00, (\$854 filing; \$40 recording)
(See attached **Fee Computation Sheet**)

Date: January 8, 2001

Respectfully submitted,


S. Peter Ludwig
Reg. No. 25,351
Attorney for Applicant(s)

TO BE ASSIGNED

Serial No. TO BE ASSIGNED

Docket No. 6727/01145

-2-

PATENT FEE COMPUTATION SHEET

	No. of Claims Presented	Extra Claims Previously Paid For	Number of Extra Claims	Rate
Basic Fee				\$710.00
Total Claims	28 - 20	- 0 = 8	x \$18.00	\$144.00
Independent Claims	2 - 3	- 0 = 0	x \$80.00	\$0.00
Multiple Dependent Claims		- if so, add	\$270.00	\$0.00
Surcharge for late submission of filing fee and/or declaration (\$130.00)				\$0.00
SUBTOTAL				\$854.00
☐ Small Entity REDUCTION (Half of Subtotal)				\$0.00
Fee for recordation of assignment (\$40.00)				\$40.00
Charge for filing non-English language application (\$130.00)				\$0.00
TOTAL				\$894.00

Serial No. TO BE ASSIGNED

Docket No. 6727/01145

BEST AVAILABLE COPY

PATENT APPLICATION FEE DETERMINATION RECORD

Effective October 1, 2000

Application or Docket Number

09756946

CLAIMS AS FILED - PART I

(Column 1) (Column 2)

TOTAL CLAIMS		
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	28 minus 20 =	* 8
INDEPENDENT CLAIMS	2 minus 3 =	*
MULTIPLE DEPENDENT CLAIM PRESENT ☐		

* If the difference in column 1 is less than zero, enter "0" in column 2

SMALL ENTITY TYPE ☐ OR

OTHER THAN SMALL ENTITY

RATE	FEE
BASIC FEE	355.00
X\$ 9=	
X40=	
+135=	
TOTAL	

RATE	FEE
BASIC FEE	710.00
X\$18=	144.00
X80=	
+270=	
TOTAL	854.00

CLAIMS AS AMENDED - PART II

(Column 1) (Column 2) (Column 3)

AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total	*	Minus	**	=
	Independent	*	Minus	***	=
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐				

SMALL ENTITY OR

OTHER THAN SMALL ENTITY

RATE	ADDITIONAL FEE
X\$ 9=	
X40=	
+135=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$18=	
X80=	
+270=	
TOTAL ADDIT. FEE	

(Column 1) (Column 2) (Column 3)

AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total	*	Minus	**	=
	Independent	*	Minus	***	=
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐				

RATE	ADDITIONAL FEE
X\$ 9=	
X40=	
+135=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$18=	
X80=	
+270=	
TOTAL ADDIT. FEE	

(Column 1) (Column 2) (Column 3)

AMENDMENT C		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total	*	Minus	**	=
	Independent	*	Minus	***	=
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐				

RATE	ADDITIONAL FEE
X\$ 9=	
X40=	
+135=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$18=	
X80=	
+270=	
TOTAL ADDIT. FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

PATENT APPLICATION SERIAL NO. _____

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE
FEE RECORD SHEET

01/12/2001 NROCHA1 00000002 09756946

01 FC:101	710.00 OP
02 FC:103	144.00 OP

PTO-1556
(5/87)

*U.S. GPO: 1999-459-082/13144

03-05-01



RECEIVED

MAR 09 2001

Technology Center 2600

2664
#2
3-13-01

CERTIFICATE OF MAILING

I hereby certify that this paper and every paper referred to therein as being enclosed is being deposited with the U.S. Postal Service as first class mail, postage prepaid, in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on _____ (Date of Deposit)

PLEASE CHARGE ANY DEFICIENCY UP TO \$300.00 OR CREDIT ANY EXCESS IN THE FEES DUE WITH THIS DOCUMENT TO OUR DEPOSIT ACCOUNT NO. 04-0100

Date

Name

6727/01145

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

70672237145

In re Application of:

Leon BRUCKMAN

Serial No: 09/756,946

Group Art Unit: N/A

Filed: January 9, 2001

Examiner: N/A

For: FLOW ALLOCATION IN A RING TOPOLOGY

EXPRESS MAIL CERTIFICATE

Date 3/2/01 Label No. EL
I hereby certify that, on the date indicated above, this paper or fee was deposited with the U.S. Postal Service & that it was addressed for delivery to the Assistant Commissioner for Patents, Washington, DC 20231 by "Express Mail Post Office to Addressee" service.

A. D. DiLullo
Name (Print) Signature

INFORMATION DISCLOSURE STATEMENT [IDS]

Honorable Commissioner of Patents and Trademarks
Washington, D.C. 20231

Sir:

This Information Disclosure Statement is submitted in accordance with 37 C.F.R. 1.97, 1.98, and it is requested that the information set forth in this statement and in the listed documents be considered during the pendency of the above-identified application, and any other application relying on the filing date of the above-identified application or cross-referencing it as a related application.

1. This IDS should be considered, in accordance with 37 C.F.R. 1.97, as it is filed:

Ex.1002

(Check one of the boxes A-D)

☒ A. Within three months of the filing date of the above-identified national application or within three months of the entry into the national stage of the above-identified international application.

☐ B. before the mailing date of a first office action on the merits, or a first office action after filing a request for continued examination.

☐ C. after (A) and (B) above, but before the mailing date of a final rejection, a notice of allowance, or any other action that closes prosecution, and Applicants have made the necessary statement in box "i" below or paid the necessary fee in box "ii" below.

(check one of the boxes "i" and "ii" below:)

☐ i. Counsel states that, upon information and belief, each item of information listed herein was either (a) cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this IDS; or (b) was not cited in a communication from a foreign patent office in a counterpart foreign application and, to the knowledge of undersigned after making reasonable inquiry, was not known to any individual designated in 1.56(c) more than three months prior to the filing of this IDS.

☐ ii.11. A check for the fee set forth in 1. 17(p), presently believed to be \$180, is enclosed.

☐ D. after (A), (B) and (C) above, but before payment of the issue fee: Counsel states that, upon information and belief, each item of information listed herein was either (i) cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the IDS; or (ii) was not cited in a communication from a foreign patent office in a counterpart foreign application and, to the knowledge of the undersigned after making reasonable inquiry, was not known to any individual designated in 1.56(c) more than three months prior to the filing of this IDS.

☐ i. A check for the fee set forth in 1.17 (p), presently believed to be \$180, is enclosed.

2. In accordance with 37 C.F.R. 1.98, this IDS includes a list (e.g., form PTO-1449) of all patents, publications, or other information submitted for consideration by the office, either incorporated into this IDS or as an attachment hereto. A copy of each document listed is attached, except as explained below.

(check boxes A and/or B and fill in blanks, if appropriate.)

☐ A. Document(s) _____ is (are) deemed substantially cumulative to document(s) _____, and, in accordance with 1.98(c), only a copy of each of the latter documents is enclosed.

☐ B. Certain documents were previously cited by or submitted to the Office in the following prior application(s), which are relied upon under 35 U.S.C. 120:

[insert serial numbers and filing dates of prior applications]

Applicant identifies these documents by attaching hereto copies of the forms PTO-892 and PTO-1449 from the files of the prior application(s) or a fresh PTO- 1449 listing these documents, and request that they be considered and made of record in accordance with 1.98(d). Per 37 CFR 1.98(d), copies of these documents need not be filed in this application.

☐ 3. Document(s) _____ are not in the English language. In accordance with 1.98(c), Applicant states:

☐ An English translation of each document (or of the pertinent portions thereof), or a copy of each corresponding English-language patent or application is enclosed.

☐ A concise explanation of the relevance of document(s) _____ is found in the attached search report (see MPEP § 609 A(3)x).

☐ A concise explanation of the relevance of document(s) _____ is set forth as follows: [Insert concise explanation of relevance]

☐ A concise explanation of the relevance of document(s) _____ can be found on page(s) _____ of the specification.

☐ A concise explanation of document(s) _____ can be found on the attached sheet.

☐ 4. No explanation of relevance is necessary for documents in the English language (see MPEP § 609 A(3)).

☐ 5. Other information being provided for the examiner's consideration follows:

6. In accordance with 37 C.F.R. 1.97(g) and (h), the filing of this IDS should not be construed as a representation that a search has been made or that information cited is, or is considered to be, material to patentability as defined in §1.56 (b), or that any cited document listed or attached is (or constitutes) prior art. Unless other-wise indicated, the date of publication indicated for an item is taken from the face of the item and Applicant reserves the right to prove that the date of publication is in fact different.

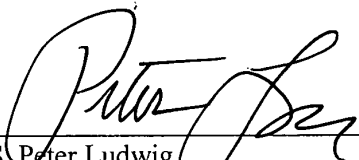
CROSS REFERENCE UNDER 37 C.F.R. §1.78 TO RELATED APPLICATIONS

Pursuant to 37 C.F.R. § 1.79, Applicant notes that the above-identified patent application may be related to the following U.S. Patent Applications:

(1) U.S. Patent Application Serial no _____, entitled _____
filed _____.

Early and favorable consideration is earnestly solicited.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Peter Ludwig", written over a horizontal line.

S. Peter Ludwig
Registration No. 25,351
Attorney for Applicant(s)

DARBY & DARBY P.C.
805 Third Avenue
New York, N.Y. 10022
(212) 527-7700

Search

L Number	Hits	Search Text	DB	Time stamp
-	1	"20020118700"	US-PGPUB	2004/07/16 10:39
-	1586	370/389,395.21,395.41,395.42,406,439,460.ccls	USPAT	2004/07/16 10:41
-	10	370/389,395.21,395.41,395.42,406,439,460.ccls	USPAT	2004/07/16 10:49
-	113	and ((QoS or (resource\$2 near reservation\$2)) same (capacity or utilization)) and (IP and ring)	USPAT	2004/07/16 10:49
-	18	((QoS or (resource\$2 near reservation\$2)) same (capacity or utilization)) and (IP and ring) not	USPAT	2004/07/16 10:55
-	7	370/389,395.21,395.41,395.42,406,439,460.ccls	USPAT	2004/07/16 11:01
-	96	((resource\$2 near reservation\$2) same (capacity or utilization)) and (ring adj network\$1)	USPAT	2004/07/16 10:56
-	2	((qos) same (capacity or utilization)) and (IP and ring) not	USPAT	2004/07/16 10:59
-	4	370/389,395.21,395.41,395.42,406,439,460.ccls	USPAT	2004/07/16 10:59
-	2	((rsvp same (capacity or utilization or use)) and (IP and ring) not	USPAT	2004/07/16 10:59
-	4	370/389,395.21,395.41,395.42,406,439,460.ccls	USPAT	2004/07/16 10:59
-	24	((qos with reserv\$6) same (capacity or utilization)) and (IP and ring) not	USPAT	2004/07/16 11:28
-	7	(rsvp same (capacity or utilization or use)) and (IP and ring)	USPAT	2004/07/16 11:34
-	0	((resource\$2 near reservation\$2) same bandwidth) and (ring adj network\$1)	USPAT	2004/07/16 11:36
-	0	((resource\$2 near reservation\$2)) and (IP same (ring adj network\$1))	USPAT	2004/07/16 11:35
-	0	("class of service" same (bandwidth or capacity or utilization)) and (IP same (ring adj network\$1))	USPAT	2004/07/16 11:35
-	0	("class of service") and (IP same (ring adj network\$1))	USPAT	2004/07/16 11:35
-	0	("class of service") and (IP)	USPAT	2004/07/16 11:35
-	0	"class of service"	USPAT	2004/07/16 11:35
-	0	((class adj2 service) same (bandwidth or capacity or utilization)) and (IP same (ring adj network\$1))	USPAT	2004/07/16 11:36
-	16	((class adj2 service)) and (IP same (ring adj network\$1))	USPAT	2004/07/16 11:38
-	0	((class adj2 service) with reserv\$6) and (IP same (ring adj network\$1))	USPAT	2004/07/16 11:38
-	11	(qos same (bandwidth or capacity or utilization)) and (IP same (ring adj network\$1))	USPAT	2004/07/16 11:54
-	12	((bandwidth with reserv\$6)) and (IP same (ring adj network\$1))	USPAT	2004/07/16 11:57
-	939	SRP or "spatial reuse protocol"	USPAT	2004/07/16 11:57
-	6	"spatial reuse protocol"	USPAT	2004/07/16 11:57
-	2	(load adj balanc\$3) and (IP same (ring adj network\$1))	USPAT	2004/07/16 14:39
-	267	(load adj balanc\$3) and (IP adj network\$1)	USPAT	2004/07/16 14:30
-	40	((load adj balanc\$3) and (IP adj network\$1)) and ((select\$3 or choos\$3) with (minimum or small\$3))	USPAT	2004/07/16 14:34

Search History 7/22/04 10:42:44 AM Page 1

C:\APPS\EAST\Workspaces\09756946.wsp

-	11	((load adj balanc\$3) and (IP adj network)) and ((maximum or large\$2) same ((select\$3 or choos\$3) with (minimum or small\$3)))	USPAT	2004/07/16 14:34
-	1	(path adj selection) and (IP same (ring adj network))	USPAT	2004/07/16 14:39

Notice of References Cited	Application/Control No. 09/756,946	Applicant(s)/Patent Under Reexamination BRUCKMAN, LEON	
	Examiner Joshua Kading	Art Unit 2661	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-5,461,611	10-1995	Drake et al.	370/420
	B	US-6,639,893	10-2003	Chickenji et al.	370/217
	C	US-6,314,110	11-2001	Chin et al.	370/468
	D	US-6,339,488	01-2002	Beshai et al.	398/59
	E	US-5,581,703	12-1996	Baughner et al.	709/225
	F	US-6,639,896	10-2003	Goode et al.	370/224
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

LIST OF REFERENCES CITED BY APPLICANT

(Use Several Sheets if Necessary)

DOCKET NO.: 6727/0145
APPLICANT: Leon BRUCKMANSERIAL NO: 09/756,946
FILING DATE: January 9, 2001**RECEIVED**

MAR 09 2001

Technology Center 2600

U.S. PATENT DOCUMENTS

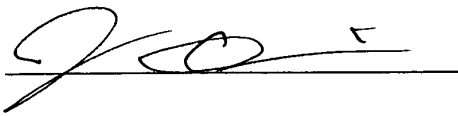
<u>*EXAMINER</u> <u>INITIALS</u>	<u>DOCUMENT</u> <u>NUMBER</u>	<u>DATE</u>	<u>NAME</u>	<u>CLASS</u>	<u>SUBCLASS</u>	<u>FILING DATE</u>
-------------------------------------	----------------------------------	-------------	-------------	--------------	-----------------	--------------------

FOREIGN PATENT DOCUMENTS

<u>*EXAMINER</u> <u>INITIALS</u>	<u>DOCUMENT</u> <u>NUMBER</u>	<u>DATE</u>	<u>COUNTRY</u>	<u>CLASS</u>	<u>SUBCLASS</u>	<u>TRANSLATION</u> <u>YES</u> <u>NO</u>
-------------------------------------	----------------------------------	-------------	----------------	--------------	-----------------	--

OTHER REFERENCES**(INCLUDING AUTHOR, TITLE DATE, PERTINENT PAGES, ETC.)***EXAMINER
INITIALS

1. Braden, R. et al., RFC 2205, "Resource ReSerVation Protocol (RSVP), Sept. 1997, pp. 1-112.
2. Moy, J., RFC 2328, "OSPF Version 2", April 1998, pp. 1-243.
3. Telede, D. et al., RFC 2814, "A Protocol for RSVP-Based Admission Control Over IEEE 802-Style Networks", May 2000, pp. 1-56.
4. Cisco, D.G., RFC 2892, "The Cisco SRP MAC Layer Protocol", Aug. 2000, pp. 1-52.

EXAMINER: 

DATE CONSIDERED: 7-16-04

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/756,946	01/09/2001	Leon Bruckman	6727/01145	6186

7590 07/29/2004
DARBY & DARBY P.C.
805 Third Avenue
New York, NY 10022

EXAMINER

KADING, JOSHUA A

ART UNIT	PAPER NUMBER
----------	--------------

2661

DATE MAILED: 07/29/2004

3

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/756,946	Applicant(s) BRUCKMAN, LEON	
	Examiner Joshua Kading	Art Unit 2661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☐ Responsive to communication(s) filed on ____.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 1-28 is/are pending in the application.

4a) Of the above claim(s) ____ is/are withdrawn from consideration.

5) ☐ Claim(s) ____ is/are allowed.

6) ☒ Claim(s) 1-11, 13-25, 27 and 28 is/are rejected.

7) ☒ Claim(s) 12 and 26 is/are objected to.

8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on 09 January 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some * c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. ____.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892) 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>2</u> .	4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. ____ 5) ☐ Notice of Informal Patent Application (PTO-152) 6) ☐ Other: ____
---	--

DETAILED ACTION

Claim Objections

Claims 1 and 15 are objected to because of the following informalities:

Claim 1, line 11; and claim 15, line 12 state "in process". It is believed applicant
5 means for this to be "in progress". Therefore, it is recommended that "in process" be
changed to --in progress--. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all
10 obviousness rejections set forth in this Office action:

15 (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, 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 at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 5-8, 10, 11, 13-17, 19-22, 24, 25, 27, and 28 are rejected under 35
U.S.C. 103(a) as being unpatentable over Drake, Jr. et al. (U.S. Patent 5,461,611) in
20 view of Chikenji et al. (U.S. Patent 6,639,893 B1).

Regarding claim 1, Drake discloses "in a communication network that includes a
plurality of nodes interconnected by links, a method for routing a data flow, comprising:
receiving a request to allocate one or more resources in the network (col. 10,
25 lines 43-46) so as to carry the data flow between first and second ones of the nodes
(figure 1 shows a plurality of nodes 10, 29, and 20 in a network) over one of a plurality

of paths therebetween, each such path comprising a respective sequence of the links (figure 1 shows several paths to and from the nodes each containing links);

determining, for the links comprised by each of the paths, respective levels of use of the requested resources due to communications in progress over the network (col. 11, lines 13-17 where the known bandwidth represents the communications in progress and the bandwidth subtracted from that represents the requested resources)...”

However, Drake lacks what Chikenji discloses, “selecting which of the paths is to carry the data flow responsive to the determined levels of use of the requested resources on the links comprised in each of the paths (col. 11, lines 35-63 (emphasis on lines 58-63) where the “path selection means”, when taken in the context of a switch (node) on the transmission line, uses “the smallest weight” to select the path, i.e. the path selection means chooses the path based on the largest amount of free bandwidth).”

It would have been obvious to one with ordinary skill in the art at the time of invention to include the selecting of paths with the rest of the method for the purpose of distributing data communications as evenly as possible across paths (Chikenji, col. 11, lines 58-63 where it is implied that by selecting a path with the smallest capacity used, other, more utilized paths, will not be overused). The motivation for evenly distributing data over the given paths is so that the system does not have some paths overburdened while others are underutilized.

Regarding claim 15, Drake discloses "a communication network, comprising:
a plurality of nodes (figure 1, elements 10, 29, and 20 all act as nodes);
a plurality of links, interconnecting the nodes to provide communications
therebetween (figure 1, where there are links drawn between the nodes); and

5 a dispatcher, coupled to receive a request to allocate one or more resources in
the network (col. 10, lines 43-46 where the allocator 26 is located in the dispatcher) so
as to carry the data flow between first and second ones of the nodes over one of a
plurality of paths therebetween, each such path comprising a respective sequence of
the links (figure 1 shows the nodes and links as previously described), and adapted to
10 determine, for the links comprised in each of the paths, respective levels of use of the
requested resources due to communications in progress over the network (col. 11, lines
13-17 where the known bandwidth represents the communications in progress and the
bandwidth subtracted from that represents the requested resources)..."

However, Drake lacks what Chikenji discloses "...to select which of the paths is
15 to carry the data flow responsive to the determined levels of use of the requested
resources on the links comprised in each of the paths (col. 11, lines 35-63 (emphasis on
lines 58-63) where the "path selection means", when taken in the context of a switch
(node) on the transmission line, uses "the smallest weight" to select the path, i.e. the
path selection means chooses the path based on the largest amount of free
20 bandwidth)."

It would have been obvious to one with ordinary skill in the art at the time of
invention to include the selecting of paths with the rest of the network for the purpose of

distributing data communications as evenly as possible across paths (Chikenji, col. 11, lines 58-63 where it is implied that by selecting a path with the smallest capacity used, other, more utilized paths, will not be overused). The motivation for evenly distributing data over the given paths is so that the system does not have some paths over
5 burdened while others are underutilized.

Regarding claims 2 and 16, Drake and Chikenji disclose the method of claim 1 and the network of claim 15. However, Drake explicitly lacks what Chikenji further discloses, "the network comprises an Internet Protocol (IP) network (col. 26, lines 27-
10 29)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the IP network with the method of claim 1 and the network of claim 15 for the same reasons and motivation as in claims 1 and 15.

Regarding claims 3 and 17, Drake and Chikenji disclose the method of claim 1
15 and the network of claim 15. However, Drake lacks what Chikenji further discloses, "the nodes are interconnected in a ring, and wherein the plurality of paths comprises a first path traversing the ring in one direction and a second path traversing the ring in the opposite direction (figure 13, Ring Network C shows two dotted paths that flow in opposite directions), and wherein selecting which of the paths is to carry the data flow
20 comprises selecting the first or the second path (figure 13 in combination with col. 11, lines 35-64 where are only the two paths to select from in figure 13 and thus the path selection means must choose between these two)." It would have been obvious to one

with ordinary skill in the art at the time of invention to include the first and second paths with the method of claim 1 and the network of claim 15 for the same reasons and motivation as in claims 1 and 15.

5 Regarding claims 5 and 19, Drake and Chikenji disclose the method of claim 1 and the network of claim 15. However, Chikenji lacks what Drake further discloses, "the one or more resources comprise a link bandwidth (col. 11, lines 13-17 whereby calculating a bandwidth by subtracting the requested or allocated bandwidth from the remaining bandwidth says that the link must have its own finite bandwidth)." It would
10 have been obvious to one with ordinary skill in the art at the time of invention to include the link bandwidth with the method of claim 1 and the network of claim 15 for the same reasons and motivation as in claims 1 and 15.

 Regarding claims 6 and 20, Drake and Chikenji disclose the method of claim 1
15 and the network of claim 15. However, Chikenji lacks what Drake further discloses, "the one or more resources comprise a processing power associated with each of the links (figure 1 and col. 11, lines 13-17 both suggest that each link has to have a processing power associated with it, as is known in the art all nodes (such as those in figure 1) have processors attached to them and each have a finite amount of processing power
20 devoted to each communication link coming in and going out of the node, further to calculate the remaining bandwidth of a link, a processor must do that calculation and thus each link will have some processing power associated with it at some time)." It

would have been obvious to one with ordinary skill in the art at the time of invention to include the processing power associated with each of the links with the method of claim 1 and the network of claim 15 for the same reasons and motivation as in claims 1 and 15.

5

Regarding claims 7 and 21, Drake and Chikenji disclose the method of claim 1 and the network of claim 15. However, Chikenji lacks what Drake further discloses "wherein selecting which of the paths is to carry the data flow comprises comparing an amount of the one or more resources requested to a resource budget assigned to the
10 first node, and permitting the data flow only if allocating the requested resources will not cause a total of the resources allocated to the first node to exceed the budget (col. 11, lines 4-10 where Drake is saying that since the requested QoS bandwidth requirement is within the bounds of the available bandwidth, or the resource budget, the data flow can be permitted because the requested resources will not exceed the available
15 bandwidth)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the permitting the data flow if the requested resources were within the resource budget for the same reasons and motivation as in claims 1 and 15.

Regarding claims 8 and 22, Drake and Chikenji disclose the method of claim 7
20 and the network of claim 21. However, Chikenji lacks what Drake further discloses, "comparing the amount of the one or more resources comprises comparing the amount of each of the resources requested to the resource budget assigned for each of the

resources, and wherein permitting the data flow comprises permitting the flow only if all of the resources requested for at least one of the paths are within the budget (col. 11, lines 4-10 where each component of the path is compared to see if the available bandwidth will be adequate for the requested resource, if all paths are adequate the
5 flow is permitted as seen in figure 5, elements 91, 82).” It would have been obvious to one with ordinary skill in the art at the time of invention to include the comparing of each path component to determine if the path is within the budget with the method of claim 7 and the network of claim 21 for the same reasons and motivation as in claims 7 and 21.

10 Regarding claims 10 and 24, Drake and Chikenji disclose the method of claim 1 and the network of claim 15. However, Chikenji lacks what Drake further discloses, “selecting which of the paths is to carry the data comprises verifying that a sufficient amount of the requested resources is available to carry the data flow on every one of the links comprised in the selected path (col. 11, lines 4-10 where determining if the
15 requested QoS is within the available resources is the same as verifying that a sufficient amount of resources are available to carry the data).” It would have been obvious to one with ordinary skill in the art at the time of invention to include the verifying of the resources with the method of claim 1 and the network of claim 15 for the same reasons and motivation as in claims 1 and 15.

20

 Regarding claims 11 and 25, Drake and Chikenji disclose the method of claim 1 and the network of claim 15. However, Drake lacks what Chikenji further discloses,

“selecting which of the paths is to carry the data flow comprises selecting the one of the paths having the lowest level of a predetermined measure of use of the requested resources (col. 11, lines 58-63 whereby selecting the smallest weight in Chikenji suggests that the lowest level of the resources in use, or the smallest weight, is used to
5 select the path).” It would have been obvious to one with ordinary skill in the art at the time of invention to include the lowest level of resources in use as a criterion for selection with the method of claim 1 and the network of claim 15 for the same reasons and motivation as in claim 15.

10 Regarding claims 13 and 27, Drake and Chikenji disclose the method of claim 1 and the network of claim 15. However, Chikenji lacks what Drake further discloses, “receiving the request comprises choosing a dispatcher within the network to manage allocation of the resources, wherein the dispatcher receives and processes the request (figure 1, node 20 acts as the dispatcher to allocate the resources of the network).” It
15 would have been obvious to one with ordinary skill in the art at the time of invention to include the dispatcher with the method of claim 1 and the network of claim 15 for the same reasons and motivation as in claims 1 and 15.

 Regarding claims 14 and 28, Drake and Chikenji disclose the method of claim 13
20 and the network of claim 27. However, Chikenji lacks what Drake further discloses, “choosing the dispatcher comprises choosing one of the nodes to act as the dispatcher (figure 1, node 20 again acts as the dispatcher as in claims 13 and 27).” It would have

been obvious to one with ordinary skill in the art at the time of invention to include the dispatcher as a node with the method of claim 13 and the network of claim 27 for the same reasons and motivation as in claims 13 and 27.

5 Claims 4 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Drake, Jr. et al. and Chikenji et al. as applied to claims 3 and 17 above, and further in view of applicant's admitted prior art (AAPA).

 Regarding claims 4 and 18, Drake and Chikenji disclose the method of claim 3 and the network of claim 17. However, both Drake and Chikenji lack what AAPA
10 discloses, "conveying the data flow over an inner or outer data link ring within the network provided by a Spatial Reuse Protocol (SRP) (Specification, page 1, lines 17- page 2, lines 1-2)." It would have been obvious to one with ordinary skill in the art to convey the data using an SRP for the purpose of allowing node to use different parts of the same ring simultaneously. The motivation for this being that more than one node
15 can use the ring at any given time, thus increasing throughput and efficiency.

 Claims 9 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Drake, Jr. et al. and Chikenji et al. as applied to claims 1 and 15 above, and further in view of Chin et al. (U.S. Patent 6,314,110 B1).

20 Regarding claims 9 and 23, Drake and Chikenji disclose the method of claim 1 and the network of claim 17. However, both Drake and Chikenji lack what Chin further discloses, "increasing an allocation to the first node of the one or more requested

resources on the selected path by a predetermined quantum (col. 11, lines 26-28).” It would have been obvious to one with ordinary skill in the art at the time of invention to include the increasing of the resources by a predetermined quantum with the method of claim 1 and the network of claim 17 for the purpose of allowing the nodes to regulate the amount of its own traffic it transmits onto the network (Chin, col. 11, lines 12-16). The motivation for this is to allow a node to increase (or decrease) its traffic independently of other nodes, thus the changing node will only use its own processing time.

10

Allowable Subject Matter

Claims 12 and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

15

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua Kading whose telephone number is (703) 305-0342. The examiner can normally be reached on M-F: 8:30AM-5PM.

20

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Douglas Olms can be reached on (703) 305-4703. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

5 For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

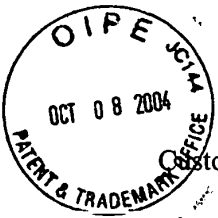


Joshua Kading
Examiner
Art Unit 2661

10 July 22, 2004



KENNETH VANDERPUYE
PRIMARY EXAMINER



10-12-04

2661
lfw

Customer No.: 07278

Docket No.: 06727/000I145-US0

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Leon Bruckman

Serial No.: 09/756,946

Filed: January 9, 2001

For: FLOW ALLOCATION IN A RING TOPOLOGY

October 7, 2004

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Information Disclosure Statement is submitted in accordance with 37 C.F.R. 1.97, 1.98, and it is requested that the information set forth in this statement and in the listed documents be considered during the pendency of the above-identified application, and any other application relying on the filing date of the above-identified application or cross-referencing it as a related application.

1. This IDS should be considered, in accordance with 37 C.F.R. 1.97, as it is filed: (Check one of the boxes A-D)

- ☐ A. Within three months of the filing date of the above-identified national application or within three months of the entry into the national stage of the above-identified international application.
- ☐ B. before the mailing date of a first office action on the merits, or a first office action after filing a request for continued examination.
- ☒ C. after (A) and (B) above, but before the mailing date of a final rejection, a notice of allowance, or any other action that closes prosecution, and Applicants have made

Docket No. 06727/000I145-US0

- 1 -

the necessary statement in box "i" below or paid the necessary fee in box "ii" below.

(check one of the boxes "i" and "ii" below:)

- ☒ i. Counsel states that, upon information and belief, each item of information listed herein was either (a) cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this IDS; or (b) was not cited in a communication from a foreign patent office in a counterpart foreign application and, to the knowledge of undersigned after making reasonable inquiry, was not known to any individual designated in 1.56(c) more than three months prior to the filing of this IDS.
- ☐ ii. A check for the fee set forth in 1. 17(p), presently believed to be \$180, is enclosed.
- ☐ D. after (A), (B) and (C) above, but before payment of the issue fee: Counsel states that, upon information and belief, each item of information listed herein was either (i) cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the IDS; or (ii) was not cited in a communication from a foreign patent office in a counterpart foreign application and, to the knowledge of the undersigned after making reasonable inquiry, was not known to any individual designated in 1.56(c) more than three months prior to the filing of this IDS.
- ☐ i. A check for the fee set forth in 1.17 (p), presently believed to be \$180, is enclosed.

2. In accordance with 37 C.F.R. 1.98, this IDS includes a list (e.g., form PTO/SB/08) of all patents, publications, or other information submitted for consideration by the office, either incorporated into this IDS or as an attachment hereto. A copy of each document listed is attached, except as explained below.

(check boxes A, B and/or C and fill in blanks, if appropriate.).

- ☐ A. Pursuant to the Notice issued by the United States Patent and Trademark Office dated July 11, 2003 waiving the requirements of 37 C.F.R. § 1.98(a)(2)(i), a copy/copies of the United States Patent on PTO/SB08 is/are not being submitted.
- ☐ B. Document(s) _____ is (are) deemed substantially cumulative to document(s) _____, and, in accordance with 1.98(c), only a copy of each of the latter documents is enclosed.
- ☐ C. Certain documents were previously cited by or submitted to the Office in the following prior applications, which are relied upon under 35 U.S.C. 120:

[SERIAL NO. & FILING DATE].

Docket No. 06727/0001145-US0



Applicant identifies these documents by attaching hereto copies of the forms PTO-892 and PTO/SB08 from the files of the prior application(s) or a fresh PTO/SB/08 listing these documents, and request that they be considered and made of record in accordance with 1.98(d). Per 37 CFR 1.98(d), copies of these documents need not be filed in this application.

☐ 3. Document(s) _____ are not in the English language. In accordance with 1.98(c), Applicant states:

- ☐ An English translation of each document (or of the pertinent portions thereof), or a copy of each corresponding English-language patent or application is enclosed.
- ☐ A concise explanation of the relevance of document(s) _____ is found in the attached search report (see MPEP § 609 A(3)x).
- ☐ A concise explanation of the relevance of document(s) _____ is set forth as follows: [Insert concise explanation of relevance]
- ☐ A concise explanation of the relevance of document(s) _____ can be found on page(s) _____ of the specification.
- ☐ A concise explanation of document(s) _____ can be found on the attached sheet.

☐ 4. No explanation of relevance is necessary for documents in the English language (see MPEP § 609 A(3)).

☒ 5. Other information being provided for the examiner's consideration follows:
An Office Action dated September 15, 2004 which issued during the prosecution of Applicant's U.S. Patent Application Serial No. 09/794,898.

6. In accordance with 37 C.F.R. 1.97(g) and (h), the filing of this IDS should not be construed as a representation that a search has been made or that information cited is, or is considered to be, material to patentability as defined in §1.56 (b), or that any cited document listed or attached is (or constitutes) prior art. Unless other-wise indicated, the date of publication indicated for an item is taken from the face of the item and Applicant reserves the right to prove that the date of publication is in fact different.

Docket No. 06727/0001145-US0

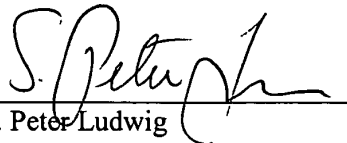
CROSS REFERENCE UNDER 37 C.F.R. §1.78 TO RELATED APPLICATIONS

Pursuant to 37 C.F.R. § 1.78, Applicant notes that the above-identified patent application may be related to the following U.S. Patent Applications:

(1) U.S. Patent Application Serial No _____, filed _____.

Early and favorable consideration is earnestly solicited.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "S. Peter Ludwig", is written over a horizontal line.

S. Peter Ludwig
Registration No. 25,351
Attorney for Applicant

October 7, 2004

DARBY & DARBY P.C.
805 Third Avenue
New York, N.Y. 10022
(212) 527-7700

Docket No. 06727/0001145-US0



Application No. (if known): 09/756,946

Attorney Docket No.: 06727/0001145-US0

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on October 8, 2004
Date


Signature
D. DAVIS

Typed or printed name of person signing Certificate

Registration Number, if applicable

Telephone Number

Note: Each paper must have its own certificate of mailing, or this certificate must identify each submitted paper.

Information Disclosure Statement (4 pages)
PTO SB/08 (1 page)
4 Documents
Copy of Office Action
Return Postcard



PTO/SB/08a/b (08-03)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Substitute for form 1449A/B/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)				Complete if Known	
				Application Number	09/756,946-Conf. #6186
				Filing Date	January 9, 2001
				First Named Inventor	Leon Bruckman
				Art Unit	2661
				Examiner Name	Joshua A. Kading
Sheet	1	of	1	Attorney Docket Number	06727/0001145-USO

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
	AA	US-6,647,008-B1	11/2003	Galand et al.	
	AB	US-6,584,535-B1	06/2003	Ouellet et al.	
	AC	US-6,400,681-B1	06/2002	Bertin et al.	
	AD	US-6,021,263-B1	02/2000	Kujoory et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T ⁶
		Country Code ³ -Number ⁴ -Kind Code ⁵ (if known)				

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). ² Applicant is to place a check mark here if English language Translation is attached.

Examiner Signature		Date Considered	
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Application No. (if known): 09/756,946

Attorney Docket No.: 06727/0001145-USO

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on October 25, 2004
Date

A. Stantini

Signature

A. Stantini

Typed or printed name of person signing Certificate

Registration Number, if applicable _____

Telephone Number _____

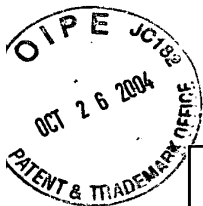
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Amendment in response to July 29, 2004 Office Action (10 pages)

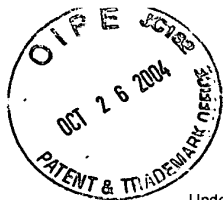
Amendment Transmittal (1 page)

Fee Transmittal (1 page)

Check No. 0531 in the amount of \$124.00



AMENDMENT TRANSMITTAL LETTER				Docket No. 06727/0001145-USO	
Application No. 09/756,946-Conf. #6186	Filing Date January 9, 2001	Examiner J. A. Kading	Art Unit 2661		
Applicant(s): Leon Bruckman					
Invention: FLOW ALLOCATION IN A RING TOPOLOGY					
TO THE COMMISSIONER FOR PATENTS					
Transmitted herewith is an amendment in the above-identified application. The fee has been calculated and is transmitted as shown below.					
CLAIMS AS AMENDED					
	Claims Remaining After Amendment	Highest Number Previously Paid	Number Extra Claims Present	Rate	
Total Claims	32	- 30 =	2	x 18.00	36.00
Independent Claims	4	- 3 =	1	x 88.00	88.00
Multiple Dependent Claims (check if applicable) ☐					
Other fee (please specify):					
TOTAL ADDITIONAL FEE FOR THIS AMENDMENT:					124.00
☒ Large Entity ☐ Small Entity					
☐ No additional fee is required for this amendment.					
☐ Please charge Deposit Account No. _____ in the amount of \$ _____. A duplicate copy of this sheet is enclosed.					
☒ A check in the amount of \$ 124.00 to cover the filing fee is enclosed.					
☐ Payment by credit card. Form PTO-2038 is attached.					
☒ The Director is hereby authorized to charge and credit Deposit Account No. 04-0100 as described below. A duplicate copy of this sheet is enclosed.					
☒ Credit any overpayment.					
☒ Charge any additional filing or application processing fees required under 37 CFR 1.16 and 1.17.					
S. Peter Ludwig Attorney Reg. No.: 25,351				Dated: October 25, 2004	
DARBY & DARBY P.C. P.O. Box 5257 New York, New York 10150-5257 (212) 527-7770					
Express Mail Label No. _____ Dated: _____					



PTO/SB/17 (10-04)
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FEE TRANSMITTAL for FY 2005

Effective 10/01/2004. Patent fees are subject to annual revision.

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$) 124.00

Complete if Known

Application Number 09/756,946-Conf. #6186
Filing Date January 9, 2001
First Named Inventor Leon Bruckman
Examiner Name J. A. Kading
Art Unit 2661
Attorney Docket No. 06727/0001145-USO

METHOD OF PAYMENT (check all that apply)

☒ Check ☐ Credit Card ☐ Money Order ☐ Other ☐ None

☐ Deposit Account:

Deposit
Account
Number

04-0100

Deposit
Account
Name

Darby & Darby P.C.

The Director is authorized to: (check all that apply)

☐ Charge fee(s) indicated below ☒ Credit any overpayments

☐ Charge any additional fee(s) or any underpayment of fee(s)

☐ Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet.	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for <i>ex parte</i> reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	
1252	430	2252	215	Extension for reply within second month	
1253	980	2253	490	Extension for reply within third month	
1254	1,530	2254	765	Extension for reply within fourth month	
1255	2,080	2255	1,040	Extension for reply within fifth month	
1401	340	2401	170	Notice of Appeal	
1402	340	2402	170	Filing a brief in support of an appeal	
1403	300	2403	150	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive - unavoidable	
1453	1,370	2453	685	Petition to revive - unintentional	
1501	1,370	2501	685	Utility issue fee (or reissue)	
1502	490	2502	245	Design issue fee	
1503	660	2503	330	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	790	2809	395	Filing a submission after final rejection (37 CFR 1.129(a))	
1810	790	2810	395	For each additional invention to be examined (37 CFR 1.129(b))	
1801	790	2801	395	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	
Other fee (specify)					
*Reduced by Basic Filing Fee Paid					SUBTOTAL (3) (\$) 0.00

FEE CALCULATION

1. BASIC FILING FEE

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
1001	790	2001	395	Utility filing fee	
1002	350	2002	175	Design filing fee	
1003	550	2003	275	Plant filing fee	
1004	790	2004	395	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	

SUBTOTAL (1) (\$) 0.00

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

		Extra Claims		Fee from below		Fee Paid
Total Claims	32	-30** =	2	x	18.00	= 36.00
Independent Claims	4	-3** =	1	x	88.00	= 88.00
Multiple Dependent						=

Large Entity		Small Entity		Fee Description
Fee Code	Fee (\$)	Fee Code	Fee (\$)	
1202	18	2202	9	Claims in excess of 20
1201	88	2201	44	Independent claims in excess of 3
1203	300	2203	150	Multiple dependent claim, if not paid
1204	88	2204	44	** Reissue independent claims over original patent
1205	18	2205	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) (\$) 124.00

**or number previously paid, if greater; For Reissues, see above

SUBMITTED BY

Name (Print/Type) S. Peter Ludwig

Registration No.
(Attorney/Agent)

25,351

(Complete (if applicable))

Telephone (212) 527-7770

Signature

Date

October 25, 2004

Express Mail Label No.

Dated: _____



39741A1

10-27-04

GMU 2661
JFW

Customer No.: 07278

Docket No.: 06727/000I145-US0

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Application of: **BRUCKMAN**

Serial No.: 09/756,946

Group Art Unit: 2661

Filed : January 9, 2001

Examiner: Joshua A. Kading

For : FLOW ALLOCATION IN A RING TOPOLOGY

October 25, 2004

AMENDMENT

Honorable Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

INTRODUCTORY COMMENTS

Sir:

In response to an Official Action dated July 29, 2004, kindly amend this application as follows.

Amendments to the claims begin on page 2.

Remarks accompanying the amendments begin on page 8.

10/28/2004 RFEKADU1 00000122 09756946

01 FC:1202
02 FC:1201

36.00 OP
88.00 OP

AMENDMENTS TO THE CLAIMS

1. (Currently amended) In a communication network that includes a plurality of nodes interconnected by links, the nodes including at least first and second nodes, a method for routing a data flow, comprising:

allocating a respective number of quanta of one or more resources in the network to each of the nodes;

receiving a request at the first node to allocate use a portion of the one or more resources in the network so as to carry the data flow between the first and second ones of the nodes over one of a plurality of paths therebetween, each such path comprising a respective sequence of the links;

if the resources already allocated to the first node on one of the paths are sufficient, directing the data flow from the first node to the second node over the one of the paths;

if the resources already allocated to the first node are insufficient, requesting an increase in an allocation to the first node of the requested resources;

determining, for the links comprised by each of the paths, respective levels of use of the requested resources due to communications in ~~process~~ progress over the network; and

selecting which of the paths is to carry the data flow responsive to the determined levels of use of the requested resources on the links comprised in each of the paths; and

increasing the allocation of the resources to the first node on the selected path by a predetermined quantum.

2. (Original) A method according to claim 1, wherein the network comprises an Internet Protocol (IP) network.

3. (Original) A method according to claim 1, wherein the nodes are interconnected in a ring, and wherein the plurality of paths comprises a first path traversing the ring in one direction and a second path traversing the ring in the opposite direction, and wherein selecting which of the paths is to carry the data flow comprises selecting the first or the second path.

4. (Original) A method according to claim 3, wherein selecting the first or the second path comprises conveying the data flow over an inner or outer data link ring within the network provided by a Spatial Reuse Protocol (SRP).
5. (Original) A method according to claim 1, wherein the one or more resources comprise a link bandwidth.
6. (Original) A method according to claim 1, wherein the one or more resources comprise a processing power associated with each of the links.
7. (Original) A method according to claim 1, wherein selecting which of the paths is to carry the data flow comprises comparing an amount of the one or more resources requested to a resource budget assigned to the first node, and permitting the data flow only if allocating the requested resources will not cause a total of the resources allocated to the first node to exceed the budget.
8. (Original) A method according to claim 7, wherein comparing the amount of the one or more resources comprises comparing the amount of each of the resources requested to the resource budget assigned for each of the resources, and wherein permitting the data flow comprises permitting the flow only if all of the resources requested for at least one of the paths are within the budget.
9. (Currently amended) A method according to ~~claim 1~~ claim 12, wherein selecting which of the paths is to carry the data flow comprises increasing an allocation to the first node of the one or more requested resources on the selected path by a predetermined quantum.
10. (Original) A method according to claim 1, wherein selecting which of the paths is to carry the data comprises verifying that a sufficient amount of the requested resources is available to carry the data flow on every one of the links comprised in the selected path.
11. (Original) A method according to claim 1, wherein selecting which of the paths is to carry the data flow comprises selecting the one of the paths having the lowest level of a predetermined measure of use of the requested resources.
12. (Currently amended) In a communication network that includes a plurality of nodes interconnected by links, a method according to claim 11, for routing a data flow, comprising:

receiving a request to allocate one or more resources in the network so as to carry the data flow between first and second ones of the nodes over one of a plurality of paths therebetween, each such path comprising a respective sequence of the links;

determining, for the links comprised by each of the paths, respective levels of use of the requested resources due to communications in progress over the network;
and

selecting which of the paths is to carry the data flow responsive to the determined levels of use of the requested resources on the links comprised in each of the paths,

wherein selecting which of the paths is to carry the data flow comprises selecting the one of the paths having the lowest level of a predetermined measure of use of the requested resources, and

wherein selecting the one of the paths comprises finding, for each of at least two of the paths, a maximum level of use of at least one of the requested resources, taken over all of the links comprised in the paths, and selecting the one of the paths having the lowest maximum level of use.

13. (Original) A method according to claim 1, wherein receiving the request comprises choosing a dispatcher within the network to manage allocation of the resources, wherein the dispatcher receives and processes the request.

14. (Original) A method according to claim 13, wherein choosing the dispatcher comprises choosing one of the nodes to act as the dispatcher.

15. (Currently amended) A communication network, comprising:

a plurality of nodes;

a plurality of links, interconnecting the nodes to provide communications therebetween; and

a dispatcher, coupled to receive a request to allocate one or more resources in the network so as to carry the data flow between first and second ones of the nodes over one of a plurality of paths therebetween, each such path comprising a respective sequence of the links, and adapted to determine, for the links comprised in each of the paths, respective levels of use of the requested resources due to communications in ~~process~~ progress over the network and to select which of the paths is to carry the data

flow responsive to the determined levels of use of the requested resources on the links comprised in each of the paths,

wherein the dispatcher is adapted to select for carrying the data flow the one of the paths that has the lowest level of a predetermined measure of use of the requested resources, and

wherein the measure of use comprises, for each of at least two of the paths, a maximum level of use of at least one of the requested resources, taken over all of the links comprised in the paths.

16. (Original) A network according to claim 15, wherein the nodes are adapted to communicate using an Internet Protocol (IP).

17. (Original) A network according to claim 15, wherein the nodes are interconnected in a ring, and wherein the plurality of paths comprises a first path traversing the ring in one direction and a second path traversing the ring in the opposite direction, and wherein the dispatcher is configured to select the first or the second path to carry the data flow.

18. (Original) A network according to claim 17, wherein the first and the second paths respectively comprise inner and outer data link ring within the network provided by a Spatial Reuse Protocol (SRP).

19. (Original) A network according to claim 15, wherein the one or more resources comprise a link bandwidth.

20. (Original) A network according to claim 15, wherein the one or more resources comprise a processing power associated with each of the links.

21. (Original) A network according to claim 15, wherein the dispatcher is adapted to compare an amount of the one or more resources requested to a resource budget assigned to the first node, and to permit the data flow only if allocating the requested resources will not cause a total of the resources allocated to the first node to exceed the budget.

22. (Original) A network according to claim 21, wherein the dispatcher is adapted to compare the amount of each of the resources requested to the resource budget assigned for each of the resources, and to permit the data flow only if all of the resources requested for at least one of the paths are within the budget.

23. (Original) A network according to claim 15, wherein the dispatcher is configured to change an allocation to the first node of the one or more requested resources on the selected path by a predetermined quantum.
24. (Original) A network according to claim 15, wherein the dispatcher is adapt to select one of the paths to carry the data flow only after verifying that a sufficient amount of the requested resources is available to carry the data flow on every one of the links comprised in the selected path.
25. (Currently amended) A network according to ~~claim 15~~ claim 31, wherein the dispatcher is adapted to select for carrying the data flow the one of the paths that has the lowest level of a predetermined measure of use of the requested resources.
26. (Original) A network according to claim 25, wherein the measure of use comprises, for each of at least two of the paths, a maximum level of use of at least one of the requested resources, taken over all of the links comprised in the paths.
27. (Original) A network according to claim 15, wherein the dispatcher is associated with one of the nodes.
28. (Original) A network according to claim 27, wherein the dispatcher is operative as a software process running on the associated node.
29. (New) A method according to claim 13, wherein requesting the increase in the allocation comprises requesting and receiving the allocation from the dispatcher.
30. (New) A method according to claim 1, and comprising, upon release of the requested resources:
 - comparing an amount of the resources that have been released to a predetermined threshold; and
 - if the amount is greater than the predetermined threshold, deallocating the predetermined quantum from the first node.
31. (New) A communication network, comprising:
 - a plurality of nodes, comprising at least first and second nodes;
 - a plurality of links, interconnecting the nodes to provide communications therebetween; and
 - a dispatcher, which is adapted to allocate a respective number of quanta of one or more resources in the network to each of the nodes,

wherein the first node is adapted, upon receiving a request to use a portion of the resources so as to carry the data flow between the first and second nodes over one of a plurality of paths therebetween, each such path comprising a respective sequence of the links, to direct the data flow from the first node to the second node over one of the paths if the resources already allocated to the first node on the one of the paths are sufficient, and to request an increase in an allocation of the requested resources to the first node if the resources already allocated to the first node are insufficient, and

wherein the dispatcher is adapted to determine, for the links comprised in each of the paths, respective levels of use of the requested resources due to communications in progress over the network and to select which of the paths is to carry the data flow responsive to the determined levels of use of the requested resources on the links comprised in each of the paths, and to increase the allocation of the resources to the first node on the selected path by a predetermined quantum.

32. (New) A network according to claim 30, wherein the first node is adapted, upon release of the requested resources, to compare an amount of the resources that have been released to a predetermined threshold, and if the amount is greater than the predetermined threshold, to deallocate the predetermined quantum from the first node.

REMARKS

This application contains claims 1-32. Claims 1, 9, 12, 15 and 25 have been amended, and claims 29-32 are hereby added. No new matter has been introduced. Reconsideration is respectfully requested.

Claims 1 and 15 were objected to for use of the term "in process." These claims have been amended to replace this term with "in progress," as suggested by the Examiner.

Claims 12 and 26 were objected to for depending from a rejected base claim, but were deemed to recite patentable subject matter. Applicant has therefore amended claim 12 to stand as an independent claim, incorporating the limitations of claims 1 and 11 from which it formerly depended. Applicant has amended independent claim 15 to incorporate the limitations of claims 25 and 26. Claim 9 has been amended to depend from claim 12, while claim 25 has been amended so that claims 25 and 26 now depend from new claim 31. Accordingly, amended claims 12 and 15 are believed to be in condition for allowance, as are claims 9, 16-24, 27 and 28, which depend from these amended independent claims.

Claims 1-3, 5-8, 10, 11, 13-17, 19-22, 24, 25, 27 and 28 were rejected under 35 U.S.C. 103(a) over Drake, Jr., et al. (U.S. Patent 5,461,611) in view of Chikenji et al. (U.S. Patent 6,639,893). Claims 4 and 18 were rejected over Drake and Chikenji in view of admitted prior art, while claims 9 and 23 were rejected over Drake and Chikenji in view of Chin et al. (U.S. Patent 6,314,110). Applicant has amended claims 1 and 15 in order to overcome this rejection. As noted above, amended claim 15 now includes the limitations of claims 25 and 26. Amended claim 1 incorporates the limitations of claim 9 along with additional clarifying language. This additional language is derived from paragraphs 0051 and 0052 in the specification of the present patent application as published (US 2002/0118700 A1), and is reflected in Figs. 3 and 4.

Drake describes a management system for local area networks. The management system receives requests from other stations on the network to reserve facilities for a data stream of a particular quality of service. If the requested facilities are available, an allocator in the management system reserves the facilities for the requesting station. Otherwise, the request is denied (abstract).

Chikenji describes a communication network in which two ring networks are connected by a pair of between-ring transmission lines. These lines are used in avoiding communication interruptions between ring networks due to faults (abstract).

Chin describes a system and method for distributed bandwidth allocation in a bi-directional ring network with spatial and local reuse. Chin's bandwidth allocation scheme allows the bandwidth of the ring to be statistically multiplexed among the nodes on the ring. No *a priori* bandwidth allocation is necessary, since each node senses the amount of traffic that it is forwarding and reports to the other nodes accordingly. Each node adjusts its own bandwidth based on the reports from other nodes (col. 3, lines 2-10).

Claim 1, as amended, specifies that resources are allocated to nodes in the network in predetermined quanta. As long as a given node (such as the first node recited in claim 1) has a sufficient amount of resources that have already been allocated to it, the node can use the resources to carry additional data flows over whatever path is appropriate. When the resources are insufficient, however, the node must request and receive an increased allocation. As noted in paragraph 0041 of the published specification, allocation of resources in quanta of this sort is useful in limiting the frequency with which allocation and deallocation operations must be performed. By contrast, in Drake's system, the nodes must request a reservation of facilities for each new data stream.

Original claim 9 in the present patent application recites increasing the allocation of a resource by a predetermined quantum. In rejecting this claim in the present official action, over Drake and Chikenji in view of Chin, the Examiner stated that although Drake and Chikenji do not disclose "increasing an allocation... by a predetermined quantum," this feature is disclosed by Chin (col. 11, lines 12-28). The cited passage in Chin describes methods for updating available and allocated bandwidth, in the context of a method by which nodes dynamically increase and decrease their fair share of bandwidth by statistical multiplexing. Chin notes that the advantage of his method is that it allows each node to send and receive bandwidth reports to the other nodes, and to adjust its own bandwidth accordingly without resort to a "ring master" (col. 3, lines 3-14).

This approach is diametrically opposed to that recited in amended claim 1, wherein resources are specifically requested by the nodes and allocated to them in quanta,

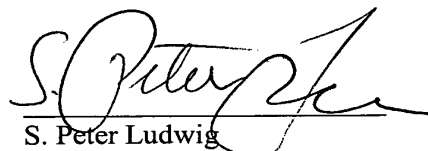
in order to reduce the communication and computing burden that are involved in frequently changing allocations. The approach of amended claim 1 is neither taught nor suggested by the cited art. Therefore, claim 1 is believed to be patentable. In view of the patentability of claim 1, claims 2-8, 10, 11, 13 and 14, which depend from claim 1, are believed to be patentable, as well.

Applicant has added new claims 29-32 in order to recite further aspects of the present invention that are related to resource allocation and deallocation. Claim 29, which depends from claim 13, recites explicitly that the allocation process is carried out by a dispatcher, in contrast to Chin's decentralized approach. Claim 30, which depends from claim 1, adds the recitation of a method for deallocating resources, which is likewise carried out in quanta. Deallocation is invoked when the amount of resources released exceeds a hysteresis threshold (as shown in Fig. 5 and described in paragraphs 0054-0056 of the present patent application). Claims 29 and 30 are thus believed to be patentable.

Claim 31 is an independent claim, which recites a communication network that operates on principles similar to those of the method of claim 1, as amended. Claim 32 depends from claim 31, and relates to deallocation of resources, in similar fashion to claim 30. Thus, for the reasons stated above, claim 31 is believed to be patentable, as are claims 25, 26 and 32, which depend from claim 31.

Applicant believes the amendments and remarks presented above to be fully responsive to all of the objections and grounds of rejection raised by the Examiner. In view of these amendments and remarks, all of the claims now pending in this application are believed to be in condition for allowance. Prompt notice to this effect is requested.

Respectfully submitted,



S. Peter Ludwig
Registration No. 25,351
Attorney for Applicant

Darby & Darby P.C.
805 Third Avenue
New York, NY 10022
(212) 527-7700

BEST AVAILABLE COPY

PATENT APPLICATION FEE DETERMINATION RECORD
Effective October 1, 2000

Application or Docket Number

09756946

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS		
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	28 minus 20 =	8
INDEPENDENT CLAIMS	2 minus 3 =	
MULTIPLE DEPENDENT CLAIM PRESENT ☐		

* If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	32	20	12
Independent	4	3	1
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐			

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total			
Independent			
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐			

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total			
Independent			
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐			

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
 ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."
 *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."
 The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

SMALL ENTITY TYPE ☐

OR OTHER THAN SMALL ENTITY

RATE	FEE	OR	RATE	FEE
BASIC FEE	355.00		BASIC FEE	710.00
X\$ 9=			X\$18=	1441
X40=			X80=	
+135=			+270=	
TOTAL			TOTAL	8541

SMALL ENTITY OR OTHER THAN SMALL ENTITY

RATE	ADDITIONAL FEE	OR	RATE	ADDITIONAL FEE
X\$ 9=			X\$18=	3600
X40=			X80=	8800
+135=			+270=	
TOTAL ADDIT. FEE			TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE	OR	RATE	ADDITIONAL FEE
X\$ 9=			X\$18=	
X40=			X80=	
+135=			+270=	
TOTAL ADDIT. FEE			TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE	OR	RATE	ADDITIONAL FEE
X\$ 9=			X\$18=	
X40=			X80=	
+135=			+270=	
TOTAL ADDIT. FEE			TOTAL ADDIT. FEE	

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S47	24	S46 and ring	USPAT	OR	OFF	2005/03/10 12:21
S46	159	(resourc\$2 same compar\$3 same releas\$3)	USPAT	OR	OFF	2005/03/10 12:21
S45	25	(resourc\$2 same compar\$3 same deallocat\$3)	USPAT	OR	OFF	2005/03/10 12:21
S44	0	(resourc same compar\$3 same deallocat\$3)	USPAT	OR	OFF	2005/03/10 12:05
S43	12	(releas\$3 same compar\$3 same deallocat\$3)	USPAT	OR	OFF	2005/03/10 12:05
S42	0	(releas\$3 with compar\$3) same deallocat\$3	USPAT	OR	OFF	2005/03/10 11:59
S41	0	(releas\$3 with compar\$3 with deallocat\$3)	USPAT	OR	OFF	2005/03/10 11:58
S40	7	S39 and qos	USPAT	OR	OFF	2005/03/10 11:56
S39	81	ring and ((link\$1 or segment\$1) with ((low\$3 or small\$3) near3 available))	USPAT	OR	OFF	2005/03/10 11:13
S38	23	ring and ((link\$1 or segment\$1) with ((low\$3 or small\$3) near3 available))	US-PGPUB	OR	OFF	2005/03/10 11:12
S1	1	"20020118700"	US-PGPUB	OR	OFF	2005/03/10 10:52
S37	24	S36 and (rout\$3) and (qos)	USPAT	OR	OFF	2005/03/09 15:47
S35	41	S34 and (rout\$3) and (qos)	USPAT	OR	OFF	2005/03/09 15:47
S36	2429	((select\$3 or choos\$3) with (path\$1 or connection\$1 or channel\$1 or link\$1) with (max\$5 or great\$3 or big\$4 or most) with (low\$3 or min\$5 or small\$3))	USPAT	OR	OFF	2005/03/09 15:46
S34	3490	((select\$3 or choos\$3) with (path\$1 or connection\$1 or channel\$1 or link\$1) with (max\$5 or great\$3 or big\$4 or most) with (low\$3 or min\$5 or small\$3 or least))	USPAT	OR	OFF	2005/03/09 15:46
S33	12975	((select\$3 or choos\$3) with (path\$1 or connection\$1 or channel\$1 or link\$1)) same (max\$5 or great\$3 or big\$4 or most) same (low\$3 or min\$5 or small\$3 or least)	USPAT	OR	OFF	2005/03/09 15:18
S32	235694	(path\$1 or connection\$1 or channel\$1 or link\$1) same (max\$5 or great\$3 or big\$4 or most) same (low\$3 or min\$5 or small\$3 or least)	USPAT	OR	OFF	2005/03/09 15:18



03-17-05

2661
IFW

Customer No.: 07278

Docket No.: 06727/000145-US0

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Leon Bruckman

Serial No.: 09/756,946

Filed: January 9, 2001

For: FLOW ALLOCATION IN A RING TOPOLOGY

March 16, 2005

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Information Disclosure Statement is submitted in accordance with 37 C.F.R. 1.97, 1.98, and it is requested that the information set forth in this statement and in the listed documents be considered during the pendency of the above-identified application, and any other application relying on the filing date of the above-identified application or cross-referencing it as a related application.

1. This IDS should be considered, in accordance with 37 C.F.R. 1.97, as it is filed: (Check one of the boxes A-D)

- ☐ A. Within three months of the filing date of the above-identified national application or within three months of the entry into the national stage of the above-identified international application.
- ☐ B. before the mailing date of a first office action on the merits, or a first office action after filing a request for continued examination.
- ☒ C. after (A) and (B) above, but before final rejection or allowance, and Applicants have made the necessary statement in box "i" below or paid the necessary fee in box "ii" below.

(check one of the boxes "i" and "ii" below:)

- ☒ i. Counsel states that, upon information and belief, each item of information listed herein was either (a) cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this IDS; or (b) was not cited in a communication from a foreign patent office in a counterpart foreign application and, to the knowledge of undersigned after making reasonable inquiry, was not known to any individual designated in 1.56(c) more than three months prior to the filing of this IDS.
- ☐ ii. A check for the fee set forth in 1.17(p), presently believed to be \$240, is enclosed.
- ☐ D. after (A), (B) and (C) above, but before payment of the issue fee: Applicant petitions under 37 C.F.R. 1.97(d) for the consideration of this IDS. Under 37 CFR 1.17(i) a check in the amount of \$130.00 is enclosed. Counsel certifies that, upon information and belief, each item of information listed herein was either (i) cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the IDS; or (ii) was not cited in a communication from a foreign patent office in a counterpart foreign application and, to the knowledge of the undersigned after making reasonable inquiry, was not known to any individual designated in 1.56(c) more than three months prior to the filing of this IDS.

2. In accordance with 37 C.F.R. 1.98, this IDS includes a list (e.g., form PTO/SB/08) of all patents, publications, or other information submitted for consideration by the office, either incorporated into this IDS or as an attachment hereto. A copy of each document listed is attached, except as explained below.

(check boxes A, B and/or C and fill in blanks, if appropriate.)

- ☒ A. Pursuant to the Notice issued by the United States Patent and Trademark Office dated July 11, 2003 waiving the requirements of 37 C.F.R. § 1.98(a)(2)(i), a copy/copies of the United States Patent on PTO/SB08 is/are not being submitted.
- ☐ B. Document(s) _____ is (are) deemed substantially cumulative to document(s) _____, and, in accordance with 1.98(c), only a copy of each of the latter documents is enclosed.
- ☐ C. Certain documents were previously cited by or submitted to the Office in the following prior applications, which are relied upon under 35 U.S.C. 120:

[SERIAL NO. & FILING DATE].

Applicant identifies these documents by attaching hereto copies of the forms PTO-892, PTO-1449 and/or PTO/SB/08 from the files of the prior application(s) or a fresh PTO/SB/08 listing these documents, and request that they be considered and made of record in accordance with 1.98(d). Per 37 CFR 1.98(d), copies of these documents need not be filed in this application.

☐ 3. Cite Nos. _____ are not in the English language. In accordance with 1.98(c), Applicant states:

- ☐ An English translation of each document (or of the pertinent portions thereof), or a copy of each corresponding English-language patent or application, or English-language abstract (or claim) is enclosed.
- ☐ The requirement for a concise explanation of the relevance of any foreign language document is satisfied by the attached search report; citation of the documents cited in the search report shall not be construed as an admission that they are or are considered to be, material to patentability of the subject matter claimed herein (See MPEP §609).
- ☐ A concise explanation of the relevance of document(s) _____ is set forth as follows: [Insert concise explanation of relevance]
- ☐ A concise explanation of the relevance of document(s) _____ can be found on page(s) _____ of the specification.
- ☐ A concise explanation of document(s) _____ can be found on the attached sheet.

☐ 4. No explanation of relevance is necessary for documents in the English language (see reply to Comments 67 in the preamble to the final rules; 1135 OG 13 at 20).

☒ 5. Other information being provided for the examiner's consideration follows:

An Office Action dated December 30, 2004, which issued during the prosecution of Applicant's U.S. Patent Application No. 09/867,414.

6. In accordance with 37 C.F.R. 1.97(g) and (h), the filing of this IDS should not be construed as a representation that a search has been made or that information cited is, or is considered to be, material to patentability as defined in §1.56 (b), or that any cited document listed or attached is (or constitutes) prior art. Unless other-wise indicated, the date of publication indicated for an item is taken from the face of the item and Applicant reserves the right to prove that the date of publication is in fact different.

CROSS REFERENCE UNDER 37 C.F.R. (1.78 TO RELATED APPLICATIONS

Pursuant to 37 C.F.R. (1.78, Applicant notes that the above-identified patent application may be related to the following U.S. Patent Applications:

(1) U.S. Patent Application Serial No _____, filed _____.

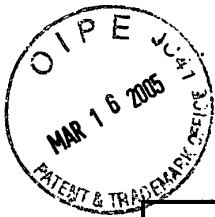
Early and favorable consideration is earnestly solicited.

Respectfully submitted,



S. Peter Ludwig
Registration No. 25,351
Attorney for Applicant(s)

DARBY & DARBY P.C.
P.O. Box 5257
New York, N.Y. 10150-5257
(212) 527-7700



Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/B/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)			Complete if Known		
			Application Number	09/756,946-Conf. #6186	
			Filing Date	January 9, 2001	
			First Named Inventor	Leon Bruckman	
			Art Unit	2661	
			Examiner Name	J. A. Kading	
Sheet	1	of	1	Attorney Docket Number	06727/0001145-US0

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
	AA**	US-6,442,134	08-27-2002	Mitchell	
	AB**	US-6,680,912	01-20-2004	Kalman et al.	
	AC**	US-6,711,125	03-23-2004	Walrand et al.	
	AD**	US-6,795,394	09-21-2004	Swinkels et al.	
	AE**	US-6,820,210	11-16-2004	Daruwalla et al.	
	AF**	US-6,256,292	07-03-2001	Ellis et al.	
	AG**	US-6,731,597	05-04-2004	Batchellor et al.	
	AH**	US-6,456,407	09-24-2002	Tammela et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T ⁶
		Country Code ³ -Number ⁴ -Kind Code ⁵ (if known)	MM-DD-YYYY			

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. **Pursuant to the Notice issued by the United States Patent and Trademark Office dated July 11, 2003 waiving the requirements of 37 C.F.R. § 1.98(a)(2)(i), a copy of the United States Patent on PTO/SB08 is not submitted. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). ² Applicant is to place a check mark here if English language Translation is attached.

Examiner Signature	Date Considered
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Application No. (if known): 09/756,946

Attorney Docket No.: 06727/0001145-US0

Certificate of Express Mailing Under 37 CFR 1.10

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Information Disclosure Statement (4 pages)
Form PTO SB/08 (1 page)
A copy of Office Action (9 pages)

Notice of References Cited	Application/Control No. 09/756,946	Applicant(s)/Patent Under Reexamination BRUCKMAN, LEON	
	Examiner Joshua Kading	Art Unit 2661	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-6,262,976	07-2001	McNamara, Tod W.	370/254
	B	US-5,706,516	01-1998	Chang et al.	719/314
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.



PTO/SB/08a/b (08-03)
Approved for use through 07/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Substitute for form 1449A/B/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)				Complete If Known	
				Application Number	09/756,946-Conf. #6186
				Filing Date	January 9, 2001
				First Named Inventor	Leon Bruckman
				Art Unit	2661
				Examiner Name	Joshua A. Kading
Sheet	1	of	1	Attorney Docket Number	06727/0001145-US0

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
	AA	US-6,647,008-B1	11/2003	Galand et al.	
	AB	US-6,584,535-B1	06/2003	Ouellet et al.	
	AC	US-6,400,681-B1	06/2002	Bertin et al.	
	AD	US-6,021,263-B1	02/2000	Kujoory et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T ⁴
		Country Code ³ -Number ⁴ -Kind Code ⁵ (if known)				

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). ² Applicant is to place a check mark here if English language Translation is attached.

Examiner Signature		Date Considered	3-8-05
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/756,946	01/09/2001	Leon Bruckman	6727/01145	6186

7590 03/21/2005
DARBY & DARBY P.C.
805 Third Avenue
New York, NY 10022

EXAMINER

KADING, JOSHUA A

ART UNIT	PAPER NUMBER
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2661

DATE MAILED: 03/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/756,946	BRUCKMAN, LEON	
	Examiner	Art Unit	
	Joshua Kading	2661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 October 2004.
 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) _____ is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 1-32 is/are rejected.
 7) ☒ Claim(s) 32 is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) ☒ Notice of References Cited (PTO-892) | 4) ☐ Interview Summary (PTO-413) |
| 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) ☐ Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>10-08-04</u> . | 6) ☐ Other: _____ |

DETAILED ACTION

Claim Objections

Claim 32 is objected to because of the following informalities:

Claim 32 is indicated as depending from claim 30. However, claim 30 is a
5 method claim and claim 32 is directed towards a network claim. Further, applicant
indicates that claim 32 is to depend from claim 31 in REMARKS, page 10, second to
last paragraph. Therefore, claim 32 should be changed to depend from claim 31.
Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all
obviousness rejections set forth in this Office action:

15 (a) A patent may not be obtained though the invention is not identically disclosed or described as set
forth in section 102 of this title, 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 at the time the
invention was made to a person having ordinary skill in the art to which said subject matter pertains.
Patentability shall not be negated by the manner in which the invention was made.

20 Claims 1-3, 5-8, 11, 13, 14, 25, 29, and 31 are rejected under 35 U.S.C.
103(a) as being unpatentable over U.S. Patent 5,461,611, Drake, Jr. et al. (Drake) in
view of U.S. Patent 6,639,893 B1, Chikenji et al. (Chikenji).

25 Regarding claims 1 and 31, Drake discloses, "a communication network,
comprising: a plurality of nodes, comprising at least first and second nodes (figure 1,
elements 10 and 29 correspond to first and second nodes); a plurality of links,

interconnecting the nodes to provide communications therebetween (figure 1 where there are links connecting the nodes); and a dispatcher, which is adapted to allocate a respective number of quanta of one or more resources in the network to each of the nodes (figure 1, element 20 allocates resources based on different quanta desired by

5 each node as read in col. 4, lines 49-54), wherein the first node is adapted, upon receiving a request to use a portion of the resources so as to carry the data flow between the first and second nodes over one of a plurality of paths therebetween, each such path comprising a respective sequence of the links (col. 10, lines 43-46), to direct the data flow from the first node to the second node over one of the paths if the

10 resources already allocated to the first node on the one of the paths are sufficient (col. 10, lines 46-51 where if there enough resources the path is established and resources granted), and to request an increase in an allocation of the requested resources to the first node if the resources already allocated to the first node are insufficient (col. 12, lines 35-67 and figure 7), and wherein the dispatcher is adapted to determine, for the

15 links comprised in each of the paths, respective levels of use of the requested resources due to communications in progress over the network (col. 11, lines 13-17 where the known bandwidth represents the communications in progress and the bandwidth subtracted from that represents the requested resources), and to increase the allocation of the resources to the first node on the selected path by a predetermined

20 quantum (col. 12, lines 60-67)."

However, Drake lacks what Chikenji discloses, "to select which of the paths is to carry the data flow responsive to the determined levels of use of the

requested resources on the links comprised in each of the paths (col. 11, lines 35-63 (emphasis on lines 58-63) where the "path selection means", when taken in the context of a switch (node) on the transmission line, uses "the smallest weight" to select the path, i.e. the path selection means chooses the path based on the largest amount of free
5 bandwidth)."

It would have been obvious to one with ordinary skill in the art at the time of invention to include the selecting of paths with the rest of the method for the purpose of distributing data communications as evenly as possible across paths (Chikenji, col. 11, lines 58-63 where it is implied that by selecting a path with the smallest capacity used,
10 other, more utilized paths, will not be overused). The motivation for evenly distributing data over the given paths is so that the system does not have some paths overburdened while others are underutilized.

Regarding claim 2, Drake and Chikenji disclose the method of claim 1. However,
15 Drake explicitly lacks what Chikenji further discloses, "the network comprises an Internet Protocol (IP) network (col. 26, lines 27-29)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the IP network with the method of claim 1 for the same reasons and motivation as in claim 1.

20 Regarding claim 3, Drake and Chikenji disclose the method of claim 1. However, Drake lacks what Chikenji further discloses, "the nodes are interconnected in a ring, and wherein the plurality of paths comprises a first path traversing the ring in one direction

and a second path traversing the ring in the opposite direction (figure 13, Ring Network C shows two dotted paths that flow in opposite directions), and wherein selecting which of the paths is to carry the data flow comprises selecting the first or the second path

(figure 13 in combination with col. 11, lines 35-64 where are only the two paths to select from in figure 13 and thus the path selection means must choose between these two)."

It would have been obvious to one with ordinary skill in the art at the time of invention to include the first and second paths with the method of claim 1 for the same reasons and motivation as in claim 1.

10 Regarding claim 5, Drake and Chikenji disclose the method of claim 1. However, Chikenji lacks what Drake further discloses, "the one or more resources comprise a link bandwidth (col. 11, lines 13-17 whereby calculating a bandwidth by subtracting the requested or allocated bandwidth from the remaining bandwidth says that the link must have its own finite bandwidth)." It would have been obvious to one with ordinary skill in
15 the art at the time of invention to include the link bandwidth with the method of claim 1 for the same reasons and motivation as in claim 1.

 Regarding claim 6, Drake and Chikenji disclose the method of claim 1. However, Chikenji lacks what Drake further discloses, "the one or more resources comprise a
20 processing power associated with each of the links (figure 1 and col. 11, lines 13-17 both suggest that each link has to have a processing power associated with it, as is known in the art all nodes (such as those in figure 1) have processors attached to them

and each have a finite amount of processing power devoted to each communication link coming in and going out of the node, further to calculate the remaining bandwidth of a link, a processor must do that calculation and thus each link will have some processing power associated with it at some time)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the processing power associated with each of the links with the method of claim 1 for the same reasons and motivation as in claim 1.

Regarding claim 7, Drake and Chikenji disclose the method of claim 1. However, Chikenji lacks what Drake further discloses "wherein selecting which of the paths is to carry the data flow comprises comparing an amount of the one or more resources requested to a resource budget assigned to the first node, and permitting the data flow only if allocating the requested resources will not cause a total of the resources allocated to the first node to exceed the budget (col. 11, lines 4-10 where Drake is saying that since the requested QoS bandwidth requirement is within the bounds of the available bandwidth, or the resource budget, the data flow can be permitted because the requested resources will not exceed the available bandwidth)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the permitting the data flow if the requested resources were within the resource budget for the same reasons and motivation as in claim 1.

Regarding claim 8, Drake and Chikenji disclose the method of claim 7. However, Chikenji lacks what Drake further discloses, "comparing the amount of the one or more resources comprises comparing the amount of each of the resources requested to the resource budget assigned for each of the resources, and wherein permitting the data

5 flow comprises permitting the flow only if all of the resources requested for at least one of the paths are within the budget (col. 11, lines 4-10 where each component of the path is compared to see if the available bandwidth will be adequate for the requested resource, if all paths are adequate the flow is permitted as seen in figure 5, elements 91, 82)." It would have been obvious to one with ordinary skill in the art at the time of

10 invention to include the comparing of each path component to determine if the path is within the budget with the method of claim 7 for the same reasons and motivation as in claim 7.

Regarding claim 10, Drake and Chikenji disclose the method of claim 1.

15 However, Chikenji lacks what Drake further discloses, "selecting which of the paths is to carry the data comprises verifying that a sufficient amount of the requested resources is available to carry the data flow on every one of the links comprised in the selected path (col. 11, lines 4-10 where determining if the requested QoS is within the available resources is the same as verifying that a sufficient amount of resources are available to

20 carry the data)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the verifying of the resources with the method of claim 1 for the same reasons and motivation as in claim 1.

Regarding claims 11 and 25, Drake and Chikenji disclose the method of claim 1 and the network of claim 31. However, Drake lacks what Chikenji further discloses, "selecting which of the paths is to carry the data flow comprises selecting the one of the
5 paths having the lowest level of a predetermined measure of use of the requested resources (col. 11, lines 58-63 whereby selecting the smallest weight in Chikenji suggests that the lowest level of the resources in use, or the smallest weight, is used to select the path)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the lowest level of resources in use as a criterion for
10 selection with the method of claim 1 and the network of claim 31 for the same reasons and motivation as in claims 1 and 31.

Regarding claim 13, Drake and Chikenji disclose the method of claim 1. However, Chikenji lacks what Drake further discloses, "receiving the request comprises
15 choosing a dispatcher within the network to manage allocation of the resources, wherein the dispatcher receives and processes the request (figure 1, node 20 acts as the dispatcher to allocate the resources of the network)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the dispatcher with the method of claim 1 for the same reasons and motivation as in claim 1.

20

Regarding claim 14, Drake and Chikenji disclose the method of claim 13. However, Chikenji lacks what Drake further discloses, "choosing the dispatcher

comprises choosing one of the nodes to act as the dispatcher (figure 1, node 20 again acts as the dispatcher as in claims 13 and 27).” It would have been obvious to one with ordinary skill in the art at the time of invention to include the dispatcher as a node with the method of claim 13 for the same reasons and motivation as in claim 13.

5

Regarding claim 29, Drake and Chikenji disclose the method of claim 13.

However, Chikenji lacks what Drake further discloses, “wherein requesting the increase in the allocation comprises requesting and receiving the allocation from the dispatcher (col. 4, lines 49-56).” It would have been obvious to one of ordinary skill in the art at the
10 time of invention to include the requesting of the increase and the allocation by the dispatcher for the same reasons and motivation as in claim 13.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Drake, Jr. et al. and Chikenji et al. as applied to claim 3 above, and further in view of applicant’s
15 admitted prior art (AAPA).

Regarding claim 4, Drake and Chikenji disclose the method of claim 3. However, both Drake and Chikenji lack what AAPA discloses, “conveying the data flow over an inner or outer data link ring within the network provided by a Spatial Reuse Protocol (SRP) (Specification, page 1, lines 17-page 2, lines 1-2).” It would have been obvious to
20 one with ordinary skill in the art to convey the data using an SRP for the purpose of allowing node to use different parts of the same ring simultaneously. The motivation for

Art Unit: 2661

this being that more than one node can use the ring at any given time, thus increasing throughput and efficiency.

Claims 9, 12, 15-17, 19-24, and 26-28 are rejected under 35 U.S.C. 103(a) as
5 being unpatentable over Drake et al. in view of Chikenji et al. and in further view of U.S.
Patent 6,262,976 B1, McNamara.

Regarding claim 26, Drake and Chikenji disclose the network of claim 25.
However, Drake and Chikenji lack what McNamara discloses, "wherein the measure of
10 use comprises, for each of at least two of the paths, a maximum level of use of at least
one of the requested resources, taken over all of the links comprised in the paths (col.
53, lines 54-59 where the capacity available to the link is the maximum level of a use of
a resource on that link, further the lowest capacity of the resources available is the one
that is selected)." It would have been obvious to one of ordinary skill in the art at the
15 time of invention to include the selecting the lowest level of a resource out of the
maximum levels of the resources available for the purpose of limiting the capacity of the
system to that of the lowest available link. The motivation for doing this is so that the
higher capacity links do not waste bandwidth by using it in conjunction with the lowest
available capacity link (McNamara, col. 53, lines 59-64).

20

Regarding claims 12 and 15, Drake discloses, "a communication network,
comprising: a plurality of nodes (figure 1, elements 10 and 29 correspond to first and

second nodes); a plurality of links, interconnecting the nodes to provide communications therebetween (figure 1 where there are links connecting the nodes); and a dispatcher, coupled to receive a request to allocate one or more resources in the network (col. 10, lines 43-46 where the allocator 26 is located in the dispatcher) so as to carry the data
5 flow between first and second ones of the nodes over one of a plurality of paths therebetween, each such path comprising a respective sequence of the links (figure 1 shows the nodes and links as previously described), and adapted to determine, for the links comprised in each of the paths, respective levels of use of the requested resources due to communications in progress over the network (col. 11, lines 13-17
10 where the known bandwidth represents the communications in progress and the bandwidth subtracted from that represents the requested resources)...”

However, Drake lacks what Chikenji discloses “...to select which of the paths is to carry the data flow responsive to the determined levels of use of the requested resources on the links comprised in each of the paths (col. 11, lines 35-63 (emphasis on
15 lines 58-63) where the “path selection means”, when taken in the context of a switch (node) on the transmission line, uses “the smallest weight” to select the path, i.e. the path selection means chooses the path based on the largest amount of free bandwidth), wherein the dispatcher is adapted to select for carrying the data flow the one of the paths that has the lowest level of a predetermined measure of use of the requested
20 resources (col. 11, lines 58-63 whereby selecting the smallest weight in Chikenji suggests that the lowest level of the resources in use, or the smallest weight, is used to select the path).”

It would have been obvious to one with ordinary skill in the art at the time of invention to include the selecting of paths with the rest of the network for the purpose of distributing data communications as evenly as possible across paths (Chikenji, col. 11, lines 58-63 where it is implied that by selecting a path with the smallest capacity used, other, more utilized paths, will not be overused). The motivation for evenly distributing data over the given paths is so that the system does not have some paths overburdened while others are underutilized.

Drake and Chikenji further lack however, what McNamara discloses, "wherein the measure of use comprises, for each of at least two of the paths, a maximum level of use of at least one of the requested resources, taken over all of the links comprised in the paths (col. 53, lines 54-59 where the capacity available to the link is the maximum level of a use of a resource on that link, further the lowest capacity of the resources available is the one that is selected)."

It would have been obvious to one of ordinary skill in the art at the time of invention to include the selecting the lowest level of a resource out of the maximum levels of the resources available for the purpose of limiting the capacity of the system to that of the lowest available link. The motivation for doing this is so that the higher capacity links do not waste bandwidth by using it in conjunction with the lowest available capacity link (McNamara, col. 53, lines 59-64).

Regarding claim 16, Drake, Chikenji, and McNamara disclose the network of claim 15. However, Drake and McNamara explicitly lack what Chikenji further discloses,

"the network comprises an Internet Protocol (IP) network (col. 26, lines 27-29)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the IP network with the network of claim 15 for the same reasons and motivation as in claim 15.

5

Regarding claim 17, Drake, Chikenji, and McNamara disclose the network of claim 15. However, Drake and McNamara lack what Chikenji further discloses, "the nodes are interconnected in a ring, and wherein the plurality of paths comprises a first path traversing the ring in one direction and a second path traversing the ring in the
10 opposite direction (figure 13, Ring Network C shows two dotted paths that flow in opposite directions), and wherein selecting which of the paths is to carry the data flow comprises selecting the first or the second path (figure 13 in combination with col. 11, lines 35-64 where are only the two paths to select from in figure 13 and thus the path selection means must choose between these two)." It would have been obvious to one
15 with ordinary skill in the art at the time of invention to include the first and second paths with the network of claim 15 for the same reasons and motivation as in claim 15.

Regarding claim 19, Drake, Chikenji, and McNamara disclose the network of claim 15. However, Chikenji and McNamara lack what Drake further discloses, "the one
20 or more resources comprise a link bandwidth (col. 11, lines 13-17 whereby calculating a bandwidth by subtracting the requested or allocated bandwidth from the remaining bandwidth says that the link must have its own finite bandwidth)." It would have been

obvious to one with ordinary skill in the art at the time of invention to include the link bandwidth with the network of claim 15 for the same reasons and motivation as in claim 15.

5 Regarding claim 20, Drake, Chikenji, and McNamara disclose the network of claim 15. However, Chikenji and McNamara lack what Drake further discloses, "the one or more resources comprise a processing power associated with each of the links (figure 1 and col. 11, lines 13-17 both suggest that each link has to have a processing power associated with it, as is known in the art all nodes (such as those in figure 1)
10 have processors attached to them and each have a finite amount of processing power devoted to each communication link coming in and going out of the node, further to calculate the remaining bandwidth of a link, a processor must do that calculation and thus each link will have some processing power associated with it at some time)." It would have been obvious to one with ordinary skill in the art at the time of invention to
15 include the processing power associated with each of the links with the network of claim 15 for the same reasons and motivation as in claim 15.

 Regarding claim 21, Drake, Chikenji, and McNamara disclose the network of claim 15. However, Chikenji and McNamara lack what Drake further discloses "wherein
20 selecting which of the paths is to carry the data flow comprises comparing an amount of the one or more resources requested to a resource budget assigned to the first node, and permitting the data flow only if allocating the requested resources will not cause a

total of the resources allocated to the first node to exceed the budget (col. 11, lines 4-10 where Drake is saying that since the requested QoS bandwidth requirement is within the bounds of the available bandwidth, or the resource budget, the data flow can be permitted because the requested resources will not exceed the available bandwidth)." It

5 would have been obvious to one with ordinary skill in the art at the time of invention to include the permitting the data flow if the requested resources were within the resource budget for the same reasons and motivation as in claim 15.

Regarding claim 22, Drake, Chikenji, and McNamara disclose the network of
10 claim 21. However, Chikenji and McNamara lack what Drake further discloses,
"comparing the amount of the one or more resources comprises comparing the amount of each of the resources requested to the resource budget assigned for each of the resources, and wherein permitting the data flow comprises permitting the flow only if all of the resources requested for at least one of the paths are within the budget (col. 11,
15 lines 4-10 where each component of the path is compared to see if the available bandwidth will be adequate for the requested resource, if all paths are adequate the flow is permitted as seen in figure 5, elements 91, 82)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the comparing of each path component to determine if the path is within the budget with the network of claim
20 21 for the same reasons and motivation as in claim 21.

Regarding claims 9 and 23, Drake, Chikenji, and McNamara disclose the method of claim 12 and the network of claim 15. However, Chikenji and McNamara lack what Drake further discloses, "increasing an allocation to the first node of the one or more requested resources on the selected path by a predetermined quantum (figure 7,
5 element where any node can request an increase in the bandwidth resource by a given amount)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the increasing of the resources by a predetermined quantum for the same reasons and motivation as in claims 12 and 15.

10 Regarding claim 24, Drake, Chikenji, and McNamara disclose the network of claim 15. However, Chikenji and McNamara lack what Drake further discloses, "selecting which of the paths is to carry the data comprises verifying that a sufficient amount of the requested resources is available to carry the data flow on every one of the links comprised in the selected path (col. 11, lines 4-10 where determining if the
15 requested QoS is within the available resources is the same as verifying that a sufficient amount of resources are available to carry the data)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the verifying of the resources with the network of claim 15 for the same reasons and motivation as in claim 15.

20 Regarding claim 27, Drake, Chikenji, and McNamara disclose the network of claim 15. However, Chikenji and McNamara lack what Drake further discloses,

“receiving the request comprises choosing a dispatcher within the network to manage allocation of the resources, wherein the dispatcher receives and processes the request (figure 1, node 20 acts as the dispatcher to allocate the resources of the network).” It would have been obvious to one with ordinary skill in the art at the time of invention to
5 include the dispatcher with the network of claim 15 for the same reasons and motivation as in claim 15.

Regarding claim 28, Drake, Chikenji, and McNamara disclose the network of claim 27. However, Chikenji and McNamara lack what Drake further discloses, “wherein
10 the dispatcher is operative as a software process running on the associated node (figure 1, node 20 has elements, such as 22-25 that indicate it is a node that uses software to run the allocation of resources).” It would have been obvious to one with ordinary skill in the art at the time of invention to include the dispatcher as a node with the network of claim 27 for the same reasons and motivation as in claim 27.

15

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Drake, Jr. et al., Chikenji et al., and McNamara as applied to claim 17 above, and further in view of applicant’s admitted prior art (AAPA).

Regarding claim 18, Drake, Chikenji, and McNamara disclose the network of
20 claim 17. However, Drake, Chikenji, and McNamara lack what AAPA discloses, “conveying the data flow over an inner or outer data link ring within the network provided by a Spatial Reuse Protocol (SRP) (Specification, page 1, lines 17-page 2, lines 1-2).” It

would have been obvious to one with ordinary skill in the art to convey the data using an SRP for the purpose of allowing node to use different parts of the same ring simultaneously. The motivation for this being that more than one node can use the ring at any given time, thus increasing throughput and efficiency.

5

Claims 30 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Drake et al. and Chikenji et al. as applied to claims 1 and 31 respectively as above, and further in view of U.S. Patent 5,706,516, Chang et al. (Chang).

Regarding claims 30 and 32, Drake and Chikenji disclose the method of claim 1
10 and the network of claim 31. However, Drake and Chikenji lack what Chang discloses, "wherein the first node is adapted, upon release of the requested resources, to compare an amount of the resources that have been released to a predetermined threshold, and if the amount is greater than the predetermined threshold, to deallocate the predetermined quantum from the first node (col. 11, lines 33-40 where the tokens
15 represent resources because they allow a given agent to use the resources while in possession of the tokens and once the resources have exceeded a given threshold they are released)." It would have been obvious to one of ordinary skill in the art to include the releasing of resources once a given threshold has been reached for the purpose of monitoring the resources used by any given node at a time. The motivation for doing
20 this would be so that the resources are shared fairly among all nodes by not allowing a single node to use all the resources.

Response to Arguments

Applicant's arguments, see REMARKS, page 8, paragraph 2, filed 26 October 2004, with respect to the objections of claims 1 and 15 have been fully considered and are persuasive. The objections of claims 1 and 15 have been withdrawn.

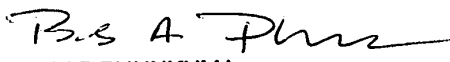
5

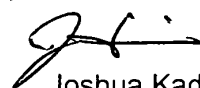
Applicant's arguments with respect to claims 1-32 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the
10 examiner should be directed to Joshua Kading whose telephone number is (571) 272-3070. The examiner can normally be reached on M-F: 8:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau Nguyen can be reached on (571) 272-3126. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

15 Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should
20 you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


BOB PHUNKULH
PRIMARY EXAMINER


Joshua Kading

Index of Claims 	Application No.		Applicant(s)	
	09/756,946		BRUCKMAN, LEON	
	Examiner		Art Unit	
	Joshua Kading		2661	

✓	Rejected	—	(Through numeral) Cancelled	N	Non-Elected	A	Appeal
=	Allowed	+	Restricted	I	Interference	O	Objected

Claim		Date				Claim		Date				Claim		Date			
Final	Original					Final	Original					Final	Original				
	3-10-05																
1	✓					51						101					
2	✓					52						102					
3	✓					53						103					
4	✓					54						104					
5	✓					55						105					
6	✓					56						106					
7	✓					57						107					
8	✓					58						108					
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11	✓					61						111					
12	✓					62						112					
13	✓					63						113					
14	✓					64						114					
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Search Notes 	Application No.		Applicant(s)	
	09/756,946		BRUCKMAN, LEON	
	Examiner		Art Unit	
	Joshua Kading		2661	

SEARCHED			
Class	Subclass	Date	Examiner

INTERFERENCE SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
	DATE	EXMR
UPDATED SEARCH	3-9-05	Ⓟ



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/756,946	01/09/2001	Leon Bruckman	6727/01145	6186

7590

03/21/2005

DARBY & DARBY P.C.
805 Third Avenue
New York, NY 10022

EXAMINER	
KADING, JOSHUA A	
ART UNIT	PAPER NUMBER
2661	

DUE: June 21, 2005
Docketed on 3/24/05 by LIG for
Docketed without file ☐
Attorney _____

DATE MAILED: 03/21/2005

9/21/05.

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/756,946	BRUCKMAN, LEON	
	Examiner	Art Unit	
	Joshua Kading	2661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 October 2004.
 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) _____ is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 1-32 is/are rejected.
 7) ☒ Claim(s) 32 is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
 Paper No(s)/Mail Date 10-08-04
 4) ☐ Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____
 5) ☐ Notice of Informal Patent Application (PTO-152)
 6) ☐ Other: _____

Patent and Trademark Office
 OL-326 (Rev. 1-04)

Office Action Summary

Part of Paper No./Mail Date 032005

DETAILED ACTION

Claim Objections

Claim 32 is objected to because of the following informalities:

Claim 32 is indicated as depending from claim 30. However, claim 30 is a
5 method claim and claim 32 is directed towards a network claim. Further, applicant
indicates that claim 32 is to depend from claim 31 in REMARKS, page 10, second to
last paragraph. Therefore, claim 32 should be changed to depend from claim 31.
Appropriate correction is required.

10

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all
obviousness rejections set forth in this Office action:

15 (a) A patent may not be obtained though the invention is not identically disclosed or described as set
forth in section 102 of this title, 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 at the time the
invention was made to a person having ordinary skill in the art to which said subject matter pertains.
Patentability shall not be negated by the manner in which the invention was made.

20

Claims 1-3, 5-8, 1, 11, 13, 14, 25, 29, and 31 are rejected under 35 U.S.C.
103(a) as being unpatentable over U.S. Patent 5,461,611, Drake, Jr. et al. (Drake) in
view of U.S. Patent 6,639,893 B1, Chikenji et al. (Chikenji).

Regarding claims 1 and 31, Drake discloses, "a communication network,
15 comprising: a plurality of nodes, comprising at least first and second nodes (figure 1,
elements 10 and 29 correspond to first and second nodes); a plurality of links,

interconnecting the nodes to provide communications therebetween (figure 1 where there are links connecting the nodes); and a dispatcher, which is adapted to allocate a respective number of quanta of one or more resources in the network to each of the nodes (figure 1, element 20 allocates resources based on different quanta desired by

5 each node as read in col. 4, lines 49-54), wherein the first node is adapted, upon receiving a request to use a portion of the resources so as to carry the data flow between the first and second nodes over one of a plurality of paths therebetween, each such path comprising a respective sequence of the links (col. 10, lines 43-46), to direct the data flow from the first node to the second node over one of the paths if the

10 resources already allocated to the first node on the one of the paths are sufficient (col. 10, lines 46-51 where if there enough resources the path is established and resources granted), and to request an increase in an allocation of the requested resources to the first node if the resources already allocated to the first node are insufficient (col. 12, lines 35-67 and figure 7), and wherein the dispatcher is adapted to determine, for the

15 links comprised in each of the paths, respective levels of use of the requested resources due to communications in progress over the network (col. 11, lines 13-17 where the known bandwidth represents the communications in progress and the bandwidth subtracted from that represents the requested resources), and to increase the allocation of the resources to the first node on the selected path by a predetermined

20 quantum (col. 12, lines 60-67)."

However, Drake lacks what Chikenji discloses, "to select which of the paths is to carry the data flow responsive to the determined levels of use of the

requested resources on the links comprised in each of the paths (col. 11, lines 35-63 (emphasis on lines 58-63) where the "path selection means", when taken in the context of a switch (node) on the transmission line, uses "the smallest weight" to select the path, i.e. the path selection means chooses the path based on the largest amount of free
5 bandwidth)."

It would have been obvious to one with ordinary skill in the art at the time of invention to include the selecting of paths with the rest of the method for the purpose of distributing data communications as evenly as possible across paths (Chikenji, col. 11, lines 58-63 where it is implied that by selecting a path with the smallest capacity used,
10 other, more utilized paths, will not be overused). The motivation for evenly distributing data over the given paths is so that the system does not have some paths overburdened while others are underutilized.

Regarding claim 2, Drake and Chikenji disclose the method of claim 1. However,
15 Drake explicitly lacks what Chikenji further discloses, "the network comprises an Internet Protocol (IP) network (col. 26, lines 27-29)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the IP network with the method of claim 1 for the same reasons and motivation as in claim 1.

20 Regarding claim 3, Drake and Chikenji disclose the method of claim 1. However, Drake lacks what Chikenji further discloses, "the nodes are interconnected in a ring, and wherein the plurality of paths comprises a first path traversing the ring in one direction

and a second path traversing the ring in the opposite direction (figure 13, Ring Network C shows two dotted paths that flow in opposite directions), and wherein selecting which of the paths is to carry the data flow comprises selecting the first or the second path (figure 13 in combination with col. 11, lines 35-64 where are only the two paths to select
5 from in figure 13 and thus the path selection means must choose between these two)."
It would have been obvious to one with ordinary skill in the art at the time of invention to include the first and second paths with the method of claim 1 for the same reasons and motivation as in claim 1.

10 Regarding claim 5, Drake and Chikenji disclose the method of claim 1. However, Chikenji lacks what Drake further discloses, "the one or more resources comprise a link bandwidth (col. 11, lines 13-17 whereby calculating a bandwidth by subtracting the requested or allocated bandwidth from the remaining bandwidth says that the link must have its own finite bandwidth)." It would have been obvious to one with ordinary skill in
15 the art at the time of invention to include the link bandwidth with the method of claim 1 for the same reasons and motivation as in claim 1.

 Regarding claim 6, Drake and Chikenji disclose the method of claim 1. However, Chikenji lacks what Drake further discloses, "the one or more resources comprise a
20 processing power associated with each of the links (figure 1 and col. 11, lines 13-17 both suggest that each link has to have a processing power associated with it, as is known in the art all nodes (such as those in figure 1) have processors attached to them

and each have a finite amount of processing power devoted to each communication link coming in and going out of the node, further to calculate the remaining bandwidth of a link, a processor must do that calculation and thus each link will have some processing power associated with it at some time)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the processing power associated with each of the links with the method of claim 1 for the same reasons and motivation as in claim 1.

Regarding claim 7, Drake and Chikenji disclose the method of claim 1. However, Chikenji lacks what Drake further discloses "wherein selecting which of the paths is to carry the data flow comprises comparing an amount of the one or more resources requested to a resource budget assigned to the first node, and permitting the data flow only if allocating the requested resources will not cause a total of the resources allocated to the first node to exceed the budget (col. 11, lines 4-10 where Drake is saying that since the requested QoS bandwidth requirement is within the bounds of the available bandwidth, or the resource budget, the data flow can be permitted because the requested resources will not exceed the available bandwidth)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the permitting the data flow if the requested resources were within the resource budget for the same reasons and motivation as in claim 1.

Regarding claim 8, Drake and Chikenji disclose the method of claim 7. However, Chikenji lacks what Drake further discloses, "comparing the amount of the one or more resources comprises comparing the amount of each of the resources requested to the resource budget assigned for each of the resources, and wherein permitting the data
5 flow comprises permitting the flow only if all of the resources requested for at least one of the paths are within the budget (col. 11, lines 4-10 where each component of the path is compared to see if the available bandwidth will be adequate for the requested resource, if all paths are adequate the flow is permitted as seen in figure 5, elements 91, 82)." It would have been obvious to one with ordinary skill in the art at the time of
10 invention to include the comparing of each path component to determine if the path is within the budget with the method of claim 7 for the same reasons and motivation as in claim 7.

Regarding claim 10, Drake and Chikenji disclose the method of claim 1.
15 However, Chikenji lacks what Drake further discloses, "selecting which of the paths is to carry the data comprises verifying that a sufficient amount of the requested resources is available to carry the data flow on every one of the links comprised in the selected path (col. 11, lines 4-10 where determining if the requested QoS is within the available resources is the same as verifying that a sufficient amount of resources are available to
20 carry the data)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the verifying of the resources with the method of claim 1 for the same reasons and motivation as in claim 1.

Regarding claims 11 and 25, Drake and Chikenji disclose the method of claim 1 and the network of claim 31. However, Drake lacks what Chikenji further discloses, "selecting which of the paths is to carry the data flow comprises selecting the one of the
5 paths having the lowest level of a predetermined measure of use of the requested resources (col. 11, lines 58-63 whereby selecting the smallest weight in Chikenji suggests that the lowest level of the resources in use, or the smallest weight, is used to select the path)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the lowest level of resources in use as a criterion for
10 selection with the method of claim 1 and the network of claim 31 for the same reasons and motivation as in claims 1 and 31.

Regarding claim 13, Drake and Chikenji disclose the method of claim 1. However, Chikenji lacks what Drake further discloses, "receiving the request comprises
15 choosing a dispatcher within the network to manage allocation of the resources, wherein the dispatcher receives and processes the request (figure 1, node 20 acts as the dispatcher to allocate the resources of the network)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the dispatcher with the method of claim 1 for the same reasons and motivation as in claim 1.

20

Regarding claim 14, Drake and Chikenji disclose the method of claim 13. However, Chikenji lacks what Drake further discloses, "choosing the dispatcher

comprises choosing one of the nodes to act as the dispatcher (figure 1, node 20 again acts as the dispatcher as in claims 13 and 27)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the dispatcher as a node with the method of claim 13 for the same reasons and motivation as in claim 13.

5

Regarding claim 29, Drake and Chikenji disclose the method of claim 13. However, Chikenji lacks what Drake further discloses, "wherein requesting the increase in the allocation comprises requesting and receiving the allocation from the dispatcher (col. 4, lines 49-56)." It would have been obvious to one of ordinary skill in the art at the time of invention to include the requesting of the increase and the allocation by the dispatcher for the same reasons and motivation as in claim 13.

10

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Drake, Jr. et al. and Chikenji et al. as applied to claim 3 above, and further in view of applicant's admitted prior art (AAPA).

15

Regarding claim 4, Drake and Chikenji disclose the method of claim 3. However, both Drake and Chikenji lack what AAPA discloses, "conveying the data flow over an inner or outer data link ring within the network provided by a Spatial Reuse Protocol (SRP) (Specification, page 1, lines 17-page 2, lines 1-2)." It would have been obvious to one with ordinary skill in the art to convey the data using an SRP for the purpose of allowing node to use different parts of the same ring simultaneously. The motivation for

20

this being that more than one node can use the ring at any given time, thus increasing throughput and efficiency.

Claims 9, 12, 15-17, 19-24, and 26-28 are rejected under 35 U.S.C. 103(a) as
5 being unpatentable over Drake et al. in view of Chikenji et al. and in further view of U.S.
Patent 6,262,976 B1, McNamara.

Regarding claim 26, Drake and Chikenji disclose the network of claim 25.
However, Drake and Chikenji lack what McNamara discloses, "wherein the measure of
10 use comprises, for each of at least two of the paths, a maximum level of use of at least
one of the requested resources, taken over all of the links comprised in the paths (col.
53, lines 54-59 where the capacity available to the link is the maximum level of a use of
a resource on that link, further the lowest capacity of the resources available is the one
that is selected)." It would have been obvious to one of ordinary skill in the art at the
15 time of invention to include the selecting the lowest level of a resource out of the
maximum levels of the resources available for the purpose of limiting the capacity of the
system to that of the lowest available link. The motivation for doing this is so that the
higher capacity links do not waste bandwidth by using it in conjunction with the lowest
available capacity link (McNamara, col. 53, lines 59-64).

20

Regarding claims 12 and 15, Drake discloses, "a communication network,
comprising: a plurality of nodes (figure 1, elements 10 and 29 correspond to first and

second nodes); a plurality of links, interconnecting the nodes to provide communications therebetween (figure 1 where there are links connecting the nodes); and a dispatcher, coupled to receive a request to allocate one or more resources in the network (col. 10, lines 43-46 where the allocator 26 is located in the dispatcher) so as to carry the data
5 flow between first and second ones of the nodes over one of a plurality of paths therebetween, each such path comprising a respective sequence of the links (figure 1 shows the nodes and links as previously described), and adapted to determine, for the links comprised in each of the paths, respective levels of use of the requested resources due to communications in progress over the network (col. 11, lines 13-17
10 where the known bandwidth represents the communications in progress and the bandwidth subtracted from that represents the requested resources)..."

However, Drake lacks what Chikenji discloses "...to select which of the paths is to carry the data flow responsive to the determined levels of use of the requested resources on the links comprised in each of the paths (col. 11, lines 35-63 (emphasis on
15 lines 58-63) where the "path selection means", when taken in the context of a switch (node) on the transmission line, uses "the smallest weight" to select the path, i.e. the path selection means chooses the path based on the largest amount of free bandwidth), wherein the dispatcher is adapted to select for carrying the data flow the one of the paths that has the lowest level of a predetermined measure of use of the requested
20 resources (col. 11, lines 58-63 whereby selecting the smallest weight in Chikenji suggests that the lowest level of the resources in use, or the smallest weight, is used to select the path)."

It would have been obvious to one with ordinary skill in the art at the time of invention to include the selecting of paths with the rest of the network for the purpose of distributing data communications as evenly as possible across paths (Chikenji, col. 11, lines 58-63 where it is implied that by selecting a path with the smallest capacity used, other, more utilized paths, will not be overused). The motivation for evenly distributing data over the given paths is so that the system does not have some paths overburdened while others are underutilized.

Drake and Chikenji further lack however, what McNamara discloses, "wherein the measure of use comprises, for each of at least two of the paths, a maximum level of use of at least one of the requested resources, taken over all of the links comprised in the paths (col. 53, lines 54-59 where the capacity available to the link is the maximum level of a use of a resource on that link, further the lowest capacity of the resources available is the one that is selected)."

It would have been obvious to one of ordinary skill in the art at the time of invention to include the selecting the lowest level of a resource out of the maximum levels of the resources available for the purpose of limiting the capacity of the system to that of the lowest available link. The motivation for doing this is so that the higher capacity links do not waste bandwidth by using it in conjunction with the lowest available capacity link (McNamara, col. 53, lines 59-64).

Regarding claim 16, Drake, Chikenji, and McNamara disclose the network of claim 15. However, Drake and McNamara explicitly lack what Chikenji further discloses,

"the network comprises an Internet Protocol (IP) network (col. 26, lines 27-29)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the IP network with the network of claim 15 for the same reasons and motivation as in claim 15.

5

Regarding claim 17, Drake, Chikenji, and McNamara disclose the network of claim 15. However, Drake and McNamara lack what Chikenji further discloses, "the nodes are interconnected in a ring, and wherein the plurality of paths comprises a first path traversing the ring in one direction and a second path traversing the ring in the opposite direction (figure 13, Ring Network C shows two dotted paths that flow in opposite directions), and wherein selecting which of the paths is to carry the data flow comprises selecting the first or the second path (figure 13 in combination with col. 11, lines 35-64 where are only the two paths to select from in figure 13 and thus the path selection means must choose between these two)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the first and second paths with the network of claim 15 for the same reasons and motivation as in claim 15.

Regarding claim 19, Drake, Chikenji, and McNamara disclose the network of claim 15. However, Chikenji and McNamara lack what Drake further discloses, "the one or more resources comprise a link bandwidth (col. 11, lines 13-17 whereby calculating a bandwidth by subtracting the requested or allocated bandwidth from the remaining bandwidth says that the link must have its own finite bandwidth)." It would have been

obvious to one with ordinary skill in the art at the time of invention to include the link bandwidth with the network of claim 15 for the same reasons and motivation as in claim 15.

5 Regarding claim 20, Drake, Chikenji, and McNamara disclose the network of claim 15. However, Chikenji and McNamara lack what Drake further discloses, "the one or more resources comprise a processing power associated with each of the links (figure 1 and col. 11, lines 13-17 both suggest that each link has to have a processing power associated with it, as is known in the art all nodes (such as those in figure 1)
10 have processors attached to them and each have a finite amount of processing power devoted to each communication link coming in and going out of the node, further to calculate the remaining bandwidth of a link, a processor must do that calculation and thus each link will have some processing power associated with it at some time)." It would have been obvious to one with ordinary skill in the art at the time of invention to
15 include the processing power associated with each of the links with the network of claim 15 for the same reasons and motivation as in claim 15.

 Regarding claim 21, Drake, Chikenji, and McNamara disclose the network of claim 15. However, Chikenji and McNamara lack what Drake further discloses "wherein
20 selecting which of the paths is to carry the data flow comprises comparing an amount of the one or more resources requested to a resource budget assigned to the first node, and permitting the data flow only if allocating the requested resources will not cause a

total of the resources allocated to the first node to exceed the budget (col. 11, lines 4-10 where Drake is saying that since the requested QoS bandwidth requirement is within the bounds of the available bandwidth, or the resource budget, the data flow can be permitted because the requested resources will not exceed the available bandwidth)." It
5 would have been obvious to one with ordinary skill in the art at the time of invention to include the permitting the data flow if the requested resources were within the resource budget for the same reasons and motivation as in claim 15.

Regarding claim 22, Drake, Chikenji, and McNamara disclose the network of
10 claim 21. However, Chikenji and McNamara lack what Drake further discloses,
"comparing the amount of the one or more resources comprises comparing the amount of each of the resources requested to the resource budget assigned for each of the resources, and wherein permitting the data flow comprises permitting the flow only if all of the resources requested for at least one of the paths are within the budget (col. 11,
15 lines 4-10 where each component of the path is compared to see if the available bandwidth will be adequate for the requested resource, if all paths are adequate the flow is permitted as seen in figure 5, elements 91, 82)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the comparing of each path component to determine if the path is within the budget with the network of claim
20 21 for the same reasons and motivation as in claim 21.

Regarding claims 9 and 23, Drake, Chikenji, and McNamara disclose the method of claim 12 and the network of claim 15. However, Chikenji and McNamara lack what Drake further discloses, "increasing an allocation to the first node of the one or more requested resources on the selected path by a predetermined quantum (figure 7,
5 element where any node can request an increase in the bandwidth resource by a given amount)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the increasing of the resources by a predetermined quantum for the same reasons and motivation as in claims 12 and 15.

10 Regarding claim 24, Drake, Chikenji, and McNamara disclose the network of claim 15. However, Chikenji and McNamara lack what Drake further discloses, "selecting which of the paths is to carry the data comprises verifying that a sufficient amount of the requested resources is available to carry the data flow on every one of the links comprised in the selected path (col. 11, lines 4-10 where determining if the
15 requested QoS is within the available resources is the same as verifying that a sufficient amount of resources are available to carry the data)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the verifying of the resources with the network of claim 15 for the same reasons and motivation as in claim 15.

20

Regarding claim 27, Drake, Chikenji, and McNamara disclose the network of claim 15. However, Chikenji and McNamara lack what Drake further discloses,

"receiving the request comprises choosing a dispatcher within the network to manage allocation of the resources, wherein the dispatcher receives and processes the request (figure 1, node 20 acts as the dispatcher to allocate the resources of the network)." It would have been obvious to one with ordinary skill in the art at the time of invention to
5 include the dispatcher with the network of claim 15 for the same reasons and motivation as in claim 15.

Regarding claim 28, Drake, Chikenji, and McNamara disclose the network of claim 27. However, Chikenji and McNamara lack what Drake further discloses, "wherein
10 the dispatcher is operative as a software process running on the associated node (figure 1, node 20 has elements, such as 22-25 that indicate it is a node that uses software to run the allocation of resources)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the dispatcher as a node with the network of claim 27 for the same reasons and motivation as in claim 27.

15

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Drake, Jr. et al., Chikenji et al., and McNamara as applied to claim 17 above, and further in view of applicant's admitted prior art (AAPA).

Regarding claim 18, Drake, Chikenji, and McNamara disclose the network of
20 claim 17. However, Drake, Chikenji, and McNamara lack what AAPA discloses, "conveying the data flow over an inner or outer data link ring within the network provided by a Spatial Reuse Protocol (SRP) (Specification, page 1, lines 17-page 2, lines 1-2)." It

would have been obvious to one with ordinary skill in the art to convey the data using an SRP for the purpose of allowing node to use different parts of the same ring simultaneously. The motivation for this being that more than one node can use the ring at any given time, thus increasing throughput and efficiency.

5

Claims 30 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Drake et al. and Chikenji et al. as applied to claims 1 and 31 respectively as above, and further in view of U.S. Patent 5,706,516, Chang et al. (Chang).

Regarding claims 30 and 32, Drake and Chikenji disclose the method of claim 1
10 and the network of claim 31. However, Drake and Chikenji lack what Chang discloses, "wherein the first node is adapted, upon release of the requested resources, to compare an amount of the resources that have been released to a predetermined threshold, and if the amount is greater than the predetermined threshold, to deallocate the predetermined quantum from the first node (col. 11, lines 33-40 where the tokens
15 represent resources because they allow a given agent to use the resources while in possession of the tokens and once the resources have exceeded a given threshold they are released)." It would have been obvious to one of ordinary skill in the art to include the releasing of resources once a given threshold has been reached for the purpose of monitoring the resources used by any given node at a time. The motivation for doing
20 this would be so that the resources are shared fairly among all nodes by not allowing a single node to use all the resources.

Response to Arguments

Applicant's arguments, see REMARKS, page 8, paragraph 2, filed 26 October 2004, with respect to the objections of claims 1 and 15 have been fully considered and are persuasive. The objections of claims 1 and 15 have been withdrawn.

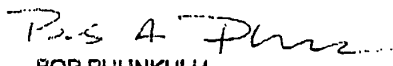
5

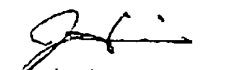
Applicant's arguments with respect to claims 1-32 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the
10 examiner should be directed to Joshua Kading whose telephone number is (571) 272-3070. The examiner can normally be reached on M-F: 8:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau Nguyen can be reached on (571) 272-3126. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

15 Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should
20 you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


BOB PHUNKULH
PRIMARY EXAMINER


Joshua Kading

Notice of References Cited	Application/Control No. 09/756,946	Applicant(s)/Patent Under Reexamination BRUCKMAN, LEON	
	Examiner Joshua Kading	Art Unit 2661	Page 1 of 1

U.S. PATENT DOCUMENTS				
*	Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
A	US-6,262,976	07-2001	McNamara, Tod W.	370/254
B	US-5,706,516	01-1998	Chang et al.	719/314
C	US-			
D	US-			
E	US-			
F	US-			
G	US-			
H	US-			
I	US-			
J	US-			
K	US-			
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FOREIGN PATENT DOCUMENTS					
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 s in MM-YYYY format are publication dates. Classifications may be US or foreign.

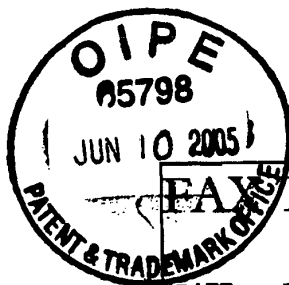
Patent and Trademark Office
 4-892 (Rev. 01-2001)

Notice of References Cited

Part of Paper No. 032005

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FAX TRANSMISSION

DATE: June 10, 2005

PTO IDENTIFIER: Application Number 09/756,946
Patent Number

Inventor: Leon Bruckman

MESSAGE TO: Examiner of Application: Joshua A. Kading
US Patent and Trademark Office

FAX NUMBER: (703) 872-9306

FROM: DARBY & DARBY P.C.

S. Peter Ludwig

PHONE: (212) 527-7770

Attorney Dkt. #: 06727/000H45-US0

PAGES (Including Cover Sheet): 3

CONTENTS: Authorization to Act in a Representative Capacity (1 page)
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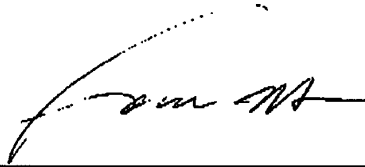
Application No. (if known): 09/756,946

Attorney Docket No.: 06727/0001145-US0

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Sample Form (09-04)

AUTHORIZATION TO ACT IN A REPRESENTATIVE CAPACITY

In re Application of: Leon Bruckman					
Application No. 09/756,946					
Filed: January 9, 2001					
Title: FLOW ALLOCATION IN A RING TOPOLOGY					
Attorney Docket No. 06727/0001145-USO	Art Unit: 2661				
The practitioner named below is authorized to conduct interviews and has the authority to bind the principal concerned. Furthermore, the practitioner is authorized to file correspondence in the above-identified application pursuant to 37 CFR 1.34: <table border="1"><thead><tr><th>Name</th><th>Registration Number</th></tr></thead><tbody><tr><td>Sanford T. Colb, Esq.</td><td>26,856</td></tr></tbody></table>		Name	Registration Number	Sanford T. Colb, Esq.	26,856
Name	Registration Number				
Sanford T. Colb, Esq.	26,856				
This is not a Power of Attorney to the above-named practitioner. Accordingly, the practitioner named above does not have authority to sign a request to change the correspondence address, a request for an express abandonment, a disclaimer, a power of attorney, or other document requiring the signature of the applicant, assignee of the entire interest or an attorney of record. If appropriate, a separate Power of Attorney to the above-named practitioner should be executed and filed in the United States Patent and Trademark Office.					
SIGNATURE of Practitioner of Record					
Signature 	Date 6-10-05				
Name S. Peter Ludwig, Esq.	Registration No., if applicable 25,351				
Telephone (212) 527-7700					

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Beit Hashenhav (A)
12 Beit Hadfus, 2nd Floor
Jerusalem 95483, Israel
Tel. 972-2-651-9453

Facsimile: 972-8-945-4556 972-8-949-1040 ♦ e-mail: colbpat@stc.co.il

**PLEASE HAND DELIVER TO EXAMINER JOSHUA KADING
IN ART UNIT 2661**

DATE: June 15, 2005
TO: Examiner Joshua Kading, USPTO
Art Unit: 2661
FAX NO. 703-872-9306
RE: USSN 09/756,946
Our Ref.: 39741
From: Sanford T. Colb

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39741

 PTOL-413A (08-05)
 Approved for use through 07/31/2005, OMB 0621-0031
 U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

Applicant Initiated Interview Request Form

 Application No. 09/756,946 First Named Applicant: Leon Bruckman
 Examiner: Joshua Kading Art Unit: 2660 Status of Application: pending

Tentative Participants:

 (1) Sanford T. Colb (2) _____
 (3) _____ (4) _____

 Proposed Date of Interview: June 15 Proposed Time: 10 (AM/PM)

Type of Interview Requested:

 (1) ☐ Telephonic (2) ☒ Personal (3) ☐ Video Conference

 Exhibit To Be Shown or Demonstrated: ☐ YES ☒ NO

If yes, provide brief description: _____

Issues To Be Discussed

Issues (Ref., Obj., etc)	Claims/ Fig. #s	Prior Art	Discussed	Agreed	Not Agreed
(1) <u>ref. (103(a))</u>	<u>1</u>	<u>Duke, Chikaji</u>	☐	☐	☐
(2) _____	_____	_____	☐	☐	☐
(3) _____	_____	_____	☐	☐	☐
(4) _____	_____	_____	☐	☐	☐

☐ Continuation Sheet Attached

Brief Description of Arguments to be Presented:

as in the proposed amendment sent to the Examiner

An interview was conducted on the above-identified application on _____

NOTE:

This form should be completed by applicant and submitted to the examiner in advance of the interview (see MPEP § 713.01).

This application will not be delayed from issue because of applicant's failure to submit a written record of this interview. Therefore, applicant is advised to file a statement of the substance of this interview (37 CFR 1.133(b)) as soon as possible.

(Applicant/Applicant's Representative Signature)

(Examiner/SPE Signature)

This collection of information is required by 37 CFR 1.121. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 38 U.S.C. 122 and 37 CFR 1.14. This collection is collected to take 21 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/756,946	01/09/2001	Leon Bruckman	6727/01145	6186
7590 06/21/2005				
DARBY & DARBY P.C. 805 Third Avenue New York, NY 10022		EXAMINER KADING, JOSHUA A		
		ART UNIT PAPER NUMBER		
		2661		
DATE MAILED: 06/21/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.



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APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
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09756946

EXAMINER

J. KADING

ART UNIT	PAPER NUMBER
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2661

DATE MAILED:

INTERVIEW SUMMARY

All participants (applicant, applicant's representative, PTO personnel):

(1) JOSHUA KADING (3) SANFORD COLB
(2) CHAU NGUYEN (4)

Date of Interview 6-15-05

Type: ☐ Telephonic ☐ Televideo Conference ☒ Personal (copy is given to ☐ applicant ☒ applicant's representative).

Exhibit shown or demonstration conducted: ☐ Yes ☒ No If yes, brief description:

Agreement ☒ was reached. ☐ was not reached.

Claim(s) discussed: 1, 12

Identification of prior art discussed:

Description of the general nature of what was agreed to if an agreement was reached, or any other comments: PROPOSED

AMENDMENT OF CLAIM 1 OVERCOMES PRIOR ART OF RECORD

(A fuller description, if necessary, and a copy of the amendments, if available, which the examiner agreed would render the claims allowable must be attached. Also, where no copy of the amendments which would render the claims allowable is available, a summary thereof must be attached.)

☐ It is not necessary for applicant to provide a separate record of the substance of the interview.

Unless the paragraph above has been checked to indicate to the contrary. A FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION IS NOT WAIVED AND MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW.

Examiner Note: You must sign this form unless it is an attachment to another form.

6-15-05

Manual of Patent Examining Procedure, Section 713.04 Substance of Interview must Be Made of Record

Except as otherwise provided, a complete written statement as to the substance of any face-to-face or telephone interview with regard to an application must be made of record in the application, whether or not an agreement with the examiner was reached at the interview.

§1.133 Interviews

(b) In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111 and 1.135. (35 U.S.C. 132)

§ 1.2. Business to be transacted in writing. All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete a two-sheet carbon interleaf Interview Summary Form for each interview held after January 1, 1978 where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks in neat handwritten form using a ball point pen. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, pointing out typographical errors or unreadable script in Office actions or the like, or resulting in an examiner's amendment that fully sets forth the agreement are excluded from the interview recordation procedures below.

The Interview Summary Form shall be given an appropriate paper number, placed in the right hand portion of the file, and listed on the "Contents" list on the file wrapper. In a personal interview, the duplicate copy of the Form is removed and given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephonic interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication.

The Form provides for recordation of the following information:

- Application Number of the application
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (personal or telephonic)
- Name of participant(s) (applicant, attorney or agent, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the claims discussed
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). (Agreements as to allowability are tentative and do not restrict further action by the examiner to the contrary.)
- The signature of the examiner who conducted the interview
- Names of other Patent and Trademark Office personnel present.

The Form also contains a statement reminding the applicant of his responsibility to record the substance of the interview.

It is desirable that the examiner orally remind the applicant of his obligation to record the substance of the interview in each case unless both applicant and examiner agree that the examiner will record same. Where the examiner agrees to record the substance of the interview, or when it is adequately recorded on the Form or in an attachment to the Form, the examiner should check a box at the bottom of the Form informing the applicant that he need not supplement the Form by submitting a separate record of the substance of the interview.

It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview:

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,
- 2) an identification of the claims discussed,
- 3) an identification of specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner. The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he feels were or might be persuasive to the examiner,
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete or accurate, the examiner will give the applicant one month from the date of the notifying letter to complete the reply and thereby avoid abandonment of the application (37 CFR 1.135(c)).

Examiner to Check for Accuracy

Applicant's summary of what took place at the interview should be carefully checked to determine the accuracy of any argument or statement attributed to the examiner during the interview. If there is an inaccuracy and it bears directly on the question of patentability, it should be pointed out in the next Office letter. If the claims are allowable for other reasons of record, the examiner should send a letter setting forth his or her version of the statement attributed to him. If the record is complete and accurate, the examiner should place the indication "Interview record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

Customer No. 07278

Attorney Docket No.06727/000I145-US0



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Application of : **BRUCKMAN**

Serial No.: 09/756,946:

Art Unit: 2661

Filed: January 9, 2001

Examiner: Joshua A. Kading

For: FLOW ALLOCATION IN A RING TOPOLOGY

AMENDMENT

Honorable Commissioner for Patents

P.O. Box 1450

Alexandria, Virginia 22313-1450

INTRODUCTORY COMMENTS

Sir:

In response to an Official Action dated March 21, 2005, kindly amend this application as follows.

Amendments to the claims begin on page 2.

Remarks accompanying the amendments begin on page 6.

AMENDMENTS TO THE CLAIMS

1. (Currently amended) In a communication network that includes a plurality of nodes interconnected by links, the nodes including at least first and second nodes, a method for routing a data flow, comprising:

allocating a respective number of quanta of one or more resources in the network to each of the nodes;

receiving a request at the first node to use a portion of the resources so as to carry the data flow between the first and second nodes over one of a plurality of paths therebetween, each such path comprising a respective sequence of the links; and

in response to the request:

if the resources already allocated to the first node on one of the paths are sufficient, directing the data flow from the first node to the second node over the one of the paths without requesting additional resources; and

if the resources already allocated to the first node are insufficient, performing the following steps:

requesting an increase in an allocation to the first node of the requested resources;

determining, for the links comprised by each of the paths, respective levels of use of the requested resources due to communications in progress over the network;

selecting which of the paths is to carry the data flow responsive to the determined levels of use of the requested resources on the links comprised in each of the paths; and

increasing the allocation of the resources to the first node on the selected path by a predetermined quantum.

2. (Original) A method according to claim 1, wherein the network comprises an Internet Protocol (IP) network.

3. (Original) A method according to claim 1, wherein the nodes are interconnected in a ring, and wherein the plurality of paths comprises a first path traversing the ring in one direction and a second path traversing the ring in the opposite direction, and wherein selecting which of the paths is to carry the data flow comprises selecting the first or the second path.

4. (Original) A method according to claim 3, wherein selecting the first or the second path comprises conveying the data flow over an inner or outer data link ring within the network provided by a Spatial Reuse Protocol (SRP).
5. (Original) A method according to claim 1, wherein the one or more resources comprise a link bandwidth.
6. (Original) A method according to claim 1, wherein the one or more resources comprise a processing power associated with each of the links.
7. (Original) A method according to claim 1, wherein selecting which of the paths is to carry the data flow comprises comparing an amount of the one or more resources requested to a resource budget assigned to the first node, and permitting the data flow only if allocating the requested resources will not cause a total of the resources allocated to the first node to exceed the budget.
8. (Original) A method according to claim 7, wherein comparing the amount of the one or more resources comprises comparing the amount of each of the resources requested to the resource budget assigned for each of the resources, and wherein permitting the data flow comprises permitting the flow only if all of the resources requested for at least one of the paths are within the budget.
9. (Canceled)
10. (Original) A method according to claim 1, wherein selecting which of the paths is to carry the data comprises verifying that a sufficient amount of the requested resources is available to carry the data flow on every one of the links comprised in the selected path.
11. (Original) A method according to claim 1, wherein selecting which of the paths is to carry the data flow comprises selecting the one of the paths having the lowest level of a predetermined measure of use of the requested resources.
12. (Canceled)
13. (Original) A method according to claim 1, wherein receiving the request comprises choosing a dispatcher within the network to manage allocation of the resources, wherein the dispatcher receives and processes the request.
14. (Original) A method according to claim 13, wherein choosing the dispatcher comprises choosing one of the nodes to act as the dispatcher.

15-24. (Canceled)

25. (Previously presented) A network according to claim 31, wherein the dispatcher is adapted to select for carrying the data flow the one of the paths that has the lowest level of a predetermined measure of use of the requested resources.

26. (Original) A network according to claim 25, wherein the measure of use comprises, for each of at least two of the paths, a maximum level of use of at least one of the requested resources, taken over all of the links comprised in the paths.

27-28. (Canceled)

29. (Previously presented) A method according to claim 13, wherein requesting the increase in the allocation comprises requesting and receiving the allocation from the dispatcher.

30. (Previously presented) A method according to claim 1, and comprising, upon release of the requested resources:

comparing an amount of the resources that have been released to a predetermined threshold; and

if the amount is greater than the predetermined threshold, deallocating the predetermined quantum from the first node.

31. (Currently amended) A communication network, comprising:

a plurality of nodes, comprising at least first and second nodes;

a plurality of links, interconnecting the nodes to provide communications therebetween; and

a dispatcher, which is adapted to allocate a respective number of quanta of one or more resources in the network to each of the nodes,

wherein the first node is adapted, upon receiving a request to use a portion of the resources so as to carry the data flow between the first and second nodes over one of a plurality of paths therebetween, each such path comprising a respective sequence of the links, to direct the data flow from the first node to the second node over one of the paths without requesting additional resources if the resources already allocated to the first node on the one of the paths are sufficient, and to request an increase in an allocation of the requested resources to the first node if the resources already allocated to the first node are insufficient, and

wherein in response to the increase requested by the first node, the dispatcher is adapted to determine, for the links comprised in each of the paths, respective levels of use of the requested resources due to communications in progress over the network and to select which of the paths is to carry the data flow responsive to the determined levels of use of the requested resources on the links comprised in each of the paths, and to increase the allocation of the resources to the first node on the selected path by a predetermined quantum.

32. (Currently amended) A network according to ~~claim 30~~ claim 31, wherein the first node is adapted, upon release of the requested resources, to compare an amount of the resources that have been released to a predetermined threshold, and if the amount is greater than the predetermined threshold, to deallocate the predetermined quantum from the first node.





Application No. (if known): 09/756,946

Attorney Docket No.: 06727/0001145-US0

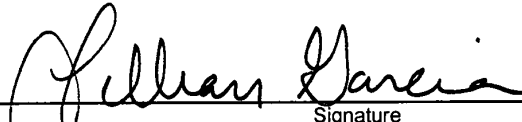
Certificate of Express Mailing Under 37 CFR 1.10

I hereby certify that this correspondence is being deposited with the United States Postal Service as Express Mail, Airbill No. _____ in an envelope addressed to:

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Date



Signature

Lillian Garcia
Typed or printed name of person signing Certificate

Registration Number, if applicable

Telephone Number

Note: Each paper must have its own certificate of mailing, or this certificate must identify each submitted paper.

Amendment (8 pages)

One Month Request for Extension of Time Under 37 CFR 1.136(a)
(1 page)

Amendment Transmittal (1 page)

Certificate of Express Mail (1 page)

Check in the amount of \$60.00

9093

REMARKS

This application contains claims 1-32. Claims 9, 12, 15-24, 27 and 28 have been canceled without prejudice. Claims 1, 31 and 32 have been amended. No new matter has been introduced. Reconsideration is respectfully requested.

Applicant thanks Examiners Kading and Nguyen for the courtesy of an interview with Applicant's representative Sanford T. Colb (Reg. No. 26,856), held in the USPTO on June 15, 2005. At the interview, Mr. Colb presented a draft amendment to claim 1 and argued the patentability of claims 1 and 12 over the cited art. It was agreed that the amendment to claim 1 would overcome the rejection of this claim. In a follow-up interview by telephone with Applicant's representative Daniel Kligler (Reg. No. 41,120) on June 29, 2005, Examiner Kading imposed a restriction requirement with respect to independent claims 12 and 15, on the grounds that these claims are drawn to a different invention from independent claims 1 and 31. It was then agreed that Applicant would withdraw claims 12 and 15, along with their dependent claims, and that the remaining claims (with the proposed amendment) would be allowed.

Claim 32 was objected to for a typographical error. The claim has been amended as suggested by the Examiner in order to correct the error.

Claims 1-3, 5-8, 10, 11, 13, 14, 25, 29 and 31 were rejected under 35 U.S.C. 103(a) over Drake, Jr., et al. (U.S. Patent 5,461,611) in view of Chikenji et al. (U.S. Patent 6,639,893). Claim 4 was rejected over Drake and Chikenji in view of "applicant's admitted prior art." Applicant has amended independent claims 1 and 31 in order to further clarify the distinction of the present invention over the cited art.

Drake describes a management system for local area networks. The management system receives requests from other stations on the network to reserve facilities for a data stream of a particular quality of service. If the requested facilities are available, an allocator in the management system reserves the facilities for the requesting station. Otherwise, the request is denied (abstract).

Chikenji describes a communication network in which two ring networks are connected by a pair of between-ring transmission lines. These lines are used in avoiding communication interruptions between ring networks due to faults (abstract).

Claim 1, as amended, describes a method for routing data flows in a network in which resources are allocated to nodes in the network in predetermined quanta. When a

given node (such as the first node recited in claim 1) receives a request to carry a data flow to another node, there are two possible courses of action:

- 1) If the first node has sufficient resources already allocated to it on one or more paths leading to the other node, the node uses the resources to carry the data flow over one of the paths to the other node, without requesting additional resources.
- 2) If the allocated resources are insufficient, the first node requests an increased allocation. The node may then receive an increased allocation of resources on one of the paths by a predetermined quantum.

This process is illustrated in the specification in Fig. 4 and is described in detail with reference thereto. As noted in paragraph 0041 of the published specification, this mode of allocation is useful in limiting the frequency with which allocation and deallocation operations must be performed.

By contrast, in Drake's system, the nodes must request a reservation of facilities for each new data stream. Drake states explicitly that "the quality of service management of a local area network is almost entirely concentrated in a single QoS management station... QoS allocations are maintained only so long as a requestor continues to refresh the request" (col. 2, line 65 – col. 3, line 10). Drake's nodes do not have a prior allocation of quanta that they can use to direct data flows in the manner recited in claim 1. When Drake's QoS management station (identified in Fig. 1 as allocator station 20) allocates a QoS transmission path for a multimedia file, it determines the exact bandwidth required and subtracts the bandwidth from each component on the path (col. 11, lines 11-21). Drake does not teach or suggest the possibility that a node could use its own allocated quanta of resources to carry a data flow, without requesting additional resources, if the allocated resources are sufficient.

Therefore, claim 1 as amended is believed to be patentable over the cited art. In view of the patentability of claim 1, claims 2-8, 10, 11, 13, 14 and 29, which depend from claim 1, are also believed to be patentable.

Claim 31 is an independent claim, which recites a communication network that operates on principles similar to those of the method of claim 1, and has been amended in like fashion. Therefore, for the reasons stated above, claim 31 is believed to be patentable, as are claims 25 and 32, which depend from claim 31.

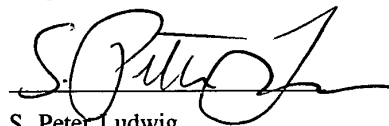
Claims 9, 12, 15-17, 19-24 and 26-28 were rejected under 35 U.S.C. 103(a) over Drake in view of Chikenji and further in view of McNamara (U.S. Patent 6,262,976).

Claim 18 was rejected under 35 U.S.C. 103(a) over Drake, Chikenji and McNamara, in view of "applicant's admitted prior art." Claim 26, which depends from claim 31, is believed to be patentable in view of the patentability of amended claim 31, as explained above. While disagreeing with the grounds of rejection of claims 9, 12, 15-24, 27 and 28, Applicant has canceled these claims, as agreed in the above-mentioned telephone interview, in order to expedite issuance of a patent on the claims that were agreed to be allowable. Applicant reserves the right to prosecute the subject matter of the canceled claims in a divisional application.

Applicant believes the amendments and remarks presented above to be fully responsive to all of the objections and grounds of rejection raised by the Examiner. In view of these amendments and remarks, all of the claims now pending in this application are believed to be in condition for allowance. Prompt notice to this effect is requested.

Date: July 5, 2005

Respectfully submitted,



S. Peter Ludwig

Reg. No. 25,351

Attorney for Applicants

DARBY & DARBY, P.C.

P.O. Box 5257

New York, NY 10150-5257

212-527-7700

BEST AVAILABLE COPY

PATENT APPLICATION FEE DETERMINATION RECORD
Effective October 1, 2000

Application or Docket Number

09756946

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS		
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	28 minus 20 =	8
INDEPENDENT CLAIMS	2 minus 3 =	
MULTIPLE DEPENDENT CLAIM PRESENT ☐		

* If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	32	Minus 20	= 12
Independent	4	Minus 3	= 1
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐			

7/10/05

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	18	Minus 32	= 0
Independent	2	Minus 4	= 0
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐			

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total		Minus	=
Independent		Minus	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐			

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
 ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."
 *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."
 The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

SMALL ENTITY TYPE ☐ OR

OTHER THAN SMALL ENTITY

RATE	FEE	RATE	FEE
BASIC FEE	355.00	BASIC FEE	710.00
X\$ 9=		X\$18=	1441
X40=		X80=	
+135=		+270=	
TOTAL		TOTAL	8541

SMALL ENTITY OR OTHER THAN SMALL ENTITY

RATE	ADDITIONAL FEE	RATE	ADDITIONAL FEE
X\$ 9=		X\$18=	360
X40=		X80=	8800
+135=		+270=	
TOTAL ADDIT. FEE		TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE	RATE	ADDITIONAL FEE
X\$ 9=		X\$18=	
X40=		X80=	
+135=		+270=	
TOTAL ADDIT. FEE		TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE	RATE	ADDITIONAL FEE
X\$ 9=		X\$18=	
X40=		X80=	
+135=		+270=	
TOTAL ADDIT. FEE		TOTAL ADDIT. FEE	

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L2	4	orkit.asn. and (rout\$3 with (resourc\$2 or Qos!))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2005/11/01 14:10
L3	2	(bruckman.in. and leon.in.) and (rout\$3 with (resourc\$2 or Qos!))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2005/11/01 14:08
L4	0	orkit.asn. and (resourc\$2 same compar\$3 same (releas\$3 or deallocat\$3))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2005/11/01 14:13
L5	0	(bruckman.in. and leon.in.) and (resourc\$2 same compar\$3 same (releas\$3 or deallocat\$3))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2005/11/01 14:11
L6	1	orkit.asn. and (resourc\$2 same quantum)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2005/11/01 14:13
L7	1	(bruckman.in. and leon.in.) and (resourc\$2 same quantum)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2005/11/01 14:13
L8	8	(resourc\$2 same compar\$3 same (releas\$3 or deallocat\$3)) and quantum	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2005/11/01 14:16

Search History 11/1/05 3:06:40 PM Page 1
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L9	4	((allocat\$3 or deallocat\$3) and (request\$ and resourc\$2) and quantum).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2005/11/01 14:24
L10	1	((allocat\$3 or deallocat\$3) and (request\$ and resourc\$2) and (dispatcher with (quanta or quantum))).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2005/11/01 14:25
L12	2	709/225,226,229,232-234,238.ccls. and (dispatcher same ((allocat\$3 or deallocat\$3) with (request\$ and resourc\$2)))	US-PGPUB; USPAT; USOCR	OR	OFF	2005/11/01 15:05
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S2	4	((("5461611") or ("6639893") or ("6262976") or ("5706516"))).PN.	USPAT	OR	OFF	2005/11/01 13:08
S3	4	((("6442134") or ("6647008") or ("6584535") or ("6314110"))).PN.	USPAT	OR	OFF	2005/11/01 13:12
S4	11	((("6680912") or ("6711125") or ("6795394") or ("6820210") or ("6256292") or ("6731597") or ("6456407") or ("6339488") or ("5581703") or ("6639896") or ("6262976"))).PN.	USPAT	OR	OFF	2005/11/01 13:27
S5	1	((("6952397") or ("6963537"))).PN.	USPAT	OR	OFF	2005/11/01 13:28
S6	1	"20020018481"	US-PGPUB; USPAT; USOCR	OR	OFF	2005/11/01 13:29
S7	1	"20020186667"	US-PGPUB; USPAT; USOCR	OR	OFF	2005/11/01 13:30



PTO/SB/08a/b (08-03)
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Substitute for form 1449A/B/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)			Complete if Known		
			Application Number	09/756,946-Conf. #6186	
			Filing Date	January 9, 2001	
			First Named Inventor	Leon Bruckman	
			Art Unit	2661	
			Examiner Name	J. A. Kading	
Sheet	1	of	1	Attorney Docket Number	06727/0001145-USO

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
TP	AA**	US-6,442,134	08-27-2002	Mitchell	
TP	AB**	US-6,680,912	01-20-2004	Kalman et al.	
TP	AC**	US-6,711,125	03-23-2004	Walrand et al.	
TP	AD**	US-6,795,394	09-21-2004	Swinkels et al.	
TP	AE**	US-6,820,210	11-16-2004	Daruwalla et al.	
TP	AF**	US-6,256,292	07-03-2001	Ellis et al.	
TP	AG**	US-6,731,597	05-04-2004	Batchellor et al.	
TP	AH**	US-6,456,407	09-24-2002	Tammela et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T ⁶
		Country Code ³ -Number ⁴ -Kind Code ⁵ (if known)	MM-DD-YYYY			

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. **Pursuant to the Notice issued by the United States Patent and Trademark Office dated July 11, 2003 waiving the requirements of 37 C.F.R. § 1.98(a)(2)(i), a copy of the United States Patent on PTO/SB08 is not submitted. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 601.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). ² Applicant is to place a check mark here if English language Translation is attached.

Examiner Signature		Date Considered	11/7/05
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Bib Data Sheet

CONFIRMATION NO. 6186

SERIAL NUMBER 09/756,946 ✓	FILING DATE 01/09/2001 ✓ RULE	CLASS 370	GROUP ART UNIT 2661	ATTORNEY DOCKET NO. 6727/01145	
APPLICANTS Leon Bruckman, Petach Tikva, ISRAEL; ** CONTINUING DATA ***** <u>N/A TP</u> ***** ** FOREIGN APPLICATIONS ***** <u>N/A TP</u> ***** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 02/22/2001					
Foreign Priority claimed ☐ yes ☒ no 35 USC 119 (a-d) conditions ☐ yes ☐ no ☐ Met after Allowance Verified and Acknowledged <u>TRI H. PHAN</u> <u>TP</u> Examiner's Signature Initials		STATE OR COUNTRY ISRAEL	SHEETS DRAWING 6 ✓	TOTAL CLAIMS 28 ✓	INDEPENDENT CLAIMS 2 ✓
ADDRESS ✓ DARBY & DARBY P.C. 805 Third Avenue New York , NY 10022					
TITLE Flow allocation in a ring topology ✓					
FILING FEE RECEIVED 978	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit		

Index of Claims 	Application/Control No.		Applicant(s)/Patent under Reexamination	
	09/756,946		BRUCKMAN, LEON	
	Examiner		Art Unit	
	Tri H. Phan		2661	

√	Rejected
=	Allowed

-	(Through numeral) Cancelled
+	Restricted

N	Non-Elected
I	Interference

A	Appeal
O	Objected

Claim		Date				
Final	Original	7/22/04	3/10/05	11/1/05		
1	1	√	√	=		
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17	26	O	√	=		
	27	√	√	-		
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Claim		Date				
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Issue Classification 	Application/Control No.		Applicant(s)/Patent under Reexamination	
	09/756,946		BRUCKMAN, LEON	
	Examiner		Art Unit	
	Tri H. Phan		2661	

ISSUE CLASSIFICATION									
ORIGINAL					CROSS REFERENCE(S)				
CLASS		SUBCLASS		CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
370		460		370	395.21	395.41	406		
INTERNATIONAL CLASSIFICATION				709	225	226	232	238	
H	0	4	L	12/43					
				/					
				/					
				/					
				/					

Tri H. Phan 11/1/2005 (Assistant Examiner) (Date)		Brian Nguyen 11/1/2005 (Primary Examiner) (Date)		Total Claims Allowed: 18	
(Signature) 11/6/05 (Legal Instruments Examiner) (Date)		BRIAN NGUYEN PRIMARY EXAMINER		O.G. Print Claim(s) 1	O.G. Print Fig. 1

☐ Claims renumbered in the same order as presented by applicant				☐ CPA				☐ T.D.				☐ R.1.47			
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	15	31		61		91		121		151		181		
2	2	18	32		62		92		122		152		182		
3	3		33		63		93		123		153		183		
4	4		34		64		94		124		154		184		
5	5		35		65		95		125		155		185		
6	6		36		66		96		126		156		186		
7	7		37		67		97		127		157		187		
8	8		38		68		98		128		158		188		
	9		39		69		99		129		159		189		
9	10		40		70		100		130		160		190		
10	11		41		71		101		131		161		191		
	12		42		72		102		132		162		192		
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12	14		44		74		104		134		164		194		
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	18		48		78		108		138		168		198		
	19		49		79		109		139		169		199		
	20		50		80		110		140		170		200		
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	23		53		83		113		143		173		203		
	24		54		84		114		144		174		204		
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17	26		56		86		116		146		176		206		
	27		57		87		117		147		177		207		
	28		58		88		118		148		178		208		
13	29		59		89		119		149		179		209		
14	30		60		90		120		150		180		210		



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

7590 11/22/2005
DARBY & DARBY P.C.
805 Third Avenue
New York, NY 10022

EXAMINER
PHAN, TRI H

ART UNIT PAPER NUMBER

2661

DATE MAILED: 11/22/2005

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/756,946	01/09/2001	Leon Bruckman	6727/01145	6186

TITLE OF INVENTION: FLOW ALLOCATION IN A RING TOPOLOGY

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1400	\$300	\$1700	02/22/2006

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN **THREE MONTHS** FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. **THIS STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE REFLECTS A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE APPLIED IN THIS APPLICATION. THE PTOL-85B (OR AN EQUIVALENT) MUST BE RETURNED WITHIN THIS PERIOD EVEN IF NO FEE IS DUE OR THE APPLICATION WILL BE REGARDED AS ABANDONED.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

- A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.
- B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

- A. Pay TOTAL FEE(S) DUE shown above, or
- B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL should be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). Even if the fee(s) have already been paid, Part B - Fee(s) Transmittal should be completed and returned. If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail

**Mail Stop ISSUE FEE
Commissioner for Patents
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or Fax (571) 273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

7590 11/22/2005

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805 Third Avenue
New York, NY 10022

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/756,946	01/09/2001	Leon Bruckman	6727/01145	6186

TITLE OF INVENTION: FLOW ALLOCATION IN A RING TOPOLOGY

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1400	\$300	\$1700	02/22/2006

EXAMINER	ART UNIT	CLASS-SUBCLASS
PHAN, TRI H	2661	370-460000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list
 (1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
 (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
 2 _____
 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are enclosed:

- ☐ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s):

- ☐ A check in the amount of the fee(s) is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The Director is hereby authorized by charge the required fee(s), or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above. NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/756,946	01/09/2001	Leon Bruckman	6727/01145	6186
7590 11/22/2005				
DARBY & DARBY P.C. 805 Third Avenue New York, NY 10022		EXAMINER PHAN, TRI H		
		ART UNIT PAPER NUMBER 2661		
DATE MAILED: 11/22/2005				

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 756 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 756 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571) 272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at (703) 305-8283.

Notice of Allowability	Application No.	Applicant(s)	
	09/756,946	BRUCKMAN, LEON	
	Examiner	Art Unit	
	Tri H. Phan	2661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 6/6/2005.
2. ☒ The allowed claim(s) is/are 1-8, 10-11, 13-14, 25-26, and 29-32 (Now renumbered as 1-18).
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

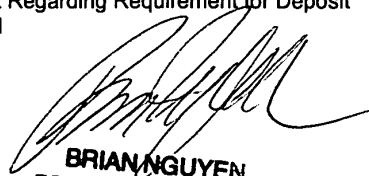
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. ☐ Notice of References Cited (PTO-892) | 5. ☐ Notice of Informal Patent Application (PTO-152) |
| 2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. ☐ Examiner's Amendment/Comment |
| 4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. ☐ Examiner's Statement of Reasons for Allowance |
| | 9. ☐ Other _____. |


BRIAN NGUYEN
PRIMARY EXAMINER

Search Notes

Application/Control No.

09/756,946

Examiner

Tri H. Phan

Applicant(s)/Patent under
Reexamination

BRUCKMAN, LEON

Art Unit

2661

SEARCHED

Class	Subclass	Date	Examiner
370	389,406, 395.21, 395.41, 395.42	7/16/2004	JK
370	439,460	7/16/2004	JK
Updated	search	3/9/2005	JK
Updated	search	11/1/2005	TP

INTERFERENCE SEARCHED

Class	Subclass	Date	Examiner
PGPub text search- November 1,2005, see interference search.		11/1/2005	TP

**SEARCH NOTES
(INCLUDING SEARCH STRATEGY)**

	DATE	EXMR
EAST	7/16/2004	JK
Consulted with Frank Duong (Pri)	10/31/2005	TP
Consulted with Brian Nguyen (Pri)	11/1/2005	TP

PART B - FEE(S) TRANSMITTAL

02-23-06

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Commissioner for Patents
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Alexandria, Virginia 22313-1450
(571) 273-2885

or Fax

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CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

7590

EXPRESS MAIL CERTIFICATE

DARBY & DARBY P.C.
805 Third Avenue
New York, NY 10022Date 2/21/06 Label No. EU 762807961-US
I hereby certify that, on the date indicated above, this paper or fee was deposited with the U.S. Postal Service & that it was addressed for delivery to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 by "Express Mail Post Office to Addressee" service.Name (Print) B.W. CEE Signature B.W. Lee

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/756,946	01/09/2001	Leon Bruckman	6727/01145	6186

TITLE OF INVENTION: FLOW ALLOCATION IN A RING TOPOLOGY

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1400	\$300	\$1700	02/22/2006

EXAMINER	ART UNIT	CLASS-SUBCLASS
PHAN, TRI H	2661	370-460000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Darby & Darby

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment. 02/24/2006 ABERHE1 00000005 09/56946

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

1400.00 OP
300.00 OP

Corrigent Systems Ltd. Tel Aviv, Israel

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are enclosed:

- ☒ Issue Fee
☒ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s):

☒ A check in the amount of the fee(s) is enclosed. \$1700.00☐ Payment by credit card. Form PTO-2038 is attached.☒ The Director is hereby authorized by charge the required fee(s), or credit any overpayment, to Deposit Account Number 04-0100 (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☒ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above. NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature

Date

Typed or printed name S. Peter LudwigRegistration No. 25,351

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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Electronic Acknowledgement Receipt	
EFS ID:	9288121
Application Number:	09756946
International Application Number:	
Confirmation Number:	6186
Title of Invention:	FLOW ALLOCATION IN A RING TOPOLOGY
First Named Inventor/Applicant Name:	Leon Bruckman
Correspondence Address:	DARBY & DARBY P.C. - 805 Third Avenue - New York NY 10022 US 2125277700 -
Filer:	Peter Anthony Nieves/Elaine Cote
Filer Authorized By:	Peter Anthony Nieves
Attorney Docket Number:	6727/01145
Receipt Date:	24-JAN-2011
Filing Date:	09-JAN-2001
Time Stamp:	12:09:05
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	executedpoaTOFILE.pdf	347366 df9ee8608d5bb0d5e838dff4303fbb4d7577dc3	no	6
Warnings:					
Information:					
Total Files Size (in bytes):			347366		
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

**COMBINED REVOCATION OF POWER OF ATTORNEY WITH A NEW POWER OF
ATTORNEY AND CHANGE OF CORRESPONDENCE ADDRESS AND STATEMENT
UNDER 37 CFR 3.73(B)**

To: Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

CORRIGENT SYSTEMS LTD., a corporation organized under the laws of Israel, states that it is:

1. The assignee of the entire, right, title and interest in each of the patents and patent applications identified on the attached Schedule A by virtue of either an assignment from the inventor(s) of each of the identified patents and patent applications to the current assignee as identified on the attached Schedule A, or a chain of title from the inventor(s) of the patent application/patents to the current assignee as identified on the attached Schedule A, said assignments recorded with the United States Patent and Trademark Office at the reel and frame identified on the attached Schedule A or for which a copy therefore is attached; and
2. As required by 37 CFR 3.73(b)(1)(i), for each of the patents and patent applications listed on the attached Schedule A the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

FURTHER, Corrigent Systems Ltd. states

3. That it hereby revokes all previous Powers of Attorney in the patents and patent applications identified on the attached Schedule A, and hereby appoints Practitioners associated with Customer Number 57449 as its attorneys and agents with respect to the patents and patent applications identified in the attached Schedule A, and to transact all business in the United States Patent and Trademark Office connected therewith; and
4. Requests that this Office please change the correspondence address for the patents and patent applications identified in the attached Schedule A to the address associated with Customer Number 57449.

The undersigned has reviewed all documents in the chain of title for the patents and patent applications identified in the attached Schedule A, and to the best of the undersigned's knowledge and belief, right, title and interest to the applications identified is in the assignee identified above. The undersigned is empowered to act on behalf of the assignee.

CORRIGENT SYSTEMS LTD.

Signature: *[Handwritten Signature]* Date: 24-Jan-2011

Printed Name: RAGI RAM

Title: PATENT ASSIGNEE

SCHEDULE A

<u>Matter No.</u>	<u>Patent name</u>	<u>Application Nr.</u>	<u>Recorded</u>
40552-6103	Multiple Data Links Aggregation With Nested Packet Interruption	09/756,553	Assignment from Inventors to Corrigent Systems Ltd. recorded 7/15/2003 at 014274/0423
40552-6100	Dynamic Fragmentation in Low Rate Channels	09/756,554	Assignment from Inventors to Orekit Communications, Ltd. recorded 3/15/2001 at 011593/0881; Assignment from Orekit Communications Ltd. to Corrigent Systems Ltd. recorded 4/26/2002 at 012866/0880
40552-6102	Flows Allocation in IP Ring Topologies	09/756,946	Assignment from Inventors to Orekit Communications, Ltd. recorded 1/9/2001 at 011435/0015; Assignment from Orekit Communications Ltd. to Corrigent Systems Ltd. recorded 4/26/2002 at 012866/0880
40552-6101	Resource Reservation in a Ring Network	09/794,898	Assignment from Inventors to Orekit Communications, Ltd. recorded 2/26/2001 at 011580/0893; Assignment from Orekit Communications Ltd. to Corrigent Systems Ltd. recorded 4/26/2002 at 012866/0880
40552-6104	One Sided RPR	09/876,414	Assignment from Inventors to Corrigent Systems Ltd. recorded 6/7/2001 at 011888/0028
40552-6107	Interconnect And Gateway Protection In Bidirectional Rings Networks	09/910,790	Assignment from Inventors to Corrigent Systems Ltd. recorded 7/24/2001 at 012017/0934
40552-6108	Fast Protection in Ring Topologies	09/941,723	Assignment from Inventors to Corrigent Systems Ltd. recorded 8/30/2001 at 012130/0608
40552-6109	Latency evaluation in a ring network	09/947,183	Assignment from Inventors to Corrigent Systems Ltd. recorded 11/29/2001 at 012336/0419
40552-6106	Selective protection for ring topologies	09/969,839	Assignment from Inventors to Corrigent Systems Ltd. recorded 10/3/2001 at 012229/0832
40552-6110	Sonet circuit emulation with VT compression	09/978,342	Assignment from Inventors to Corrigent Systems Ltd. recorded 10/17/2001 at 012270-0165
40552-6111	Configuration of network interfaces in a bidirectional ring network	09/978,642	Assignment from Inventors to Corrigent Systems Ltd. recorded 10/16/2001 at 012274/0607
40552-6117	Generic Framework for Embedded Software Development	10/005,030	Assignment from Inventors to Corrigent Systems Ltd. recorded 12/3/2001 at 012358/0508
40552-6118	Fast failure protection using redundant network edge ports	10/036,518	Assignment from Inventors to Corrigent Systems Ltd. recorded 1/7/2002 at 012442/0914
40552-6114	Avoiding Overlapping Segments In ring based TLS	10/054,845	Assignment from Inventors to Corrigent Systems Ltd. recorded 1/25/2002 at 012523/0691
40552-6115	Spanning Tree Protocol For Transparent LAN Services	10/057,332	Assignment from Inventors to Corrigent Systems Ltd. recorded 1/25/2002 at 012535/0510
40552-6112	Protecting the Filtering Data Base in Virtual B bridges	10/061,721	Assignment from Inventors to Corrigent Systems Ltd. recorded 2/1/2002 at 012568/0664
40552-6113	Protecting the filtering database in virtual bridges	10/061,721	Assignment from Inventors to Corrigent Systems Ltd. recorded 2/1/2002 at 012568/0664

40552-6121	Performance monitoring of multiple channels in an automatic protection switched network	10/082,771	Assignment from Inventors to Corrigent Systems Ltd. recorded 2/25/2002 at 012645/0029
40552-6120	Differentiated services with multiple lagging levels	10/128,454	Assignment from Inventors to Corrigent Systems Ltd. recorded 4/24/2002 at 012833/0049
40552-6116	Performance Monitoring of high speed communications network	10/128,459	Assignment from Inventors to Corrigent Systems Ltd. recorded 4/24/2002 at 012832/0932
40552-6122	Hidden Failure Detection	10/156,851	Assignment from Inventors to Corrigent Systems Ltd. recorded 5/30/2002 at 012954/0104
40552-6123	Equipment Protection Using a Partial Star Architecture	10/211,065	Assignment from Inventors to Corrigent Systems Ltd. recorded 8/2/2002 at 013170/0387
40552-6119	Traffic Engineerings in Bi-directional Ring Networks	10/211,066	Assignment from Inventors to Corrigent Systems Ltd. recorded 8/2/2002 at 013172/0613
40552-6125	VPLS using a multicast protocol	10/226,525	Assignment from Inventors to Corrigent Systems Ltd. recorded 8/23/2002 at 013242/0050
40552-6126	Hierarchical VPLS protection	10/337,382	Assignment from Inventors to Corrigent Systems Ltd. recorded 1/7/2003 at 013638/0975
40552-6124	MPLS signaling over RPR	10/369,953	Assignment from Inventors to Corrigent Systems Ltd. recorded 2/20/2003 at 013807/0903
40552-6130	Ring network with variable rate	10/387,657	Assignment from Inventors to Corrigent Systems Ltd. recorded 3/12/2003 at 013884/0505
40552-6128	Efficient Transport of TDM Services	10/396,008	Assignment from Inventors to Corrigent Systems Ltd. recorded 3/24/2003 at 013915/0077
40552-6131	Bandwidth Allocations for Link Aggregation	10/436,516	Assignment from Inventors to Corrigent Systems Ltd. recorded 5/13/2003 at 014072/0524
40552-6132	Multiprotocol media conversion	10/461,807	Assignment from Inventors to Corrigent Systems Ltd. recorded 6/13/2003 at 014190/0326
40552-6133	Layer 3 network routing with RPR Layer 2 visibility	10/812,321	Assignment from Inventors to Corrigent Systems Ltd. recorded 3/29/2004 at 015161/0655
40552-6134	Weight calculation for traffic management	10/861,272	Assignment from Inventors to Corrigent Systems Ltd. recorded 6/3/2004 at 015444/0178
40552-6135	Multipoint to multipoint communication over ring topologies	10/933,572	Assignment from Inventors to Corrigent Systems Ltd. recorded 11/17/2004 at 015389/0644
40552-6137	Synchronized Ring Software Download (SRDL)	10/951,575	Assignment from Inventors to Corrigent Systems Ltd. recorded 9/27/2004 at 015844/0428
40552-6136	VPLS over ring networks	10/993,882	Assignment from Inventors to Corrigent Systems Ltd. recorded 11/19/2004 at 016019/0425
40552-6138	Link aggregation With Tunneling	11/123,801	Assignment from Inventors to Corrigent Systems Ltd. recorded 5/6/2005 at 016545/0876
40552-6140	Two Way Link Aggregation	11/279,045	Assignment from Inventors to Corrigent Systems Ltd. recorded 4/7/2006 at 017441/0881

40552-6142	Resource Sharing Among Network Tunnels	11/305,486	Assignment from Inventors to Corrigent Systems Ltd. recorded 1/11/2006 at 017001/0167
40552-6144	VPLS Failure Protection In Ring Networks	11/335,770	Assignment from Inventors to Corrigent Systems Ltd. recorded 1/18/2006 at 017502/0055
40552-6143	Route Selection with Bandwidth Sharing Optimization Over Rings	11/339,148	Assignment from Inventors to Corrigent Systems Ltd. recorded 1/24/2006 at 017504/0802
40552-6145	High capacity ring communication network	11/367,231	Assignment from Inventors to Corrigent Systems Ltd. recorded 3/2/2006 at 017651/0359; corrective assignment to add the additional name of a conveying party recorded 6/27/2006 at 017868/0544; corrective assignment to correct the 5th assignor's name previously recorded, recorded 7/31/2006 at 018035/0163
40552-6146	MAC address learning in a distributed bridge	11/419,444	Assignment from Inventors to Corrigent Systems Ltd. recorded 7/10/2006 at 017904/0311
40552-6139	Transparent Transport of Fibre Channel Traffic Over Packet-Switched Networks	11/479,595	Assignment from Inventors to Corrigent Systems Ltd. recorded 6/29/2006 at 018034/0195
40552-6149	Connectivity Fault Management (CFM) In Networks With Link Aggregation Group Connections	11/483,650	Assignment from Inventors to Corrigent Systems Ltd. recorded 7/11/2006 at 018103/0490
40552-6150	Point-to-multipoint functionality in a bridged network	11/508,599	Assignment from Inventors to Corrigent Systems Ltd. recorded 8/22/2006 at 018222/0834
40552-6151	Fault-tolerant medium access control (MAC) address assignment in network elements	11/534,536	Assignment from Inventors to Corrigent Systems Ltd. recorded 9/22/2006 at 018292/0823
40552-6154	Hash-based multi-homing	11/559,037	Assignment from Inventors to Corrigent Systems Ltd. recorded 12/27/2007 at 020292/0128
40552-6152	Forwarding Multicast Traffic Over link Aggregation Ports	11/644,773	Assignment from Inventors to Corrigent Systems Ltd. recorded 12/21/2006 at 018743/0396
40552-6155	Frame Concatenation with Drop Precedence Assignment	11/704,615	Assignment from Inventors to Corrigent Systems Ltd. recorded 2/8/2007 at 018986/0082
40552-6153	MAC ADDRESS SCALABILITY IN INTERCONNECTED RINGS	11/764,764	Assignment from Inventors to Corrigent Systems Ltd. recorded 6/18/2007 at 019459/0806
40552-6156	Prevention Of Frame Duplication In Interconnected Ring Network	12/044,158	Assignment from Inventors to Corrigent Systems Ltd. recorded 3/7/2008 at 020615/0339
40552-6141	VPLS remote failure indicator	12/093,824	Assignment from Inventors to Corrigent Systems Ltd. recorded 7/22/2008 at 021269/0633
40552-6158	A Device Method and System for providing a media stream	12/143,944	Assignment from Inventors to Corrigent Systems Ltd. recorded 2/2/2009 at 022186/0537

40552-6159	Efficient Full Mesh Load Testing of Packet based Communication Systems	12/261,072	Assignment from Inventors to Corrigent Systems Ltd. recorded 10/30/2008 at 021759/0438
40552-6162	Ring Network Aggregate Rates	12/348,361	Assignment from Inventors to Corrigent Systems Ltd. recorded 1/5/2009 at 022053/0650
40552-6160	High-Speed Processing of Multicast Content Requests	12/369,011	Assignment from Inventors to Corrigent Systems Ltd. recorded 2/11/2009 at 022238/0791
40552-6129	Efficient transport of TDM services over packet networks	12/404,444	Assignment from Inventors to Corrigent Systems Ltd. recorded 3/17/2009 at 022405/0541
40552-6161	Method for unicast streaming of multicast content	12/628,247	Assignment from Inventors to Corrigent Systems Ltd. recorded 12/1/2009 at 023582/0533



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/756,946	01/09/2001	Leon Bruckman	6727/01145

CONFIRMATION NO. 6186

POA ACCEPTANCE LETTER

57449
SHEEHAN PHINNEY BASS & GREEN, PA
c/o PETER NIEVES
1000 ELM STREET
MANCHESTER, NH 03105-3701



Date Mailed: 02/01/2011

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 01/24/2011.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/mtekle michael/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/756,946	01/09/2001	Leon Bruckman	6727/01145

DARBY & DARBY P.C.
805 Third Avenue
New York, NY 10022

CONFIRMATION NO. 6186
POWER OF ATTORNEY NOTICE



OC000000045/47651

Date Mailed: 02/01/2011

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 01/24/2011.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

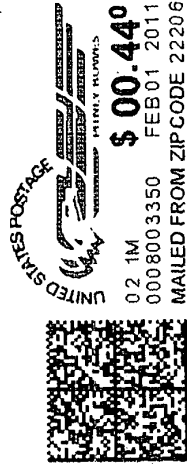
/mteklelmichael/

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/756,946	01/09/2001	Leon Bruckman	6727/01145

DARBY & DARBY P.C.
805 Third Avenue
New York, NY 10022

CONFIRMATION NO. 6186
POWER OF ATTORNEY NOTICE



OC000000045747651

Date Mailed: 02/01/2011

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/mtekle michael/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

Electronic Acknowledgement Receipt	
EFS ID:	26106881
Application Number:	09756946
International Application Number:	
Confirmation Number:	6186
Title of Invention:	FLOW ALLOCATION IN A RING TOPOLOGY
First Named Inventor/Applicant Name:	Leon Bruckman
Customer Number:	57449
Filer:	Yehuda Binder
Filer Authorized By:	
Attorney Docket Number:	6727/01145
Receipt Date:	19-JUN-2016
Filing Date:	09-JAN-2001
Time Stamp:	13:46:38
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	Signed-POA.pdf	137789 03199d6fc2535ea8201418fc7d2606b12fcefb97	no	2

Warnings:

Information:

2	Assignee showing of ownership per 37 CFR 3.73	SIGNED-sb0096-50.pdf	139264 c93c94ed7e90473e22fd45e8a4e617a75cbf bf8f	no	2
Warnings:					
Information:					
Total Files Size (in bytes):				277053	
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					

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POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:



Practitioners associated with the Customer Number:

131926

OR



Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:



The address associated with Customer Number:

131926

OR

Firm or
Individual Name

Address			
City	State	Zip	
Country			
Telephone		Email	

Assignee Name and Address:

Orckit IP, LLC
874 Walker Road, Suite C, Dover, Delaware, USA**A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.**

SIGNATURE (The Signature of Record)

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature			
Name	Yehuda Binder	Date	June 5, 2016
Title	CEO and Owner of Orckit IP LLC	Telephone	+972-54-4444577

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Leon Bruckman

Application No./Patent No.: 09/756,946

Filed/Issue Date: 01-09-2001

Titled: FLOW ALLOCATION IN A RING TOPOLOGY

ORCKIT IP, LLC

, a Limited Liability Company

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. ☒ the assignee of the entire right, title, and interest in;
2. ☐ an assignee of less than the entire right, title, and interest in
(The extent (by percentage) of its ownership interest is _____ %); or
3. ☐ the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

- A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy therefore is attached.

OR

- B. ☒ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: Leon Bruckman

To: ORCKIT COMMUNICATIONS LTD

The document was recorded in the United States Patent and Trademark Office at

Reel 011435, Frame 0015, or for which a copy thereof is attached.

2. From: ORCKIT COMMUNICATIONS LTD

To: ORCKIT IP, LLC

The document was recorded in the United States Patent and Trademark Office at

Reel 038529, Frame 0087, or for which a copy thereof is attached.

3. From: _____

To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☐ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Yehuda Binder/

Signature

Yehuda Binder

Printed or Typed Name

ORCKIT IP, LLC
DE LLC # 5886551
831 Beacon St. # 307
Newton, MA 02459-1840

June 19, 2016

Date

CEO and Owner of Orckit IP LLC

Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/756,946	01/09/2001	Leon Bruckman	

57449
SHEEHAN PHINNEY BASS & GREEN, PA
c/o PETER NIEVES
1000 ELM STREET
MANCHESTER, NH 03105-3701

CONFIRMATION NO. 6186
POWER OF ATTORNEY NOTICE



Date Mailed: 06/24/2016

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 06/19/2016.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/rmtturner myles/



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/756,946	01/09/2001	Leon Bruckman	

131926
May Patents Ltd. c/o Dorit Shem-Tov
P.O.B 7230
Ramat-Gan, 5217102
ISRAEL

CONFIRMATION NO. 6186
POA ACCEPTANCE LETTER



Date Mailed: 06/24/2016

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 06/19/2016.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/rmtturner myles/